



Regional Status Report

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Who am I?



 Kyle Spencer

- E-mail: kyle@stormzero.com
- Uganda Internet eXchange Point (UIXP)
- African IXP Association (AFIX)
- Internet eXchange Federation (IX-F)
- Multiplayer Internet gaming in Africa
- A few other hats

What is AFIX?



The African IXP Association (AFIX) is a group of regional Internet exchange point (IXP) operators.

We aim to foster an enabling environment for IXPs in order to help them maximize their value, improve connectivity within the region, and increase the Internet's value for all.

Member of IX-F along with Euro-IX, LAC-IX, and APIX.

What is Af-IX?



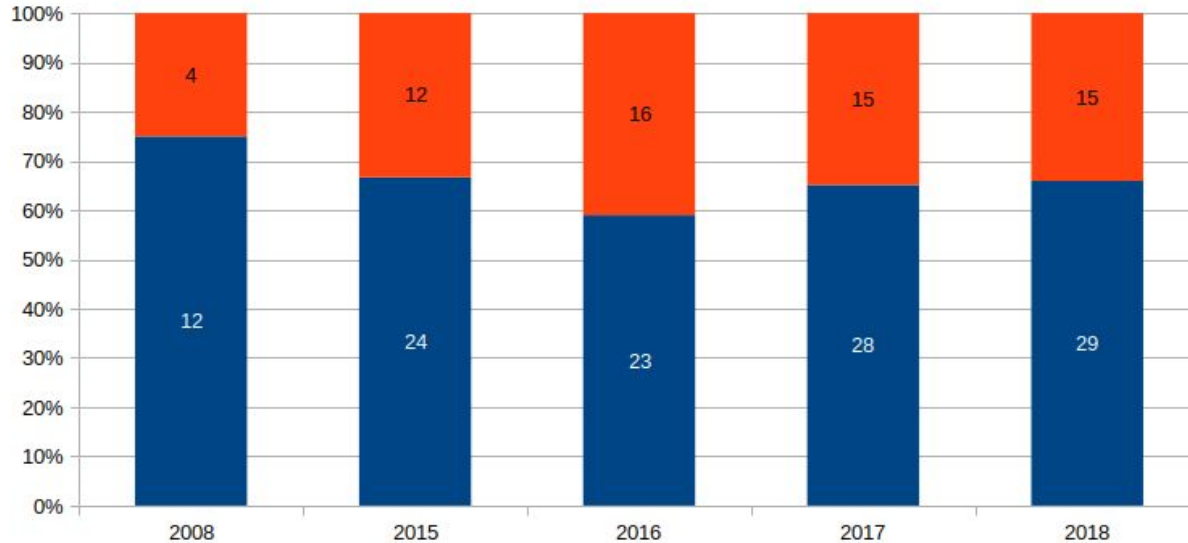
- Launched in 2012 at AfPIF in Johannesburg
 - Member of the Internet eXchange Federation (IX-F) since 2014
- Currently 45 IXPs in 41 cities in 33 countries
 - Oldest: JINX (1996)
 - Newest: Somalia, Zanzibar
- We host bi-annual meetings at AIS and AfPIF
- We host a private mailing list for IXP operators
- We research and publish data about our region
- Website: <http://www.af-ix.net>

The Data



African IXPs: Survey Response Rates

Source: African IXP Association (2019)



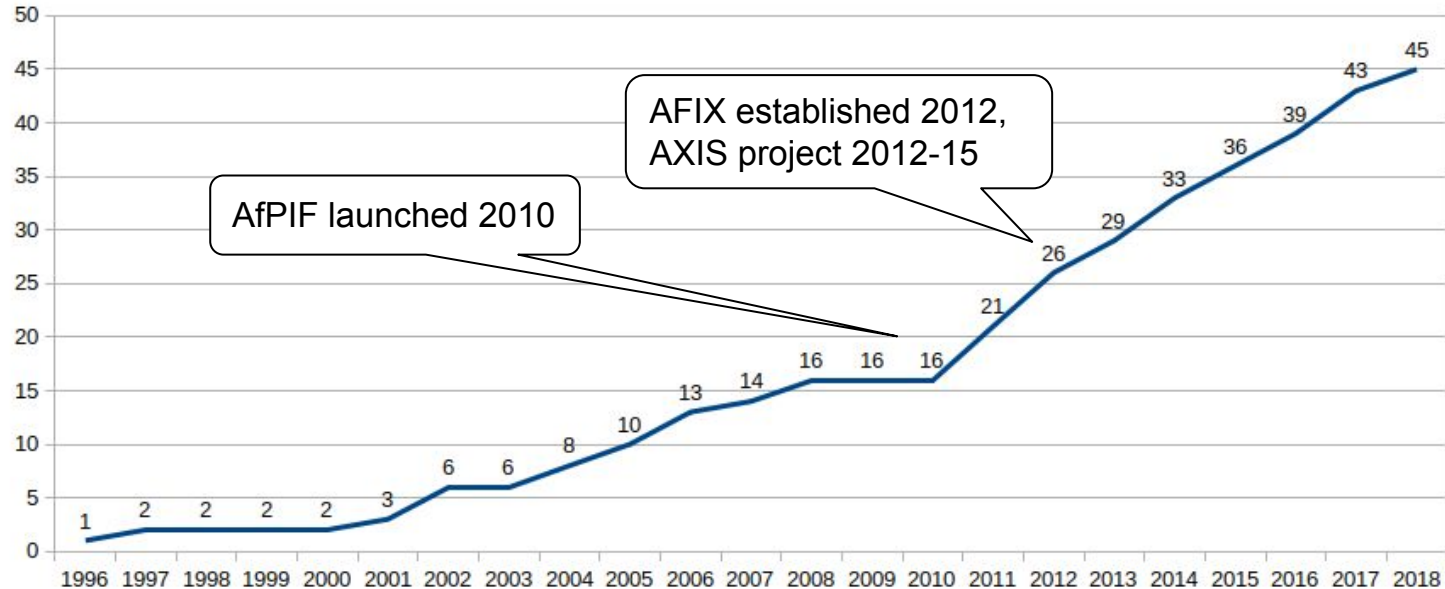
- 2008: Michuki Mwangi
- 2015-2018: AFIX Benchmark Survey
- Different mixture of IXPs respond each year
- Some 3rd party sources
- Some data is manually collected or refined

Growth in Africa



African IXPs: Total Number of Active IXPs by Year

Source: African IXP Association (2019)

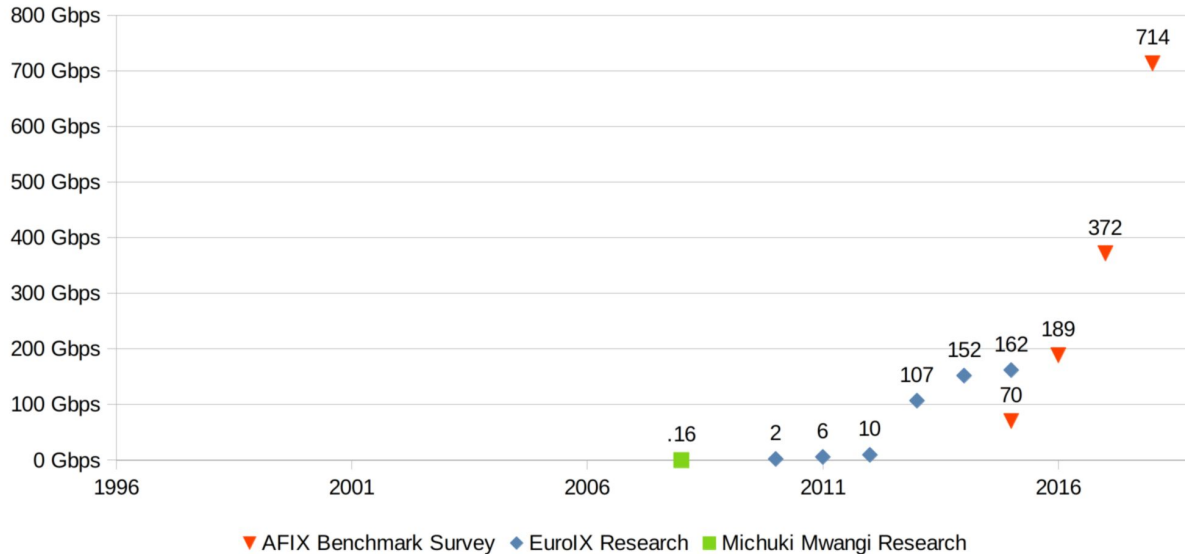


Traffic



African IXPs: Peak Traffic

Source: African IXP Association (2019)



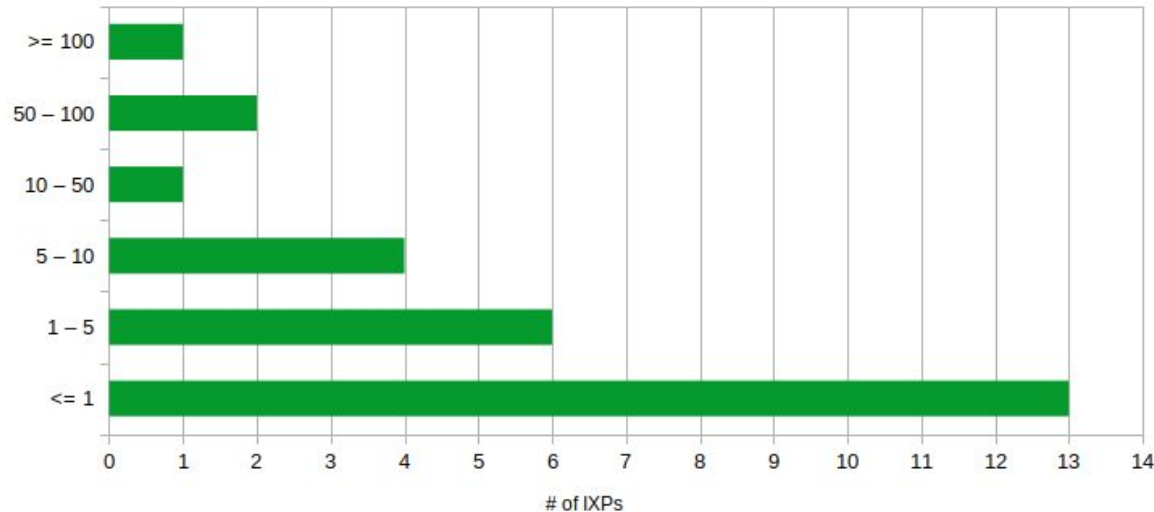
- Conservative figures
- No traffic data-sets are fully comprehensive
- Not all IXPs have and/or publish traffic statistics
- Inconsistent accounting of traffic statistics
- Some samples include significant transit traffic

Traffic



African IXPs: Peak Traffic - Distribution in 2018 (in Gbps)

Source: African IXP Association (2019)



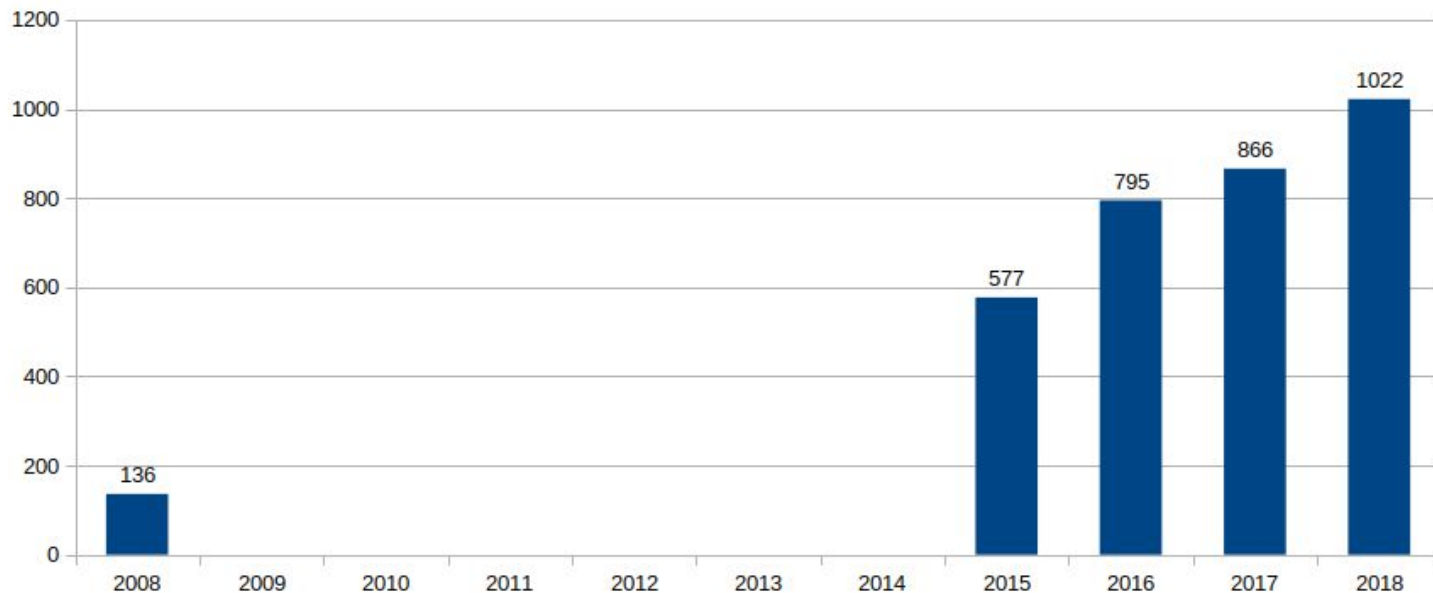
- Nearly universal growth, but uneven distribution
- Largest was ~480G
- Approximately half carry less than 1 Gbps

Connections



African IXPs: Network Connections

Source: African IXP Association (2019)

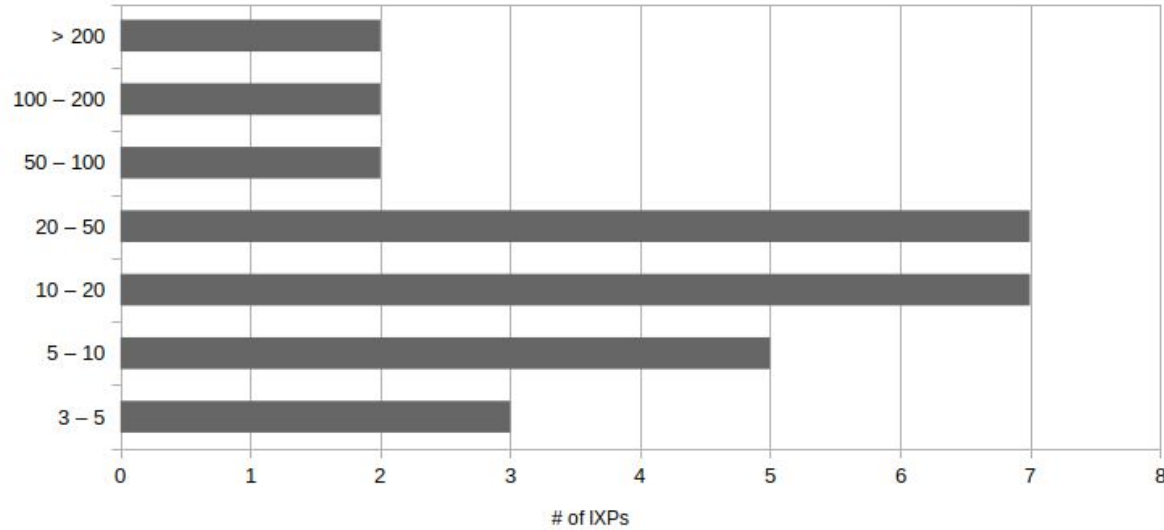


Connections



African IXPs: Network Connections - Distribution in 2018

Source: African IXP Association (2019)



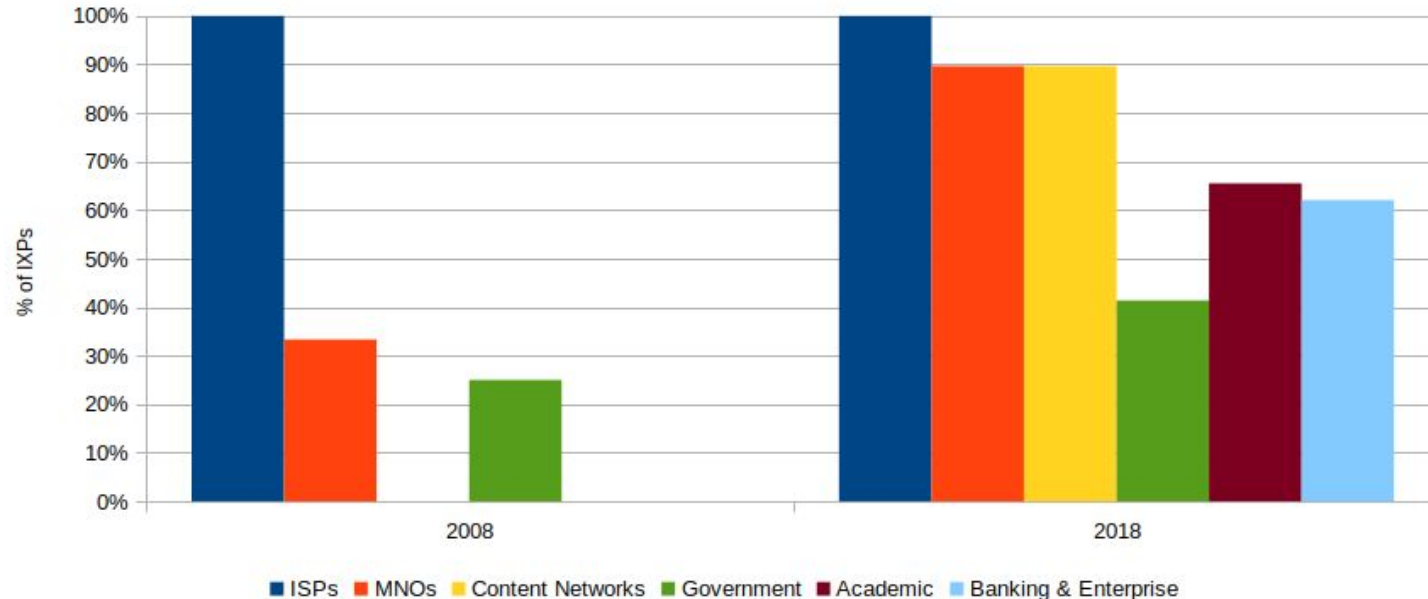
- Nearly universal growth, but uneven distribution
- Largest had 302
- Approximately half had between 10 - 50

Membership Composition



African IXPs: Regional Membership Composition

Source: African IXP Association (2019)

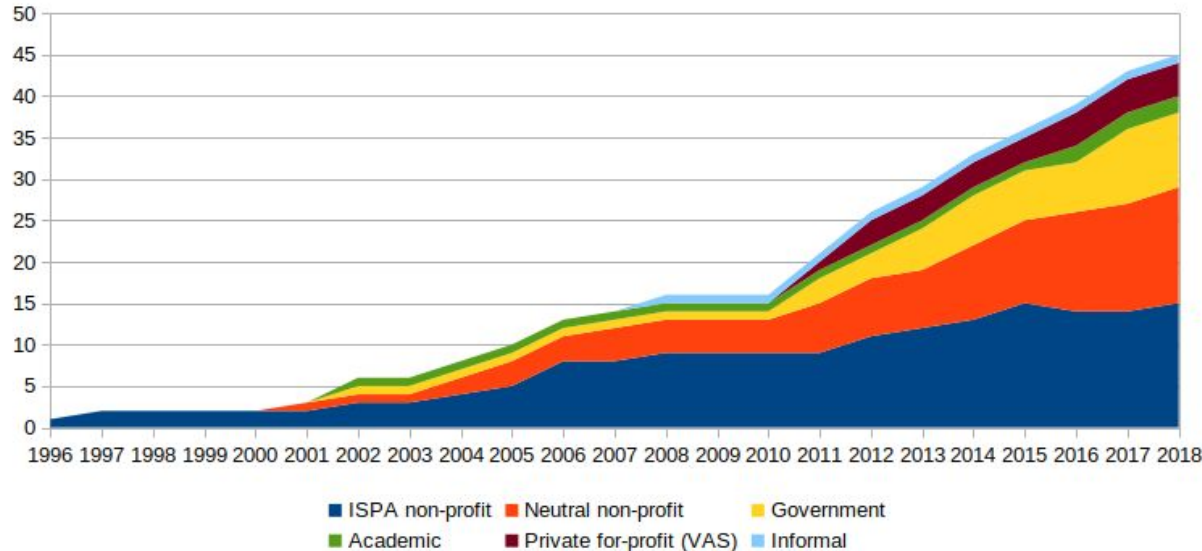


Models



African IXPs: Governing Entity Types

Source: African IXP Association (2019)



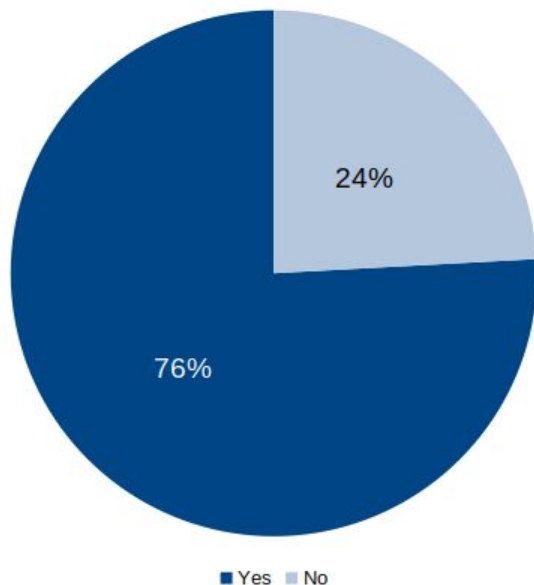
- Government IXPs had lowest average annual growth rates:
 - 91 Mbps
 - 1 network
- For-profit IXPs had the highest average annual growth rates:
 - 20 Gbps
 - 19 networks

Contracts



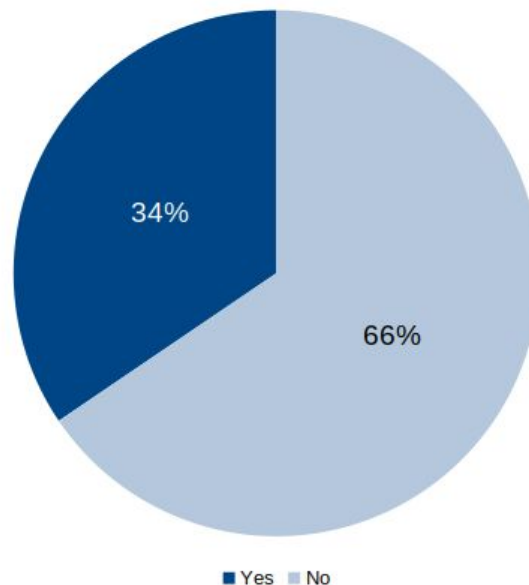
African IXPs: Formal Contract Required to Join?

Source: African IXP Association (2019)



African IXPs: Service Level Agreement Offered?

Source: African IXP Association (2019)

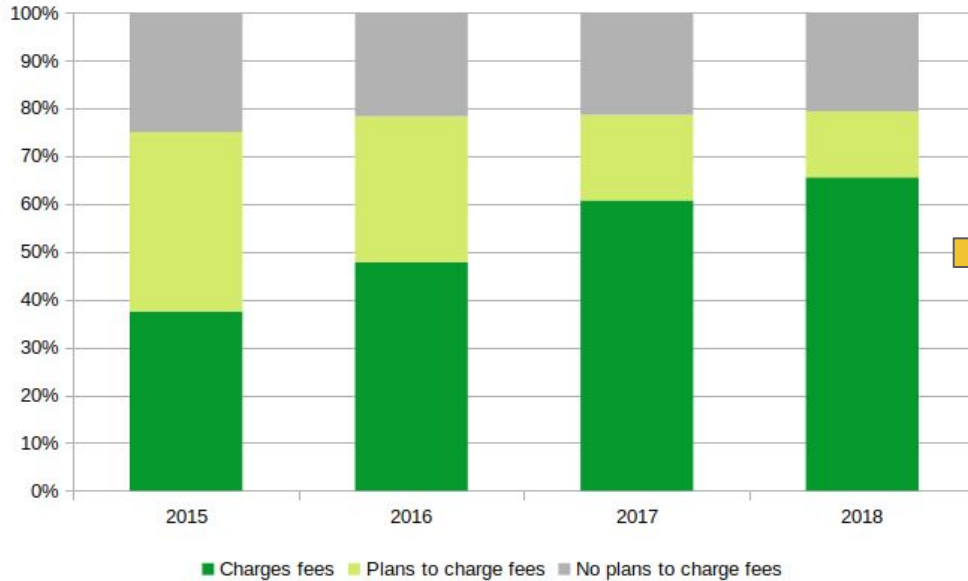


Service Fees



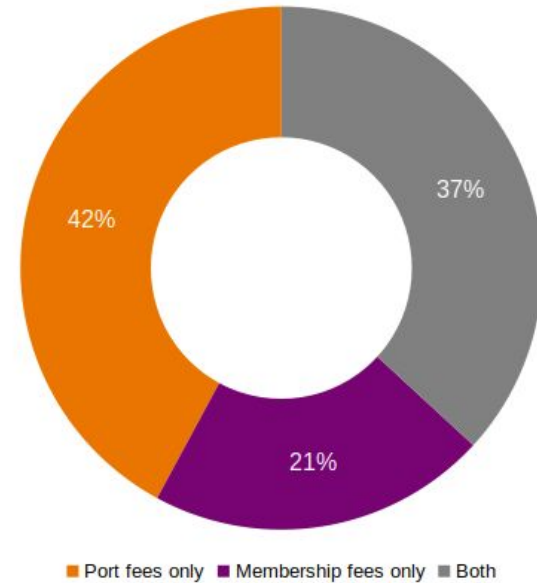
African IXPs: Service Fees

Source: African IXP Association (2019)



African IXPs: Service Fees by Type in 2018

Source: African IXP Association (2019)

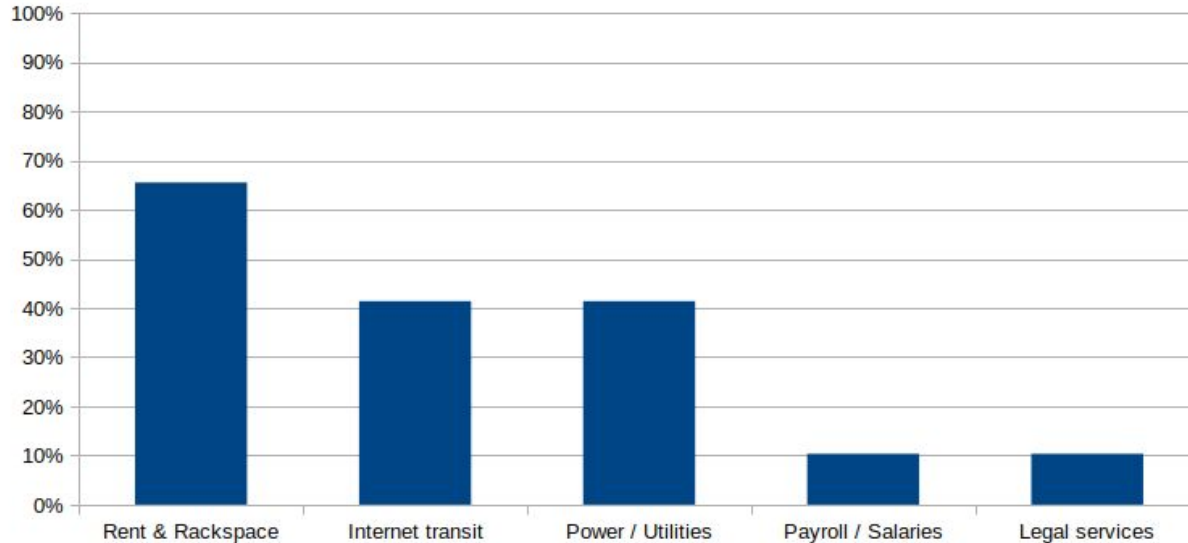


Donations



African IXPs: % of IXPs w/ Recurring Donations (2018)

Source: African IXP Association (2019)



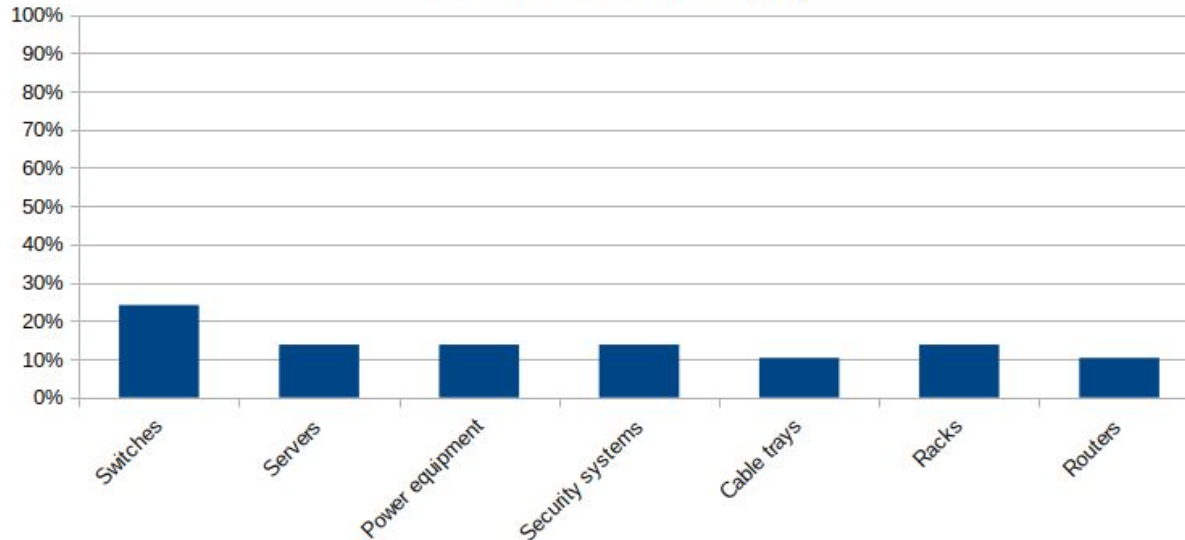
- 59% of IXPs receive recurring donations
- 41% of IXPs have received a hardware donation in the last 12 months
- 21% of IXPs have received grant funding in the last 12 months

Donations



African IXPs: % of IXPs w/ Donations in Last 12 Months (2018)

Source: African IXP Association (2019)



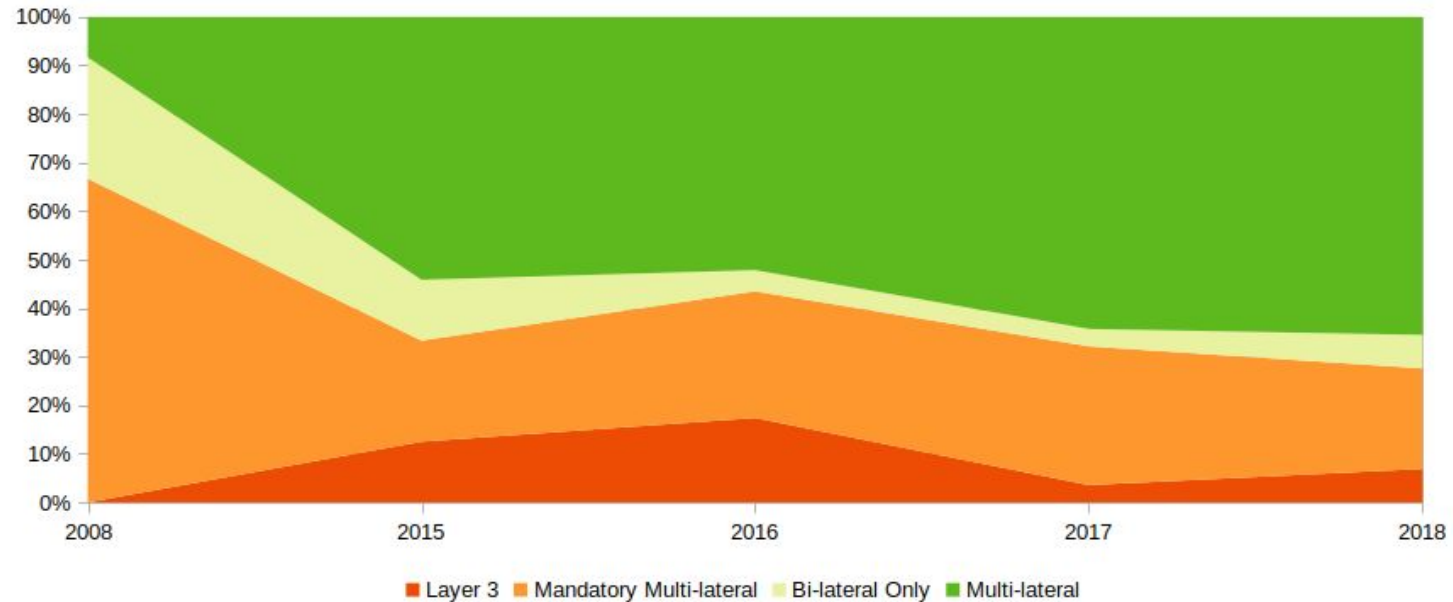
- 59% of IXPs receive recurring donations
- 41% of IXPs have received a hardware donation in the last 12 months
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House Rules



African IXPs: Peering Environments

Source: African IXP Association (2019)

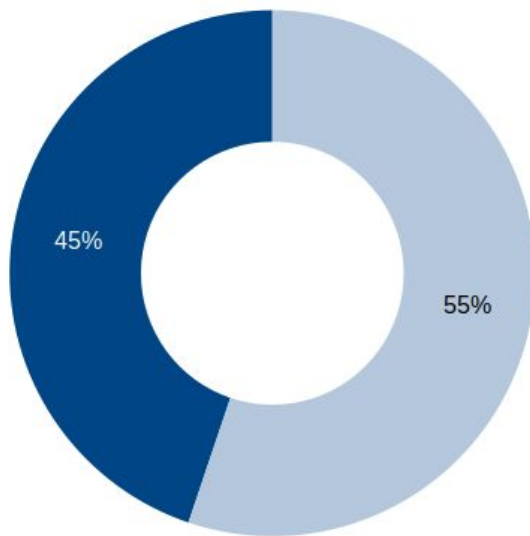


Staffing



African IXPs: Full or Part-time Staff in 2018

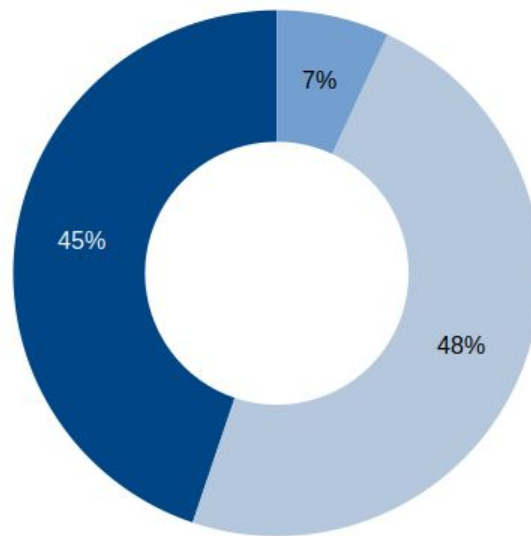
Source: African IXP Association (2019)



■ Full-time staff ■ Part-time staff

African IXPs: Paid and Volunteer Staffing in 2018

Source: African IXP Association (2019)



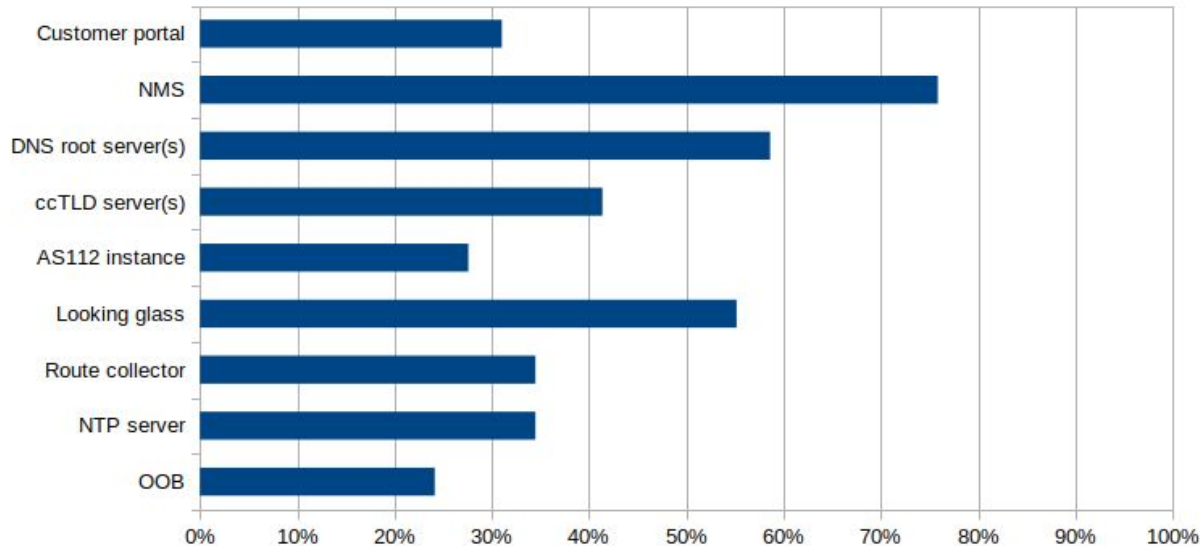
■ Paid staff only ■ Volunteer staff only ■ Both

Value Added Services



African IXPs: Value Added Services in 2018

Source: African IXP Association (2019)



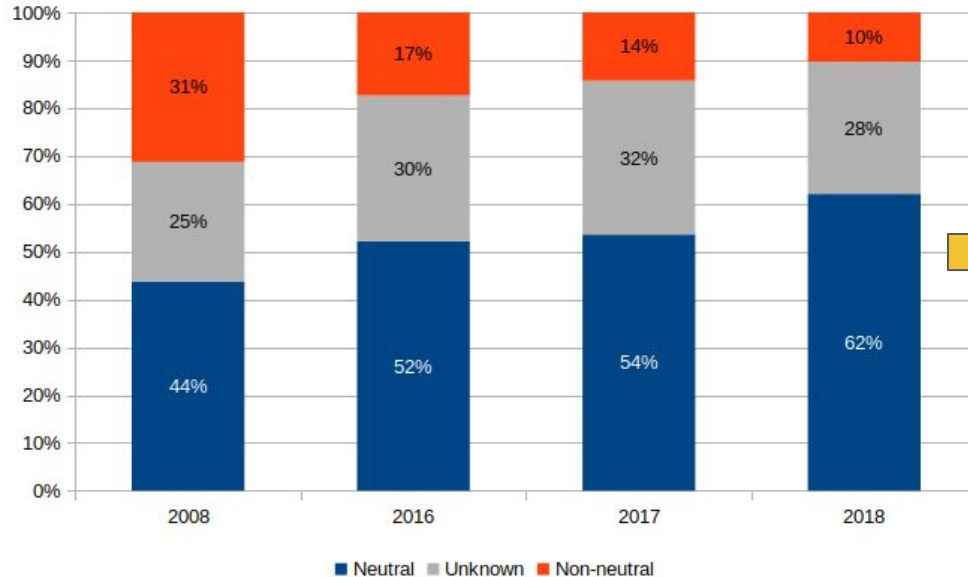
- VAS is more common:
66% had some in 2008
100% reached in 2018
- More IXPs with Root DNS nodes:
25% in 2008
66% in 2018
- Significant growth in customer portals and automation systems

Facilities



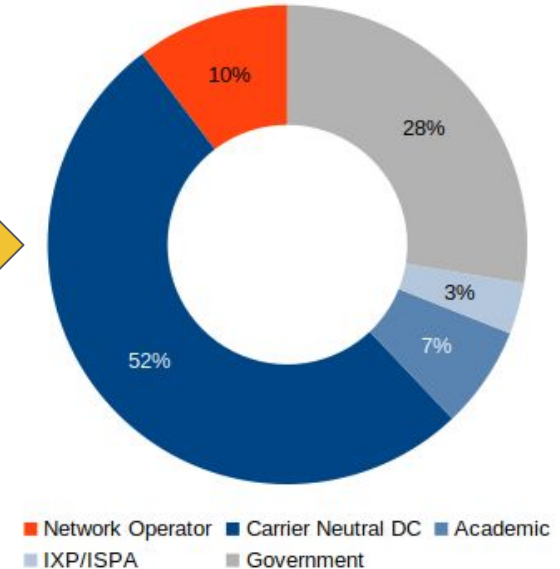
African IXPs: Facility Neutrality

Source: African IXP Association (2019)



African IXPs: Facility Ownership in 2018

Source: African IXP Association (2019)

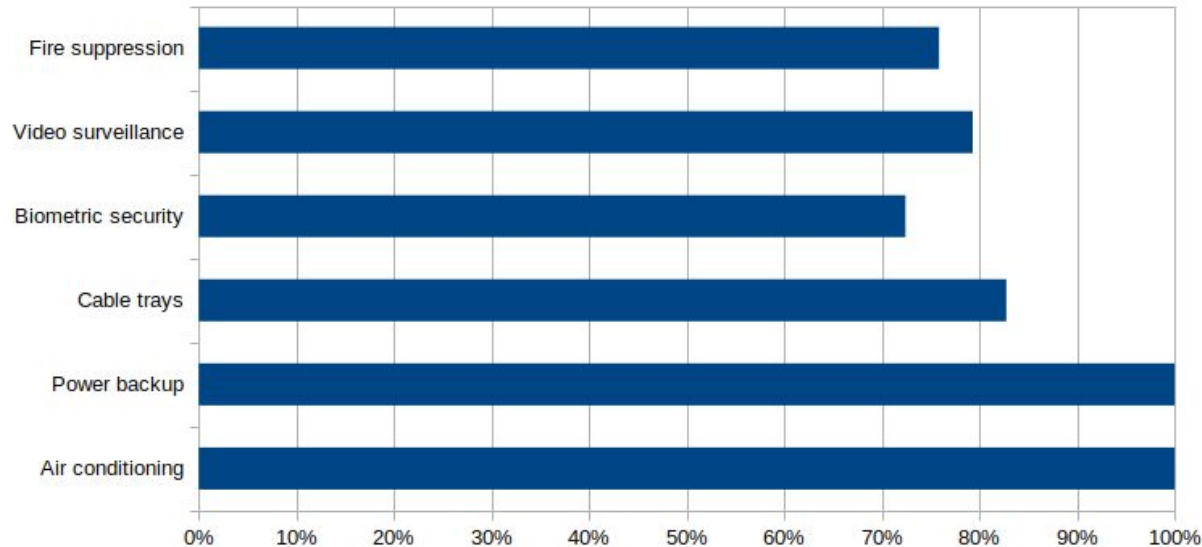


Facilities



African IXPs: Facility Amenities in 2018

Source: African IXP Association (2019)



- The average quality of IXP facilities has greatly improved in recent years
- IXPs in carrier neutral DCs had the best amenities on average
- **Reality: YMMV**

Thank you!



- Kyle Spencer
 - kyle@stormzero.com
- Visit the AFIX website
 - <https://af-ix.net>

Conclusions



- Clear growth throughout the region
- Export your data to IXPDB (e.g. via IXP Manager)