The African IXP Association

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About Me

- Kyle Spencer
  - African IXP Association (AFIX)
  - Internet eXchange Federation (IX-F)
  - Uganda Internet eXchange Point (UIXP)
    - Peer with us: http://uixp.co.ug

  - ICT Association of Uganda (ICTAU)
  - GamersNights

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.

Our purpose is to provide an enabling environment for IXPs, to help them maximize their value, to improve connectivity within the continent, and to increase the Internet's value for all.

What is AFIX?

- Established in 2013
  - AfPIF in Casablanca, Morocco

- Coordinators:
  - Kyle Spencer (UG), Nishal Goburdhan (ZA)

- Member of Internet eXchange Federation
  - Joined June 2014

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

Benchmark Survey

- Annual survey of IXPs in Africa
    - Helps us better understand our region
    - Launched in 2015
- 73% of IXPs responded (24 of 33)
    - This is good but has significant margin of error
    - It's hard to gather and verify the data
- This report incorporates other data-sets
    - Which faced similar challenges

Growth in Africa
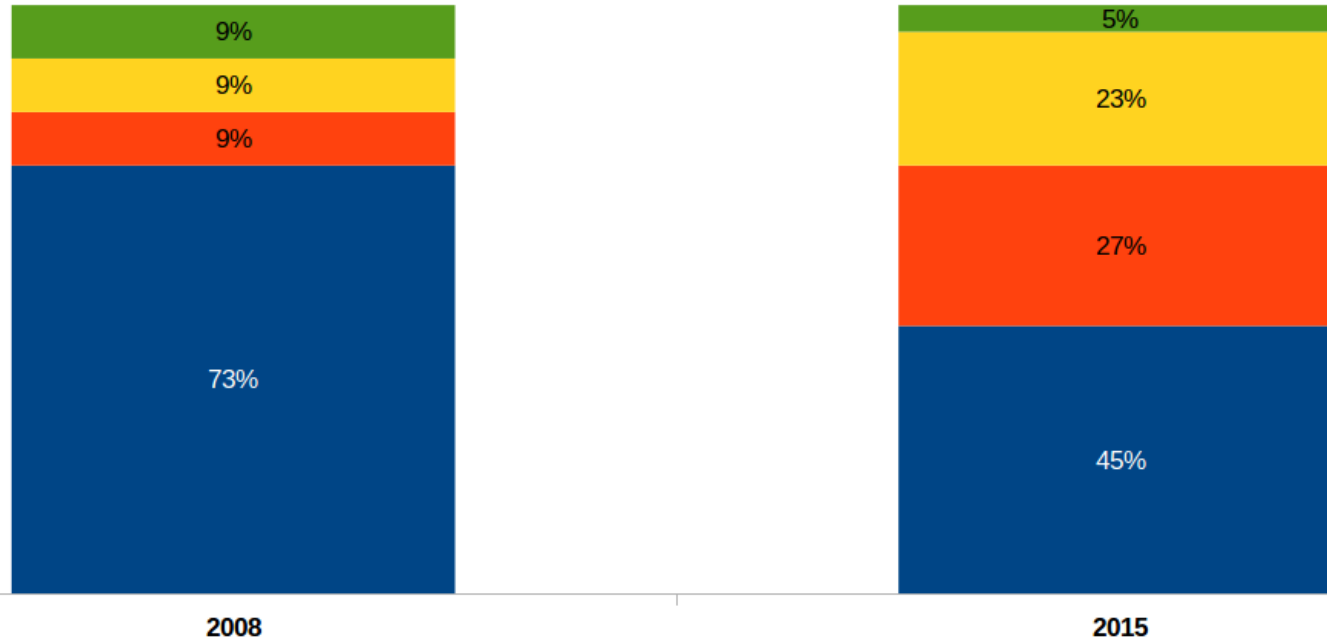

Number of IXPs by Year

Based on survey submissions from 24 out of 33 IXPs

10 new IXPs since 2011
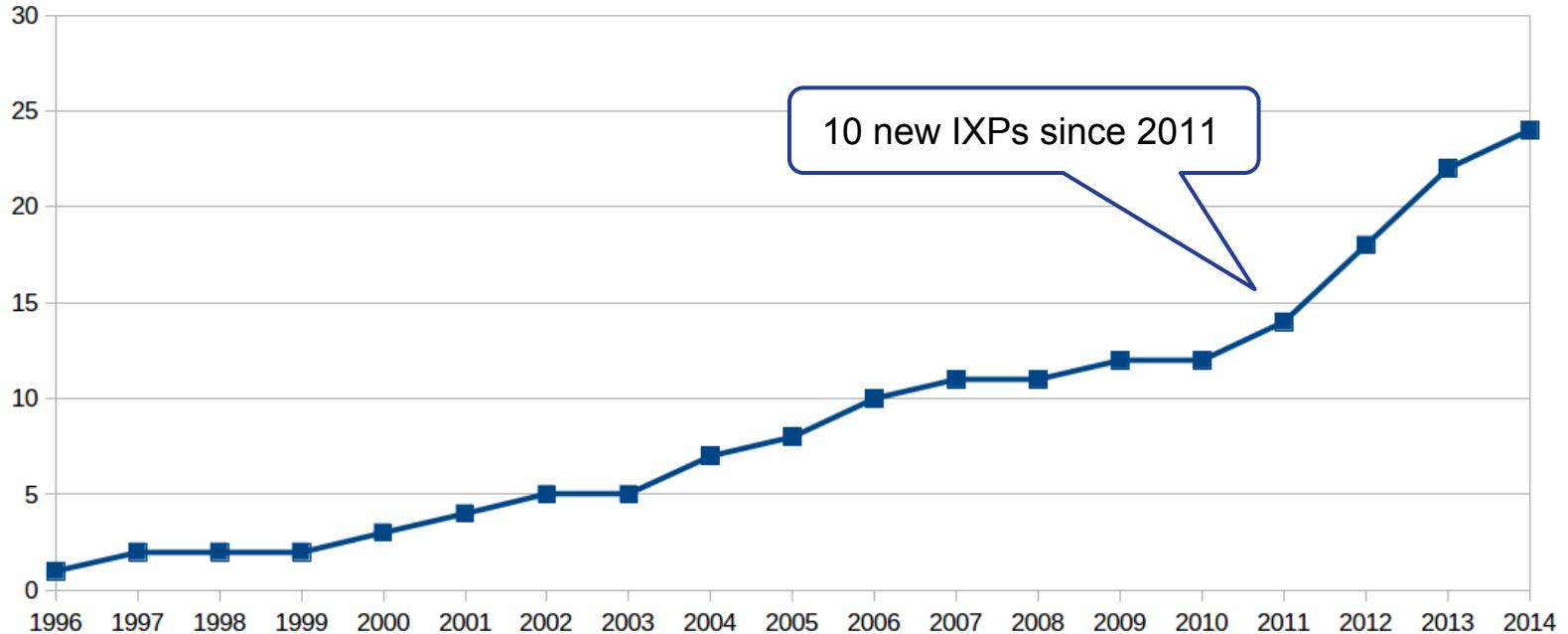
Governing Entity Types

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

2008
- 9% (Academia)
- 9% (Government)
- 9% (Private not-for-profit)
- 73% (Industry association not-for-profit)

2015
- 5% (Academia)
- 23% (Government)
- 27% (Private not-for-profit)
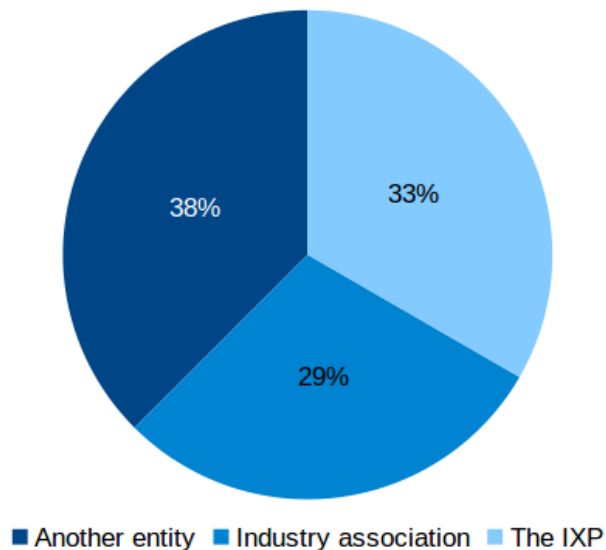- 45% (Industry association not-for-profit)

■ Industry association not-for-profit ■ Private not-for-profit ■ Government ■ Academia

Facility: Control

Who owns and/or operates the IXP facility?

Based on submissions from 24 of 33 IXPs

- 38%
- 33%
- 29%

■ Another entity ■ Industry association ■ The IXP

- **62%** of IXPs (24) are assumed to be in neutral facilities.

- **50%** of IXPs (12) were in neutral facilities in 2008. Source: Michuki

- All **Private NFP** IXPs appear to be located in **neutral** facilities.

- Future versions of this survey will attempt to capture more information regarding facility neutrality and accessibility.

Facility: Amenities

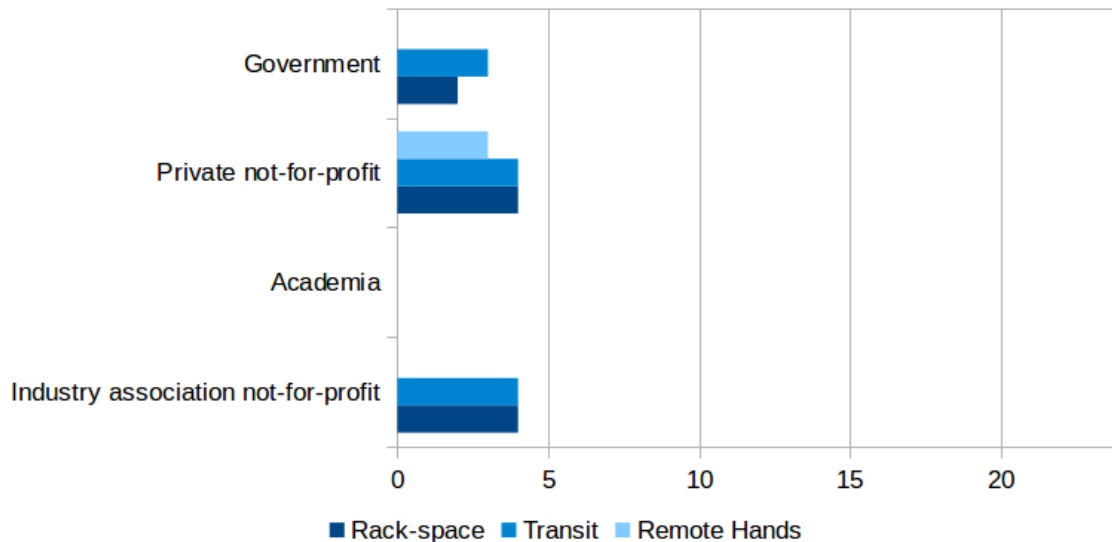## IXP facility amenities

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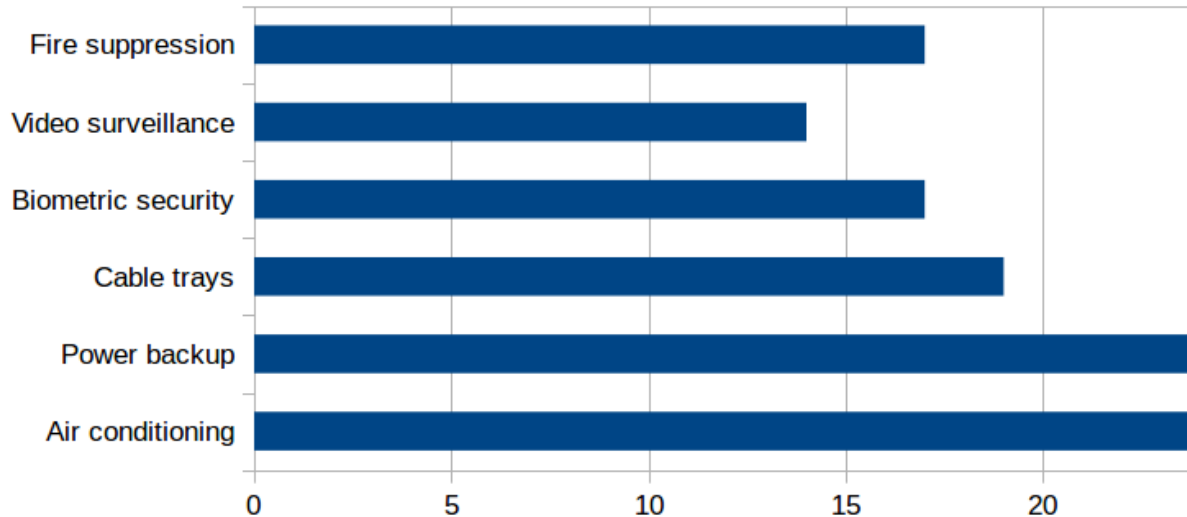
- The quality of IXP facilities has greatly improved.

- Government IXP facilities appear to have the best security and amenities on average.

- **YMMV**

Environment

Commercial services available in same facility as IXP

Based on submissions from 24 of 33 IXPs

(chart categories: Government, Private not-for-profit, Academia, Industry association not-for-profit; legend: Rack-space, Transit, Remote Hands)
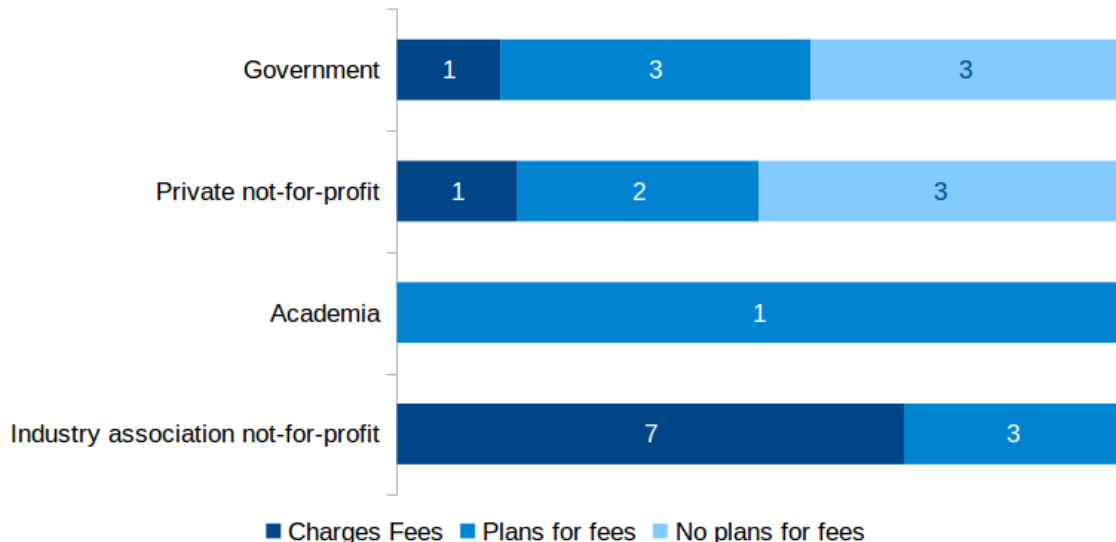
- IXPs in facilities with commercial services had significantly higher traffic levels and more networks connected on average.

- But: 50% are in South Africa

Fdees: Ports and Membership

Fees by governing entity type

Based on submissions from 24 of 33 IXPs

Government	1	3	3
Private not-for-profit	1	2	3
Academia		1	
Industry association not-for-profit	7		3

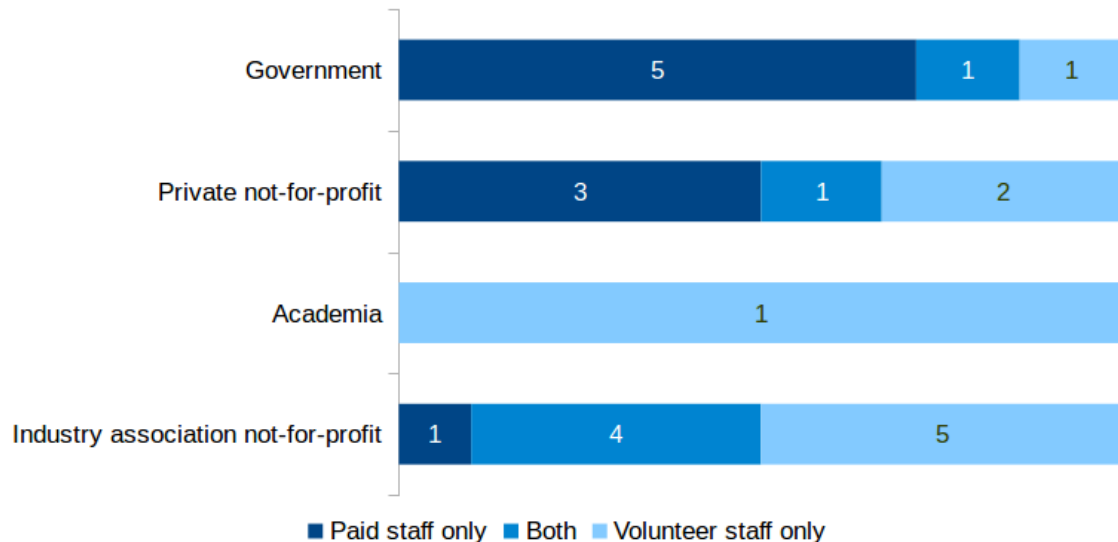■ Charges Fees　■ Plans for fees　■ No plans for fees

- Most IXPs charge fees or plan to in the future.

- Monthly fees are more common than annual fees.

- Fees are significantly more common at Industry Association NFP IXPs.

- All Private NFP IXPs with no plan to charge fees had other sources of revenue and are in facilities which offer commercial services.

Staff: Paid or Volunteer

Paid or volunteer staff by governing entity type

Based on submissions from 24 of 33 IXPs

Entity type	Paid staff only	Both	Volunteer staff only
Government	5	1	1
Private not-for-profit	3	1	2
Academia			1
Industry association not-for-profit	1	4	5

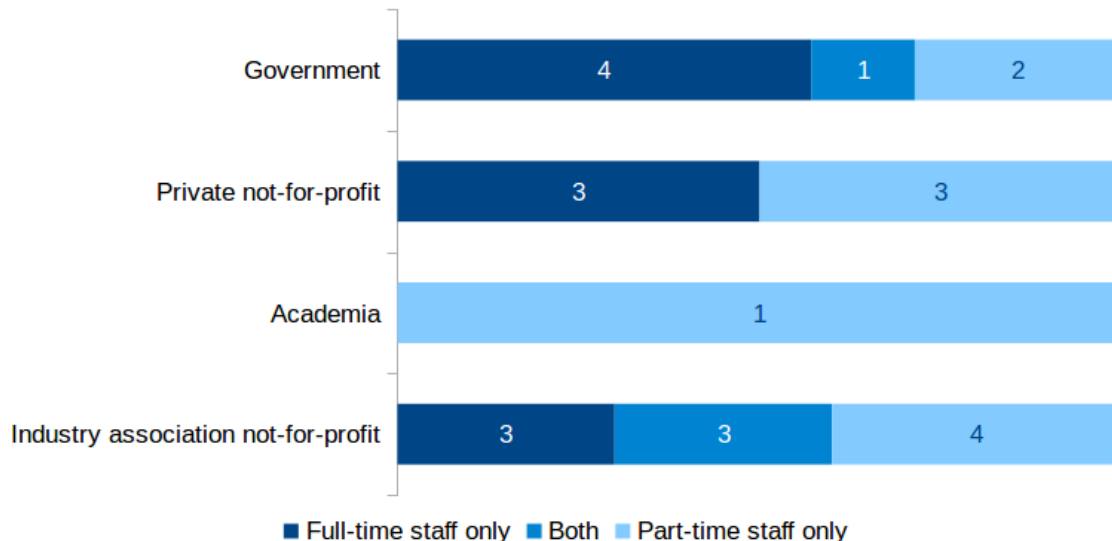■ Paid staff only ■ Both ■ Volunteer staff only

- Most Government IXPs have paid staff and don't involve volunteers.

- Industry Association NFPs utilize the most volunteers.

- Some Industry Association NFP IXPs that charge fees are run by volunteer staff.

Staff: Full or Part-time

Full or part-time staff by governing entity type

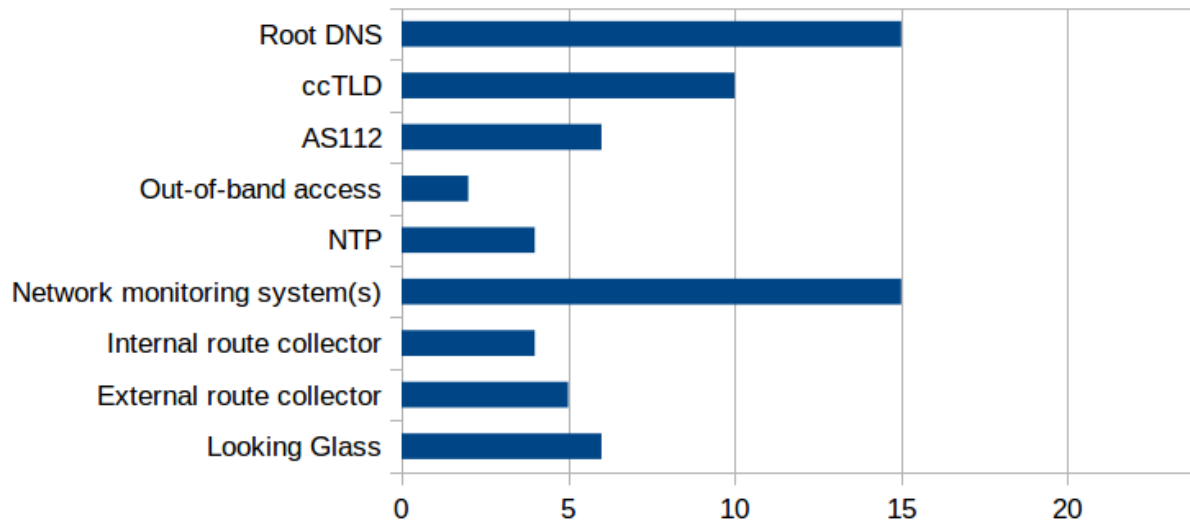Based on submissions by 24 of 33 IXPs

- Approximately half of IXPs have full-time staff.

- Obvious: Full-time staff correlates with paid staff.

- Industry Association NFPs and Private NFPs have the best indicators for sustainable growth.

Value Added Services

Value Added Services available from the IXP

Based on submissions from 24 of 33 IXPs

- IXPs with some VAS:

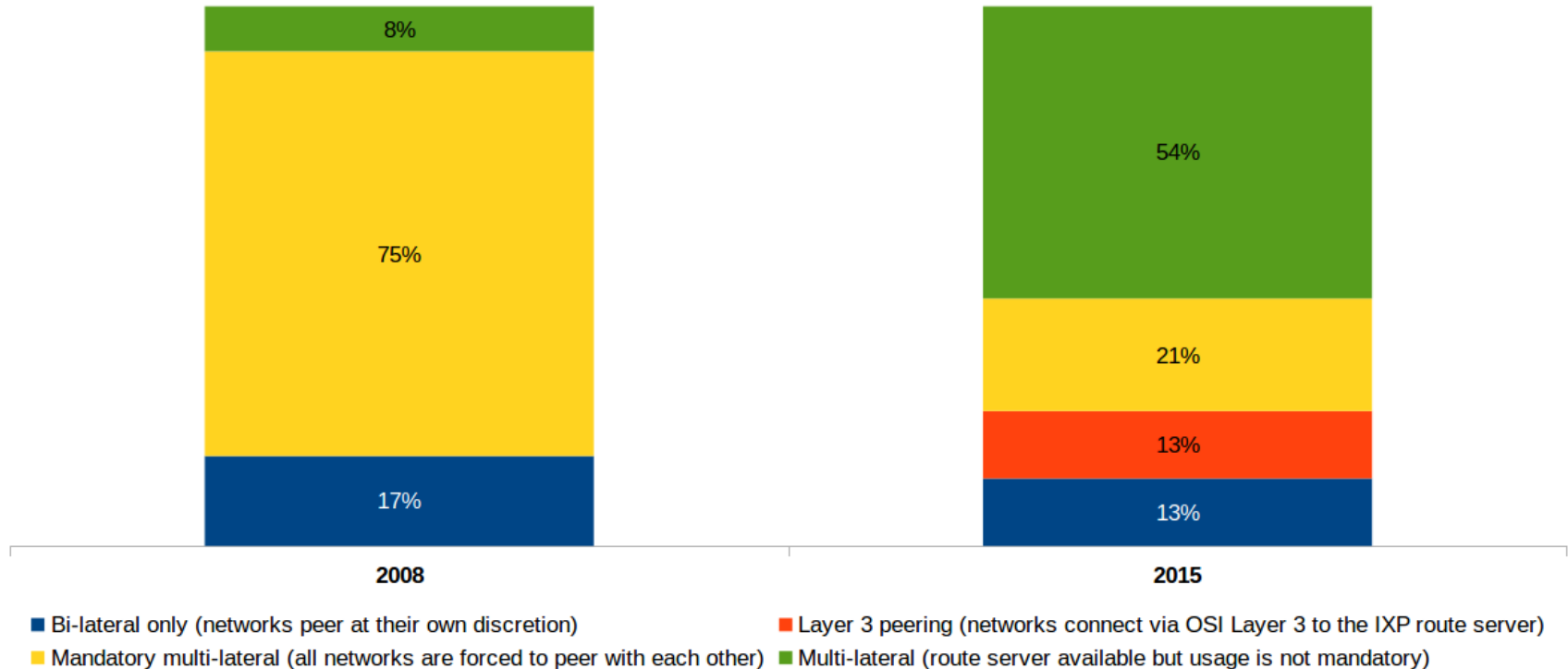 **66%** in 2008
  87.5% in 2015

- DNS services are now more widely available:

  3 Root DNSs in 2008

Peering Policies

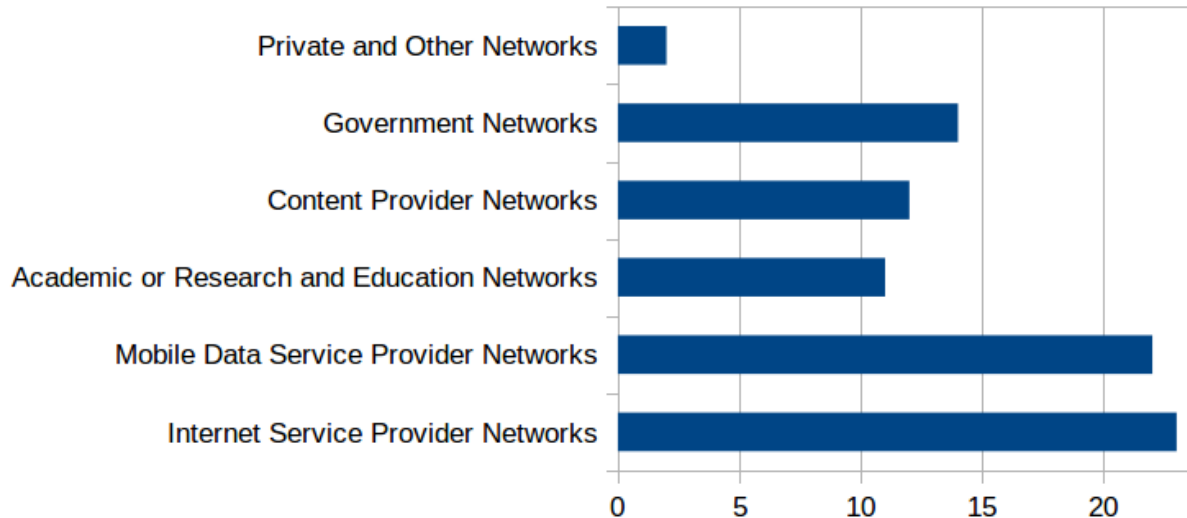2008 Data Source: Michuki Mwangi / 2015 Data Source: AFIX Benchmark Survey

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)

Composition

Types of networks connected to IXPs
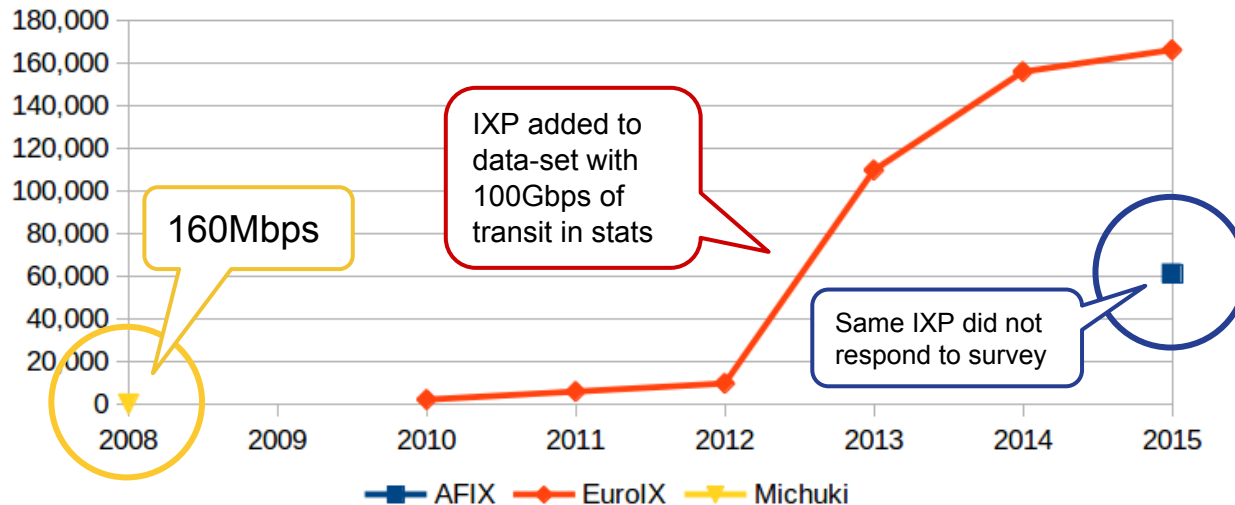
Based on submissions from 24 of 33 IXPs

- Total number of networks connected:

  563 (129 in 2008)

- Highest number of networks at a single IXP:

  115 (24 in 2008)

- Average number of networks connected:

  23.5 (11 in 2008)

Traffic: Challenges

Peak traffic by year

Based on three data-sets (graph in Mbps)

- None of the data-sets include all IXPs in Africa.

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

- Some IXPs publish statistics that include transit traffic.

- Different measurements: monthly vs. daily peak statistics, etc.

Additional Observations

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

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

Thank You

- Kyle Spencer
  - kyle@stormzero.com

- Visit the AFIX website
  - af-ix.net