ITU RDF for Americas
NGN and Broadband- Opportunities and Challenges
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Emerging Trends in Infrastructure Sharing- Six Degrees of Sharing

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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
- Beyond Sharing- Managed Services
- Functional Separation- Unlocking the potential
- Interconnect Exchange- Sharing common resources

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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**



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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*


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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

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How to Share?

- ☐ 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, Cconnection services to mobile, fibre
- Equal-Ease of Access to international gateway facilities
- And Finally Functional Separation

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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
- Results could be phenomenal help in the Downturn times.

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6 Degrees of Sharing- What it Is?

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

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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**

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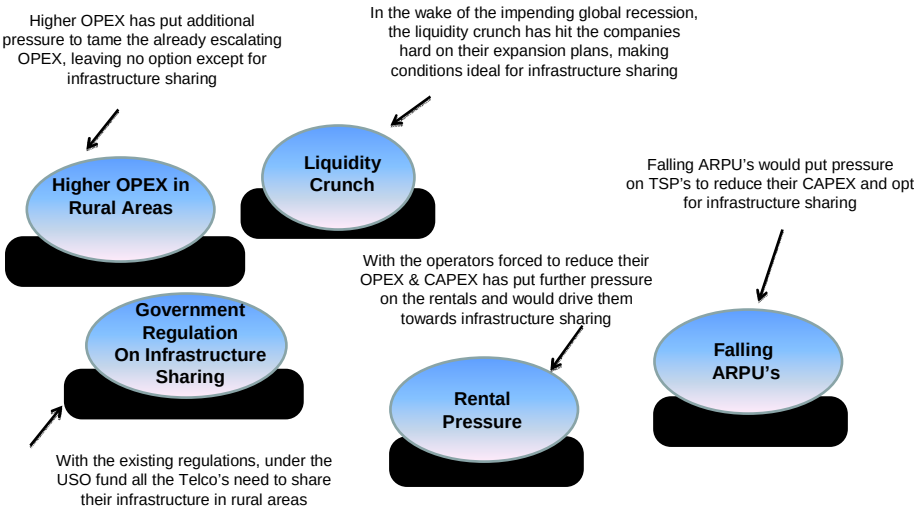
Current economic scenario creates further challenges… and better case for infrastructure sharing



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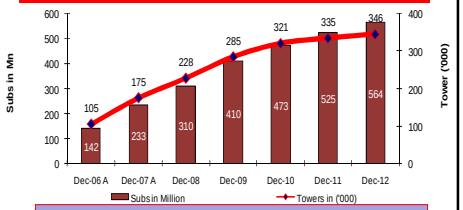
Growth Drivers

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

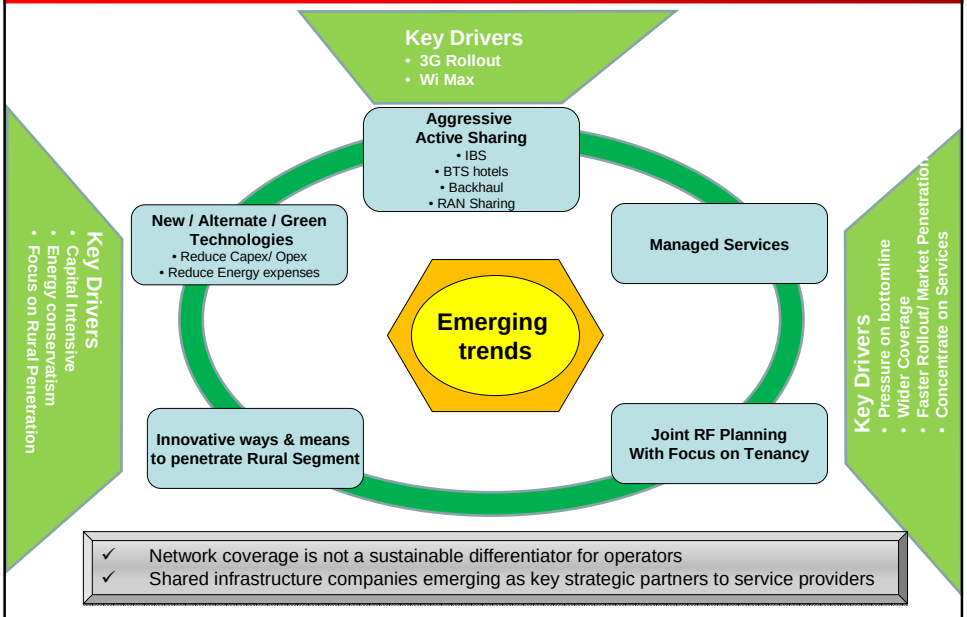
Demand for infrastructure sharing will rise due to:

- 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

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

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Service Providers' imperatives

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

Source : E & Y analysis

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Aggressive Active Sharing

- ✓ Next generation networks (3G) likely to facilitate greater sharing
- ✓ New Usages 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

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Support Required from Government / Regulators

Telecom Industry
- *Concentrate on market*
- *More coverage*
- *Faster rollout*

Government/ Regulatory Authorities

Infrastructure **Partner of choice in creating prosperity** **Provider**

Society
- *Environment friendly &*
- *Better aesthetic*

Consumers
- *Wider Choice*
- *Better Tariffs*
- *Less call drops*

Support Required

- 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, centralised invoice for electricity
- Facilities access to passive infrastructure

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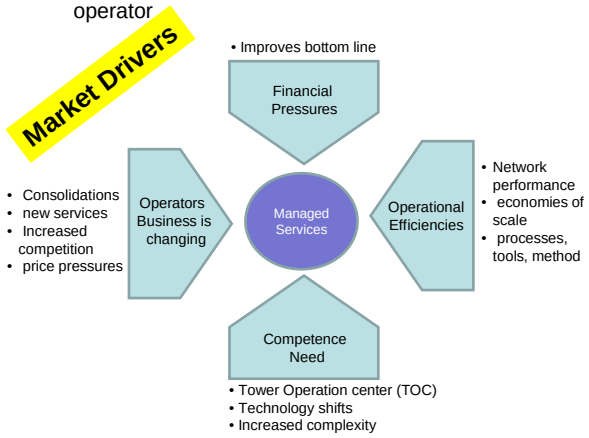
Managed Services- Outsourcing the Non-core

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

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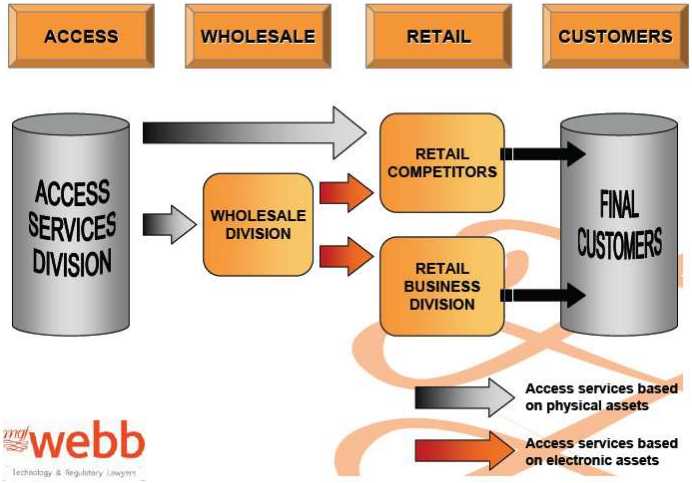
Functional Separation – A Mandated Sharing Concept



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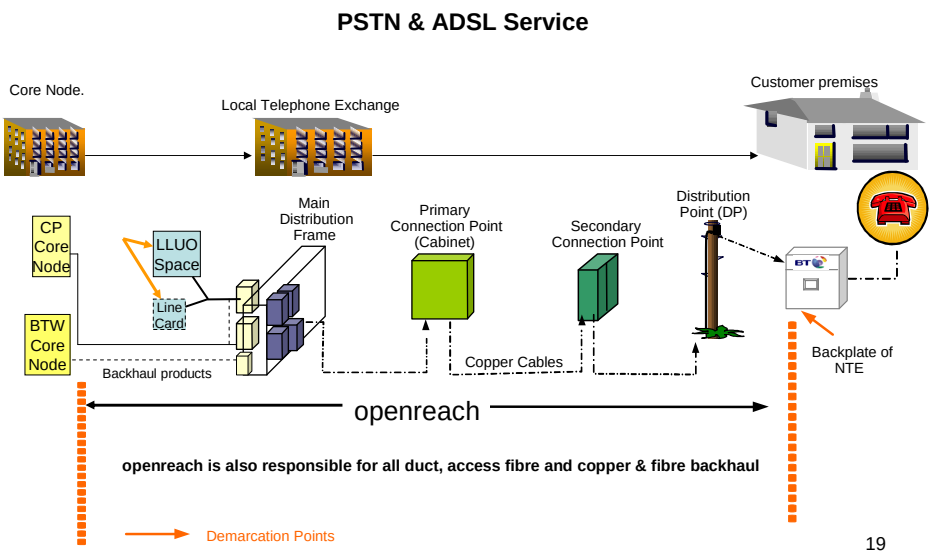
UK- Functional Separation (BT-Openreach)



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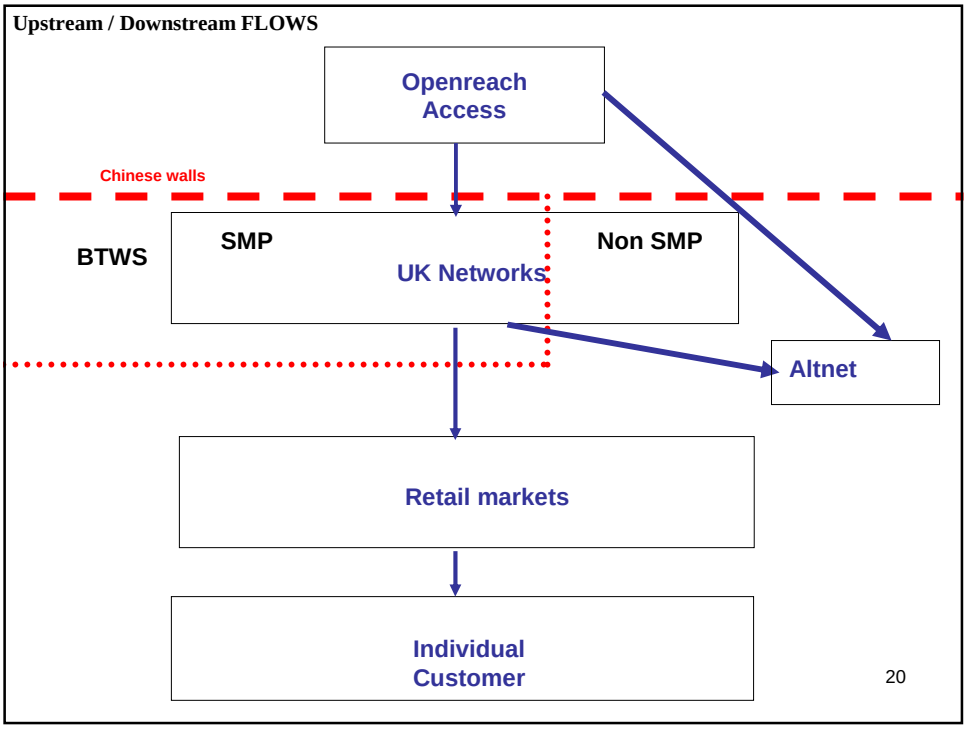

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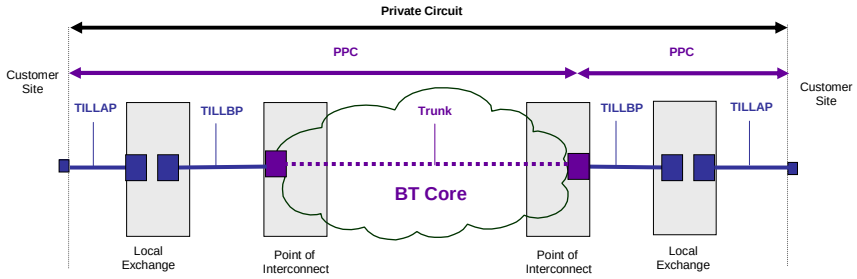
Private Circuit (Leased Line)



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

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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'.**

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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**

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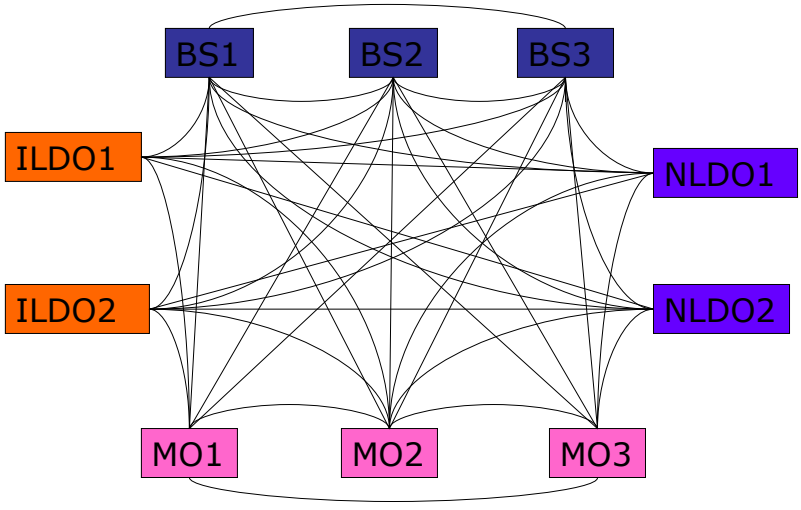
Present Scenario contd.



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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

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Challenges

- 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

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Solution- IP based IX

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

Thus NGN interconnect Exchanges (IX) can be best solution for interconnection

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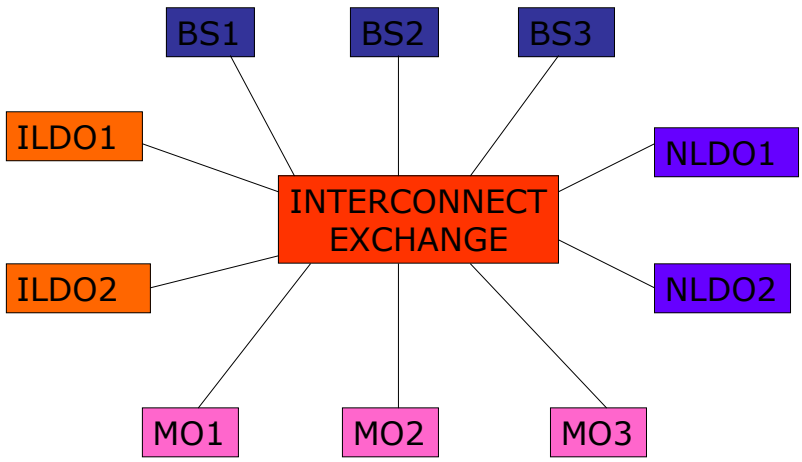
IP based Interconnect Exchange



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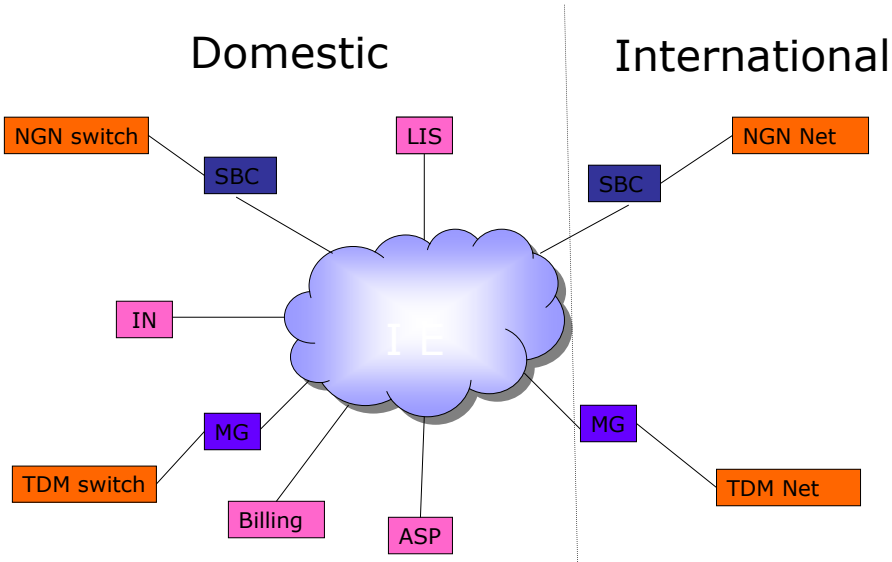

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Advantages

- **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**

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Advantages contd

- Simplification in carrier selection function
- 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

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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

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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**

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Future

- **Separate access providers: DSL, Wi-Fi, WiMAX, FTTX, GSM, CDMA etc**
- **Separate network provider**
- **Separate long/short distance connectivity providers**
- **Separate Infra: Tower, Power, BTS providers**
- **Perhaps Separate billing system providers**
- **MVNO/ Virtual Operator concept**

Specialized people will maintain different entities, conveniently and in a cheaper way

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Thank You

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