Project Title:	**IXP in Djibouti: keeping regional Internet traffic regionally through Djibouti**
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Brief Description:

This document focuses on presenting the significance of an IXP in Djibouti, in order to develop peering activities with and between the Middle East and East Africa networks. Peering actions through a well-built IXP and its related data-center activities will democratize Internet access …

The project aims to enable and enhance community-led development efforts to achieve the Millennium Development Goals (MDGs) by harnessing cutting-edge ICT technologies.

IXP in Djibouti:
keeping regional Internet traffic regionally through Djibouti.

Prepared for:
Djibouti

Table of Contents

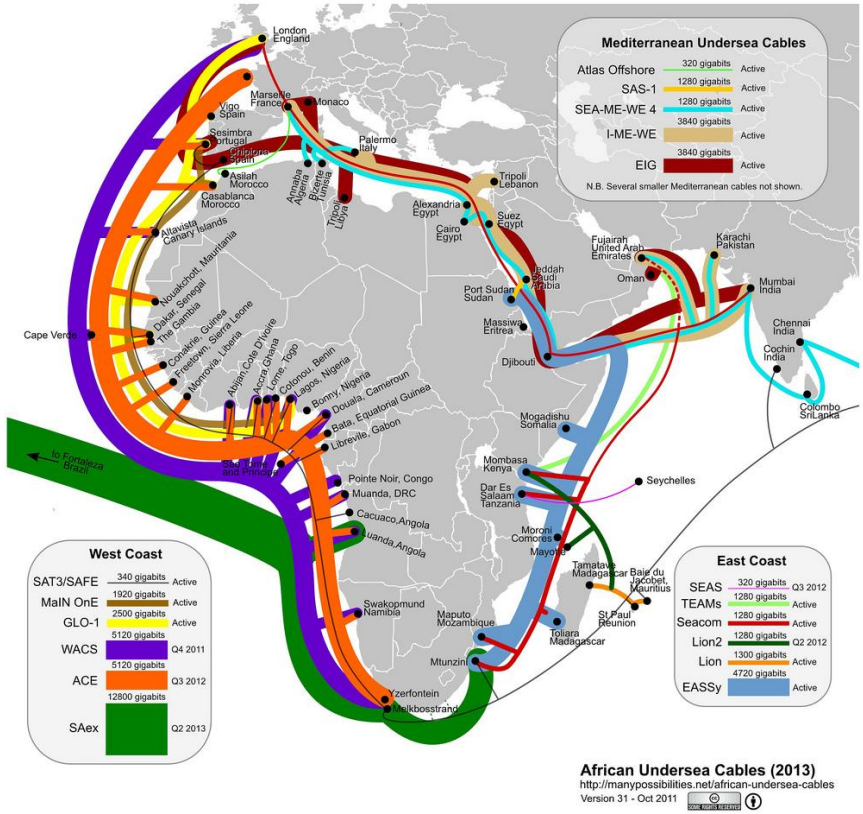
Action plan for regional IXP activities in DJIBOUTI

05-07 March 2012

IXP in Djibouti:
keeping regional Internet traffic regionally through Djibouti

Introduction:

Djibouti is located in a key position on the East Africa Coast, already connected by fiber with the neighboring countries, and is the landing point of major submarine cable systems like SMW3, Eassy, Seacom and EIG.
Djibouti is the perfect hub where naturally converge the IP needs of the African countries that face the Indian Ocean.



- **However, even if access to International bandwidth is facilitated in Djibouti , in comparison with many advanced countries, bandwidth in Africa is still expensive because :**
  - *Submarine capacity costs much more than **terrestrial** capacity*
  - ***Purchasing power of East African citizens** is not **as high** as the one in developed countries*
  - *Infrastructure for access network toward the end-user **is** limited and expensive (copper is 32 times expensive than optical fiber, but fiber connectivity **needs** expensive public works),*

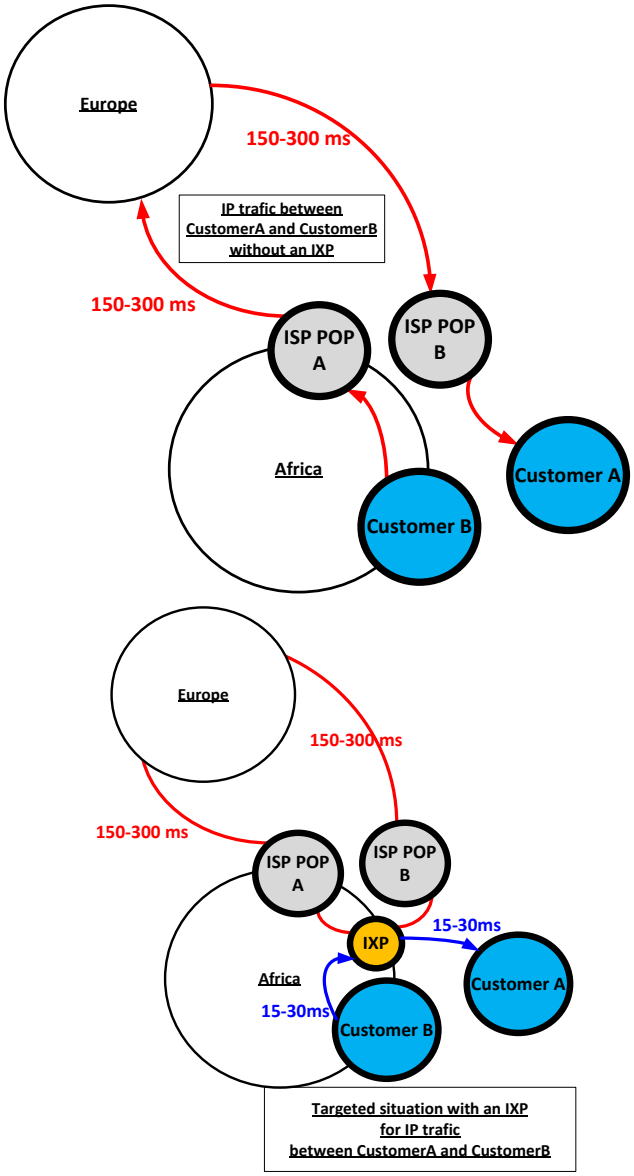
- **Consequently, Internet bandwidth for end-user is still expensive for everyone in East Africa.**

- **Tier1 and Tier2 operators still preserve the price of the bandwidth very high; do not peer regionally in the Middle East or East African region. They peer and keep the traffic in Europe and in the USA to bring in these regions.**

- It is usual to observe IP traffic between a Middle East and East African Skype users going through Europe …
  As a result bandwidth price is still high, it does not drop, IP transit volumes are still low and democratization of Internet access is hard to push. Therefore Internet is not a priority for many citizens; it just targets an elite class who can afford it.

- Regional or local traffic is sent overseas and comes back between POPs. In terms of QoS, the goal is to keep the traffic through its shortest path, with the minimum latency as much as possible.

  ➔ **It is well known that Internet philosophy aims to merge everyone, as in a global village with all social classes joined. Thus, it is paradoxical that Tier1 and Tier2 ISPs do not boost IXP development**



A) The IXP situation that Djibouti aims in the region.

1. Djibouti can be connected to Middle East and to Europe with minimum latencies. It is one of the best geographical middle position, in order to exchange the contents of the Middle East world with the contents of the East African world.

2. Djibouti has **30 years of experience in the submarine cables**, and actually partners with some major important IP actors such as **Level3** (1st ISP ranked in the world), **STC**, and **Telecom Italia Sparkle** in order to propose IP transit products.

3. **The question is the following: How Djibouti can place an IXP in this region, in order:**

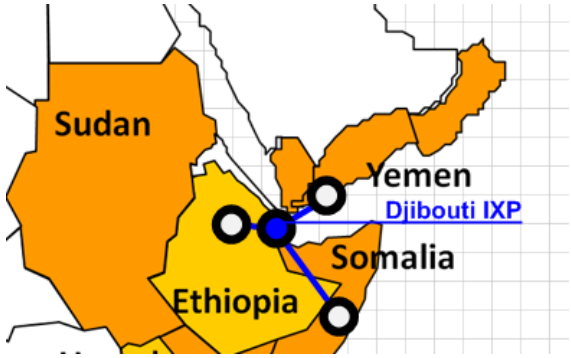
   a. **to connect the IP Arab World contents to the IP East African contents, and thus develop new cultural/social/business opportunities between these two words.**

   b. **to insure that this IXP and its peering activities will develop other IP businesses and democratize Internet**

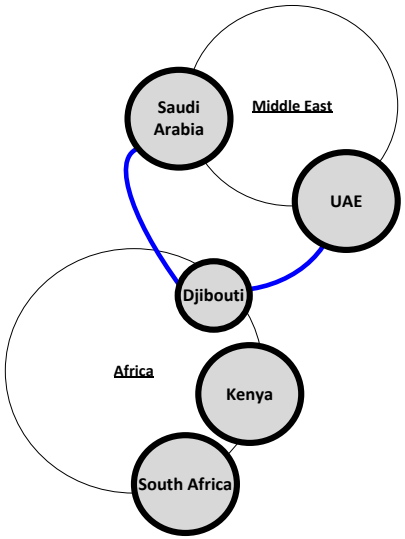
4. **As a result, thanks to its geographical situation, the next natural step for Djibouti is to play an important role in the peering activities for the region.**

   Simply we can say that Djibouti can be an **IXP link between the Middle East world and the East African world.**

a. Phase 1 of the IXP: Djibouti is connected with regional countries (IP transit relations already exist).

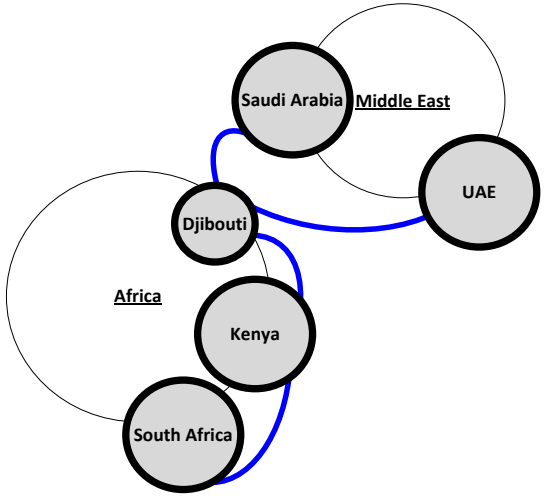


b. Phase 2 of the IXP, simultaneously with Phase1 : Djibouti is connected with Arab World IXPs



c. Phase 3 : Djibouti is connected other major East Africans IXPs

d. Phase 4 : Djibouti is one IXP hub between the Middle East and the East Africa



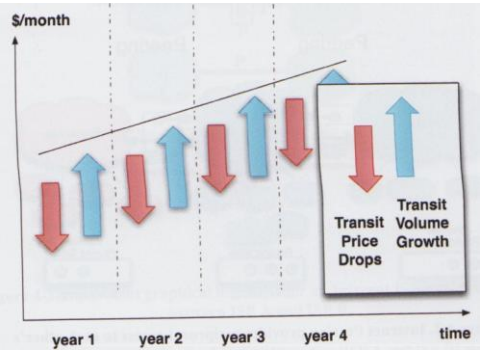
B) The peering business/model that Djibouti should plan.

1. Is the peering business for Djibouti essential, compared to the IP transit activities? In fact Peering business will improve the IP transit activity in the region, and also democratize the Internet. How?
   a. When **customers** can be **connected to an IXP** (with all related Data Center activities such as CDN, Mirroring, POP contents …), they **can save up to 20-30%** of the bandwidth.
   b. As a result they can have more customers, and so with **growing revenues**, they **still need to buy the 70-80%** remaining Internet bandwidth needs though IP transit way.
   c. If more volume of IP transit is sold, the price will decrease because price capacity on cable (terrestrial and submarine) will be lower via upgrades.

2. The unit cost of Internet bandwidth drops, but the volume increases. **The result is a monthly Internet Transit bill which continues to rise thanks to peering.** So even though the unit cost of transit drops, the monthly transit bill increases.

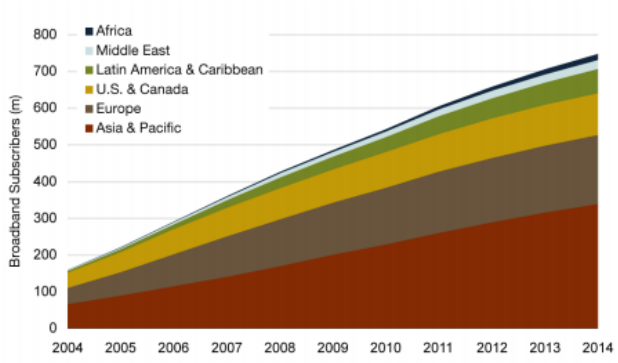
   ➔ Decreasing the absolute cost of Internet Transit is one of the principal drivers for pursuing an Internet Peering strategy.

   ➔ Thus the peering activity contributes to the Internet democratization.



3. Internet Peering is typically settlement-free, meaning that neither party pays the others for access to each other customers, reflective of the underlying notion that peering is a relationship of approximately equal value to each party.
   Since both parties benefit about the same from the relationship, there is no need to worry with the overhead of rneasurement and settlement.

FIGURE 22
Global Broadband Subscriber Growth, 2004–2014



Notes: Data as of year-end.

Source: TeleGeography © 2011 PriMetrica, Inc.

4. Now what peering principles should Djibouti think about its peering business model?
   a. **Traffic engineering discussions and data disclosure may be needed to justify the peering relationship.** Each ISP typically has a set of requirements for peering. During these discussions both sides explore the peering prerequisites such as peering at some number of geographically distributes locations, or peering at some public exchange points remotely …

   b. **In some cases the effect on the business is also examined.** Might this "peer" be a customer? How will peering will boost the network?

c. **Public and Private Peering?** The interconnections at the IXP take one of two forms: Private Peering or Public Peering.

d. Private Peering is peering across a dedicated layer 2 circuit between exactly two parties, typically using a fiber cross-connect or a VLAN between two parties at an IXP. There is typically a nominal cost to Private Peering (a few hundred dollars per month for a fiber cross-connect, for example), where circuits are typically more expensive (a few thousand dollars per Month for a 10G circuit, for example).

e. Public Peering is peering across a shared fabric such as an Ethernet switch. Public Peering is the dominant method of peering in the peering ecosystems we studied, although many support both Public and Private Peering. **Public peering allows aggregation benefits is a selection criterion for customers.**

C) How Djibouti should make the peering activity attractive economically, and thus allow Internet expansion.

1. Djibouti should think to interest the major IP actors in the Middle East and in East Africa about the policies models. Four key peering metrics describe the effectiveness of peering:
   - ***a.*** The Peering Break-Even Point answers the question**,** ***"How much traffic I have to peer for free, to save enough money to cover the cost of peering?"***
   - ***b.*** The Effective Peering Bandwidth answers the question, **"*What is the maximum amount of traffic I can realistically push through the peering infrastructure?"***
   - ***c.*** The Effective Peering Range answers the question, ***"Where is the peering sweet spot—the peering bandwidth range where peering is financially rational?"***
   - ***d.*** The Minimum Cost for Traffic Exchange answers the question, ***"What is the best possible unit cost for peering?"***

2. It is well known, that Internet contents is not as developed in East Africa, as in Europe or USA. What amount of peer bandwidth can we save?

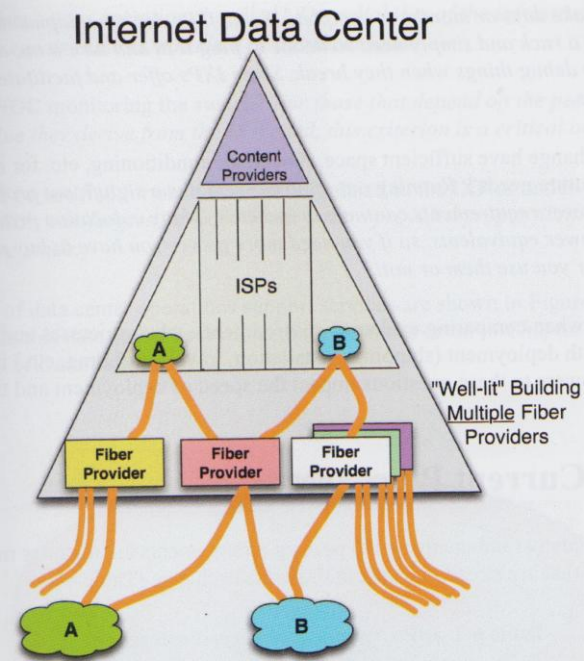
➔ **The response for growing the peering activity is to attract major Internet actors to put their contents in a data center.**

3. **Develop "Data center", "Media Center" and "Data warehouses" activities could boost the peering activities and attract major Internet actors such as: Google, Akamai, ISPs CDNs nodes and mirroring activities.**

4. We know that the market is in expansion because all these contents are used through 3g, wireless and landlines networks. Even media converges to IP …

5. Through natural IP expansion presence plan, all these major actors are always ready to expend their presence everywhere, since the East African market is still virgin.

6. **What Djibouti needs is :**
   a. **to aggregate a lot of IP traffic through Djibouti** (which is already in process thanks to our Tier1 partners presence such as Level3; Telecom Italia or STC)
   b. to build a Tier3 or Tier4 data center which responds to standards.



Conclusion:

- **To summarize :**
  - **IP transit is existent and will be boosted by peering activity.**
  - **How to grow Peering activity: attract major Internet actors: This is already the case, because major ISPs (with CDN node) are present in the region, and more parties will come soon.**
  - **As a result, if the IP routes providers are here, the IP contents providers will follow to fill these routes….**
- **All commercial and market elements are at this juncture to realize an IXP in Djibouti.**

➔ **Djibouti is a part of the Arab league; its main target is to be a major IP tie between the Middle East and the East Africa continent, through this IXP.**