



Growth, Sustainability, and Governance

Update for the Uganda Communications Commission (UCC)

Date: February 21st, 2018

Author: Kyle Spencer <kyle@stormzero.com>

Why are we here?



- The UIXP is a not-for-profit organization that provides neutral interconnection infrastructure for data networks in Uganda.
 - Currently 28 networks are connected that collectively exchange 5 Gbps of local Internet traffic on a daily basis.
 - Includes multiple CDNs and core Internet services (e.g. Root DNS).
- Our services have been provided for free since inception in 2001
 - An effort to develop the Internet ecosystem in Uganda
 - Relied entirely on volunteer staff and donations in order to do this
- However, as demand for our service has grown over time, so have our operational requirements, and we have now reached a scale that can no longer be sustained without a regular source of monetary income.
- In response, the UIXP introduced service fees as of January 1st, 2018
 - This has predictably caused controversy despite many years of sensitization, but we cannot delay any longer.

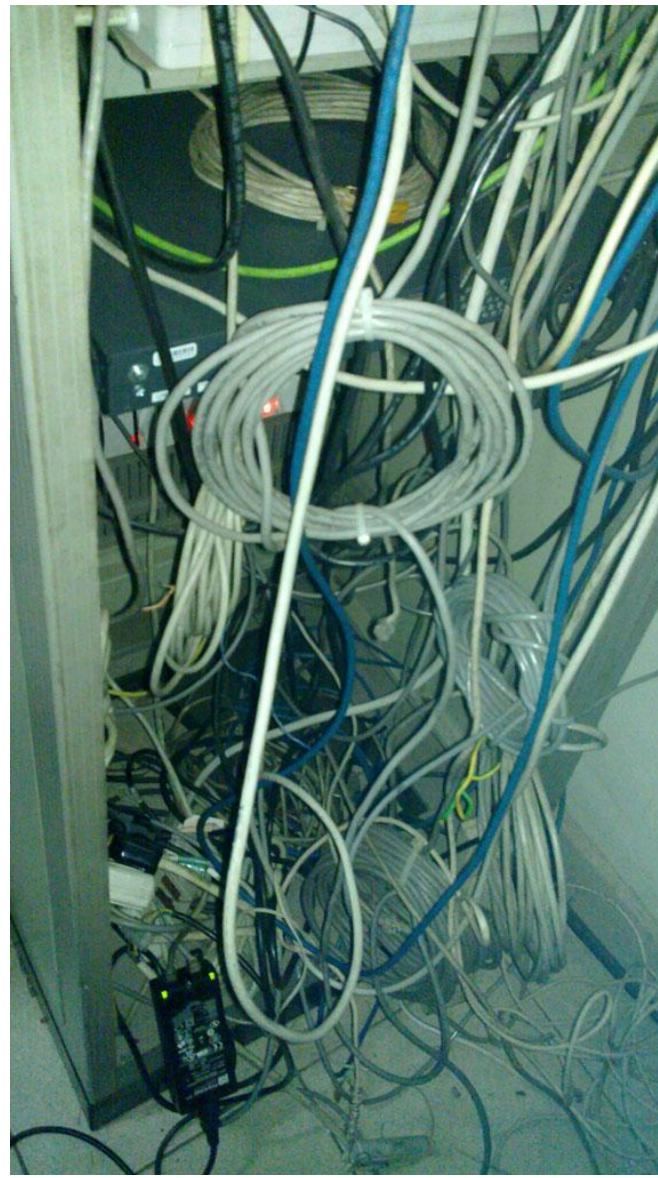
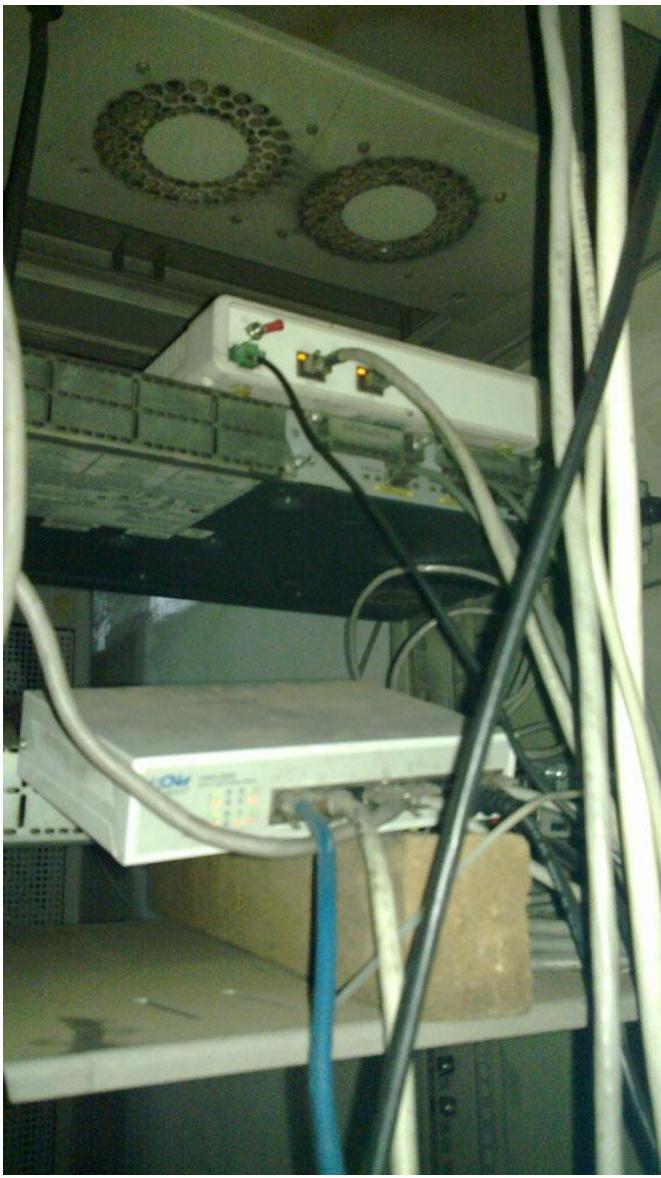
Growth in pictures



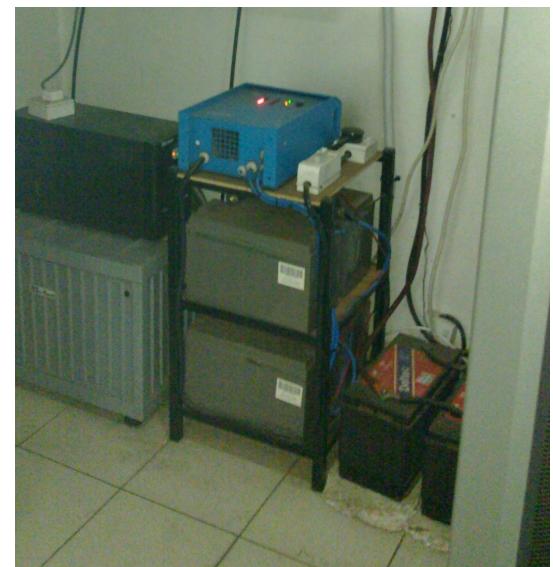
UIXP in 2001: In a ventilation shaft



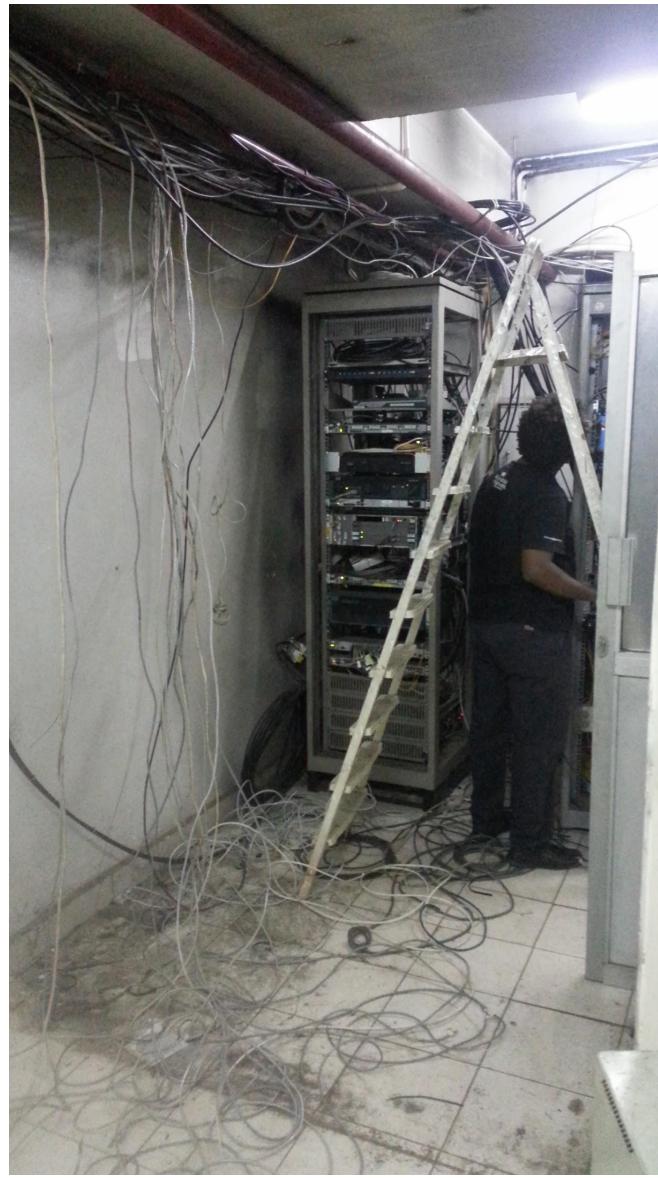
UIXP in 2009: In a storage closet; unmanaged



UIXP in 2009: In a storage closet; unmanaged



UIXP in 2010: Rebuilt; managed voluntarily by KS/SV



UIXP in 2014: New Directors and a new home



UIXP in 2014: New Directors and a new home

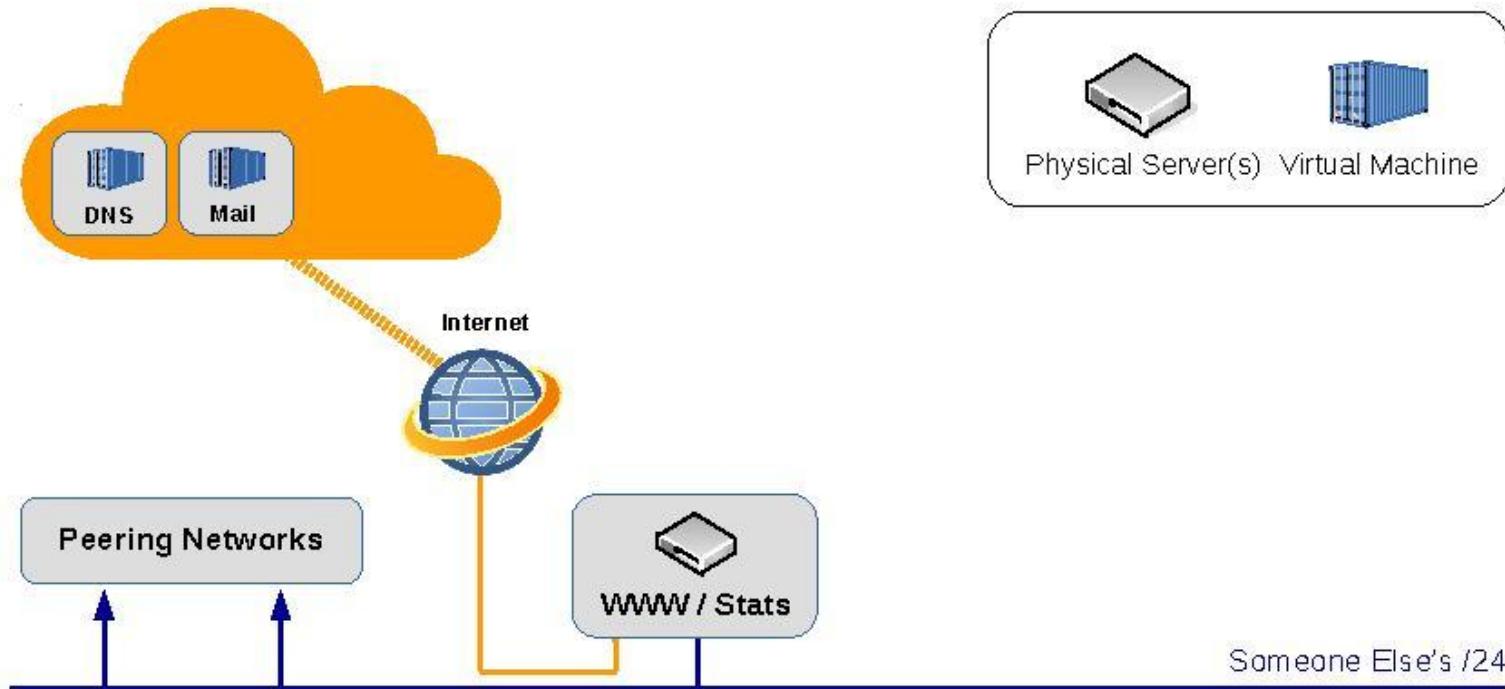


UIXP in 2017: Major increase in networks and traffic

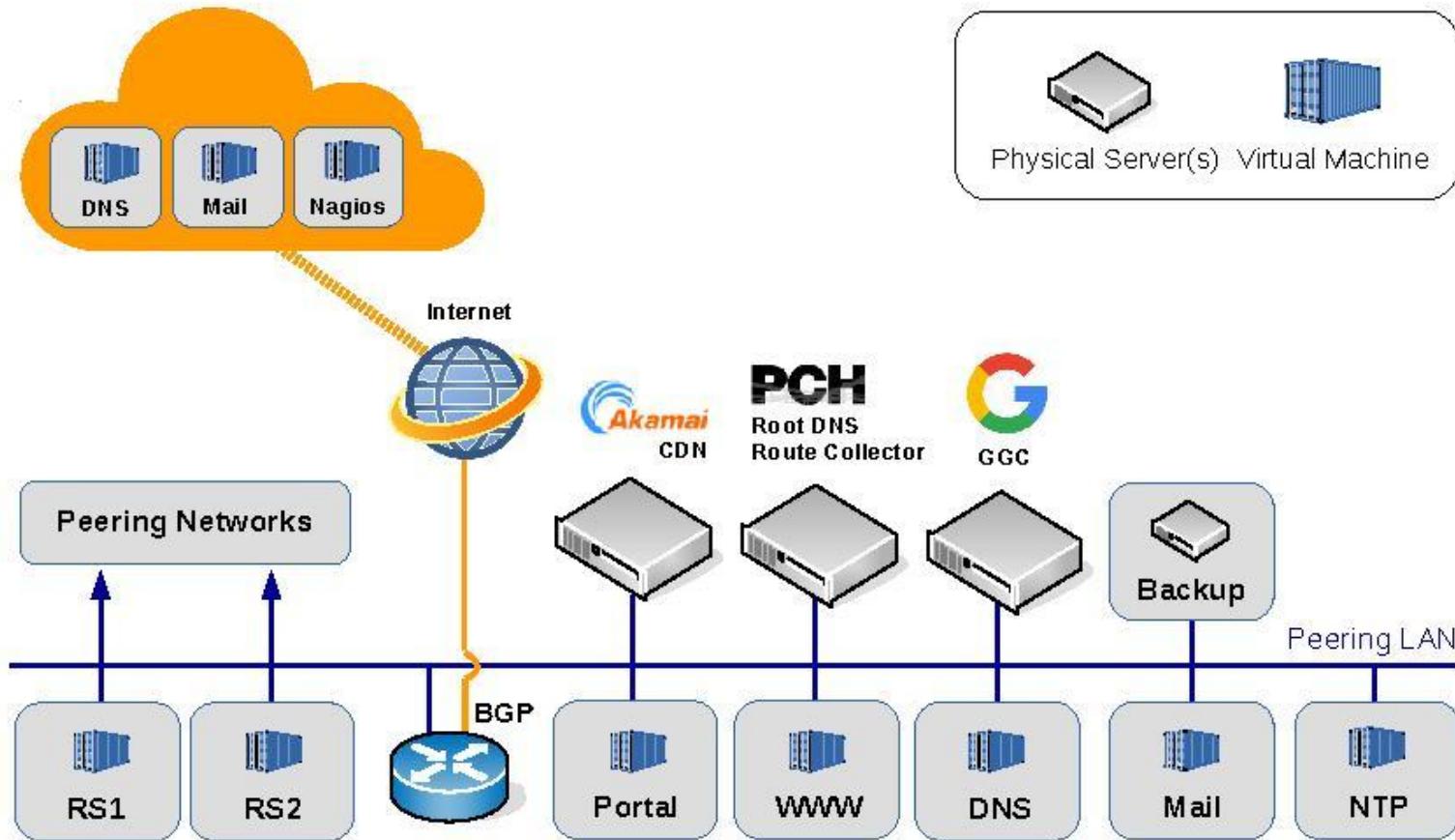


UIXP in 2017: Major increase in networks and traffic

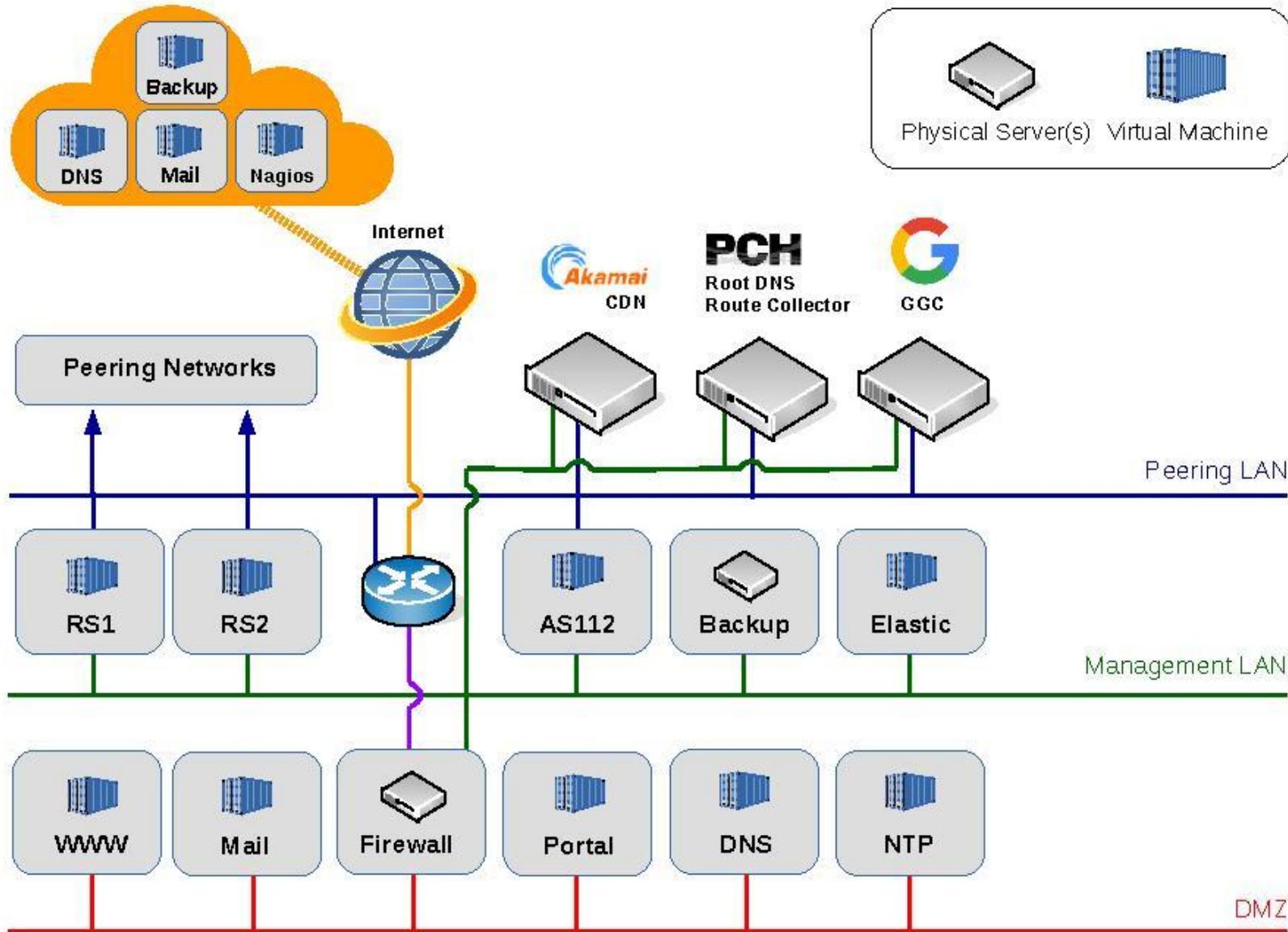
Growth of systems and services



UIXP in 2001-2009: Logical diagram



UIXP in 2017: Logical diagram



UIXP in 2018: Logical diagram (planned)

?

IXP CUSTOMER ACTIONS

- [Customers](#)
- [Interfaces](#)
- [Patch Panels](#)
- [Users](#)
- [Contacts](#)
- [Colocated Equipment](#)

IXP ADMIN ACTIONS

- [Infrastructures](#)
- [Locations](#)
- [Cabinets](#)
- [Routers](#)
- [Switches](#)
- [IPv4/6 Addresses](#)
- [MAC/L2 Addresses](#)
- [Vendors](#)
- [Console Server Connections](#)
- [VLANs](#)
- [IRRDB Configuration](#)
- [Route Server Prefixes](#)

IXP STATISTICS

- [Member Statistics - Graphs](#)
- [Member Statistics - List](#)
- [League Table](#)

IXP UTILITIES

- [PHP Info](#)
- [Last Logins](#)

Home

Customer Type	Count
Internal	1
Pro-bono	29

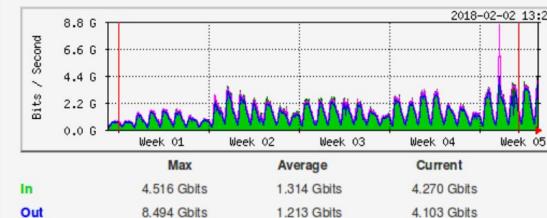
Customer Ports by Location

Location	1000	10000	Total
Communications House	28	4	32
Totals	28	4	32

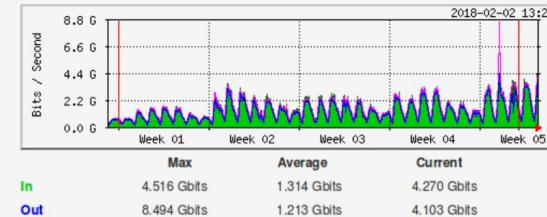
Customer Ports by Infrastructure

Infrastructure	1000	10000	Total	Connected Capacity
Kampala 1	28	4	32	68G
Totals	28	4	32	68G

Uganda Internet eXchange Point Aggregate Traffic



Kampala 1 Aggregate Traffic

Powered by IXP Manager V4.5.0 | <http://www.ipxmanager.org/>

Licensed under GPL v2.0. | This program is provided AS IS, without warranty. | Generated in 0.022 seconds

UIXP in 2018: Central Management w/ Automation

UIXP

The Uganda Internet eXchange Point

Portal Login

Search 

- HOME
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- NETWORKS
- STATS
- TEAM
- BLOG
- DOCS
- CONTACT



Cheaper, faster, and more reliable

The Uganda Internet eXchange Point allows networks to directly interconnect and freely exchange data traffic at a common point, thereby reducing the amount which must be delivered via costly intermediaries.

This lowers the overall cost of network service delivery, improves routing efficiency, and increases fault-tolerance. In other words: We make the Internet cheaper, faster, and more reliable.

Who we are

The Uganda Internet eXchange Point is a private not-for-profit company founded in 2001 with the goal of improving Internet connectivity within Uganda.

[Click here](#) to learn more about us.

What we offer

We host neutral, reliable, high-speed network interconnection infrastructure complete with route servers, content delivery networks, and Root DNS services.

Learn how to [get connected](#).

Networks and traffic

28 networks are directly connected with a combined capacity of 73 Gbps.



Latest blog entries

- 2017-09-25: UIXP Portal: Launch Announcement
- 2016-12-30: UIXP Network development report for 2016/17
- 2016-12-30: Diarmuid O'Brien joins our technical operations team
- 2016-12-29: Welcome to the Uganda Internet eXchange Point blog

Online support

Our website hosts a variety of useful policy and technical documentation which we are gradually expanding over time.

Take a moment to [browse our database](#)

Follow us on social media

Follow us on Facebook and Twitter to get local Internet news, company announcements, and service status updates:

[Facebook](#) [Twitter](#)

The African IXP Association

The Uganda Internet eXchange Point is a proud member of the African Internet Exchange Point Association (AFIX).

We encourage you to [visit their website](#)

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The Uganda Internet eXchange Point

Portal Login

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Directly connected networks

These networks are directly connected to our infrastructure. Other networks may be reachable through them. Click on the name of a network to visit their website, or click on their ASN for technical data. The table columns are sortable.

Network Name	ASN	Uses Route Server	Port Speed	Joined
Africa Online	AS29039	Yes	1 Gbps	2001
Arcois	AS36981	Yes	1 Gbps	2009
Airtel	AS36977	Yes	1 Gbps	2009
Akamai	AS320940	Yes	10 Gbps	2016
Bandwidth & Cloud Services (BCS)	AS37273	Yes	1 Gbps	2015
CMC Networks	AS25918	Yes	1 Gbps	2016
Dataneet	AS29032	Yes	1 Gbps	2001
Gilat	AS12491	Yes	1 Gbps	2016
Google	AS36040	No	10 Gbps x2	2017
Infocom / Liquid Telecom	AS36987	No	1 Gbps	2001
Internet Solutions	AS12556	Yes	1 Gbps	2017
MTN Uganda	AS20294	Yes	1 Gbps	2001
NFT Consult	AS37610	Yes	1 Gbps	2013
NITA-U	AS327724	Yes	10 Gbps	2014
PCH Root DNS (WoodyNet)	AS42	Yes	100 Mbps	2016
PCH Route Data Collector	AS3856	Yes	100 Mbps	2016
Research & Education Network for Uganda (RENU)	AS327687	Yes	10 Gbps	2015
Roko Telkom	AS37063	Yes	1 Gbps	2011
SEACOM	AS37100	No	1 Gbps x2	2016
SimbaNet	AS37027	Yes	1 Gbps	2012
Smart Telecom	AS327717	Yes	1 Gbps	2015
Smile	AS37122	Yes	1 Gbps	2015
Somila Networks	AS328015	Yes	1 Gbps	2016
Tangerine	AS37113	Yes	1 Gbps	2010
Uganda Revenue Authority	AS37679	Yes	1 Gbps	2014
Uganda Telecom	AS21491	Yes	1 Gbps	2001
UMEME	AS64520	Yes	1 Gbps	2015
Vodafone	AS327744	Yes	1 Gbps	2015

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UIXP in 2018: New website w/ key data (since 2014)

Looking Glass BGP Protocol Summary

Bird 1.6.3 | API: 1.1.0 | Router ID: 196.223.25.11 | Uptime: 12 days | Last Reconfigure: 2017-09-25 13:25:01

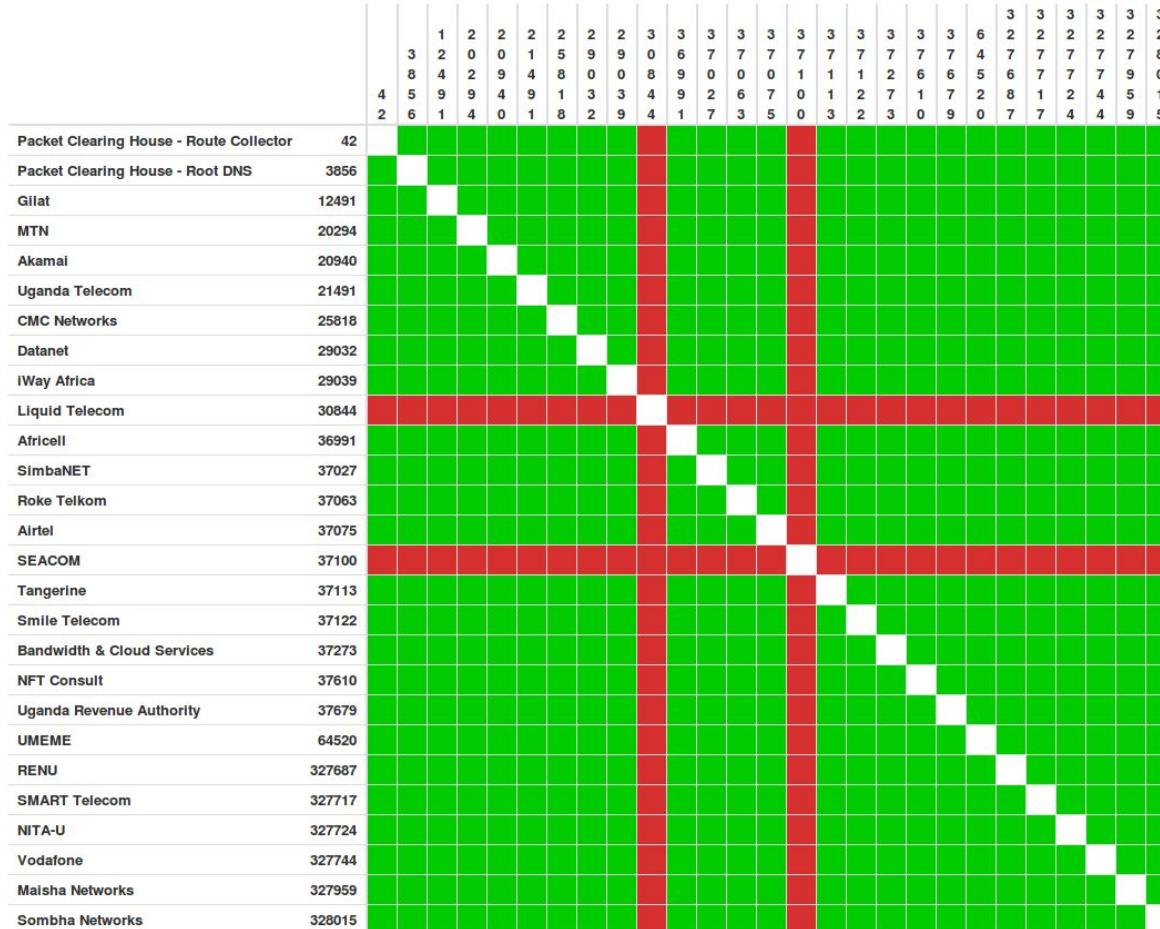
Search:

Neighbor	Description	ASN	Table	PfxLimit	State/PfxRcd	PfxExp	
196.223.25.48	AS542 - Packet Clearing House - Route Collector	42	I_0029_xx42	931000	03	391	Details
196.223.25.48	AS5356 - Packet Clearing House - Root DNS	3556	I_0028_xx3556	11000	1	463	Details
196.223.25.59	AS12431 - Oifel	12491	I_0014_xx12491	1581000	795	438	Details
196.223.25.63	AS12431 - Oifel	12491	I_0033_xx12491	1561000	795	425	Details
196.223.25.36	AS520294 - MTN	29294	I_0003_xx29294	491000	49	426	Details
196.223.25.56	AS520940 - Akenis	29940	I_0022_xx29940	11000	1	463	Details
196.223.25.38	AS521481 - Uganda Telecom	21491	I_0018_xx521481	351000	35	469	Details
196.223.25.68	AS525818 - CMC Networks	25818	I_0015_xx525818		Connected		Details
196.223.25.39	AS524032 - Datonet	29032	I_0005_xx524032	61000	6	478	Details
196.223.25.34	AS520699 - iWay Africa	29038	I_0026_xx520699	711000	1	431	Details
196.223.25.31	AS530991 - Aficell	38991	I_0008_xx530991	81000	8	439	Details
196.223.25.44	AS537027 - SinbaNET	37027	I_0006_xx537027	371000	37	412	Details
196.223.25.32	AS537063 - Raka Telkoms	37063	I_0005_xx537063	571000	57	362	Details
196.223.25.41	AS537075 - Airtel	37075	I_0019_xx537075	361000	36	449	Details
196.223.25.37	AS537113 - Tangerine	37113	I_0021_xx537113	461000	46	438	Details
196.223.25.53	AS537122 - Smile Telecom	37122	I_0012_xx537122	511000	51	367	Details
196.223.25.64	AS537973 - Bandwidth & Cloud Services	37273	I_0002_xx537973	261000	26	414	Details
196.223.25.49	AS537974 - LAPP Connect	37274	I_0002_xx537974	141000	4	453	Details

UIXP in 2018: Sophisticated diagnostic utilities

[Home](#) / [Peering Matrices for the Peering using IPv4](#)

All Peerings ▾ IPv4 ▾



UIXP in 2018: Powerful reporting and data viz

Sustainability

The need for fees



- Donations and volunteers are useful, but:
 - Donations can be hard to get; have long lead times; often involve import taxes; and don't help with salaries or external bills
 - Committed and qualified volunteers are hard to find and transient
- We are at risk of losing key staff and not being able to replace them
 - Increasing need to pay salaries for key roles as we scale up
 - Managing the UIXP is now a full-time job for more than one person even after major efficiency improvements (e.g. automation)
 - Key staff work other jobs to survive because we can't pay them
 - This limits their availability and significantly hinders our growth
 - Key staff hard to retain and replace; qualified people are valuable
 - Qualifications for key roles have increased substantially
- External debt: We owe lawyers for a few years of retainer fees
 - Corporate governance, governance reform work, bank prep, etc.
 - All other years paid for by Kyle Spencer
 - They are threatening to halt work unless we pay debts

The need for fees (cont'd)

UIXP

- Urgent infrastructure and facility upgrades needed
 - Power system can no longer handle load; daily failures
 - IXP less attractive; slows growth; increases support burden
 - Security is weak because someone stole our biometric system
 - Installation paid for by Kyle Spencer; discount given by vendor
 - Demand for 10G fibre optic switching capacity growing fast
 - Current infrastructure has limited ability to accommodate this
- Cannot accommodate new CDN deployments
 - Multiple CDNs currently wish to deploy but we cannot host them due to inadequate power and inability to pay import taxes.
 - This significantly hinders our growth
- No ability to expand into a second location for growth or redundancy
- No ability to pay cloud hosting and other costs
- The current situation cannot last forever.

The search for a solution



- Looked around; evaluated various approaches within our industry
 - Examined sustainability models at IXPs around the world, within Africa, and within the East Africa sub-region.
- Tiered port fees are the most common model by far
 - All other East African IXPs charge tiered port fees
 - Some (e.g. Tanzania) also charge membership fees
 - Other models exist but do not apply to our context:
 - Some IXPs owned by DC operators do not charge port fees because they can charge for cross-connects instead.
 - A few government run IXPs do not charge fees, but all plan to introduce them in the future (See: 2017 AFIX Survey).
- Estimated our expenses and revenue for the coming year
 - Created a basic budget that is slightly inflated to account for error
 - Created a revenue calculator and projected customer base
 - Benchmarked our pricing against other East African IXPs as a sanity check and in order to ensure that we are aligned with the region.

Why tiered port fees?



Why not just charge all networks a flat fee (e.g. a membership fee)?

- Discourages smaller networks from joining the exchange:
 - $\text{TotalCosts} / \text{Members} = \text{FlatFee}$
 - Example: $\$10,000 / 20 = \500 fee (for 10M/100M/1G/10G/etc)
 - Only networks with high traffic levels could justify the cost
 - Smaller networks would subsidize larger networks
 - Exact opposite of what you want from an IXP
- Not all networks cost the same to maintain:
 - Does a network with a single 100M port cost the same to maintain as a network that uses 4x 10G ports?
 - Does 6RU of content servers draw the same power as a 1RU router?
 - How would we recover the additional costs associated with maintaining larger networks without raising the flat fee?
 - Remember that smaller networks must also pay the flat fee.
- This is why most IXPs that charge membership fees **also** charge port fees.

How much and why?



Monthly fees based on port capacity:

- 10 Mbps: \$50 (free for 6 months)
- 100 Mbps: \$250
- 1 Gbps: \$550
- 10 Gbps: \$1000

One-time setup fee: \$200

- Shows commitment, pays for hardware, etc

Example customer bandwidth costs:

- iWay Africa: 140 Mbps @ \$3.92 / Mbps
- Roke Telkom: 560 Mbps @ \$0.98 / Mbps
- RENU: 1280 Mbps @ \$0.78 / Mbps

Monthly port fees, multiplied by estimated customers, needs to equal projected expenses.

Daily Peak Mbps	Peering Cost \$/Mbps
1	\$50.00
2	\$25.00
3	\$16.67
4	\$12.50
5	\$10.00
6	\$8.33
7	\$7.14
8	\$6.25
9	\$5.56
10	\$25.00
20	\$12.50
30	\$8.33
40	\$6.25
50	\$5.00
60	\$4.17
70	\$3.57
80	\$3.13
90	\$2.78
100	\$5.50
200	\$2.75
300	\$1.83
400	\$1.38
500	\$1.10
600	\$0.92
700	\$0.79
800	\$0.69
900	\$0.61
1000	\$1.00
2000	\$0.50
3000	\$0.33
4000	\$0.25
5000	\$0.20
6000	\$0.17
7000	\$0.14
8000	\$0.13
9000	\$0.11

REVENUE				
Product/Service	Est # of customers	Monthly	Annually	
Port: 10M		2	\$100	\$1,200
Port: 100M		6	\$1,500	\$18,000
Port: 1G		12.5	\$6,875	\$82,500
Port: 10G		0.5	\$500	\$6,000
Additional Peering IP Address		2	\$40	\$480
Additional Rack Unit (RU)		0	\$0	\$0
VLAN		0	\$0	\$0
Private Network Interconnect (PNI)		0	\$0	\$0
50% discounts for academic networks (RENU) and NITA for Akamai CDN fill				
		TOTAL REVENUE	\$9,015	\$108,180
		TOTAL W/ ANNUAL DISCOUNTS	\$8,294	\$99,526
EXPENSES				
Cost Item		Monthly	Annually	
Executive Director			\$3,000	\$36,000
Technical Operations Director			\$2,000	\$24,000
Finance Manager (part time)			\$250	\$3,000
Savings & Misc			\$1,500	\$18,000
Equipment upgrades			\$500	\$6,000
Equipment maintenance			\$500	\$6,000
Community building, events, and outreach	Unlikely to have enough money for salaries in year 1 even if all pay fees		\$200	\$2,400
Marketing			\$50	\$600
Travel & accommodation			\$200	\$2,400
Legal Fees			\$150	\$1,800
		TOTAL EXPENSES	\$8,350	\$100,200

Projected revenue and expenses (excl. VAT)

Sensitization



- Need for fees dates back to the UIXP's inception in 2001:
 - Networks agreed to pay \$200/mo each to help meet costs.
 - This was never implemented; initial grant funding quickly exhausted.
 - UCC waived power and rent to keep UIXP alive. This continues today.
- Need for fees has been raised numerous times since then:
 - 49 separate community e-mail threads since 2011; many before that
 - Discussed fees at first legal “AGM” in 2014
 - Potential fee requirements noted in 2014 MoU; every network signed
 - All new networks since 2015 told fees would be coming soon
- This issue is contentious, so we delayed as long as we possibly could
 - All other IXPs in East Africa implemented fees many years ago
- Need for fees became critical in 2017; high risk of stagnation and failure
 - Implementation notice sent to all contacts at every network
 - Performed prep work: URA, banking, legal, internal process dev, etc
 - Virtual sensitization meeting organized; sponsored by ISOC
 - Offered to meet everyone individually and share data if requested

2014 AGM: Agenda

UIXP

1. Opening prayer
 2. Adoption of the agenda
 3. Communication from the Chair
 4. Discussion of the following matters:
 - a. Legal status 
 - b. Technical status
 - c. Facility status
 - d. Sustainability model 
 - e. The East African Exchange Project (EAIX)
 - f. New website
 - g. Route servers
5. Way forward
 6. A.O.B.
 7. Close of meeting

Sustainability model

UIXP

- UIXP can not survive forever without revenue/income
- No ability to pay for
 - Rent and utilities (covered by UCC)
 - Equipment, transit, and facility maintenance
 - Legal and administrative fees
 - Marketing (e.g. conferences, advertising)
 - Staff salaries
- No ability to grow
 - Completely reliant on donations
 - Cannot upgrade equipment or deploy VAS
 - Cannot deploy additional exchange points
 - Cannot execute any strategy or growth plan
 - We are in an extremely vulnerable position

Sustainability model

UIXP

- We should all recognize the need for sustainability
- Charge for services
 - One-time setup/installation fees
 - Monthly port fees (e.g. 100Mbps, 1Gbps)
 - Rack-space rental fees
 - Charge for VAS (e.g. OOB, PDU)
- Fees will be reasonable
- Plan to implement fees as part of facility upgrade

2014 AGM slides: Fees, sustainability, and governance



Memorandum of Understanding
Document Version 0.6 (2014-10-16)

The undersigned confirms the participation of the below mentioned network in the Uganda Internet Exchange Point (UIXP) and that the Technical, Organizational, and Commercial requirements listed within this document are accepted and shall be adhered to.

Company Name:
ROKET FELKOM

Company Address:
7, KNUBUYA CLOSE
BUNGODOI, KAMPALA
P.O. BOX 31386, KAMPALA

Administrative Contact Name:
Timothy Musoke
E-mail:
timothy@roketcable.com.ug
Telephone:
+256 773212520

Technical Contact Name:
Hari Kunup
E-mail:
hari@roketcable.com.ug
Telephone:
+256 756710279

Authorized Representative Name:
Timothy Musoke
Position:
CHIEF TECHNICAL OFFICER
Signature:
[Signature]
Date (YYYY / MM / DD):
2015 / 04 / 07

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Memorandum of Understanding
Document Version 0.6 (2014-10-16)

6. Participants are required to pay all fees (according to Section C of this document) in advance. Failure to do so shall result in immediate disconnection.
7. Participants are responsible for ensuring that all contact information held by the UIXP in connection with their participation is correct and up to date.
8. Participants are responsible for ensuring that their employees register for secure access to the UIXP facility.
9. All applications to join the UIXP must follow the correct joining procedure as follows:
 - a. A formal request letter is submitted to the UIXP Management Team, signed by an authorized representative of the requesting company/participant
 - b. Applications shall be accepted provided that this MoU is accepted and signed by an authorized representative of the requesting company/participant
 - c. Applications must be accompanied by any fees required according to Section C of this document.
10. Any complaints must be made in writing to the UIXP Management Team. All decisions made by the UIXP Management Team shall be final.
11. The UIXP shall not provide rebates of any sort for down time. The UIXP does not warrant or assume any liability or responsibility for services provided or not provided.
12. Participants of the UIXP are requested to give 3 months notice in writing to the UIXP Management Team if they intend to stop using the IXP. There shall be no refund on charges under any circumstances.

C. Miscellaneous

1. All exchange participants shall be given a minimum 21 days notice prior to the implementation of any changes to this policy.
2. Following the notice period, all exchange participants shall be required to sign an updated copy of this document in order to continue receiving services from the UIXP.

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2014 MoU mentions fees; signed by all networks

STUDY ON PEERING AND INTERCONNECTIVITY IN EAST AFRICA

final

May 2017



Summit Strategies Ltd

ICT Research & Consultancy

Landmark Plaza, 13th Flr
Argwhings Kodhe Rd
Mail : P.O Box 25513-00603 Nairobi Kenya.
Voice: +254 722520090
Other: +254 20 3673891, 703 041891, 730173891
E-mail address: info@summitstrategies.co.ke

3.1.4.2 IXP charges and applicable fees

BDIXP and UIXP have not implemented commercialized models and therefore clarify to new peers that there is no cross-connect fee but the peer will bear all charges that pertain to setup. Thereafter, peering services and any other value-add services are free of charge. This should however change over 2018 as both IXPs are working towards commercialization.

For IXPs with commercialized models, specifically KIXP, RINEX, TIX and UIXP, the following fees apply for initial setup:

- KIXP US\$300
- RINEX US\$0
- TIX US\$500
- UIXP US\$200 (to be introduced in the near future)

Implemented port fees and other charges for all IXPs are included in Annex 2

At the time of writing this report (April 2017), IXPs have explored and invested in various active and passive infrastructure to support operations, which are discussed in Table 2.

Table 2: IXP Infrastructure

	IXP Switching Fabric	Network Management systems	Power Backup
BDIXP	One IXP Core Switch (Cisco Layer 2 Switch, a HP Server, which virtualizes all the virtual servers (Quagga BGP router, web/mail server, monitoring servers). The IXP does not have a Disaster Recovery (DR) site but has a backup switch in case the principle switch fails.	Observium and Weathermap	Uses the university power backup measures.
KIXP	Various 24 GE switches at EADC, Chancery building and Mombasa sites that form the DeMAC point into peering LAN, BIRD AND Cisco Route servers.	Cacti, Nagios, RANCID, TACACS, OTRS, Manager	Uses EADC backup for primary peering site
RINEX	DR measures in place	Juniper switch with backup power (10GE scaled down 10mbps), BIRD route server. Does not have DR site in place but working to implement in the near future	Utilizes BSC power comprising of UPS and generator setup.
TIX	Cisco Nexus 24 port 10GE MRTG, switches, Cisco 48 port ME Switch, 2 active Cisco Route servers.	LibreNMS, Cacti, IXPManger, Nagios and Cacti	Has own backup with Four 5 KVA online UPS's and a 10 KVA battery bank. There is Internal network management



Uganda Internet eXchange Point
Plot 33, Clement Hill Road, Kampala, Uganda
<http://www.uixp.co.ug>

Chief Executive Officer
Uganda Telecom
Plot 2A-4A, Telephone House, Speke Road
P.O. Box 7171
Kampala, Uganda

Tuesday, December 5th, 2017

INTRODUCTION OF SERVICE FEES AT THE UGANDA INTERNET EXCHANGE POINT

The purpose of this letter is to announce the introduction of service fees at the Uganda Internet eXchange Point (UIXP) starting January 1st, 2018. As you may be aware, your network has been utilizing our service since 2001.

The UIXP is a not-for-profit organization that provides neutral interconnection infrastructure for data networks in Uganda. There are currently 27 networks connected that collectively exchange over 3 Gbps of local Internet traffic on a daily basis. This includes multiple content delivery networks and core Internet service providers such as the Root DNS.

Since our inception in 2001, we have provided this service for free in an effort to develop the Internet ecosystem in Uganda – and relied entirely on volunteer staff and donations in order to do so. However, as demand for our service has grown over time, so have our operational requirements, and we have now reached a scale that can no longer be sustained by this model. Put simply, we cannot continue to provide a reliable service and satisfy the growing needs of the networks that rely on us without a regular source of monetary income.

Thankfully we are not the first Internet exchange point (IXP) to encounter this problem, and the revenue model we are implementing is common in our industry both globally and within East Africa. It is designed to provide value to all existing networks, attract new networks, and encourage traffic growth by rewarding increased utilization.

Based on your network's current utilization and projected near-term growth, we estimate that you will require a **1 Gbps port** which will cost a total of **\$550 USD per month**, exclusive of VAT. We will send your company an invoice to effect this in early January unless you request a change to the services you receive from us.

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Uganda Internet eXchange Point
Plot 33, Clement Hill Road, Kampala, Uganda
<http://www.uixp.co.ug>

Note that we offer a significant discount for networks that are willing to pay annually, as this helps to reduce our administrative overhead related to invoicing and collections. We also offer discounts for academic networks and others that provide pro-bono services to the UIXP. Further, as a matter of policy, we will review and revise our prices annually in order to ensure that we continually provide our services at the lowest possible cost as this is in the best interest of our exchange, the networks we serve, and the Internet ecosystem in Uganda.

More details, including a list of services and the fees we will charge for each, can be found on our website at <https://uixp.co.ug/services>

A list of frequently asked questions and answers regarding fees and their implementation can be found here: <https://uixp.co.ug/documentation/fees>

If you have any additional questions or concerns, we will host a virtual meeting on Monday, December 11th, 2017 at 2:00 PM East Africa Time (GMT+3). The Internet Society (ISOC) has generously donated a virtual room in their digital conference system for this purpose. Please visit this URL at the above date/time to join the meeting: <https://isoc.zoom.us/j/958704524>

Please also feel free to contact us directly by email at: support@uixp.co.ug

Regards,

Kyle Spencer,
Director

Page 2 of 2

Formal notice sent; virtual meeting held in Q4 2017

Mixed responses



- Some networks immediately agreed to pay
 - Mostly non-commercial networks and networks that operate in more than one country (as they already pay these fees at other IXPs).
- Some networks pledged support but were concerned about cost
 - Many local networks have never considered the service's value because they have not had to (it's been free since 2001)
- Some individuals began actively conspiring against us; misled community & government
 - Leaks revealed private e-mail conversations and meetings
 - Same antagonists as 2014 hostile takeover attempt (Roke, UTL)
 - Misinformation deliberately spread within the local community
 - Used to galvanize opposition and formation of “UISPA” lobby group
 - Antagonists selected as “UISPA” representatives
 - “Management has stolen company; refuses to meet members; no accountability; no transparency; no budget; issue mishandled; etc.”
 - UIXP offered to meet, discuss, and share all data with “UISPA” representatives
 - No meetings or position statement sent to UIXP despite multiple requests
 - “UISPA” representatives met with UCC and submitted a formal petition instead
 - Accuses UIXP management and CDNs of fraud and impropriety
 - Not shared with “UISPA” members; only revealed due to pressure from UIXP
 - Government now heavily involved; increased risk of harmful intervention

>>> On 12/26/2017 2:21 PM, Kyle Spencer wrote:
>>
>>> Baldwin, James, Dorothie,
>>
>>> Merry Christmas.
>>
>>> I heard that you had a productive ISPA meeting at NITA, and that one
>> of your immediate objectives will be to hold a formal meeting with the
>> UIXP management team in order to discuss sustainability and
>> governance.
>>
>>> If this is true, we are happy to oblige. It would be a good
>> opportunity for us to share more information about the exchange in
>> order to foster mutual understanding.
>>
>>> However, I will be out of the country performing some consulting work
>> during the second and third week of January, so any meeting would need
>> to take place prior to that (e.g. Jan 1-4) or wait until I return on
>> the 22nd.
>>
>>> If you would like to meet, please send a written request as soon as
>> possible. I would be happy to help arrange an appropriate venue and
>> participation from the UCC if desired.
>>
>>> Regards,
>>> Kyle Spencer

>> On Thu, Dec 28, 2017 at 6:53 AM, James Byaruhanga <james@roketelkom.co.ug>
>> wrote:
>>
>>> Hey Kyle,
>>
>>> Yes the meeting was rather interesting. I did receive a call from Mr.
>> Twine Manzi from UCC shortly after that. I think he had the intention of
>> calling a meeting between UCC and UIXP. He says he will invite us as well.
>>
>>> I will let him know of your proposed travel dates as soon as i return to
>> the city so we can all harmonise our schedules.
>>
>>> Rgds
>>
>>> JB

>> On 12/28/2017 12:26 PM, Kyle Spencer wrote:
>>
>>> James,
>>
>>> Good. Thank you.
>>
>>> In the mean-time, we request that the ISPA communicate its position and
>> objectives for the proposed meeting so that we can plan accordingly. Time is
>> of the essence.
>>
>>> Regards,
>>> Kyle Spencer

> On Fri, Dec 29, 2017 at 6:28 AM, James Byaruhanga <james@roketelkom.co.ug>
> wrote:
>>
>>> Kyle,
>>
>>> The "ISPA" elected a steering committee which will represent the ISPs as
>> par the discussions held. The initial plan was for the steering committee
>> to get in touch with the "UIXP" and harmonizing their positions. This was
>> proposed for the post festive season.
>>
>>> Informally and this is the key word. UCC Representative mentioned that
>> they had a plan to invite UIXP and Stakeholders to a meeting in the second
>> week of January to discuss the matter of commercialization as key stake
>> holder, land lord, licensor and sponsor of the IXP. This to me means that
>> there will be formal communication on the same.
>>
>>> What i dont know is if the 2 meetings should run in parallel or in tandem.
>>
>>> Rgds
>>
>>> JB

No meetings or comms from UISPA despite requests

On Fri, Dec 29, 2017 at 2:50 PM, Kyle Spencer <kyle@stormzero.com> wrote:

> James,

>

> In the interest of time, I think it would be good for the UIXP and ISPA to

> meet as soon as possible and not wait for the UCC. Based on what I heard

> about the ISPA meeting at NITA, I think there is a good chance that we can

> find a mutually agreeable way forward. Even if we don't reach a final

> agreement, any progress we can make together will make any eventual meeting

> with the UCC more productive.

>

> Do you think the ISPA representatives could rally for a meeting on January

> 2nd, 3rd, or 4th? If so, we would just need to find a small conference room

> with a projector as we are preparing a slide deck to help inform the

> discussion.

>

> Regards,

> Kyle Spencer

No further communication was received from
UISPA representatives.

UISPA representatives then met with the UCC
on January 5th, 2018.

No meetings or comms from UISPA despite requests

“UISPA” petition to UCC



Petition submitted to UCC by “UISPA” in Jan 2018 accuses UIXP management and other third-parties of fraud and impropriety:

- Claims management has converted the company to a private for-profit.
- Insinuates that management may be signing contracts with third parties in a personal capacity.
- Claims management does not involve membership and avoids meeting with them.
- Claims management lacks transparency and accountability.
- Signed by James Byaruhanga (Roke Telkom) and Baldwin Okello (UTL).

This slander has been spread within the local Internet community in order to discourage networks from paying fees.

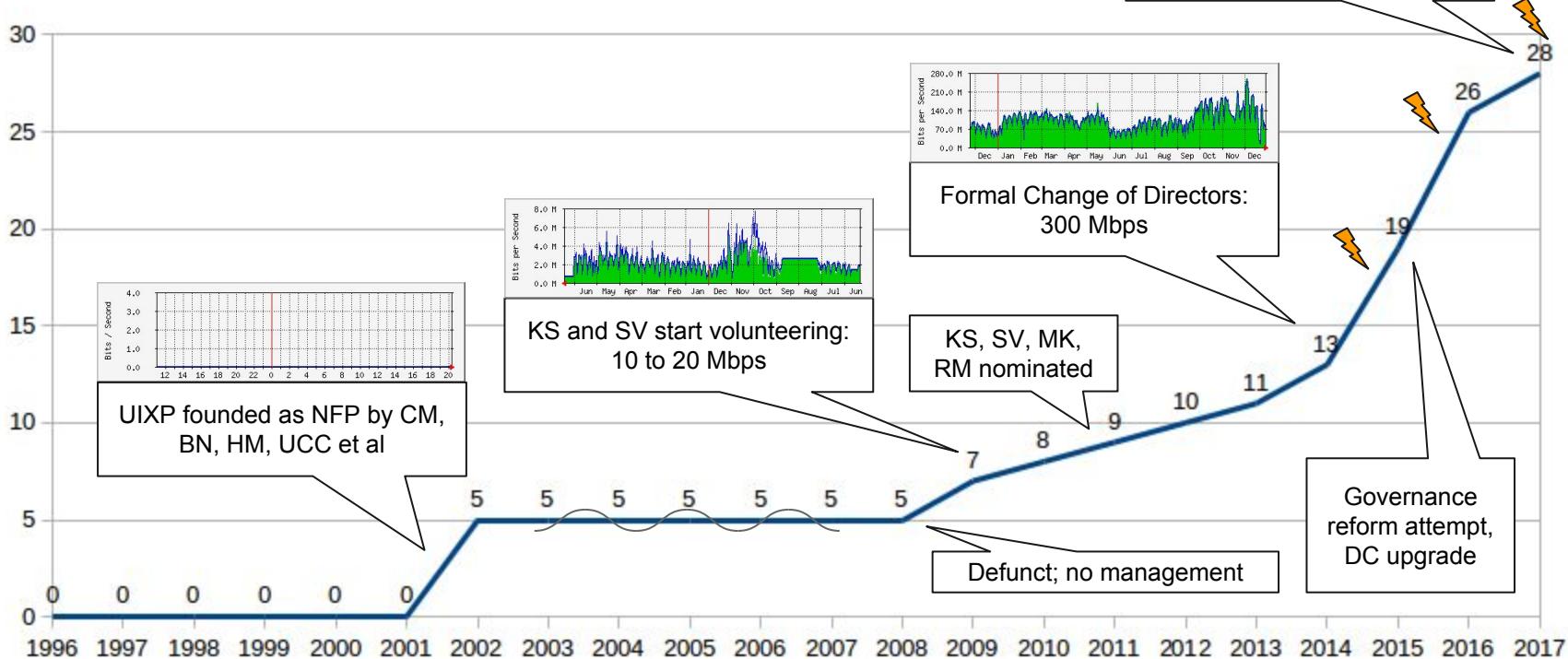
- The Legal Status and management of the UIXP. There are concerns from the ISPAU members that the current UIXP management have deviated from the primary objective to the UIXP and is now a Private Company Limited by Shares. How did the UIXP change its status to a private company and yet the known Articles of Association & Memorandum of Understanding of the UIXP had ISP signatories as members. Is UCC aware of the status of UIXP as Private Limited Company?
- Governance of the UIXP. The current governance model of the UIXP does not in any way put into consideration administrative and operational involvement of the members. Members want to be involved in the running of the UIXP but the management is reluctant to meet and have a meaningful discussion about this. The UIXP is now registered as a Private Limited Company and therefore the current directors are not answerable to anyone not even the members. This puts the IXP at high risk of fraud. Who are the directors of the UIXP Ltd?
- Port Fees and Membership of the UIXP. Lack of transparency and accountability to the UIXP members. With a payment model, there is a need to know how these fees were derived, which account the monies will be paid to and who the signatories of these accounts are. What is UCC's position on the fees proposed by the UIXP as a monopoly?
- There are Content Delivery Network (CDN) providers like Akamai, Google, who have cache servers hosted at the UIXP to boast the quality of experience for Ugandan Internet users however there is no visibility as to whom these CDN providers signed contracts with and yet these CDN's cache Ugandan Internet traffic. Is UCC aware of these CDN's?
- Particularly on the issue of governance, ISPAU proposes that the UIXP should be a membership based Non-Profit Organization run and managed by members. The members all have one vote each in the running of the organization (UIXP) and would appoint a board on a termly basis for the day-to-day operation of the IXP who are voted for by members (ISPAU and Non ISP members). The UIXP board will report and be directly answerable to the members for accountability and transparency.

Governance

UIXP: Governance and Growth

— = Connected Networks

⚡ = Hostile takeover attempt



Major growth 2009-17; hindered by hostile attacks

Misconceptions

1
THE REPUBLIC OF UGANDA
THE COMPANIES ACT, CAP. 85
CERTIFIED TRUE COPY
LAWS OF UGANDA

COMPANY LIMITED BY GUARANTEE, AND
NOT HAVING A SHARE CAPITAL

MEMORANDUM
AND
ARTICLES OF ASSOCIATION

OF
UGANDA INTERNET EXCHANGE POINT
LIMITED REGISTRAR OF COMPANIES
KAMPALA

DRAWN AND PREPARED BY:
M/S KATENDE, SSEMPEBWA & CO. ADVOCATES
2ND FLOOR RADIANT HOUSE
PLOT 20 KAMPALA ROAD
P. O. BOX 2344 KAMPALA
UGANDA, EAST AFRICA.
URL: www.kats.co.ug

50125
13-9-2009

UIXP

The Uganda Internet eXchange Point

HOME SERVICES NETWORKS



Who we are

The Uganda Internet eXchange Point is a private not-for-profit company founded in 2001 with the goal of improving Internet connectivity within Uganda.

[Click here](#) to learn more about us.

What we offer

We host neutral, reliable, high-speed network interconnection infrastructure complete with route servers, content delivery networks, and Root DNS services.

Learn how to [get connected](#).

Networks and traffic

26 networks are directly connected with a combined capacity of 73 Gbps.



Latest blog entries

- 2017-09-25: [UIXP Portal: Launch Announcement](#)
- 2016-12-30: [UIXP Network development report for 2016/17](#)
- 2016-12-30: [Diamuud O'Brian joins our technical operations team](#)
- 2016-12-29: [Welcome to the Uganda Internet eXchange Point blog](#)

Online support

Our website hosts a variety of useful policy and technical documentation which we are gradually expanding over time.

Take a moment to [browse our database](#)

Follow us on social media

Follow us on Facebook and Twitter to get local Internet news, company announcements, and service status updates:

[Facebook](#) [Twitter](#)

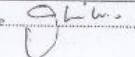
The African IXP Association

The Uganda Internet eXchange Point is a proud member of the African Internet Exchange Point Association (AFIX).

We encourage you to [visit their website](#)

UIXP: Not-for-profit since 2001; public information

CERTIFIED TRUE COPY FOR BANK PURPOSES					
No. OF COMPANY 12 DAY OF 120. FILED THIS 2014 RECEIPT NO. 00001120 FEES PAID 2000 GOVERNMENT OF UGANDA REGISTRATION FEE MERCCELLA <small>THE COMPANIES ACT CAP 110</small> 11-3-14 <small>NOTIFICATION OF CHANGE OF DIRECTORS OR SECRETARY</small> <small>REGISTRAR OF COMPANIES IN THEIR PARTICULARS</small> <small>KAMPALA</small> <small>(Pursuant to Section 201 (5))</small> <small>REGISTRAR OF COMPANIES</small> <small>KAMPALA</small>					
<small>Name of Company UGANDA INTERNET EXCHANGE POINT Limited</small> <small>Presented by KASIRYE BYARUHANGA & CO. ADVOCATES</small>					
<small>To Registrar of companies,</small> <small>UGANDA INTERNET EXCHANGE POINT Limited hereby notifies you</small> <small>in accordance with section 201 of the COMPANIES ACT CAP 110 that CHARLES MUSIGI, HOPE MUGANGA AND BADRU</small> <small>NTAGE CEASED TO BE DIRECTORS OF THE COMPANY AND A NEW BOARD WAS CONSTITUTED</small> <small>AS BELOW AND THAT HOPE MUGANGA CEASED TO BE THE COMPANY SECRETARY AND ANGEL</small> <small>COMPANY SECRETARY WAS APPOINTED AS BELOW.</small> <small>(Here specify nature and date of change. If change of a new Director or</small> <small>Secretary fill in particulars below)</small>					
<small>PARTICULARS OF NEW DIRECTOR OR SECRETARY</small> <small>(Columns 1,2 and 4 only need be completed for a Secretary)</small>					
 DOREEN ESAETE					
1. Name <small>(In the case of an individual, present Christian name or names and surname; In the case of a corporation, the corporate name)</small>	2. Any former Christian name or names and surname	3. Nationality	4. Usual residential and postal address, (In the case of a corporation, the situation of its registered or principal office and its registered postal address)	5. Business occupation and particulars of other directorships	6. Date of Birth
1. KIRK SPENCER	2. —	3. —	4. P.O. Box 10946 KAMPALA	5. ICT EXPERT	6. 16/2/83
2. SHANNON YOUNG	2. —	3. —	4. P.O. Box 10946 KAMPALA	5. REGISTRAR OF COMPANIES KAMPALA	6. 28/6/196
3. ROBINIE MUEHLMAN	2. —	3. —	4. P.O. Box 10946 KAMPALA	5. ICT EXPERT	6. 9/7/73
4. MIKE BARNARD KINATAMPORA	2. —	3. —	4. P.O. Box 10946 KAMPALA	5. ICT EXPERT	6. 20/9/98
5. KASIRYE BYARUHANGA & CO. ADVOCATES	2. —	3. —	4. P.O. Box 10946 KAMPALA	5. —	6. —

DATED the **14th** day of **March** **2014** Signature 

Printed by Uganda Bookshop Press
and exclusively distributed from
UGANDA BOOKSHOP

Change of Directors in 2014; public information

We are not a monopoly



- We are the first player in an emerging industry.
- The reason why we are the only Internet exchange point (IXP) in Uganda is because demand for network interconnection is limited.
 - There is no legal barrier preventing anyone from starting a new IXP.
- Our service generates demand for network interconnection
 - This growth will eventually create space for healthy competition.
- Competition is good for Uganda and the UIXP:
 - Increases redundancy, puts downward pressure on pricing, helps to ensure higher quality of service, and makes nationalization harder.
- Examples of this in Africa (Europe is also useful to look at):
 - South Africa now has two IXP operators with 6 PoPs in 3 cities
 - Nigeria now has two IXP operators with multiple PoPs in 2 cities
 - Angola now has two IXP operators with multiple PoPs
 - Kenya may soon have multiple IXP operators in 2 cities

ISPs should not run the IXP



Many early African IXPs were founded by ISPAAs because ISPs were the only Internet networks in the market at the time.

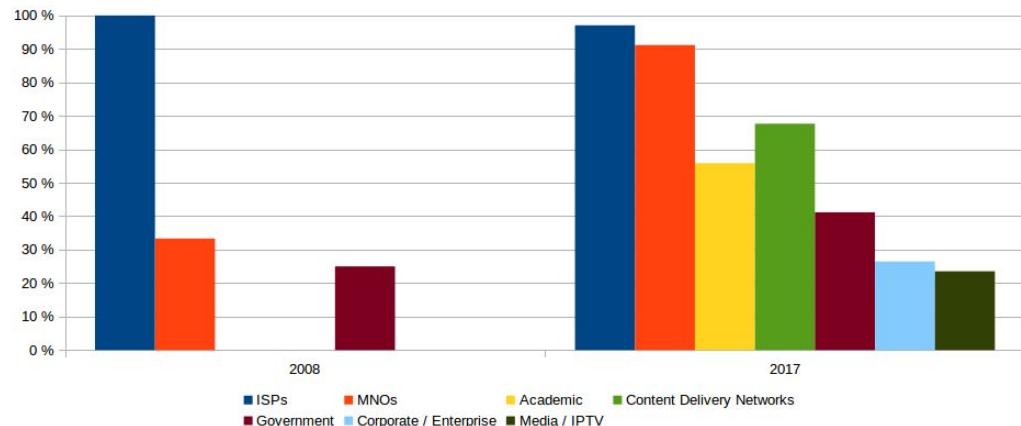
Over time, other network types emerged and the African Internet ecosystem became more diverse. As a result, neutral non-ISPA governance models became dominant.

Some ISPA IXPs even transitioned to non-ISPA governance models because the ISPA governance model was increasingly unrepresentative and hindered their growth.

The UIXP wisely selected a neutral non-ISPA governance model in 2001, but was never able to effectively implement it due to poorly designed MEMARTs, community infighting, and mismanagement.

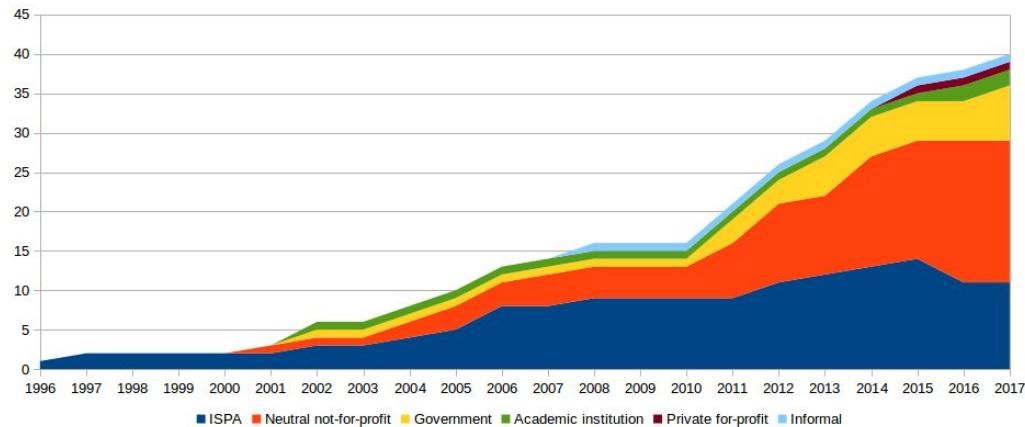
African IXPs: Percentage of IXPs by Connected Network Types

Source: Michuki Mwangi (2008), African IXP Association (2017)



African IXPs: Governing Entity Types

Source: African IXP Association (2017)



The real issues

Governance: Current

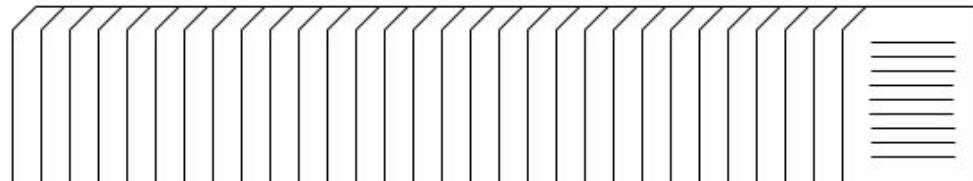
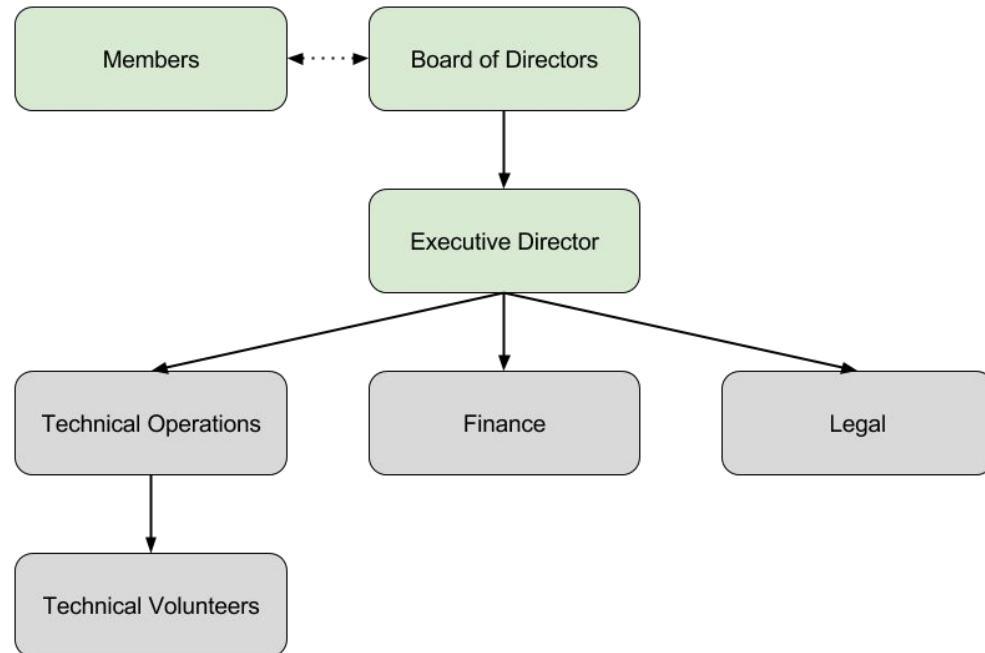
The 2001 UIXP MEMARTs, which define the objectives of our company, its top-level structure, and rules of governance:

- Do not recognize members other than those listed on the documents filed at Companies House.

This means that the MEMARTs must be altered, re-signed, and re-filed every time a network joins or leaves the exchange. This is highly impractical and was never done.

As a result, very few of the networks connected to the exchange are legally recognized members of the company.

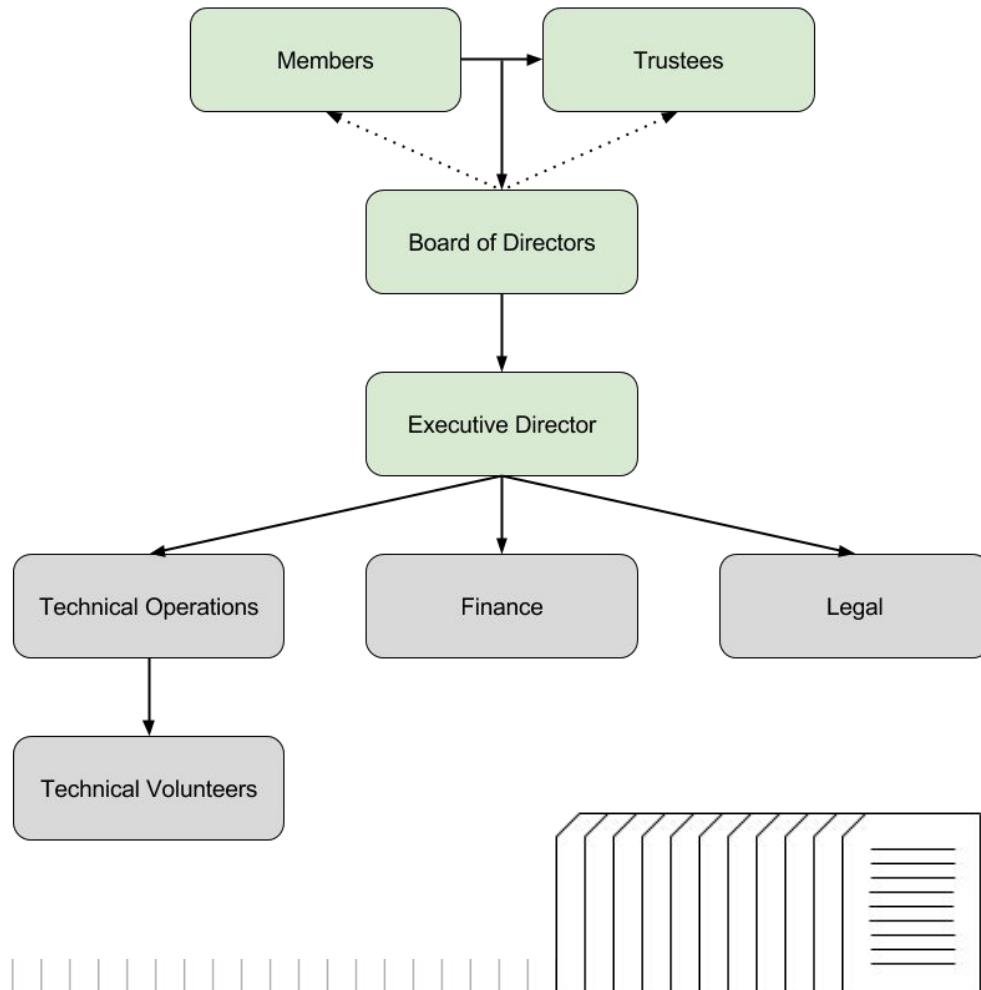
- Give excessive powers to Directors sufficient to expropriate control of the association from its members.
- Are enormous in length, riddled with loopholes, and full of cryptic jargon. Hard to understand and implement.



Governance: Proposed

To resolve these issues, we drafted heavily revised MEMARTs in collaboration with lawyers and Douglas Onyango which:

- Legitimize the membership of every connected network and allow new networks to join by signing a contract. This requires the creation of a Trustee membership class which will sign the MEMARTs.
- Ensure that Directors are accountable to the membership and resolve problems related to elections, term limits, conflicts of interest, and governance capture.
- Allow for electronic participation and voting in company meetings.
- Close loopholes, eliminate numerous inappropriate or redundant clauses, and use plain language wherever possible.
- Are shorter: 30 pages reduced to 11



Revised MEMARTs were proposed in 2015,
but the community gave no feedback despite
multiple requests for input.

As a result, the project had to be delayed.

New Governance Proposal - Request For Comment

Inbox Projects/Uganda Internet eXchange Point



Kyle Spencer Dear Techies, As you may know, the Uganda Internet eXchange Point (UIXP) was ...

11/13/15

3 older messages

Kyle Spencer <kyle@stormzero.com>
to UIXP, Mike, Robbins, Simon

11/30/15

Hi all,

Just writing to remind everyone about this. It would be great to get some feedback.

Regards,
Kyle Spencer

Kyle Spencer <kyle@stormzero.com>
to Hari, Hari, Baldwin, Peter, Simon, Robbins, Mike

11/30/15

Hari, Baldwin, Peter,

I forgot to send this to you guys directly. If you haven't already seen it, please read on. We've come up with a new governance model that I think could work well and make everyone happy.

It would be great to get your feedback. I'm happy to meet and talk through it if you're interested.

Regards,
Kyle Spencer

4 Attachments



Proposed to community in 2015; no feedback received

Democracy requires active participation. It is
risky to implement without first having
demonstrated buy-in from the membership.

Fix governance before fees?



- Fixing the governance model will take significant time, effort, and money
 - Not everyone agrees on what the final model should be
 - Some still think the UIXP should be run by ISPs, etc.
 - Few people have demonstrated a willingness to contribute
 - Some happy to complain and issue demands but never willing to help
 - Lawyers are required for review and implementation
 - UIXP staff would need to be paid in order to dedicate full time
- We have an urgent need for revenue that cannot wait
- Can networks donate the money required to sustain the UIXP until reform?
 - The community donation model has been tried before and fails every time
 - Which networks are going to pay, how much, and when?
 - Not all networks will agree; some are already paying port fees
 - Equal distribution of costs hurts small networks (see slide #24)
 - Proportional distribution of costs is the same as tiered port fees
 - What will the networks that donate expect in return?
 - Will they expect more influence in the governance reform process?
 - Who will organize this? Who will collect and spend the money? Lack of trust
 - Tiered port fee model would still need to be implemented in the future

Summary

In summary...



- The new UIXP management has successfully revitalized the exchange, delivered significant value to the networks, and grown the Internet ecosystem in Uganda. For free.
- The UIXP has now reached a scale that cannot be sustained by volunteers and donations alone. It is now vulnerable to stagnation and failure without recurring revenue.
- UIXP management has demonstrated its commitment to governance reform. The ISP community has not, and has made few contributions to the UIXP since 2001.
- Any governance reform will take significant time and money to implement. Fees must be implemented first, port fees are the most logical model, and we have done our homework.
- The implementation of fees will likely inspire more meaningful involvement from senior network representatives. This buy-in will be necessary for any governance reform.
- An ISPA should not govern the UIXP. The governance model should stay neutral.
- The UIXP is not a monopoly; it is the beginning of an industry.



<https://uixp.co.ug>