LIQUID
INTELLIGENT TECHNOLOGIES

Mombasa to Kinshasa – Unlocking Trade in a Digitally Connected Continent.

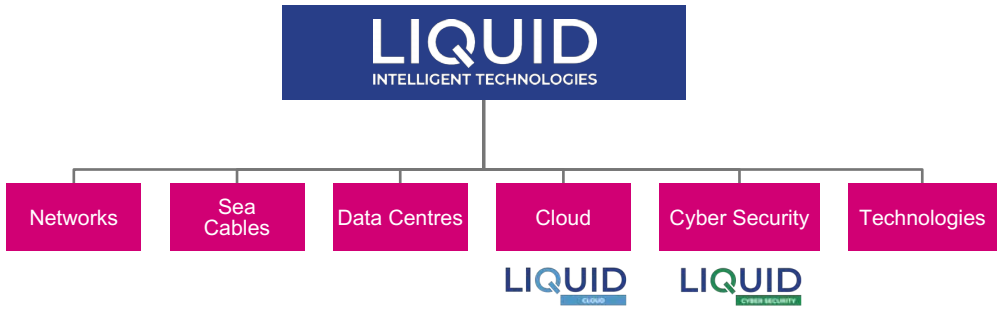
C2C Continued….

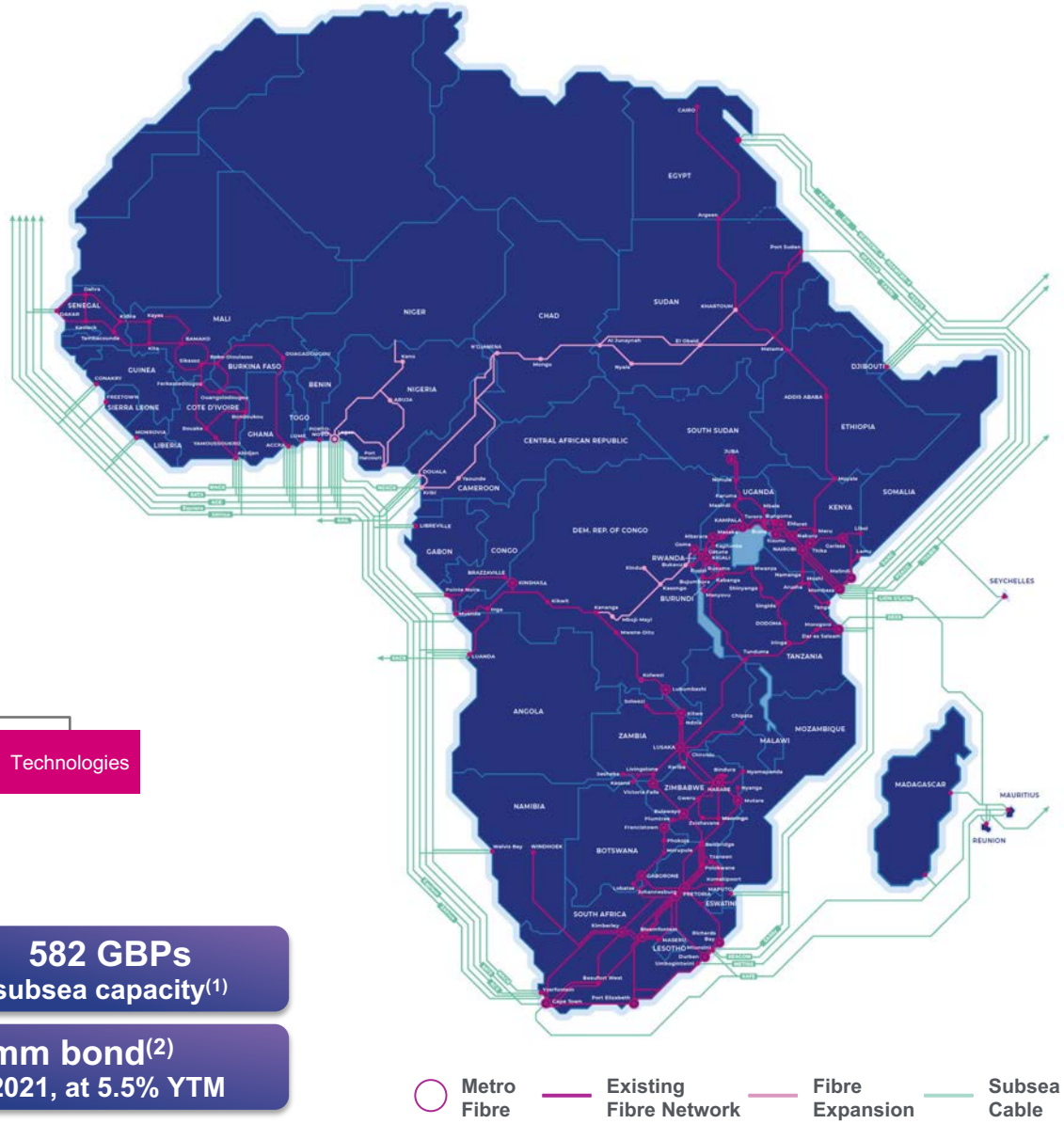
24th August 2023

Liquid Intelligent Technologies Overview

LIQUID
INTELLIGENT TECHNOLOGIES

- The leading cross-border communications and cloud solutions provider with owned proprietary network across 11 countries in SSA and 3 countries outside SSA
- Bringing high-speed and reliable **connectivity**, **colocation**, **cloud**, **cybersecurity** and **digital services** to mobile carriers and blue-chip enterprise customers
- Extensive **metropolitan and last mile access networks**





100,000+ km fibre network

14 countries in Africa

582 GBPs subsea capacity(1)

250,000 cloud seats

US$840mm bond(2) refinanced in 2021, at 5.5% YTM

Source: Company information.
Note: (1) As of February 28, 2021. (2) Consists of $620mn bond and $220mn variable ZAR term loan.

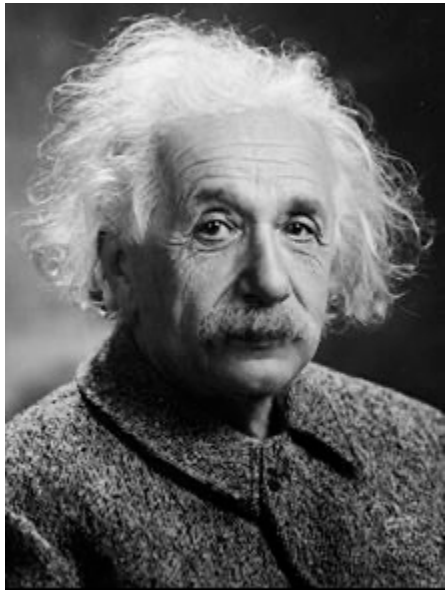
Recap - The Laws of Physics

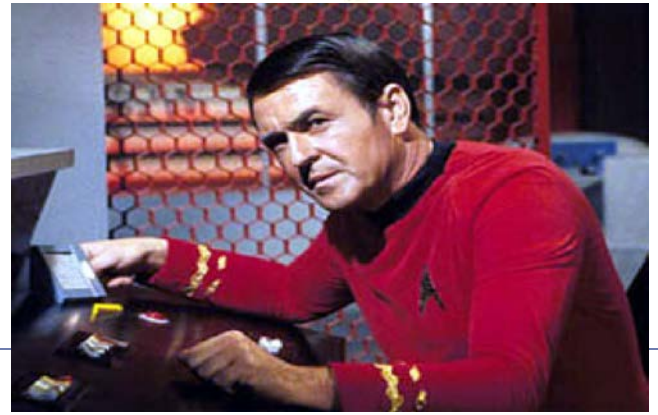
Theories
- Speed of light in a medium = c / refractive index
- Velocity= Distance/Time

UoM
- 1 ms = 1 second /1000
- RTT = Round trip delay – Time taken there and back
- 1 km = 1000 m

Universal Constants
- Speed of light in a vacuum (c) is 2.99 x 10^8 m/s
- Refractive index of doped silica with an index around 1.4475
- Speed of light in fibre = 2.06 x 10^8 m/s

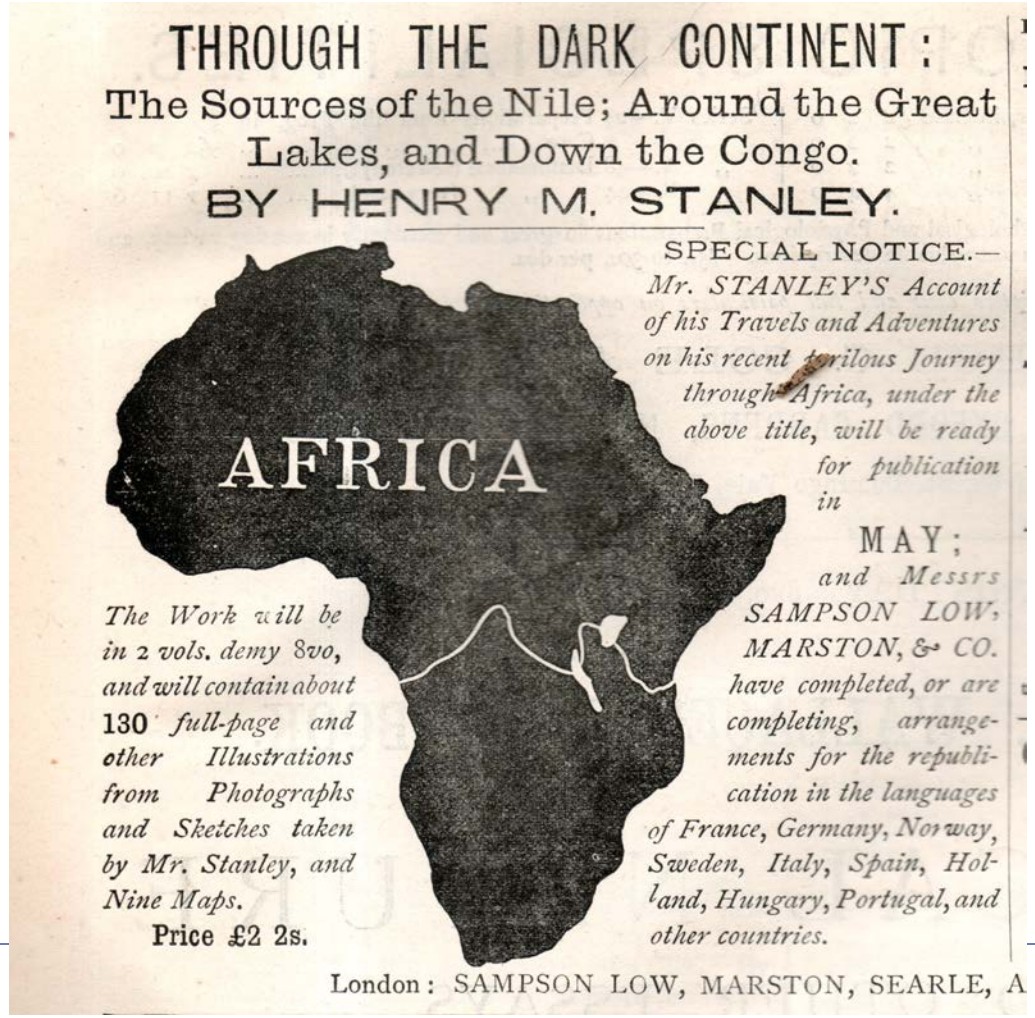
RTT (ms) = 1000 x 2 x Distance(m) / 2.06 x 10^8 m/s





Recap - Early Journeys by Europeans into Africa

- Henry Morton Stanley was a British explorer. He came to East Africa to look for David Livingstone, a missionary who had come to Africa and not returned home.
- He travelled over 700 kilometres through the dense tropical forests. He hoped that the journey through Africa would bring him fame and wealth.
- In 1871, he found Livingstone in Ujiji.
- Stanley wrote a book when he returned home to describe his adventures in Central Africa.
- In 1873, Stanley decided to continue with his travels. He travelled along River Congo to see if he could discover more new things in Africa.
- In 1877, he reached the Atlantic Ocean. He then wrote a book entitled “Through the Dark Continent.”

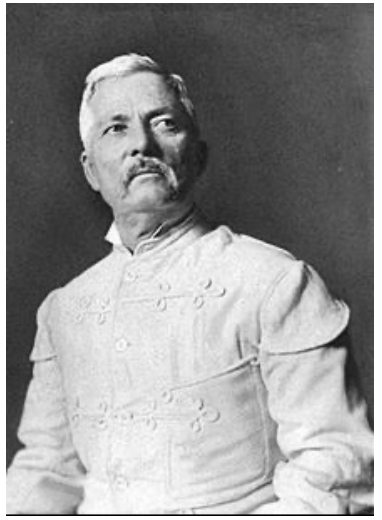

THROUGH THE DARK CONTINENT:
The Sources of the Nile; Around the Great Lakes, and Down the Congo.
BY HENRY M. STANLEY.

AFRICA

SPECIAL NOTICE.—*Mr. STANLEY'S Account of his Travels and Adventures on his recent perilous Journey through Africa, under the above title, will be ready for publication in*
MAY;
and Messrs SAMPSON LOW, MARSTON, & CO. have completed, or are completing, arrangements for the republication in the languages of France, Germany, Norway, Sweden, Italy, Spain, Holland, Hungary, Portugal, and other countries.

The Work will be in 2 vols. demy 8vo, and will contain about **130** *full-page and other Illustrations from Photographs and Sketches taken by Mr. Stanley, and Nine Maps.*
Price £2 2s.

London: SAMPSON LOW, MARSTON, SEARLE, A



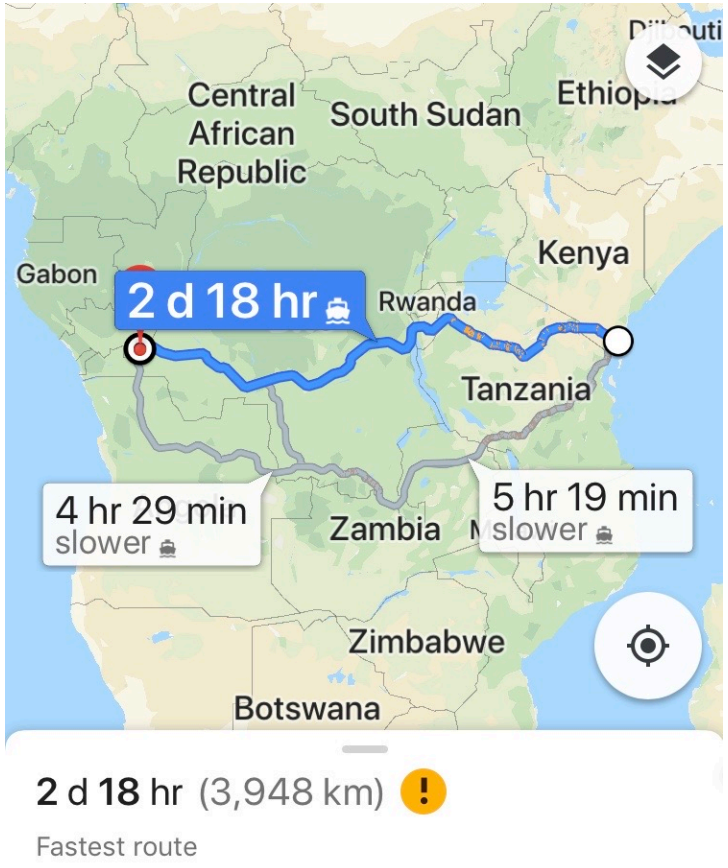
Name: Henry Morton Stanley
Born: 28 January 1841, Denbigh, United Kingdom
Died: 10 May 1904, London, United Kingdom

Recap - 2018 Africa Continental Free Trade Agreement

Intra-African trade at the moment sits at approximately 10%, whereas intra-European and Intra-North American trade sits at 30% to 40% within those continents

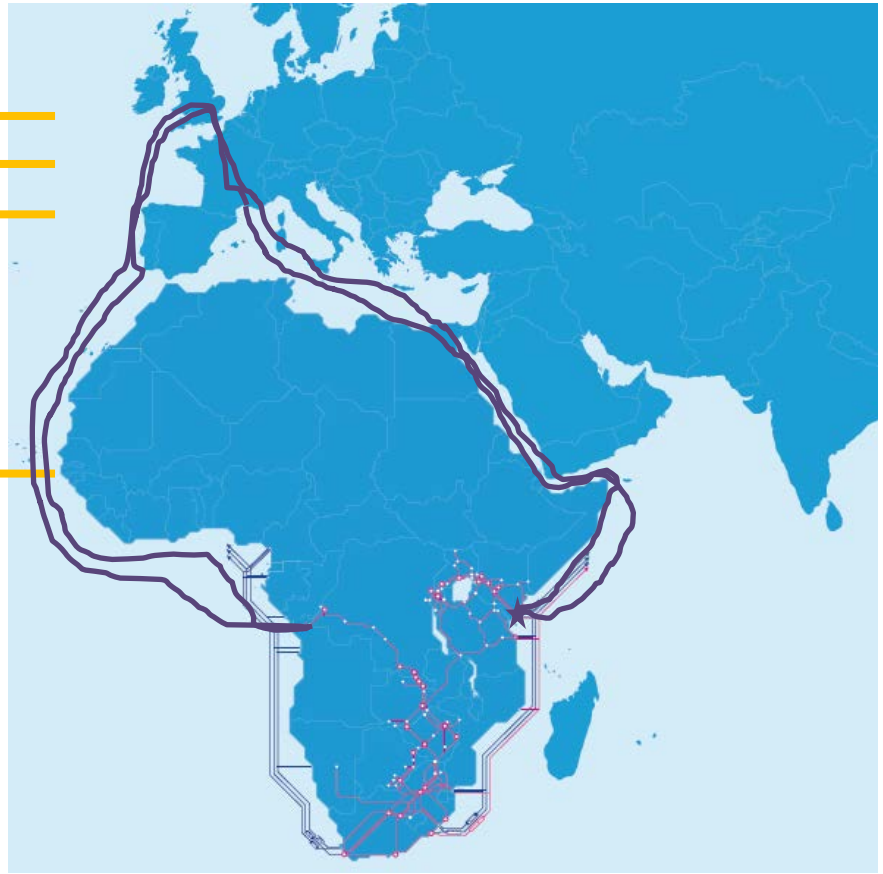
The deal creates a continental market of 1.2 billion people, with a combined gross domestic product of more than $3.4 trillion

Recap - 2018 - Mombasa to Kinshasa – 38 ms?



LKE-P1-MSA#traceroute 41.243.13.1
1 teng0-0-1-0-0-lfr-pe1-mrs.liquidtelecom.net
2 te0-0-0-0.luk-pe1-gsw.liquidtelecom.net
3 be5.luk-pe1-tho.liquidtelecom.net
4 5.11.10.95 145
5 195.66.226.204 131
6 182.79.222.165
7 125.62.187.189
8 dsl-del-static-078.45.246.61.airtelbroadband.in
9 41.243.13.1 302

296 ms



Emergence of the Digital Economy

But there is a Need for Speed

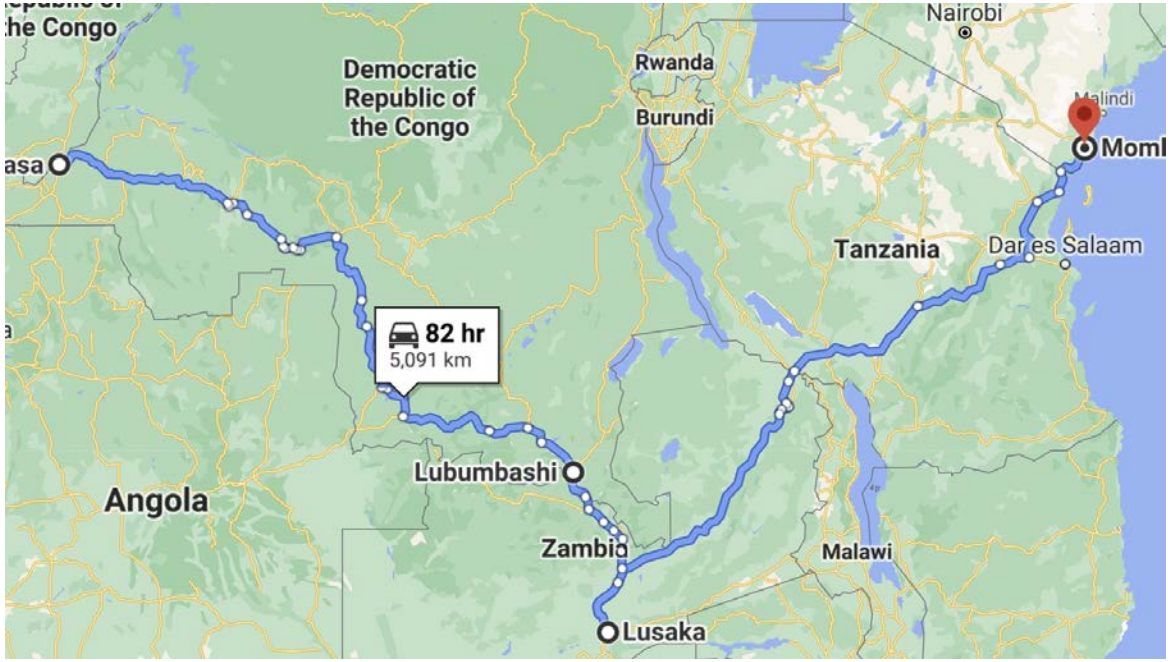
Stark & Widening Gulf Between Leading & Lagging Countries

- African startup ecosystems can be grouped into three categories based on the levels of publicly-disclosed venture capital (VC) funding since 2015.

High Startup Activity - TIER 1	*Modest Startup Activity* - TIER 2	*Negligible Startup Activity* - TIER 3
Nigeria South Africa Kenya Egypt	Ghana Tunisia Senegal Morocco Uganda Tanzania Algeria Zambia Cote d'Ivoire DR Congo Rwanda	Rest of Africa (40 countries)

Source: Fola Odufuwa & Muriuki Mureithi.

Now 61 ms - But will reduce to 40 ms



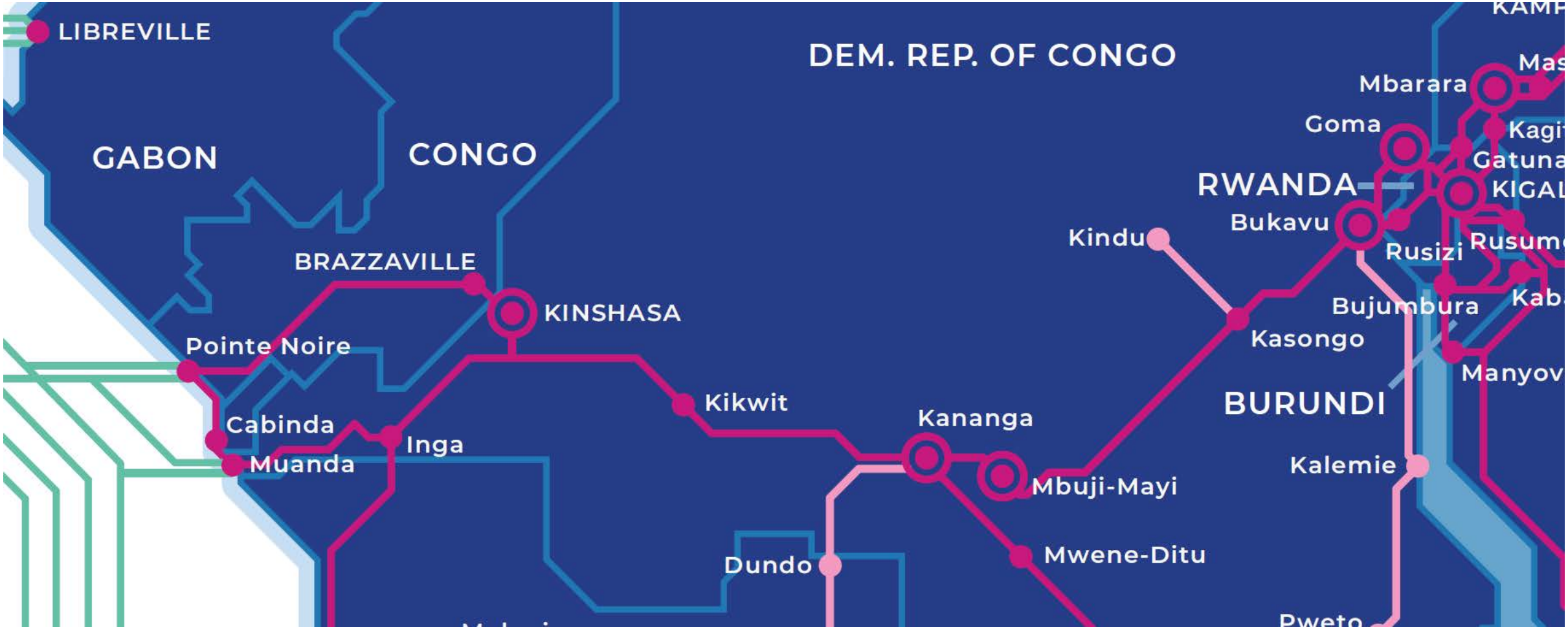
PE1-FIH> traceroute
197.155.86.231.liquidtelecom.net

63.188 msec

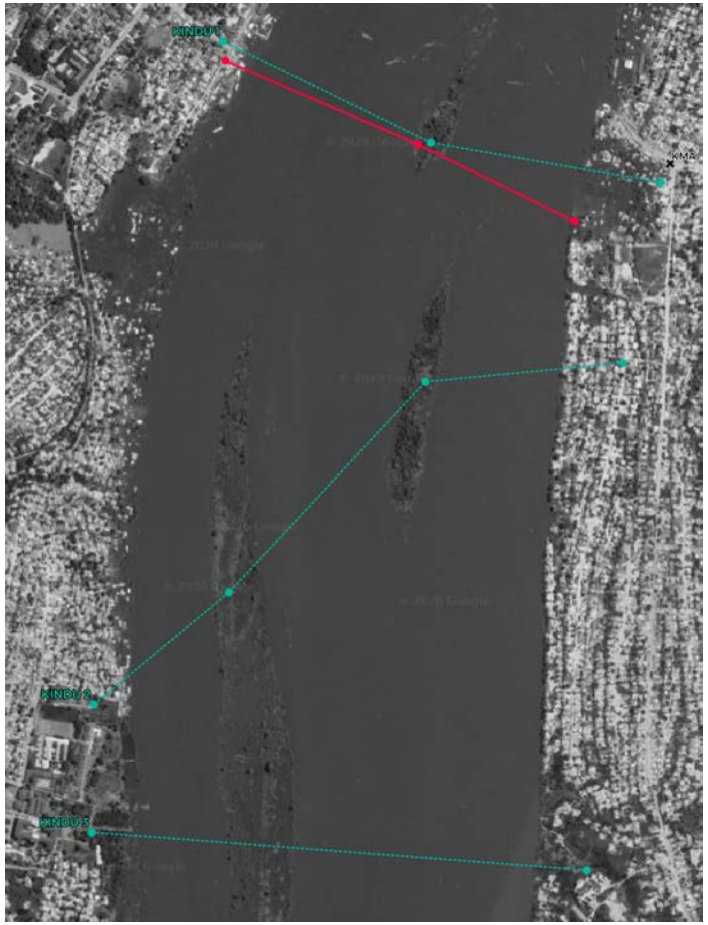
PE1-MSA > traceroute
197.155.86.230.liquidtelecom.net

62 msec

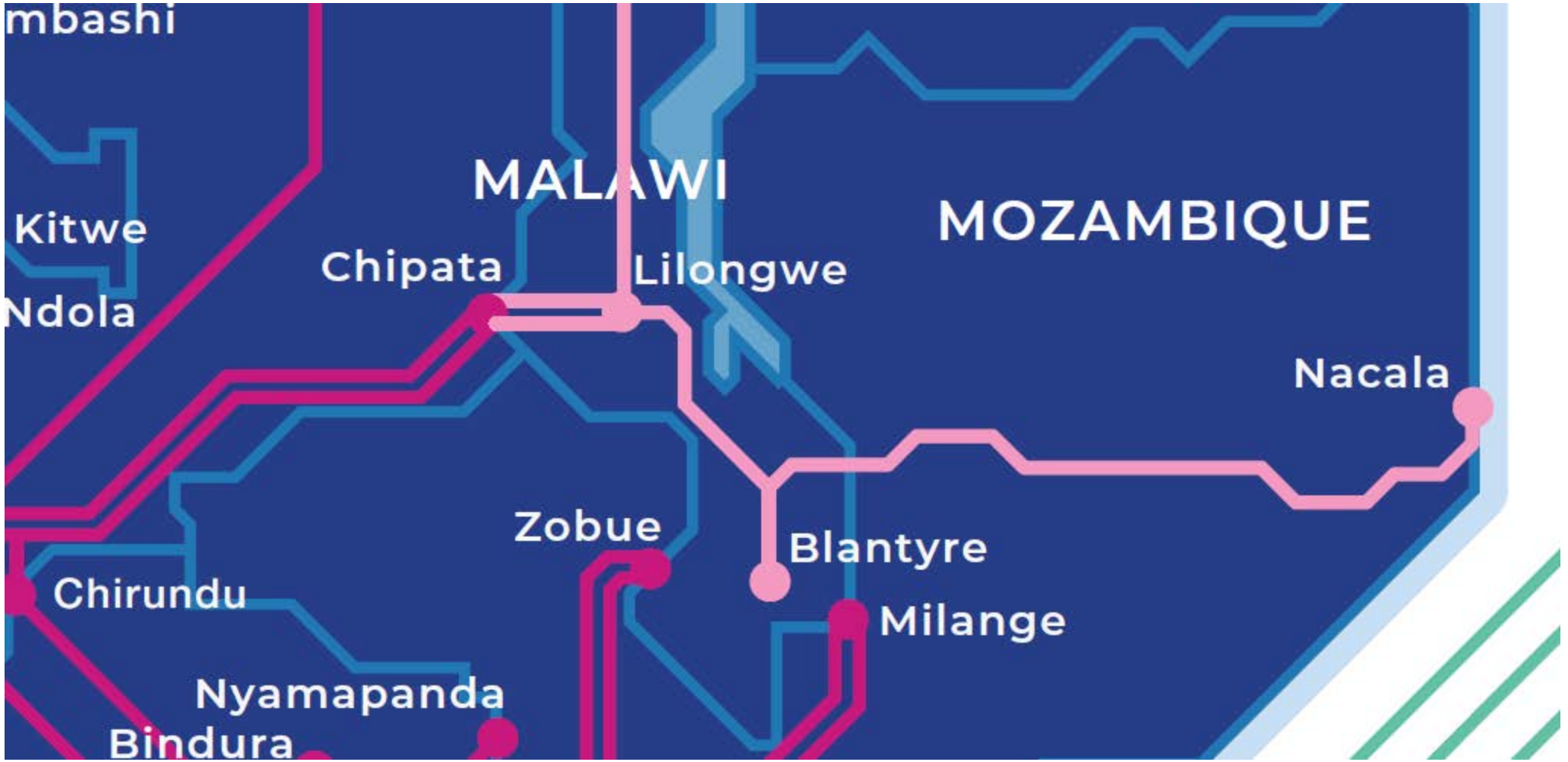
Impacting millions of Africans by addressing gaps in First and Middle Mile



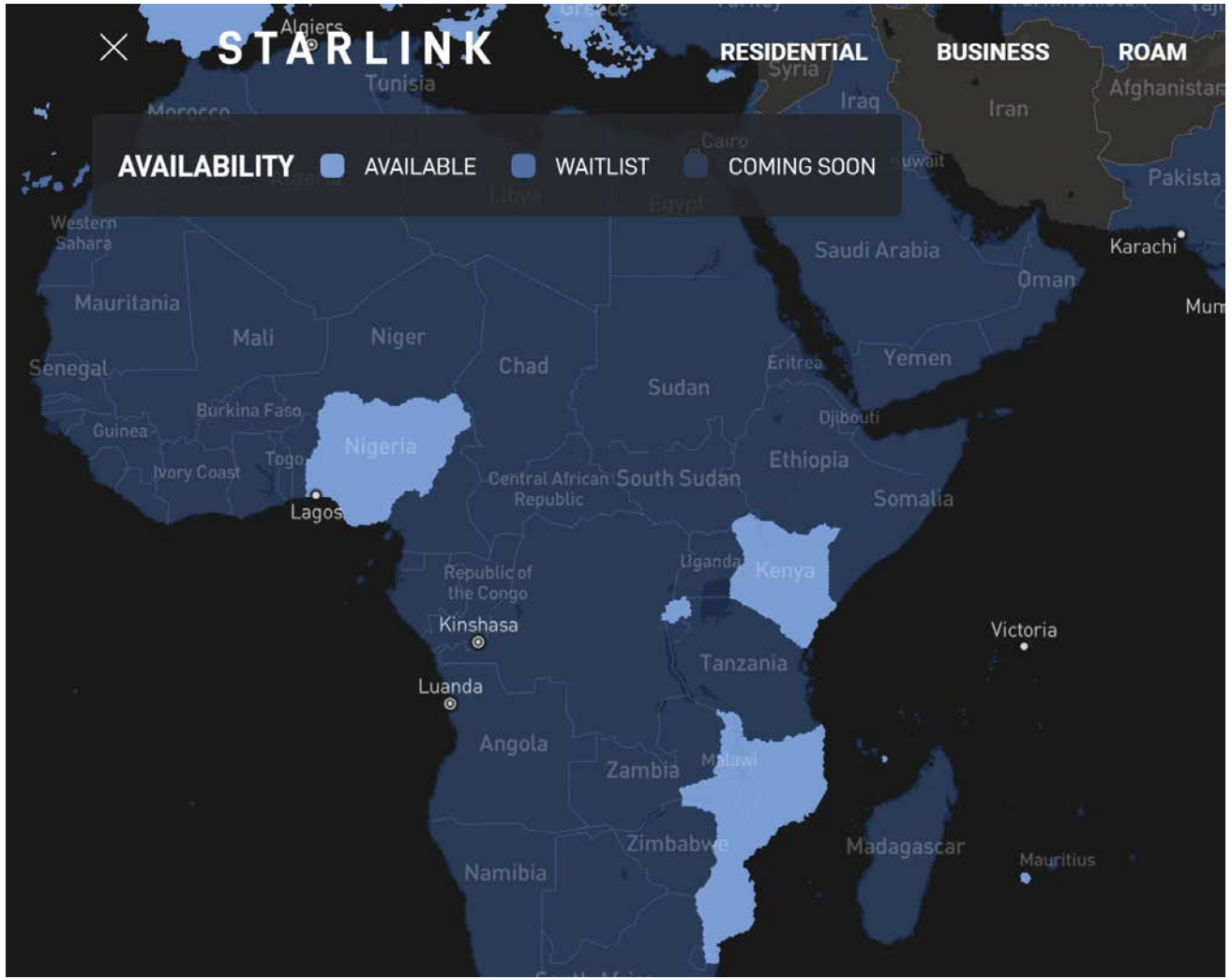
Technology and Civil Engineering Challenges to Solve



Strengthening Existing Cross Border Links for Enhanced Reliability



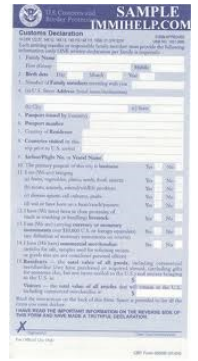
New Technologies delivering new Services in the Last Mile – And Some Not Suceeded



Digital Trade – Emerging Trend of Cross Border Harmonisation

To Travel Across a Border You need

- A valid document to be present on both sides of the document (Passport + Visa)
- A means of travel (Plane, Train, car)
- Proof of payment of that means of travel (ticket, vehicle log book)
- To declare any goods you carry across and pay appropriate taxes
- A reason to go (holiday, business etc)
- You might need or useful to have
- Yellow Fever Certificate
- Local currency in the country you go to
- Local currency to spend when you get there
- Different clothes and equipment appropriate to the weather/climate and activity you are going to do



For Cross Border Trade We need to think about

- Data Protection
- Taxation
- Addressing
- Identity

Digital Policy aligning to Foreign Policy to Dive Trade through Regional Blocs

Our digital future starts here.

Malawi launches Diplomatic Data Corridors project

06 March 2023

Malawi has launched the Diplomatic Data Corridors project to address the high cost of internet and data services, as well as the country's low internet penetration.

Malawi's government has entered negotiations with Mozambique, Tanzania, and Zambia to consider directing their internet traffic into Malawi.

Daud Suleman, director general of the Malawi Communications Regulatory Authority (Macra), said that the country wants to double the current internet penetration rate to 40% in three years and leverage connections from undersea cables into Malawi to

Nairobi Declaration on the AfCFTA Digital Trade Protocol: Unlocking the Opportunity of Africa's Digital Trade

Our digital future starts here.

Intersect with other protocols

- Adopting a "digital-first" approach to the related services Negotiations
- Recognition of a balanced approach to source code protection as part of the IP Protocol Patent Annex negotiations
- Start-up and tech sector considerations in the Investment Protocol

Annex on digital ID

- A unified approach to Digital ID as first priority for cross-border financial flows

Annex on cross-border data transfers

- Taxation & duties
- Adopt the Malabo convention and implement a liberalization approach to data localisation and cross-border data flows

Annex on emerging and advanced technologies

- A digital-first approach to data storage and retrieval- Cloud First
- Development of principles for a proportionate, risk-based approach to AI, with a mutual recognition clause
- Implementing an African regulatory sandbox for distributed ledger technologies to aid e-commerce

Annex on cross-border payment

- A digital-first approach to the second phase of the Guided Trade Initiative

Annex on the Pan-African Digital Trade Centre

- Capacity building
- Involvement of industry experts in further developing theregulatory system

Public

Afreximbank launches Africa Trade Gateway, a single window for digital services

Our digital future starts here.

Accra, 21 June 2023

MANSA, Africa's due diligence platform, provides a single source of primary data required for the conduct of customer due diligence on African entities.

PAPSS was established to enable efficient payment for intra-African trade in national currencies, promoting intra-African trade, minimising risk and contributing to financial integration across Africa.

TRADAR Club, is member-driven network aimed at empowering international businesses and executives to transform trade and investments in Africa through trusted trade intelligence and advisory services through innovative digital tools and networking opportunities.

ATEX is a B2B and B2G e-commerce platform to help small and medium scale and large African businesses to tap into new markets in Africa and to facilitate the optimisation of their supply chains.

ATG Connect serves to connect business service providers across Africa. It provides freight and logistics connectivity solutions which allow for frictionless connecting and matching of freight/ logistics requests with freight and logistics providers listed on the platform. Customers can get quotes for the pickup and delivery of goods to and from any location in Africa at a very competitive price.

Public

But I’m Just a Network Engineer. Whats my role in all this Geo-Politics?

- Peer!
- Configure networks Properly for better Customer Experience
- Use Open Network Data for Strategic Decision Making
- Contribute Data into Open Data Initiatives
- Share Experiences to build each others capacity
- Inform your wider business executives about tech policy emerging issues

Possible Outcomes…

- Make new friends and business relationships
- Affordable Data
- Faster Digital Adoption when Stuff works good…
- Data Driven Policy Development and Review
- Impact Financing

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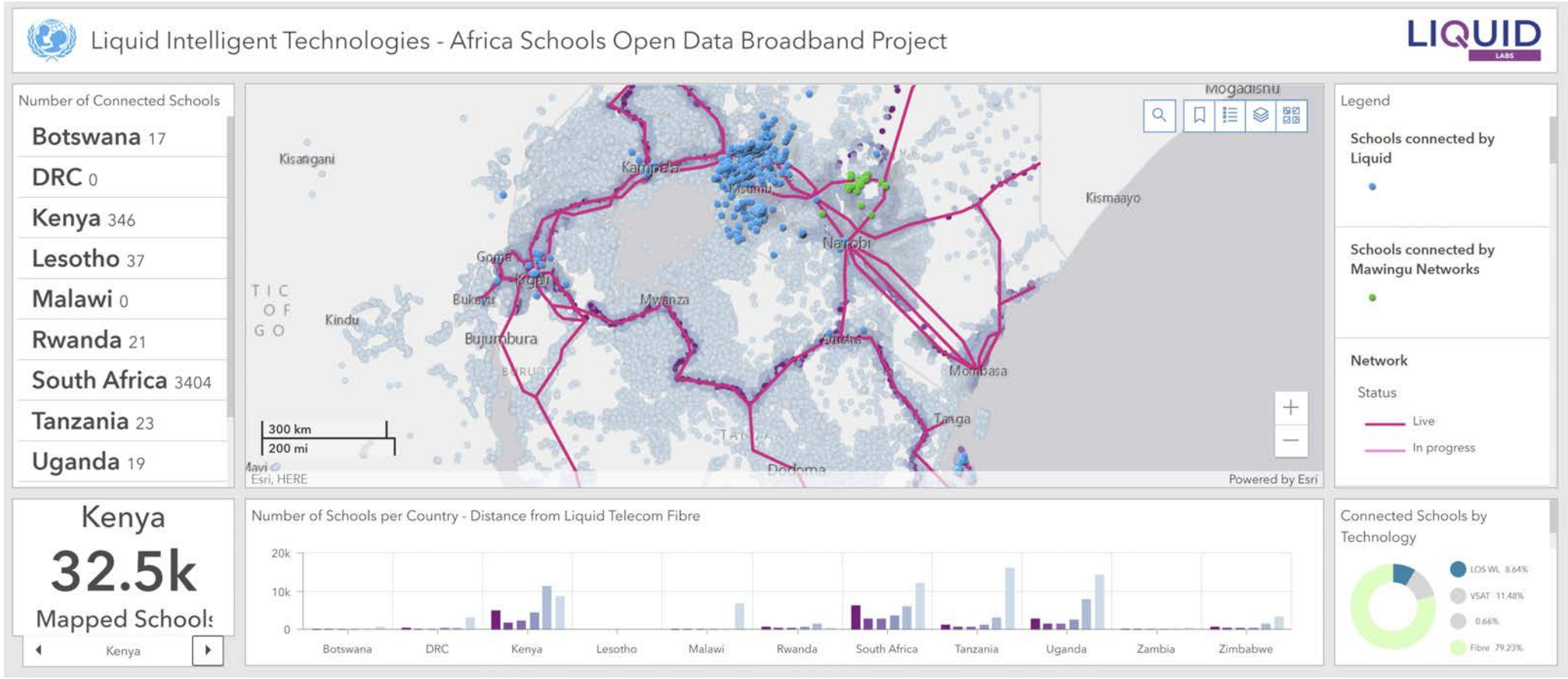
Open –Schools Mapping Project schools.liquid.tech

- Used Publicly available open data
- Or data Requested from Ministries
- Installing school connectivity for UNICEF in Kenya – 250 Primary Schools
- 11 countries ~ 250,000 Schools Mapped
- Around 5000 Schools Connected
- Schools.liquid.tech
- https://www.unicef.org/innovation/press-releases/unicef-and-liquid-launch-partnership-giga



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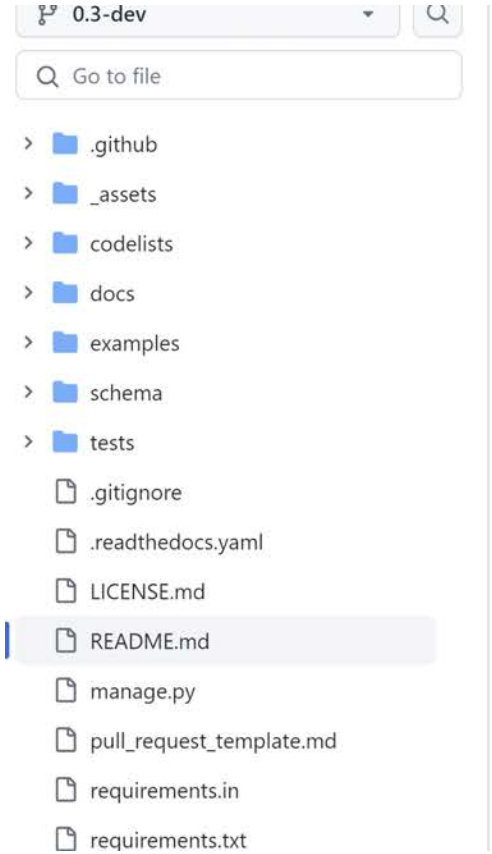
Open Fibre Mapping

Our digital future starts here.

https://github.com/Open-Telecoms-Data/open-fibre-data-standard



Open Fibre Data Standard

Welcome to the GitHub repository for the Open Fibre Data Standard.

Contributing

To contribute to the development of the standard, check out the discussion tracker. To facilitate discussions, we have prepared a number of consultation topics with accompanying documents to act as starting points for discussion. These are:

- Data stewardship, publication formats and access methods | Document | Discussion
- Demand side research: Use cases | Document | Discussion
- Supply side research: Common concepts and standardisation | Document | Discussion
- Conceptual model | Document | Discussion

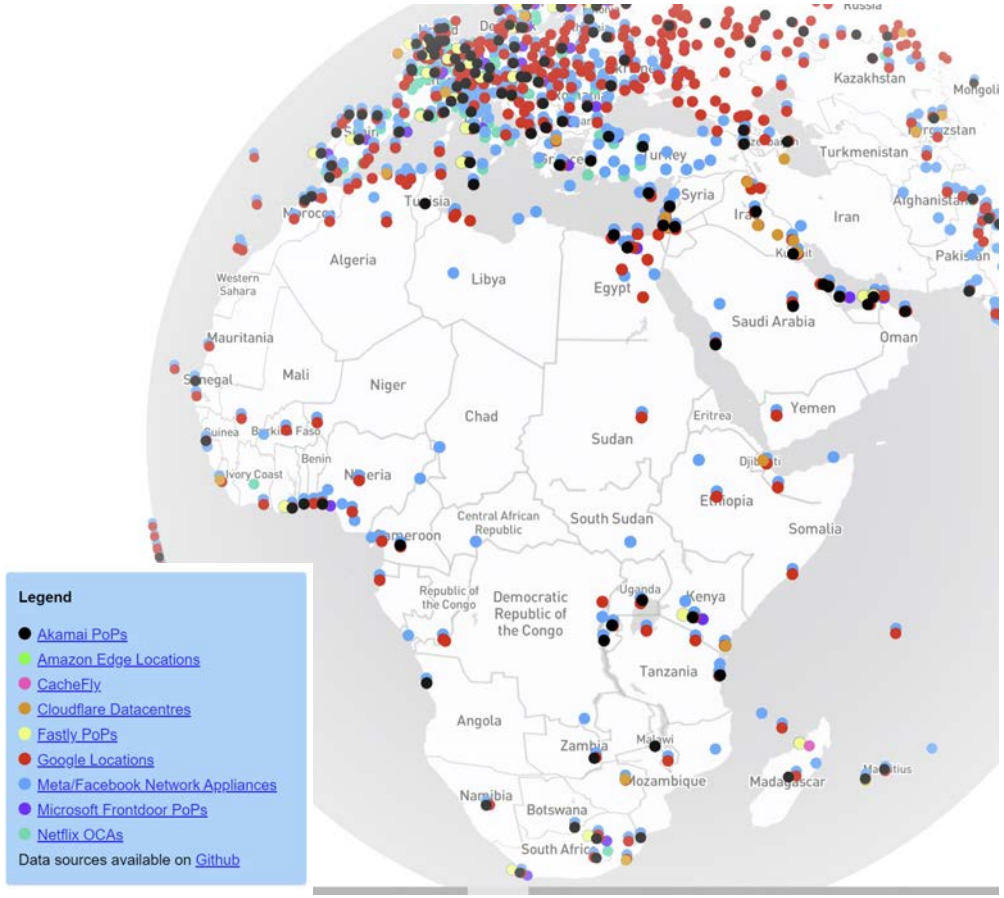
Background

The World Bank, the International Telecommunications Union (ITU), Mozilla Corporation, the Internet Society (ISOC), Liquid Intelligent Technologies, CSquared, and Digital Council Africa are partnering to promote the collaborative development of open data standards for describing telecommunications infrastructure. The first challenge we have taken on is that of terrestrial fibre optic infrastructure.

Open Content Delivery Networks Mapping

Our digital future starts here.

https://opentelecomdata.org/cdns/



Observations

- Every country has at least one CDN cache
- ‘Hub Cities’ have all/most CDNs
- Mix of operator caches and IXP hosted
- Physical density is sparse
- Only a few countries have density of caches in tier 2 cities
- Google and Meta have the most caches

Public

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Thank You