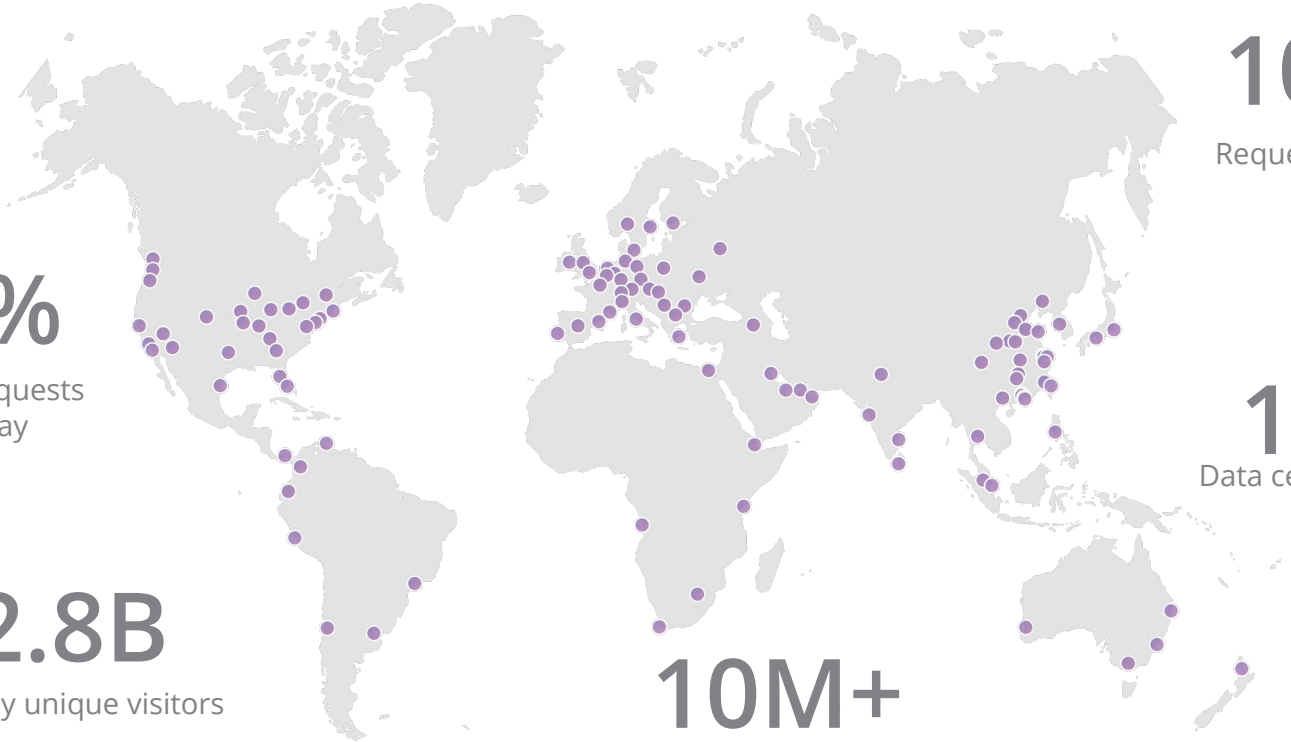
Traffic trends in Africa

AfPIF 2018, Cape Town

Who are we ?



10M
Requests/second

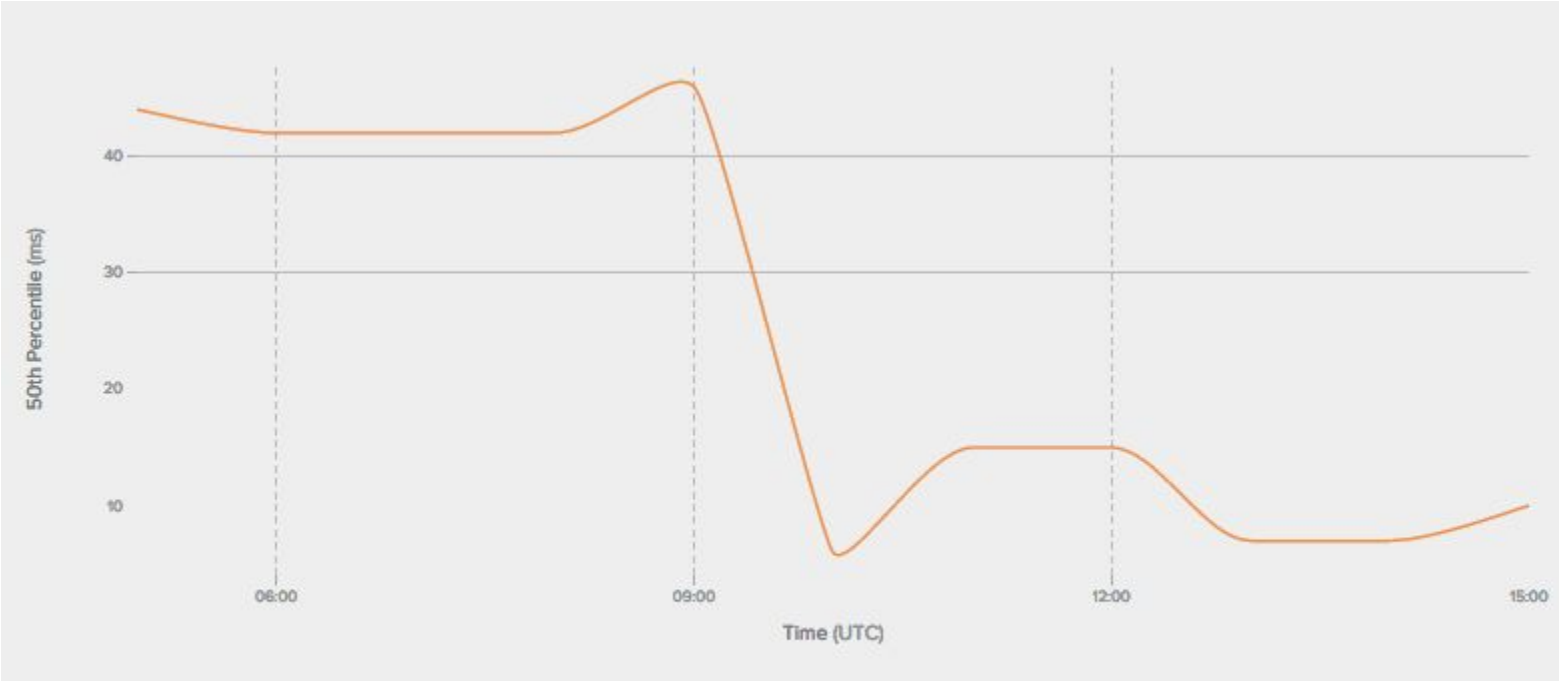
10%
Internet requests everyday

151+
Data centers globally

2.8B
Monthly unique visitors

10M+
websites, apps & APIs in 150 countries

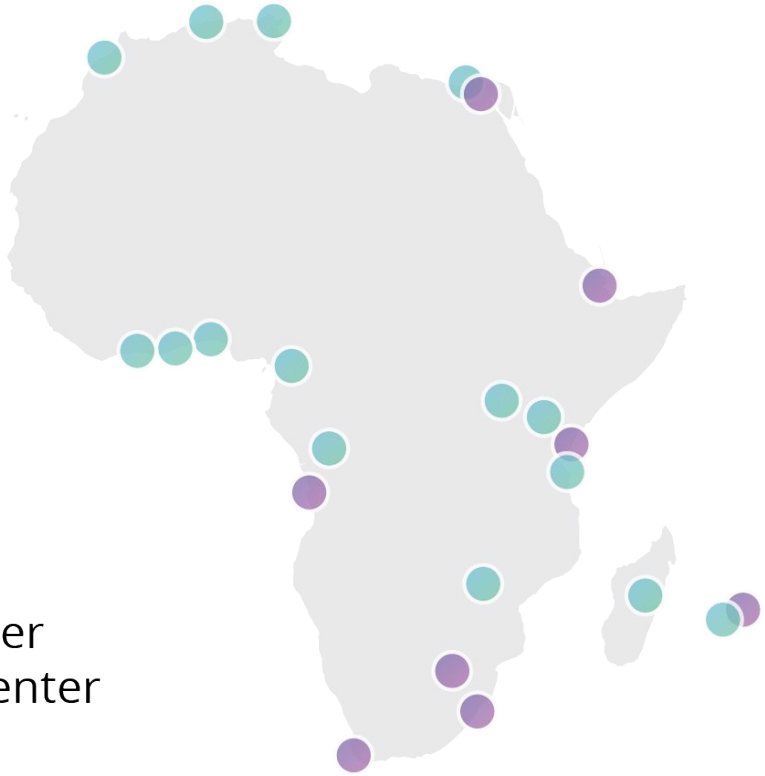
~10 million Internet applications faster in…



Measurements of the Speed of Light

Date	Investigator	Method	Estimate Kilometers/Second
1667	Galileo Galilei	Covered Lanterns	333.5
1676	Ole Roemer	Jupiter's Moons	220,000
1726	James Bradley	Stellar Aberration	301,000
1834	Charles Wheatstone	Rotating Mirror	402,336
1838	François Arago	Rotating Mirror	
1849	Armand Fizeau	Rotating Wheel	315,000
1862	Leon Foucault	Rotating Mirror	298,000
1868	James Clerk Maxwell	Theoretical Calculations	284,000
1875	Marie-Alfred Cornu	Rotating Mirror	299,990
1879	Albert Michelson	Rotating Mirror	299,910
1888	Heinrich Rudolf Hertz	Electromagnetic Radiation	300,000
1889	Edward Bennett Rosa	Electrical Measurements	300,000
1890s	Henry Rowland	Spectroscopy	301,800
1907	Edward Bennett Rosa and Noah Dorsey	Electrical Measurements	299,788
1923	Andre Mercier	Electrical Measurements	299,795
1926	Albert Michelson	Rotating Mirror (Interferometer)	299,798
1928	August Karolus and Otto Mittelstaedt	Kerr Cell Shutter	299,778
1932 to 1935	Michelson and Pease	Rotating Mirror (Interferometer)	299,774
1947	Louis Essen	Cavity Resonator	299,792
1949	Carl I. Aslakson	Shoran Radar	299,792.4
1951	Keith Davy Froome	Radio Interferometer	299,792.75
1973	Kenneth M. Evenson	Laser	299,792.457
1978	Peter Woods and Colleagues	Laser	299,792.4588

Continental presence



Live Data Center
Future Data Center

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Open (8):

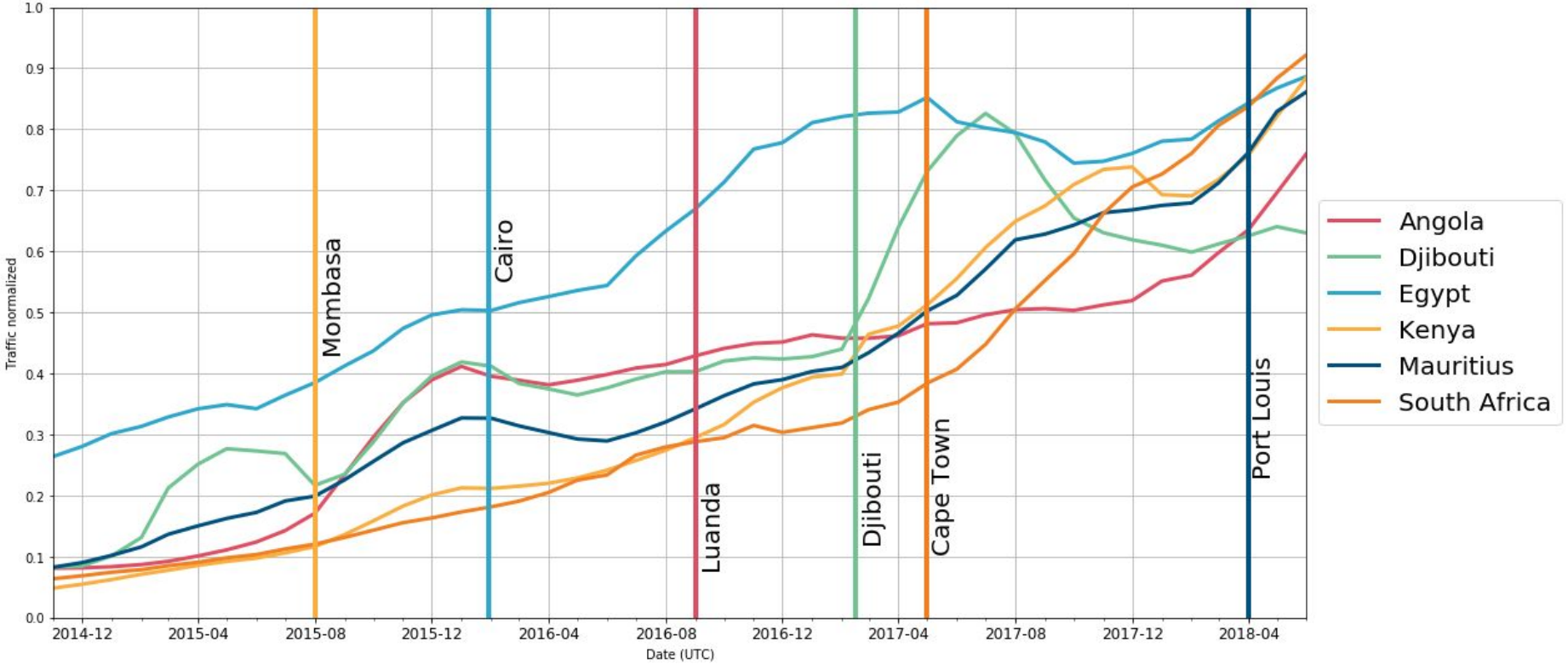
- ✓ Djibouti
- ✓ Angola
- ✓ Johannesburg, Cape Town, Durban
- ✓ Mauritius
- ✓ Kenya
- ✓ Egypt

Coming (14):

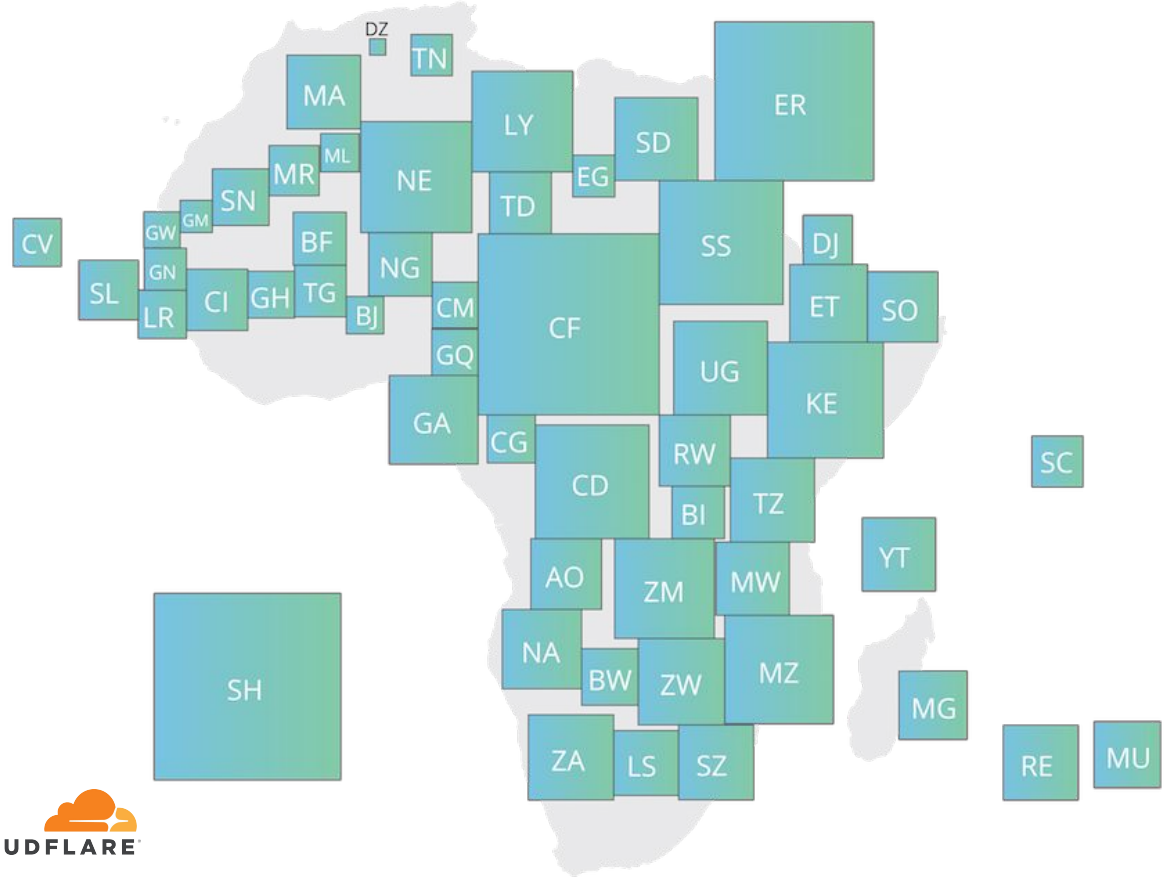
- ☐ Ghana
- ☐ Egypt
- ☐ Algeria
- ☐ Madagascar
- ☐ Morocco
- ☐ Tanzania
- ☐ Zimbabwe
- ☐ Uganda
- ☐ Côte d'Ivoire
- ☐ Cameroon
- ☐ La Reunion
- ☐ DRC
- ☐ Nigeria
- ☐ Tunisia

Cloudflare measurements

Evolution of traffic when edge nodes are deployed



Average latencies to Europe



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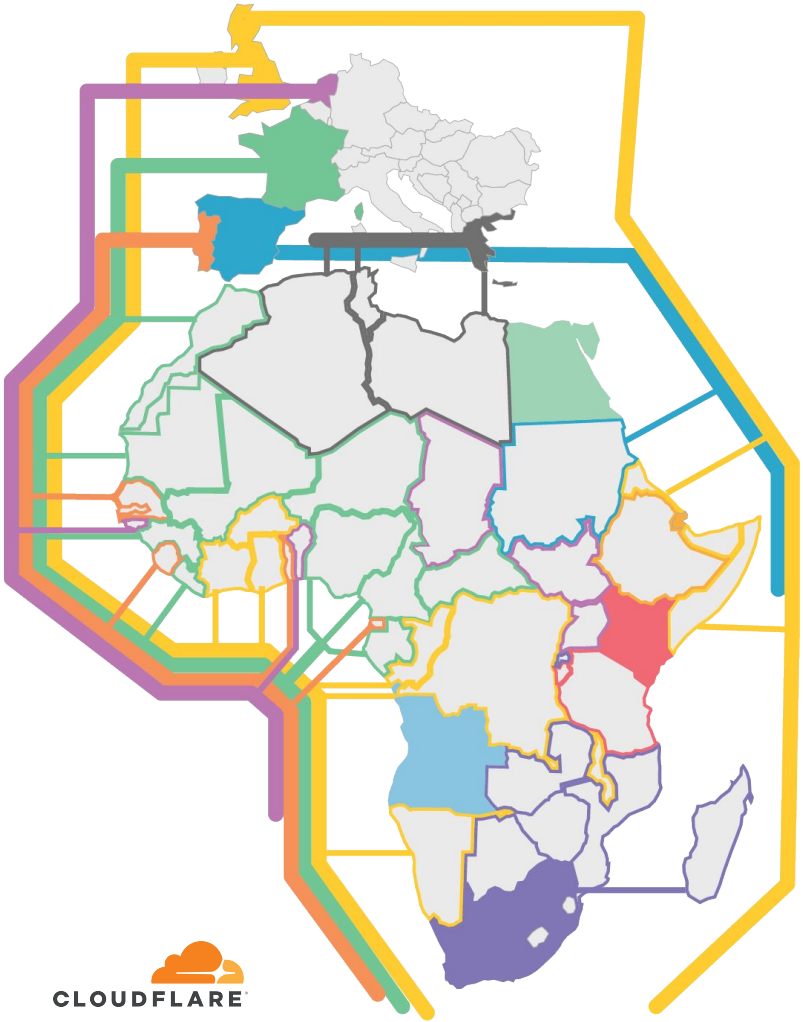
Low latencies from western coastal countries

Central countries have higher latencies due to distance to submarine cables and limited interconnection options



Where is African traffic mostly being served from

Nothing surprising here:

French speaking countries are served from France

English speaking countries are served from London

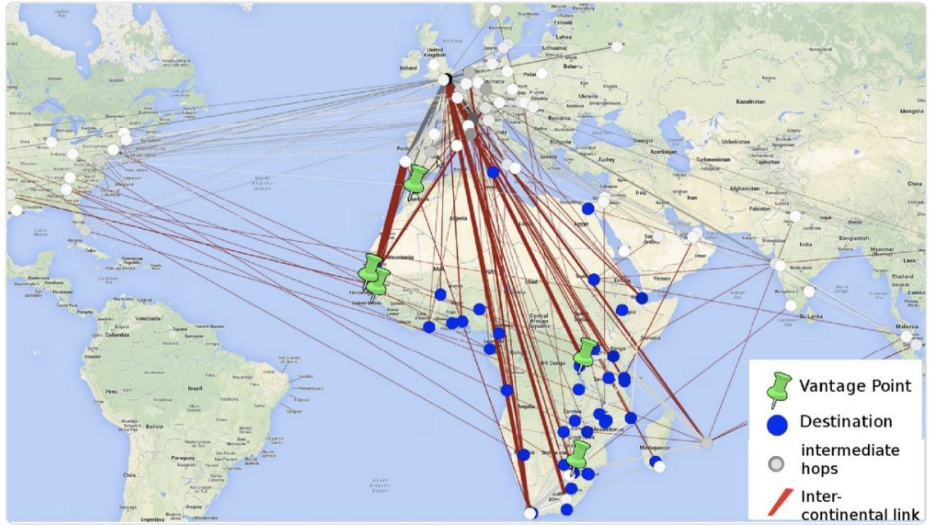
New trend: some countries break ties and start serving traffic from closer European countries: Portugal, Spain and Greece

niels✊🏽♥8♠

@nielstenoever

Following

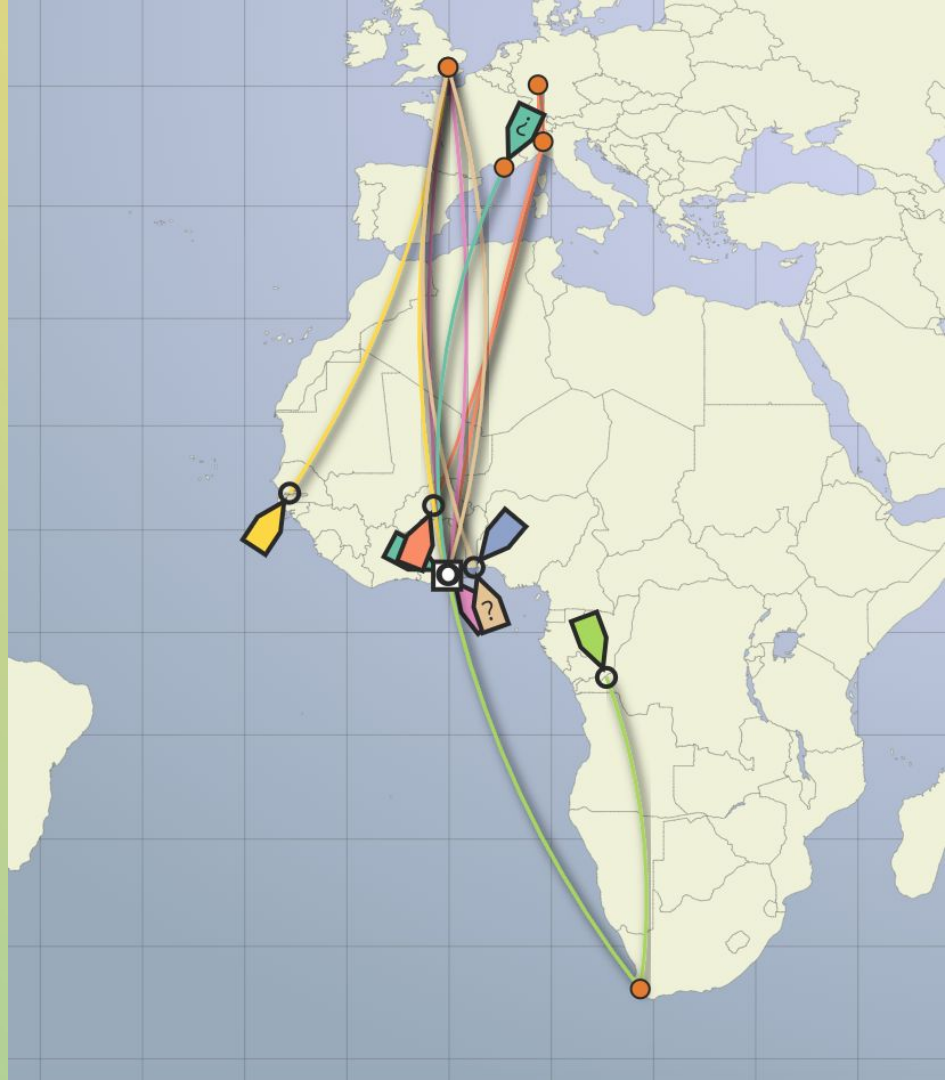
Amazing how much of the African Internet traffic goes through Europe, with high latency and high costs as a result. #IETF100 #GAIA #needmorepeering



6:41 AM - 15 Nov 2017

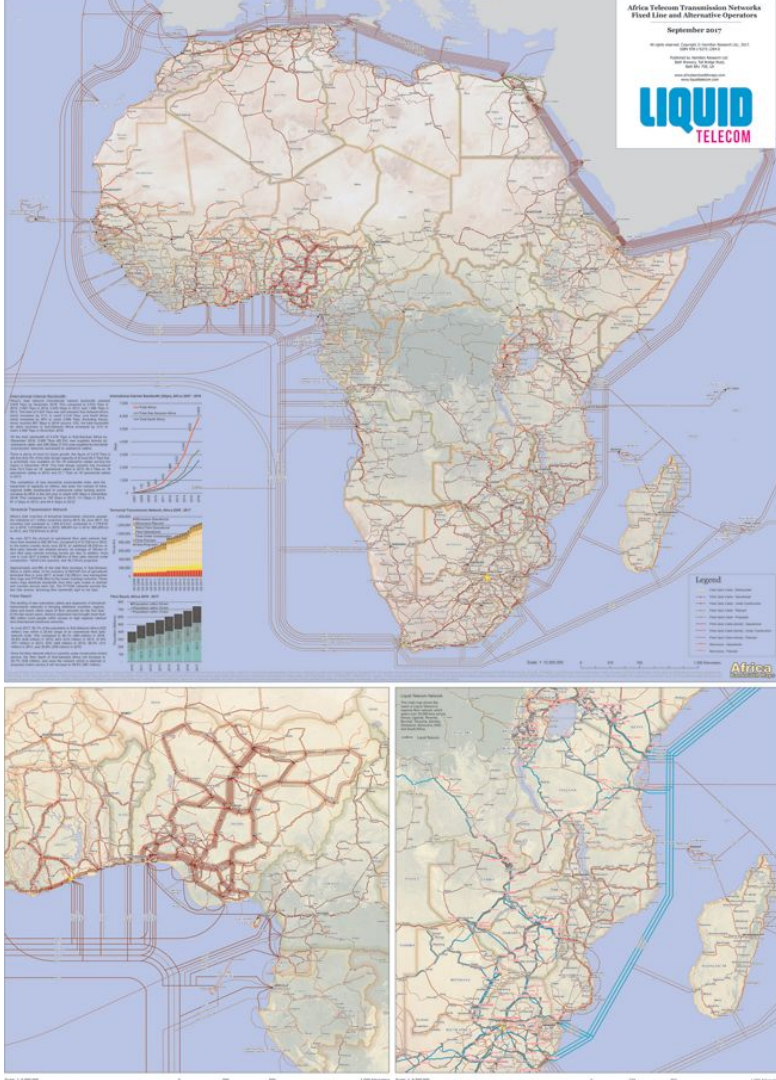
145 Retweets **106** Likes

Our own tests using RIPE Atlas confirm that most inter-ISP traffic is routed through Europe



Edge deployment is much needed

- √ Higher latencies than anywhere else in the world
- √ Because of the longer distances. Africa is huge.
- √ But also because of the limited inland interconnections
- √ A continent that still essentially relies on its connections to Europe



"Source: Hamilton Research 2017, www.africabandwidthmaps.com"

Initiatives like One Africa Network will help building that ecosystem

Ben Roberts
@benliquidkenya

Following

Our technicians from @liquidtelecom in ‘No mans land’. The space between borders. Fixing fibre that works across borders. This is how we keep Africa’s Digital Future running . #SomewhereinAfrica.

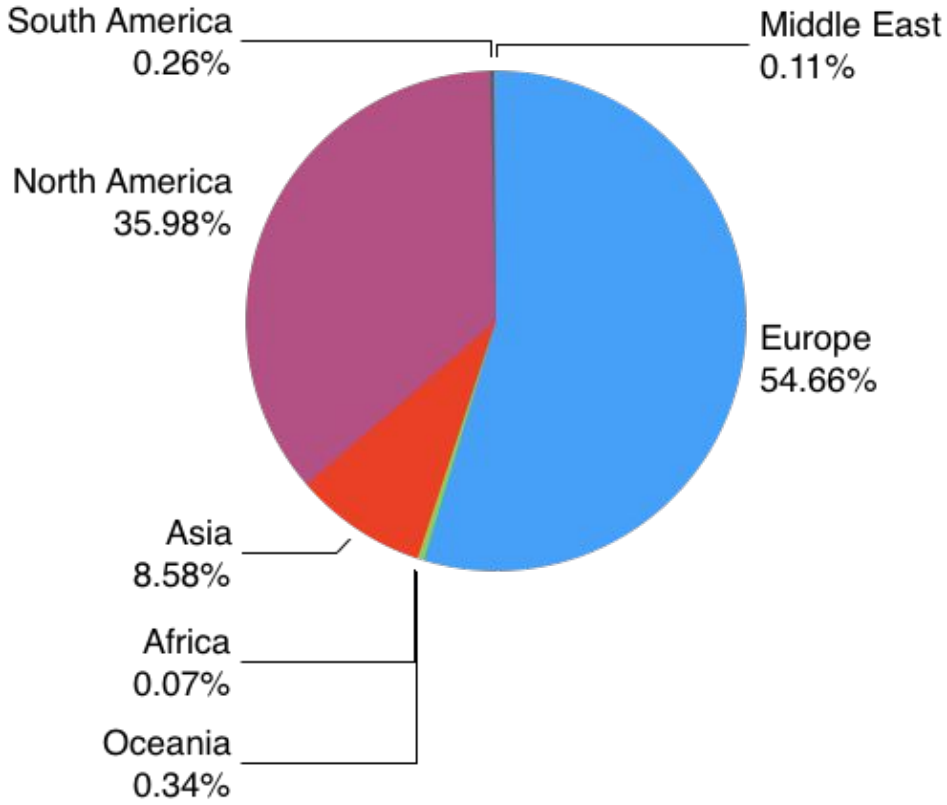
2:03 PM - 22 May 2018

15 Retweets **28** Likes

2 15 28

The content

Where is content hosted ?



10 millions web properties flow through our servers, sitting between the users and the hosting providers.

We have a unique view of where the content is hosted.

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Looking for African hosted content

A popular Moroccan content hosted on Afrinic IPs

```
inetnum:        41.77.112.0 - 41.77.119.255
netname:        GENIOUS-v4
descr:          Genious Communications
country:        MA
org:            ORG-GC6-AFRINIC
admin-c:        HA11-AFRINIC
tech-c:         LOH1-AFRINIC
status:         ALLOCATED PA
mnt-by:         AFRINIC-HM-MNT
mnt-lower:      GENIOUS-MNT
source:         AFRINIC # Filtered
parent:         41.0.0.0 - 41.255.255.255
```

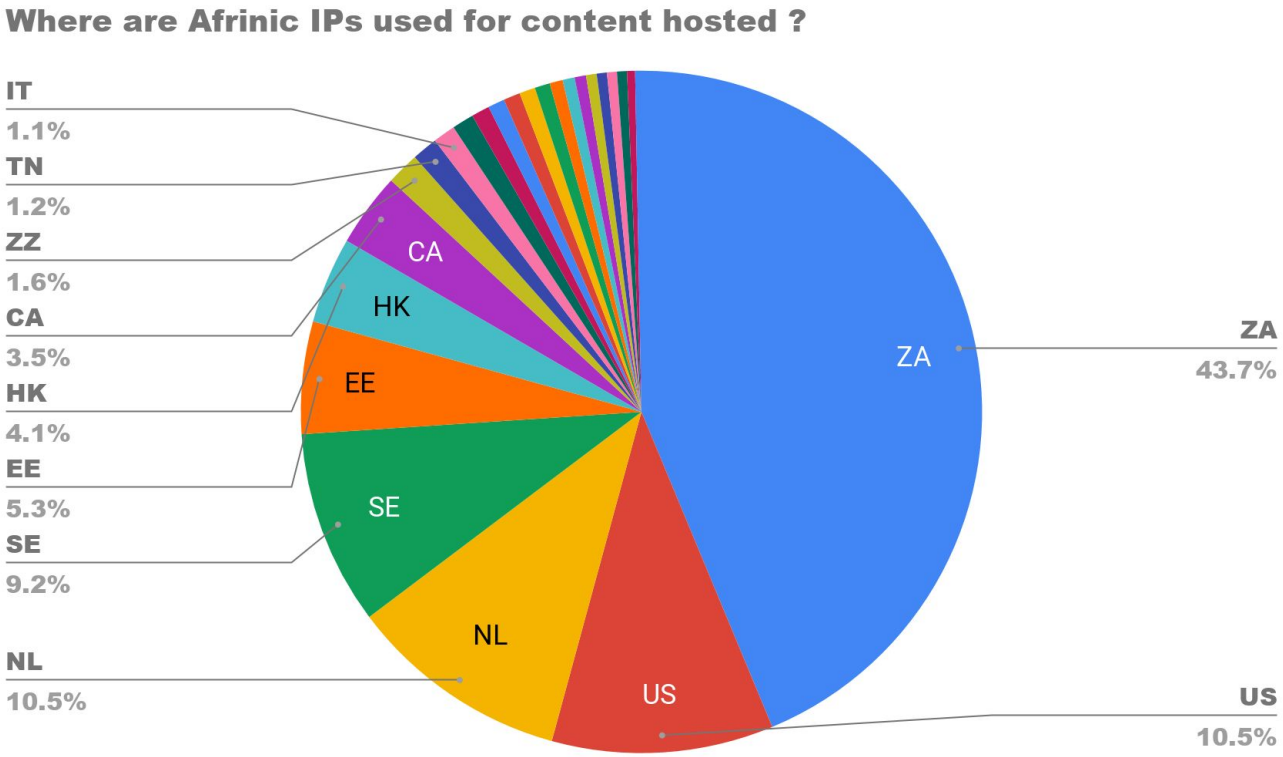
Too good to be true

```
jerome@edge01.jnb01> traceroute  41.77.116.1
traceroute to 41.77.116.1 (41.77.116.1), 30 hops max, 52 byte packets
 1  ae-2-113.er-01-jnb.za.seacomnet.com (105.22.32.217)  1.245 ms  1.555 ms  1.218 ms
 2  ce-0-2-0-0.cr-02-jnb.za.seacomnet.com (105.16.28.2)  157.321 ms ce-0-3-0-0.cr-01-jnb.za.seacomnet.com (105.16.29.1)
164.310 ms ce-0-3-0-0.cr-02-jnb.za.seacomnet.com (105.16.29.2)  162.336 ms
     MPLS Label=24190 CoS=0 TTL=1 S=1
 3  xe-0-0-0-8.cr-02-cpt.za.seacomnet.com (105.16.9.182)  160.678 ms xe-0-1-0-2.cr-02-cpt.za.seacomnet.com
(105.16.9.158)  158.034 ms xe-0-0-0-8.cr-02-cpt.za.seacomnet.com (105.16.9.182)  157.300 ms
     MPLS Label=24019 CoS=0 TTL=1 S=1
 4  xe-0-0-0-4.cr-01-lhr.uk.seacomnet.com (105.16.13.38)  159.904 ms  158.913 ms  159.625 ms
     MPLS Label=24009 CoS=0 TTL=1 S=1
 5  xe-0-0-1-0.br-01-lhr.uk.seacomnet.com (105.16.35.254)  156.852 ms  156.714 ms  157.387 ms
 6  ldn-b5-link.telia.net (213.248.97.177)  164.961 ms  156.711 ms  156.984 ms
 7  ldn-bb3-link.telia.net (213.155.132.194)  156.698 ms  156.988 ms  156.874 ms
 8  nyk-bb4-link.telia.net (62.115.136.185)  225.922 ms  227.830 ms *
 9  ldn-bb4-link.telia.net (62.115.134.138)  235.410 ms motl-b1-link.telia.net (62.115.134.53)  233.169 ms  233.357 ms
     MPLS Label=6038 CoS=0 TTL=1 S=1
10  po-50-60.csr2.mtl8.globo.tech (67.215.0.168)  245.656 ms  246.012 ms  245.715 ms
```

Hosted in **Montreal**

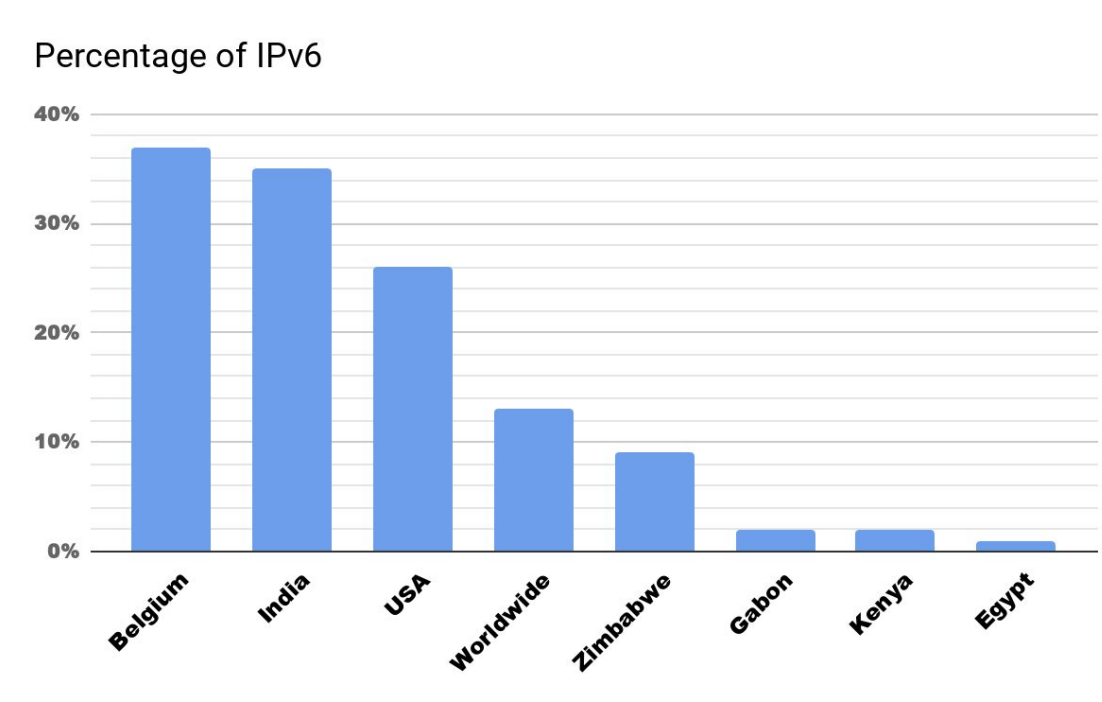
Unexpected high latency

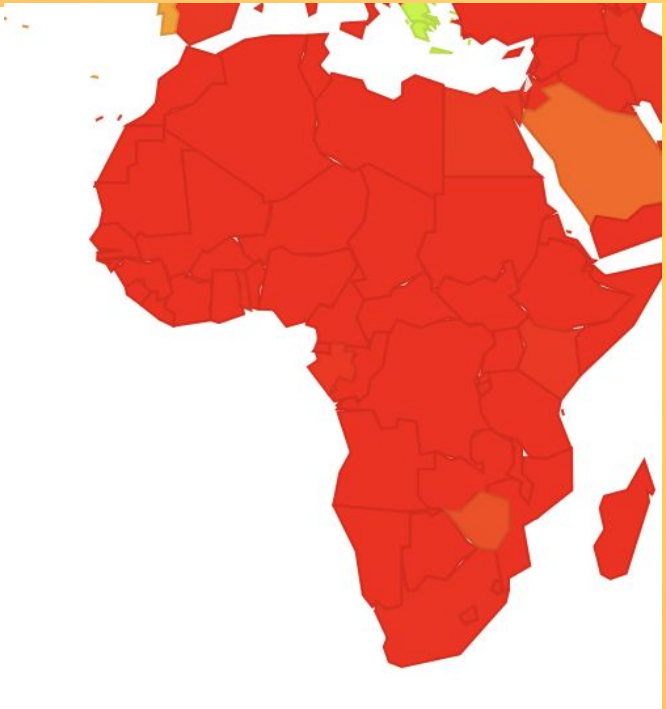
A very unusual distribution

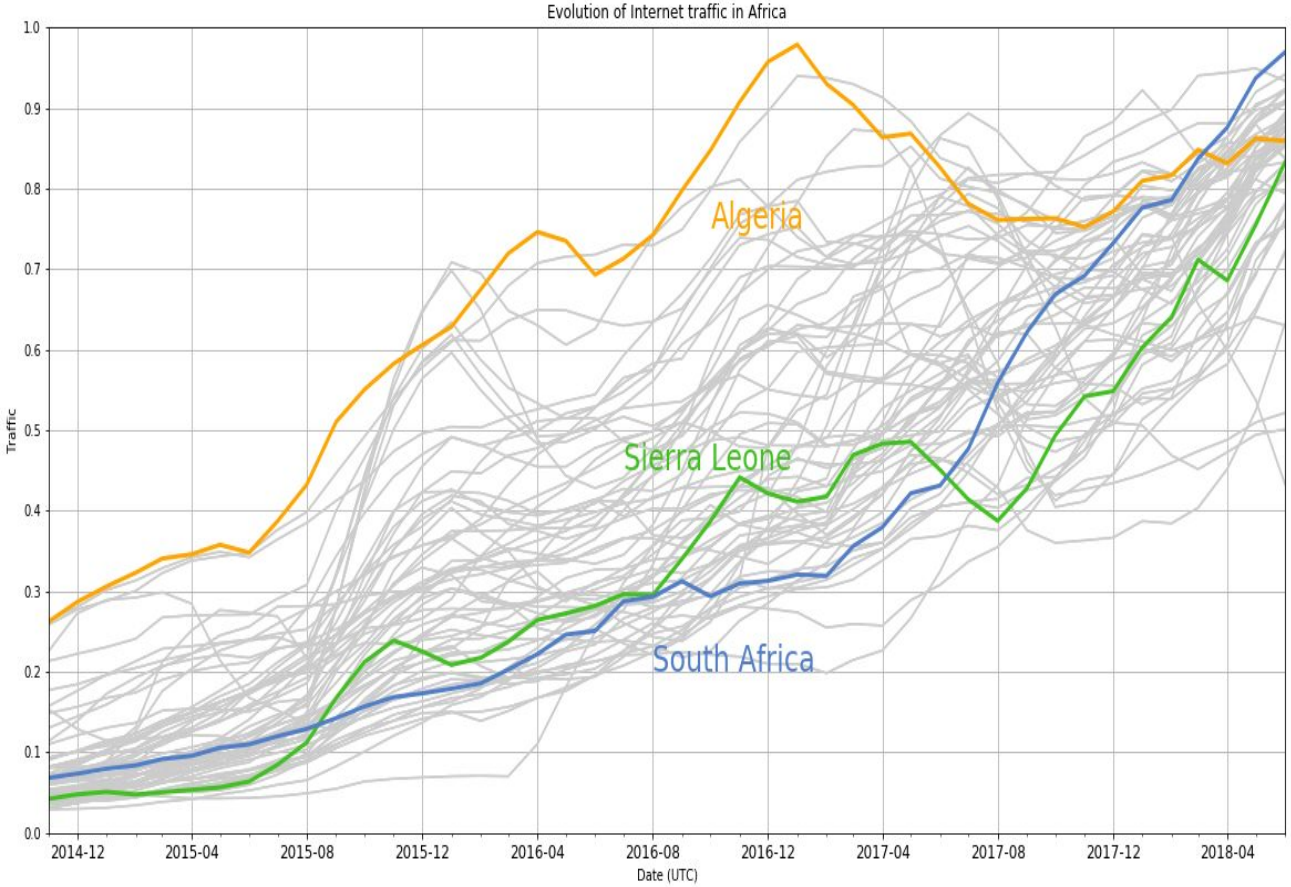


On all content hosted on Afrinic IPs, less than 50% is actually hosted in African countries. Hosting providers in Europe, Canada and Asia advertise Afrinic IP space on behalf of African companies.

What about IPv6 ?







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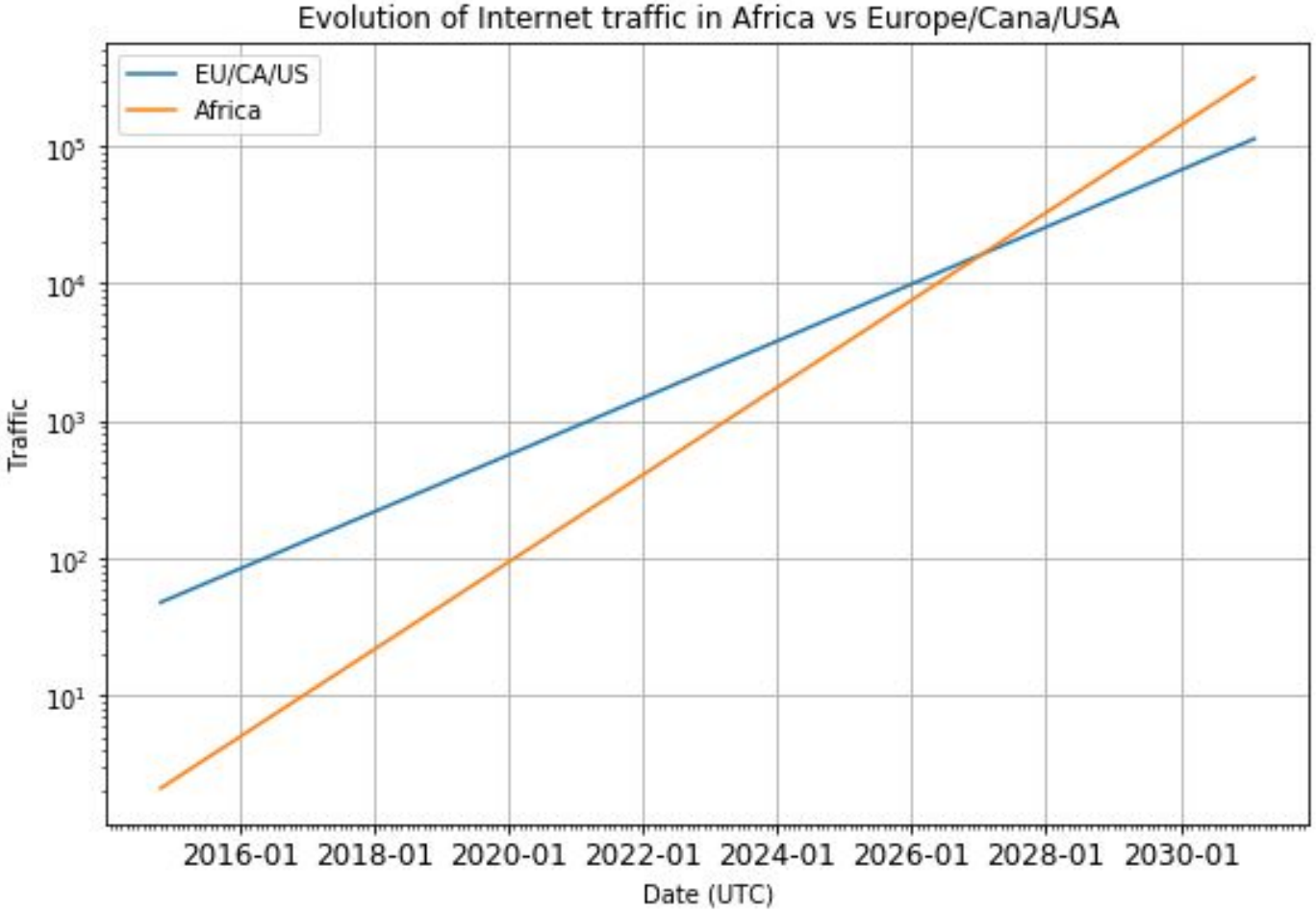
We are seeing a steady increase over the last four years.

Sierra Leone is the country who grew the most at around 8% per month.

Algeria only increased by 2% per month.

The mean of all those countries is 6.2% per month, which is also the Internet traffic growth of South Africa.



Comparing with Europe, USA and Canada, it will take 51 months for Africa to reach today's traffic levels similar to these two countries and continent.

If Europe, USA and Canada keep their current 4% growth rate, it will take approximately 8 to 12 years for Africa to catch up and surpass.

https://blog.cloudflare.com/african-traffic-growth-and-predictions-for-the-future/

Thank you

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