The African IXP Association

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What is AFIX?

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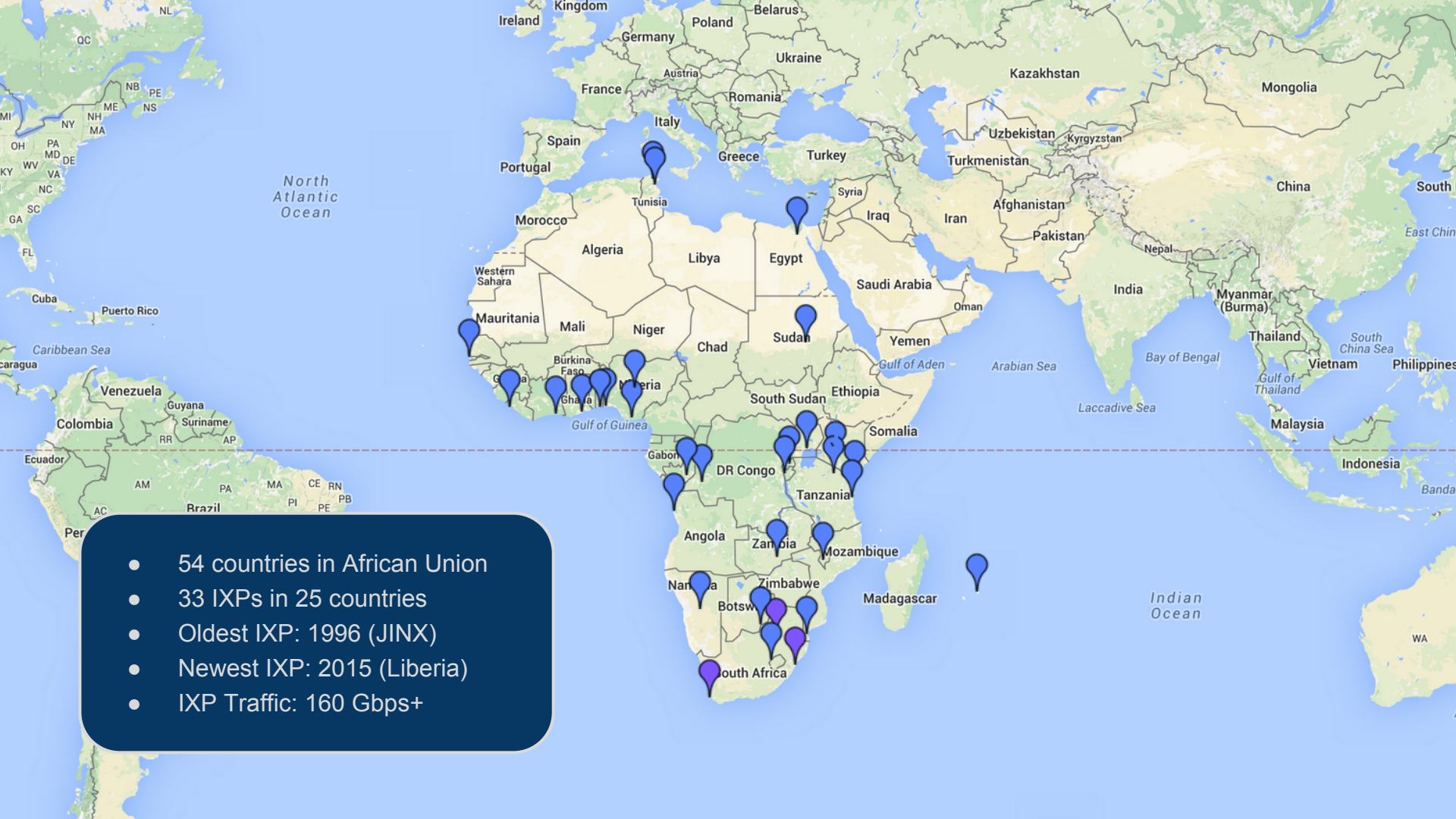
What is AFIX?

Our purpose is to provide an enabling environment for Internet exchange point operators.

We aim to help IXPs' maximize their value, to improve connectivity within the continent, and increase the Internet's value for all.

What is AFIX?

- Established in 2013
  - AfPIF in Casablanca, Morocco
- Informal organizational structure
  - Not legally registered
- Co-coordinators:
  - Kyle Spencer / Nishal Goburdhan
- Member of IX-F since June 2014
  - Internet Exchange Federation

- 54 countries in African Union
- 33 IXPs in 25 countries
- Oldest IXP: 1996 (JINX)
- Newest IXP: 2015 (Liberia)
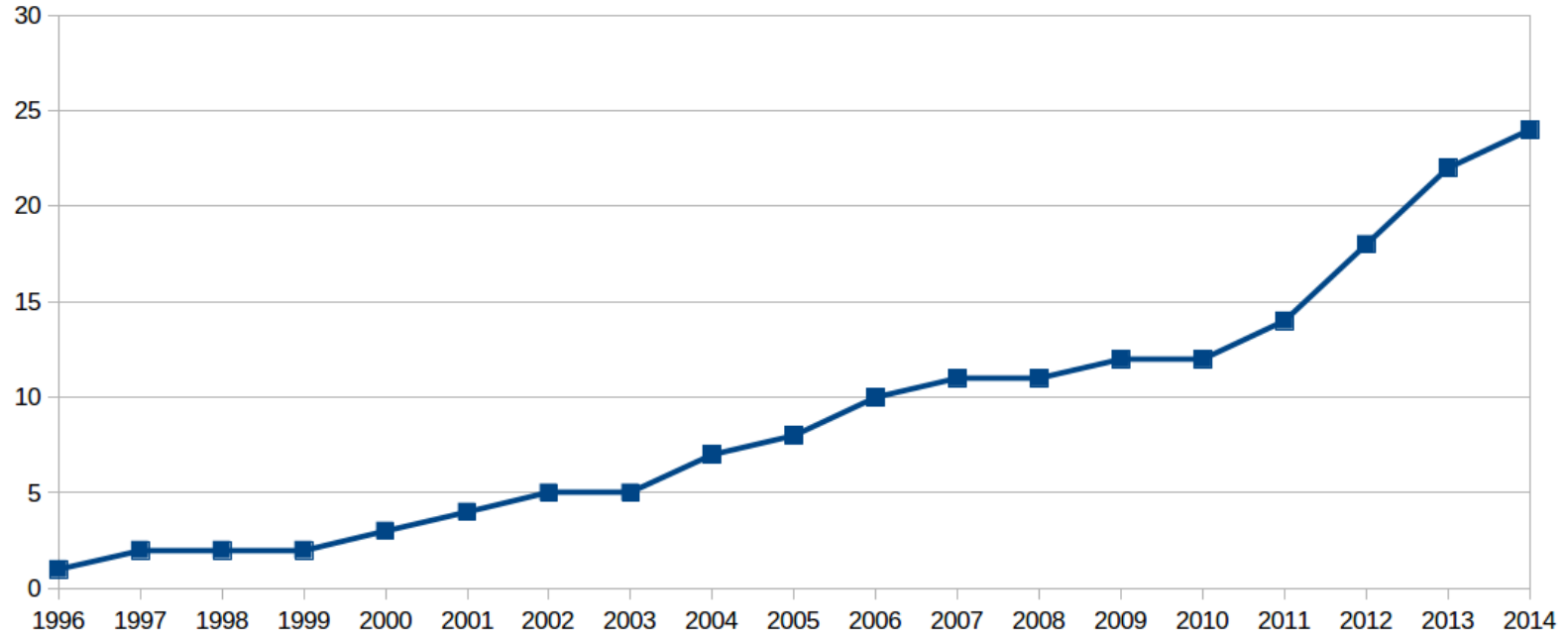- IXP Traffic: 160 Gbps+

Benchmark Survey Overview

- Annual survey of IXPs in Africa
  - Launched in 2015
  - Helps us better understand our region
- Submissions received from 73% of IXPs
  - 24 of 33 IXPs
  - It's hard to gather and verify the data
  - Some margin of error
- Compared with historical data when possible
  - These data-sets suffer from similar issues

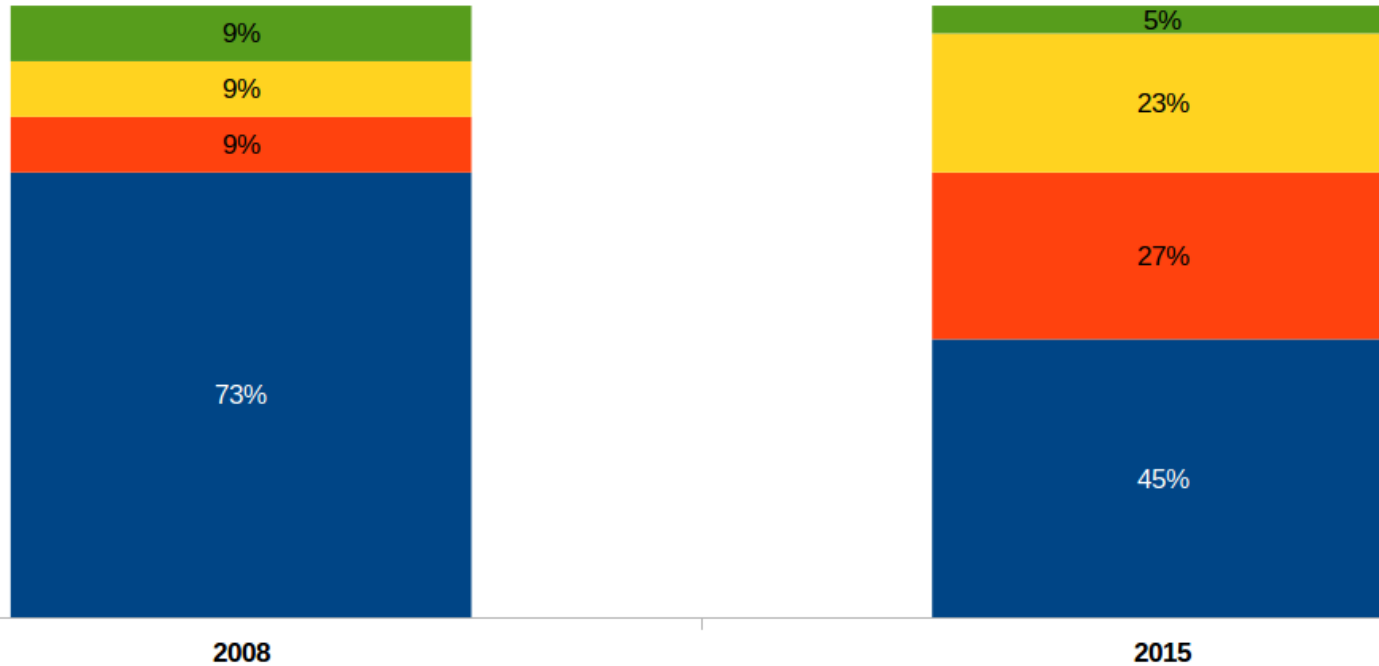# Growth in the Ecosystem

Number of IXPs by Year

Based on survey submissions from 24 out of 33 IXPs

Governing Entity Types

Revenue: Fees

Fees by governing entity type

Based on submissions from 24 of 33 IXPs

Legend: ■ Charges Fees ■ Plans for fees ■ No plans for fees
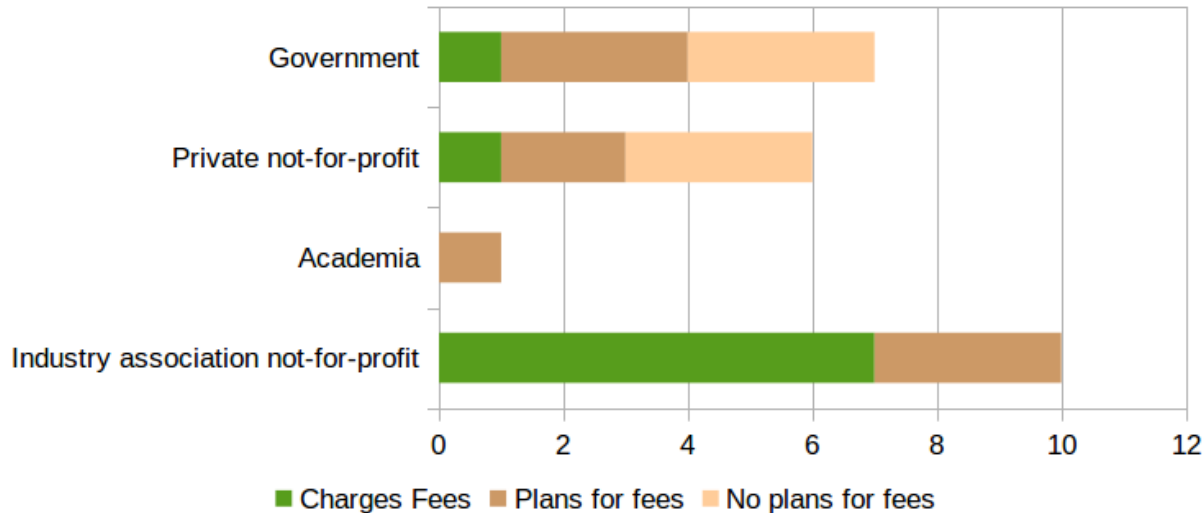
- Most IXPs charge fees or plan to in the future.

- Fees are far more common in Industry Association NFP IXPs. Why is this?

- All Private NFP IXPs with no intention to charge have other sources of revenue.

Revenue: Services

Revenue generating services available in same facility as IXP
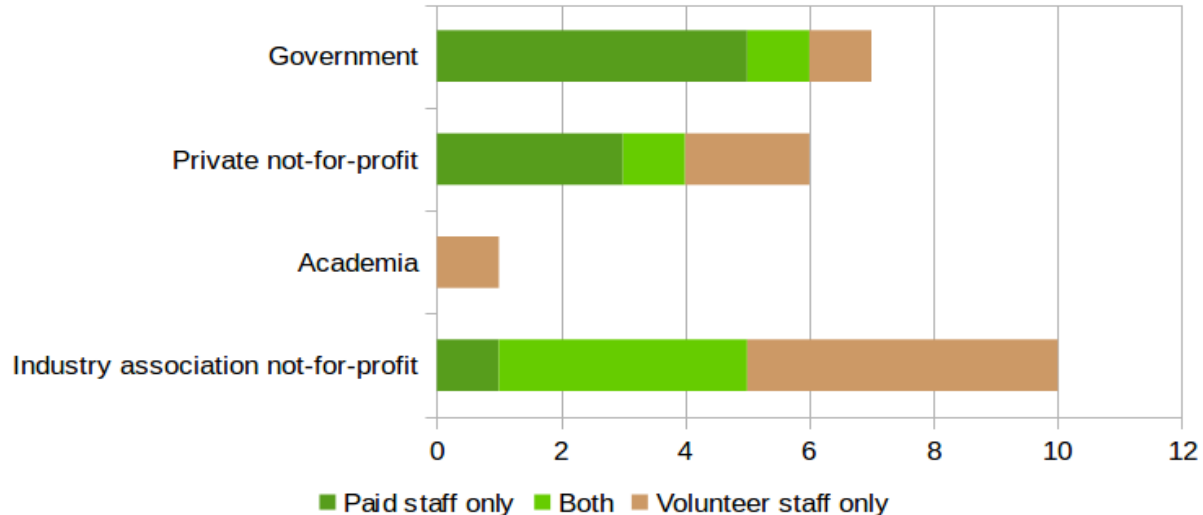
Based on submissions from 24 of 33 IXPs
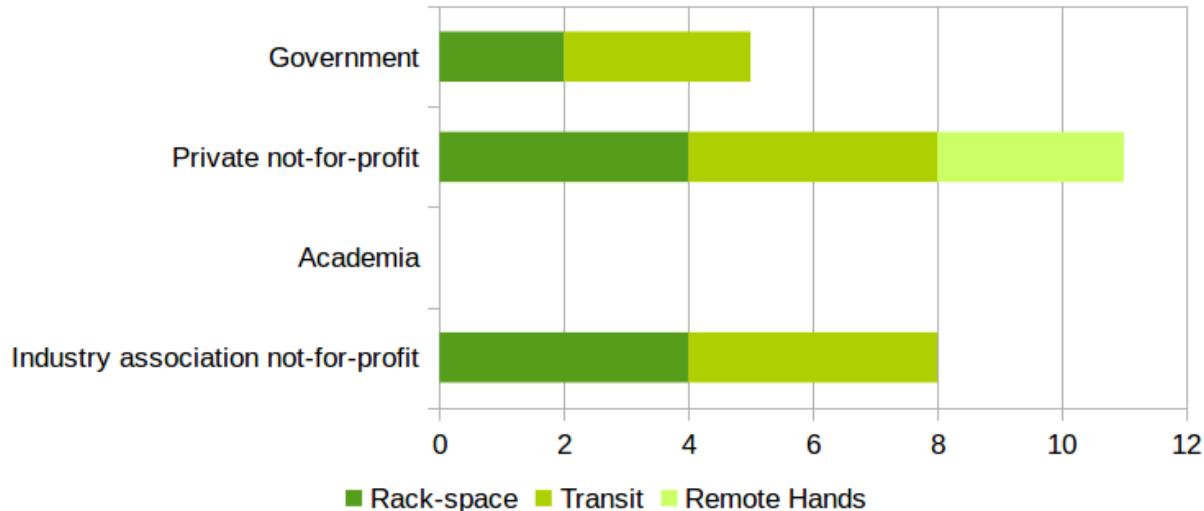
- IXPs that offer commercial services have significantly higher traffic levels and participant numbers, but most are in South Africa.

Staff: Paid or Volunteer

Paid or volunteer by governing entity type

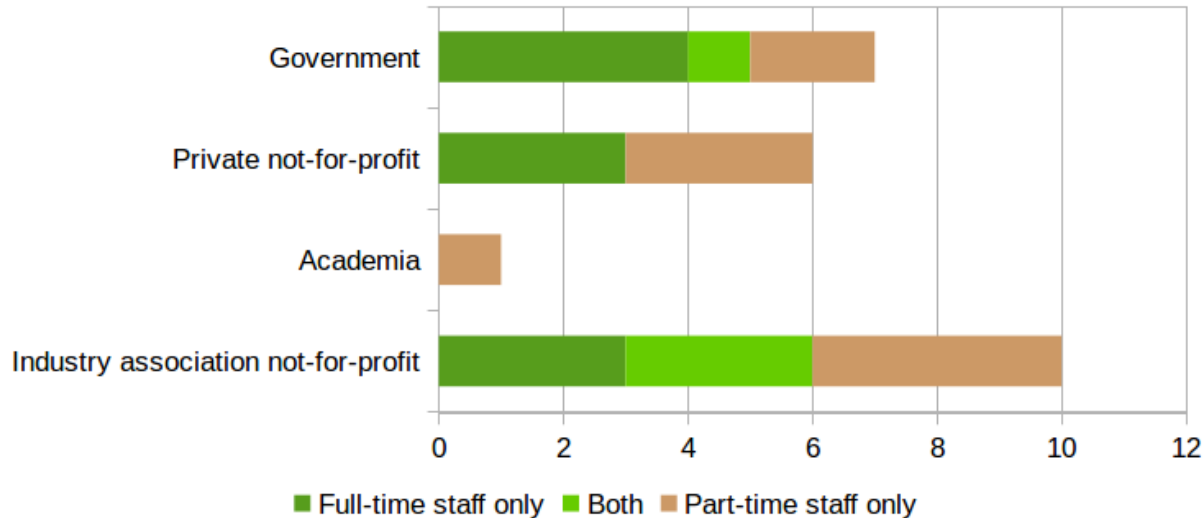Based on submissions from 24 of 33 IXPs

- Some Industry Association NFP IXPs charge fees but have volunteer staff. Where does the money go?

- Most Government IXPs don't incorporate volunteers.

Staff: Full or Part-time

Full or part-time by governing entity type

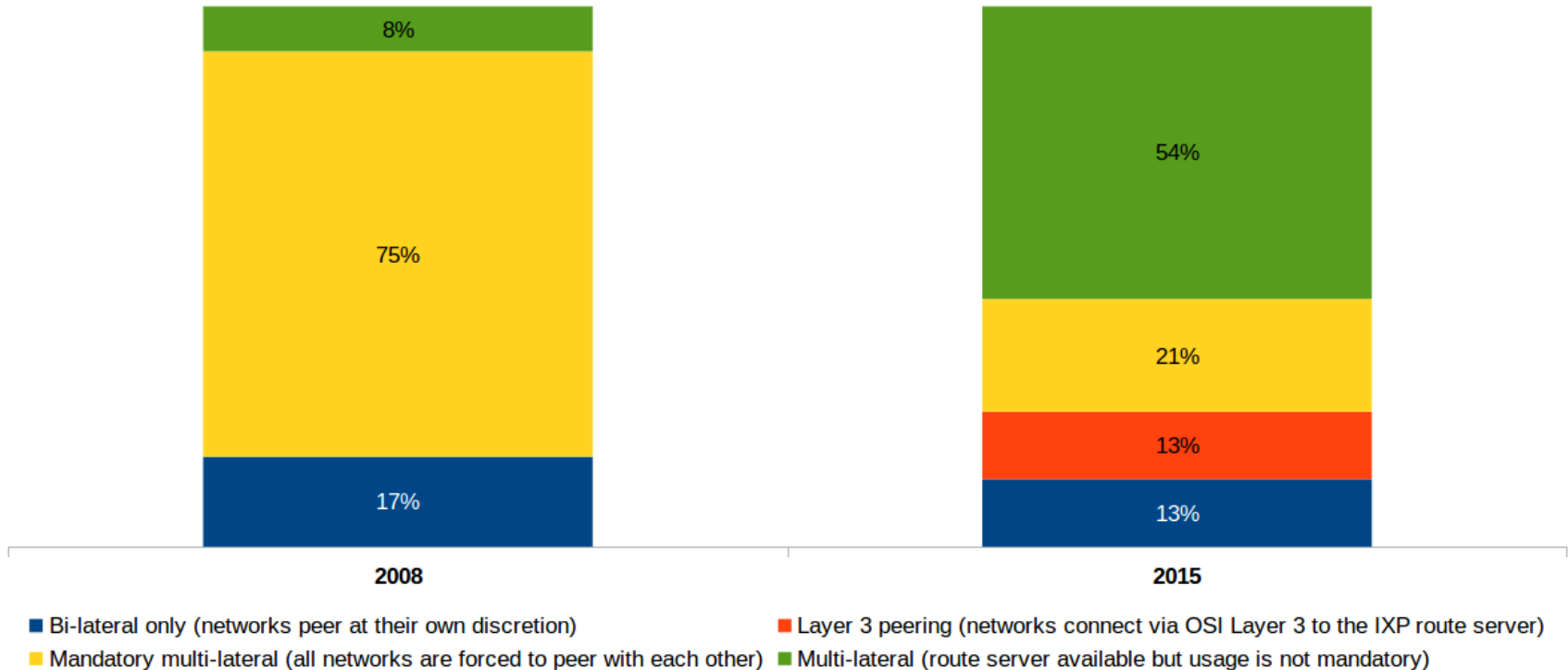Based on submissions by 24 of 33 IXPs

- Obvious: Full-time staff correlates with paid staff

- Many Government IXPs have paid full-time staff and don't charge fees, but plan to in the future.

- Industry NFPs have best indicators for sustainable growth

Peering Policies

2008 Data Source: Michuki Mwangi / 2015 Data Source: AFIX Benchmark Survey

2008
- 8%
- 75%
- 17%

2015
- 54%
- 21%
- 13%
- 13%

- ■ Bi-lateral only (networks peer at their own discretion)
- ■ Layer 3 peering (networks connect via OSI Layer 3 to the IXP route server)
- ■ Mandatory multi-lateral (all networks are forced to peer with each other)
- ■ Multi-lateral (route server available but usage is not mandatory)

Other Value Added Services

Value Added Services available from the IXP

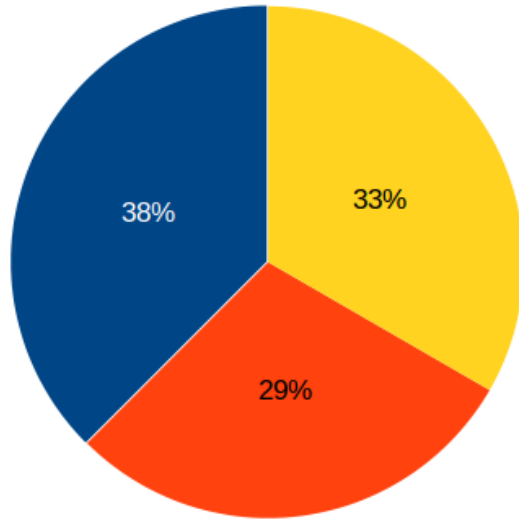Based on submissions from 24 of 33 IXPs
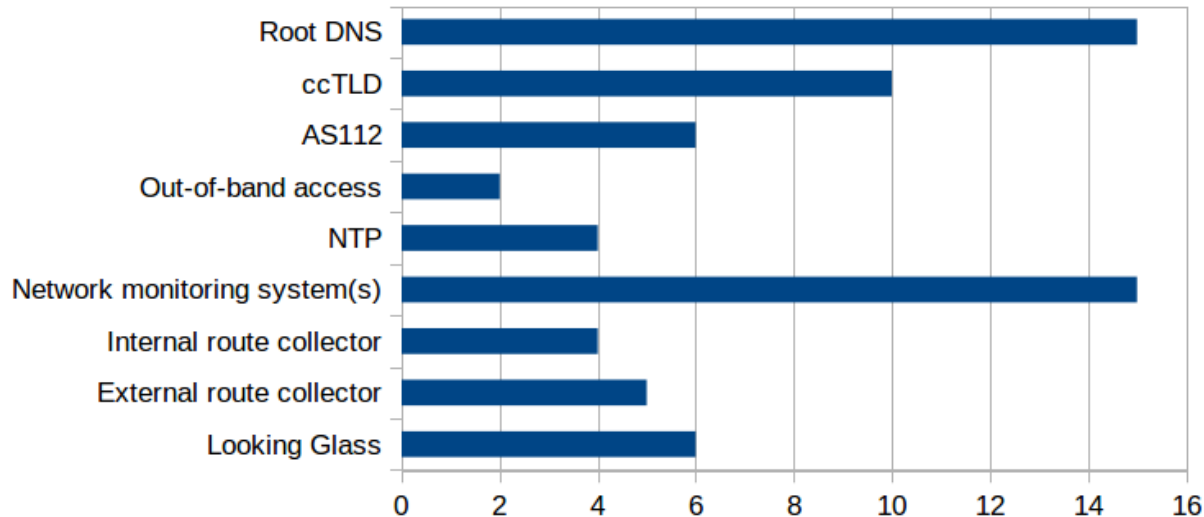
- VAS is increasing:
  66% of IXPs in 2008
  87.5% of IXPs in 2015

- DNS services are also
  more widely available:
  Only 3 Roots in 2008

- 62.5% have a transit link

- 54% have been issued
  IPv6 address space

Facility Control

Who owns and/or operates the IXP facility?

Based on submissions from 24 of 33 IXPs

- 38% Another entity
- 29% Industry association
- 33% The IXP

- 62% of surveyed IXPs are assumed to be in neutral facilities.

- All surveyed Private NFPs appear to be hosted in neutral facilities.

- 2008 facility neutrality data is available (50%) but the AFIX Benchmark Survey needs to be improved in order to make an accurate comparison.

Facility Amenities

IXP facility amenities

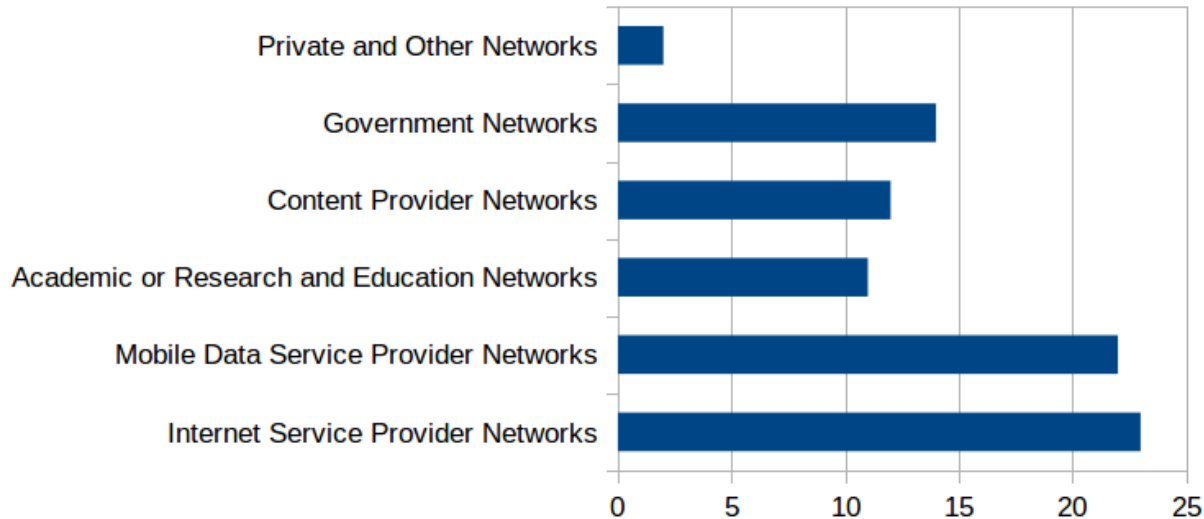Based on submissions from 24 of 33 IXPs
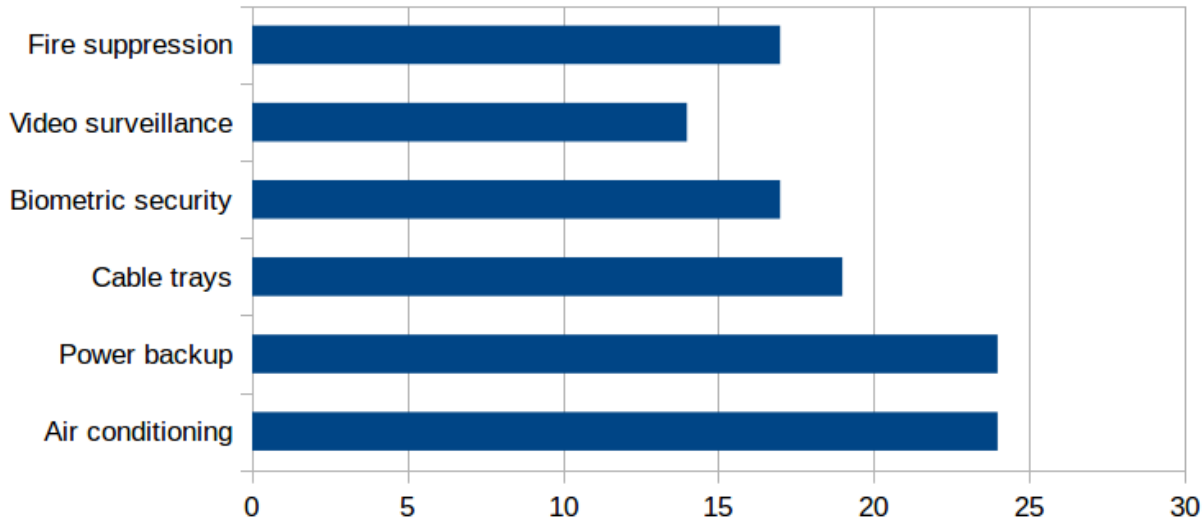
- The quality of IXP facilities has greatly improved overall.

- Government IXPs appear to have the best security and facility amenities on average.

- YMMV

Composition

Types of networks connected to IXPs

Based on submissions from 24 of 33 IXPs
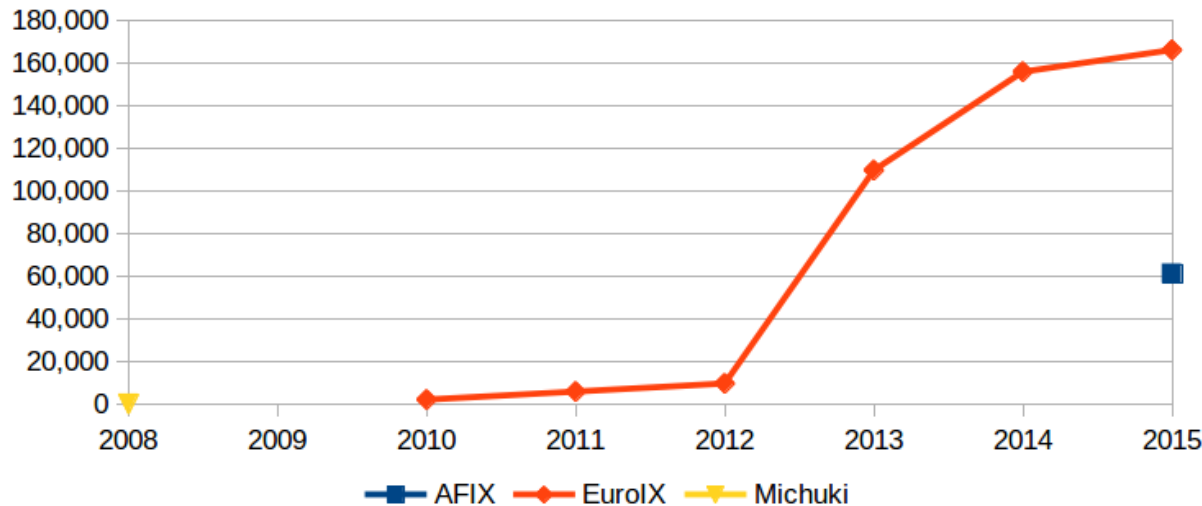

- Total number of participants: 563
    - 2008: 129

- Highest number of participants: 115
    - 2008: 24

- Average number of participants: 23.5
    - 2008: 11

Traffic: Challenges

Peak traffic by year

Based on three data-sets (graph in Mbps)

- Inconsistent measurements: Some data is monthly peak, some data is daily peak.

- None of the datasets include all IXPs in Africa

- Not all IXPs publish statistics (~83% do)

- Some IXPs publish statistics that include transit traffic

Additional Observations

- Almost all IXPs have websites
  - 83% with ccTLD domains

- Most IXPs receive donations
  - Many rely on them.
  - This survey captured donation related information but it was not of sufficient quality to report on. This will be improved next year.

More Information

- Visit our website
  - http://www.af-ix.net
- Join our public mailing list
  - http://af-ix.net/mailman/listinfo/
- Follow us on Twitter
  - @AF_IX and #AFIX2015
- E-mail me
  - kyle@stormzero.com