

# Wireless Local Loops and NGNs

PUBLIC

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# Our Broadband Wireless Experience

TelstraClear has substantial experience in Wireless Local Loop:

- Spread Spectrum Radio base stations in Auckland Hamilton Tauranga Rotorua Napier Christchurch delivering High Speed Internet access to 350 customers. Maximum customers per base station - 50: then escalating customers complaints
- LMDS base stations in Penrose and Whangarei providing multiple voice lines to larger customers: 70 customers total
- Digital Microwave links nationally for high bandwidth customers - 200
- Now deploying latest 3.5 GHz wireless technology

# TelstraClear Broadband WLL

In the later part of 2002 10 WLL vendors were evaluated (including similar wireless technology to Woosh's)

Only 2 were suitable for SME market from a technical and commercial viewpoint

Recent deployments of Alvarion WLL in Auckland and Rotorua Napier, Dunedin and Nelson networks are under construction

Initial rollout is for Alvarion V3 with downstream capacity of 16 Mbs per base station or 400 lines per base station. The mix of services per CPE unit is 4 voice, 1 data

Upgrade from Jan 04 to V4 with downstream capacity of 32 Mbs per base station or 800 lines per base station

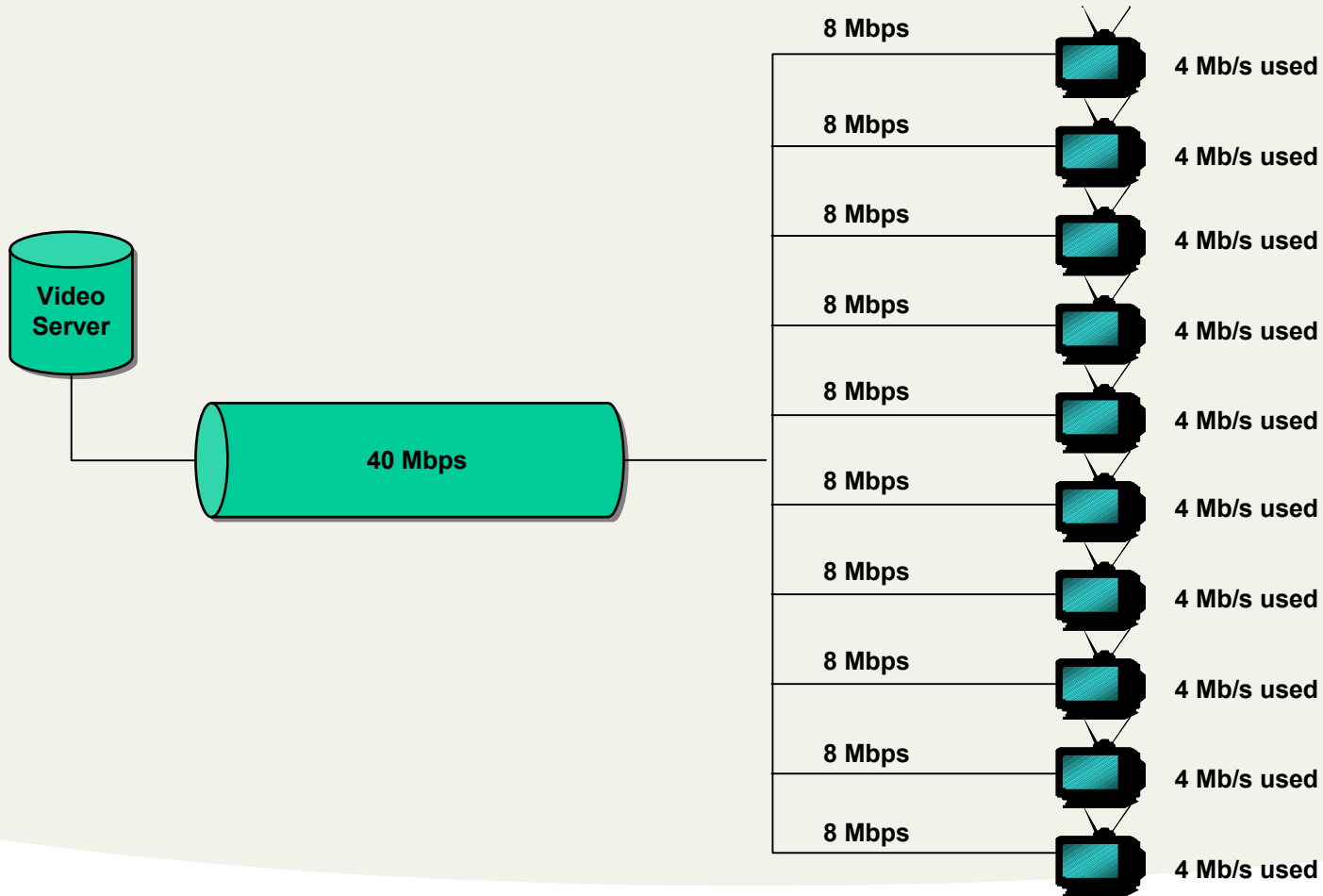
# WLL as Broadband Medium

TelstraClear agrees with Telecom that “triple play”/NGN services should be the benchmark for evaluating the substitutability of wireless for copper

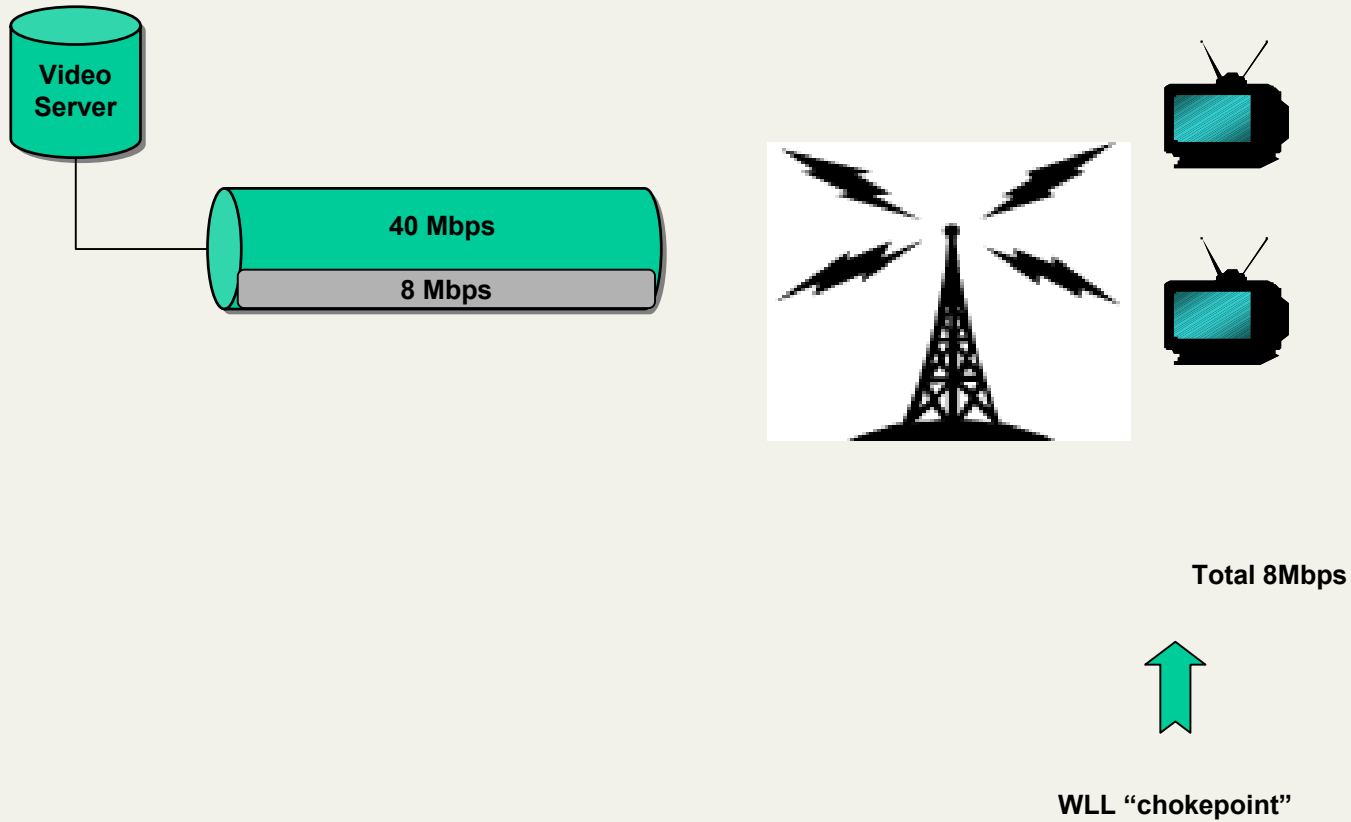
3 factors limit WLL as an access medium for broadband:

- whether offering “internet grade” or “business grade” data (applies to both DSL and wireless);
- WLL as a shared medium (cumulative impact with internet grade vs. business grade); and
- the absolute capacity of WLL (compared to copper).

# Capacity of DSL



# Absolute Capacity of WLL



# Different Demands on WLL of Internet Grade or Business Grade Data

Internet grade:

- “best efforts”
- no SLA so can substantially “over-subscribe” number of services to available WLL capacity and
- typical contention ratios are upwards of 50:1.

Business grade”:

- committed rate
- resembles “traditional” data services like frame relay
- contention ratios are 4:1 or less.

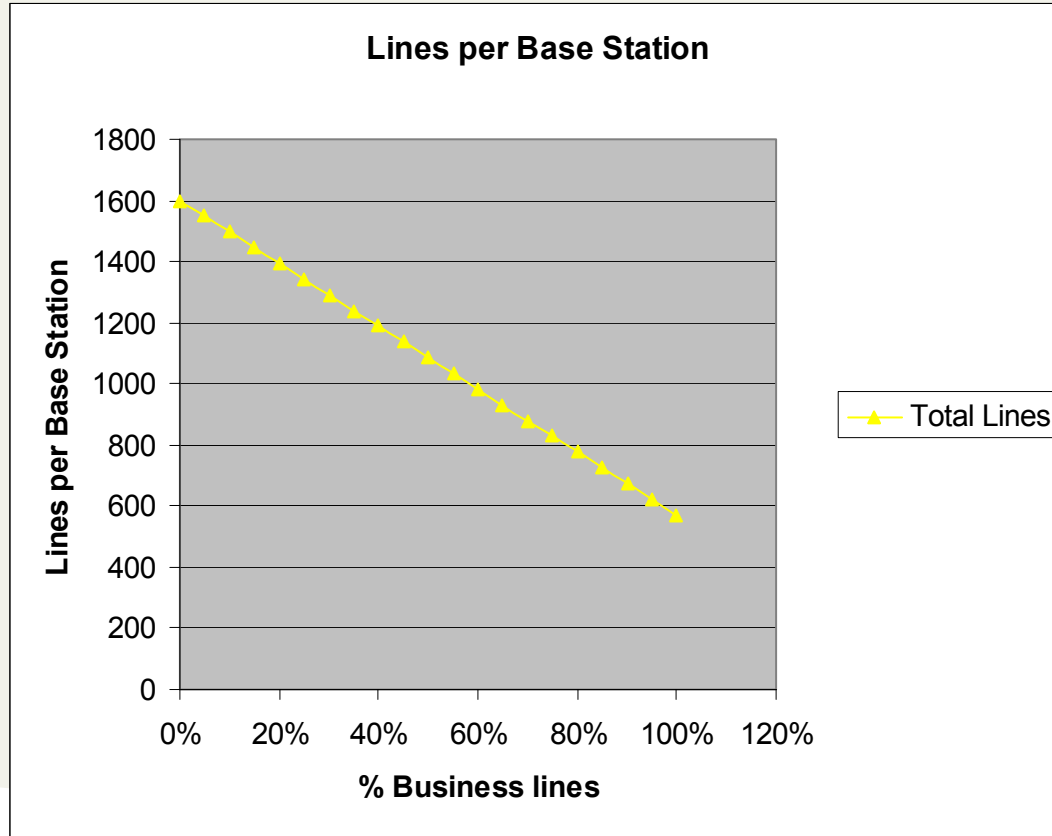
# Rationing Limited Spectrum

Data services deplete base station capacity at a higher rate than voice services

Business grade data services deplete base station capacity at a much higher rate than internet grade services

Business customers deplete base station capacity at a higher rate than residential customer

# TelstraClear Broadband WLL



# The difference between Bursting on WLL and on Copper

Broadband services are designed with two rates in mind:

- average user rate - comparatively low rate because most of the time users are involved in low data intensive activities: eg, page browsing on Internet; and
- bursting - capacity available to an individual user for data intensive activity: eg, downloading.

# The difference between Bursting on WLL or Copper (contd)

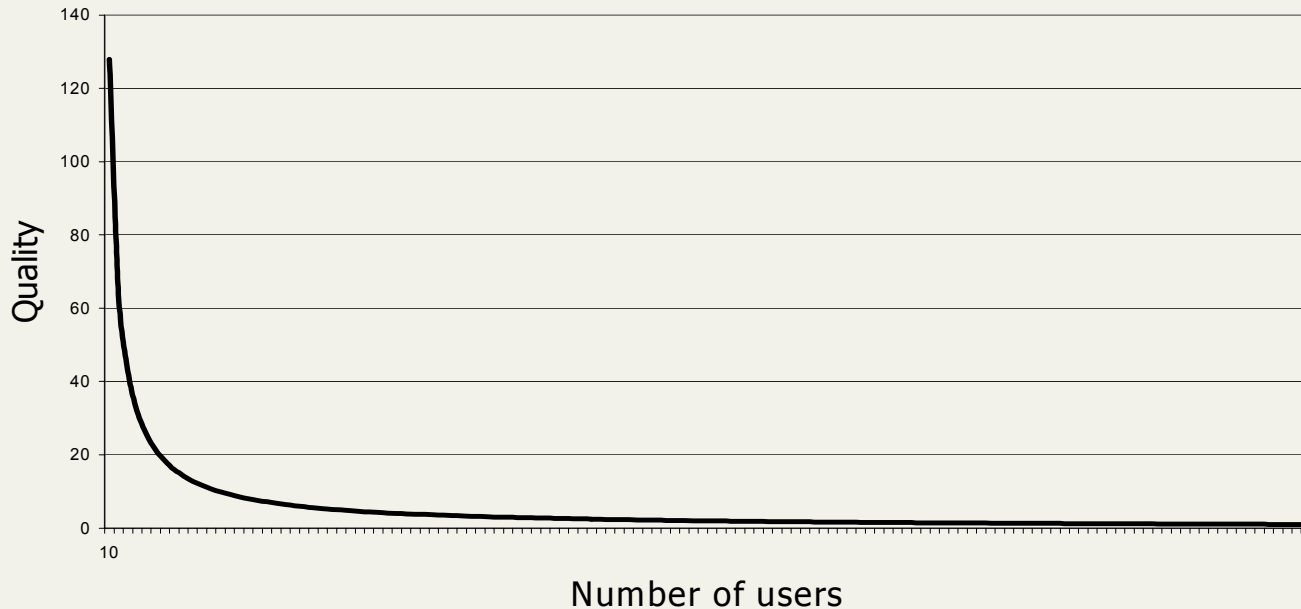
On fixed DSL, each user can burst to maximum capacity of own DSL link (8Mbps) - bursting has impacts in the core network but bursting traffic over many users appears as “smoothed out” traffic in the core network.

On WLL, bursting is limited in the access network as well because of the limited capacity of base station.

As more users are added, bursting capacity rapidly falls to average user levels.

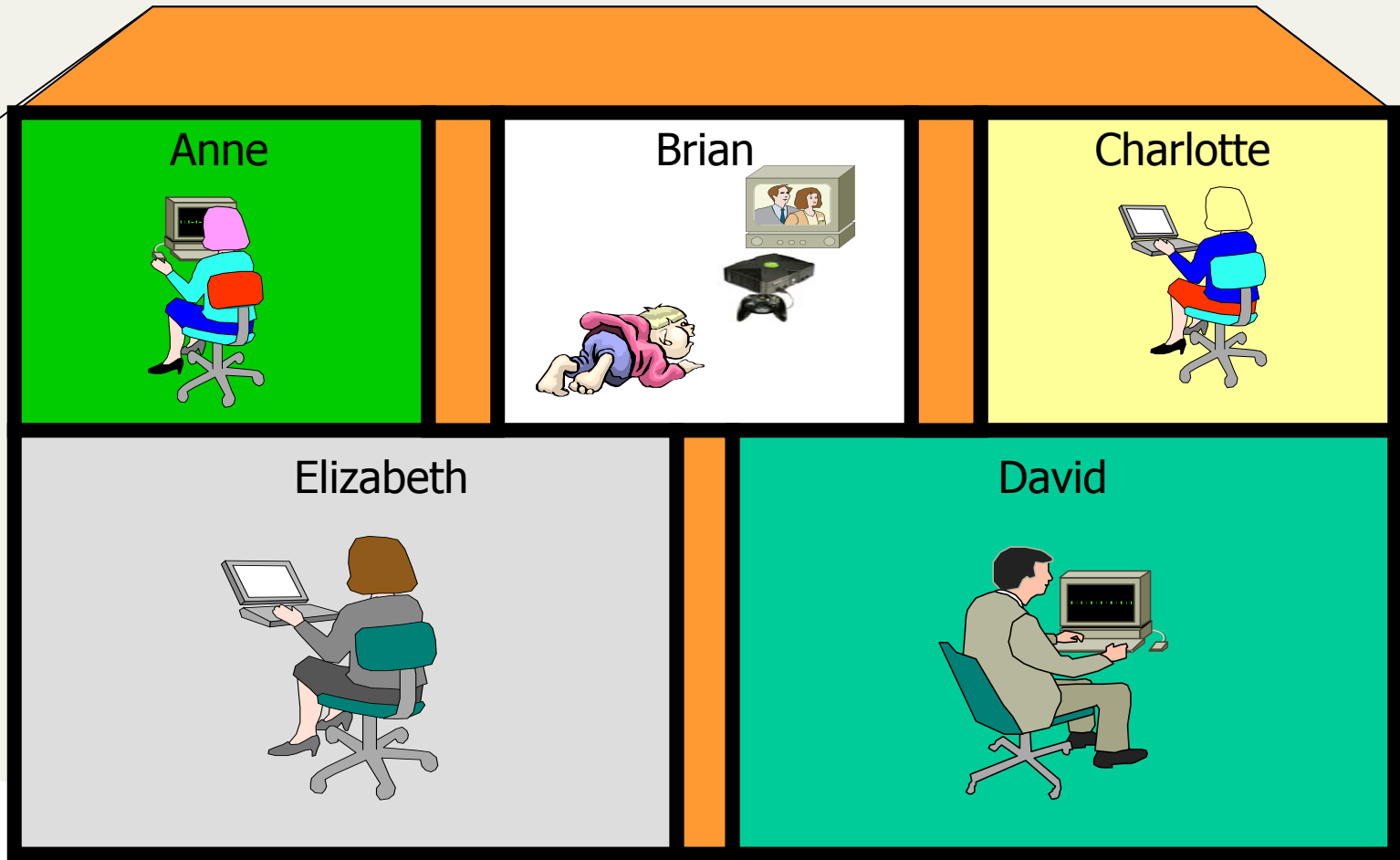
# The difference between Bursting on WLL or Copper (contd)

Quality of service - wireless



**RESTRICTED**

# Multi-Service Access cannot be delivered over Wireless



# So is there a solution to the Bandwidth Constraints of WLL?

Some wireless technologies, while still shared spectrum, can deliver higher bandwidth than TCL's 3.5 GHz systems, eg, LMDS.

However, the cell sites are much smaller (2 kms), therefore many more cell sites (10:1 compared to 3.5 GHz) and the CPE is expensive.

In TCL's experience, only suitable for corporate customers with more than 14 voice lines.

# RESTRICTED

**RESTRICTED**

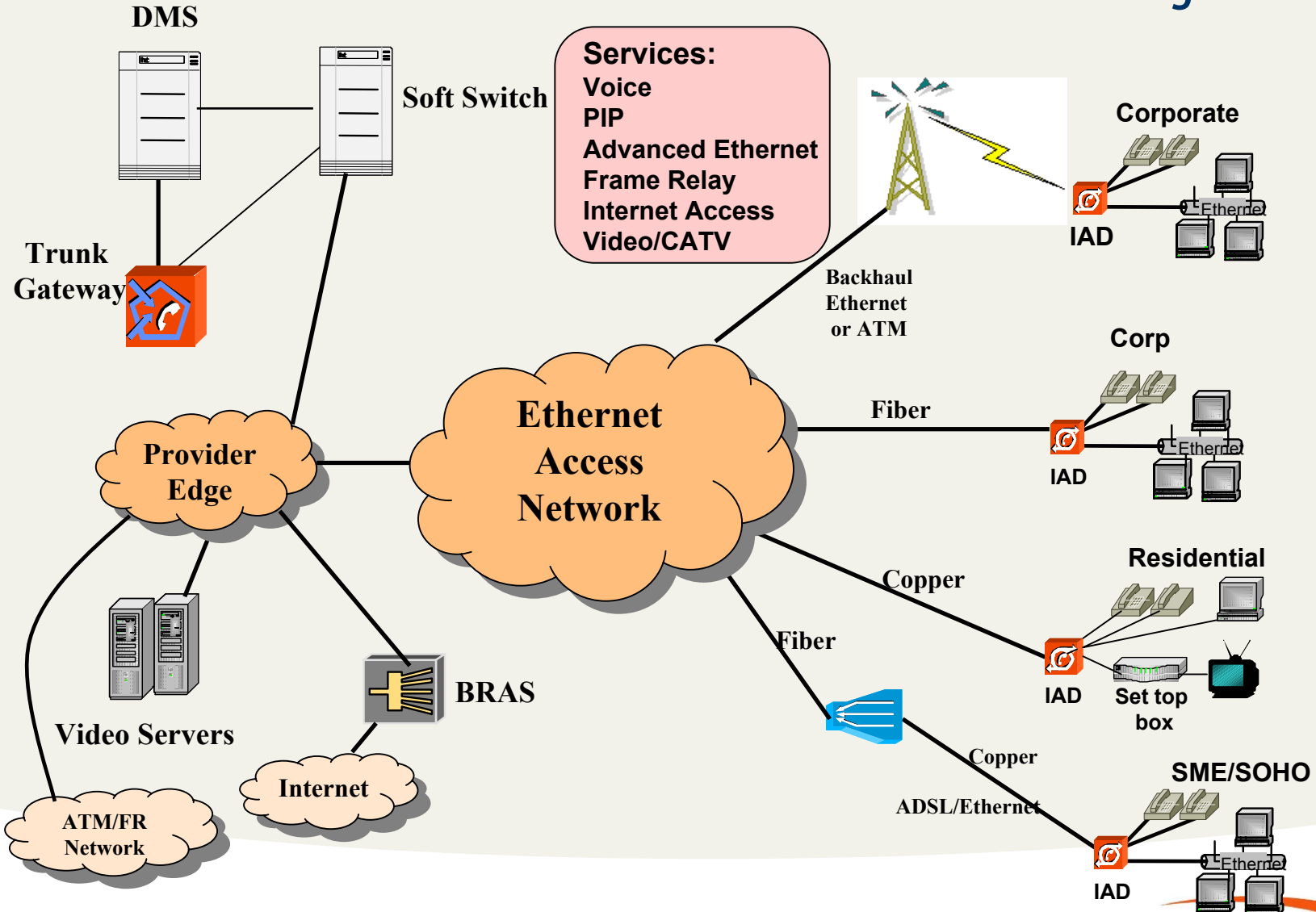
# Unbundling in the world of Next Generation Networks

Entrants are seeking access only to the layer of transport and not to services built on NGN.

The model is of competing NGNs over a common Ethernet access network.

TelstraClear knows how NGNs work: already deploying an NGN and integrated access devices (**IADs**) in customer premises which support multi-service access.

# TCL Next Generation Network – Testing Now



# LLU Bitscreen and NGN

