**ITU-D Regional Development Forums 2010 on NGN and Broadband (ARB, EUR & CIS Regions):**
***"NGN and Broadband, Opportunities and Challenges"***
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# Emerging trends in Infrastructure Sharing for faster Broadband Deployment

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1

## AGENDA

- Infrastructure Sharing- What, Why, How
- Passive and Active Sharing- Elements
- Six Degrees of Sharing – What and What Not
- India case Study-Mobile revolution by Sharing
- Innovative outsourcing- Managed Services
- Functional Separation- Unlocking the potential
- Interconnect Exchange- Sharing common resources

2

## What is Telecom Infrastructure?

- **Passive: Non- Electronic (Civil and Electrical) Elements**
- **Towers, Masts, Posts, Power System, Land , Building, Duct, Dark Fibre, Trenches, Air- conditioning, Co-location space etc.**
- **Active: Electronic Elements**
  - **Switches/Routers : TDM and IP based**
  - **Transport network**
    - **OFC- Long Distance Carrier**
    - **Wireless: M/W, Satellite, Anteenae**
  - **Access network**
    - **Copper: Local loop( Full, Partial, Bit-stream/ALA)**
    - **Fiber: Back Haul and FTTX**
    - **Wireless: BTS**
  - **Applications, Software, NMS**
  - **IN Platform, BSS, OSS, International Gateways, LIM**
  - **Spectrum**



3

## What to share?

- Any Element which has spare Capacity
- Any Element which can be Pooled
- Any Element which is a Bottleneck
  - *Passive Infrastructure*
  - Access Network
  - Carrier/Transport
  - Billing System, NMS, IN
  - Applications/Software
  - *Common interconnect points,Gateways, Spectrum*



4

# Why Share?

- Cost single biggest reason to share
- ☐ Developing countries seek to leverage mobile
- infrastructure boom into Broadband boom
- ☐ Developing countries also seek to build IP-based
- backbone and backhaul networks ( NGN),which has enormous extra capacity
- ☐ Developed countries seek to leverage fixed line
- investments and upgrade to Fibre to Home,
- Building or Curb
- ☐ Both share the same goal: to accelerate network
- deployment and growth by cutting costs

5

# How to facilitate Sharing?

- ☐ Share some infrastructure but still compete on
- Services ( Co-opetition)
- ☐ Requires political will and clear regulatory
- framework
- ☐ Many of the regulatory tools already exist in
- Interconnection regulations and Competition frameworks
- ☐ Can apply principles like Tower/Site sharing,
- Collocation, LLU,Bit-stream/Active Loop Access, Connection services to mobile, fibre
- Equal-Ease of Access to international gateway facilities
- And Finally Functional Separation

6

## Sharing-Time is Right, Now

- For many developing countries, end of
- exclusivity periods
- A second wave of regulatory reforms could
- be unleashed
- Sharing strategies could be central to the
- second wave of regulatory reform
- Phenomenal help in the Downturn times to become Recession-proof.

7

## 6 Degrees of Sharing- What it Is?

- Using infrastructure sharing
- together with Universal Access
- strategies within a competitive
- framework
- Reducing costs through efficient usage
- Allowing new players to provide
- services faster
- Relying on time-tested
- Competition and Regulatory principles
- Allowing markets to function
- Enabling Consumers to get services faster

8

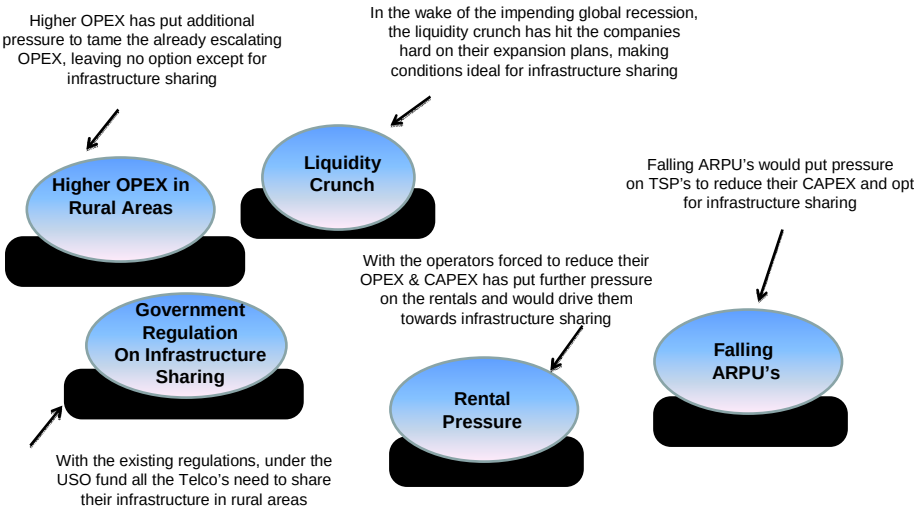
## 6 Degrees of Sharing- What it is not?

- An attempt to put infrastructure
- back in the hands of monopoly
- providers or to stifle
- competition (Sharing's not
- possible if there's only one
- player!)
- ☐ A strategy to lessen
- competition or to deploy less equipment

- ☐ About markets not working
- ☐ Limiting consumer choices
- ☐ A limit on facilities-based competition

9

## Current economic scenario creates further challenges… and better case for infrastructure sharing




10

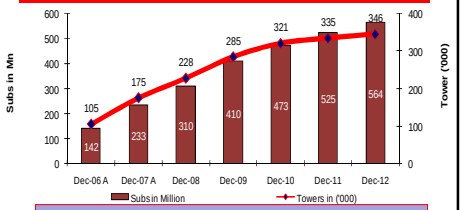
# Growth Drivers

## Factors driving Infrastructure Sharing

- Compelling economic value proposition
- Reduced time to market
- Plug and play offerings – connected network with backhaul
- Large geographical coverage requirements
- Heavy usage of voice services
- Allow the service provider to focus on their core competencies
- Pressure on strategic site's availability
- ***Infrastructure sharing likely to gain momentum with increasing competition and new entrants in market***
- Government support - Government's aim of narrowing the ***"digital divide"*** between rural and urban areas

***Expected CAPEX savings between US$7 Bn to US$12 Bn and additional OPEX savings of US$1 Bn, over four years for telecom operators on account of Infrastructure Sharing***

## Industry Forecast




***By 2012, approx no of towers-350,000 with tenancy ratio of 1.8-2.0 operators per tower***

**Demand for infrastructure sharing will rise due to:**

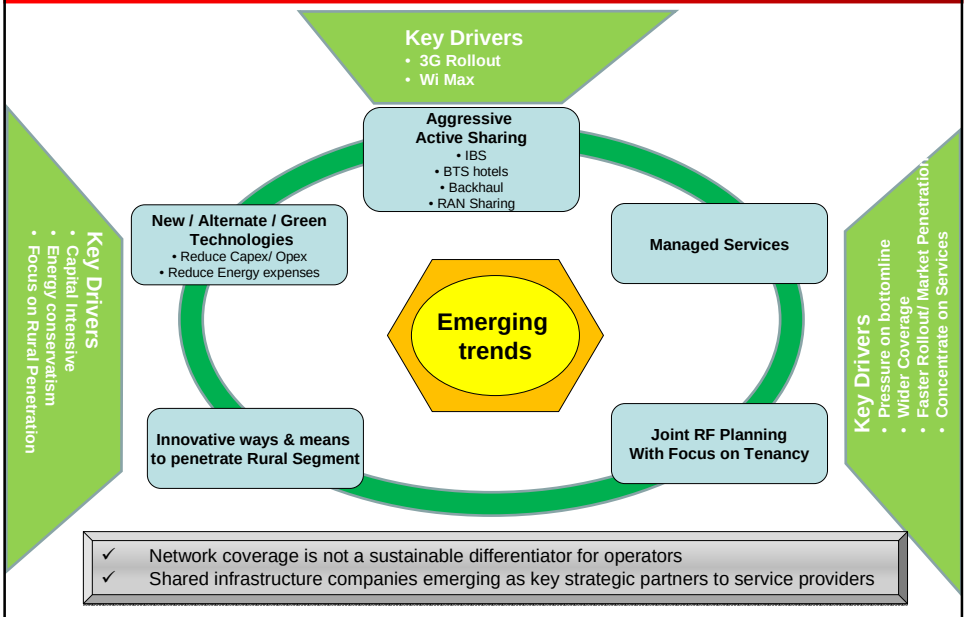
- Worsening credit conditions and recent surge in cost of capital
- Demand on account of new technologies such as 3G, Wi Max and Broadband Wireless
- Operators need to prioritize capital allocation

**A huge Industry in making- Minutes factories**

*Source: Broker research estimates; Ernst & Young analysis*



# Emerging trends in Sharing




✓ Network coverage is not a sustainable differentiator for operators
✓ Shared infrastructure companies emerging as key strategic partners to service providers

# Evolution of Infrastructure sharing in India

**Within a span of last 3-4 yrs the telecom infrastructure sharing has observed significant progress**

| | |
|---|---|
| **July 2005** | Quippo Telecom, a Tower company pioneers the passive infrastructure model. Signs up main mobile operators Bharati, Vodafone, Idea and Spice as its customers. |
| **July 2007** | Reliance Communication another operators hives off its tower unit and sells a 5% stake to investors in US, Europe and Asia valuing the business at about USD 6.75 bn |
| **December 2007** | Quippo Telecom acquires 988 towers from Spice in both its operating circles of Punjab and Karnataka |
| **December 2007** | Airtel, Vodafone & Idea cellular merge their tower assets in 16 telecom circles to form Indus. |
| **January 2008** | A group of overseas investors acquire a 9% stake for USD 1 bn in Bharti Infratel Limited ( Airtel tower unit) |
| **February 2008** | US based private equity company Kohlberg Kravis Roberts (KKR) invests USD 250 mn for a 2% stake in BIL |
| **January 2009** | Quippo Telecom acquires 49% stake along with management control in Tata Teleservices tower arm - WTTIL |
| **March 2009** | American Tower Corporation acquires Mumbai based Xcel Telecom established in 2006 with USD 500 mn funding commitment from Q investments |

13

# Service Providers' imperatives

| Investment | Operating Margins | Go-To-Market |
|---|---|---|
| • Cater to low ROIC but high rural population<br>• Spectrum scarcity vs. coverage; 3G rollout will require more towers<br>• Huge capacity in high MoU areas<br>• Increased share of passive in total capital expenditure | • Maintain operating margins despite falling tariffs<br>• Keep rentals low despite high demand<br>• Service rural population with high cost per subscriber | • Speed of deployment and time-to-market<br>• Enhance market share by access to larger base of towers and investment in network and product innovations |
| Capex savings :<br>US$7-12 b in 4 years | Opex savings:<br>US1b per annum | Focus on core areas to enhance market share |

***Source : E & Y analysis***

14

## Aggressive Active Sharing

- ✓ Next generation networks (3G+) likely to facilitate greater sharing
- ✓ New Usage by Subscribers - email, text messaging, web access, & media applications such as picture sharing, video viewing
- ✓ 3G antennas need to be installed on each tower and data equipment needs to be added in the common shelter beneath the tower
- ✓ Greater cell-site density is required for data-centric networks.

- Intra-circle roaming
- In Building Solution (IBS)
- BTS Hotels
- Backhaul Sharing

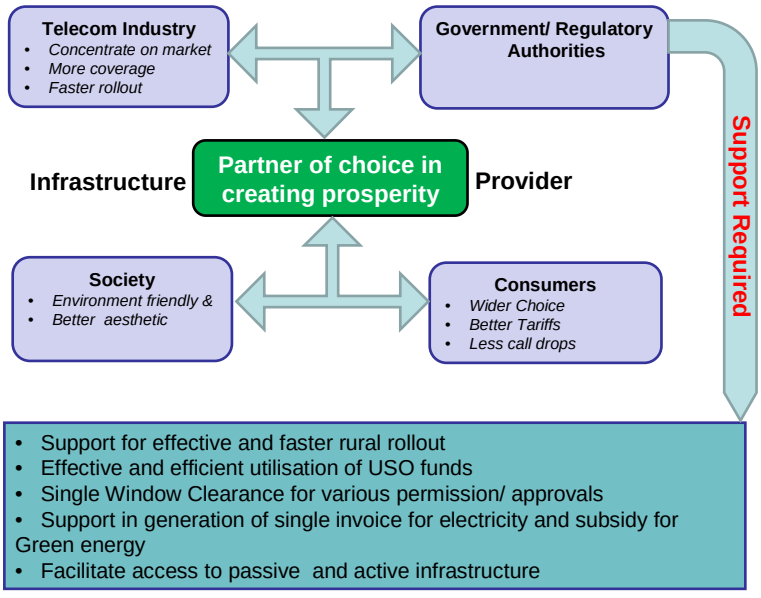
**Operators**
- Opex savings on both infrastructure and active equipment O&M
  - Opex savings per site (~30-35%)

**Infra Provider**
- Capex savings (25% ~40% per site) through leaner remote sites compared to full fledged tower sites
- Opportunity to attract incumbents and de-risk the tower business

**Target customers**
- Anchor customers on new sites
- Incumbents on existing and new sites

15

## Support Required from Government / Regulators




- Support for effective and faster rural rollout
- Effective and efficient utilisation of USO funds
- Single Window Clearance for various permission/ approvals
- Support in generation of single invoice for electricity and subsidy for Green energy
- Facilitate access to passive and active infrastructure

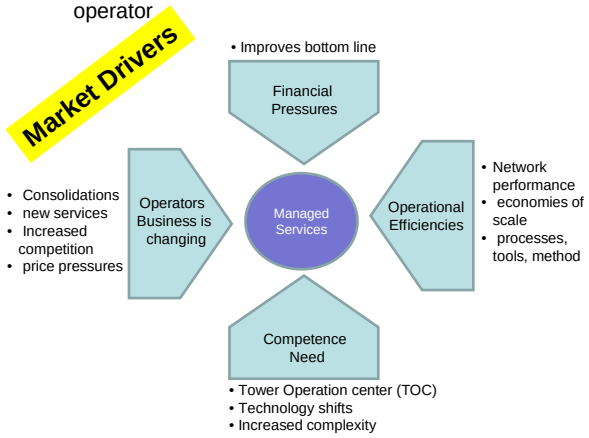
16

# Managed Services- Innovative Outsourcing

A Managed Service is provided by a service provider that takes on management responsibility for a function that has traditionally been carried out internally by a telecom operator

Managed Services **functions** typically include:

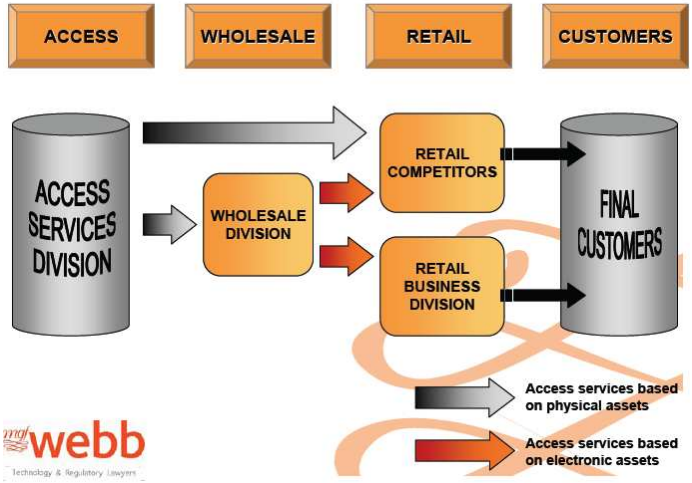
- **Plan and design** – planning, optimization and development.
- **Build** – technology integration and implementation of networks, services and business support systems.
- **Operate** – day-to-day operations such as operation and maintenance of networks, services and business support systems, field services, customer problem management including helpdesk, and service and resource fulfillment




Massive deployment of high-speed wireless networks throughout has opened up a new market for telecom outsourcing and managed services

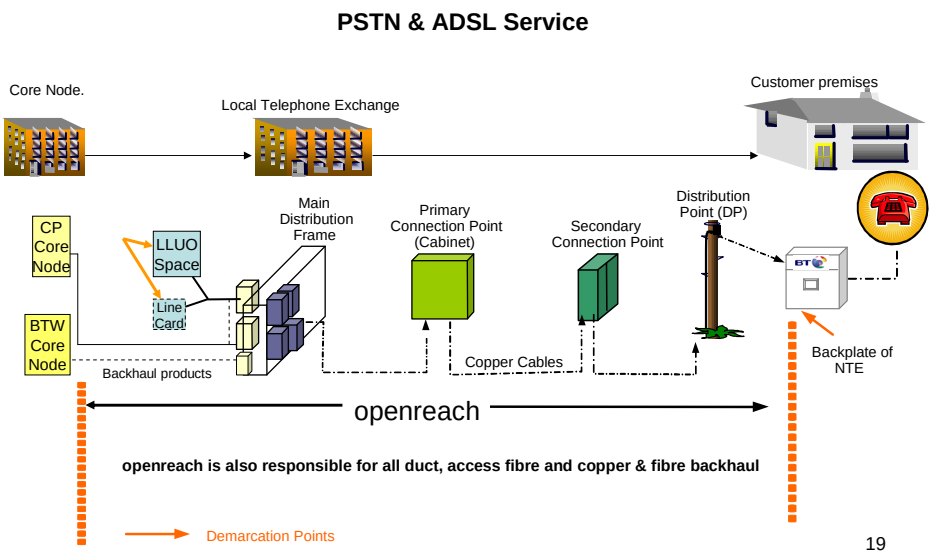
17

# Functional Separation – A Mandated Sharing Concept




18

## UK- Functional Separation ( BT-Openreach)

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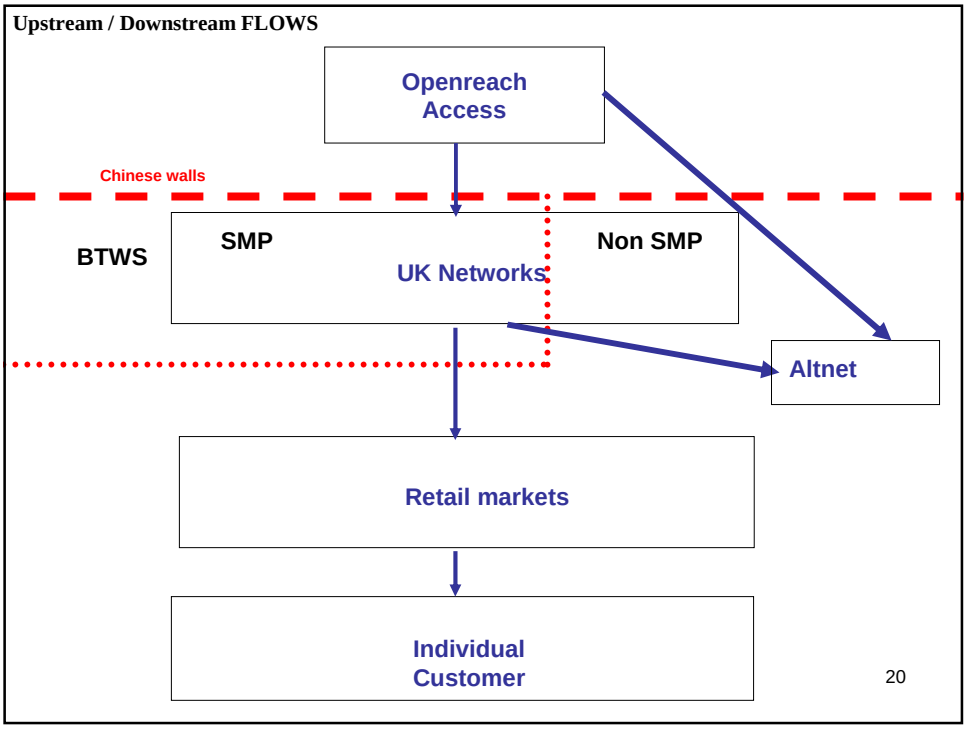
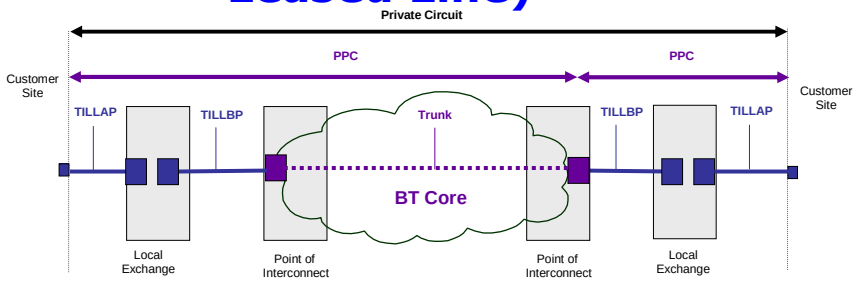



20

# Partial Private Circuit (Built-up Leased Line)




- **Retail PC Product**
- **Wholesale Provide**
  - **PPC Partial Private Circuit**
- **Openreach Provide**
  - **TILLAP and TILLBP**

21

# UK-Equality of Access

- **All services falling within the scope of Openreach will be offered to all on equal terms – *Equality of Input (*EoI).**
  - **EoI is the key concept of Openreach**
  - **EoI is more than *non discrimination*.**
  - **EoI means: *same* ordering system, *same* ability to influence, *same* prices, terms & conditions, *same* services and same access to commercial information.**
  - **It will guarantee *equal* access to the 'economic bottleneck' and drive further downstream competition in the UK.**
  - **It will focus the regulation where it is needed**
  - **It will allow 'investment ladder' to remain. More 'steps' and more evenly placed steps; in addition to nationwide coverage of the 'ladder'.**

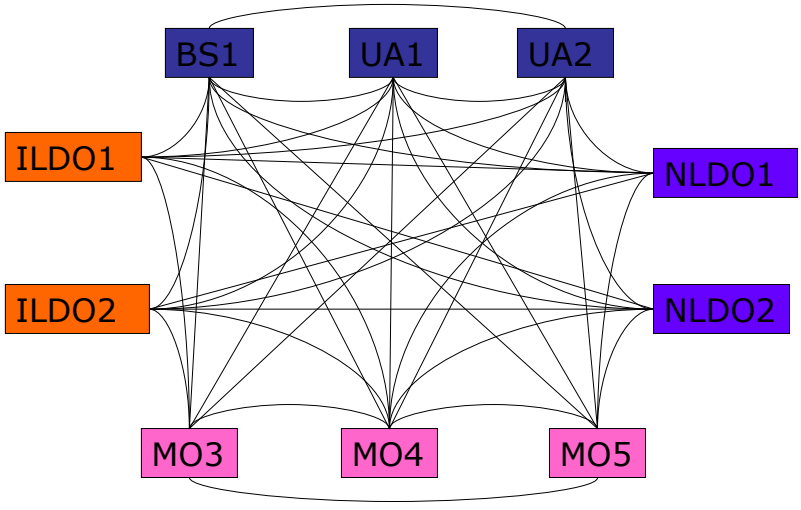
22

## Sharing of Interconnect resources

- **Separate Network for Basic/Mobile (Voice) and for Data**
- **Huge growth in Mobiles**
- **Increasing numbers of Application developers, Operators and Traffic**
- **Every Basic/Mobile operator to have interconnection with each other and with many NLD and ILD operators**

23

## Present Scenario contd.




24

## Results

- Sub-optimal utilization of resources
- Inefficient handling of calls
- High operational cost for managing inter operator connections
- Inter carrier billing problems
- Complexity in settlement in Interconnect usage charges
- Increase in CAPEX and OPEX

25

## Shortcomings

- High interconnection cost
- Connection at different levels and at many places Complex routing at every point
- Huge requirement of ports and their cost
- Physical provisions at different places causes delay and need more capacity

26

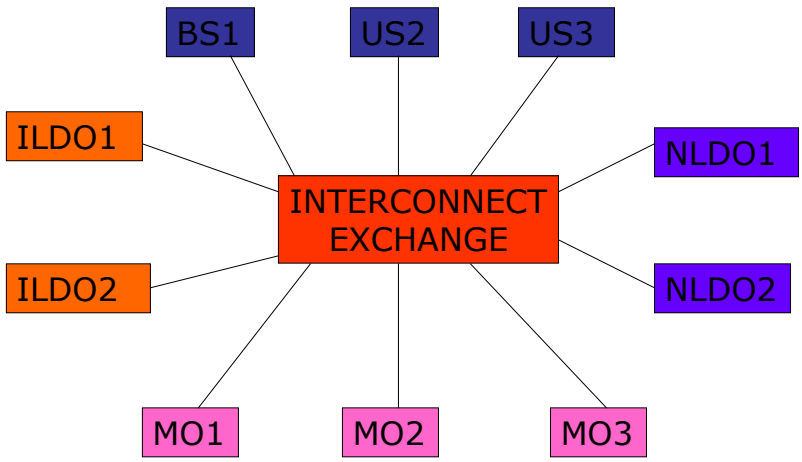
## Solution- IP based IX

- **Open and Distributedted Architecture**
- **Best breed of products**
- **Better Performance**
- **Required Quality of Service**
- **Efficiency in Inter- working**

***Thus NGN based interconnect Exchange (IP-IX) can be best solution for interconnection***

27

## Interconnect Exchange- Concept

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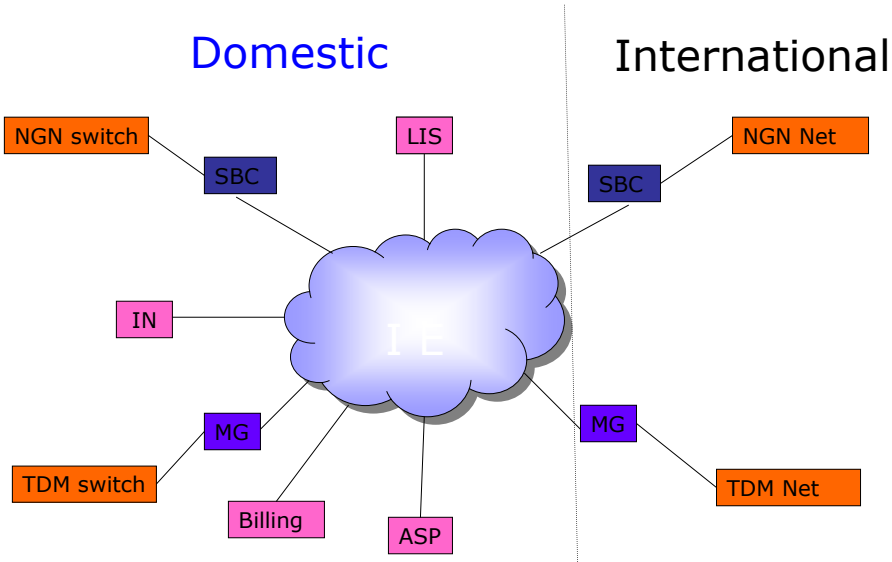


29

# Advantages

- **Network simplicity leads to reduction in interconnection cost and port charges**
  - **Simple network interconnection using GE or OFC as per ITU-T G.653**
  - **Reduction in number of links**
  - **Simplifies digit analysis for all inter operator and long distance calls from the switches connected to it**
- **Help in quadruple (Voice, Video, Mobile TV and data) play**
- **Less time consumption in provision/augmentation of PoIs**
- **Help in convergence of services, application and provisioning**

30

## Advantages contd

- Simplification in carrier selection function and Number Portability
- Integration of different service providers at one point
- FMC and Femto cell concept in multi operator environment in case of intra roaming, thus saving in spectrum
- Low latency
- Reduction in Capex and Opex

31

## Advantages contd

- Integrated and Inter carrier billing
  - Less connection: less disputes
  - Clearing house function
  - Inter operator charging, based on GOS, Content and network elements used in interconnection
- Intelligent network services
  - Easy provision in a multi operator and multi-service scenario
  - Content can be integrated at ICE and can be pooled to all the operators connected to it

32

## Who will do it?

- **Regulator and Licencor: Terms to be redefined with light touch approach**
- **All stake holders to come to-gather**
- **By incumbent operator or by other or separate independent operator**
- **Management : To be decided by all stake holders**

33

## Future- back to core competency towards minutes factory

- **Separate access providers: DSL, Wi-Fi, WiMAX, FTTX, GSM, CDMA etc**
- **Separate network providers**
- **Separate long/short distance connectivity providers**
- **Separate Infra: Tower, Power, BTS providers**
- **Separate Operation/ Billing system providers**
- **MVNO/ Virtual Operator concept**
- **3rd party VAS providers**

***Specialized entities will handle different segments, efficiently and in a cost effective expert manner***

34

# Thank You

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35