

Overview of Kenya's Internet Infrastructure Resilience

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Agenda

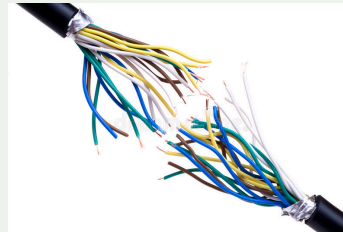
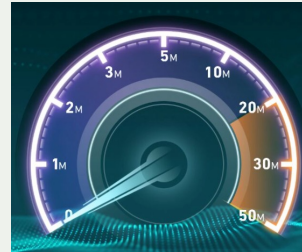
1. Internet Resilience Index - Overview
2. Data on Kenya's Infrastructure
3. Interpreting the data and improving Africa's Internet resilience

NB: More details can be found on ISOC Pulse



What we wanted to understand by measuring Internet Resilience in Africa

- How can we gauge the different Internet experiences in Africa?
- How can we compare experiences on an equal scale?
- What policies are beneficial or have a positive impact in improving Internet Resilience?



A resilient Internet connection is one that maintains an acceptable level of service in the face of faults and challenges to normal operation.

The Internet Resilience Index (IRI) is an indicator that measures a country's performance against the key pillars of a robust Internet ecosystem.

The Internet Resilience Index (IRI) is an indicator derived from key pillars and is used to give a rounded score of country's Internet Resilience score against the key pillars of a robust Internet ecosystem

Infrastructure

- Cable ecosystem
- Mobile connectivity
- Enabling infrastructure

Performance

- Fixed networks
- Mobile networks

Enabling technologies and security

- Enabling technologies
- DNS Ecosystem
- Routing Hygiene
- Security threat

Local ecosystem & Market readiness

- Market structure
- Traffic localization

See our white paper at <https://pulse.internetsociety.org>

Weighting

- Data aggregated from several sources like UN, ITU, Ookla, CyberGreen, PeeringDB, EGDI, among others
- Weighting to allow for balanced view to all the data collected
- IRI is modular – metrics can be added/changed/deleted

Pillar	Weight	Dimension	Weight
Infrastructure	25 %	Cable ecosystem	40%
		Mobile connectivity	30%
		Enabling infrastructure	30%
Performance	25 %	Fixed networks performance	40 %
		Mobile networks performance	60 %
Enabling technologies and security	25 %	Enabling technologies	20%
		DNS ecosystem	30 %
		Routing hygiene	30 %
		Security threat	20 %
Local Ecosystem and Market readiness	25 %	Market structure	50 %
		Traffic Localization	50 %

Criteria used when selecting the datasets

Relevance

The indicator should work towards showing an increase or decline in the resilience of the Internet in a selected country.

Accuracy

The indicator should correctly estimate or describe the quantities or characteristics they are designed to measure

Coverage

The data should cover as many countries as possible, as the Index is intended to be a global index

Freshness

Any dataset should be at most two years old. Some datasets such as performance or network coverage should be recent.

Continuity

We use a stable list of indicators, which will provide data consistently over time.

pulse.internetsociety.org

Your Data Dashboard

- Launched December 2020.
- We curate Internet measurement data from trusted sources to help everyone gain deeper, data-driven insight into the Internet.

Trusted data from multiple sources:

- **Benefit:** Helps to assess whether efforts to ensure that the Internet remains open, globally connected, secure, and trustworthy are working.
- **Benefit:** Allows policymakers, researchers, journalists, network operators, civil society groups, and others to better understand the health, availability, and evolution of the Internet.



How to use the Internet Resilience Index

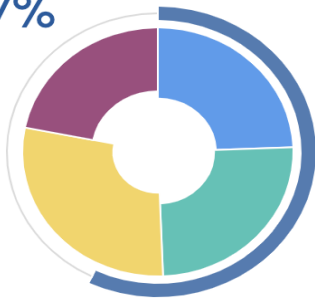
- The data can be used by:
 - governments – identify areas for improvement
 - Policy experts – identify barriers
 - Individuals – compare performance
 - Infrastructure providers – areas for investment/improvement

How to use it: Use the Internet Resilience Index to make informed decisions.

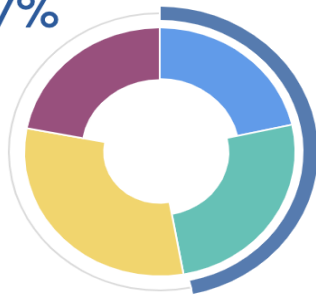
Global Resilience

Overall Resilience

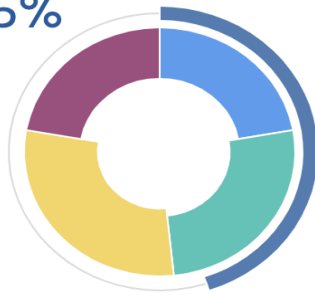
Europe
57%



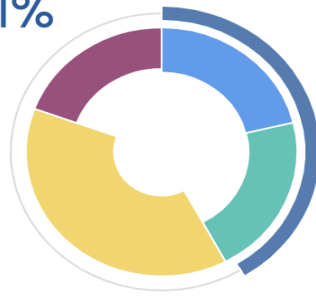
Asia
47%



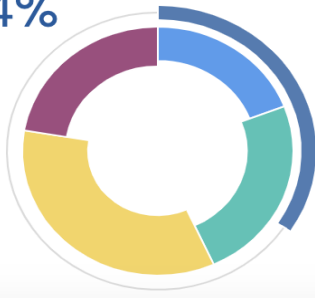
Americas
45%



Oceania
41%



Africa
34%

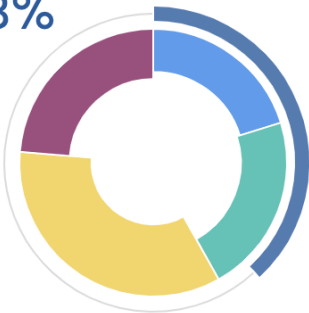


Africa Overall Resilience

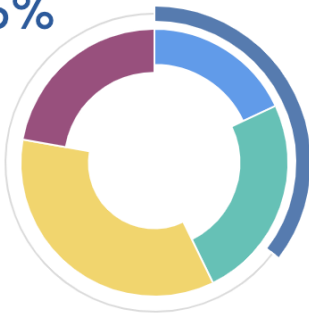
Overall Resilience

Africa ×

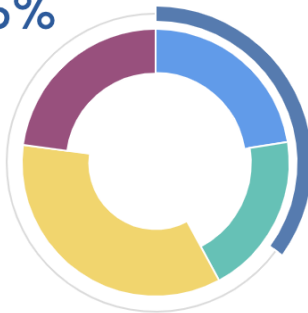
Southern Africa
38%



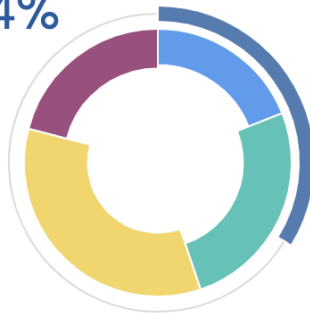
Eastern Africa
35%



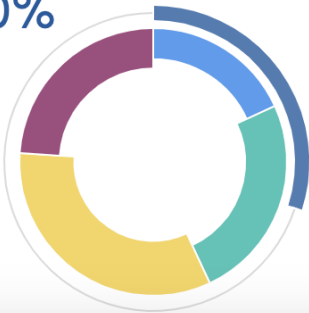
Northern Africa
35%



Western Africa
34%



Middle Africa
30%

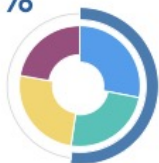


Eastern Africa Resilience

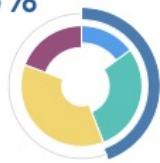
Overall Resilience

Eastern Africa ×

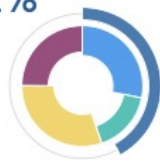
Mauritius
52%



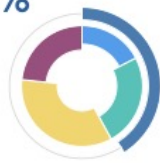
Seychelles
45%



Kenya
42%



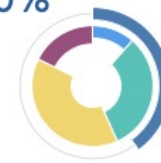
Uganda
41%



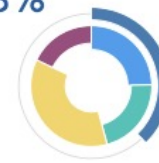
Rwanda
40%



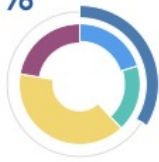
Madagascar
40%



Tanzania
38%



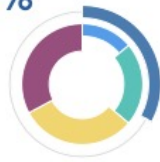
Zambia
34%



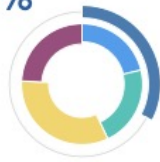
Ethiopia
33%



Mozambique
33%



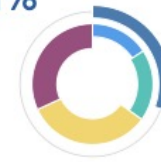
Zimbabwe
33%



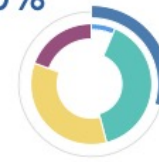
Djibouti
32%



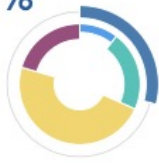
Malawi
31%



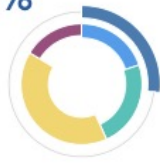
Eritrea
30%



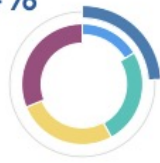
Somalia
29%



Comoros
27%



Burundi
24%



Kenya - Infrastructure

Infrastructure

47%

Infrastructure: The existence and availability of physical infrastructure that provides Internet connectivity

Cable ecosystem

25%

Fibre 10km reach

25%

Mobile connectivity

71%

Network coverage

80%

Spectrum allocation

48%

Enabling infrastructure

54%

Data centers

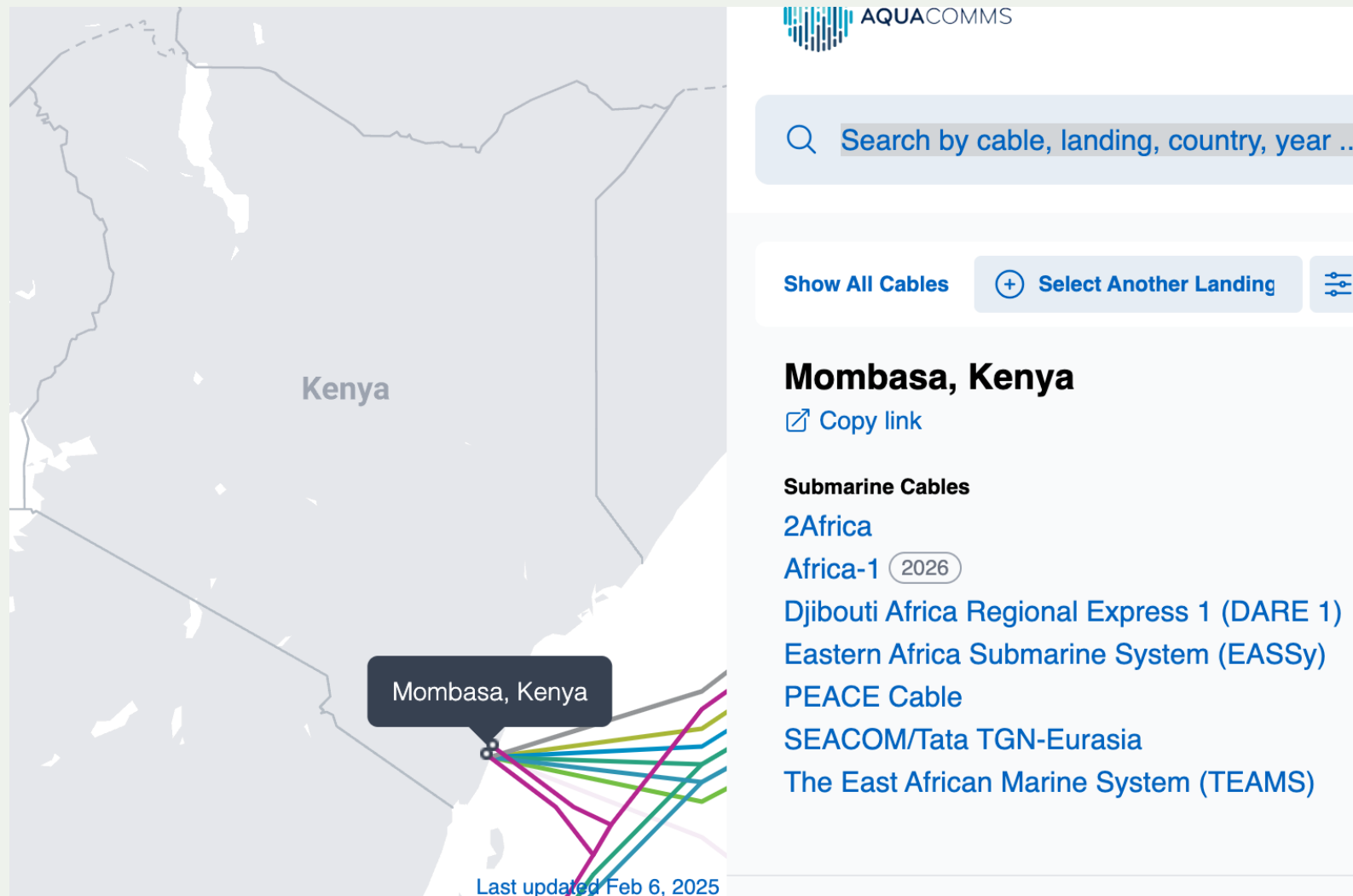
38%

Number of IXPs

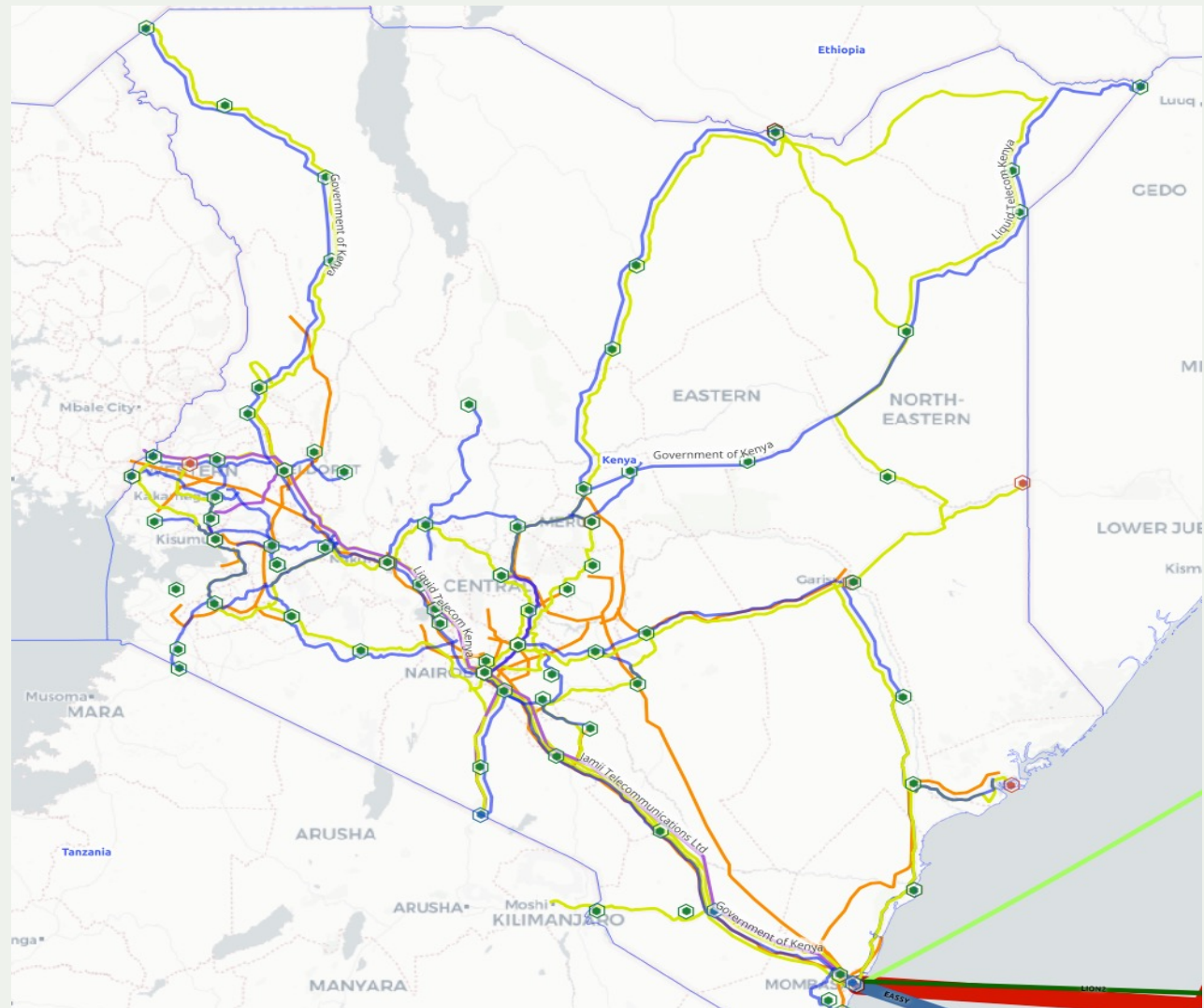
70%

Kenya's infrastructure resilience

Kenya - Submarine Cables – *submarinecablemap.com*



Terrestrial Fiber



Redundancy is important to improve Resilience

- Countries that are significantly impacted by cable outages have lower Internet Resilience scores than those that are able to remain operational
- IXPs play a critical role in keeping local traffic flowing if submarine cables go offline.
- Having local content and services like DNS, Email and E-Government services improve availability of services in the event of outages
- Low Earth Orbit Satellites (LEOs) also help however their coverage is currently low in Africa



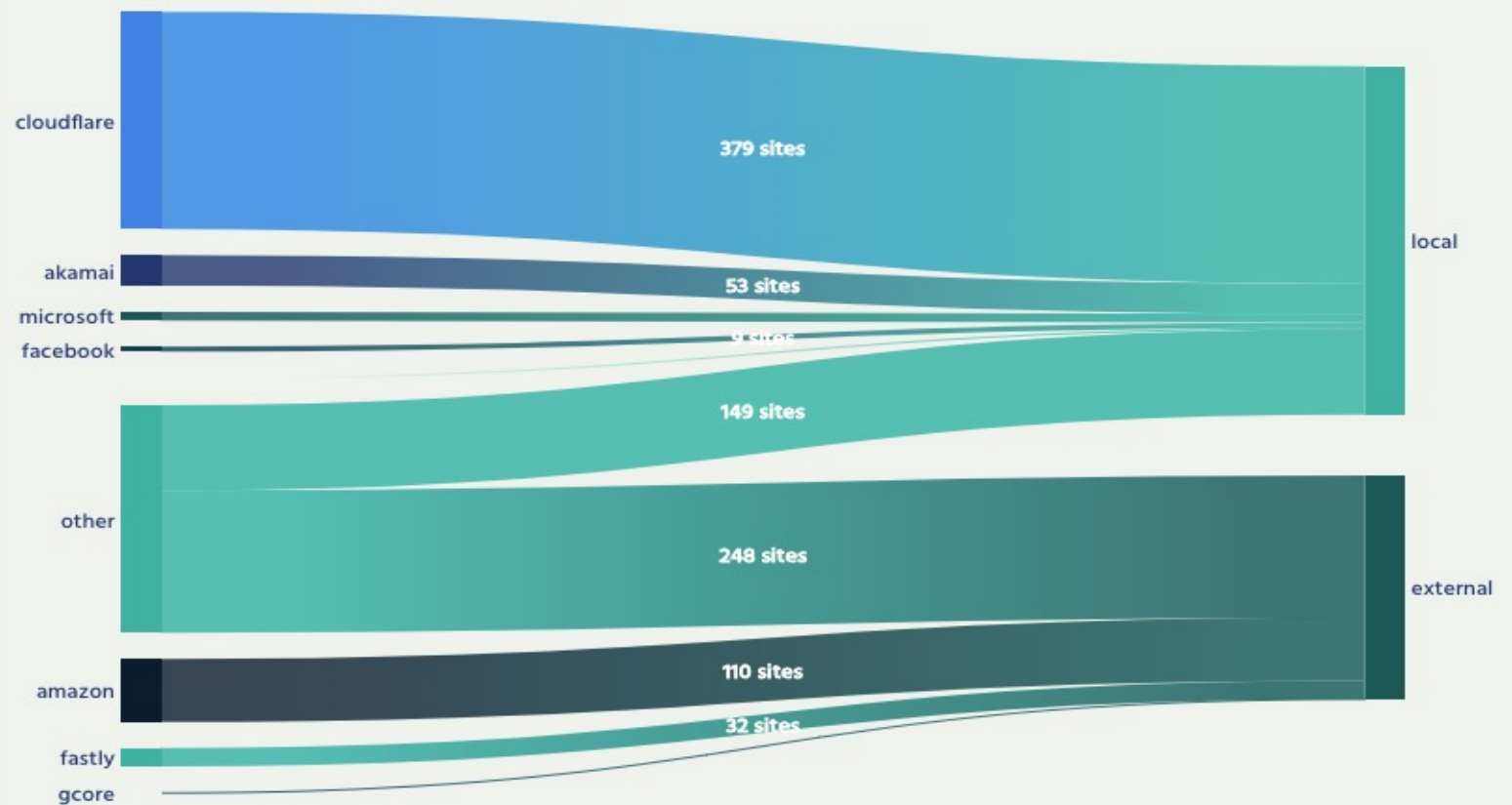
Top 1,000 Sites Location



Cache Locality

Hosting Location of Top 1,000 Websites

Kenya



Source: [Internet Society Pulse](#) • Measurement date: October 2024
Additional data: Google CRuX, FindCDN, IPinfo/Maxmind



IXP Growth



Kenya

Active Internet Exchange Points

The total number of IXPs in operation in Kenya, as of February 2025.

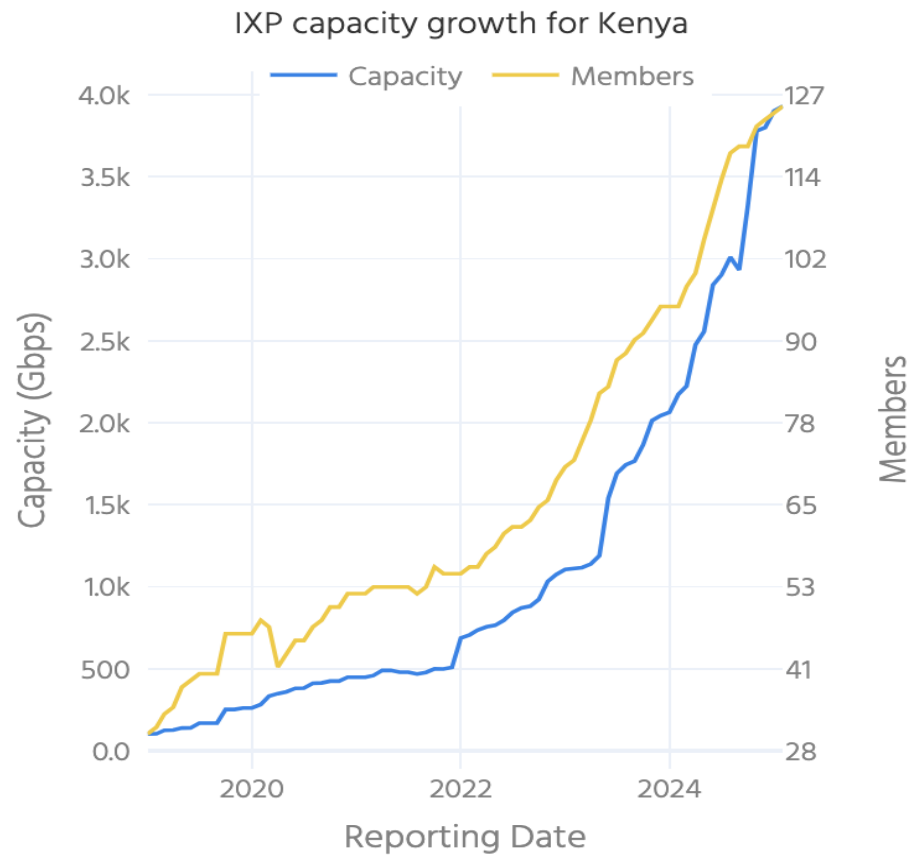
7

Active IXPs



IXP capacity growth over time in Kenya

The total of IXPs over time, shown along with the growth in combined capacity.



Summary

- Kenya has good submarine cable diversity with more cables either to be installed/expanded:
 - 2Africa cable – which recently was partially activated with Airtel announcing the activating of a segment of the cable which will connect Kenya, Tanzania and South Africa
 - The Umoja Cable – which will connect Kenya, Rwanda, DRC, Zambia, Zimbabwe and South Africa to Australia
- Several IXPs that help to keep local traffic local
- Low Earth Orbit Satellites (LEOs) coverage is increasing



What would be the impact of a shutdown?

Netloss Calculator

Want to know how much a recent Internet shutdown in your country cost the economy? Or, curious to understand the impact of a recent Internet shutdown? Use the Internet Society Pulse NetLoss Calculator to find out more.

Select the country from the drop down list, then select the dates you are interested in (leave the current date for the most recent Internet shutdown).

The NetLoss calculator does not distinguish between national and regional shutdowns and should therefore be used for regional shutdowns in countries that frequently disrupt Internet access to the Internet at a regional level.

Country:

Kenya ▼

Start Date:

02/01/2025 📅

End Date:

02/28/2025 📅

Type of Shutdown:

☐ Internet Shutdown

☒ Service Blocking

Calculate



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Thank You

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