

# ITU-D Regional Development Forum for the Asia Pacific Region NGN and Broadband, Opportunities and Challenges

## NGN Migration Strategy and Scenarios

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## Agenda

- **Technology migration issues**
- **Migration strategies per network segment**
- **Main steps for IMS and NGSS**

## NGN Migration Strategy Issues for migration planning



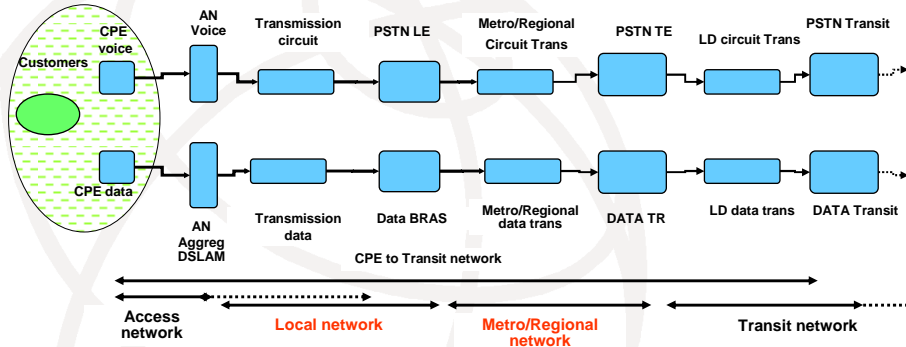
- Where to start migration?
- Which topologies and connectivity are required?
- How network segments change in access , local and core?
- Which level of protection to assure?
- Where to locate new functionalities?
- How to ensure service continuity?
- Others .....

## NGN Migration Strategy Modeling issues for NGN design



- New **models** needed to represent multiservice flows
- New **dimensioning methods** for resources handling multimedia services with QoS
- New **measurement procedures** for aggregated multi-service traffics
- New procedures to ensure **interoperability** and end-to-end performance across multiple domains
- Redefinition of **network segments** at the new structure and for QoS quota assignment
- New units to define dimensioning and costing for **interconnection**

# Network segments: Historical reference configurations



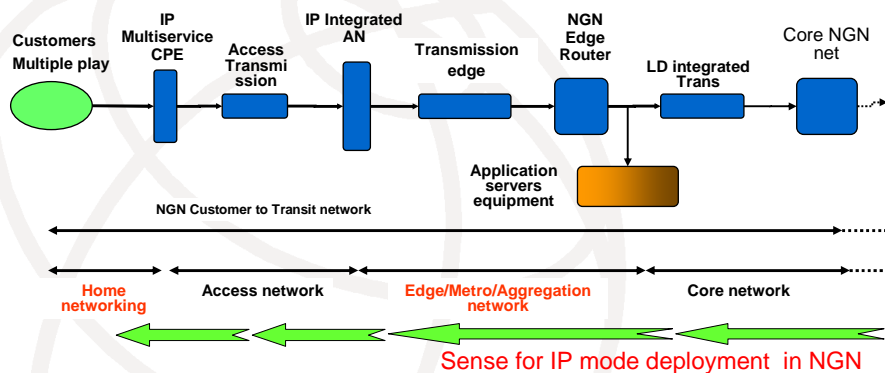
- Double network in circuit and packet modes
- Frequently with separated physical media, transmission and energy

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# Network segments: Target full NGN reference configurations



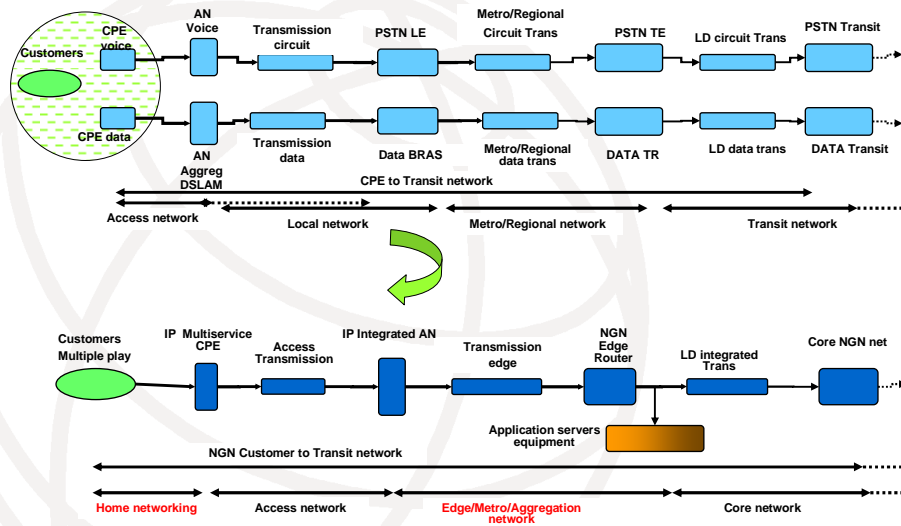
- Integrated network at all layers NGN based on IPv6 network with carrier grade QoS

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# Network segments: Migration from historical to target NGN

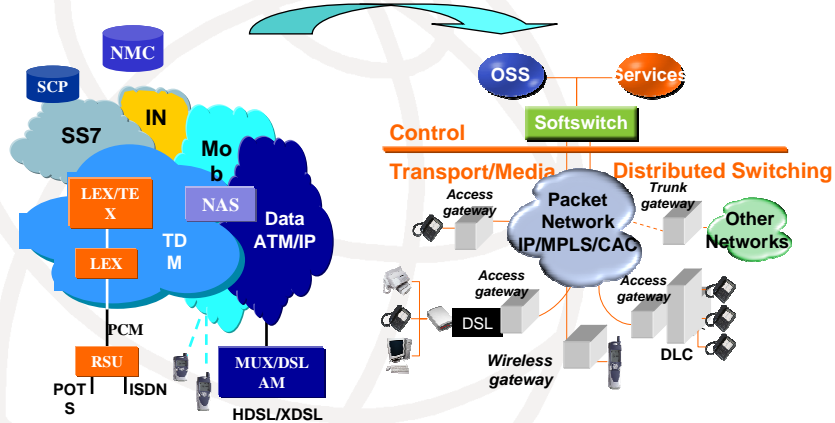


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## Architecture migration: Topology

What changes from current scenario towards target network ?



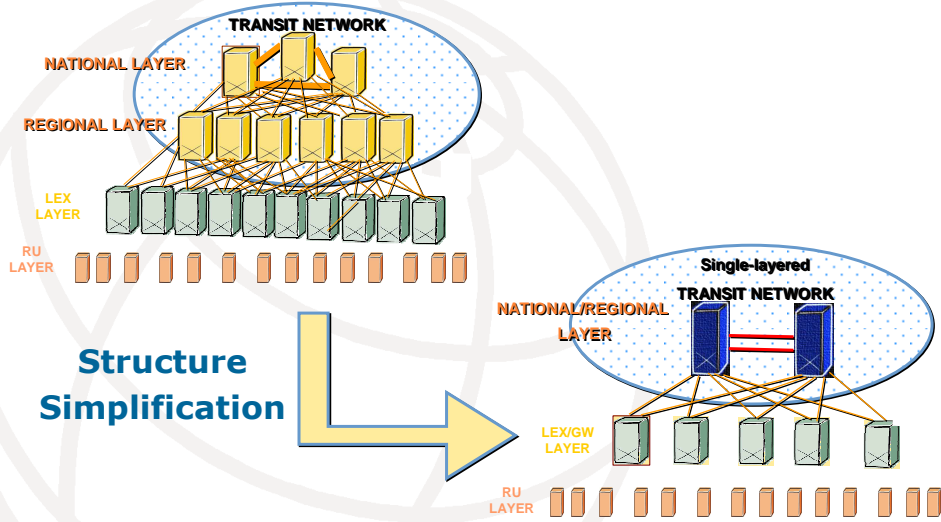
## NGN: Topology migration strategies

**Network topology change is more difficult and needs more time that just system substitution**

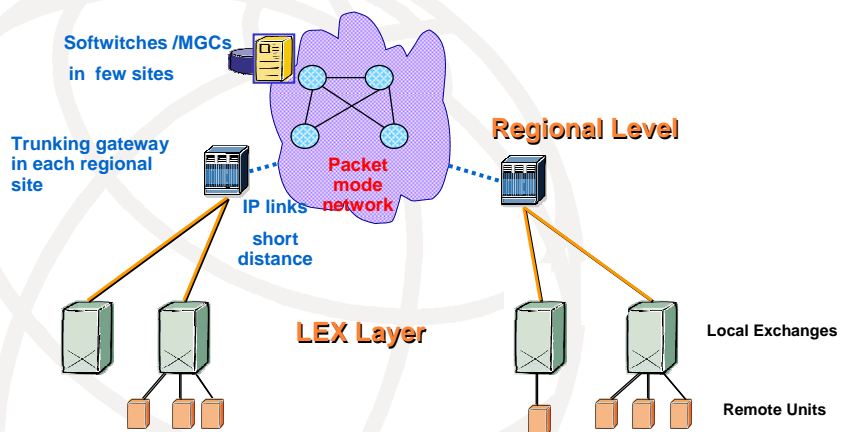
- **Migration in overlay :**
  - At transit and international levels
  - At local level
  - At access level
- **Migration in island** (substitution/extension)
  - At transit and international levels
  - At local level
  - At access level
- **Hybrid migration:** overlay and island combination:
  - By network levels
  - By geographical regions
  - By obsolescence level

# Network Architecture towards NGN

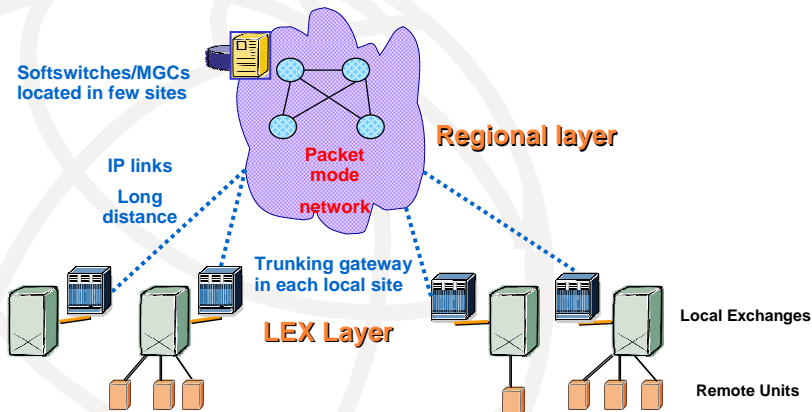
## Architecture Consolidation: Topology



# Topology reconfiguration for Core



## Topology reconfiguration for Core

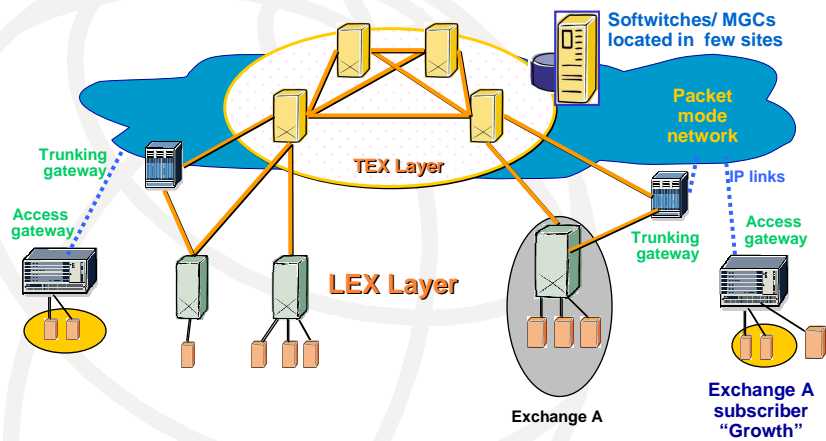


## Core: migration strategy

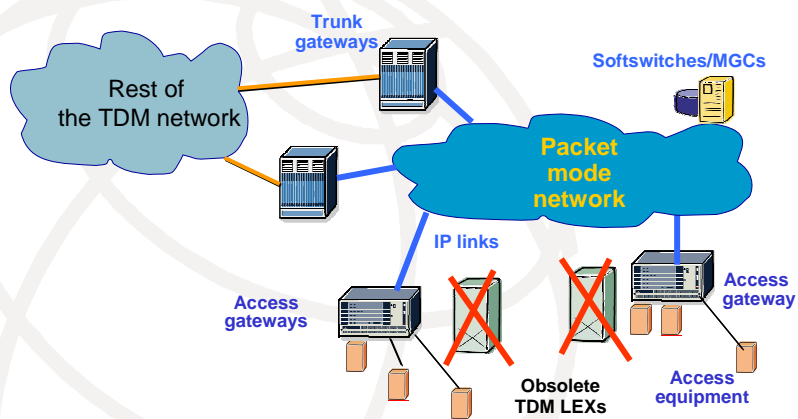
### Dominated by high capacity and protection level

- Overlay deployment for full coverage in all regions
- Quick deployment needed for homogeneous end to end connections (2 to 3 years)
- Strong requirements for high quality, protection and survivability
- Importance of the optimization for location and interconnection

## Local/Edge level migration: grow with NGN



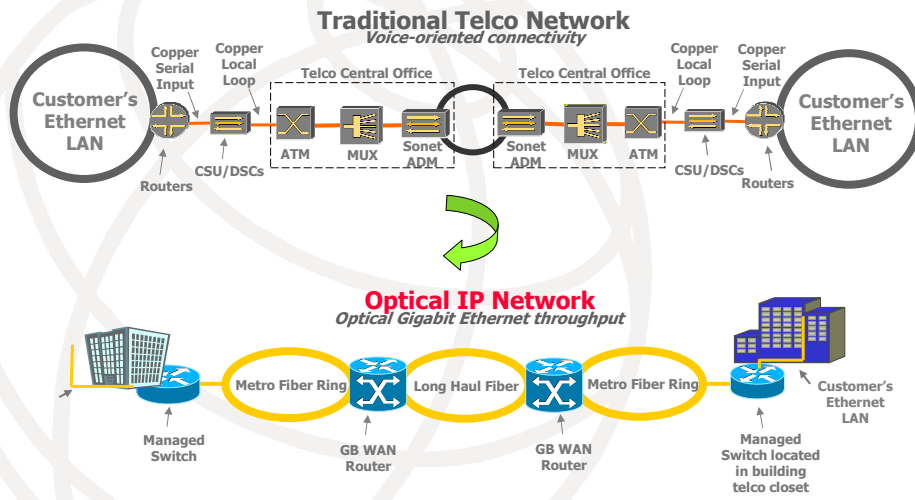
## Local/Edge level migration: substitute with NGN





## Metro-Ethernet

- Vision by the Metro Ethernet Forum **METRO<sup>the</sup>net Forum** for LAN to LAN network:



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## Local/Edge network migration

### Dominated by functions migration investment and interoperability

- Move from joint switching and control to separated control and media GW
- Introduce Multimedia Services at all areas
- Optimize number, location of nodes and interfaces among existing and new network
- Requires longer time and higher investments due to variety of geo- scenarios and geographical distribution

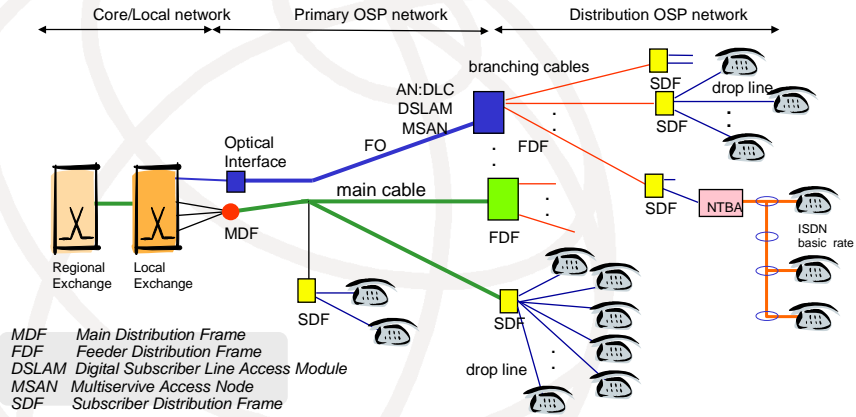
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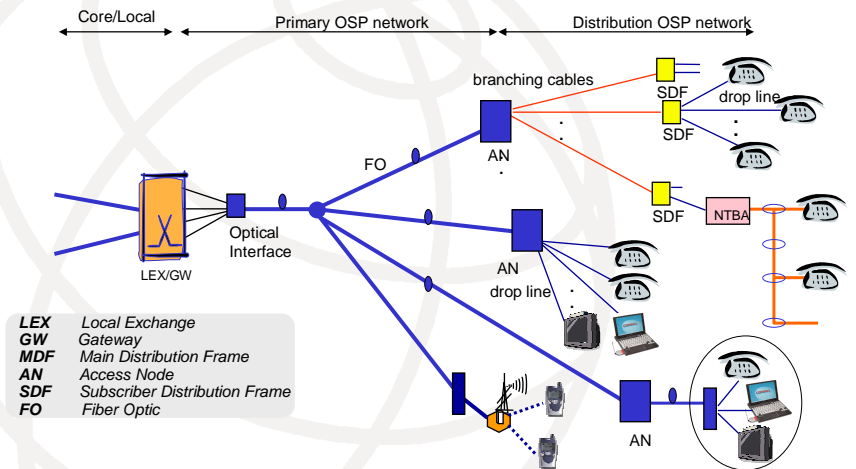
# Access Network Migration: Physical network today

## Structure of the OSP Access Network in most scenarios



# Access Network Migration: Physical network evolution

## Typical trend for Access Network infrastructure evolution



## Network Architecture towards NGN



### Architecture Consolidation: Access

#### Access dominated by physical infrastructure cost and deployment time

- Quick deployment of DSL and Multimedia Services
- FO closer to customer when implementing new outside plant or renovating existing one
- New Wireless technologies for low density customer scenarios
- Shorter LL length than classical network to be prepared for high bandwidth Multimedia services

## Topology migration: combined segments



### Where to start and how to co-ordinate migration?

#### Network “consolidation” for topology

Cost Optimisation of the network

- Reducing nodes and increase their capacity
- Deployment of ADSL and multiservice access

#### Network expansion

NGN solution :

- **Cap and Grow**; this means keeping the existing PSTN network as it is, and grow demand with NGN equipment

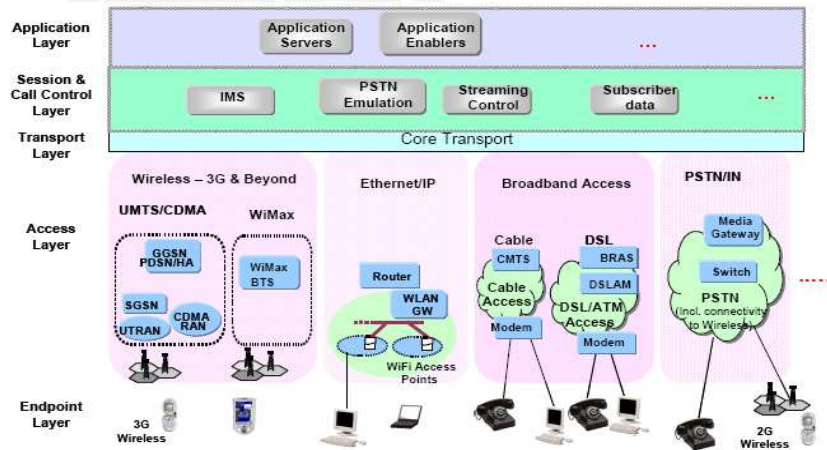
#### Network replacement

Replacement of out-phased (end of life) TDM equipment

- gradual replacement : this means **coexistence** of the two technologies
- full **accelerated replacement** with a short transition period

*Need to optimize overall network evolution: technically and economically*

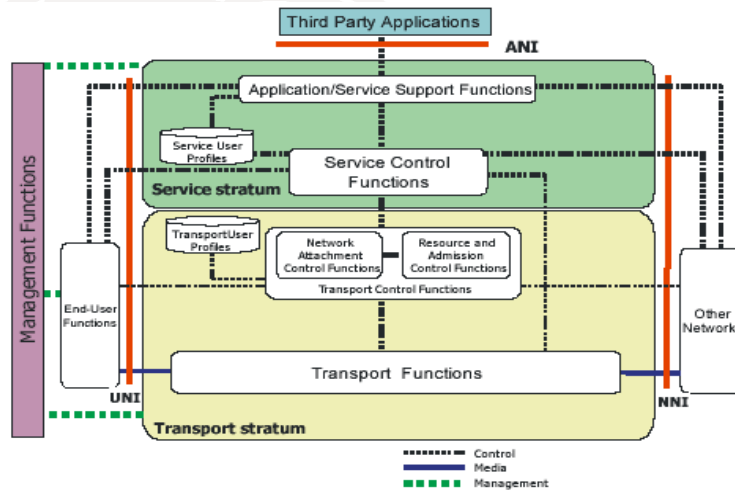
# Overall Network Structure Architecture at transition stage



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- Technology migration issues
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- Main steps for IMS and NGSS

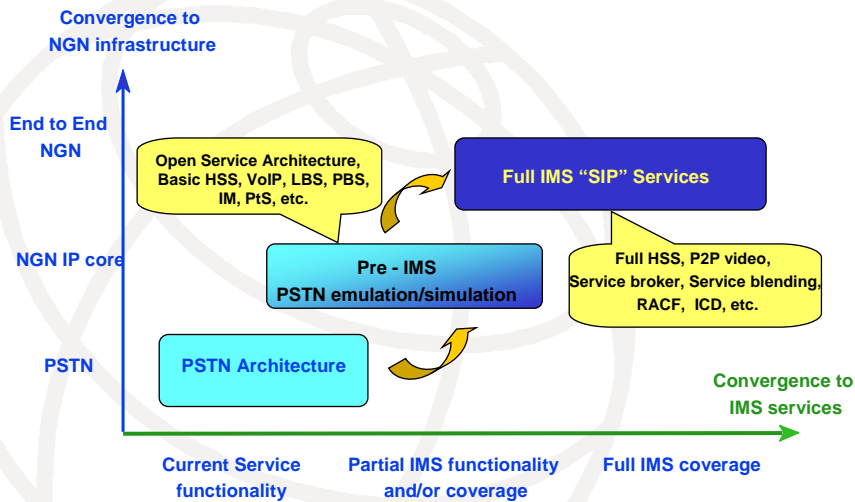
## Network Architecture towards NGN: IMS Architecture



## Network Architecture towards NGN: IMS Benefits

- **First advantage is the higher flexibility of the IMS functionality to adapt to the customer services**, irrespective of the technology they use and the access method to reach the network.
- **Saving in effort and time for the development and deployment** of a new service is considerably reduced once the architecture is ready at the network, implying economic savings and better Time to Market for a given service provider in a competitive market.
- **Efficient introduction on new services at a lower cost** will increase the service provider revenues and ARPU which is the major business driver for the healthy operation, market grow and financial results.
- **Higher utilization of services and better personalization** of functions to specific requirements from the end customers' point of view, a common use and feel for all services and applications

## Evolution to IMS: Phases



## Evolution to converged OSS/BSS: Classical requirements

Typical functions for the OSS and BSS imply a vast set of activities in current networks like:

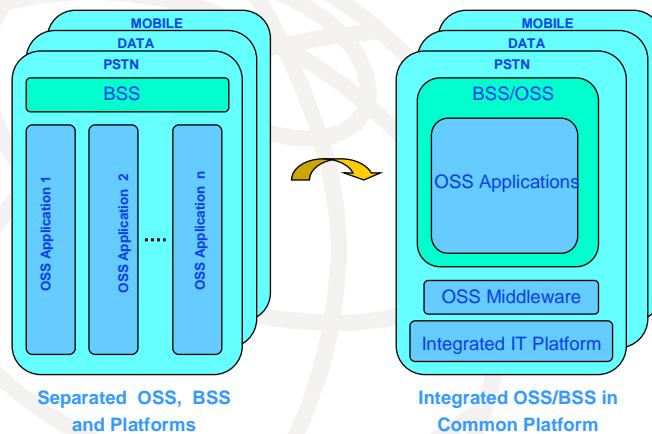
- Inventory management,
- Network engineering,
- Order management,
- Network elements supervision,
- Application monitoring,
- Traffic measurement and post processing,
- Capacity augmentation,
- Routing planning,
- Trouble ticketing,
- Repair management,
- Workforce management,
- Service activation,
- Service creation,
- Customer Relations Management (CRM),
- Rating,
- Billing,
- Invoicing,
- Performance supervision,
- Accounting management,
- Pricing agreements,
- SLA management
- Support to Marketing & Sales, etc

## Evolution to converged OSS/BSS: New requirements

- In addition to conventional typical functions, new requirements and higher relevance for existing tasks are needed in the NGN IP mode technology as follows:

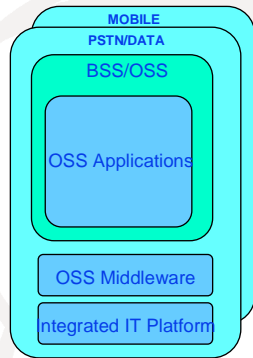
- Managing support to multimedia services with voice, data, video and multiple play
- Security policy management,
- Content management,
- Managing inter-domain operational activities
- Managing functionalities for the coexistence of legacy and new technologies
- Implementing new business procedures associated to bundled offers
- Manage multimedia/multiparty charging application
- Service Level Agreements (SLA) management,
- Service creation and upgrading management,
- Focus on common processes to all support functions and technologies

## Evolution to converged OSS/BSS: Phases



Migration from legacy support systems in vertical piles towards integrated OSS/BSS in an IT platform per network type

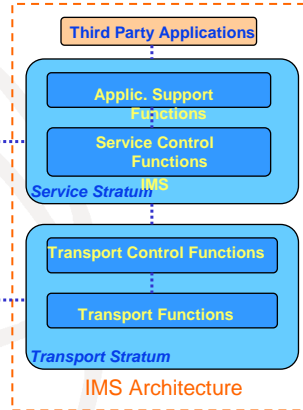
# Evolution to converged OSS/BSS: Phases



Integrated OSS/BSS in Common Platform

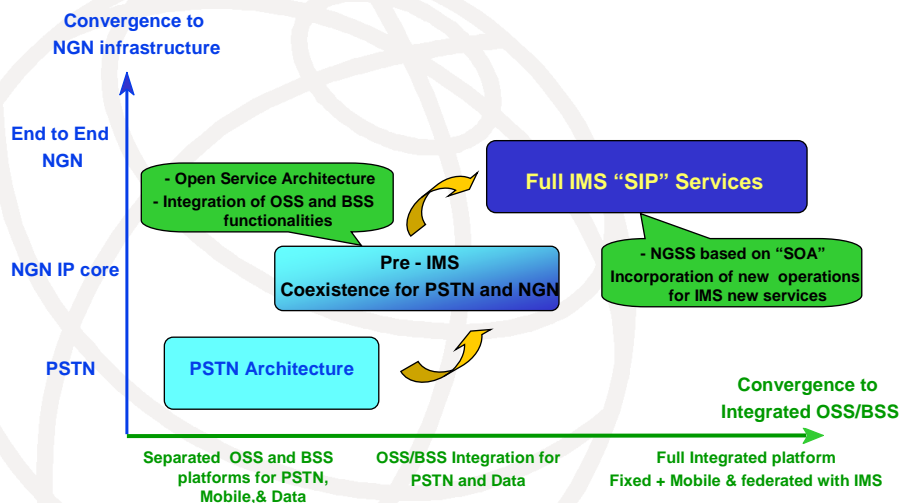


Full Integrated NGSS platform interworking with IMS



Migration from IT platforms per network type towards New Generation OSS/BSS for an NGN multiservice network with IMS functionality

# Matching evolution to NGN, IMS and NGSS





## NGN Migration Strategy: Conclusions



- **Network Topology migration** is the base for architecture modernization and requires overall design
- **Different timings** apply to 5 network areas: Core, Local/Edge, Services and OSS/BSS
- **Per country coordination** is required for Migration at each area