What is going on at the MIXP?

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(On behalf of MIXP team)

AS327821 & AS37324

MIXP

Mauritius Internet Exchange Point

Contents

- Purpose of the MIXP
- Current status of the MIXP
- Equipment
- Tech team
- Challenges
- Plans for the future

Purpose of MIXP

- ○ Keep local traffic within local infrastructure to **reduce costs** of traffic exchange between networks
- ○ **Improve quality of internet services -** reduce latency and improve user experience
- ○ Create favorable environment for **local Internet infrastructure and service: Local content and Shared services**
- ○ **Knowledge sharing and capacity building**

What an IXP is not...

- ○ Not a hosting platform for companies' content (does not compete with operators
- ○ Not (necessarily) a platform for inter-nations CDNs or content providers.
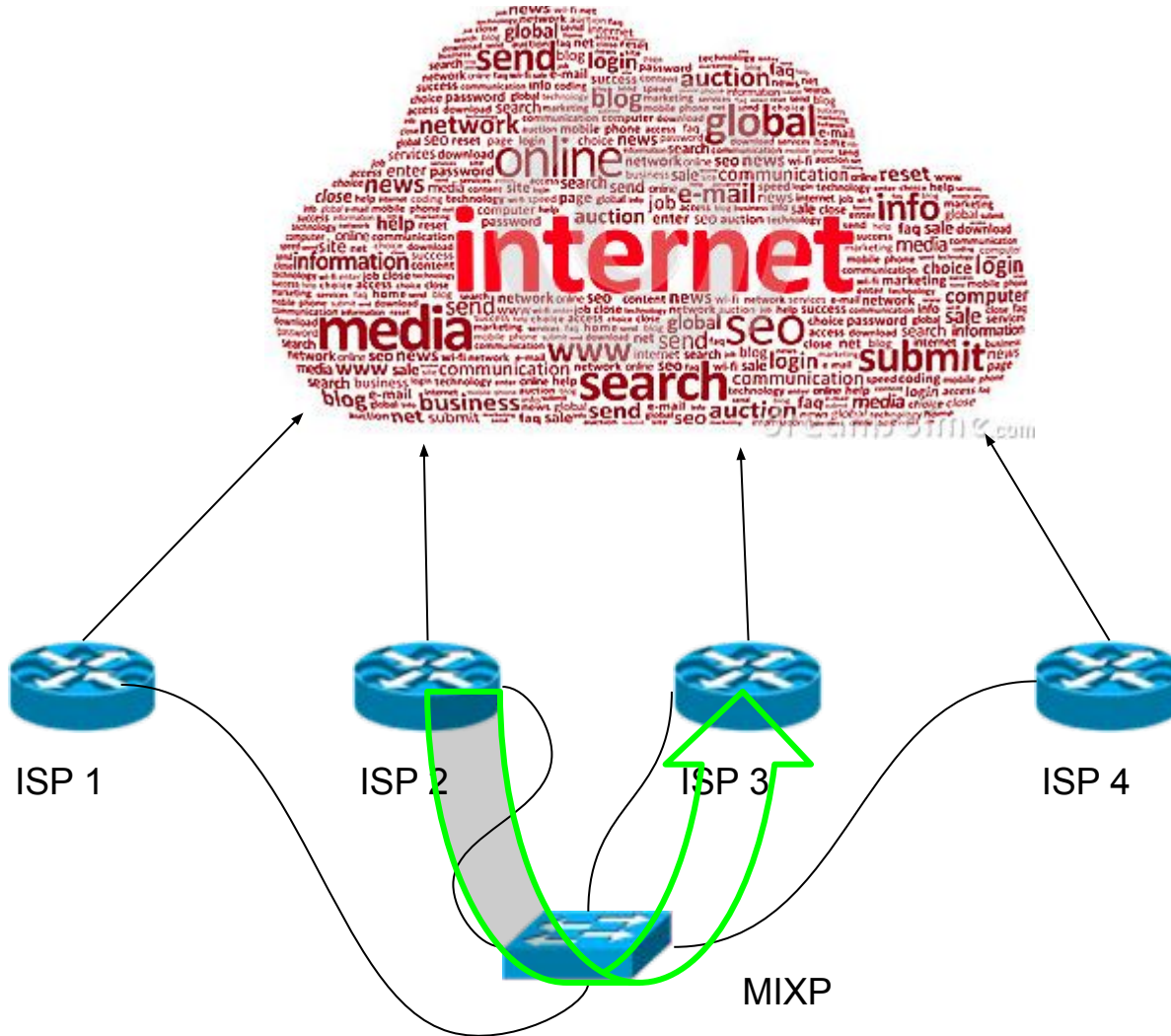- ○ Not a regulator

Purpose of MIXP

Without MIXP

Latency: > 200ms

ISP 1   ISP 2   ISP 3   ISP 4
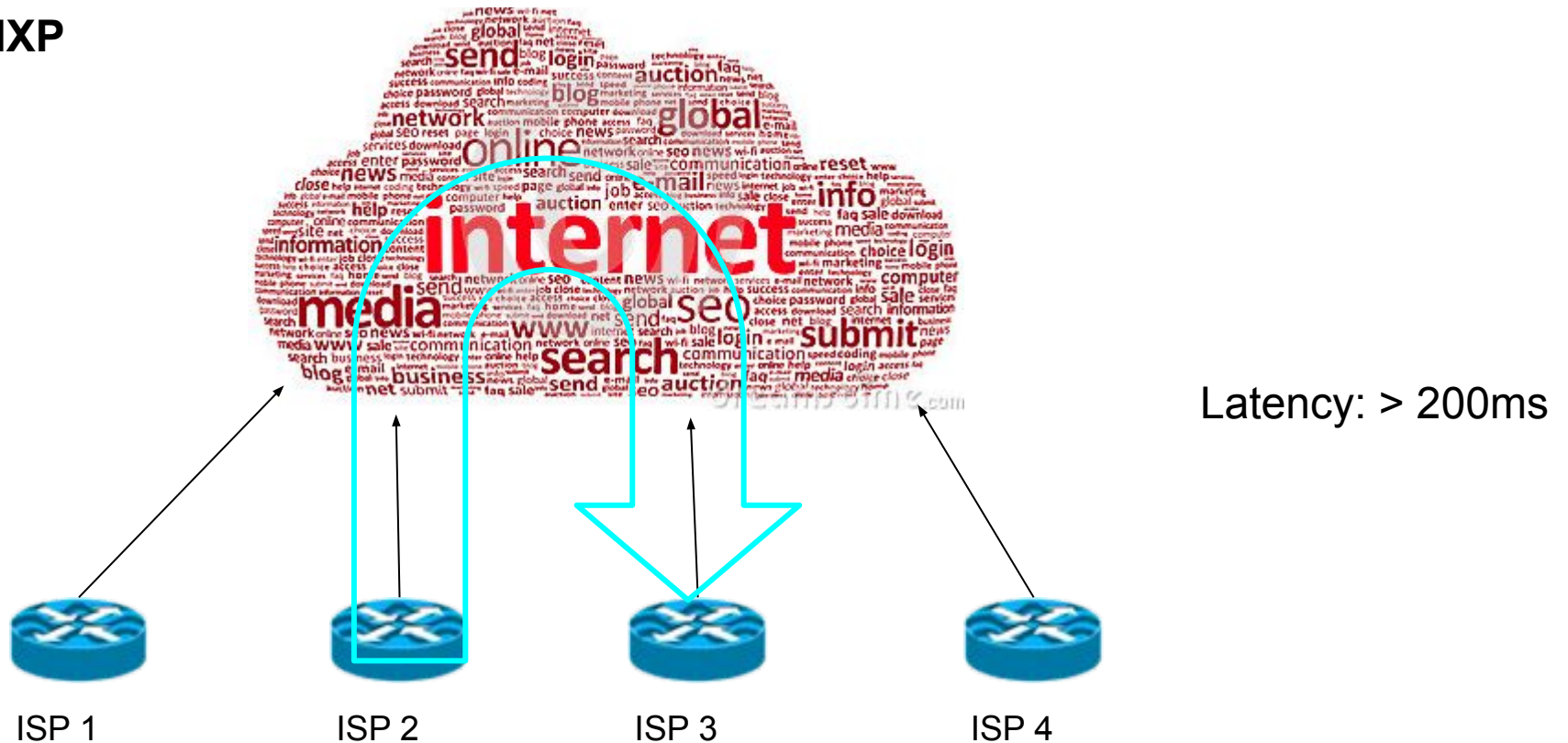
What happens if Customer from ISP 2 wants to connect to ISP 3?

Purpose of MIXP

With MIXP

Latency < 50ms

ISP 1   ISP 2   ISP 3   ISP 4

MIXP

What happens if Customer from ISP 2 wants to connect to ISP 3?

Purpose of MIXP

Support latency-sensitive applications
1. Storage-area networks
2. Data centers
3. High-frequency trading
4. High-performance computing
5. High-volume transaction systems
6. Streaming video/video on-demand
7. Online/MMOG gaming
8. Cloud computing
9. Virtual Reality
10. IoT based solutions such as connected drive services

Sources of latency
- Proximity delay – how close are you to the fiber?
- Fiber delay – how long is the fiber?
- Equipment delay – how fast is your equipment?
- Network design – is this your optimal network design?
- End-to-end low-latency advantage

IXPs around the world
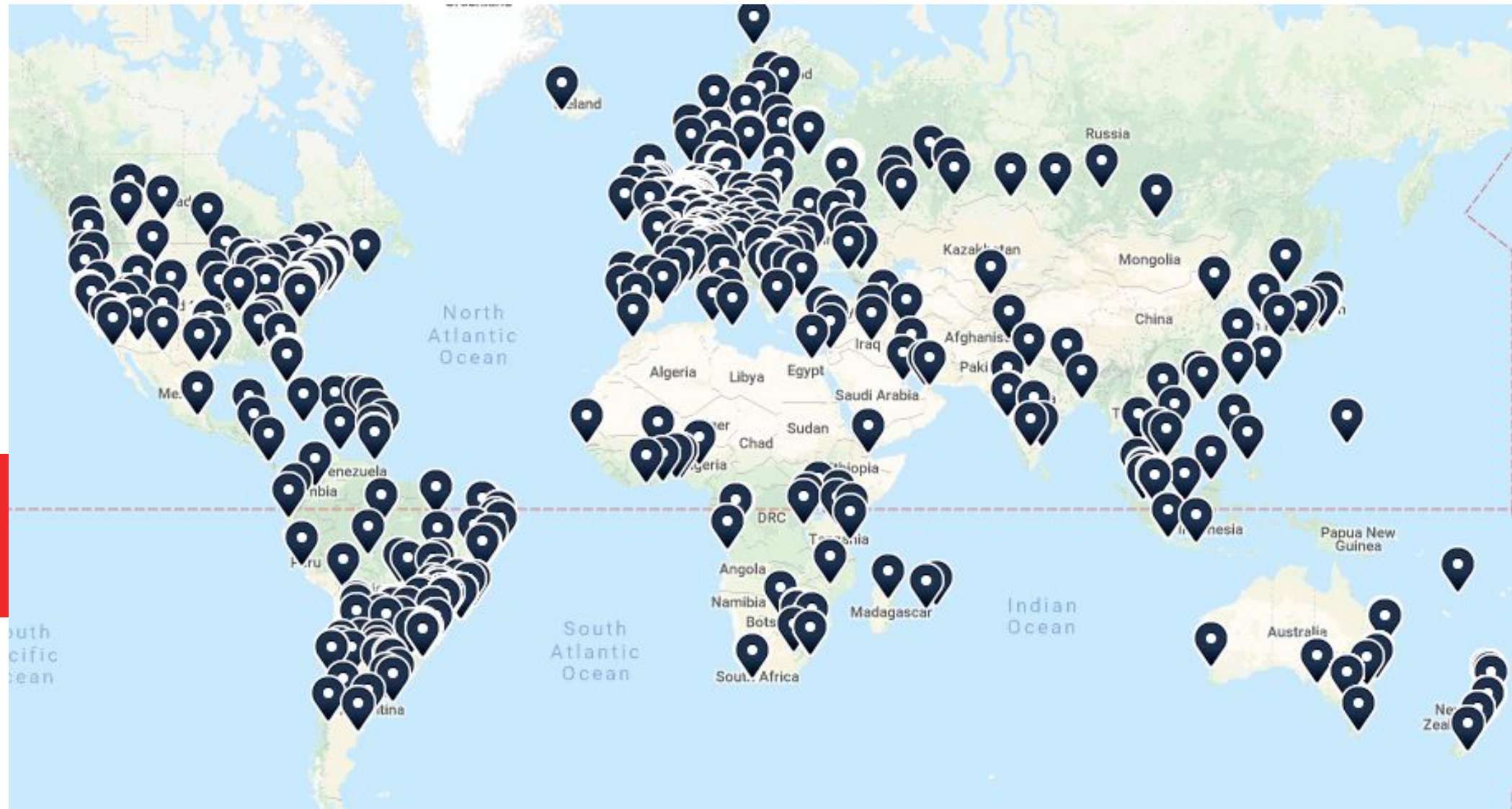
Start-up of the MIXP

(Early 2000's)

- PCH helped with the setup and installed services

- (Almost) no one was peering with PCH - or each other!

- Very few peers and participants at MIXP

- Little traffic, almost nothing.

Our current status

- PCH is now peering with almost everyone at the MIXP

- Two (2) BGP route servers live.

- Many more participants now present at the MIXP; major players and ISPs in Mauritius such as: Atlas Communication, Bharat Telecom Ltd, Data Communications Ltd, Rogers Capital, Emtel Ltd, GOC (NCB), Kaldera, Mauritius Telecom, MTML and PCH

- Current Services available:

  - BGP route servers

  - BGP collector + Looking Glass

  - Mailing Lists for community

Looking Glass

| eighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
196.223.0.1	4	42	1490009	1685391	0	0	0	18:30:18	43
196.223.0.2	4	3856	1443718	1443877	0	0	0	18:30:29	1
196.223.0.3	4	36882	1598975	1610006	0	0	0	02w2d07h	Active
196.223.0.5	4	36868	1641579	1491674	0	0	0	18:27:57	**0**
196.223.0.8	4	30999	1305879	1211295	0	0	0	18:30:00	145
196.223.0.9	4	36894	0	0	0	0	0	never	Active
196.223.0.12	4	23889	0	0	0	0	0	never	Active
196.223.0.13	4	51110	0	0	0	0	0	never	Active
196.223.0.14	4	37455	0	0	0	0	0	never	Active
196.223.0.15	4	327821	1880010	1708714	0	0	0	05:11:50	1
196.223.0.16	4	37622	0	0	0	0	0	never	Active
196.223.0.17	4	328019	1522068	1331883	0	0	0	29w6d22h	Active
196.223.0.18	4	37674	0	0	0	0	0	never	Active
196.223.0.201	4	37324	1717148	1708729	0	0	0	12w6d15h	73
196.223.0.202	4	37324	1717112	1708729	0	0	0	12w6d15h	73

Total number of neighbors 15

Looking Glass

196.223.0.3   36882   DCL

196.223.0.9   36894   GOC

196.223.0.12   23889   Mauritius Telecom

196.223.0.13   51110   Kaldera

196.223.0.14   37455   Bharat Telecom

196.223.0.16   37622   MTML

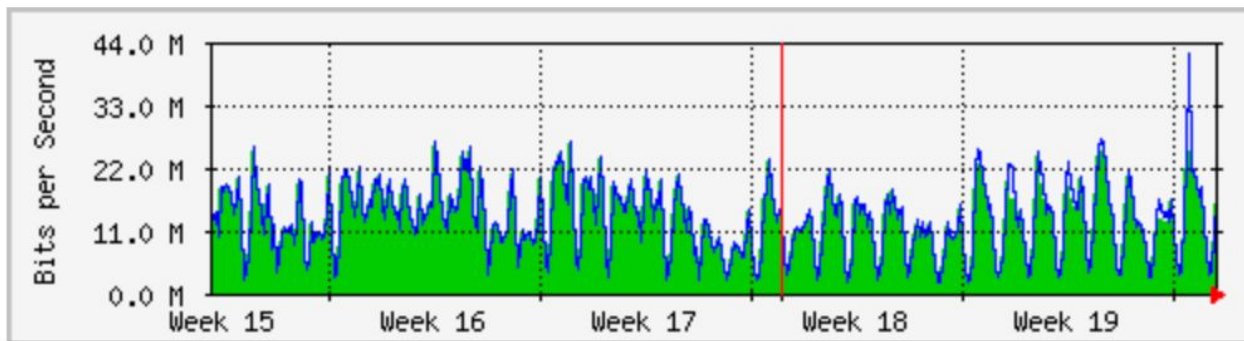196.223.0.17   328019 Les Relais

196.223.0.18   37674   Millenium

2018 Stats

MIXP — Mauritius Internet Exchange Point

`Weekly' Graph (30 Minute Average)
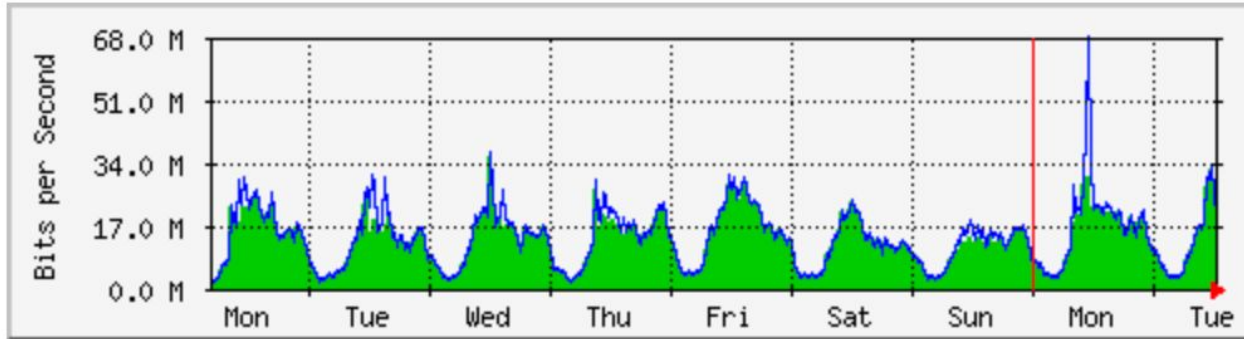
	Max	**Average**	**Current**
In	35.7 Mb/s (3.6%)	12.6 Mb/s (1.3%)	18.9 Mb/s (1.9%)
Out	67.6 Mb/s (6.8%)	13.6 Mb/s (1.4%)	19.6 Mb/s (2.0%)

`Monthly' Graph (2 Hour Average)

	Max	**Average**	**Current**
In	26.0 Mb/s (2.6%)	12.3 Mb/s (1.2%)	15.6 Mb/s (1.6%)
Out	41.4 Mb/s (4.1%)	12.7 Mb/s (1.3%)	16.6 Mb/s (1.7%)

Current Stats

`Weekly' Graph (30 Minute Average)
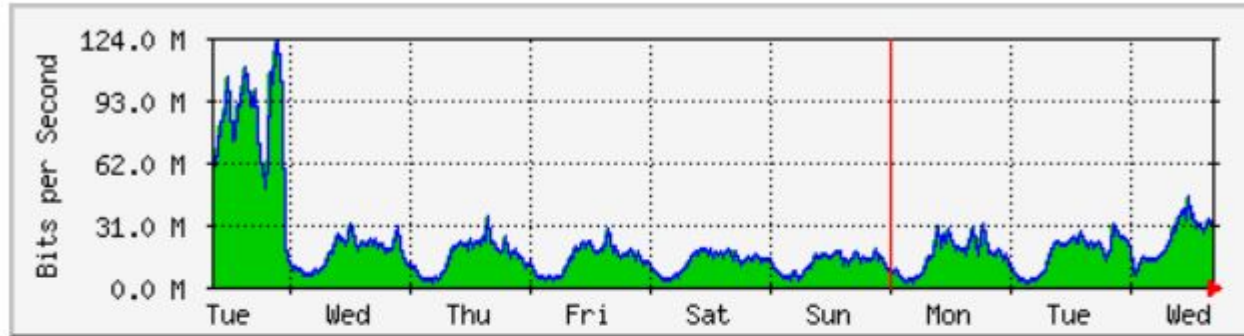
|	Max	Average	Current
In	121.6 Mb/s (12.2%)	20.1 Mb/s (2.0%)	29.9 Mb/s (3.0%)
Out	121.6 Mb/s (12.2%)	20.0 Mb/s (2.0%)	29.9 Mb/s (3.0%)

`Monthly' Graph (2 Hour Average)
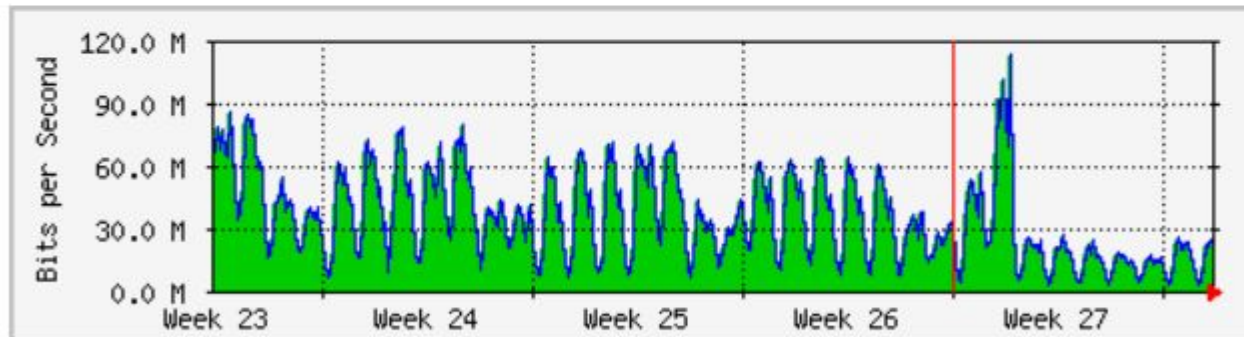
	Max	Average	Current
In	111.8 Mb/s (11.2%)	33.1 Mb/s (3.3%)	29.8 Mb/s (3.0%)
Out	111.8 Mb/s (11.2%)	33.2 Mb/s (3.3%)	29.8 Mb/s (3.0%)

Equipment

Location: GOC
- Peering Switch (the core of the IXP)
  - Cisco WS-C3560G-24TS-S

- Management service(s) Infrastructure:
  - HP Proliant for virtualisation of services
    (1x in use; 1x in progress)
  - Cisco WS-C2960S-48TS-L switch for LAN
    (1x in use; 1x cold stand-by)
  - Cisco C2811 router for transit
    (1x in use; 1x cold stand-by)
  - Route Server(s) are Linux + Quagga VMs

- Hosted:

  - RIPE Atlas Probe

  - Caida Probe
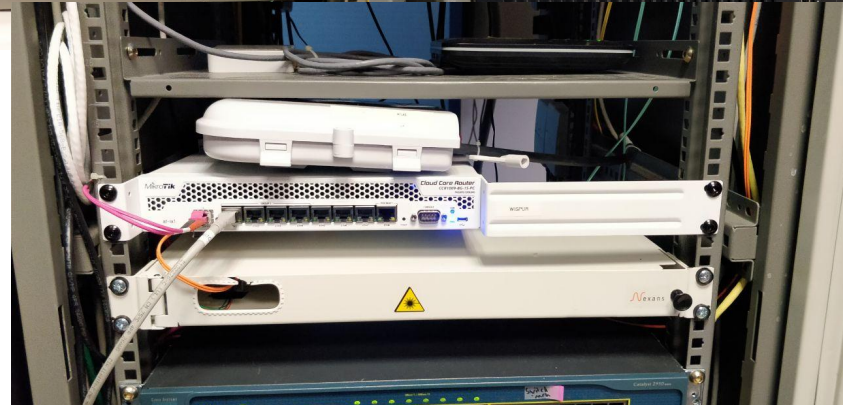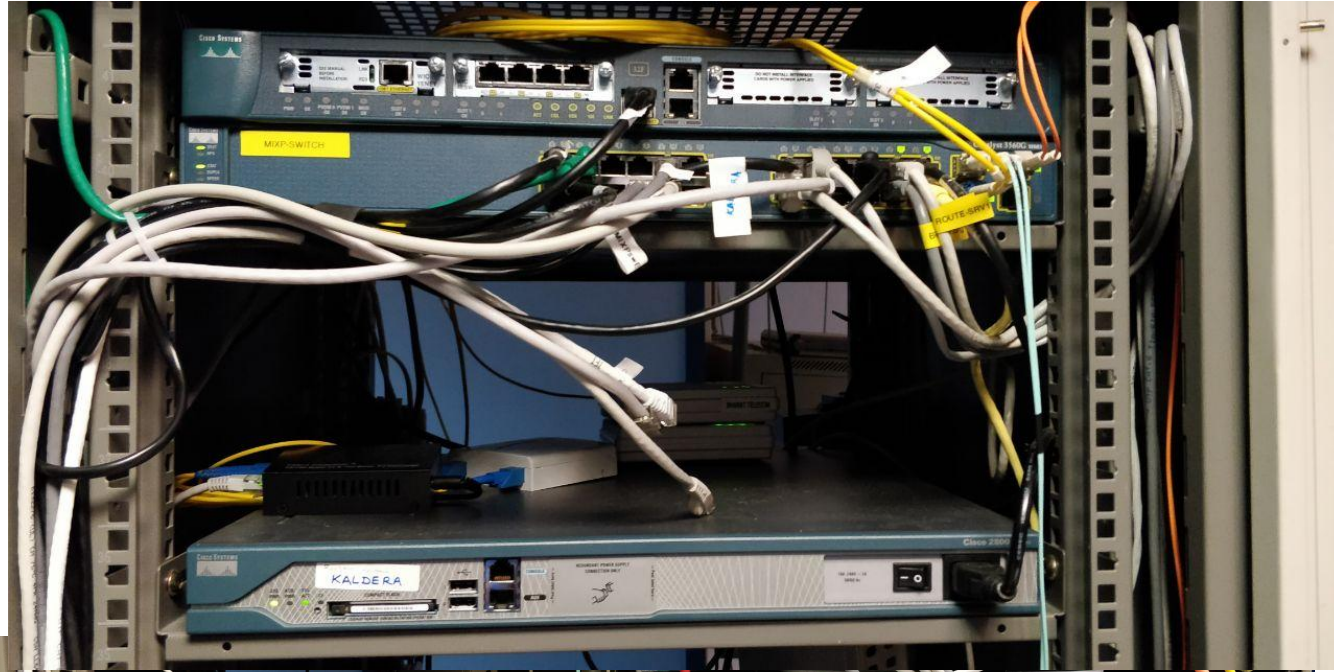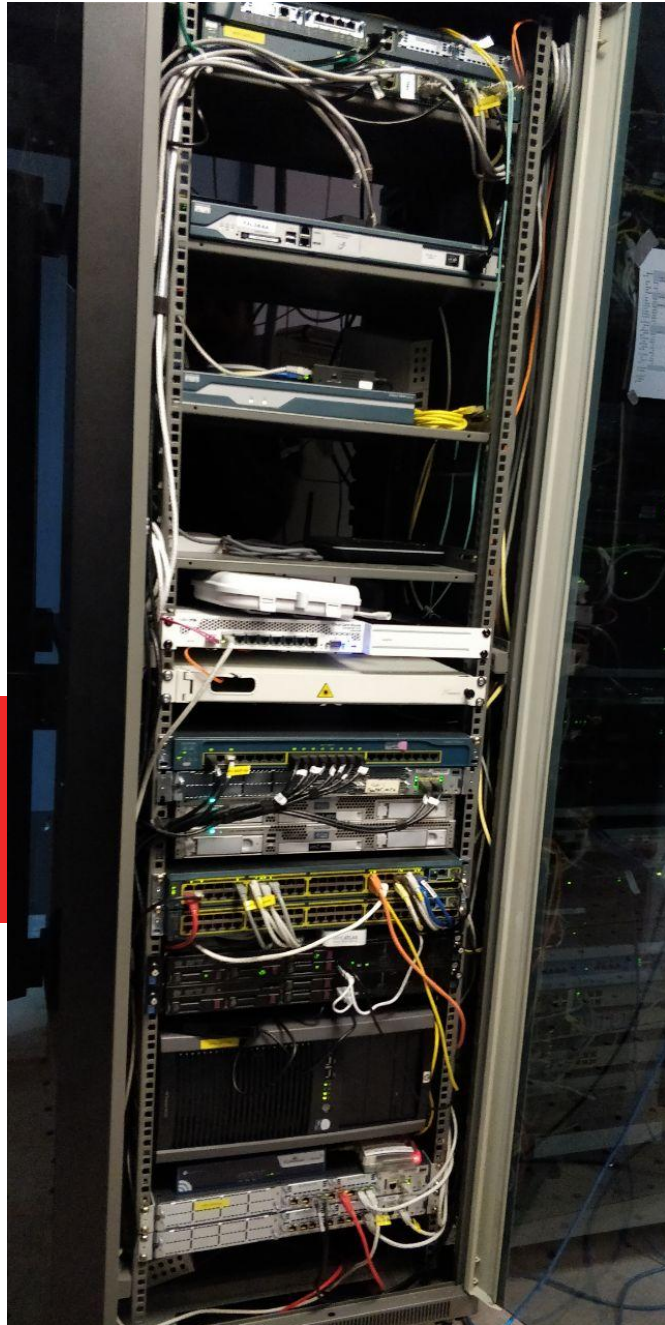
Events

2014 - IXP technical workshop

2016 - First MIXP meet-up

15 May 2018 - Mgmt Meeting

IXP Technical Workshop

Technical Aspects on Setting up, Operating and Administering Internet Exchange Points (IXPs) Training Workshop:

The Ministry of Information and Communication Technology, in collaboration with the African Union Commission, conducted a **Technical Aspects on Setting up, Operating and Administering Internet Exchange Points (IXPs) Training Workshop** in Mauritius from 25th to 29th August 2014 at Cyber Tower 1, Ebene.

This 5-day Workshop allowed the high level technical personnel and high level network engineers to receive hands-on training on interconnection techniques. The participants were coached to design, implement dynamic interconnections necessary to support and maintain the technical operations between their networks and Internet Exchange Point.

Ministry of ICT in collaboration with the African Union Commission, with ISOC as facilitator

First MIXP meet-up

FIrst MIXP meet-up was held during AFRINIC-25 at **Sofitel Imperial Resort and Spa**

Venue(room) was sponsored by AFRINIC

Refreshments were sponsored by Nishal(PCH)

Tech team

Our IXP is run & managed by volunteers who are mostly AFRINIC staffs:

1. Keessun Fokeerah
2. Cedrick Adrien Mbeyet
3. Musa Stephen Honlue

Nishal Goburdhan(PCH) also occasionally shares his experiences and recommendations

Daniel Shaw also helps from remote

We welcome more volunteers

Roles of the tech team

Coordination between team members for:

1. Service maintenance
2. Debugging during downtimes/issues
3. Implementation of new services

Plans for the future

- More online presence & communication about the MIXP. Eg. social media
- Blogs to update general public on evolution of the IXP
- Website review
- Further increase engagement through our Mailing Lists
- New peers on MIXP, AFRINIC can provide support to get an ASN
- Increase participation at the MIXP and inter-peering.
- Education and sensitise local orgs on the benefits of peering at the MIXP.
- Implement redundancy on our management VMs, hardware are ready.

Plans for the future(cont)

- More Value-add services:

  - Cache for open-source repositories

  - Cache for apps (such as open street)

  - Implement AS112 – Blackhole for RFC1918

  - NTP service

- Implement and extend AFRINIC DNS services such as rDNS

- Increase participation of local Hosting providers to keep local traffic local. Example MRA, MCB Internet banking etc

- IXP manager implementation

- Increase redundancy

Challenges

- Does the Mauritius Internet Exchange Point Association still exist? Same has been referred to on NCB website
- Is the Ministry of ICT or NCB involved with MIXP?
- Who is maintaining our domain name mixp.org? Is it donation? What happens if person stops payment?
- How to finance the MIXP?
- New services such as Google Cache, Facebook Cache and other Cache services require fill bandwidth. Each operator wants to have their own.
- Reluctance from the BIG players to provide access to their content.
- We note that a paid direct peering between ISPs is preferred in some cases.
- How to connect local orgs wanting to peer at MIXP?
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Thank you!