



Venue: Intercontinental Hotel, Balaclava, Mauritius Date: 20<sup>th</sup> – 22<sup>nd</sup> August, 2019

# CONFERENCE **REPORT**

Organized by:





**Local Host:** 

**Rogers Capital** CORPORATE • TECHNOLOGY • FINANCIAL



	<b>367</b> Participants
	Representing <b>59</b> countries: <b>202</b> from Africa, <b>36</b> from Europe, <b>16</b> from America, and <b>13</b> from Asia.



#### **456,860%** Increase in total traffic exchanged locally in the past decade

### AfPIF Celebrates Ten Year Anniversary, Future Looks Bright

The tenth edition of Africa's premier Internet technology forum on peering and network interconnection was held in Balaclava, Mauritius, with a commitment to continue investments that guarantee improved interconnectivity and lower costs for end users within the region.

The past decade has seen significant developments in the Internet sector; from the deployment of local, national, and cross-border fibre-optic networks to a 456,860% increase in total traffic exchanged locally. The goal of exchanging 80% of the content locally by 2020 remains in sight and will be discussed at next year's AfPIF forum in Kigali, Rwanda.

It was fitting that the tenth edition of AfPIF was held in Mauritius; a country anchored firmly by technology. At the turn of the century, Mauritius was dependent on agriculture, but has since embraced opportunities in technology to become a leader in fintech and cybersecurity. As a result, it has become the preferred headquarters for many technology companies investing in Africa.

To some extent, Mauritius highlights what African countries could become if they made efforts to attract more technology investments through a favorable regulatory environment, attractive tax regime, investment in technology infrastructure, and an educated workforce capable of serving the needs of the future.



#### Infrastructure is still a priority, though at a different level

Ten years ago, countries were looking to set up primary infrastructure; the first submarine cable or the first terrestrial network. Today, countries are looking for ways to further reduce costs and interconnect between different cities. For instance, the Indian Ocean Islands are looking to lay a third cable that interconnects them and terminates in Durban, South Africa.



#### Global carriers have taken note

*Akamai, AWS, Facebook, Google, Netflix,* and *Microsoft* are some of the global players that sponsored AfPIF this year. Asian players such as *China Telecom* were also represented, showing a growing recognition from America, Europe and Asia.

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#### Data Center growth key to content hosting

Continued dialogue between content creators, hosts and data center providers has led to better understanding of what needs to be done to achieve 80% local traffic exchange by 2020.



#### Innovation is the key to the future

Presentation on how Africa looks in 2030 identified innovation as key to continuous growth and relevance. As customers become more aware and demand better services, organizations will have to evolve and adapt to better suit the customer



#### The benefits of an IXP are not disputed

Previously, the benefit of an IXP may have been seen mainly in the capacity and the number of CDNs or caching networks present. The debate has now moved to the value created in the particular ecosystem, whether its spurring innovation, e-commerce or access to faster government services within a country.

Operators have found new ways to add value to the ecosystem and attract new players in the market, without dwelling so much on the capacity exchanged.



#### New hubs will emerge as more people get online

With the cost of connectivity falling and more people coming online, it is expected that new hubs will emerge, as Africa looks for new ways to interconnect, as new data centers come up in new cities, and as terrestrial and submarine cable routes influence the location of future hubs.



#### The role of the traditional telco is changing

It may have been very attractive in the last ten years, but the business of providing mere infrastructure is slowly losing its lustre. Companies that are providing just pipes are now under pressure, as content remains local and the demand and pricing for international transit falls in more advanced markets like South Africa.

Companies are now being forced to look to other underdeveloped markets or offer more innovative products that can allow more competition with more demanding customers.



## **Highlights**

The tenth meeting of Africa Peering and Interconnection Forum (AfPIF) kicked off in Balaclava, Mauritius, with participants celebrating the achievements and looking forward to further collaboration.

Andrew Sullivan, the President and CEO of the Internet Society, opened by highlighting the importance of the meeting, which helps create a community that supports the growth of the Internet in Africa, identifies challenges, and ensures that understanding spreads.

In his speech, he noted that traffic exchanged inside Africa has expanded enormously as a result of the work done by AfPIF over the ten years. One of AfPIF goals is to increase the level of local content exchanged locally to 80% by 2020.

Sullivan, who has extensive experience working with international Internet bodies, emphasized the need for a robust community in Africa, led by *Af-IX*, that will continue working together to ensure that the Internet is built in Africa, according to the needs of Africans and the African network experience.

**80%** One of AfPIF goals – increase in of local content exchanged locally by 2020. The annual meeting brings together chief technology officers, peering coordinators and business development managers from the African region, Internet service providers and operators, telecommunications policymakers and regulators, content providers, Internet exchange point (IXP) operators, infrastructure providers, data center managers, National Research and Education Networks (NRENs), carriers and transit providers, and international financial organizations. The forum is planned as a non-profit event and international sponsorship and support have been sought to convene the event.

The first meeting was held in Kenya in 2010 when the region was tackling different kinds of challenges: connectivity was mainly via satellite, there were only a few submarine cables, the benefits of interconnectivity were not well known within the local tech communities, and the cost of bandwidth was between \$ 3,000 and \$5,000 per Mbps.

Between 2010 and 2014, the meeting highlights included "The Peering Game," where participants were led by Dr. Peering (Bill Norton) in understanding how peering works, the economics of it, and the benefit to end users. This game helped share knowledge and understanding, which set the stage for peering personals and bilaterals that are the current highlight of AfPIF.

Over the past decade, the Internet Society and its partners has offered equipment donations and technical training and community mobilization in at least 28 African countries. One of the highlights is a partnership between the African Union (AU) and the Internet Society on the AXIS Project between 2012 and 2018 where over 1500 people in 28 countries were trained. The project also supported the creation of several new IXPs, support of 8 IXPs into becoming regional IXPs increased awareness on value of IXPs and policy work on importance of cross border interconnection. One notable outcome of the capacity building work, has been the development of regional subject matter experts and trainers who speak French and Portuguese which was a challenge before.

Going forward, it is clear that the work has just begun and the next decade will equally be critical. The goal is to get service providers from all African countries to participate in AfPIF, sustained learning and information sharing is needed, increased collaboration between data center operators and the tech community and increased research and measurements in the region.

As the host of the 10<sup>th</sup> meeting, Mauritius took the chance to showcase how it is leading in efforts to interconnect the Indian Ocean Islands, as well as grow its reputation as an attractive locale for technology companies seeking to invest in Africa.

Mauritius, Reunion, Mayotte, Comoros and Madagascar make up the Indian Ocean Islands with a combined population of 28.3 million. These islands are connected by Safe and Lion submarine cables but there are efforts in the pipeline to set up a third cable connecting all the islands with South Africa.

The Day Two Summary will cover more about the economics of peering and the infrastructure issues in the region!



## **Highlights**

n the last five years, Africa's international traffic patterns have changed, with international and intra regional traffic growing, according to the latest statistics from *Telegeography*, presented at this year's AfPIF.

Johannesburg, Cape Town, Lagos, and Nairobi maintain their top hub status, but Cotonou, Kigali, Libreville, Abidjan, and Dakar have emerged as major hubs as international traffic grows. Cotonou recorded 88Gps between 2018 and 2019, showing a 77% growth, while Kigali recorded 75Gbps, a 92% growth, and Libreville had 113Gbps at 71% growth.

This was attributed to a drastic reduction in connectivity costs, which led to more data center space and eventual demand for more capacity to other international hubs. West African connection, especially between Dakar, Abidjan, Accra, and Lagos has also increased.

*Telegeography* monitors international transit traffic and the presentation was one of the highlights of the day. Domestic traffic is a bit harder to capture but *Telegeography* promised to work with more providers to get future snapshots of the growing traffic.



77%

Rate of growth in international traffic recorded by Cotonou (88Gps) between 2018 and 2019, according to *Telegeography*. The presentation by *Telegeography* explored the shifting connectivity landscape in Africa and its effect on interconnection hubs, showing that new hubs may soon emerge, as more and more cities reduce the cost of connectivity and invest in more infrastructure.

The data emerging shows that Europe is still a preferred transit route and Intra-Africa route capacity has increased between East and West while South to North connectivity is increasing, probably because of the Cape to Cairo infrastructure projects.

The data also shows that new hubs will be driven by new submarine cable routes, carrier neutral data centers IXs, a friendly regulatory environment that is geared towards business growth, business competition and low prices for local connectivity, and a rich ecosystem with content and growing corporations.

AfPIF also included a presentation exploring Africa by 2030 and what we need to be prepared for. It was clear that intra-regional connectivity was key, as prices continue falling, and expected to be on par with other parts of the world by then. There were other expectations for 2030, including:

The customer will have more control over the routing of traffic and the applications, while networks will be expected to be more agile, to provide for the evolving customer needs, and running flexible networks. International organizations will invest more in Africa, given that now there are a billion unconnected in the region and it is slowly becoming an important market for international tech companies.

For each of the past ten years at AfPIF, there has been a presentation on the economics of peering – a way to deepen the conversation on why networks should peer and introduce any newcomers to the economics of IXPs. This year, the conversation was led by **Susan Forney** from *Hurricane Electric*.

In her presentation, she projected that Africa's IXP growth will follow the international trajectory, with falling connectivity costs leading to an increase in content and the eventual need for exchanging content locally and strategically.

For any community considering whether to set up an IXP, it is important to consider the port costs, equipment support costs, cost of cross connects, data center costs, and any third party costs that may be incurred.

These costs can be weighed with the benefits of an IXP, such as reaching content networks or cloud providers like *Microsoft, AWS, Google, Akamai, Limelight, Fastly, Facebook,* and *Netflix* among others.

To understand where to peer, it is important to get statistics about the highest traffic sources and destinations on the network, allowing the easier upgrade of capacity.



## **Highlights**

It's been a record-breaking year: **97** women attended AfPIF 2019, the highest ever, showing the fruits of diversity efforts from organizers and sponsors.

In the last three years, there have been fellowships targeting women in engineering, supported by organizations like *Workonline, Google, LINX*, and *Akamai*. There's also been a working lunch, where participants discuss the best way AfPIF can be more inclusive to women.

As the curtains fell on the tenth edition of AfPIF, it was clear that the future is looking bright, with **367** men and women attending, representing **59** countries: **202** from Africa, **36** from Europe, **16** from America, and **13** from Asia.

The first panel of the day was dedicated to looking back at the challenges in the last ten years, identifying the opportunities going forward, and what we all must do in order to guarantee business growth and better connectivity for the region.

97

Number of women who attended AfPIF 2019, the highest ever, showing the fruits of diversity efforts from organizers and sponsors. One of the key points was that the traditional telco model is changing, and companies will have to adapt in order to stay relevant. *Seacom*, for instance is exploring other business opportunities as the demand for traditional infrastructure falls and local content grows, leading to formation of ISPs that can survive largely without the need for IP transit.

"The notion that everyone wants transit to London doesn't hold anymore. In South Africa, it is now possible for a local ISP to survive on 90% of local traffic, meaning they may not need IP transit, compared to other parts of the continent. That makes sales harder in South Africa, but growth opportunities are there in countries that are yet to open up," said **Mark Tinka**, **Head of IP Engineering** at *Seacom*. The panel made it very clear that the ecosystem is made up of complex relationships and will need all parties working together in order to grow. The growth in content has a direct correlation with the growth in data center space. While in other parts of the world it's easier to predict the uptake, it is much harder to predict the growth in Africa.

For *Teraco*, initially, the goal was to have more space, explain to people the benefits of co-location, and have more connections. However, virtualization means one can do more with smaller spaces and the challenge now is continued innovation and scaling, as more companies explore having 10G ports, which was unheard of 10 years ago.



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Mark Tinka, Head of IP Engineering, Seacom

Ten years ago, *Akamai's* challenge was how to enter more markets, build relationships and navigate complex regulatory issues in different countries. Now, the CDN is in major service providers in 26 countries and is using the lessons learned to grow its footprint to more countries.

For *Google*, the challenge still remains access. How do we make connectivity more accessible to more people? Smartphones have become cheaper, but the bandwidth needs to get more affordable for more people to use it. The cost of last mile equipment needs to get more affordable for networks to provide more affordable connectivity, whether through the radio network or fiber.

The issue of wayleaves, whether by national, local, or aviation authorities remains a major issue for many organizations. Whether it's on cost or the time it takes to get the approval, it was clear that more dialogue is needed in order to make the process smoother.

The afternoon session focused on Routing security which has become more paramount, due to the high number of routing security incidents. In the recent past, a number of routing security incidents have resulted in the global outage of large content providers such as *Cloudflare*. One common routing security incident is known as route prefix hijacking. This occurs when a network broadcasts or announces Internet Protocol (IP) address routing information, accidentally or otherwise, that belongs to a different network. As a result, Internet users trying to connect to the original network that owns the IP addresses are redirected to a different (wrong) network.

Speakers on the security sessions demonstrated various techniques and tools that ISPs and IXPs can implement to reduce the effect of route hijacking incidents. Networks were asked to implement RPKI which increases the integrity of the global routing address information system. RPKI enables networks to validate the source of routing information received from other networks. The validation ensures that invalid sources are flagged appropriately and are not propagated across to other networks globally. For instance. Cloudflare demonstrated how a recent route hijack incident, which affected many networks globally from accessing their services, did not affect those networks that had implemented RPKI.

Networks were also encouraged implement and join the Mutually Agreed Norms on Routing Security (MANRS) actions to mitigate against the recurrence of similar routing security incidents in the future.

AfPIF 2020 will be held in Kigali, Rwanda.



