

A photograph of a man in a light-colored striped shirt and glasses, seen from the side, holding a blue marker and looking at a whiteboard. The whiteboard has some faint diagrams and lines drawn on it. The background is slightly blurred, showing a colorful abstract shape on the left.

## Evaluating options to support Future Mobile Broadband Networks

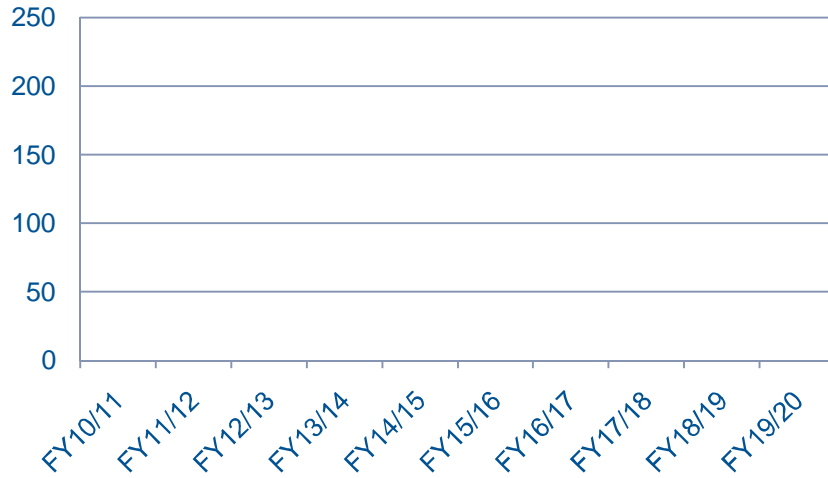
David Strongs

AWTG Seminar on Future Broadband Networks and Services:  
challenges and opportunities,

Dubai, 13th April 2010

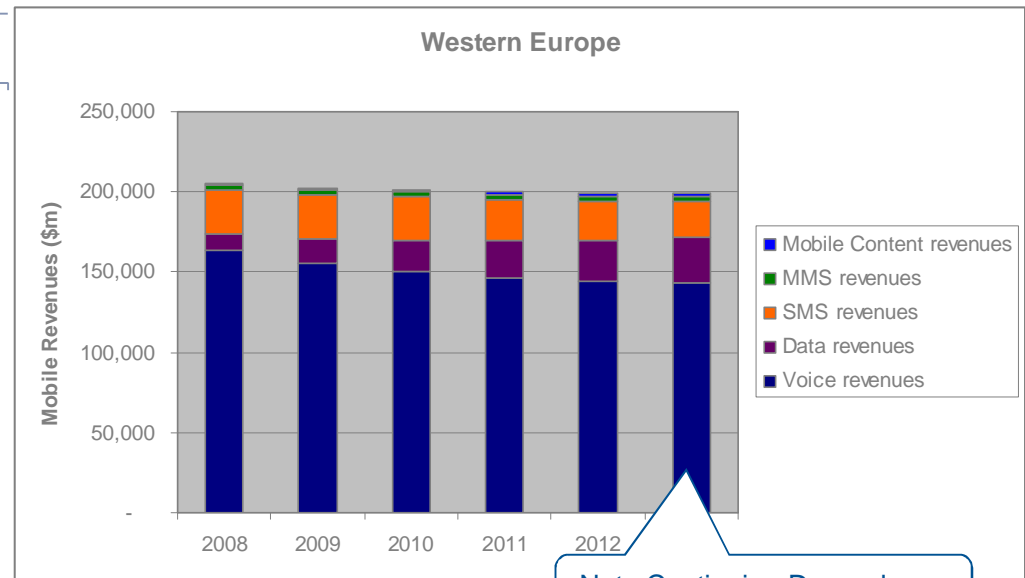
# Helping Deal with the Growth of Data Traffic

## Mobile capacity forecast (MB)



*Global mobile data traffic surpassed voice for the first time in December 2009 - expects worldwide data traffic to double annually over next five years.*  
 Source: Ericson

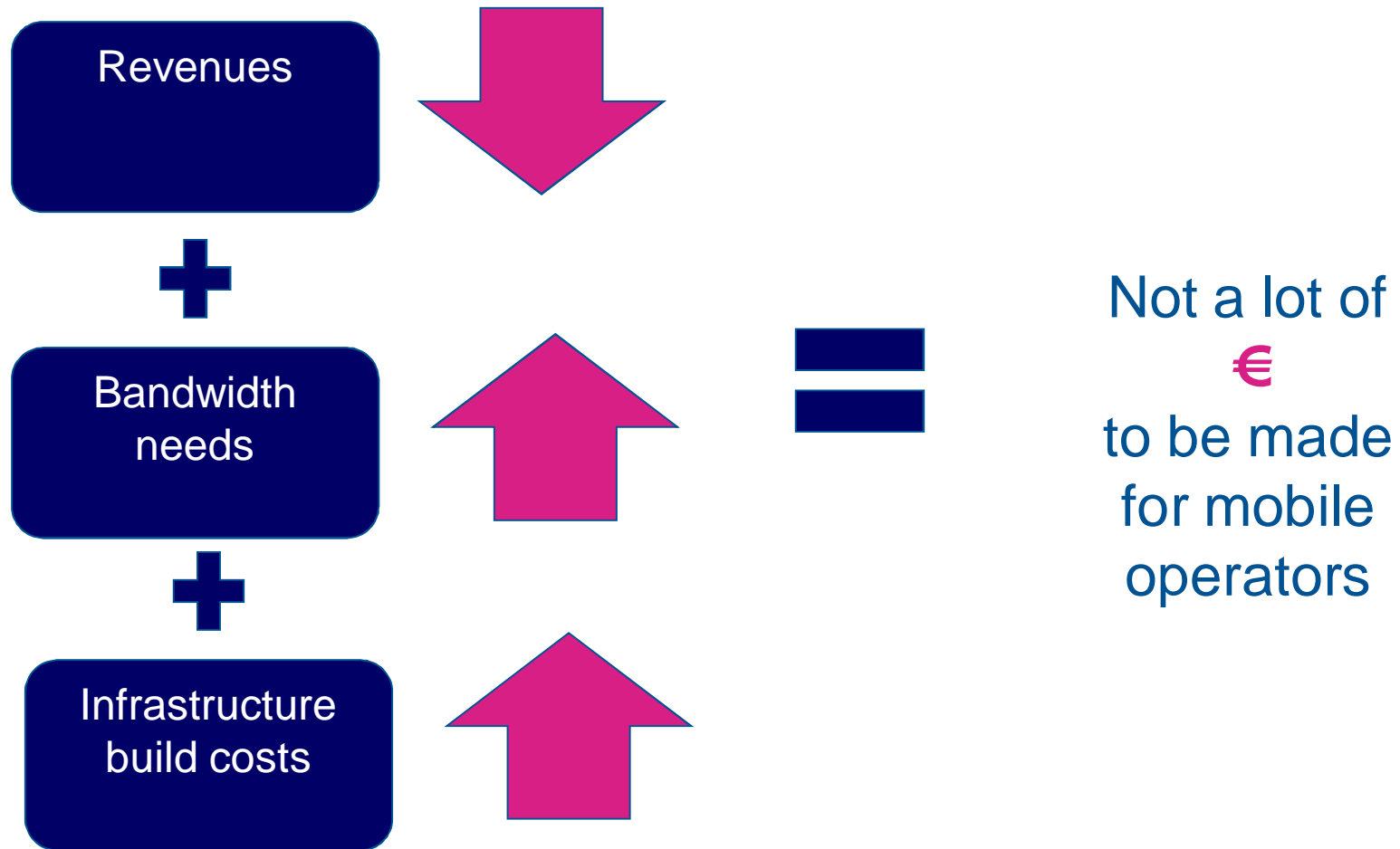
*Annual global IP Traffic will exceed half a zettabyte in four years and will nearly double every two years through 2012. The Internet in 2012 will be 75 times larger than it was in 2002.*  
 Source: Cisco



Note Continuing Dependence on Declining Voice

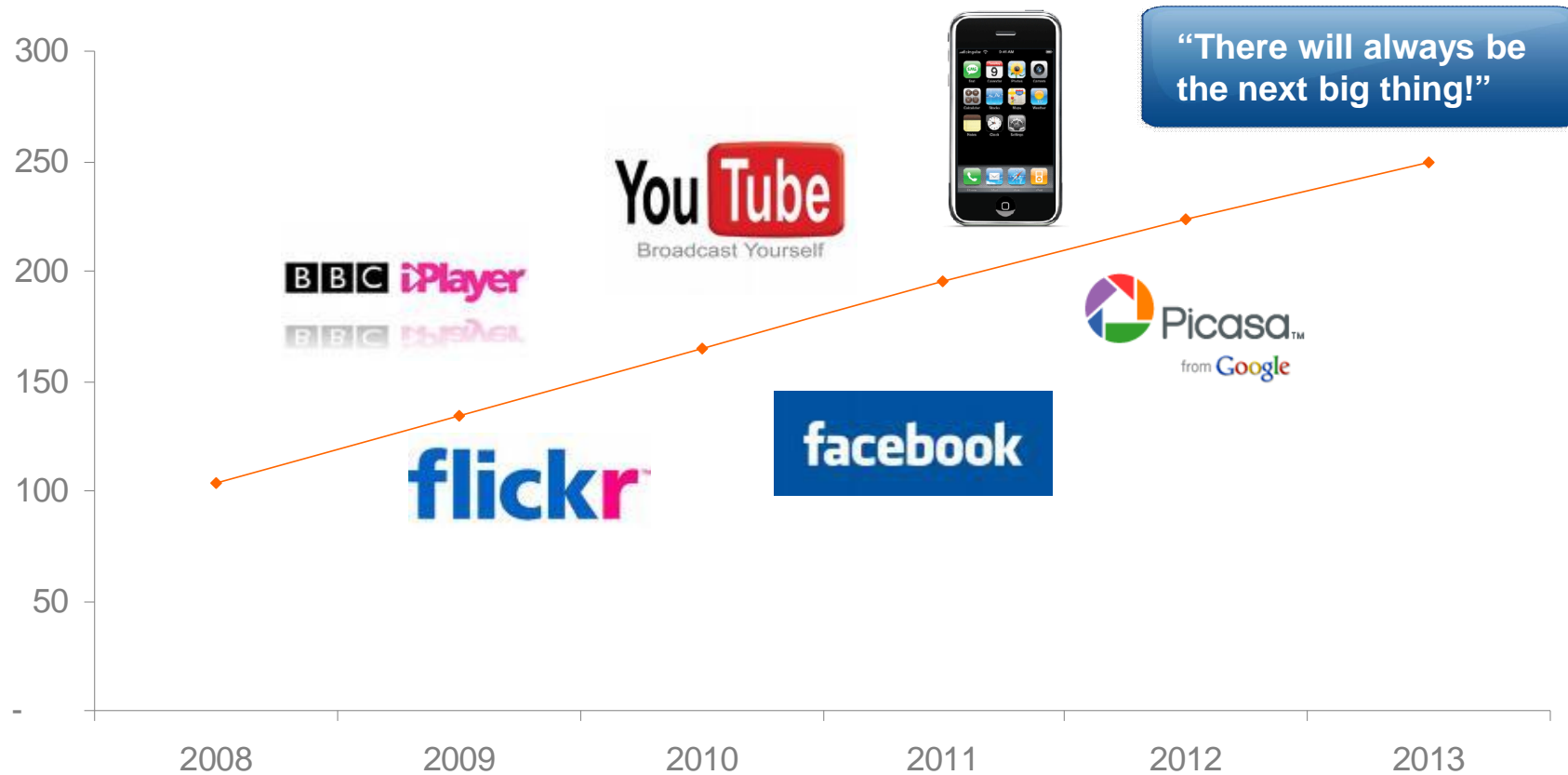
**Mobile Operators need flexible solution for these problems**

# The reality...



# Bandwidth Keeps Growing (no of Connections x Bandwidth)

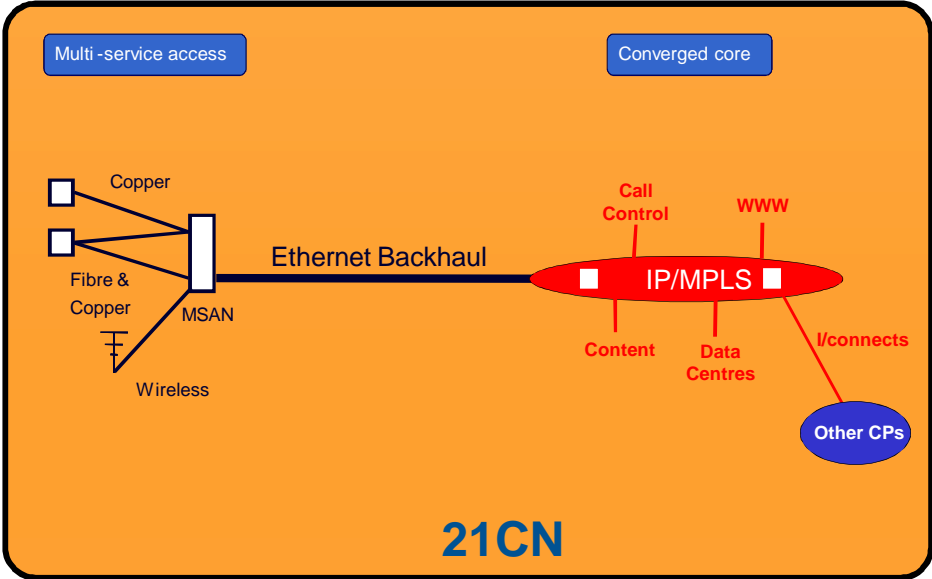
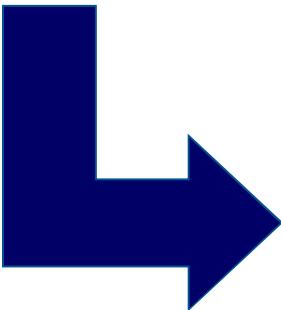
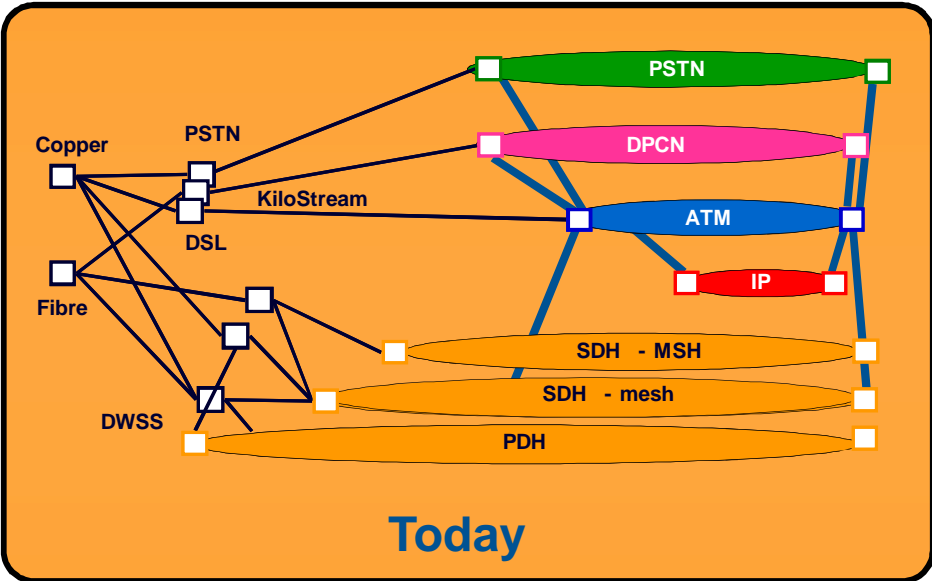
Total Mobile Data Connections (m) Source: IDC



# Fixed Network Experience – this is not new

- Original business model sustained by voice, particularly international
- Needed to offer broadband, particularly to retain customers and grow new revenues and then subsequently ramp up speed to remain competitive.
- Operating Legacy networks had large cost.

# Evolution to a converged packet infrastructure



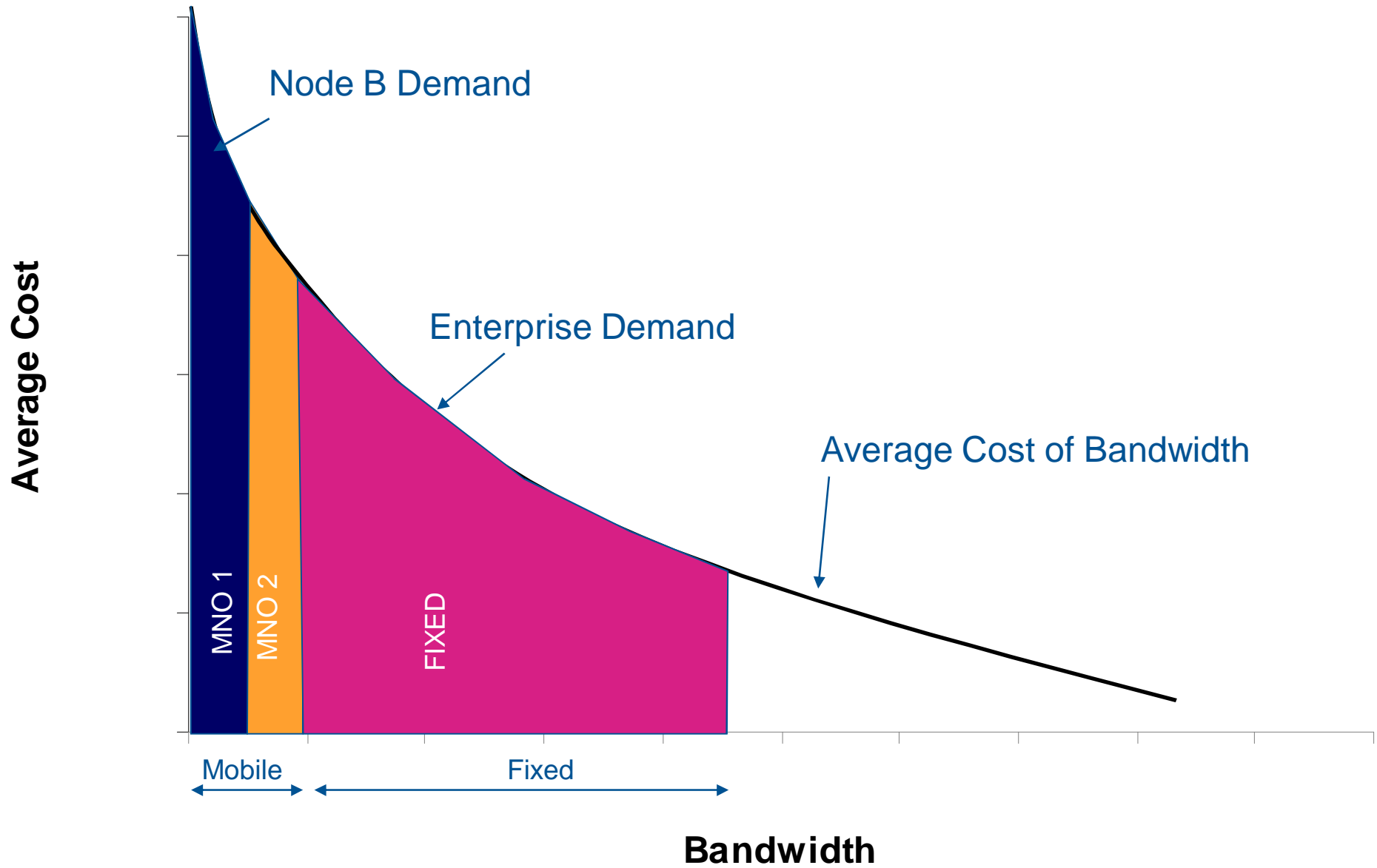
■ Substantial network simplification



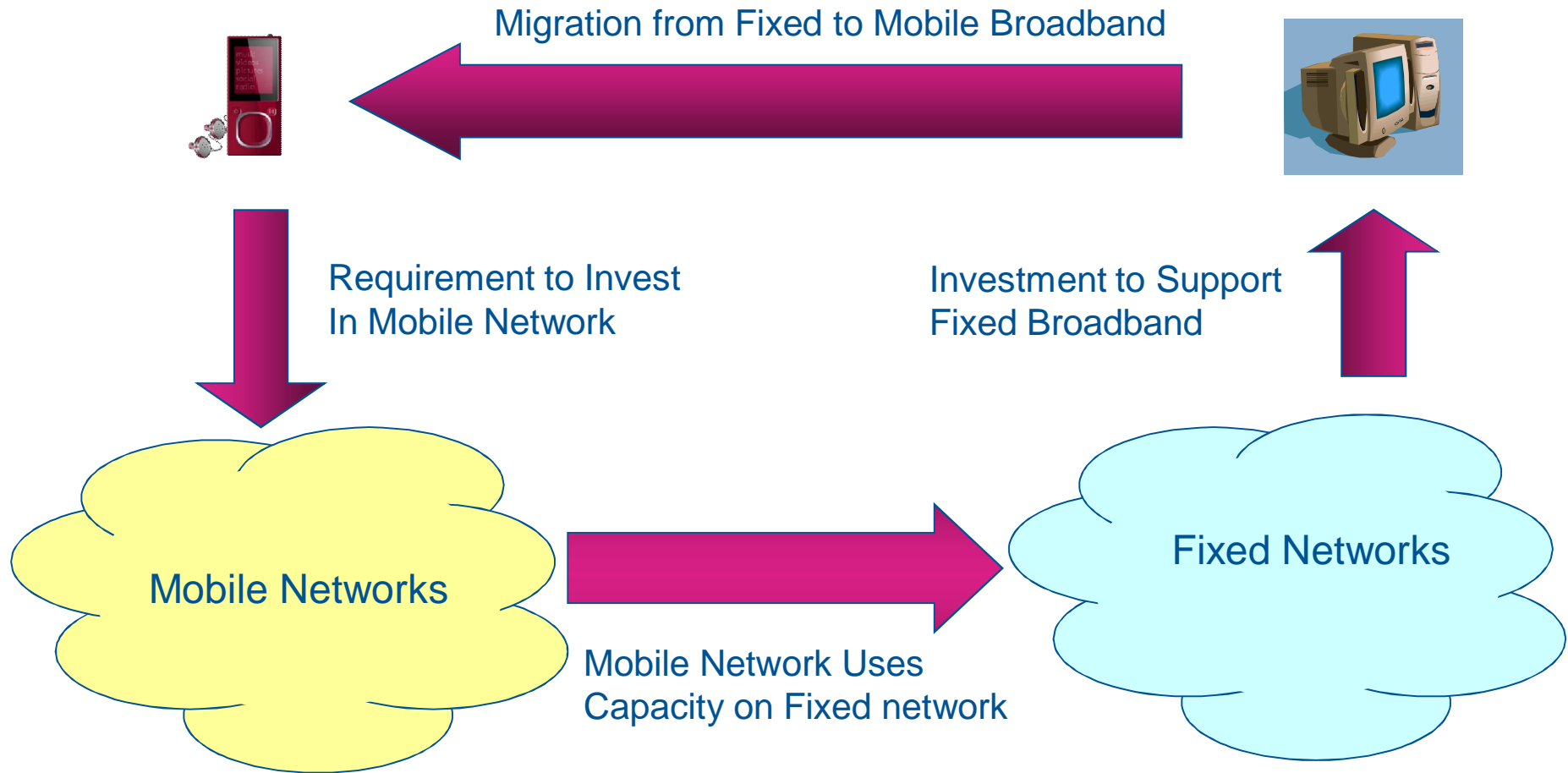
# So what?

- Fixed operators have seen this before and have made investments in their core transport networks.
- **Mobile operators shouldn't need to replicate this**
- Fixed network operators are already investing in their metro/access networks
- **Mobile operators shouldn't need to replicate this**
- **Mobile and fixed operators can gain greater economies of scope and scale partnering with fixed networks, than mobile operators working alone or bilaterally with one another.**

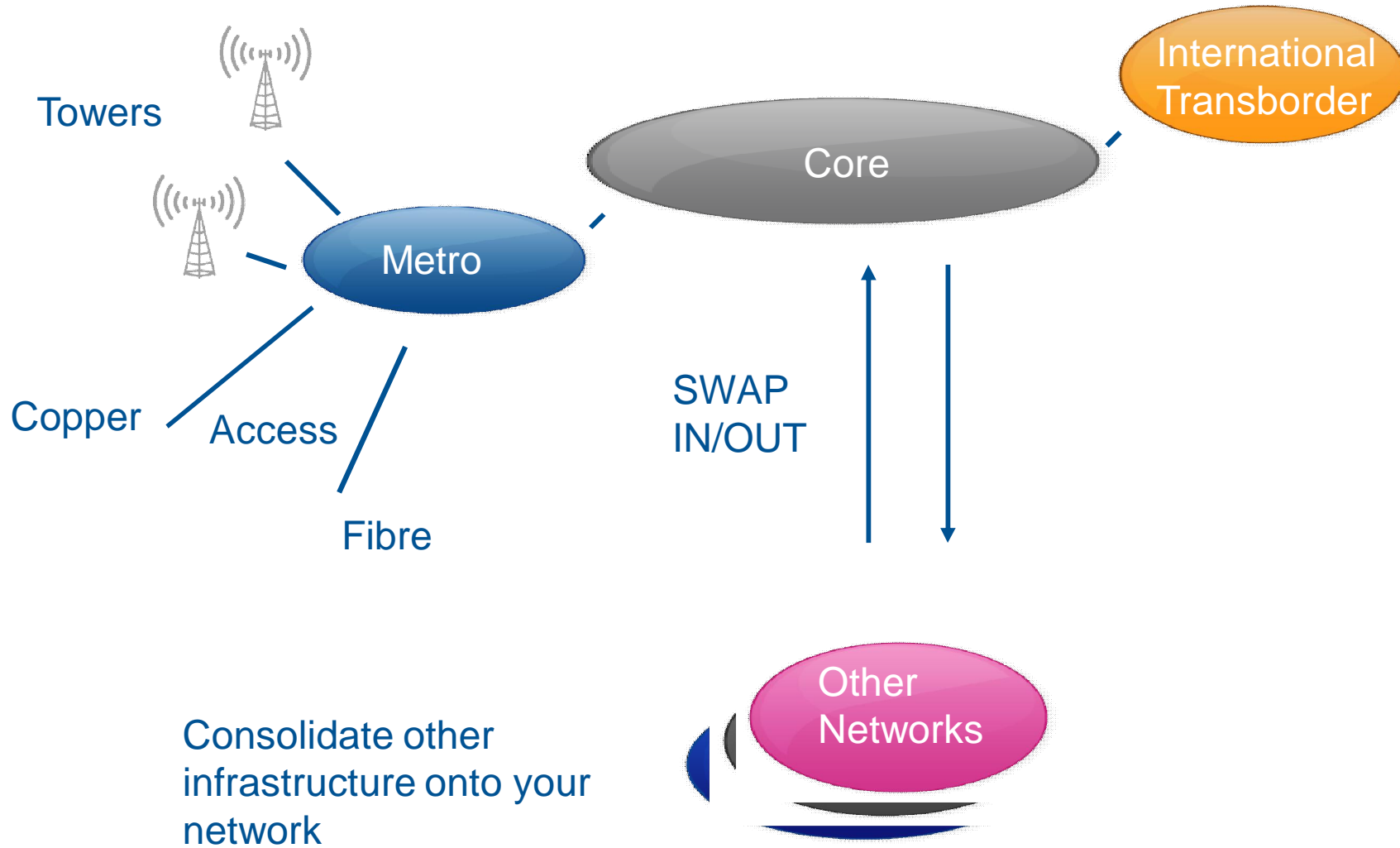
Economics of fibre favour sharing not just with mobile, but with fixed too...



# Fixed network can help mobile networks as substitution takes place

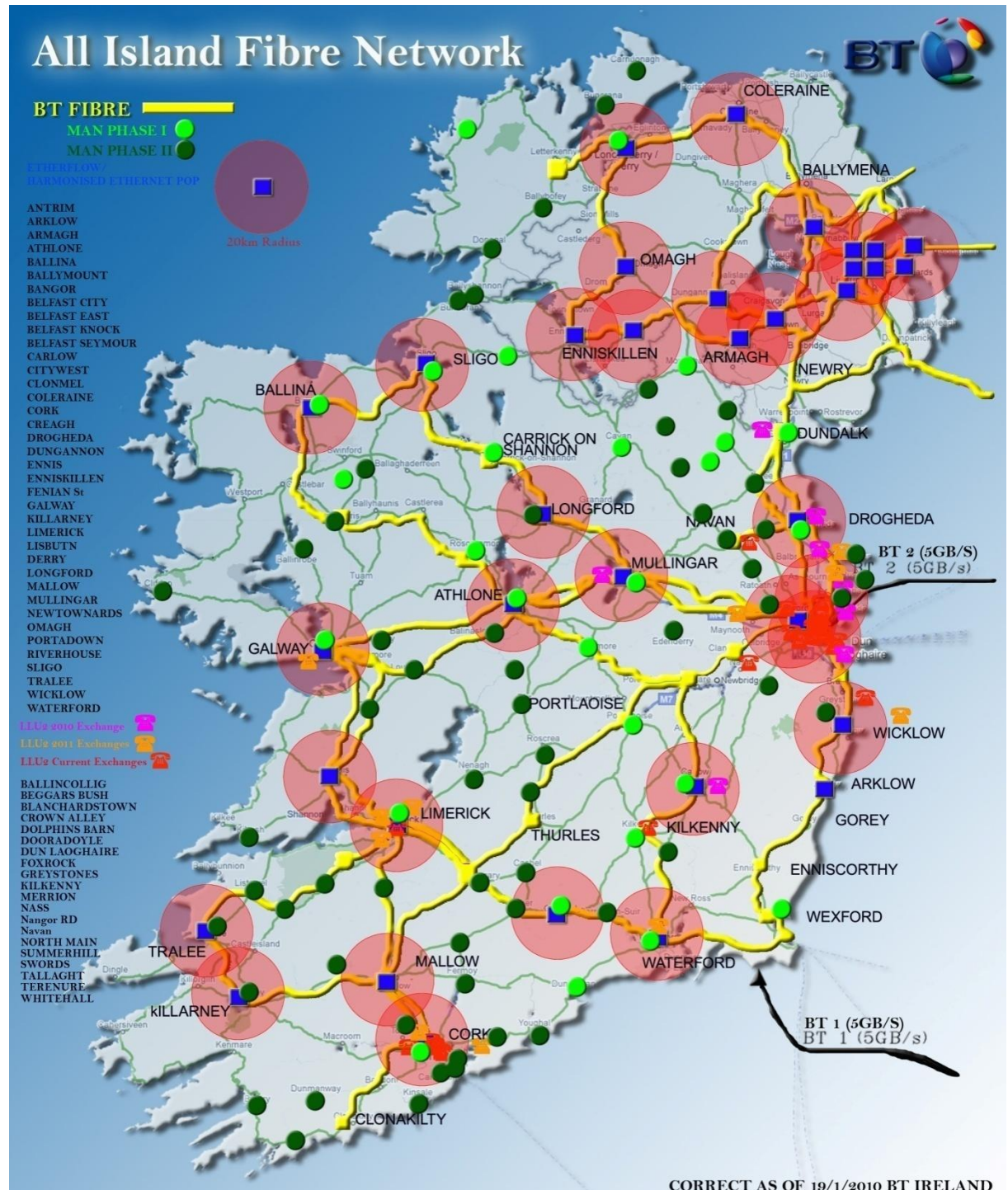


# All elements of infrastructure can be considered



## BT's investment in our 21CN

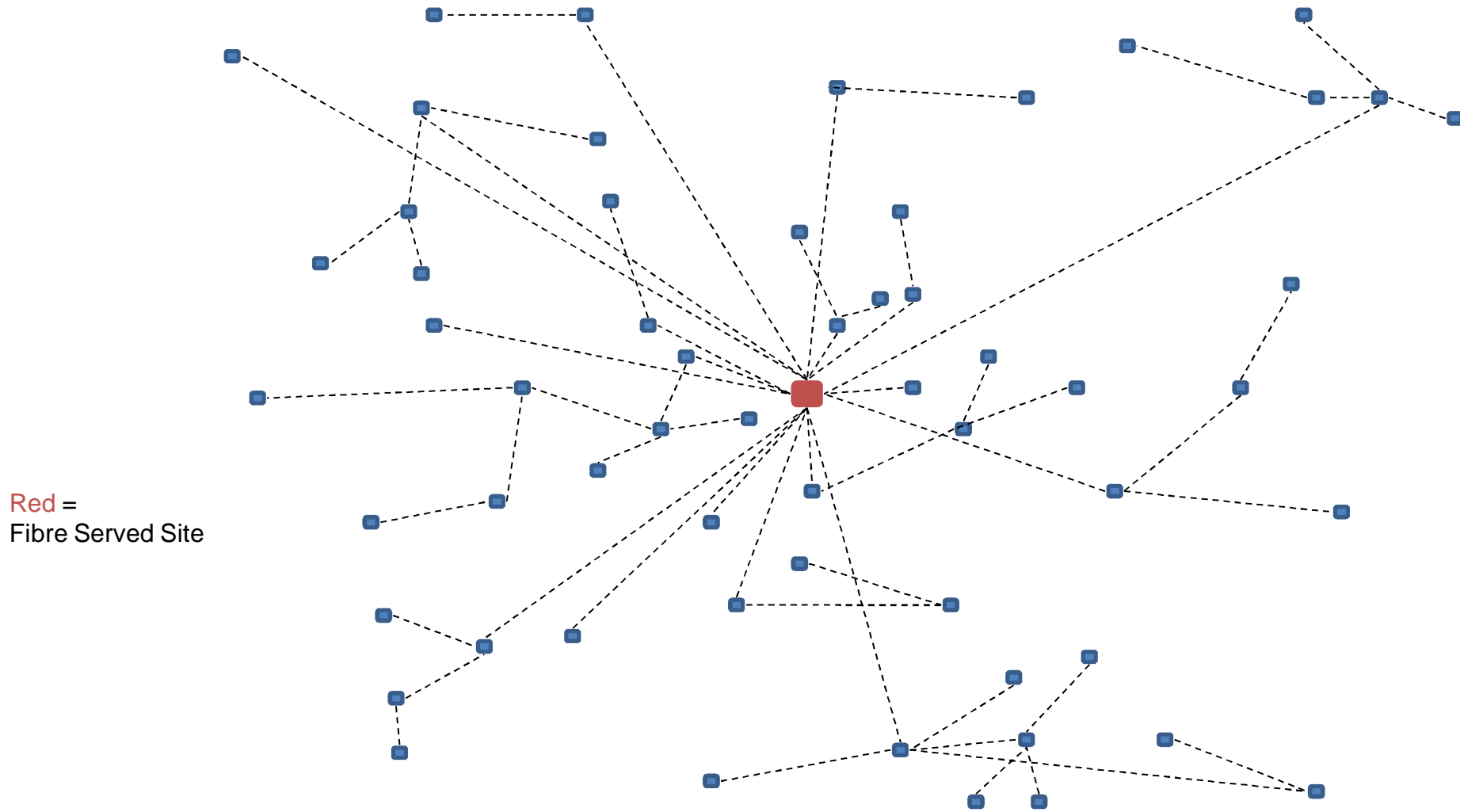
- Ongoing fibre investment
- Rol network contains over 5,300km of Fibre optic cable
- DWDM resilient ring architecture
- NGN Etherflow PoPs in Rol and NI
- Opportunity to combine with other operators to extend fibre reach



## Evolution from THS Model for BT Total Transmission

- Ethernet Radio limit of ~300MB in practice
- Evolution to max of 2 Hops per fibre node
- Maximise the fibre footprint

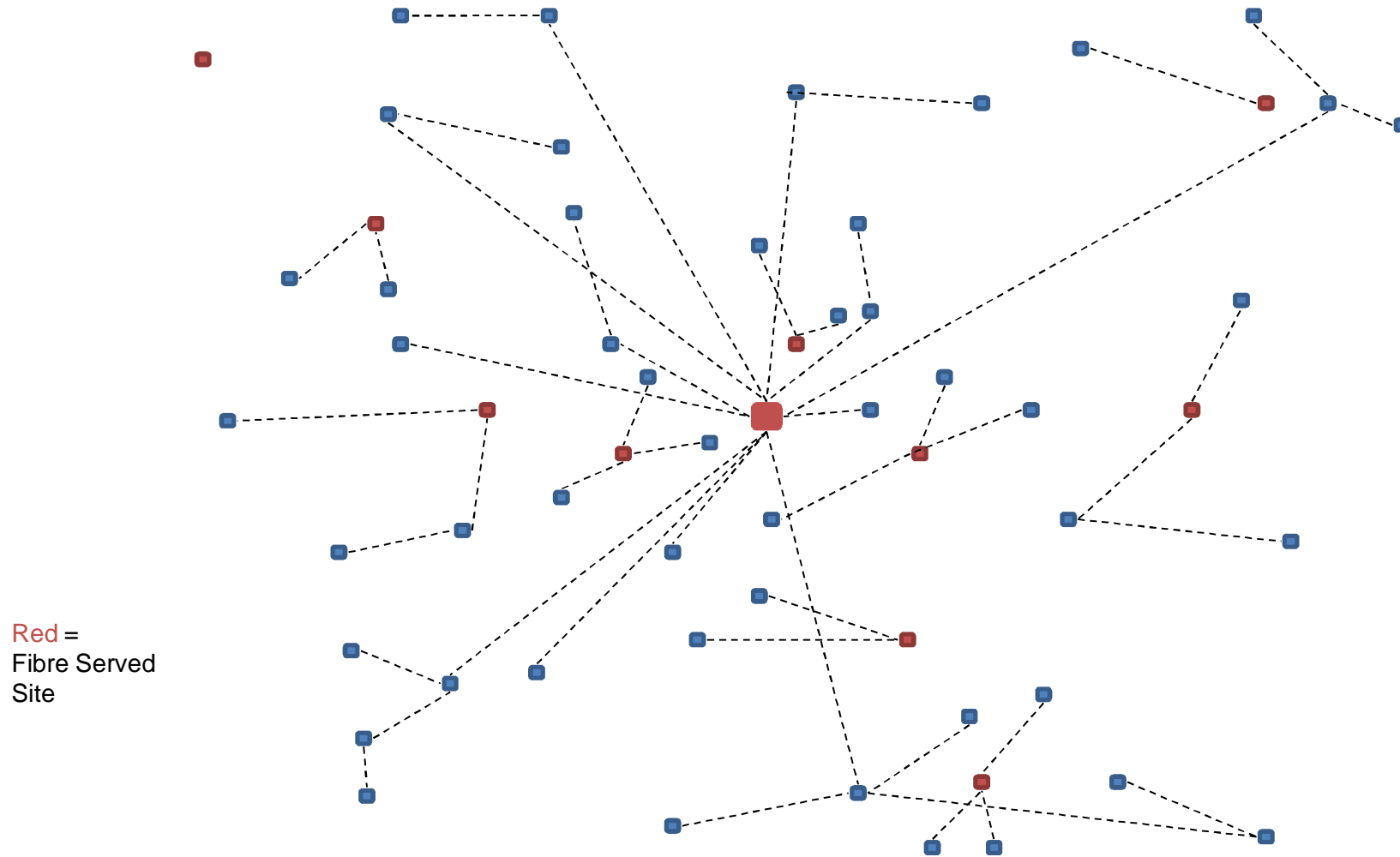
# A large THS with Microwave backhaul today



Red =  
Fibre Served Site

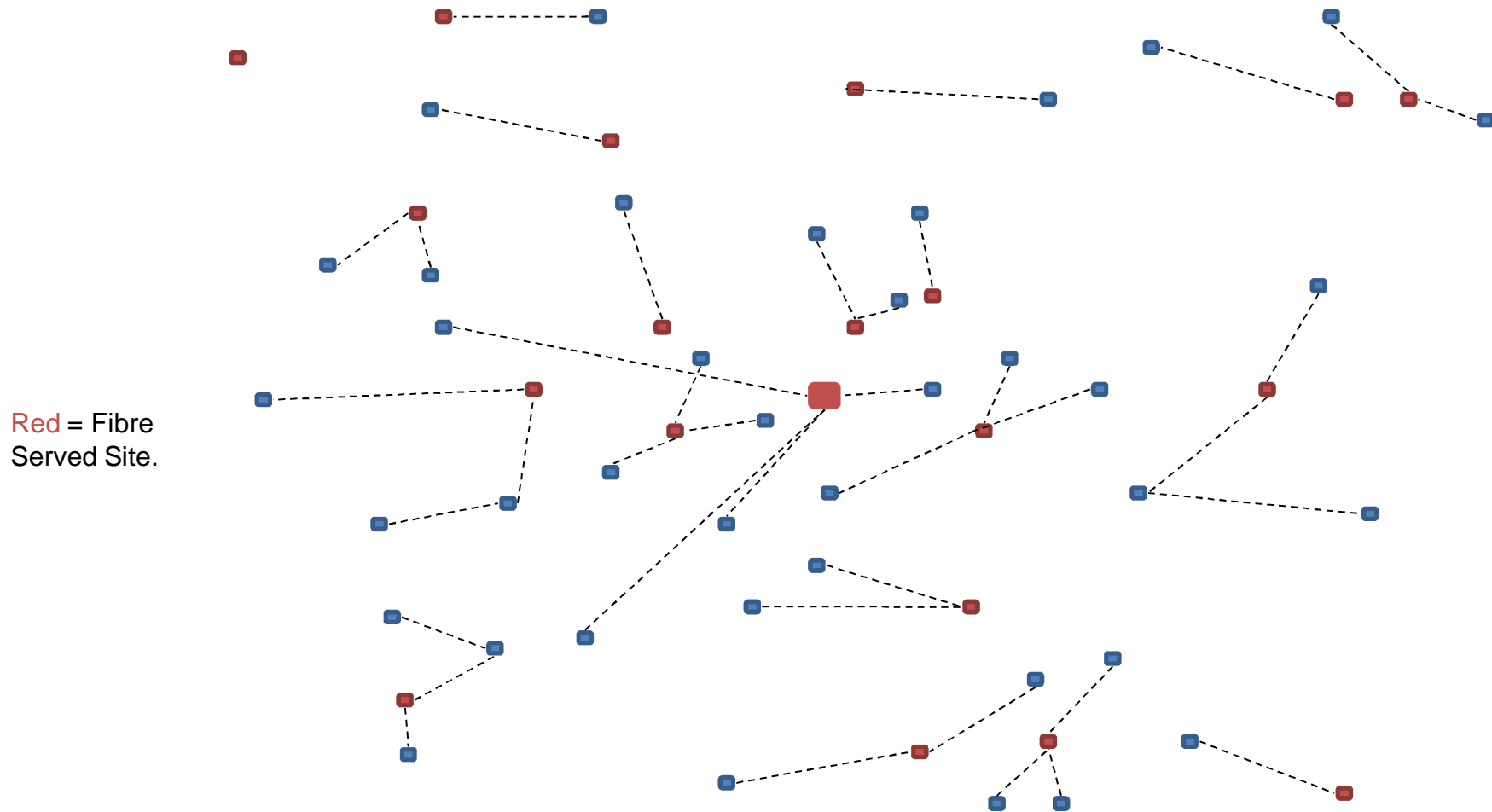
***It is clearly not possible to simply upgrade the hub at such a site to very high bandwidths – the microwave chains would simply exhaust if upgraded to Ethernet speeds.***

# Large hub partial offload (to fibre)



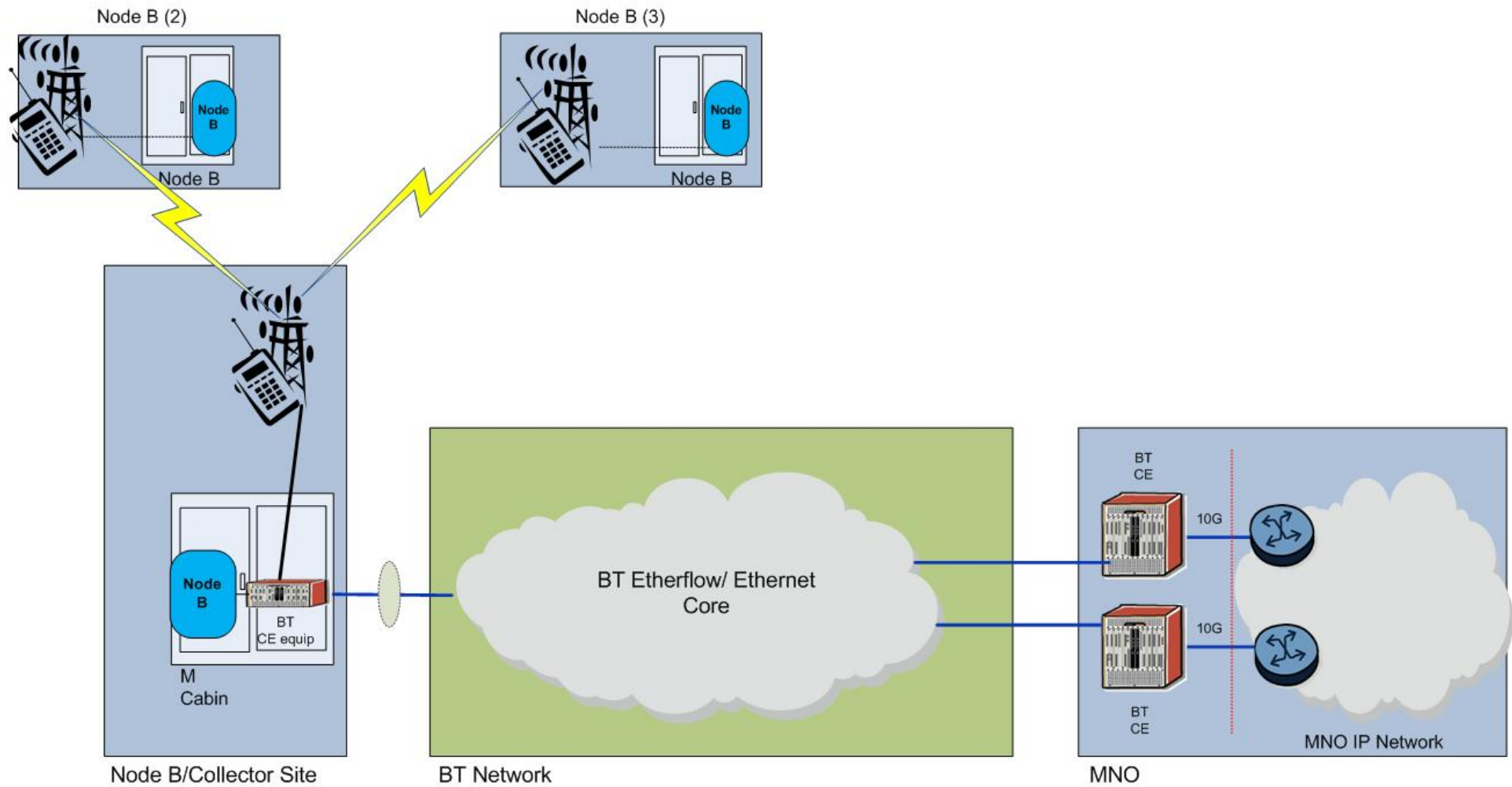
Red =  
Fibre Served  
Site

# Large hub substantial offload



*2 hop maximum over radio, in some geographies may be cost effective to replace microwave 100% with Ethernet over fibre*

# High Level Design for a Fibre collector site



# Carrier Ethernet Standards and Challenges

- QoS and traffic differentiation
- Interoperability
- Synchronisation options and support for Legacy services
  - Migration to Synch-E?
  - Support for 1588v2?
  - Out of Band synch options
- IP routing and traffic optimisation
- Flat pricing and supply of an ubiquitous utility network

## Experience Using BT's Infrastructure for Mobile Operators

### New Managed Network Solutions (MNS) agreement for both Vodafone and O2



- Five year managed access agreement
- Deploys 21CN Ethernet service to connect UK base stations to their core national network
- Offers backhaul speeds of up to 60 Mbit/s
- Ideal solution for O2 and Vodafone as this provides a cost-effective and scalable solution for bandwidth-heavy mobile applications

# The way forward

- The growth of low margin data means that the status quo cannot continue
- Fixed operators have already experienced this and have made their investments
- Work closely with fixed operators to find ways in which you can ride on their incremental network economics and use the infrastructure they have already invested in
- Look creatively at ways in which you can hand investing in 4G and running masts, antennas and infrastructure to another neutral party, rather than trying to strike bilateral deals with other MNOs - it may be more efficient
- We can help find opportunities to do this outside, as well as leveraging solutions in UK and Ireland.

THANK YOU