

NGN Regulation and Best Practices

**Regional Economical and Financial Forum
for Africa
Brazzaville, République du Congo
February 2014**

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NGN Regulation and Best Practices

- **Challenges on regulation for NGN**
- **Example cases in Africa**
- **Trends and best practices worldwide**

Challenges on regulation for NGN

Main issues

- How to follow quick **evolution of technology** and services ?
- How to **regulate multiservices** including simultaneously voice/data/video ?
- How to define **new reference networks**, architectures and interfaces to new players?
- How to define and quantify **dimensioning and costing units** for interconnection ?
- How to ensure consistency for regulation principles when different **network types coexist** in the migration phases ?
- How to consider **different network players** in the value chain at physical, equipment and services layers ?

Challenges on regulation for NGN

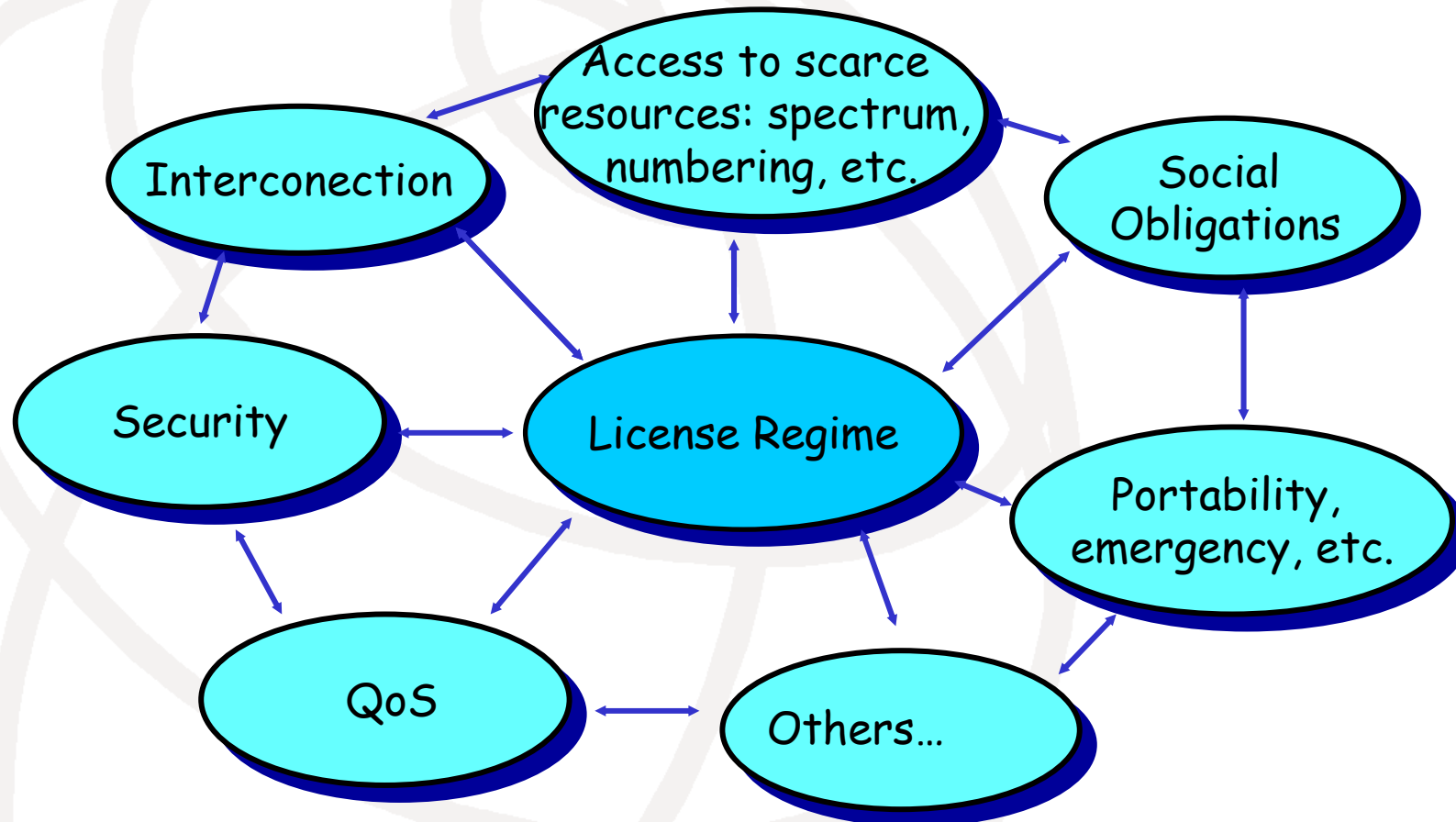
Positioning needed on:

- National regulation versus Regional and versus OTT?
- Resource sharing domains and levels
- Network, Technology and service neutrality
- Cyber-security level and extension to other telecom dependent sectors
- Consumer protection and Quality of Service levels ?
- Accessibility for Multilanguage groups and people with disabilities
- Lawful Interception versus Privacy and data Protection regulation?

OTT: Over The Top

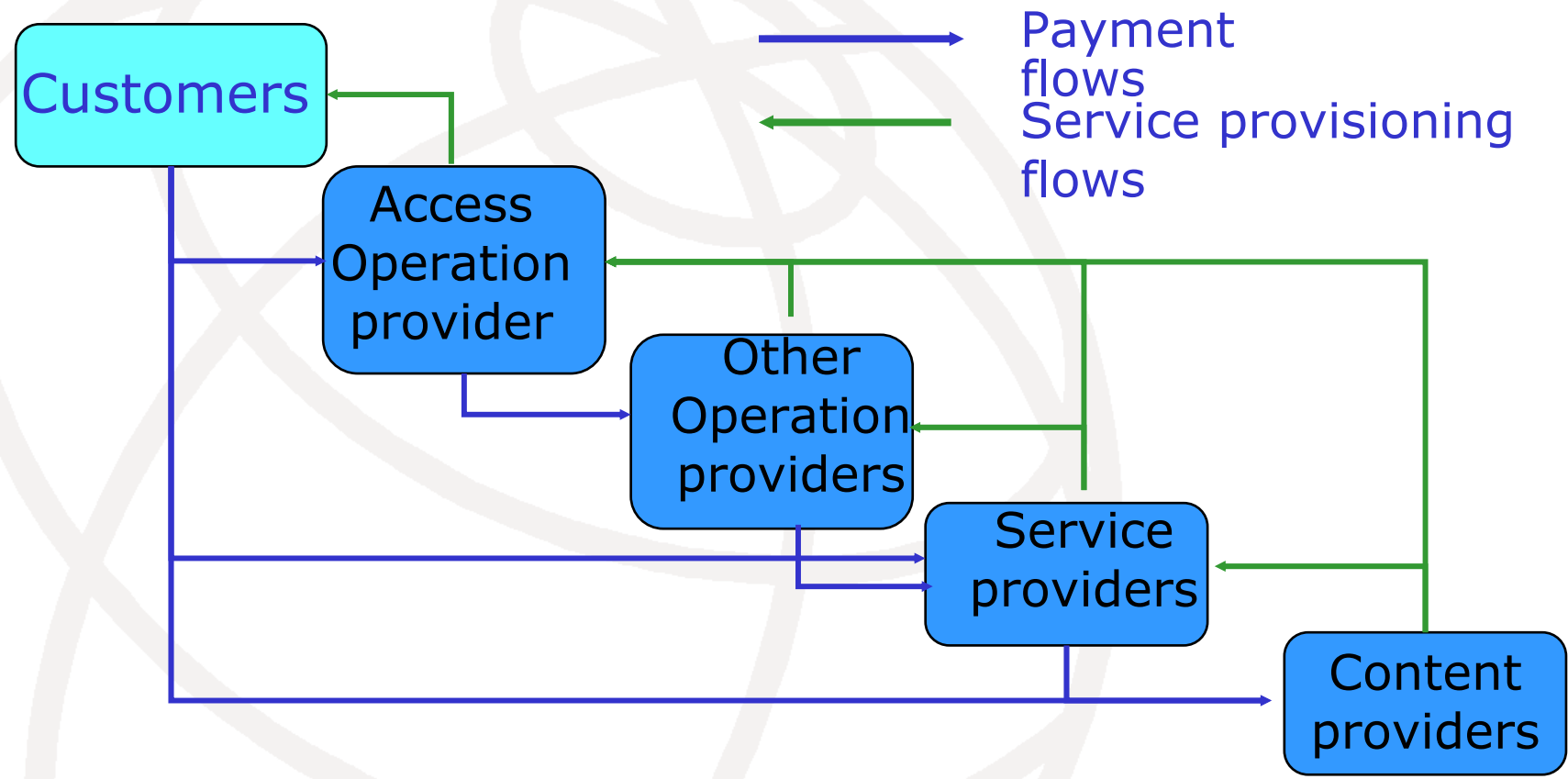
Challenges on regulation for NGN

Multiple areas for regulation



Challenges on regulation for NGN

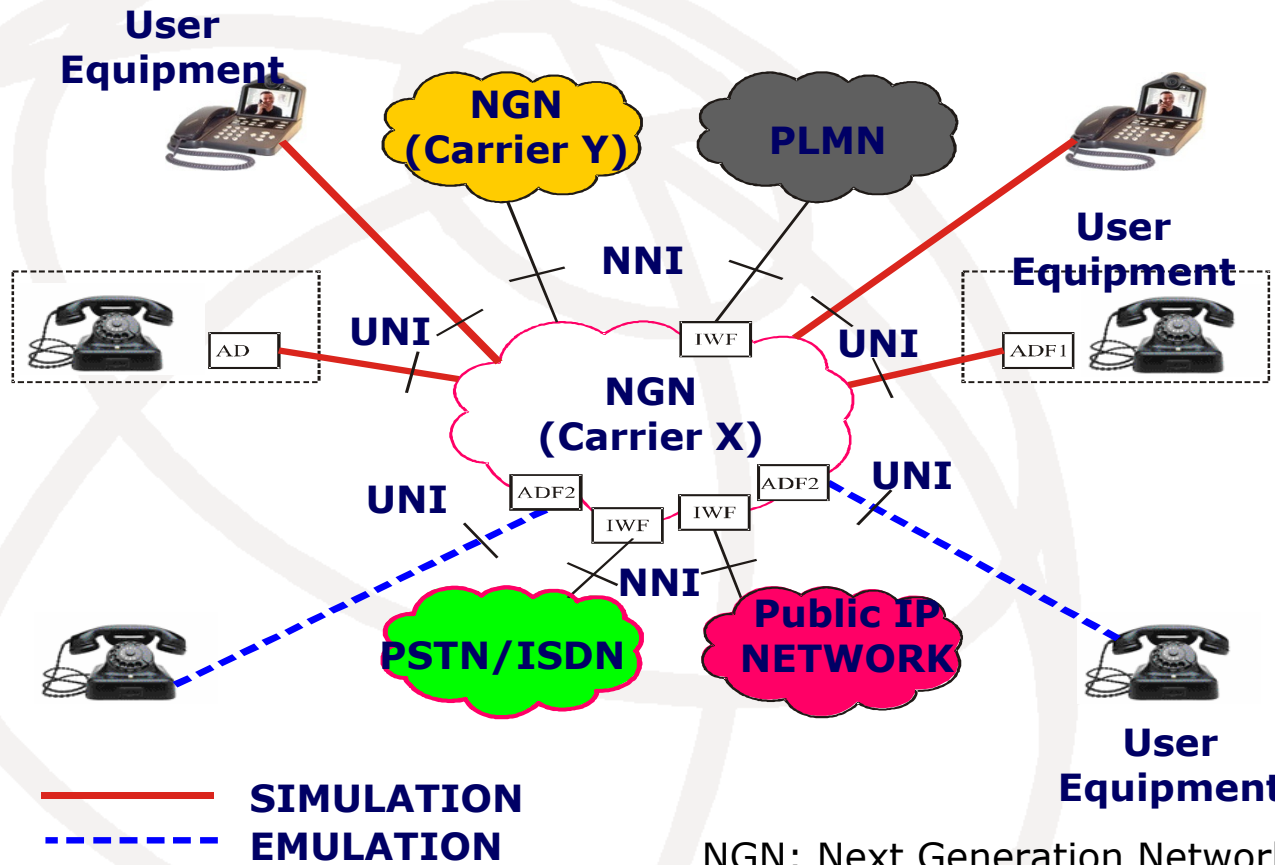
New players interrelation



Regulation will affect all players involved in the value chain

Challenges on regulation for NGN

Multiple interoperability scenarios to address



- Variety of scenarios for interconnection
- ✓ TDM- TDM
 - ✓ TDM – NGN
 - ✓ NGN – NGN

NGN: Next Generation Network
 PLMN: Public Land Mobile Network
 UNI: User Network Interface
 NNI: Network -Network Interface
 PSTN: Public Switched Telephone Network
 ISDN: Integrated Services Digital Network

Challenges on regulation for NGN

Interconnection units

How to define network dimensioning and costing units for interconnection ?

- Which units to be used for dimensioning ?
- Which units to be used for billing ?
- Which units to be used for interconnection and termination taxes ?
 - Usage time?
 - Bandwidth?
 - Information Volume?
 - Interface or link capacity?

Challenges on regulation for NGN

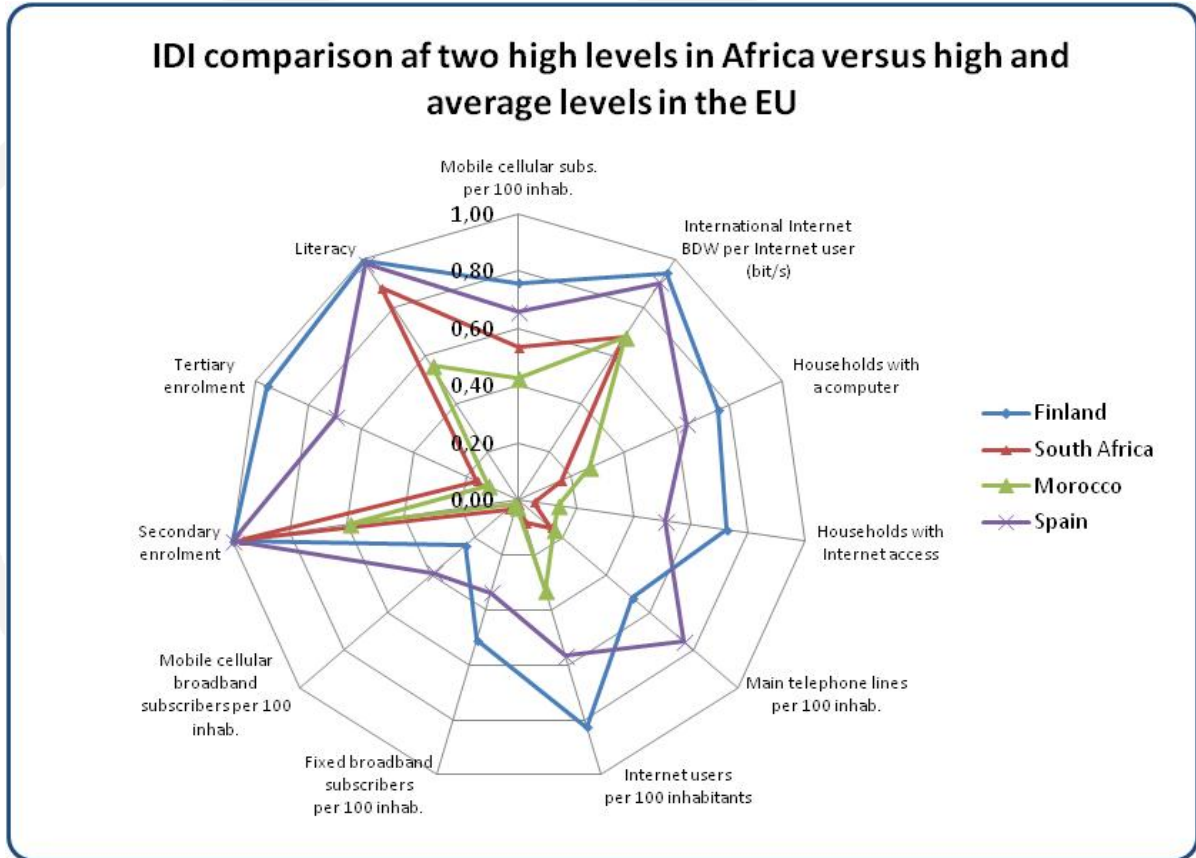
Main principles that remain

- **Fairness:** The regulatory rules should be neutral and fair so that all players will be treated equally.
- **Transparency:** the regulatory rules, decisions making process and results should be made public and open to all.
- **Independence:** the regulatory bodies should be independent of any business interests as well as protected from any political influences.
- **Quality and consistency:** Quality evaluations with experts in market, laws, economics, engineering etc. to maintain valid rules and consistent among players and solutions.
- **Effectiveness:** the regulatory bodies should be able to implement rules by penalizing those who break the rules thus help to create the expectation that all rules will be observed.
- **Accountability:** the regulatory bodies should be made accountable for their decisions by the regulatory procedures and through appeal clauses.

NGN Regulation and Best Practices

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- Trends and best practices worldwide

Example cases in Africa from external observation: Context on IDI levels

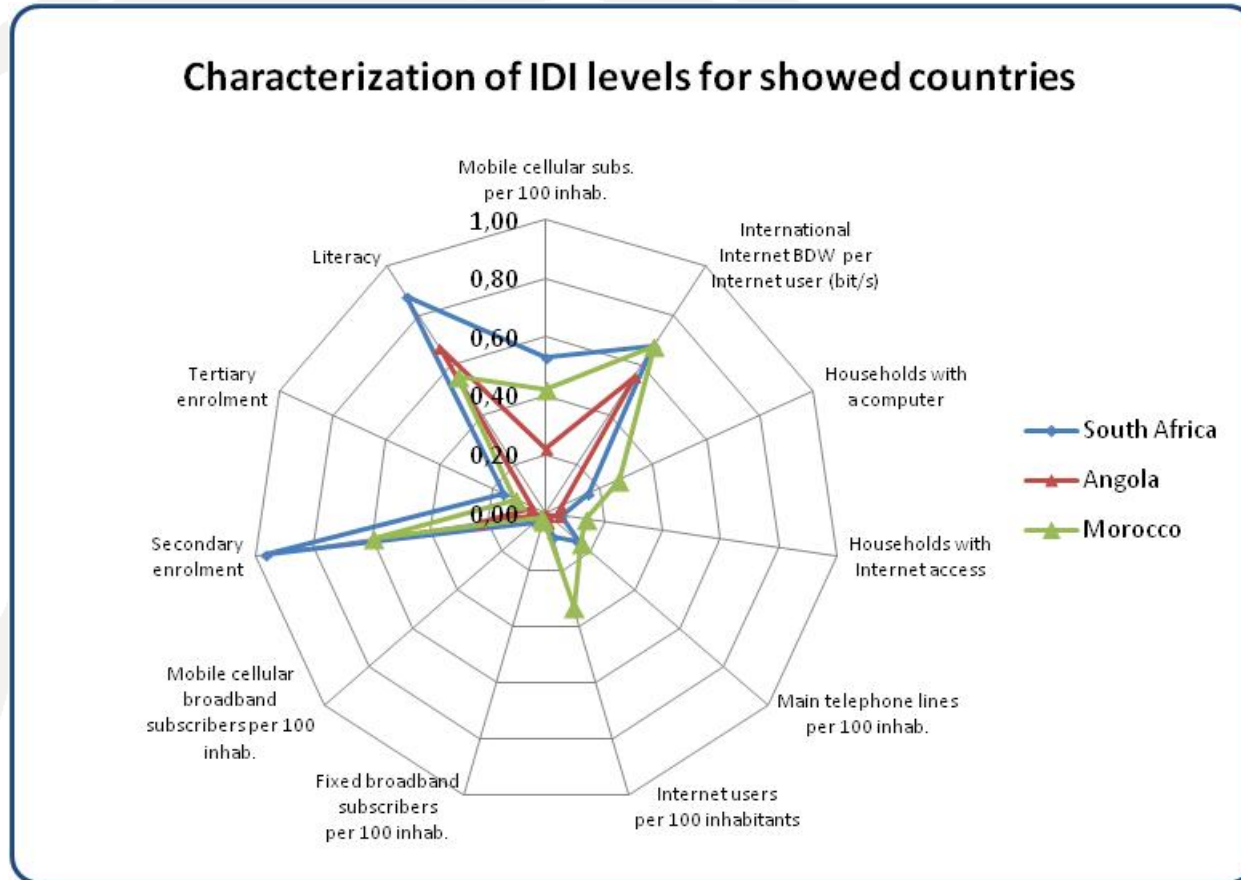


Countries with higher Information and Communication Technologies Index (IDI) than Africa average (2):

- South Africa 3,95
- Morocco: 3,79
- Algeria: 3,05
- Kenya: 2,46
- Nigeria: 2,08
- Senegal: 2,02

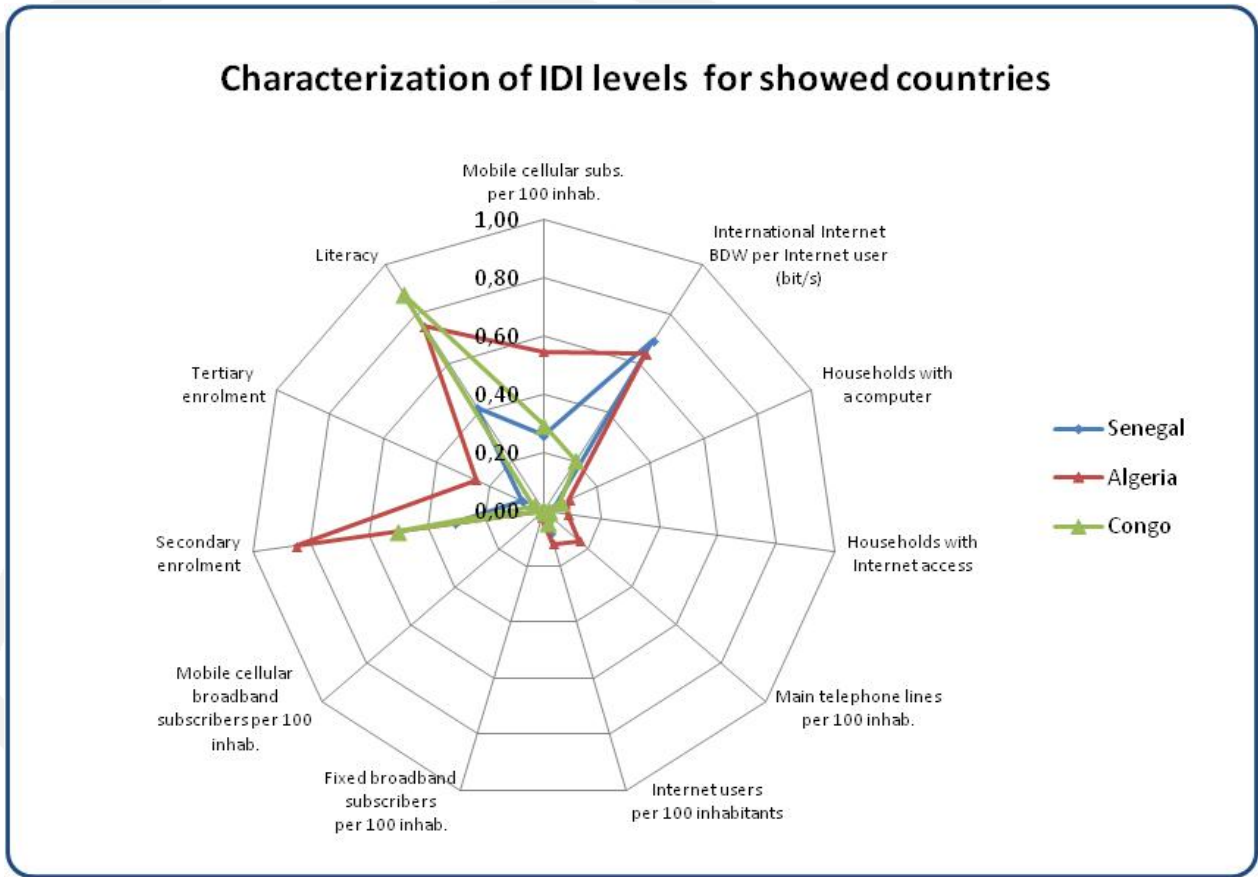
-Better positioning in Africa at literacy and secondary enrolment indexes than at other parameters
 -The two highest IDI factors in Africa approach European level in Literacy and second Enrolment while distance is high at the other IDI factors to the average in EU (Spain) and highest in EU (Finland) → Shows Priority for development

Example cases in Africa from external observation: Context on IDI levels



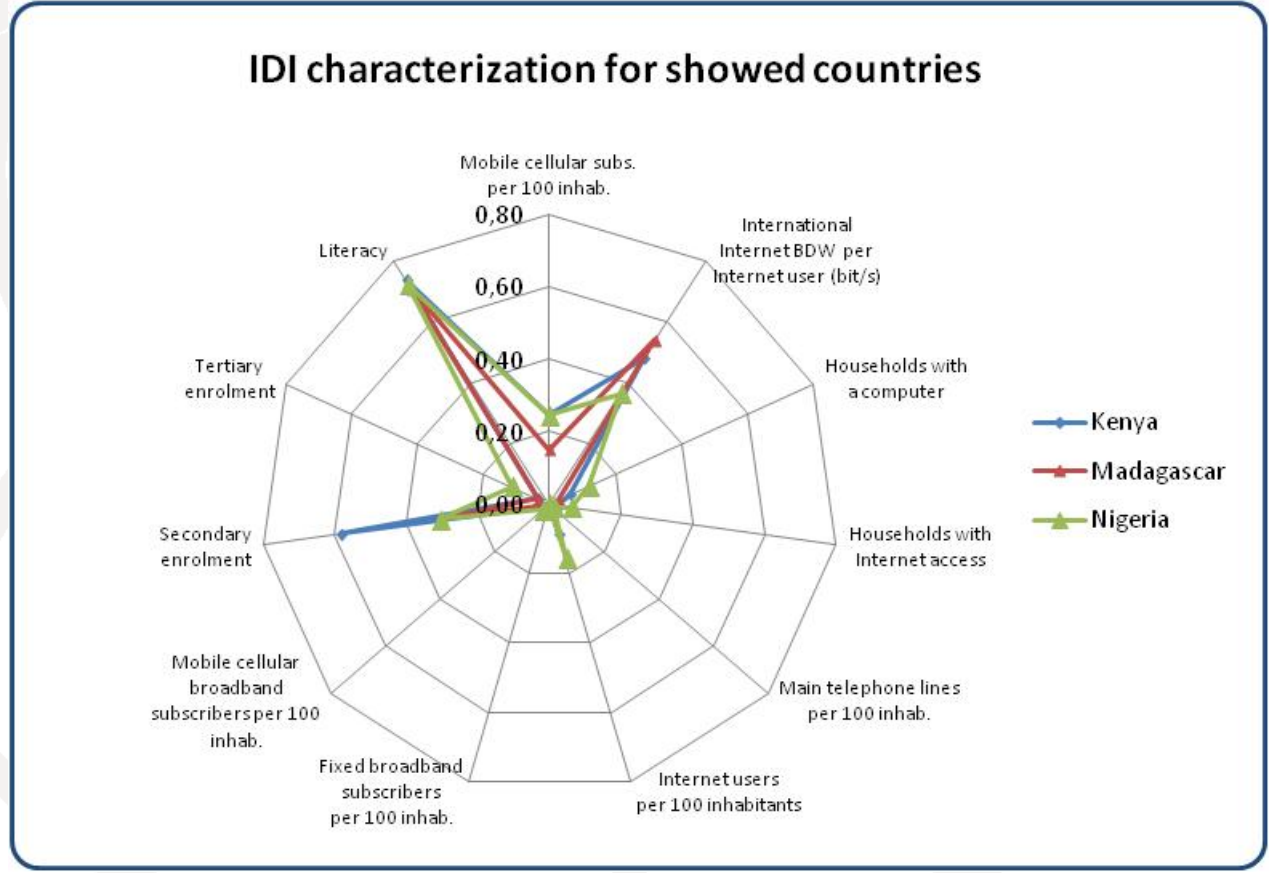
-South Africa has the highest IDI factors for Literacy and secondary enrolment while Morocco is better positioned on Internet users per 100 inhabitants, household with computers and households internet access

Example cases in Africa from external observation: Context on IDI levels



- Algeria is better positioned on Secondary enrolment, mobile penetration and main telephone lines per 100 inhabitants
- Senegal is better positioned on International bandwidth per user and Congo in Literacy

Example cases in Africa from external observation: Context on IDI levels



- All these 3 countries are well positioned on Literacy with Kenya better ratio in secondary enrolment
- Nigeria is better positioned on internet users per 100 inhabitants

Example cases in Africa from external observation: Regulatory highlights

■ *South Africa*

- Electronic Communications Act defined at 2005. Very complete and comprehensive definition of Regulatory processes, documents and guidelines. **Emphasis on a consumer orientation**
- Well defined responsibilities between the Ministry for general policies and the Independent Communications Authority of South Africa (ICASA) as an independent entity for the ICT domains
- **Extensive web page for related information status** for all regulatory domains including licensing, competition, spectrum, consumer protection etc.
- Heterogeneous implementation levels at different degrees as a function of the topic
- LTE 1800, 2100 and 2300 TDD bands licensed and in service at 2012, 2013

<https://www.icasa.org.za/>

LTE: Long Tern Evolution
TDD: Time Division Duplexing

Example cases in Africa from external observation: Regulatory highlights

■ *Angola*

- INACOM, *Instituto Angolano das Comunicações* created at 1999 with autonomous operation from the legal, financing, administration and infrastructure view points. Supervised by the *Ministério dos Correios e Telecomunicações*
- Well defined responsibilities for the main regulatory rules at 2011 like general licensing, services regulation, data protection, etc.
- *Livro Branco das TI* reported under definition in 2013
- **LTE bands at 1800 and 2100 licensed and in service since 2012**

<http://www.mtti.gov.ao/>

http://www.inacom.og.ao/Inacom_home_page.htm

TI: Technologies for Information

Example cases in Africa from external observation: Regulatory highlights

■ *Senegal*

- ART, Autorité de Régulation des Télécommunications created at 2001 with financial and legal autonomy and direct reporting to the Président de la République. Extended to the ARTP in 2006 incorporating the postal service
- **Ex-ante regulation defined for 12 markets including:** fixed network termination, mobile network termination, Local Loop, BB access, etc.
- Decision for market information provision taken at 2007
- Decision for significant market power operators defined per year and already fixed for 2014
- LTE bands defined and service in trial

<http://www.artpsenegal.net/>

LTE: Long Term Evolution

Example cases in Africa from external observation: Regulatory highlights

■ *Nigeria*

- Nigerian Communication Act defined at 2003
- Monitoring and enforcement processes started at 2005
- Competition practices and Telecom network interconnection defined at 2007
- Quality of service regulation 2012 for conventional networks
- **Licensing Regulation 2013 generalized and structured at 3 levels** as: Individual license, class license, frequency license
- LTE 800 and LTE-TDD 2300 bands defined and in service since 2013. Other bands planned or in trial

<http://www.ncc.gov.ng/>

Example cases in Africa from external observation: Regulatory highlights

■ Kenya

- CCK: Communications Commission of Kenya: Act 1998, Act Amendment 2009, Kenya Communications Regulation 2001
- **Unified License Framework (ULF)** with neutrality to technologies and services: (i) Network Facilities Provider (ii) Application Service Provider (iii) Content Service Provider
- **Well defined ICT 3rd strategic plan for the 2013-2018** period with a complete description of status, challenges, objectives and SWOT analysis
- **National Broadband strategy and plan defined in a complete form for medium (2017) and long term (2030)**
- LTE bands defined and service in trial 2013

<http://www.cck.go.ke/>

SWOT: Strengths, Weakness, Opportunities and Threats

Example cases in Africa from external observation: Regulatory highlights

■ Congo

- Agence de Régulation des Postes et Communications Electroniques (ARPCE) created in 2009 with legal and financial autonomy. Derived from the initial Direction Générale de l'Administration Centrale des Postes et Télécommunications (DGACPT) with the market liberalization in 1998
- Set of decisions at 2011 for the main regulatory issues with emphasis on the **sharing principles for the passive infrastructure**
- Good reporting of yearly market status, services and carried traffic.

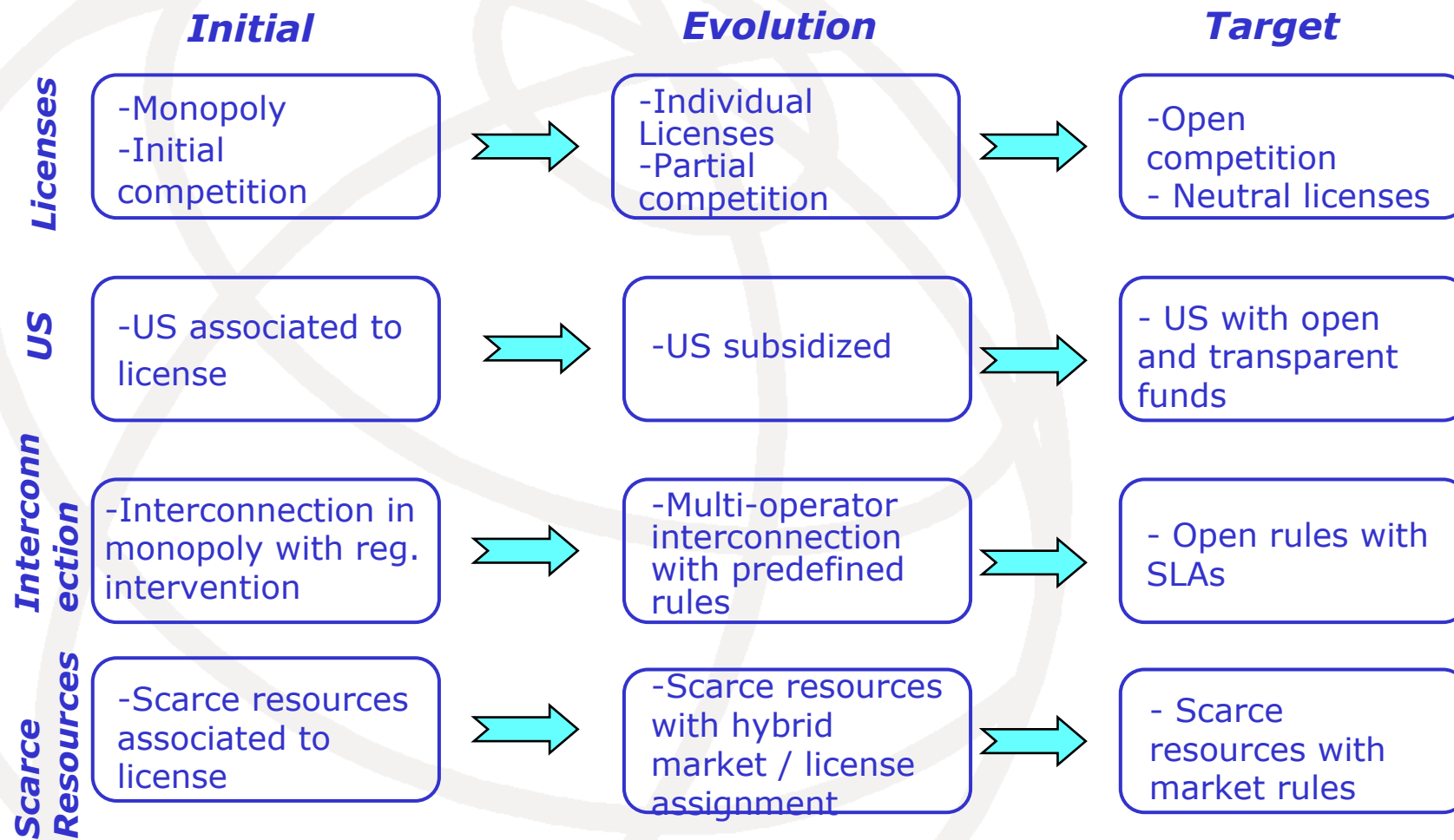
www.arpce.cg

NGN Regulation and Best Practices

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- **Trends and best practices worldwide**

Trends on Licensing

Feasible evolution path towards open market



US: Universal Service
SLA: Service Level Agreement

Trends and best practices worldwide

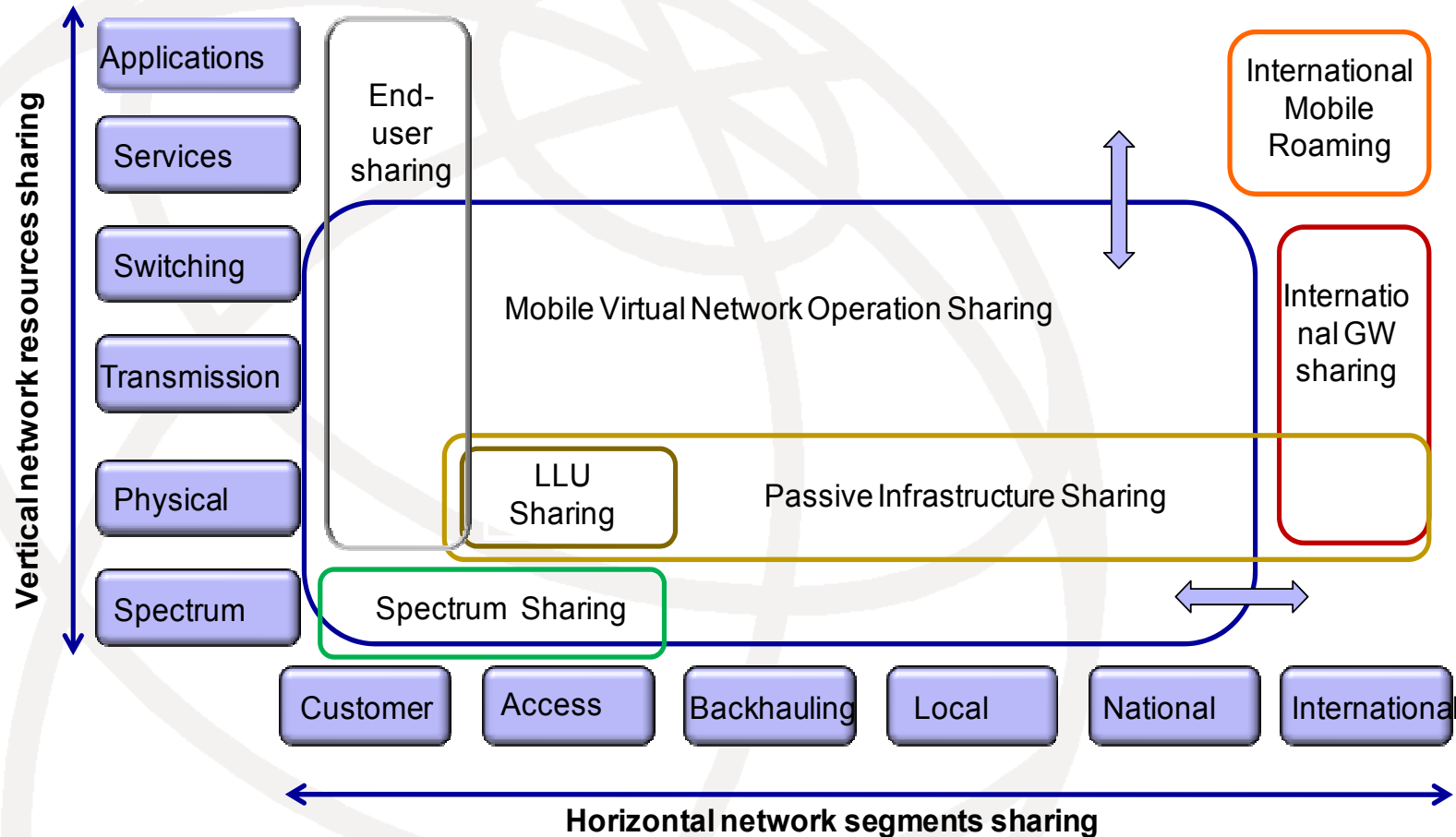
Models for charging in NGN

- Volume based
 - Payment per received Mbit in linear or step scale
 - Additional payment per content
 - No cost if not utilized
- Event based
 - Payment per individual event (SMS, MMS, tones, etc.)
 - Payment per event category (premium football, concerts, etc.)
 - Direct relation between customers and content providers
- Content or Value added based
 - For special applications (Ex.: ASP applications, remote office, cloud computing)
 - Based on demand, quality, etc.
 - May also be related to events

ASP: Application Service Provider
SMS: Short Messages Service
MMS: Multimedia Message Service

Trends and best practices worldwide

Resource sharing options to save investments (in CAPEX and OPEX)



Mapping of sharing domains to network segments and network resource layers

LLU: Local Loop Unbundling
GW: gateway


Trends and best practices worldwide

Net neutrality

- Net neutrality understood as Internet neutrality is the principle for Internet Service Providers and Governments to treat all data on the Internet equally, not discriminating or charging differentially by user, content, site, platform, application, and modes of communication.
- Basic principle originated at the Telegraph networks (1860) practical engineering developed with A.K. Erlang (1917) works to network dimensioning and popularized in 2003 for Internet
- Debate between Net neutrality understood in strong sense (no difference between on bit and another) versus fair sense
- Neutrality on connectivity and basic services ? → yes
- Neutrality from OTTs on service priority, searching procedures and revenues/taxes per country? → yes

Trends and best practices worldwide

Net neutrality

- Neutrality on management, service capacity and QoS ?  Not necessarily unique but graded as a function of:
 - Network survivability requirements
 - Treatment of viruses propagation
 - Service Level Agreement agreed
 - Cost of Resources

Note: Recent repositioning by FCC removing full net neutrality paradigm towards a light position. FCC Jan 14th and still interpretation and consequences under discussion

QoS: Quality of Service
FCC: Federal Communications Commission (USA)

Trends and best practices worldwide

Convergent Licensing Types

- General Authorization for operation licenses (Ex.: EU)
- Converged-multiservice License (Ex.: Malaysia)
- Converged-Unified Access License (Ex.: India)

EU: European Union

Trends and best practices worldwide

EU (I): General authorization

- **General authorization for operation.** All electronic communication services and networks will be covered under a general authorization regime.
- A maximum set of conditions to be attached to general authorizations. The Directive introduces a strict separation between:
 - conditions under general law, applicable to all undertakings in all economic sectors
 - conditions under the general authorization applicable to all telecommunication services and networks
 - conditions attached to rights of use for radio frequencies and numbers

Trends and best practices worldwide

EU (II): general authorization

- Examples of general conditions for the electronic communications:
 - Financing contribution to the Universal Service
 - Interoperability for services and network interconnection
 - Personal data and privacy specific for the electronic communication sector
 - Access obligations
 - Public network security against non-authorized access
 - Capacity for the legal interception by the competent national authorities
 - Measures to ensure compliance with standards and specifications within the `specific directive
 - Etc. etc

Trends and best practices worldwide

Malaysia: Convergent-Multiservice

- Four basic type of licenses by network layers:
 - **Network Facility Providers (NFPs):** which include owners of satellite earth stations, fiber optic cables, communications lines and exchanges, radio communication and transmission equipment, mobile communication base stations and broadcasting towers and equipment
 - **Network Service Providers (NSPs):** for entities that provide basic connectivity and bandwidth to support a variety of applications
 - **Application Service Providers (ASPs):** for licensees that provide particular functions such as voice services, data services, Internet access services, IP telephony and other transmission services
 - **Content Applications Service Providers (CASPs):** A special subset of applications service providers, including traditional broadcast services and services such as online publishing and information services.

Trends and best practices worldwide

India (I): Convergent-Unified

Since October 2003, India adopted a Universal Access Service Licensing (UASL) regime as a first step towards Unified Licensing

- Technology and Service Neutral Regime
- Long distance, Internet Services etc. licensed separately
- Within a service area, license does not distinguish between types of access e.g. fixed, mobile, WLL
- Basic Service operators had to pay a fee to enter UASL at levels of cellular mobile
- Unified Access License considered as an intermediate step to Unified License

WLL: Wireless Local Loop

Trends and best practices worldwide

India (II): Convergent-Unified

- **Framework of Unified Licence:** There shall be four categories of licenses:
 - **Unified License** - All Public networks including switched networks irrespective of media and technology capable of offering voice and/or non-voice (data services) including Internet Telephony, Cable Television (TV), Direct To Home (DTH), TV & Radio Broadcasting shall be covered under this category. Unified License implies that a customer can get all types of telecom services, from a Unified License Operator. The operator can use wire line or wireless media.
 - **Class License** - All services including satellite services, which do not have both way connectivity with Public Network, shall be covered under Class license. This category excludes Radio Paging and Public Mobile Radio Trunking Systems (PMRTS) Services and includes Niche Operators.

Trends and best practices worldwide

India (III) : Convergent-Unified

■ Framework of Unified Licence: (contd)

- **Licensing through Authorization** - This category will cover the services for provision of passive infrastructure and bandwidth services to service provider(s), Voice Mail, Video Conferencing, E-mail service, Unified Messaging Services, Tele-banking, Tele-medicine, Tele-education, E-commerce, etc.; within or outside India, PC in India to Telephone outside India, IP based H.323/SIP Terminals connected directly to ISP nodes to similar Terminals; (within or outside India).
- **Standalone Broadcasting and Cable TV license** – This category shall cover those service providers who wish to offer only broadcasting and/or cable services.

PC: Personal Computer
IP: Internet Protocol
SIP: Session Initiation Protocol
ISP: Internet Service Provider

NGN Regulation and Best Practices: Positioning in Africa

- ➔ Regulatory status in observed countries shown a very heterogeneous progress according to country and domain
- ➔ Countries with higher IDI than average in Africa have recently progressed on the modernization of Regulatory rules
- ➔ In most cases definition of rules is more advanced that its practical implementation and performance metric is low developed and/or not sufficiently published
- ➔ Best practices of top countries in definition/implementation within the continent (i.e.: SA, Kenya, Nigeria) are good guides to follow at short term within the continent
- ➔ Best practices worldwide at EU level and APAC leading countries in regulatory convergence are good references for the medium term

SA: South Africa
EU: European Union
APAC: Asia Pacific

NGN Regulation and Best Practices: Items to care

- ▶ Manage customers rights to better services at lower costs → More Customer orientation
 - ▶ Have a **vision** of market evolution on overall services and **business development**
 - ▶ Always promote Innovation, never stop it by rules
 - ▶ Maintain **fundamental principles** for regulation objectives and decrease degree of detail
 - ▶ **Converge regulation** for the converged Telecom usage
 - ▶ Care on OTT watching and **cross borders regulation**
- Measure accountability by country customers satisfaction**

International Telecommunication Union

Committed to connecting the world