Metrodata

communicating solutions

REDUCING THE COST OF METRO FIBRE ACCESS

A SOLUTION GUIDE FOR SERVICE PROVIDERS

The Fibre Challenge

Fibre: Plentiful commodity or scare & expensive resource?

For those Carriers able to lay their own fibre, the 'economies of scale' with this media are such that the costs of individual fibre strands within a typical trunk cable are low compared with the actual cost of 'in street' installations.

Even so, where street ducting is unsuitable or has reached capacity and the opportunity to lay new fibre becomes limited, or whenever the cost of laying new fibre is high relative to likely incremental service revenues, cost effective approaches to maximisation of existing fibre plant becomes more critical.

Similarly, to the 'alternative carrier', wishing to run value-adding services over mainly third-party fibre infrastructure, a clear challenge is to maximise the number of services carried via that part of the fibre network only available at expensive rates from other infrastructure Carriers, whilst minimising both up front investment and incremental costs.

Low Cost Fibre Access Networks

One efficient option is to multiplex many services over a small number of physical fibres, and often the decision about which level of multiplexing technology to use will be dependent on a number of factors, including run length and quality (age) of the installed fibre, and the number and bandwidth of services to be offered.

Classically, National carrier Backbone networks use 'Dense Wavelength Division Multiplexing' (DWDM) to carry many tens of services (up to ~160) using different wavelengths across single fibre pairs. In the Metro area, core Optical Multiplexed rings are often deployed, typically inter-linking smaller 'Access' rings between distributed local 'Points of Presence' (PoP), at which DSLAM or 'Multi-Service Platform' (MSP) devices fan-out connections to individual customers for a variety of services.

To date the choice for carriers, even for Metro Access rings, has often been to use highly flexible but expensive DWDM-based multi-service platforms, even perhaps when the projected number or density of customer services do not readily justify either the initial outlay or incremental connection costs associated with DWDM. In these times of greater cost-consciousness, this choice is becoming less obvious.

Considerable savings can be realised on initial deployment and during early customer acquisition, by opting for simple passive 'Coarse Wavelength Division Multiplexing' (CWDM) solutions at the Metro Access layer. The cost of both multiplexer units and particularly of individual end-point Optical Transceivers are appreciably lower than for DWDM alternatives. Using CWDM, typically 8 to 16 (max. 18) wavelengths are available for multiplexing across a single fibre pair. Passive (i.e. completely unpowered) multiplexers contribute relatively low signal loss, allowing for highly adequate transmission distances of well over 50km between PoP locations.

Continued....

The cost of running up to 16x 1Gbps or 10Gbps services on a single rented fibre pair becomes extremely compelling Vs. DWDM solutions for initial deployment, and does not preclude the break-out of individual CWDM channels into further wavelengths, via the subsequent deployment of DWDM, as service take-up demands more bandwidth.

Passive CWDM Access Rings

Typical Metro IP-DSLAM Topology using Passive CWDM

Last-mile fibre Metro Access solutions may be deployed either with star or ring topologies, but often rings are used, due to the inherent resilience to link failure offered by this approach.

The schematic on the next page illustrates the case of a Metro Ethernet 'Access Ring' network, linked at each carrier PoP by twin passive CWDM multiplexers. If the service termination platform (i.e. MSP / DSLAM) supports dual-homing, then it is a simple matter to build resilient rings within the Metro Area, for which a readily supportable PoP - PoP distance of 50Km - 100Km should be more than sufficient.

The deployment of a ring topology assumes that such a topology is 'allowable' given the transport running over the fibre layer. If a Layer 2 Ethernet network is deployed, a protocol such as RSTP should be enabled to eliminate loop propagation whilst preserving resilience.

Metrodata offers a number of extremely effective components for such a network, including:

- MetroWAVE family of passive CWDM multiplexers and associated CWDM wavelength Transceivers

  An expandable range of solutions offering from 4 to 16 CWDM wavelengths, including support for conventional 'non-CWDM' 1300nm optical device connectivity and minimally intrusive 'optical power' monitoring port, enabling in-service testing and maintenance

- FCM9000 intelligent switched10/100Mbps & 1Gbps Ethernet demarcation device

  The FCM9000 can be used as an extremely cost-effective and yet fully manageable (including carrier-Ethernet OAM standards) Ethernet interface device, offering dual-homed connections into the CWDM Access ring.

- MetroCONNECT MC12000 chassis system for high density media conversion & intelligent demarcation

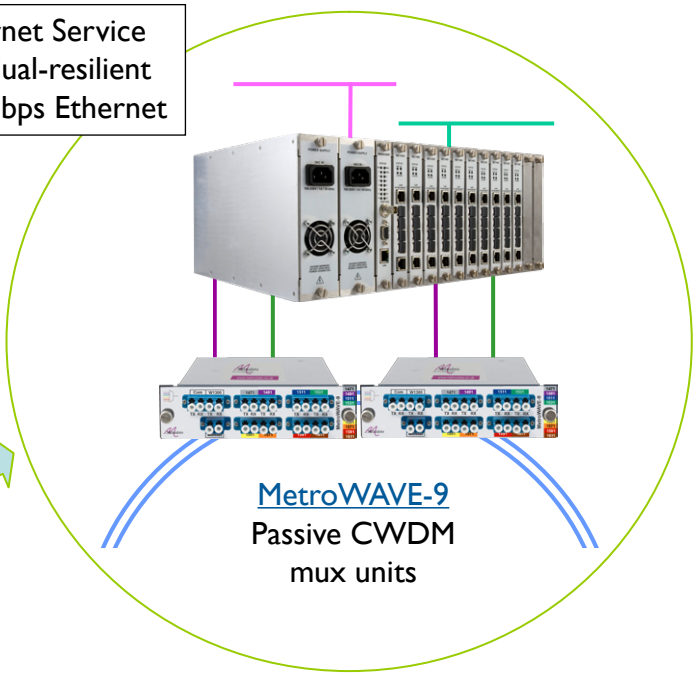
For more about Metrodata and for links to our Web Site for further details on our extensive Access Networking range, check the 'About Us' and 'More Information' pages at the end of this guide.

Metrodata

communicating solutions

CWDM Metro Access

Metrodata MC12000 Ethernet Service Delivery system supports dual-resilient connection of up to 24 x 1Gbps Ethernet



MetroWAVE-9
Passive CWDM
mux units

Ethernet connections to MSP / DSLAM etc directly, or via high-density Managed switching & media conversion chassis system e.g. Metrodata MC12000

Carrier PoP

dual-homed chassis system

mux

mux

Core Network

mux

mux

Passive CWDM Ring Network up to 16 x λ

Carrier PoP

mux

mux

media conv

Alternate individual connections via intelligent dual-homed switching media converter e.g. Metrodata FCM9000

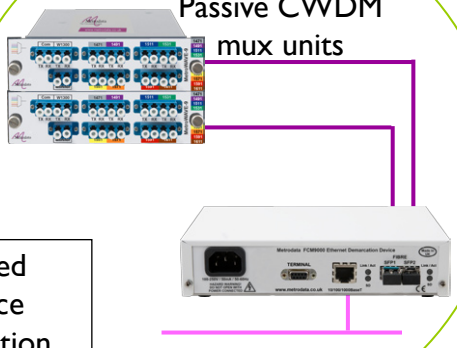
mux

mux

Ethernet 'loops' resolved via RSTP

dual-homed chassis system

MetroWAVE-9
Passive CWDM
mux units



Metrodata FCM9000 Managed Ethernet Demarcation Device supports dual-resilient connection of 10/100 or Gigabit Ethernet devices

About Us

Who Are We?

Founded in 1989, Metrodata Ltd. specialises in Network Transport and Interface Conversion products and technologies. Based near London's Heathrow Airport, Metrodata designs and manufactures solutions for customers Worldwide, with some 40% of production destined for markets outside the U.K.

What Do We Do?

Metrodata offers a wide range of connectivity solutions for the LAN and WAN arena. Network Interfaces and Transports supported include those for Serial, SDH/PDH, ATM, Ethernet and Fibre applications. Our portfolio today extends from simple connectivity products through to Multiplexing and Managed Service Delivery Solutions for the Telecoms Carrier market.

The company offers Network Design and Integration services and in this area has a particular expertise in Fibre technologies, enabling clients to maximise the effectiveness of their Fibre infrastructure investments.

Our Customers and Markets

Metrodata Ltd's customers worldwide include Telecoms Service Providers, Corporate Enterprises of all sizes and Governmental organisations. Our multi-service convergence and satellite communications 'backhaul' capabilities, allied with extensive expertise in interfacing military serial Cryptos, has given us a strong position with Defence organisations.

Metrodata supplies both directly and via Integration Partners, primarily in Europe, the USA, LATAM and the Middle East.

Why Metrodata?

Metrodata's product quality and design expertise make us the 'gold standard' for many of the world's Telecoms Service Providers for interface conversion and service demarcation applications.

Metrodata is a highly expert Company, but one small enough to be responsive to our customers. Our willingness to meet customers' precise requirements through close consultation and bespoke development, differentiates Metrodata from larger, less agile equipment manufacturers.

More Information

For more in-depth information regarding metrodata Products and Solutions, follow the links to our Web Site or contact us by phone or e-mail as below..

MetroWAVE CWDM Networking Solutions:

http://www.metrodata.co.uk/PassiveCWDM

MetroCONNECT MC12000 Ethernet Service Delivery System:

http://www.metrodata.co.uk/MC12000

MetroCONNECT FCM9000 Ethernet Demarcation Device:

http://www.metrodata.co.uk/FCM9000

Metrodata Ltd
Fortune House, Crabtree Office Village
Eversley Way, Egham, Surrey TW20 8RY
U.K.

Tel: +44 (0)1784 744700
Fax: +44 (0)1784 744730
E-mail: sales@metrodata.co.uk
Web: www.metrodata.co.uk