



The African IXP Association

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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)
- A few other hats

What is AFIX?



The African IXP Association (AFIX) is a group of Internet exchange point operators from across Africa, brought together by a shared need to coordinate and exchange knowledge.

AFIX aims to foster an enabling environment for IXPs, help them maximize their value, improve connectivity within the continent, and increase the Internet's value for all.

What is AfIX?



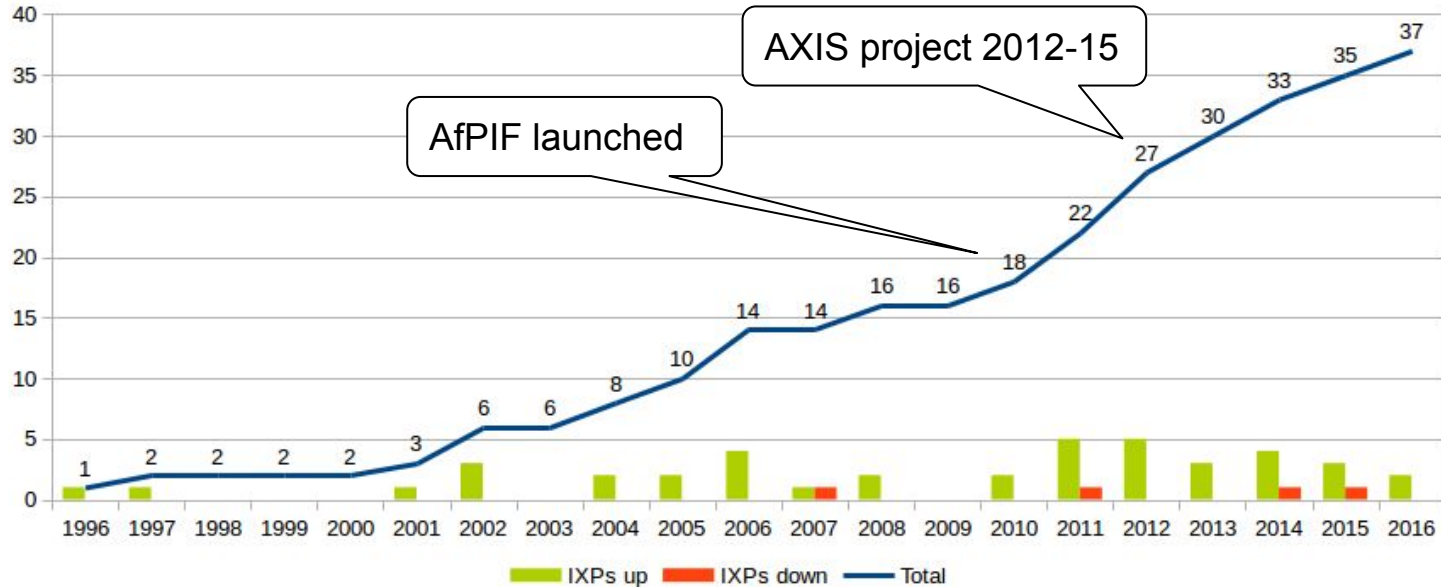
- Launched in 2012 at AfPIF in Johannesburg
 - Member of the Internet eXchange Federation (IX-F) since 2014
- Currently 38 IXPs in 29 countries out of 55 (AU)
 - Oldest: JINX (1996)
 - Newest: Madagascar, Djibouti, Togo
- We host bi-annual meetings at AIS and AfPIF
- We host a private mailing list for IXP operators
- We research and publish data about our region
- We host a website with useful information
 - URL: <http://www.af-ix.net>

Growth in Africa



African IXPs: Total Number of Active IXPs by Year

Source: African IXP Association (2016)

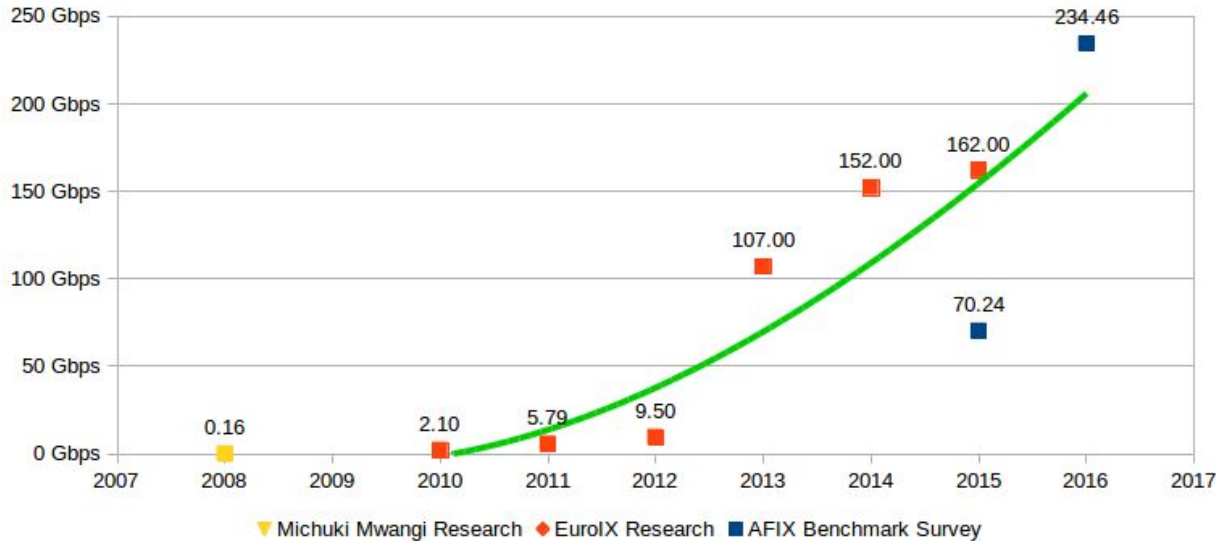


Traffic Carried by IXPs



African IXPs: Aggregate Regional Peak Traffic

Source: African IXP Association (2016)



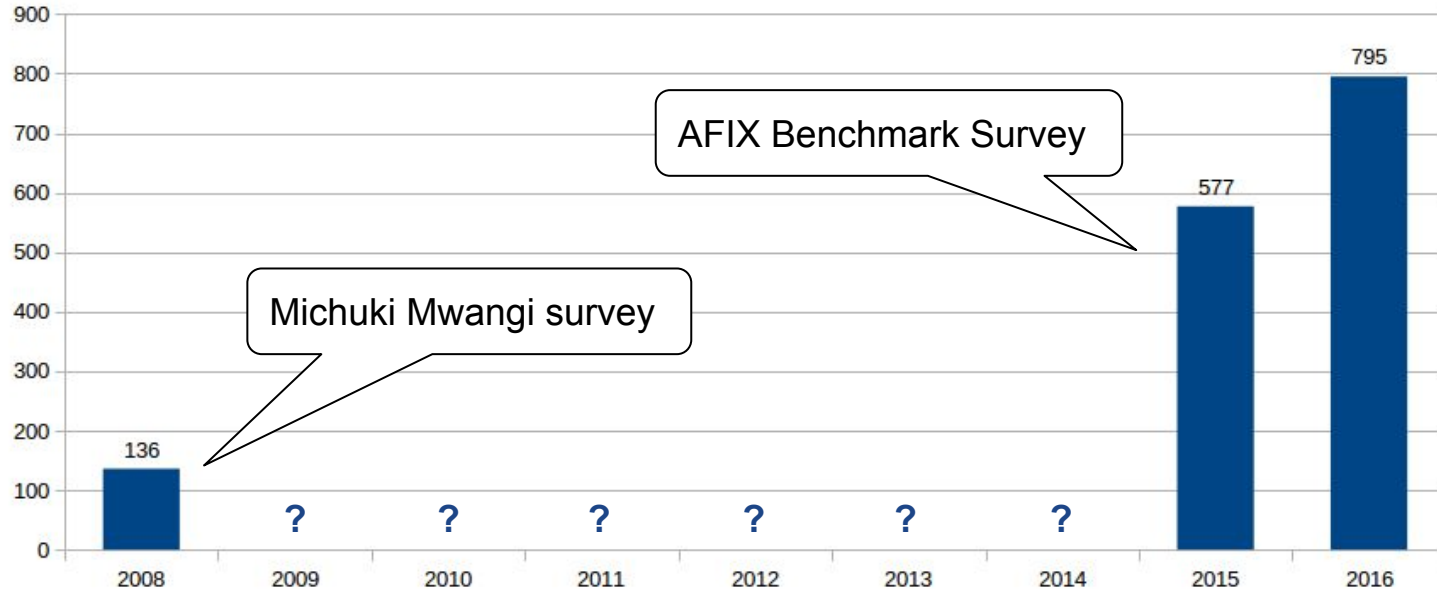
- No traffic data-sets are fully comprehensive
- Not all IXPs have and/or publish traffic statistics
- Inconsistent accounting of peak traffic statistics (e.g. monthly vs. daily)
- Some IXPs carry significant transit traffic

Connected Networks



African IXPs: Total Number of Networks Connected

Source: African IXP Association (2016)

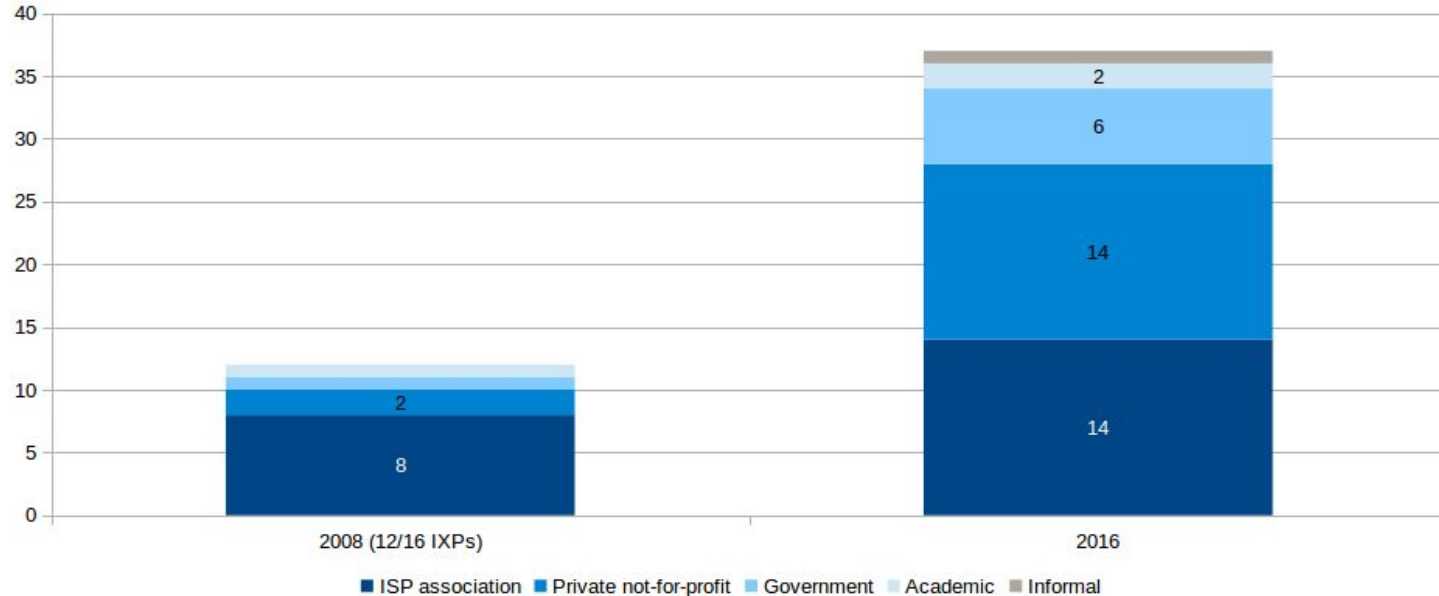


Governance Models



African IXPs: Governing Entity Types

Source: Michuki Mwangi (2008), African IXP Association (2016)

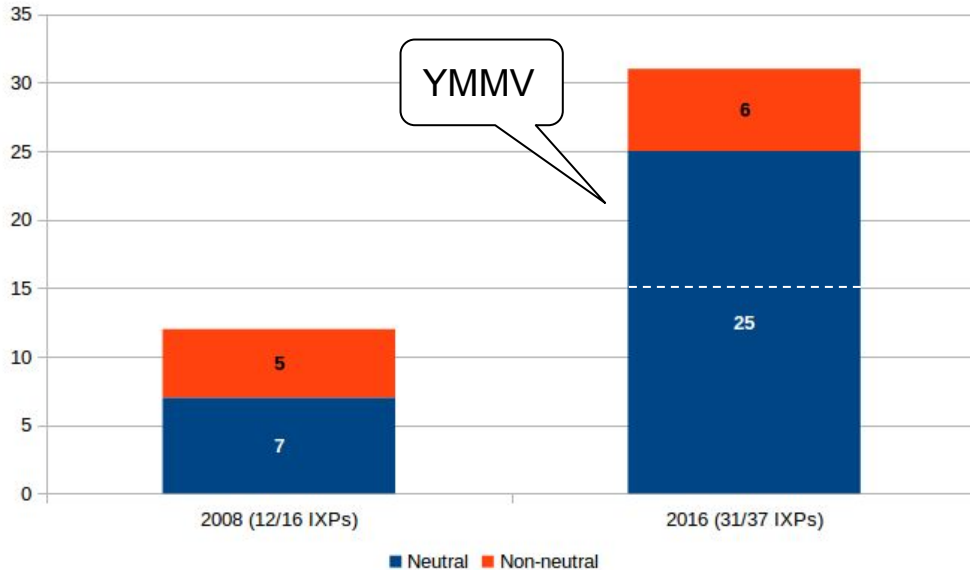


Facilities



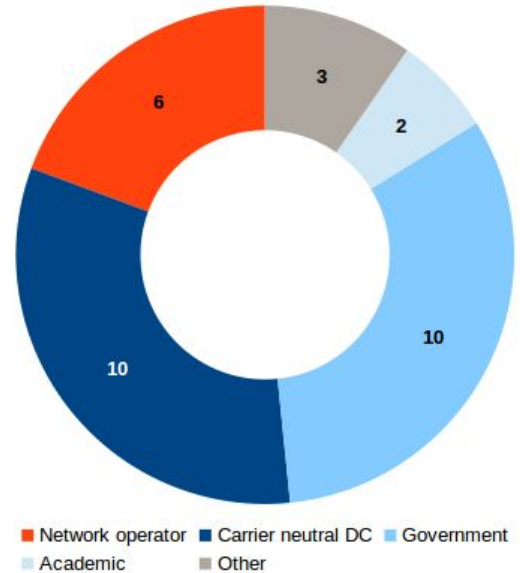
African IXPs: Facility Neutrality

Source: Michuki Mwangi (2008), African IXP Association (2016)



African IXPs: Facility Type Breakdown

Source: African IXP Association (2016)

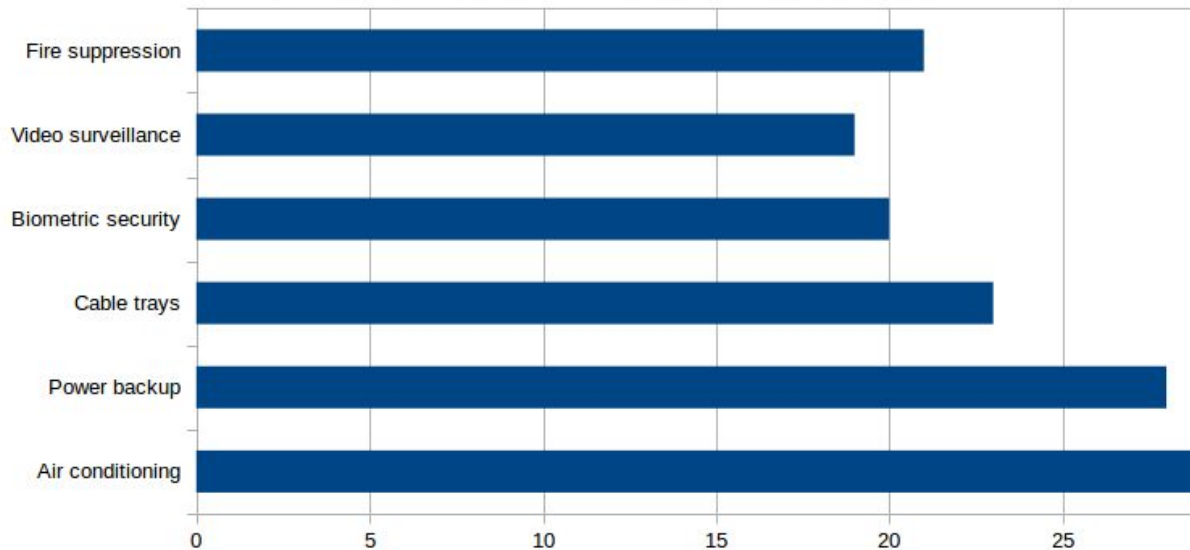


Facilities



African IXPs: Facility Amenities

Data from 29/37 IXPs / Source: African IXP Association (2016)



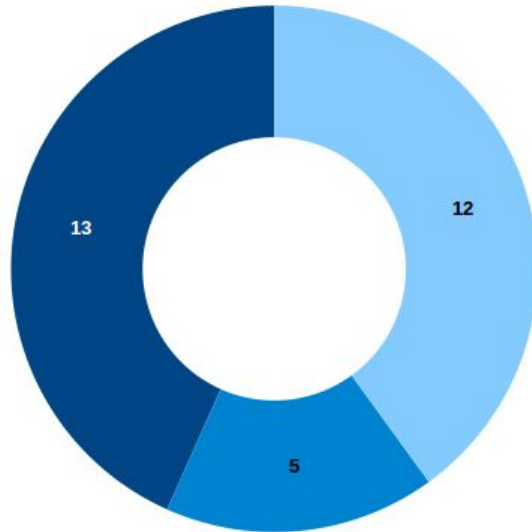
- The quality of IXP facilities has greatly improved over time
- IXPs in carrier neutral DCs had the best amenities on average
- **Reality: YMMV**

Staffing



African IXPs: Full or Part-time Staff

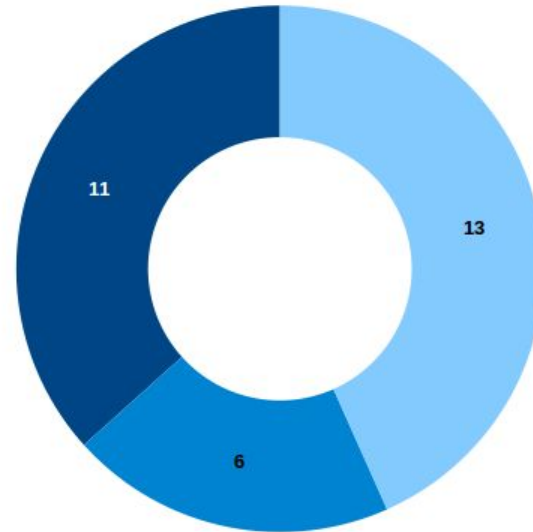
Data from 30/37 IXPs / Source: African IXP Association (2016)



■ Full-time staff only ■ Both ■ Part-time staff only

African IXPs: Paid or Volunteer Staff

Data from 30/37 IXPs / Source: African IXP Association (2016)



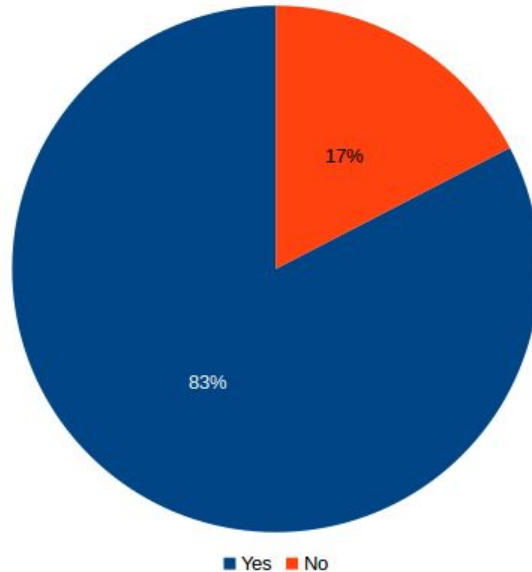
■ Paid staff only ■ Both ■ Volunteer staff only

Contracts and Fees



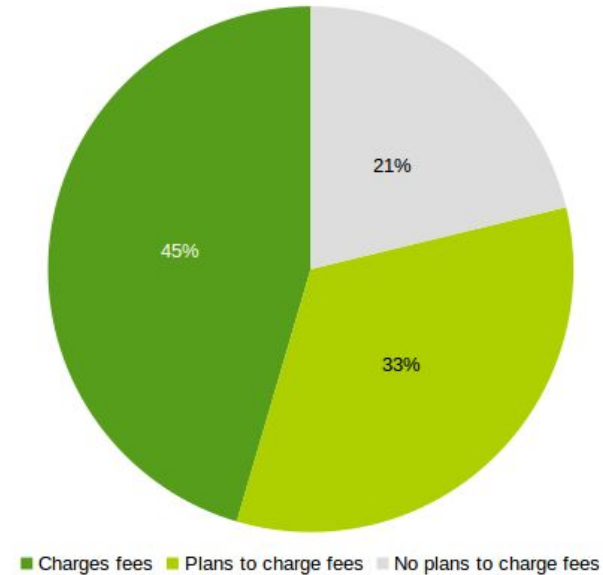
African IXPs: Formal Contract Required to Join?

Data from 23/37 IXPs / Source: African IXP Association (2016)



African IXPs: Fees

Data from 33/37 IXPs / Source: African IXP Association (2016)

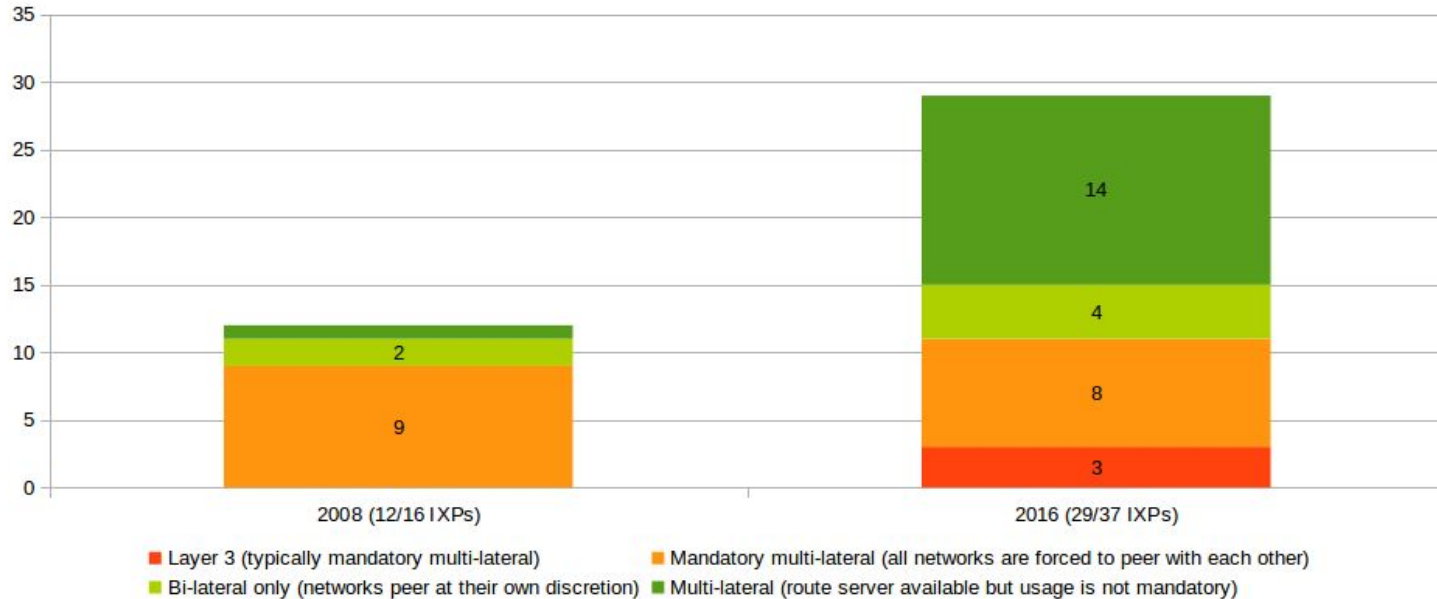


House Rules



African IXPs: Regional Peering Environment

Source: Michuki Mwangi (2008), African IXP Association (2016)

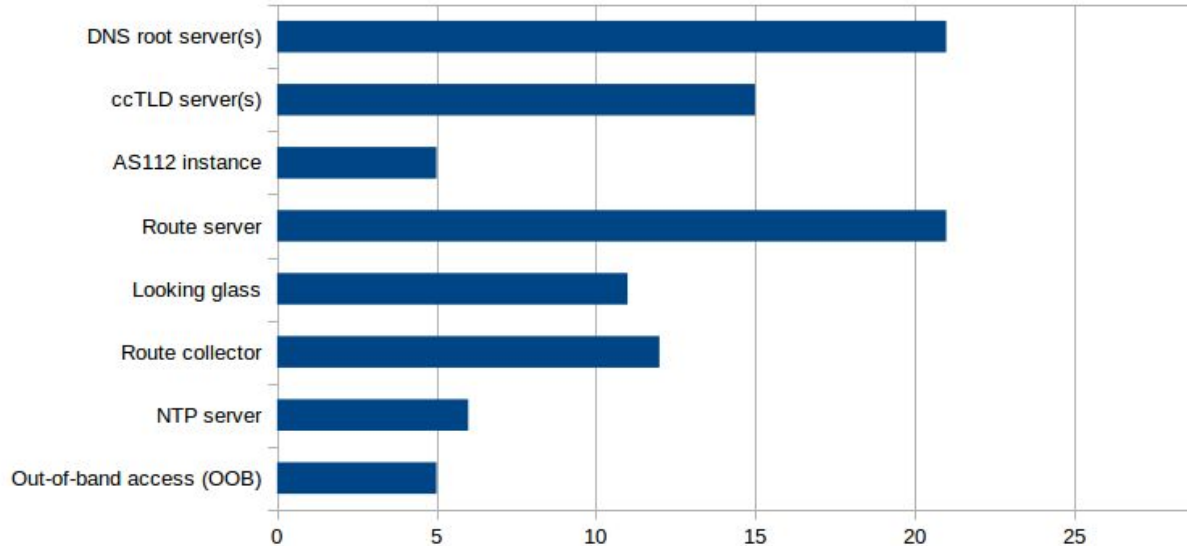


Value Added Services



African IXPs: DNS and Value Added Services

Data from 29/37 IXPs / Source: African IXP Association (2016)



- VAS is more common:
66% had some in 2008
90% had some in 2016
- More Root DNS nodes:
3 in 2008
21 in 2016
- Looking Glasses nearly doubled 2015-2016

Additional Observations



- Increasing network diversity at IXPs
 - More content, government, and enterprise networks
- Most IXPs have websites (30/38) w/ ccTLD but:
 - Many are poor quality; don't list members or networks
 - Only 12 out of 37 have public traffic stats
- Some IXPs do not have internal stats
 - Michuki survey found 7/12 had stats in 2008

Thank you!



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- Visit the AFIX website
 - af-ix.net