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 AFIX?

- 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](http://www.af-ix.net)
The Data

- 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

AfPIF launched 2010

AFIX established 2012, AXIS project 2012-15
Traffic

- 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

- 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

- 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 the 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)
- 76% Yes
- 24% No

**African IXPs: Service Level Agreement Offered?**
Source: African IXP Association (2019)
- 34% Yes
- 66% No
Service Fees

African IXPs: Service Fees

Source: African IXP Association (2019)

African IXPs: Service Fees by Type in 2018

Source: African IXP Association (2019)

- Port fees only: 42%
- Membership fees only: 37%
- Both: 21%
Donations

- 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
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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: 45%
- Part-time staff: 55%

African IXPs: Paid and Volunteer Staffing in 2018

Source: African IXP Association (2019)

- Paid staff only: 45%
- Volunteer staff only: 7%
- Both: 48%
Value Added Services

- **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

- 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

African IXPs: Facility Amenities in 2018

Source: African IXP Association (2019)
Thank you!

- Kyle Spencer
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- Visit the AFIIX website
  - https://af-ix.net
Conclusions

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