



---

# The African IXP Association

**AIS 2017 / May 28th, 2017 / Nairobi, Kenya**

Kyle Spencer / [kyle@stormzero.com](mailto:kyle@stormzero.com)

# Who am I?

---



## Kyle Spencer

- E-mail: [kyle@stormzero.com](mailto: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?



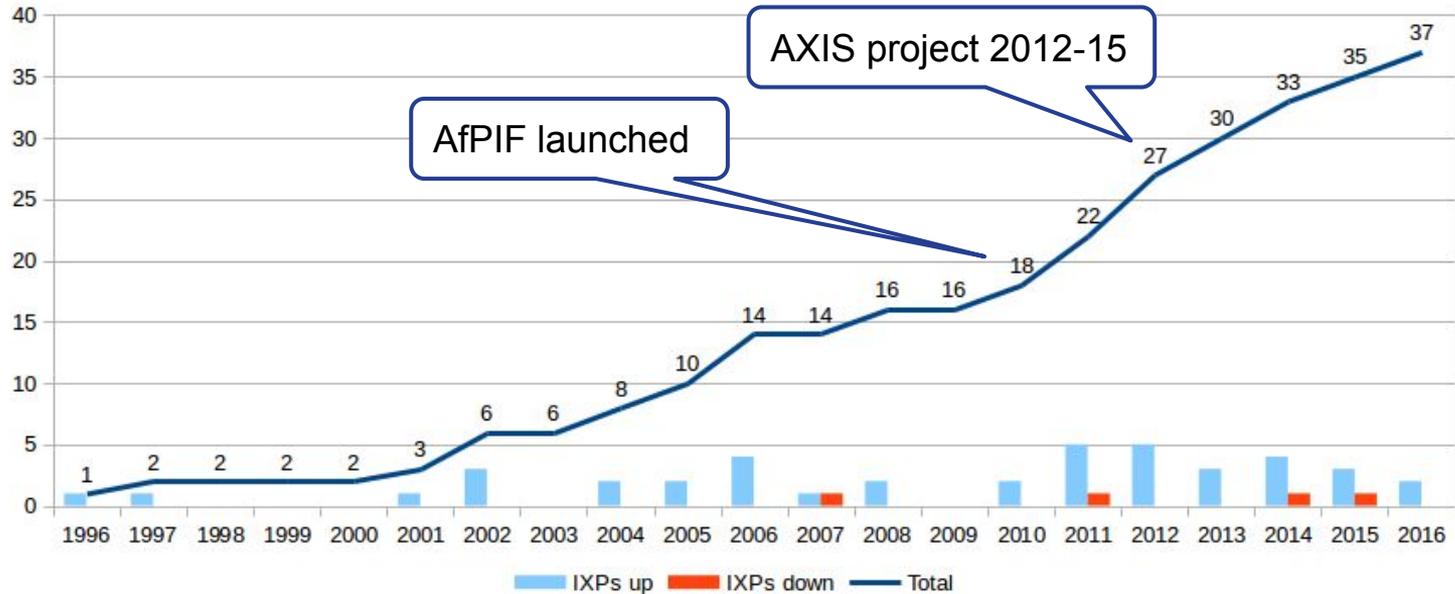
- Launched in 2012 at AfPIF in Johannesburg
  - Member of the Internet eXchange Federation (IX-F) since 2014
- Currently 37 IXPs in 28 countries out of 54 (AU)
  - Oldest: JINX (1996)
  - Newest: Madagascar, Djibouti (2016)
- We host bi-annual meetings at AfPIF and AIS
- We host a private mailing list for IXP operators
- We research and publish data about our region
- We host a website with useful resources
  - URL: <http://www.af-ix.net>

# Growth in Africa



African IXPs: Total Number of Active IXPs by Year

Source: African IXP Association (2016)

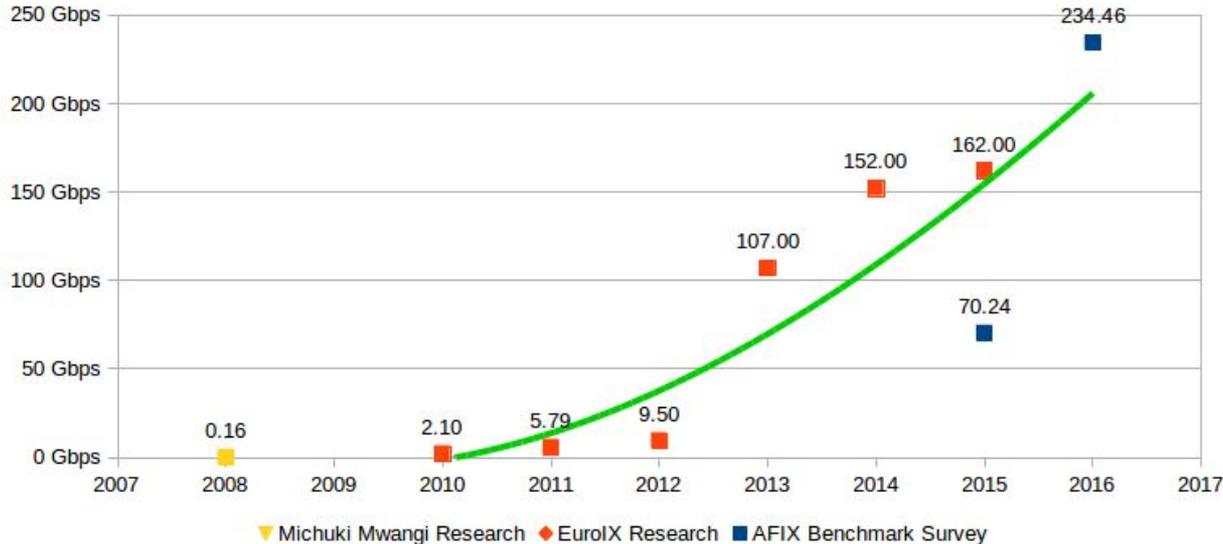


# Traffic carried by IXPs



## African IXPs: Aggregate Regional Peak Traffic

Source: African IXP Association (2016)



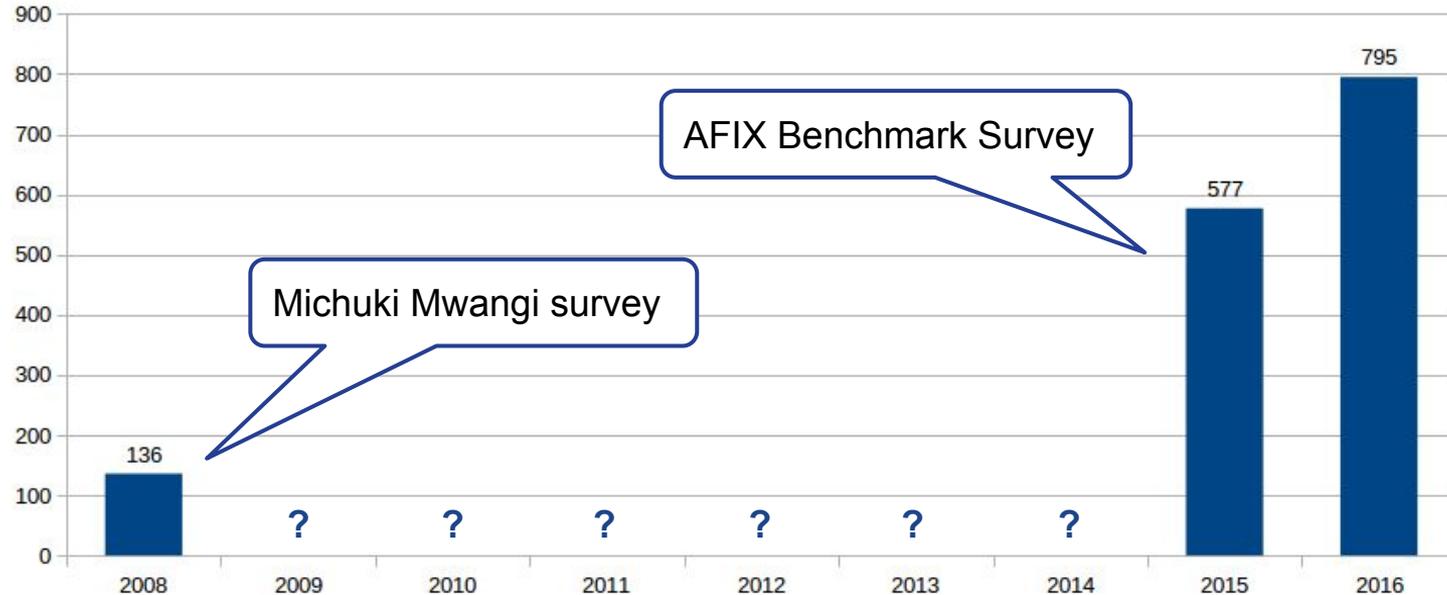
- No traffic data-sets are fully comprehensive
- Not all IXPs have and/or publish traffic statistics
- Inconsistent accounting of peak traffic statistics (e.g. monthly vs. daily)
- Some IXPs carry significant transit traffic

# Connected networks



African IXPs: Total Number of Peering Ports Connected by Year

Source: African IXP Association (2016)

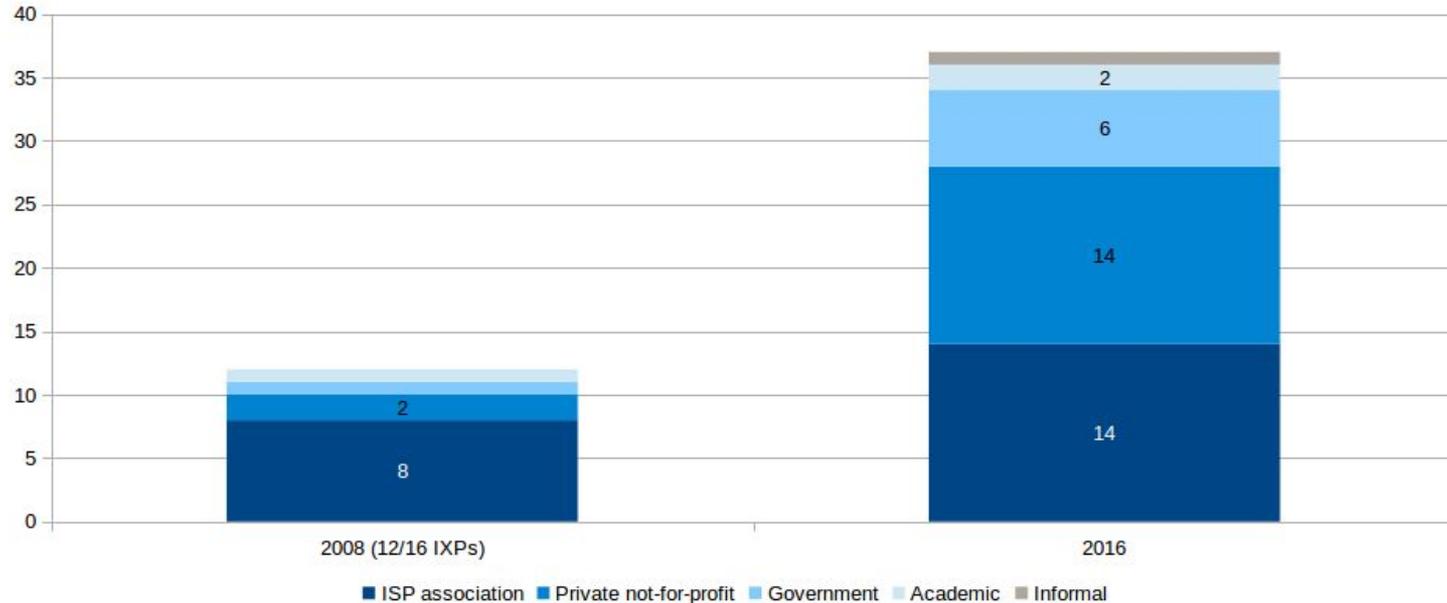


# Governance models



## African IXPs: Governing Entity Types

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

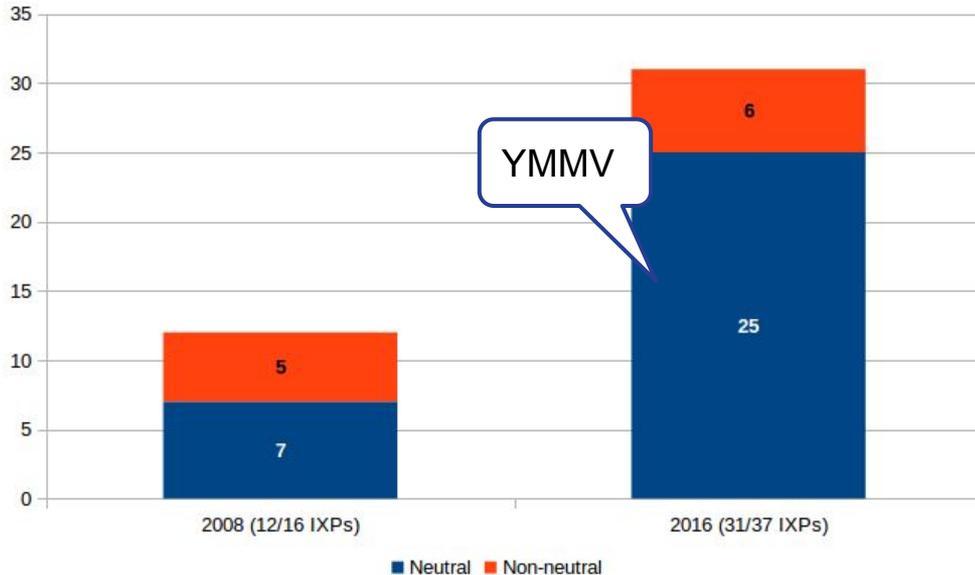


# Facilities



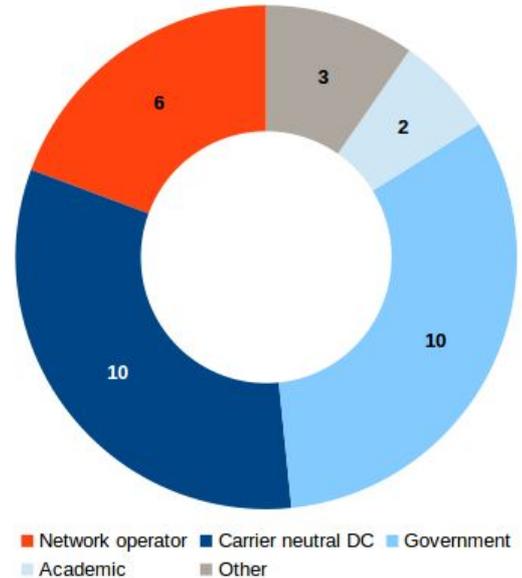
## African IXPs: Facility Neutrality

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



## African IXPs: Facility Type Breakdown

Source: African IXP Association (2016)

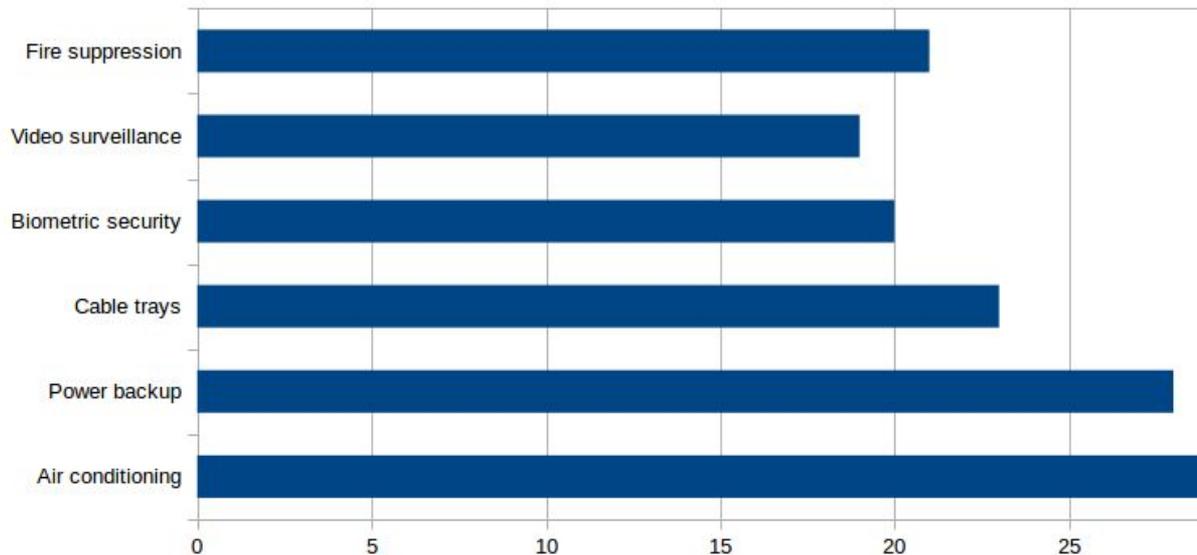


# Facilities



## African IXPs: Facility Amenities

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



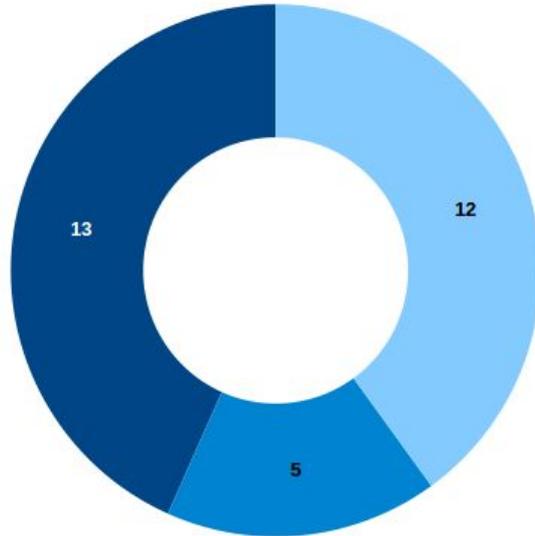
- The quality of IXP facilities has greatly improved over time
- IXPs in carrier neutral DCs had the best amenities on average
- **Reality: YMMV**

# Staffing



## African IXPs: Full or Part-time Staff

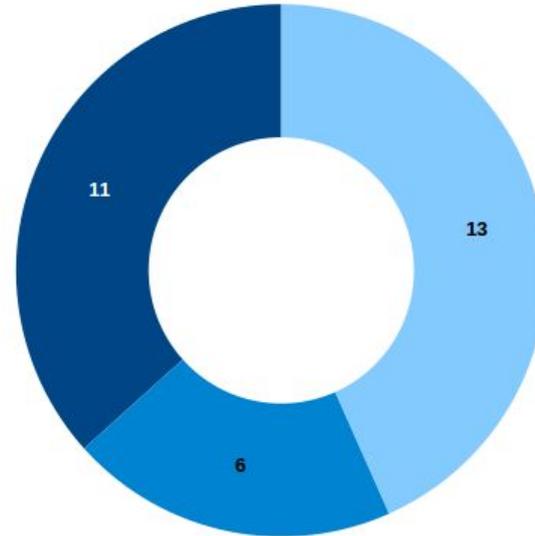
Data from 30/37 IXPs / Source: African IXP Association (2016)



■ 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)



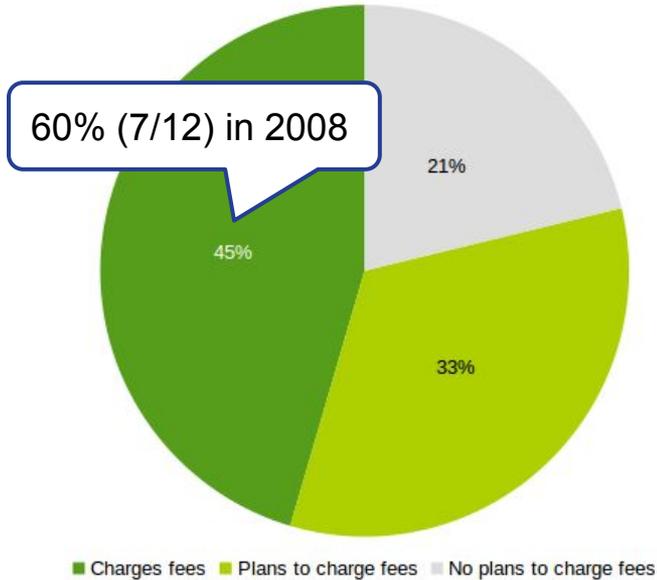
■ Paid staff only ■ Both ■ Volunteer staff only

# Sustainability



### African IXPs: Fees

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



### African IXPs: Fees by Governing Entity Type

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

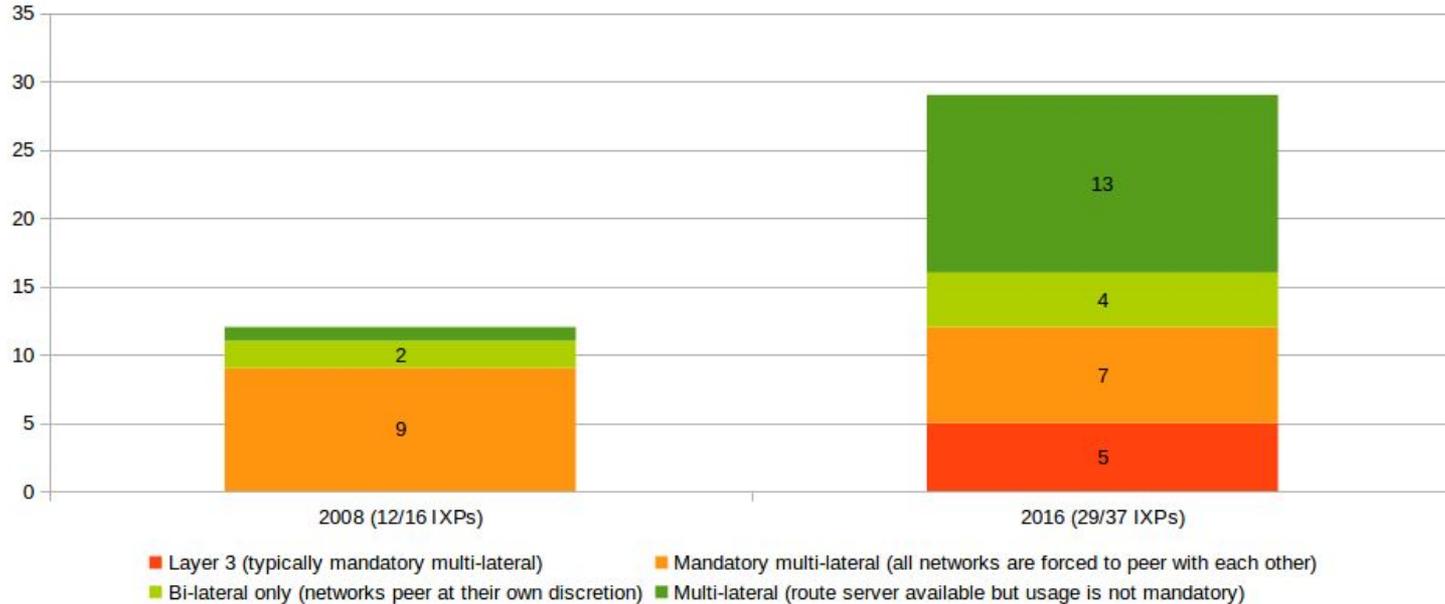


# House rules



## African IXPs: Regional Peering Environment

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

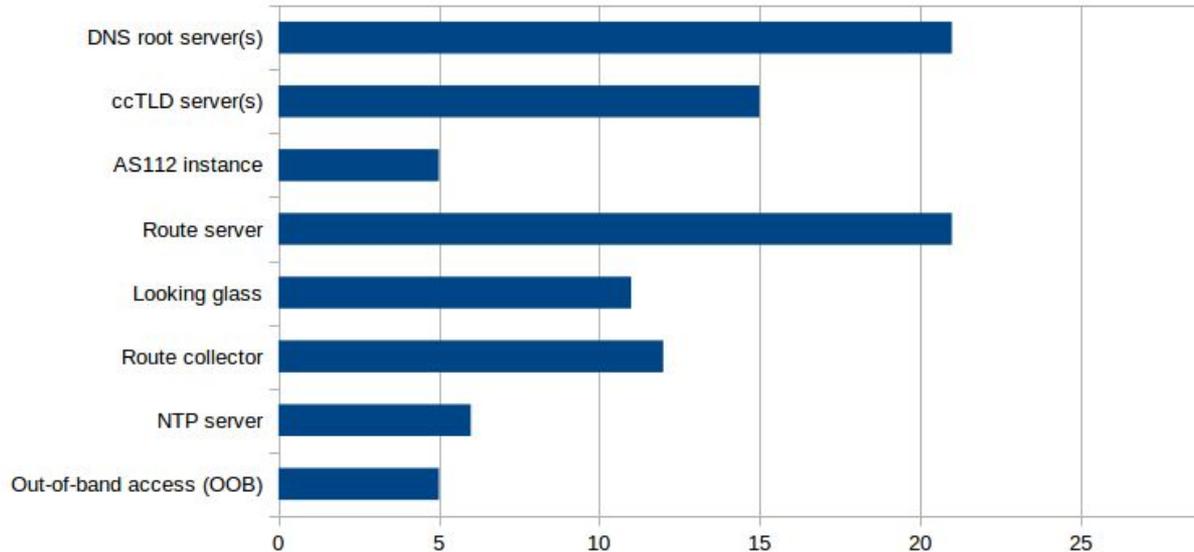


# Value Added Services



## 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 (30/37) w/ ccTLD
  - But many are poor quality and don't list members
- Only ~12/37 IXPs have public traffic stats
  - Many may not have internal stats either
  - Michuki survey found 7/12 had stats in 2008

# Thank you!

---



- Kyle Spencer
  - [kyle@stormzero.com](mailto:kyle@stormzero.com)
- Visit the AFIX website for more information
  - [af-ix.net](http://af-ix.net)