

**ITU Regional Economic Dialogue for Africa RED20-AFR:  
Meaningful and Affordable Digital Connectivity for Africa**

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**NEXT GENERATION INTERCONNECTION/ PEERING  
ARRANGEMENTS IN THE DIGITAL MARKET, RELATED  
BUSINESS MODELS AND PRICING FOR NEW SERVICES (IoT,  
OTT and Data)**

**Hilda.Mutseyekwa@potraz.gov.zw**

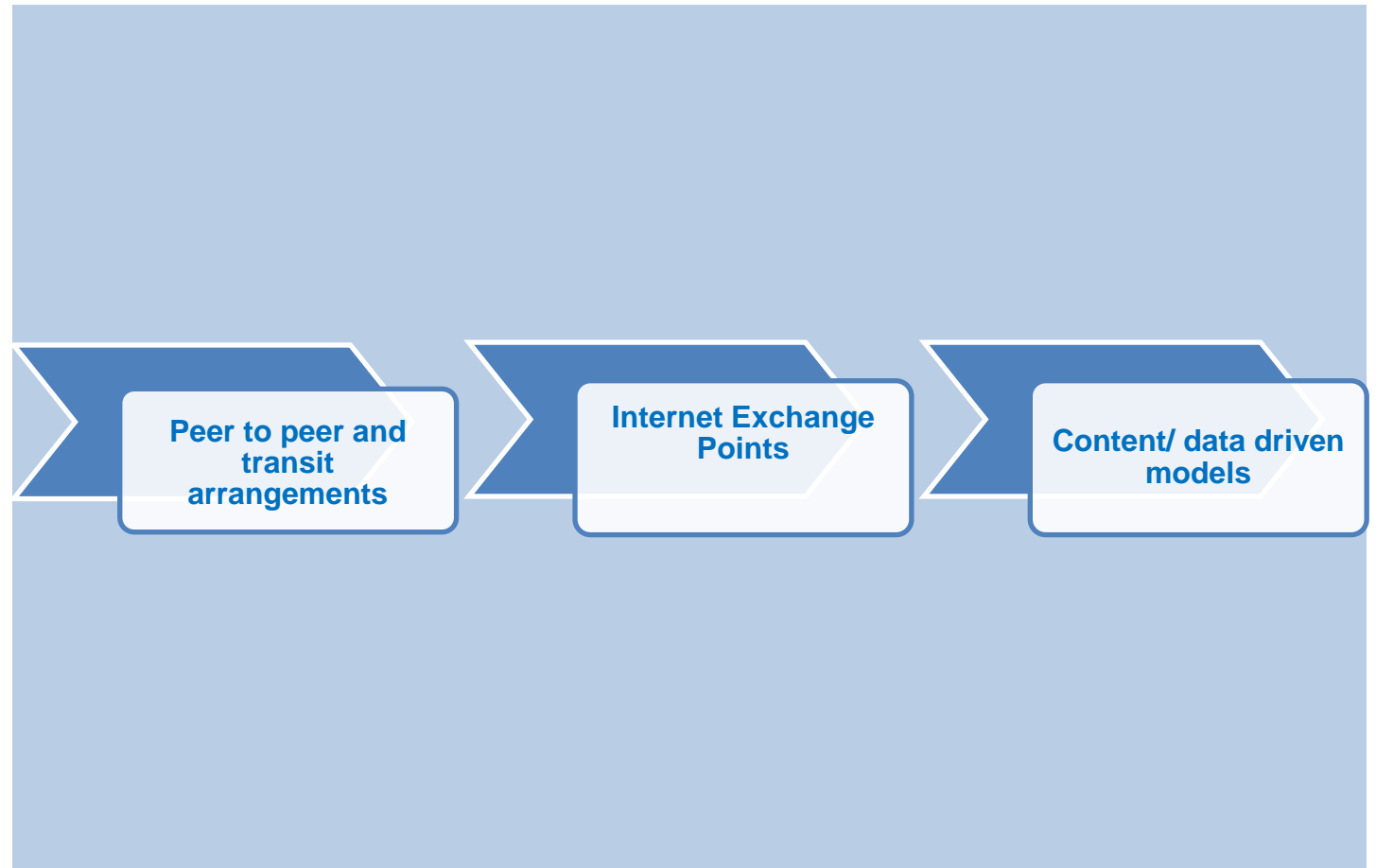


# OUTLINE

- Evolution of IP Interconnection
- NGN Interconnection Ecosystem
- Status of IP Interconnection in Africa vs other regions
- Emerging Business Models
  - Peering Arrangements
  - Pricing strategies
- Regulatory Issues
- Way Forward for Africa

## EVOLUTION OF IP INTERCONNECTION

- Decentralised; trend towards secondary peering via IXPs at national and regional levels.
- Commoditisation of IP services/prices
- Proliferation of CDNs
- Direct interconnection between content /app providers and



# THE IP INTERCONNECTION ECOSYSTEM

## Content/Application Providers

- **Examples:** Netflix, Facebook, Google, Amazon, Twitter

## IP Transit Providers

- Interconnected to several regional networks, undersea cables, terrestrial cables and satellite links
- **Examples:** WIOCC, Liquid Telecom, SEACOM,, MainOne

## Internet Exchanges

- Usually located in major cities.
- **Examples:** JINX, HIX,

## Content Delivery Networks.

- Store none real time local content for local consumption by end-users.
- **Examples:** Akamai, Level 3; Limelight; Edgecast, CDN77

## Terminating ISPs

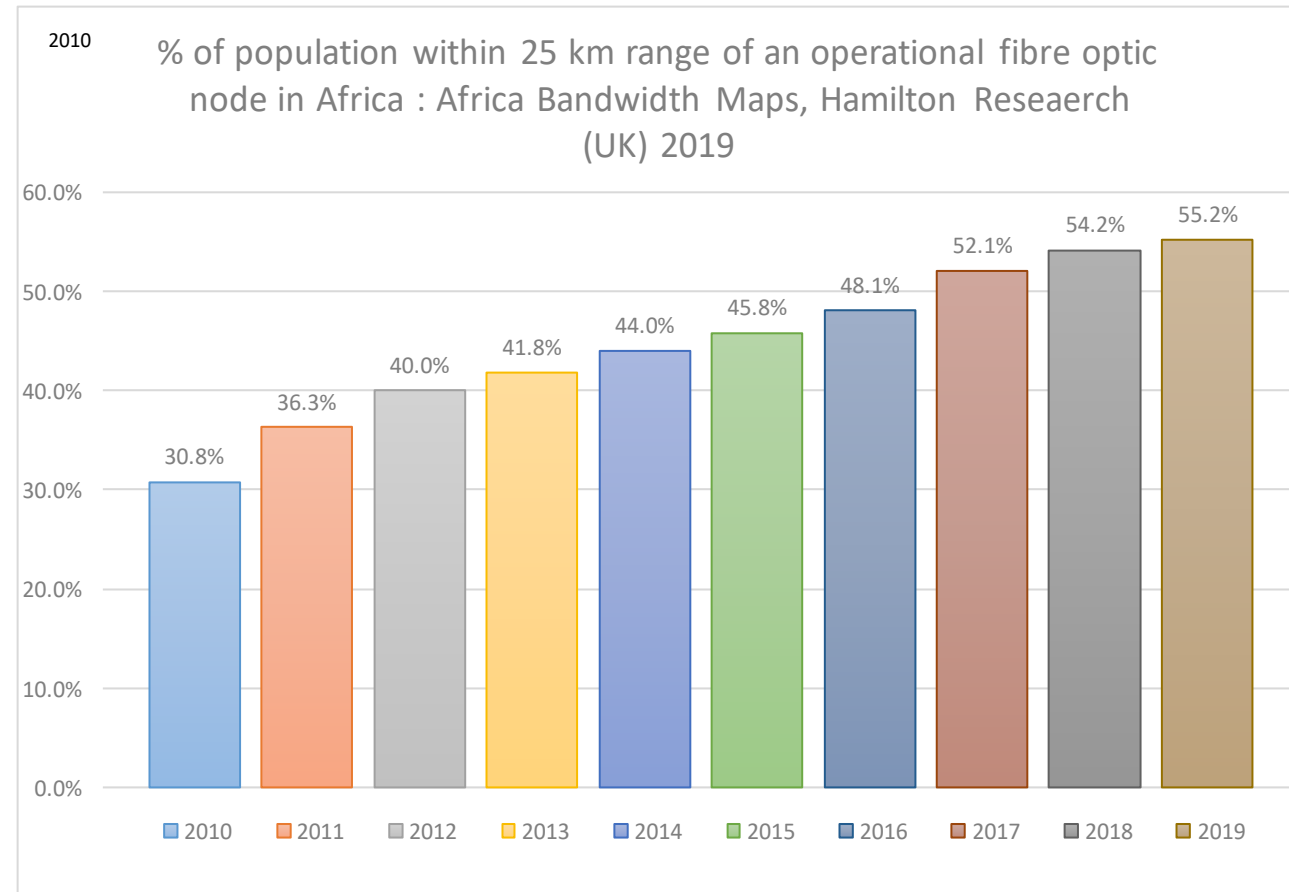
- Act as both originating and terminating ISP
- **Examples:** Vodacoms, Econet, Safaricom, Orange, MTNs

## STATUS OF IP INFRASTRUCTURE IN AFRICA

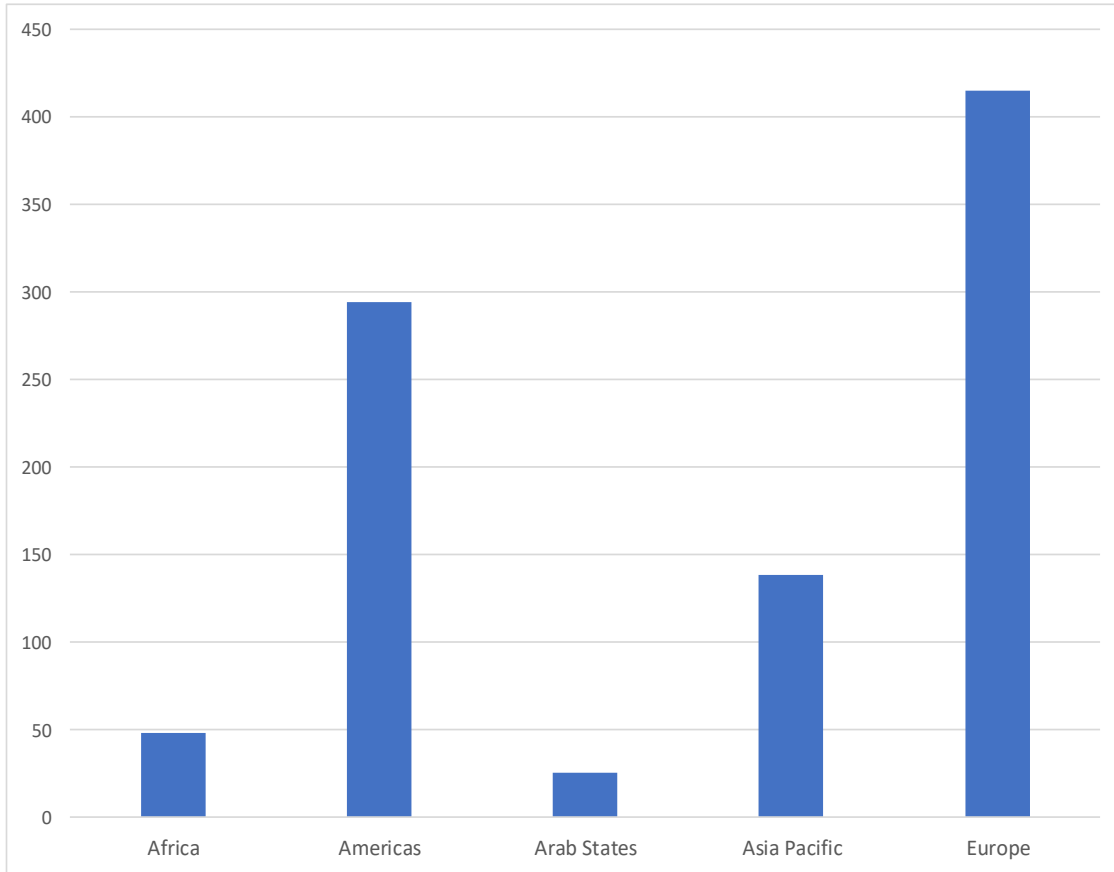
**WE ARE GETTING THERE, SLOWLY BUT SURELY:**

- 26 submarine cables serving Africa as at December 2018.
- 1,000,000 km of operational terrestrial fibre optic cables (Hamilton Research, (2019)
- 48 Active IXPs in 34 countries (2020) .( the African Internet Exchange Association)
- 69 colocation data centres in 13 countries.

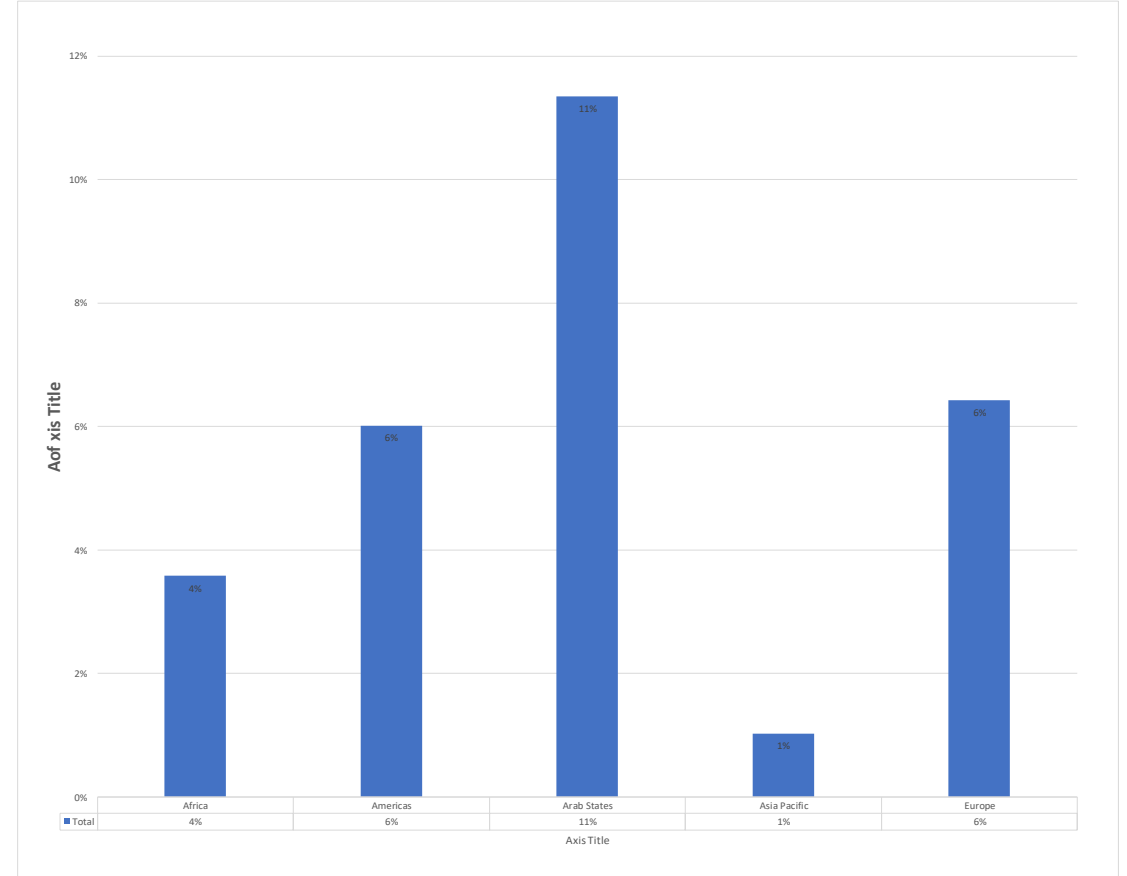
### • Growth of Terrestrial Fibre optic in Africa



## Number of IXPs by Region



## Number of IXPs as a Percentage of total population by region



## EVOLUTION OF IP SERVICES

- **Bourgeoning data hungry services, i.e.: OTTs, IoT, data applications**
- **Reducing cost of service provision due to economies of scope and scale.**
- **Increased flexibility in service offerings (Bundled services offerings).**
- **Intensified service based competition across different types of service providers.**
- **Emergence of two sided markets where consumers of content are also providers of content.**



# PEERING MODELS

## Content Peering

Usually between ISPs and CAPs where traffic is balanced

## Paid Peering

Applies on content peering where traffic is unbalanced

## Multihoming

CDNs or ISPs interconnect with several competing ISPs and choose opportunistically and often in real time to route traffic

## Partial Transit

Where an ISP resells access to Interconnection routes secured via a peering relationship

## Public Peering

Where several ISPs interconnect with each other (IXPS)



# EMERGING BUSINESS MODELS AND PRICING STRATEGIES

- **At the Wholesale level: the tendency is towards Bill and Keep:** No payments and no terms and conditions between partners- usually applied where traffic is balanced
- **Where traffic is unbalanced, the trend is towards capacity based charging as follows:**
  - **Capacity based charging with pre-booking:** charges for wholesale access are premised on ordered network capacity, usually on the basis of number of dedicated links. The number of interconnection links or ports are used as the charging unit.
  - **Capacity based charging without pre-booking:** charges are based on the actual used network capacities in a defined period, for example, peak time. The charging unit is the transmission capacity required in the peak time which can be Kbit/s; Mbit/s or Gbit/s
  - **Retail Minus:** Usage based model at retail minus 15%. This works well where there is effective competition

# EMERGING BUSINESS MODELS AND PRICING STRATEGIES

- **At the end user service provision level:**
- **Utility/ Connectivity Providers:** operators opting to model themselves as utility providers only, focusing on providing high speed and quality connectivity services and cost efficiency to maximise on economies of scale. The rise of MVNOs, who specialise only in end-user services using different business models:
- **Business to Business to Consumer (B-B-C)** by entering into partnerships with other businesses to support transactions with a wide range of other industries. IoT based use cases such as intelligent health, smart car, smart home and municipal smart parking, etc.
  - **Direct Carrier billing:** Operators are exploiting their customer and billing relationships to provide payment platforms for digital services and content (Content Access Providers, app stores)
  - **Data Management services:** operators are exploiting their vast knowledge and expertise on transactional data to provide data management services and solutions that facilitate the functioning of the Internet of Things (IoT).
- **OTT-MNO Partnerships**
  - **Limited Free Access/Zero rating:** OTT providers and network providers going into arrangements where subscribers of a network service provider can enjoy free access to a limited number of websites and services. This helps in attracting users, particularly in countries where connectivity is deemed unaffordable
  - **Value added Service Bundling:** Network Service Providers are entering into partnerships with OTT providers under which they include OTT music and video streaming services, amongst others, in their service bundles.

# Charging /Pricing Models For IoT, OTT and data services

## At the retail level:

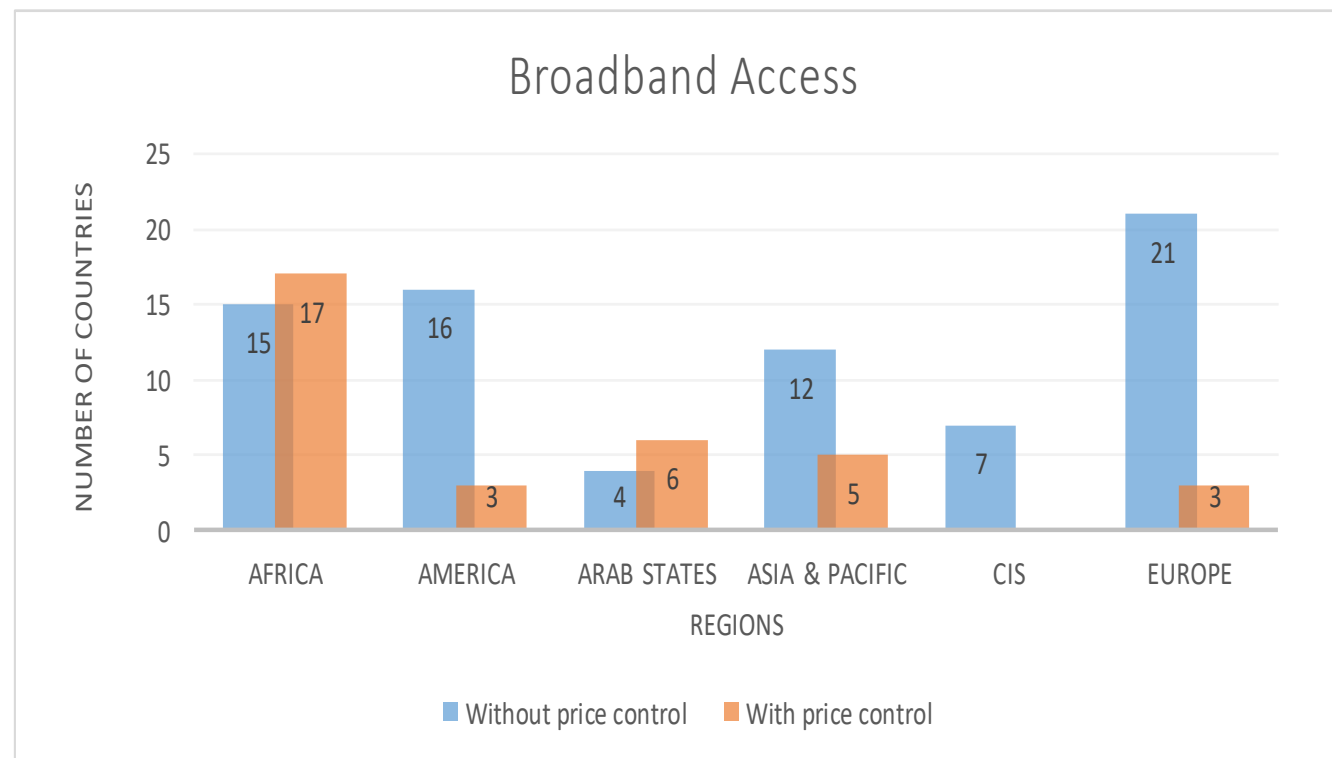
- From **average cost transaction based pricing**, to **Capacity based flat data packages charging**, to **tiered mobile data packages**, where each service in the bundle is priced differently as and when its used. The following charging methods may be used where applicable:
  - **Volume/Usage based** : charging is based on data volume exchanged in terms of megabytes or Gigabytes.
  - **QoS based charging** : Charging is based on time of use, content or location.
  - **Event based charging**: Users pays per event e.g. soccer matches, live shows etc.
  - **Eyeball monetization**: zero-rated data packages where usage is billed to the sponsoring company or advertiser.
  - **Direct end-user subscriptions**: pay for use for content or other services such as video services or information sites.

**N.B. Alliance for Affordable Internet Research revealed that on average in Africa, 1GB of data accounted for 8%of average income compared to 2.7% and 1.5% in America and Asia respectively.**

# TO REGULATE OR NOT?

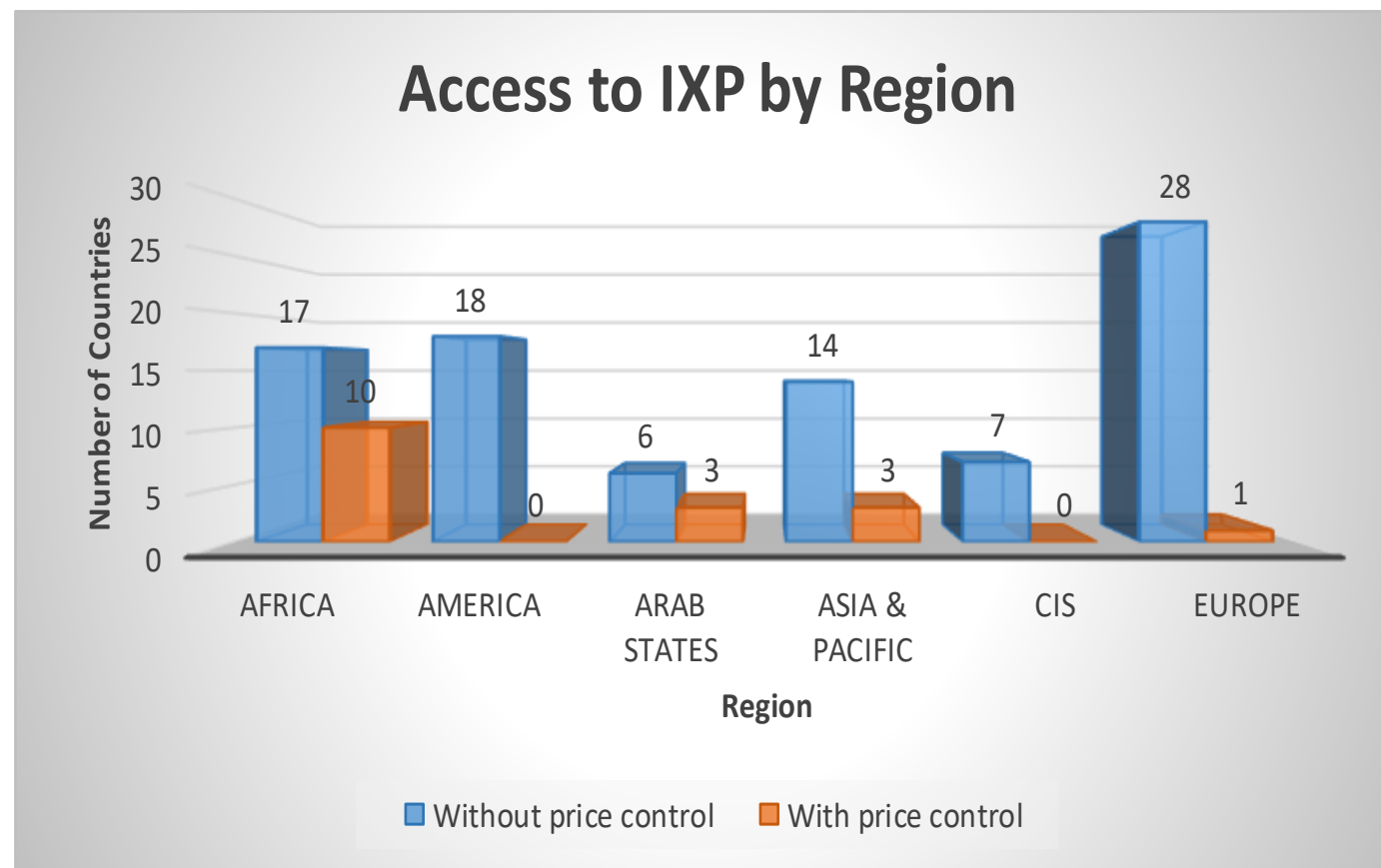
- The general tendency across the world is not to regulate IP Interconnection
- According to the ITU ICT Eye database (2019), Africa remains with a significant number of countries that control broadband access.
- This could be largely attributable to the fact that mobile technology is the most widely used and interconnection pricing is still largely TDM based as most 4G penetration is still low of the fixed networks are yet to complete their migration to NGNs.
- Price regulation in an NGN environment can be tricky in view of service complexity and the vast array of emerging business models
- Service costing requires detailed demand statistics, which may be difficult to estimate

## Price Regulation of Broadband Access



# TO REGULATE PRICES OR NOT?

- Africa has the highest number of countries that control access to Internet Exchange Points. (Source: ITU ICT Eye database)
- Ideally, ISPs peering through an IXP should own and operate their own connectivity infrastructure.
- In cases where regulation does not allow them to build infrastructure they should be obliged to lease capacity.
- Regulation of peering **would** mean setting clear T&Cs as to who peers with who, under what circumstances and at what terms.
- The issue is how do you curtail abuse of dominance?
- Can existing operators survive the impending competition of OTT providers who are venturing into connectivity infrastructure.



# PRIORITIES FOR AFRICA

## GOVERNMENTS

- Facilitate both public and private sector investment for increased competition.
- Facilitate cross border deployment of infrastructure, including carrier neutral data centre facilities.
- Encourage local and international content hosting and local applications development in order to attract CDNs
- Do not over tax the sector.
- Speed up transposition of regional policies and regulations into national ones.
- Foster trust and collaboration amongst stakeholders

## NRAs

- Adapt and adopt open access interconnection regimes
- Forbearance, Light touch regulation where there is no competition
- Promote interconnection between all local Internet Access Providers and Internet Service Providers.
- Operationalise RIXPs.
- Encourage investment in carrier neutral Data Centres
- Mandate separation of wholesale and retail businesses.
- Infrastructure sharing- both passive and active (spectrum sharing)
- Collaborative regulation

## OPERATORS

- Invest in carrier neutral Data Centers
- Capacity building
- Aggregate as much traffic as possible at Internet Exchange Points
- Invest in last mile connectivity
- Invest in network based content delivery platforms (deep caching)
- Explore new revenue streams

**THANK YOU**