AfPIF 2013
The Fourth Africa Peering and Interconnection Forum
Sheraton Casablanca Hotel & Towers
Casablanca, Morocco
3 -5 September 2013

Summary of Proceedings

AfPIF 2013 SPONSORS

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## Abbreviations

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<th>Abbreviation</th>
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<tr>
<td>AfPIF</td>
<td>Africa Peering and Interconnection Forum</td>
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<tr>
<td>ASN</td>
<td>Autonomous System Numbers</td>
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<td>AS</td>
<td>Autonomous System</td>
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<td>AXIS</td>
<td>African Internet Exchange System</td>
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<tr>
<td>AU</td>
<td>African Union</td>
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<td>EU</td>
<td>European Union</td>
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<td>NREN</td>
<td>National and Regional Internet Exchange Networks</td>
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<td>NREP</td>
<td>National and Regional Internet Exchange Points</td>
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<tr>
<td>Gbps</td>
<td>Gigabits per second</td>
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<tr>
<td>IP</td>
<td>Internet Protocol</td>
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<tr>
<td>ISOC</td>
<td>Internet Society</td>
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<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
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<td>IX</td>
<td>Internet Exchange</td>
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<td>IXPs</td>
<td>Internet Exchange Points</td>
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<td>ROI</td>
<td>Return on Investment</td>
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<tr>
<td>Tbps</td>
<td>Terabits per second</td>
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<tr>
<td>TELCOS</td>
<td>Telecommunication Service Providers</td>
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For the last four years, Africa’s Internet community has been gathering to discuss and find ways to make Internet connectivity more affordable, connect more people especially those in remote areas and enhance interconnection between different countries and societies.

Africa Peering and Interconnection Forum (AfPIF) has become the forum for ISPs, academic institutions and networks, content carriers, network and infrastructure providers, regulators and policy makers to meet and find ways to interconnect and exchange content easily and efficiently.

After forums in Nairobi (2010), Accra (2011), and Johannesburg in 2012, this year’s forum was held in Casablanca, Morocco. The meeting attracted more than 150 participants and each day had a theme, calculated to achieve the goals of AfPIF.

During the last four years of AfPIF, Africa’s community has pursued infrastructure roll out and affordability, generation of local content and ways to share the same among countries and mostly to make Africa attractive to global content carriers.

With the roll out and operation of several fiber optic cables across the region, the infrastructure challenge has been partly solved while the local content question now remains the biggest hurdle; how to generate and share content locally without crossing borders.

Google and Akamai are among the leading global content carriers and for the last two years, they have supported AfPIF and indicated their interest in attracting Africa’s Internet users. Google already has extensive operations in Africa while Akamai recently partnered with NAPAfrica, the largest independent exchange point and Wananchi Group, one of the largest ISP in East Africa. The partnership allows the two network providers to host Akamai hardware in their data centers.

AMSIX, which has supported AfPIF since inception also announced its partnership with KIXP, which means that operators interested in peering at AMSIX can do so from KIXP thereby reducing costs and latencies.

The investments and interest shown by the global operators is likely to lead to increased interest from other global players and to further reduce connectivity costs, allowing operators to connect more people in rural and economically unattractive areas.

This report summarizes the three-day discussions, highlighting salient issues emerging from each.
Peering Coordinators Day

The Peering Coordinators Day is an open session for peering coordinators, network operators and policy makers to discuss practical ways to make content exchange and interconnection in Africa possible. Peering Day was started two years ago as a forum for Internet engineers, peering coordinators, Internet exchange point (IXP) operators, and content providers to understand the economics and engineering opportunities and challenges associated with peering and interconnection.

On this day, engineers discuss the challenges and opportunities provided by peering and the considerations determining whether to peer at a location or not.

A highlight at every AfPIF, Dr. Bill Norton once again led participants in playing “The Peering Game” which is comprised of players, each representing an IXP.

The game presents financial considerations and may lead people to think there is real money involved and decisions on where to peer determine whether an IXP makes money or not. The game represents real life situations that IXPs and networks face in determining whether to peer at a certain IXP or not.

Language issues

During this session, language barrier emerged as a challenge; the players were from English, French and Portuguese speaking countries. To some participants, language is a barrier they face occasionally when negotiating or initiating peering agreements.

The game also underscored the need to understand Internet business models that will allow the IXP to attract more peers and eventually be the preferred peering destination for all networks.

In the end, the game helped participants understand the peering and transit economics and what it means for each party.

You can follow the game and the rules as explained in the Internet Peering Playbook.

On the engineering point, Andy Davidson from Allegro Networks focused on BGP traffic engineering for peering networks, exploring the importance of peering with clean and efficient networks in order to attract more peers.

Anibe Onuche presented on the benefits of AS Path Transparency using BIRD, focusing on the experience at the Nigeria IXP, where they have been able to reduce packet losses and manage peers in an efficient way using BIRD.

What is BIRD?

BIRD is an open-source software routing system maintained by the research and development department of the CZ.NIC Association (Czech Domain Registry). BIRD was first implemented as a Route-Server at LONAP in 2009. In test environment, BIRD recorded better performance over other well-known open-source routing software. It’s stability, portability, modularity, efficiency and support of
current routing protocols including IPv6 support has resonated well with the IXP community. As a result, BIRD represents 45% of the total Route-Server deployments at European IXPs. In Africa, the IXPN and KIXP use BIRD as their IXP Route-Server implementation.

Practical Experiences
One of the main issues in Africa’s technology sector is the lack of research on how to set up IXPs, the challenges and how to make it successful.

To contribute to the body of knowledge on African IXPs, Nishal Goburdhan, a leading expert on IXPs in Africa shared his 16-year experience in setting up and running IXPs in South Africa.

Goburdhan has been involved in running JINX, the largest IXP in Africa with over 80 networks peering.

Why is JINX an African success?
1. Having bottom up policy approach where members decide what works for them and what does not.
2. Keeping costs lean, operating as a non-profit, and on cost recovery basis.

What are some of the noted practices over the years?
Originally, for you to peer, you had to be a member of the South Africa ISP Association, meaning there was no incentive for non South African operators to become ISPA members. This requirement was scrapped in 2008.

Also there were assumed technical competencies - 16 years ago, South Africa’s largest operators were the first to peer since they had teams with technical capacity on BGP and routing. Today we have over 80 peers at JINX and not all have the capacity hence the need for more training through workshops.

Today, there is complacency in building expertise within the local communities, yet it is expected that the IXP will work; community sense has been lost and there is need for continued training sessions for the tech community as well as dedicated staff to run the IXP.

Read more about Nishal’s experiences.

Emerging Topic of the day:
Remote Peering emerged as the newest and most interesting topic of the day. This is a new strategy used by IXPs, carriers and network operators to extend the reach into an IXP while at the same time reducing infrastructure building related costs. A number of IXPs including JINX have remote peering solutions. SEACOM made an announcement of their new product aimed at promoting remote peering to various IXPs in Africa and Europe;

How does Remote Peering work?
Traditional peering at an IXP requires the ISP/CDN/Network operator to have a router at the IXP location. This model is ideal when the IXP have the space, power and cooling required for its peering members. However, in an environment where these requirements are consistently growing, the associated costs increase for both the IXP and the peering members forcing the peering members to buy an additional and expensive high capacity router to serve at the IXP location. In locations where “Ethernet” services are available, the IXP can lower its operating costs and those of its peering members by removing the requirement to have a router at the IXP thus Remote Peering.
Many African countries are currently engaged in or pursuing Public-Private partnerships (PPP) to achieve increased connectivity to enjoy the benefits of ICT infrastructure. Many PPP projects involve large capital contribution like in the case of putting up fiber optic cables. However, in some cases, local governments have sought to partner with communities in achieving increased connectivity. These efforts have also been replicated at the regional level and there has been some success especially in large projects.

Day two discussions focused on how PPP’s can help improve regional interconnectivity. Lack of political will and policy bottlenecks have also been blamed for failure to interconnect. The presentations delivered dwelt on practical examples that have worked or failed.

The opening remarks were delivered by Abdelkader Amara, Minister for Industry, Trade and New Technologies in Morocco. He underscored the government’s commitment in ensuring technology innovation and development.

Sofie Maddens, Senior Director Global Services at the Internet Society delivered a speech on the strides made by AfPIF having begun with 60 participants at the inaugural meeting in 2010 to more than 200 who attended the meeting last year.

The presentation had the necessary balance of ambition and reality; the Internet Society’s vision is that by 2020, Africa’s content will have grown to the extent that 80 percent of the content will be exchanged within the continent while only 20 percent of the content will be international.

Maddens acknowledged that 80 percent was ambitious but noted that the conversations at AfPIF prove that Africa will be at a different level in seven years.

Maddens underscored the need to build communities and continue with training the technical community to set up and maintain networks, improve on the bottom-up approach that involves stakeholders and develop more content for access by the 167 million Africans who are online. She noted that infrastructure investments had enabled more people to come online but there was need to push connectivity to cover a larger part of the one billion people in Africa.

Maddens noted that there were Internet infrastructure growth disparities between countries in the same region. Currently more than 60 percent of African countries lack Internet exchange points that promote both national and cross-border interconnection.

In his keynote speech, Moez Chakchouk Chairman and CEO of the Tunisian Internet Agency, and founder

Theme: Role of Public-Private Partnerships in Promoting National and Regional Interconnection
Since 2010, the debate was on the challenges posed by lack of infrastructure, political will and investments although some of these challenges have been tackled, some obstacles still linger.

Mike Jensen, who has done extensive research on ICT landscape in Africa, set out some of the lingering challenges and offered possible solutions:

1. Reduce the dominance of incumbent players in some of the countries and end discrimination for new entrants
2. Increase passive infrastructure sharing or make it mandatory for fiber optic players to share infrastructure instead of each player digging their own fiber optic cable infrastructure.
3. Reduce difficulty in obtaining right of way, especially in cross border networks
4. Increase public-private funding mechanisms to accelerate the pace of investment
5. Improve spectrum management to promote uptake at the consumer level
6. Invest in and promote the use of e-government services
7. Reduce taxes levied towards ICT services and equipment

In discussing how to solve interconnection issues, regulators participating in the discussions maintained that there is need to strike a delicate balance between market openness and regulations that protect markets and investments. Haitham El-Nakhal, Senior Manager, Internet Policies and Technical Affairs, National Telecoms Regulatory Authority (NTRA) Egypt presented on the efforts by the Egyptian National Telecoms Regulatory Authority to ensure interconnectivity, encouraging candid discussions between the operators and regulators.

Read more

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Read more
Over the last three years, lack of local content has been an overriding theme at AfPIF, with participants decrying lack of e-commerce portals, payment platforms and general entertainment content that interests Africans locally and abroad.

Iroko Partners, Africa’s first content provider has overcome challenges in providing a platform for Nollywood enthusiasts to enjoy their favorite movies and music at minimal fees. Nollywood is Nigeria’s film industry, considered second after Bollywood in India, in terms of film production.

Michael Ugwu, CEO - IRoking Limited and co-founder of Iroko Partners gave his keynote address, showing how a company founded in December 2010 has raised $10million in Venture Capital Funding, providing 5000 movies and 40 000 tracks on its online platform with over 1.8million registered users; 80 percent of whom are outside Africa.

Get more information on some of the fascinating statistics from Nollywood and Iroko platforms from the presentation.

Watch the recorded webcast

Entertainment content is considered key because it appeals to a broader segment of the population, but universities and education institutions have also proven to be major reservoirs of content. Campus networks have formed a base for the biggest connectivity numbers in some countries.

A panel discussing the role of national and regional educational networks showed common threads of how infrastructure set up in the last few years had yielded improved content, but there were still challenges of interconnecting the national and regional networks for them to share information and best practices.

Read more

The last session of the day addressed traffic analysis and measurement labs in Africa and some of the uses that can benefit IXPs in attracting more peers to the exchange. While there are concerns and trust issues that need to be addressed, there was consensus that once peers agree to data analysis, it can greatly benefit the IXP.

Once the data is collected and analyzed, it can help the IXP in the following ways:

1. Stability: - identify bad traffic
2. Support: - help troubleshoot
3. Strategic introductions: - ensuring peers obtain maximum value from the Exchange
4. Visibility: assist bilateral peers
5. Security: detection of security threats
6. Marketing: using data to promote the IXP
7. Planning: capacity planning can help the peers

AfPIF 2013 – Casablanca closing remarks
by Dr Dawit Bekele

Dawit Bekele, the Regional Bureau Director for Africa at the Internet Society delivered the closing remarks, highlighting the annual growth in the number of countries participating and an increase in the number of sponsors.

In his speech, Bekele said AfPIF has grown in a number of ways since its inception:

Sponsors


In 2011, AfPIF 2 in Accra Ghana attracted six sponsors: Google, Afrinic, Seacom, Amsix, Netnod, National Information Technology Agency (NITA) and iSOC.

Subsequently, in 2012 AfPIF 3 in Johannesburg, South Africa recorded an increase of 133 percent sponsorship and also an increased number of participants.

The sponsors were:

De-cix, Google, Terraco, Arbor networks, Afrinic, DFA Open Acess Network, Netnod, dot Africa, Internet solutions, Hurricane Electric Internet Services, Akamai, Linx, Amsix and ISOC

This year AfPIF 4 in Casablanca, Morocco had a total of 144 participants from 41 countries. The forum attracted 18 sponsors with continued support from Google, Amsix, and Netnod. Other sponsors included: De-cix, Brocade, Afrinic, Seacom, Akamai, Linx, Main one, Internet solution, dot Africa, Liquid Telecom and France-IX.

Casablanca offered an ideal venue for the event. It is also home to Hassan II Mosque the largest religious monument in the world after Mecca.

The forum was endorsed by the Moroccan Ministry of Industry, Trade, and New Technologies.

Participating Countries

Forty one countries were represented including: Uganda, South Africa, Sudan, Kenya, Ethiopia, Mozambique, Malawi, Nigeria, Rwanda, Ghana, Morocco, Zambia, Senegal, France, Tunisia, Burundi, Guinea Conakry, Mali, Niger, Burkina Faso, Benin, Algeria, Namibia, Australia, Somalia, DRC, Chad, Sierra Leone, Egypt, Mauritania, US, Switzerland, Germany, Cameroon, Italy, Lesotho, England, Netherlands, Djibouti, Sweden, Germany and Angola.

Conclusion

Senegal will host AfPIF-2014 with the patronage of Autorite de Regulation des Telecommunications et des Postes (ARTP).
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