

Cooma's optical telecommunications superhighway



Reasons & Enablers

- Existing dial- up only
- Few choices for rural towns
- Reticulation of gas within Cooma
- Shared trench



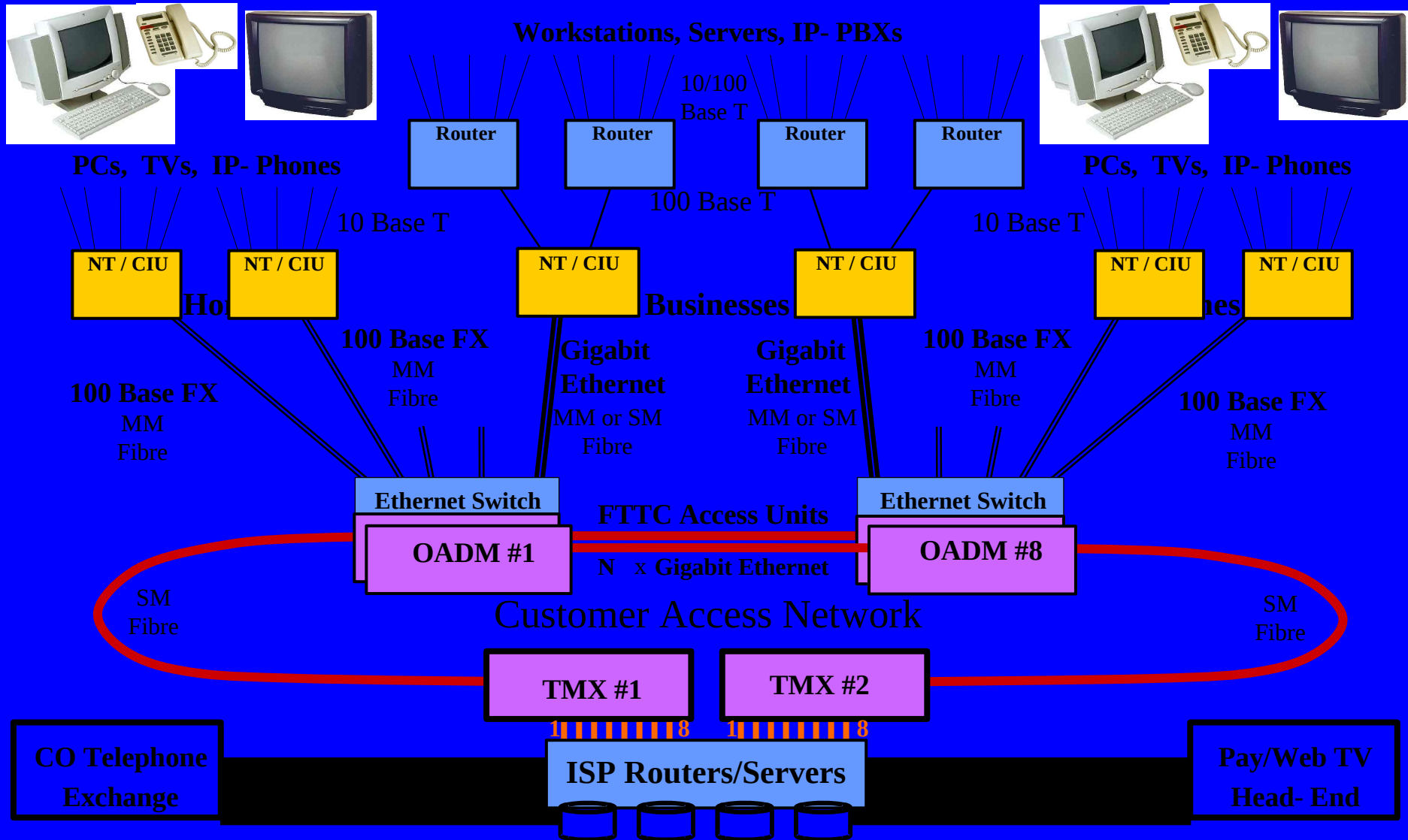
Why fibre?

- Potential bandwidth and potential expanded and new services (future proofing)
- Separate network possible because rural towns have wide streets and verges
- Medium density housing
- Multi mode fibre, lower cost, easy to install, 100Mbps for 2Km
- Single mode fibre, very high capacity in a few fibre with small cables.

Is 100 Mbps enough ? (in 1999)

- Telephony 100 Kbps
- Internet 1 or 2 Mbps (5 to 10 Mbps, 2009)
- Data, file transfers, remote backup, games
10Mbps to 20Mbps, remote applications, cloud computing.
- Video 3 concurrent video sessions @ 6 Mbps/channel or 10 Mbps/channel for HDTV
- Plenty of spare bandwidth for the future

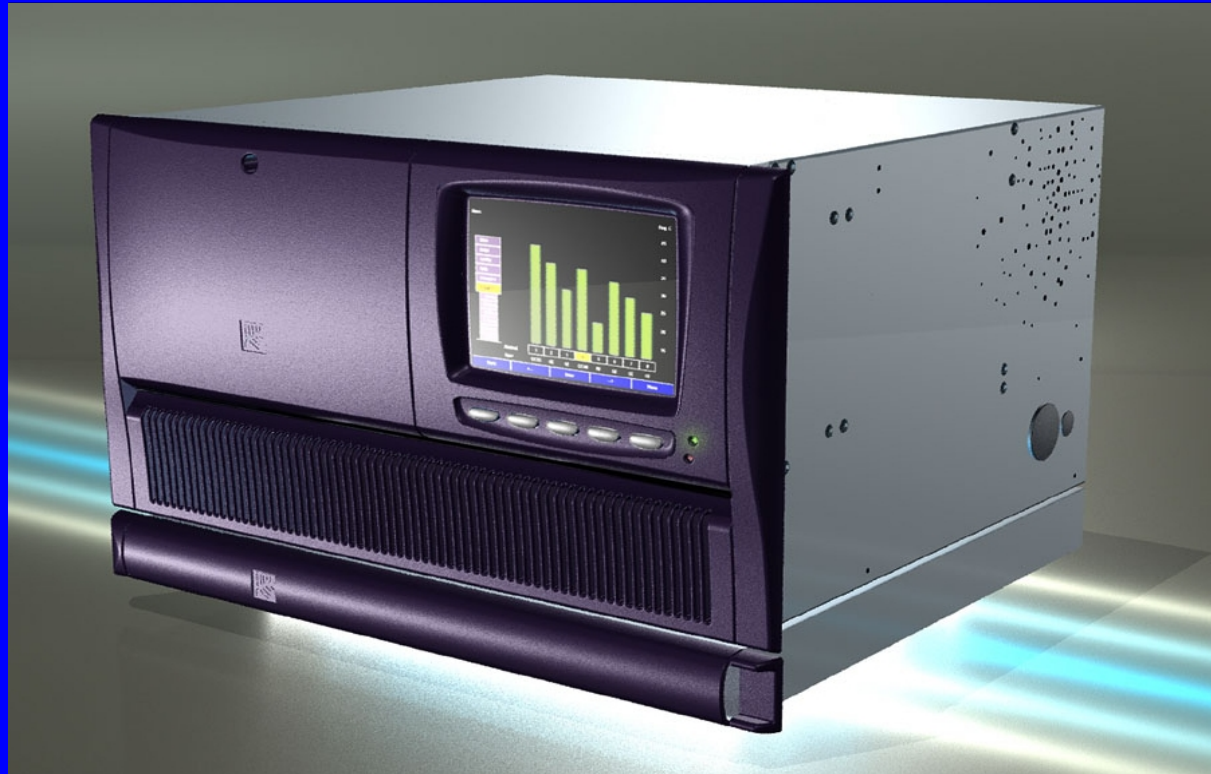
IP/Ethernet/DWDM Access Network



Network topology

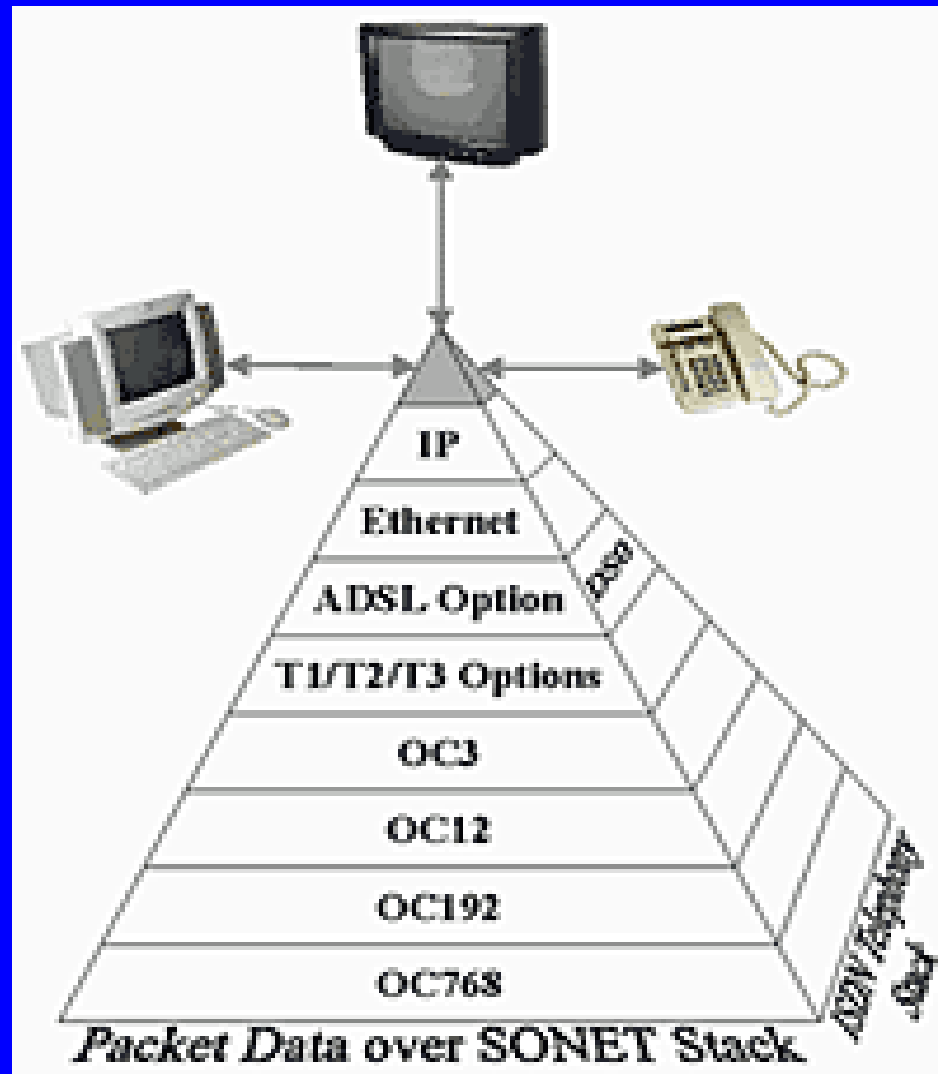
- Multiple single mode (SM) fibre loops, petals
- Dense wavelength division multiplexing (DWDM) on SM fibres
- 64 X 1 Gbps duplex channels/fibre and 4 fibres/cable
- Ethernet directly onto the fibre
- Upgradable to 2.5Gbps or 10 Gbps

DWDM hardware

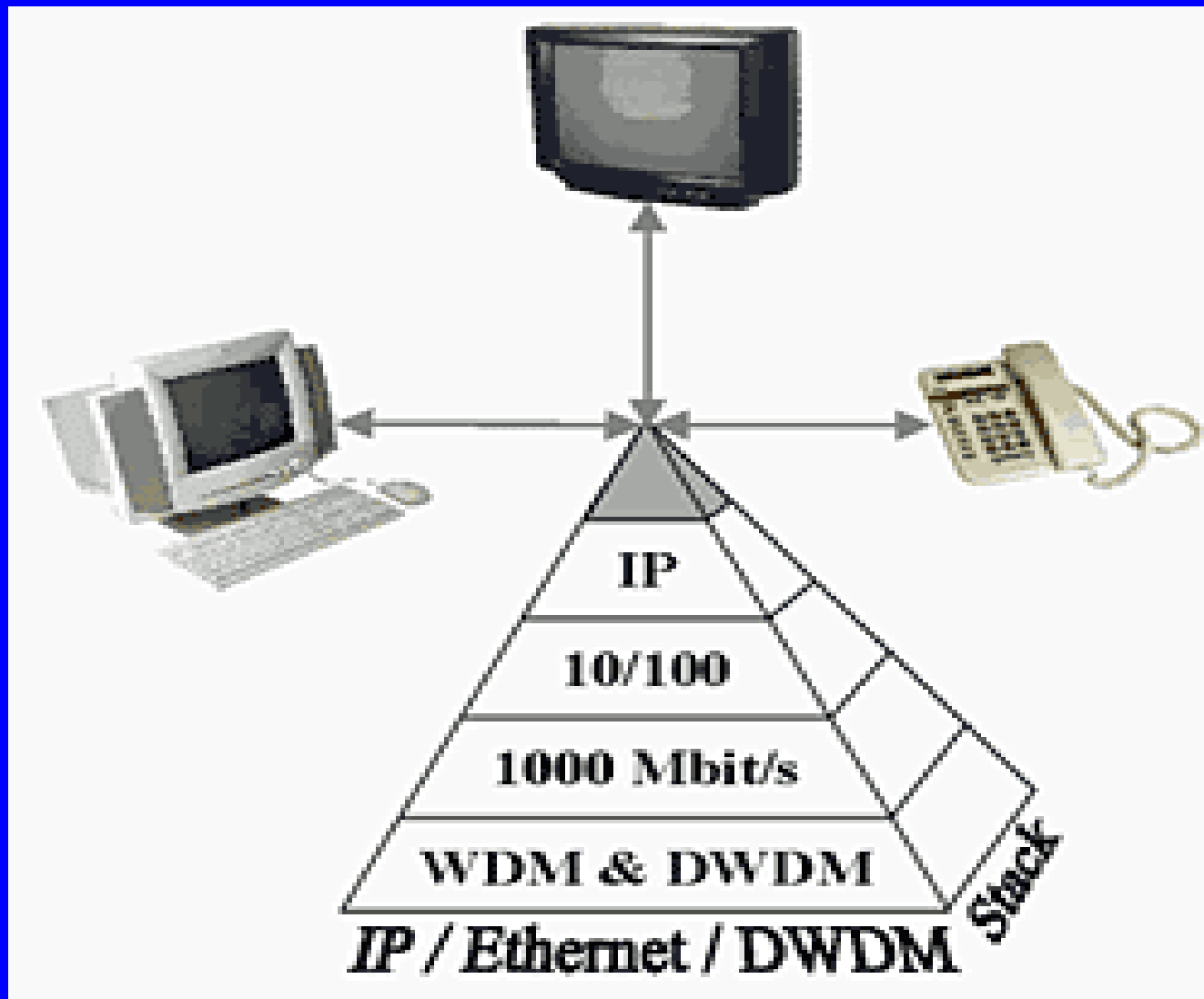


- 8 duplex channels per Gigawave™
- 8 Gbps/box
- Stackable
- easy management
- Australian design and manufacture

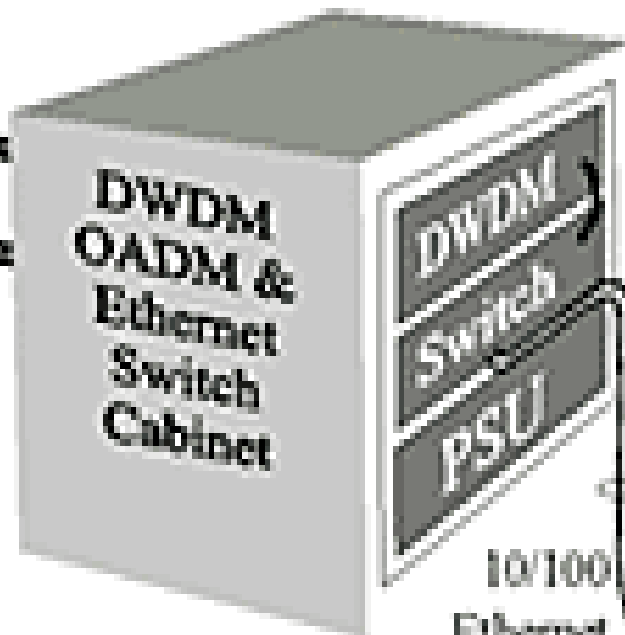
Traditional multiplexing of data on fibre, many layers



Ethernet and DWDM directly onto fibre



1 - 100
Gbit/s
Fibre
Backbone



← VDSL or 100BaseFX Interface
Options for FTTC Applications

10/100
Ethernet

IP Phone



Pinical, a network switch for the kerbside

- A carrier grade, reliability, features
- Low power, 1 watt per port 300 watts
- Port security
- Layer 2 & 3 switching
- Expansion and stacking

Telecommunications survey 1999

- Local telephony about \$1m p.a.
- Regional telephony
- Telephony to ACT
- Internet
- Long distance telephony
- Pay TV

Second survey in August 2000 has similar results

Now in 2009 a slightly different order

Potential Customers

- 2600 households
- 250 active businesses
- Telecommunications and gas combination
- Many existing customers
- Customer's view of Telstra's performance and \$s
- Enhanced content & services
- Internet and video is the driver for selecting an alternative carrier

The "perfect" IP telephone



- The most- integrated IP Phone processor, minimal external components
- Fibre port
- 4 Ethernet ports
- Low cost
- Additional ' phone sockets
- Low cost (\$450)

The IP telephony gateway



- T1 and E1, 360 ports per gateway
- Stackable
- Real-time fax
- Many add-on telephony services
- Management software
- Billing software

Cabling design and selection, a complex problem !

- Cost of splicing
- Cost of cables
- Choice of fibres in cables, 96, 32, 12
- Minimise number of splices
- Time to splice
- Number of enclosures per pit
- Cost of installing pits
- **Result** => an innovative solution

Key success factors

- DWDM & Redfern Broadband Networks
- Decrease in cost of fibre & optical components (30% p.a.)
- Ethernet directly on the fibre
- AGL's gas reticulation, shared trenching
- VOIP IP telephony solution
- Additional content - video- on- demand, educational material, aggressive telephony pricing

Industry relationships



*Fibre to the home in regional
Australia*

