FORUM ON NEXT GENERATION STANDARDIZATION

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Developing NGN Regulatory Ecosystem for Emerging Markets

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Agenda

- NGN Ecosystem - Introduction
- Regulatory Challenges for NGN
- Existing licensing regime - India
- NGN in India – SWOT analysis of present framework
- Regulator's consultation process
- Way forward
  - Unified Licensing
  - Phased Migration
  - Functional Separation - Wholesale concept
  - NGN Regulatory ecosystem for emerging markets

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NGN - Introduction

Next Generation Networks as the name suggests are the networks of future based on emerging technology of IP which is leading to convergence of networks, services and markets and providing efficiency and flexibility.

NGN are based on the layered approach wherein services provision is separated from the network infrastructure.

These are enabling the operators to increase their depleting ARPU by providing advanced value added services in addition to plain (vanilla) voice.

The incumbent operators are going for NGN by replacing their existing networks to compete on the technology front and being able to provide innovative value added services, cutdown on Opex as well as to make their network future-proof

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Definition of Next Generation Network (ITU)

Next Generation Network (NGN) is a *packet-based* network able to provide services including Telecommunication Services and

Able to make use of multiple *Broadband, QoS-enabled* transport technologies in which *service-related* functions are independent from underlying *transport-related* technologies;

It offers *unrestricted access* by users to different service providers.

It supports generalized *mobility* which will allow *consistent and ubiquitous* provision of services to users.

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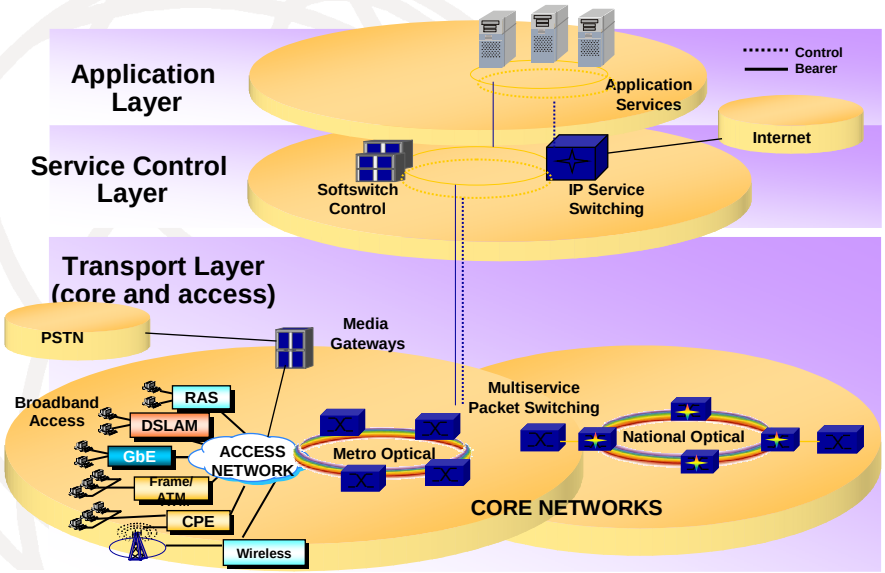
NGN-A layered architecture distributing intelligence



Advantages of NGN

- NGN makes use of best of both the worlds (flexibility, efficiency & Innovativeness of IP and QOS, Security, Reliability, Customer-friendly features of proven PSTN
- ***Advantages for service providers***
  - Reduced CAPEX due to integrated and efficient IP-based technology (Packetize or Perish)
  - Reduced OPEX due to transmission cost saving, less power consumption, less space requirement, less O&M costs
  - Ability to offer increased range of services
  - More flexibility increasing market penetration by offering personal service customization and management
  - Single network layer for management
  - No need for separate networks for voice, data and video
- ***Advantages for subscribers***
  - Reduced call charges
  - New innovative services at a fast speed
  - Single connection and bill for voice, data, video,mobile (Quad play)
  - Develop and Control the application service

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What is NGN Ecosystem?

- Next Generation Services – Converged (quad-play- VOIP, data, video, mobile)
- Next Generation Access – High speed (Broadband) IP based connectivity (ADSL, VDSL, WiMax, Digital Cable TV, FTTH, PLC)
- Next Generation Transport – Carrier Ethernet, I-MPLS
- Next Generation Architecture – Service oriented (SOA), Layered (transport, control, application)
- Next Generation Mobile – 3G+(B3G)
- Next Generation Internet – IPv6
- Next Generation Interconnect – Cost of Capacity and Quality based
- Next Generation Licensing – Unified & Class, technology-neutral and service agnostic
- Next Generation Regulation – Converged, Differentiated/Asymmetric, Facilitating, Light-handed

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Driving forces for NGNs

- Asia Pacific Region including India
  - Operational cost savings, new services for increased ARPU
  - Predominantly mobile users, less investment in legacy infrastructure, Semi-greenfield environment
  - Low tele-density and Broadband penetration
  - Address space limitations,
  - Government's / Regulator's NGN initiatives
  - Increased roll-out of networks by new operators

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NGN Regulatory Challenges

As per ITU:-

"The move to NGNs represents an opportunity to establish in advance ground rules for ensuring the continued passage to effective competition and minimise damage during transition".

It is in contrast to the regulation of the legacy network, which came after the networks were actually in place. That is why, NGN is different.

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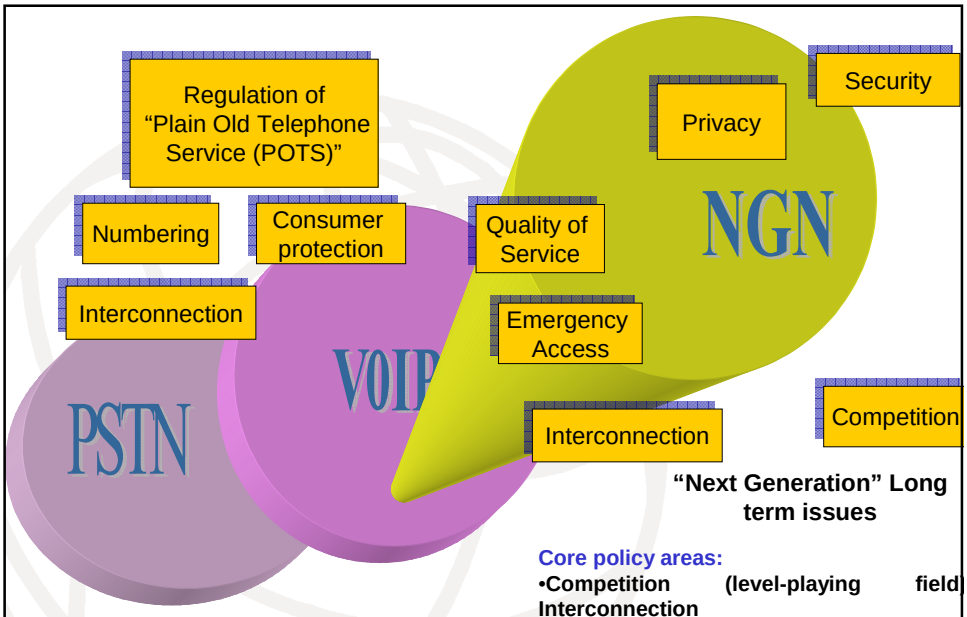

"Next Generation" Long term issues

Regulatory implications of NGN

Core policy areas:

- **Competition (level-playing field) Interconnection**
- **Consumer (QOS, privacy, emergenc access)**
- **Security & legal interception**

Scope for light-touch regulation

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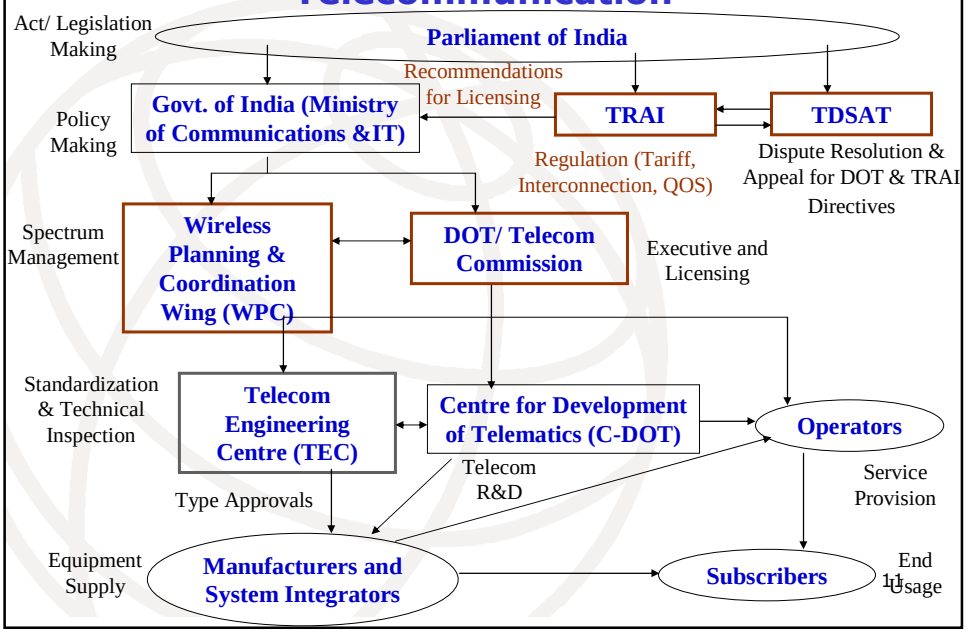
Institutional Framework for the Indian Telecommunication



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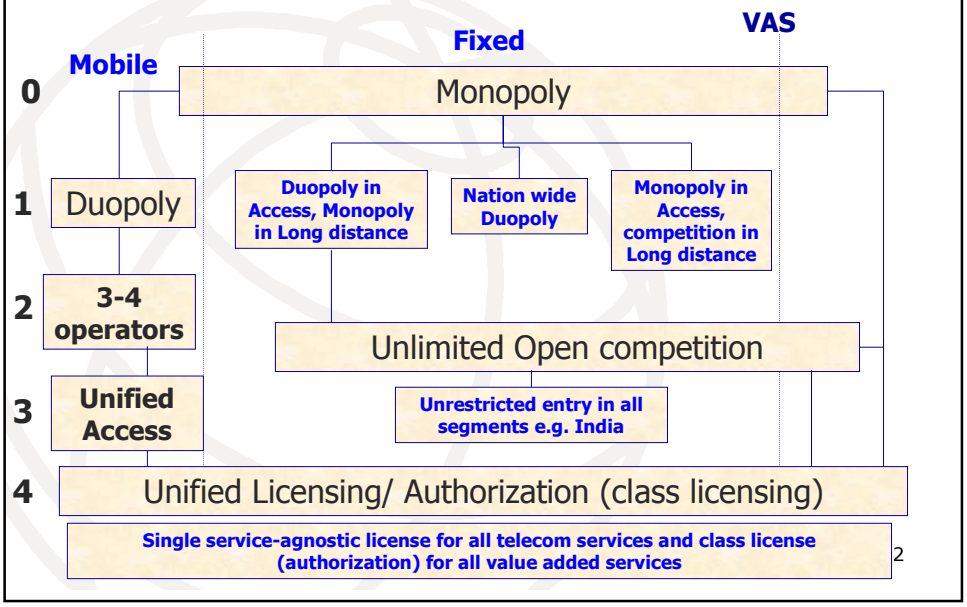
Promoting Competition in Phases



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Service specific licensing in India

Type of Service	Service Area	Connectivity with PSTN	Entry Fee	Annual License Fee (% revenue share)
ILD	International	Full PSTN/PLMN Interconnection	Rs.25 million	6%
NLD	National	-do-	Rs. 25 million	6%
Unified Access (Fixed and Mobile) (UASP)	Circle	-do-	Different for each Circle (Rs. 16 billion for all India)	Type A - 10% Type B - 8% Type C - 6%
VSAT	National	No Interconnection	Rs. 3 million	6%
Internet Service Providers	National, Circle wise	-do-	Rs. 2 Million (All India)	Nil (6% for Internet Telephony)
Public Mobile Trunked Radio Service	City wise and Circle wise	Limited One way	Nil	5%
Infrastructure Providers Cat I	National	NA	Nil	Nil
OSP (Other Service Providers)	Site Specific	Application services	Nil	Nil

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Salient features of existing regime

- **Unified Access (technology-neutral) – coexistence of GSM/ CDMA (WLL), Fixed**
- **Very low symmetric termination rates (< 0.5 cent/min) (same for fixed and mobile)**
- **Very low carriage charges (1 cent/min)**
- **Very low mobile tariff (2 cent/min)**
- **Very low long distance tariff (2 cent/min)**
- **Very low ARPU (8 US$/month)**
- **Very low Broadband charges (5 US$/month)**
- **Low rural tele-density (< 15%)**
- **Highest Mobile additions per month- (> 12 million)**
- **Overcapacity for international bandwidth (17 Tbps/ 500 Gbps)**
- **Wide spread national backbone (12 lakhs Km)**
- **Dominance of wireless access (400 million mobiles vis-à-vis 40 million wirelines)**
- **Large cable TV homes population- (65 million)**

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NGN India – A SWOT Analysis

- Strength/Drivers
- Weaknesses/Challanges
- Opportunity/ Benefits
- Threats/ Risks

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Strength of present licensing framework

- Open unrestricted competition in all segments (including mobile)
- Access service provision unified (broadband, triple play, internet telephony permitted in addition to voice, fixed/ mobile/ WLL)
- General technology-neutrality (technology option left to operators)
- General tariff forbearance (Except leased lines where competition is not enough)
- Broadband policy in place (Govt's mission to accelerate broadband uptake)
- Access network dominated by wireless (400 million out of 440 million)
- More than 12 million mobiles additions per month
- 65 million cable TV homes and 39 million wirelines
- Proactive regulator (initiatives on emerging issues like IP based NGNs,IPv6,UnifiedLicensing,Resale in IPLC, VOIP, MVNO, MNP, CPS through Calling cards, Abolition of ADC,Cost based MTC,CPNP etc.)

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Weaknesses/Challanges

- Multiple regulatory agencies - licensor (DOT), spectrum management (WPC), technical regulation (TEC), interconnection, tariff & QOS regulation (TRAI), dispute settlement (TDSAT), Security Agencies, Competition Commission.
- Non-unbundling of local loop (no competition for DSL based broadband)
- Unidirectional,Analog CableTV infrastructure
- Legacy interconnection regime (Minutes of Usage, MOU based), CPNP (Calling Party Network Pays)
- General Resellers (non-facility based operators) not permitted
- Value-added service providers (ISPs) not treated as interconnection entity
- Unrestricted VoIP not permitted yet for ISPs
- No Functional Separation Regime for Incumbent

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Opportunity/ Benefits

- Large unmet demand for telecom services (telephony tele-density– 40%, Broadband penetration - 0.5%)
- Mobile coverage only 75% (semi-greenfield environment to expand)
- Rationalization of network resulting into simplicity and reduced OPEX
- Network expansion by using future proof technology (NGN)
- EX-ANTE regulation for NGN to remove uncertainties
- Involvement of industry in various issues fully in a pro-active manner
- Bring Quad play services to rural area (bridge digital divide)

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Threats/ Risks

- Standards and interoperability issues yet to be settled
- Technical challenges in Emergency access/ Security monitoring
- High CAPEX without guaranteed corresponding increase in ARPU
- Project oriented risks due to huge scope and costs in migration

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NGN Consultation Process – India

Issues for Consultation

- 'Light-touch' v/s 'Tight' regulation or regulatory withdrawal (hands-off, forbearance)
- Ex-ante v/s Ex-post regulation
- Level-playing field issues – Service-based competition, Network-based competition, Access competition
- Regulatory incentives – standardization, transition time-table, special rate of return, alternate access paths, special concession for deployment in rural areas
- QOS regulation for NGN
- Interconnection regime in NGN context – interconnecting parties, interconnection products, types of interconnection, basis for charging, interconnect exchange
- Mandating for emergency access – 100, 101 etc
- Security aspects of NGN – Adherence to requirements for Legal Interception and Monitoring (LIM),Encryption

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NGN Consultation Process – India

Findings from Public Consultation

- Lack of awareness about NGN and need for training/ educational programmes
- Lack of enough infrastructure for considering any service based competition
- Need for a single licence to provide all services (data, voice, broadcast through same network)
- Need for detailed consultation on interconnection issues and QOS regulation in NGN environment
- Need for accelerating the Broadband penetration for access migration
- Need for deliberations on technical and standardization issues with special reference to interoperability, emergency access and legal interception and security monitoring
- Need for cross-industry collaboration under the aegis of regulator to deliberate upon time table for NGN migration as well as interconnection issues(NGN eCO)

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NGN Regulatory Challenges Emerging Markets

(i) Death of distance and blurring of the traditional boundaries between Access (local) providers and long distance carriers.

(ii) VOIP as a "disruptive technology" putting a challenge for the regulators to perform a balancing act in maintaining level playing field.

(iii) On-going technological developments causing drastic impact on the telecom scenario forcing a re-look at the service based licensing and geographical area based regulatory regime including Numbering systems.

(iv) Level playing field issue between the licensed telecom operators and value added service providers.

(v) Need for new interconnect products based on capacity and quality (V&V) in place of those based on distance and duration (miles & minutes).

(vi) Access to emergency services like police control room, fire services, medical help etc. (PSAP, E 911 (US), 999 (UK), 100 (India))

(vii) Security monitoring like legal interception & monitoring (LIM), wiretap, CLI etc.

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Unified Licensing Regime - Recommended

Three categories of licenses:

1. 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. Examples: Unified Access Service, NLDO, ILDO, Internet Telephony, Broadcast (eg. DTH, FM Radio, TV Broadcast).

2. Class License- All services including satellite services which do not have both way connectivity with Public network. This category excludes Radio Paging and PMRTS Services and includes Niche Operators. (The concept of niche operators is being included to promote growth of telecom services in rural/remote/backward areas from teledensity point of view). Examples: VSAT, Niche Operators.

3. Licensing through Authorisation - Services for provision of passive infrastructure and bandwidth services to service provider(s), Radio Paging, PMRTS and Internet including existing restricted Internet telephony (PC to PC, IP device to IP device using lease line only and PC to phones-phones outside India only).

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Major operator's approach towards NGN

Five-fold Migration Approach

- Create nationwide IP-MPLS backbone network (fiber-based Packetisation)
- Create access agnostic Metro Area Networks (MAN) (subscriber access capable of convergent voice, video and data services over DSL, Optical Ethernet and Wireless technologies)
- Implementation of VOIP based Class 4 services (packetize Trunk Swithches)
- Implementation of Class 5 services over packet network (Packetise Access Swithces)
- Offer Multimedia/ Triple play services including VOIP and IPTV to Broadband subscribers

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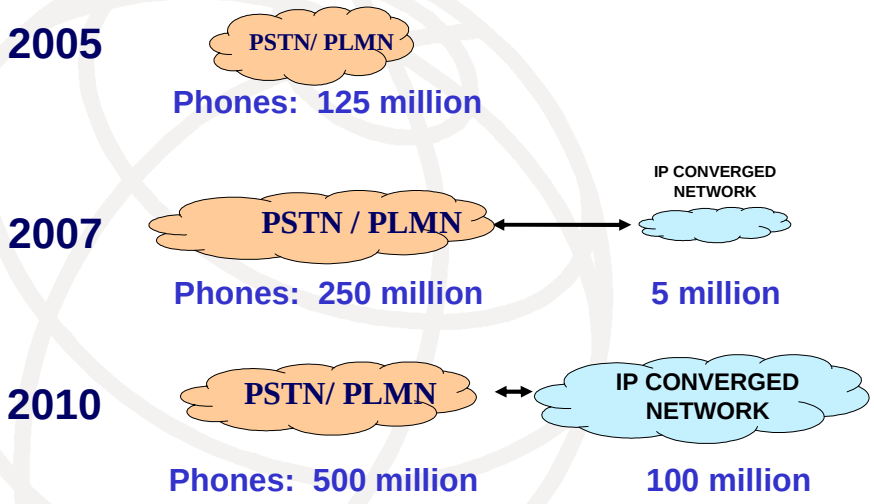
Next Generation Network- Vision India



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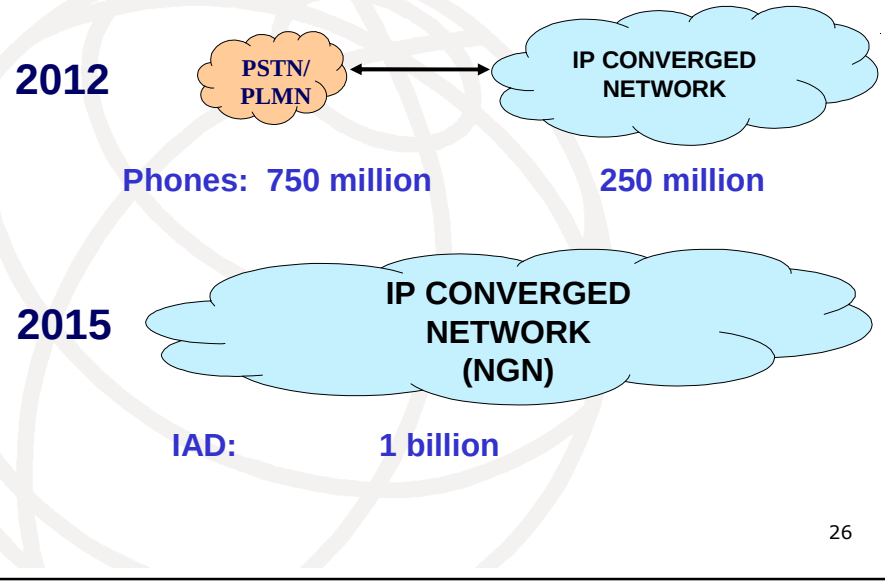
Telecom Network Vision



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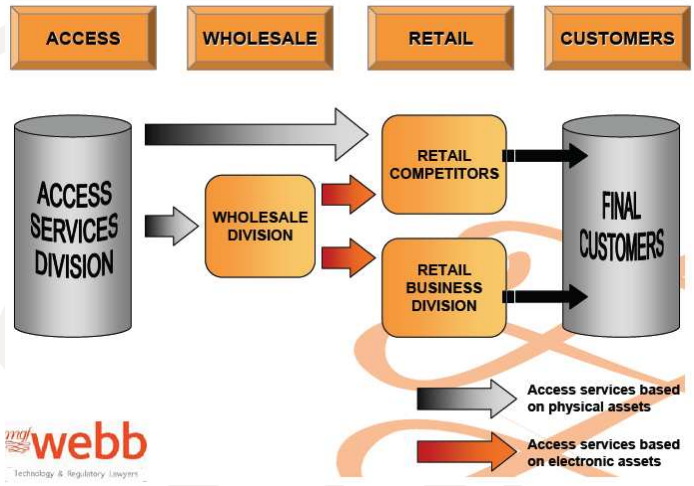
Functional Separation – A new Wholesale Concept



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NGN Regulatory Ecosystem for Emerging Markets

A converged regulator for ICE (single regulator for Telecom, IT & Broadcasting)

A single technology-neutral, service-agnostic license (one license - one network – all services) to facilitate Efficiencies

A Class Licensing Regime (Authorisation/Registration) for Value Added Services to facilitate Innovation

A cost of capacity based, open access, interconnect regime and light handed regulation to promote Competition and Investments

Functional Separation to encourage full infrastructure sharing in open manner and to unlock the potential of existing assets to promote Co-Opetition

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Thank You

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