![BlasCom IT — IT & TELECOM STRATEGY]

The primordial interest of a GIX* or IXP* within each African country

To improve effectively the INTERNET use,

regarding the African population, in the interest of breaking

the established model, where south countries are partially financing

Telecommunication networks of north countries

* GIX : Global Internet eXchange
IXP : Internet Exchange Point

Summary

1. **Internet Traffic Evolution and risks linked to its centralization**

2. **Digital development advantages of African territories to develop a decentralization for the Internet relocation within the African continent**

3. **Some technical and regulatory data for an IXP implementation**

4. **Budget, Funding Project, economic and environmental impacts**

5. **Business Plan, Legal Structure, Local Economic Players**

6. **The current situation in Africa**

7. **All in images …… (Fr - En)**

8. **Contact**

BlasCom IT

1. Internet Traffic Evolution and risks linked to its centralization

Internet is called : "The network of networks"

These networks are those of Internet Service Providers (ISP), of web host providers, of large IP networks (public interest Networks, larges companie's networks,...) or, of large Telecom operators which already have an IP activity (Orange, BT, etc...) These networks are identified by a number, named Autonomous System (AS).

But when we send informations, so IP packets, from a machine to an other machine located on an other AS, competitor and locally hosted, **How it works ?**

These 2 AS, not linked directly and locally, the traffic is routing by operators more important **(Transit provider)** which exchange points between themselves, BUT **these exchange points are always located outside of Africa**, generally in Europe or United States.

The amazing result is that south networks, are financing north networks.

Global Internet traffic is globally routing by exchange points. Therefore, we understand interest of a Internet eXchange Point (**IXP**) LOCALY, witch will reduce the number of intermediaries to carry information from a source to a destination, where local part of traffic is very important, as well as with the telephony market.
Too often in Africa, when you want to visit an African website, or exchange by email, **the population unknowingly use roads through European third networks**.
Meanwhile, local initiatives would be an **important economic or financial interest.**
Local **"IXP or GIX"** implementation allows to **local traffic to be exchanged localy,** and thus with **Peering,** without any routing in Europe. **This improves, inter alia, response times** (bandwidth and latency), and to improve **Internet speed**.
That facilitate some uses as for example, IP videoconferencing, and will avoid all datacenters and website to be, most of the time, to be located in Europe.
In this way, this allows to contribute to the **development of various digital activities and jobs**, linked to Internet, in Africa.
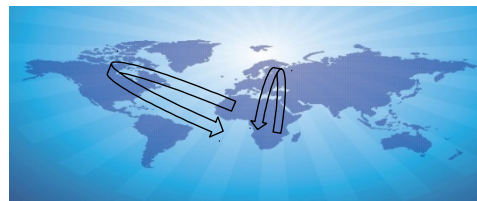
BlasCom IT

Africa is therefore subject to agreements transit, where large worldwide operators sell their Internet access to smaller African operators, reaching the last mile.
However, agreements transit whose costs are proportional to the distance between the 2 interconnection points, shows different problems : low bandwidth links, high latency, and the local traffic is systematically routing through NO-AFRICAN links.

Consequences are severe at **local economy level** :

·   Agreements transit **costs** are directly **charged to customers.**

·   That is why, we are witnessing a **kind of capital flight** from Africa to Europe, because economic players host theirs applications and Internet services **outside** of the African continent.

·   The **local added value is low** because a few IT services are possible to be used, and firstly :
     Email services.

<div align="center">

Internet exchange Points: "Unity is strength" !
This creates value creation and new growth expectations and development opportunities

</div>

Centralize Internet access on a national or local IXP, provide the opportunity to negotiate peering arrangements, which allow to improve the traffic exchange quality, and to develop new services locally, as for example : websites or applications hosting, the opportunity to pay online, mutualized services as E-Government, E-Learning, E_Health,... or even, a real datacenter creation.

This has been exacerbated by the emergence of submarine optical fibers, which allow to link the african continent to the worldwide broadband access.

The economic challenge is therefore huge. There is only twenty major Internet eXchange Points, against several hundreds in Europe or United States.
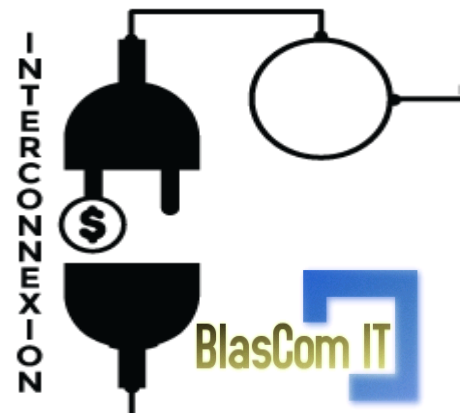
2. **Digital development advantages of African territories to develop a decentralization for the Internet relocation within the African continent**

2/2

The biggest African challenge still the progressive modernization of the local access network to users, but with the advent of 4G technology, access for rural populations will be easier **and, the mode of interconnection will be the main problem to be solved**, in order to **reduce costs and rationalize the traffic.**

The solution : At African and national level, to relocate the Internet traffic !

LES BARRIERES A LA PENETRATION DE L'INTERNET HAUT DEBIT EN AFRIQUE

1 **Connectivité** largeur de bande limitée et chère

2 **Réseaux d'accès** couverture restreinte des réseaux

3 **Faibles revenus** les clients Internet sont principalement des utilisateurs à revenus élevés et les entreprises

4 **Coût des terminaux**

5 **Energie**

6 **Contenus locaux**

7 **Analpha-bétisme**

8 **Les offres commer-ciales**

...

• *« IXP Points are the cornerstone of all Internet economy" :*
Its ensure interconnection to the different Internet players, and allows to different ISP (Internet Service Provider) to connect with each other, thus in turn creating a national centralized transportation hub.
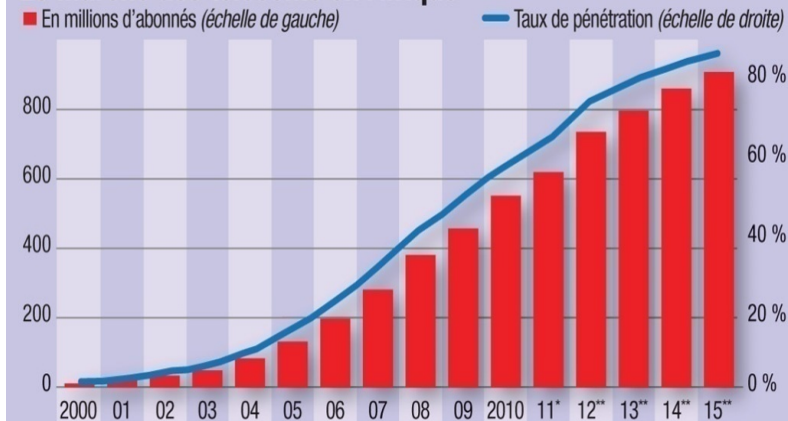
That is not a traffic routing which emphasizes large distances :

" Local traffic must stay local "

* « If the Internet, quite correctly, is viewed as the network of networks, by Telecom private operators, it is duly viewed as a consistency and interconnection tool, by regional development planners. »

* Source ; IUT (International Union Telecom – United Nations)

Le marché des télécoms en Afrique
■ En millions d'abonnés *(échelle de gauche)* — Taux de pénétration *(échelle de droite)*

800
600
400
200
0

80 %
60 %
40 %
20 %
0 %

2000 01 02 03 04 05 06 07 08 09 2010 11* 12** 13** 14** 15**

* Depuis le début de l'année, ** Prévisions - Source : GSMA

3. Some technical and regulatory data for an IXP implementation

A IXP is globally composed of :

- - a machine room : 5m*5m minimum, secure or securable, not liable to flooding, 24/7 access,
- - a computer cabinet hosting several Gigabit Ethernet network switches, manageable with Vlan where each
-    ISP could connect,
- - an inverter,
  - a small operational technician team, to ensure connections,
    and modifications on IXP set up,
  - a well sized air-conditioning system.

The IXP technical set up is relatively simple.
At the center, there are switches end Ethernet routers,
piloting the ISP traffic to another ISP.

These equipment can be doubled-up, to ensure **redundancy**
requirements.

All possible speeds on Ethernet port can be found on a IXP,
from 10 Megabits/second in developing countries,
with Ethernet port of 10 Gigabits/second, in some locations with
high concentration of people.

A stable peering is working well through **BGP protocol.**
An **interconnection to other African IXP can be a judicious choice.**

Telecom regulation authorities and state power are free to organize its own rules
and operational arrangements.

Advantages at national level will be, among other things, a decrease in currency needs.
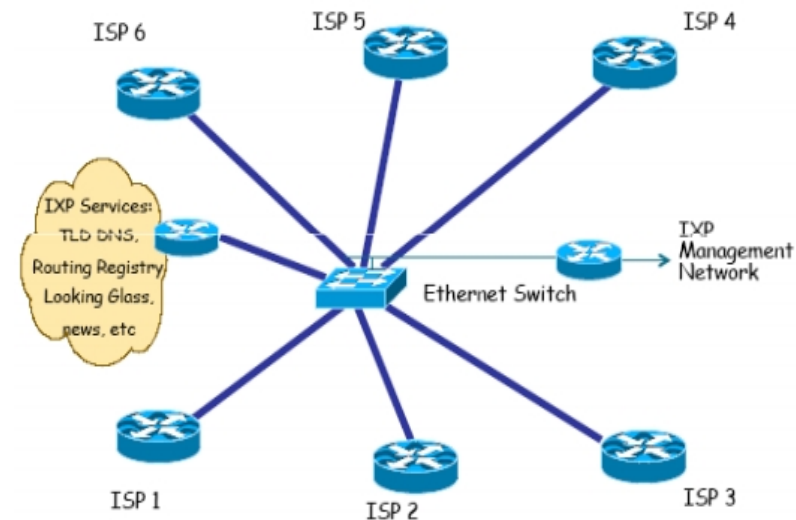
4. Budget, Funding Project, economic and environmental impacts

Aside from the strategic approach, linked to the implementation of a **dynamic and virtuous Internet ecosystem, a IXP allows a cost optimization :**
Traffic going through the IXP is not billed, while flows to the upload traffic ISP provider is billed.

A ITU study shows the figures below in Botswana :

- Saving of **$US 51 480 per year for a small ISP (512 Kb);**
- Saving of **$US 106 272/year for a medium ISP (1 Mb);**
- Saving of **$US 377 208/year for a high rate ISP (8 Mb);**

For all ISP in Botswana, saving of **$US 822 240/year, thanks to IXP (~400.000.000 FCFA), allow to considerably reduce cost internet to the population.**

Global cost of IXP :
implementation + necessary associated services (Email + Datacenter)
Around 1M$

Tableau 1 – Comparaison de coûts de la largeur de bande au niveau local et au niveau international

Largeur de bande	Niveau international	Niveau local
64 K	1 687 USD	190 USD
128 K	2 386 USD	274 USD
256 K	3 375 USD	378 USD
512 K	4 773 USD	535 USD
1 MB	6 750 USD	757 USD

Tableau 2 – Tarifs comparatifs pour des distances différentes

Niveau local (une ville)	60 USD par mois pour 64 kbit/s
Niveau national (grande distance)	300 USD par mois pour 64 kbit/s
Niveau international (distance équivalente)	1 000 USD par mois pour 64 kbit/s

This acquisition cost can be quickly amortized via different economic models, which have to be analyzed.
(annual cost of interconnection to the IXP for all ISP, Tax on the flow volume billed between the different ISPs, etc.)
and/or could be financed, either by international funders (World bank, African bank of development, Islamic bank of development, AFD, United Nations, etc..), or by private funds coming from raw materials companies.

A third financial solution could come from revenues offered by new local digital services as :
- Videoconferencing - Local MP3/MP4 broadcast – Telemedecine - Electronic trade
- Emails and online storage - E-Learning - E-Government - E-Payment – etc.

Important Environmental Impacts : The local IP trafic which will not be sent outside of the country, will significantly reduce CO_2 emissions (in relation to the amount of energy required by routers equipments)

Green IT

BlasCom IT

5. Business Plan, Legal Structure, Local Economic Players

FINANCIAL EQUILIBRIUM and POSSIBLE FINANCING SCHEMES

In order to reach the overall balance of an IXP project, it is necessary to do a financial analysis aiming to :
On the one hand, to identify the overall incoming cash flows and outgoing (Capex / Opex) of the project during a period of more than 10 years, and on the other hand, to determine the net present value at the beginning of the project, through a refresh rate, chosen by the project funder.

- Investment costs (CAPEX) are IXP implementations cost (around 1M€);
- Exploitation costs (OPEX) including maintenance and IXP routine operations (around 100K€/year)
  including expenses of major repairs and replacement to prevent the IXP obsolescence, and to maintain
  in an operational condition.

LEGAL STRUCTURE

Various legal form are possible :

⇨ **Economic Interest Group (EIG)**   ⇨ **Association**   ⇨   **Private company**   ⇨   **Public Company**
⇨ **EPIC**   ⇨   **Mixed company**

LOCAL ECONOMIC PLAYERS

- Regulation authority or any related government authority
- Telecommunications operators (mobile, land-line, satellite)
- ISPs
- Funders (Large Companies, International Funders,...)
- A consulting firm, neutral and objective (Project Management, coordination, Audit Reporting,
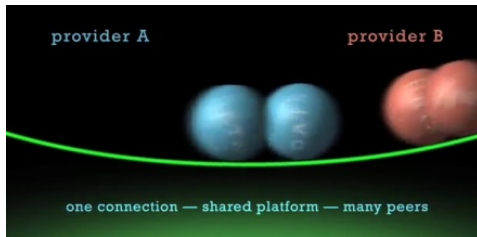 **commitment to results, expertise, Communication,...)**
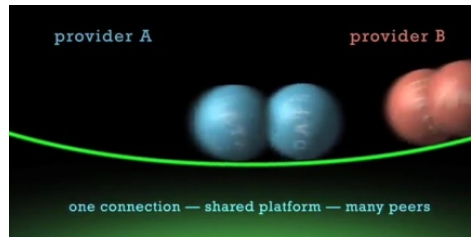
BlasCom IT

What about your country ?
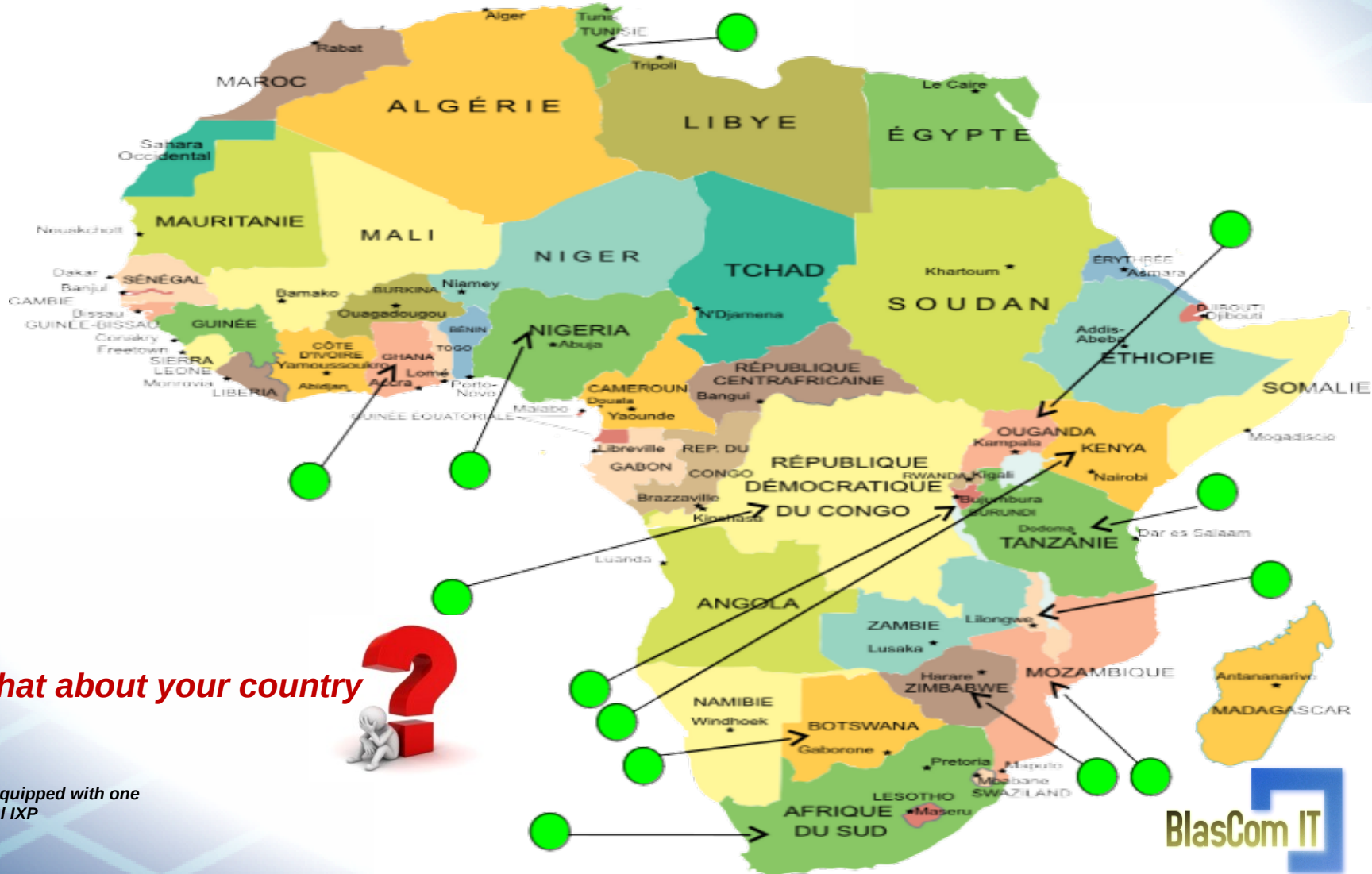
Country equipped with one or several IXP

BlasCom IT
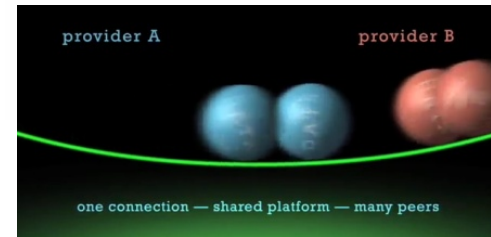
7. All in images …… (Fr - En)

English version

English version with French subtitles

Version Anglaise avec sous-titrage en Français

Version Française

Nota : If Link problem, Copy/Paste of :

http://www.blascom.com/slides_blascom/GIX-IXP_C.mp4

Nota : Si problème de lien, Copier/Coller de :

http://www.blascom.com/slides_blascom/GIX-IXP-ST_C.mp4

Nota : Si problème de lien, Copier/Coller de :

http://www.blascom.com/slides_blascom/GIX-IXP_F_C.mp4

BlasCom IT

27 rue du Président Édouard Herriot
69002 LYON – FRANCE

Tel Std : +33(0)4 27 50 10 55 - **Fax** : +33(0)4 28 29 51 41

Web : www.BlasCom.com

Email : blascom@blascom.com

BlasCom IT is a company participating in the 'Global compact Local Network ' charter of the United Nations,
to make a commitment in favor of practices, among others, of development and distribution of environment-friendly technologies.

BlasCom IT has also been incorporated into the DCICC: Dynamic Coalition on Internet and Climate Change,
depending on the International Telecommunication Union (ITU) and counting 51 companies and/or authorities at worldwide level.

www.BlasCom.com