

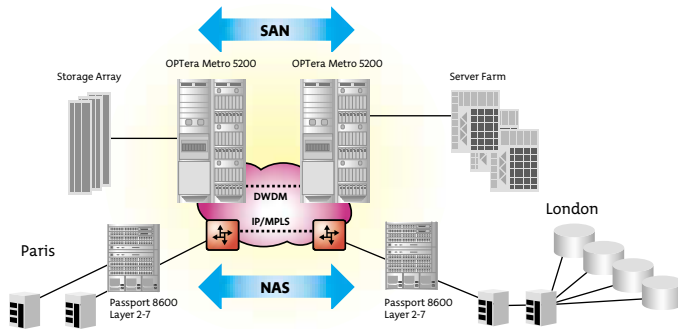
## Optical

# Storage Area Networking Solution

### Customer Needs

- Disaster recovery – disk and tape back-up solutions for rapidly recovering data from offsite facilities and contingency planning for unforeseen circumstances
- Business continuity – the business continues to function even if a data centre disaster is suffered.
- Store and access a large amount of data online, quickly and cost effectively, no matter where the data is held geographically
- Higher levels of system availability, faster scalability of resources and better storage management
- Server and Storage Consolidation, to enable more efficient scaling in the face of unpredictable demands for processing power and storage
- A Wide Area Storage Area Network (SAN) based upon a reliable, high performance network

### Nortel Networks Solution



Storage Area Networking solutions use a number of integrated infrastructure components to enable a variety of storage applications. The solutions are typically comprised of a number of disk storage arrays and tape drives connected to a Fibre Channel (FC) switch via FC links. The **OPTera Metro 5200 Multiservice Platform** enables service access delivery providing the solution with flexibility and scalability.

Until recently, businesses transported most of their data within Local Area Networks (LANs) at a single location. Today this trend has reversed and more and more traffic and protocol types are demanding

transport across public Metropolitan Area Networks (MANs). Unfortunately, storage centric protocols such as ESCON and FC are seldom handled by these networks.

Nortel Networks Storage Area Networking solution overcomes this problem, by transporting all of these and other essential protocols in their native format to interconnect an organisation's critical storage devices.

The Storage Area Networking concept consists of setting up a separate high-speed mesh network that links servers and storage devices. Typically Fibre

Channel is used as the means of connecting the various devices together. Sometimes Gigabit Ethernet, ESCON and ATM are also used, but these have distance limits. The Nortel Networks Storage Area Networking solution offers the connectivity to accommodate any of these protocols over extended distances. The Nortel Networks Storage Area Networking Solution supports a variety of complementary storage applications.

These applications include:

- Disaster Recovery - the ability to resume core business functions as quickly as possible following a disastrous data loss, such as viruses or other data corruption, natural disasters, hardware or software failure, theft or vandalism and electrical disruptions
- Business Continuity - enables core business applications to continue in the event of a disaster with little or no disruption. Typically, business continuity implies a distributed server architecture using clustering and/or load balancing, together with mirrored disk storage
- Data Warehousing - works across enterprises. It organises and stores a wide variety of data over time, which can be used to create reports and extract data at a later date. Data mining involves processing large volumes of data and can take advantage of the processing, storage and querying potential of a data warehouse

- Data Sharing - entails using computer software and systems designed to aid with group decision-making, communication and coordination
- Centralised Storage Management - a broad category of storage functions that includes centralised disk and tape management. Data is centralised to a common location and data administration is handled by software

### Solution Value Proposition

- Enables disaster recovery over reliable high speed connectivity
- Centralised management of mission critical information storage
- Improves performance of database and information retrieval systems
- Reduces equipment costs in centralised storage management due to shared devices
- Reduces staffing costs because of automation and improved resource utilisation
- Faster provisioning of storage and reduced downtime

For further information please contact your local Nortel Networks representative.

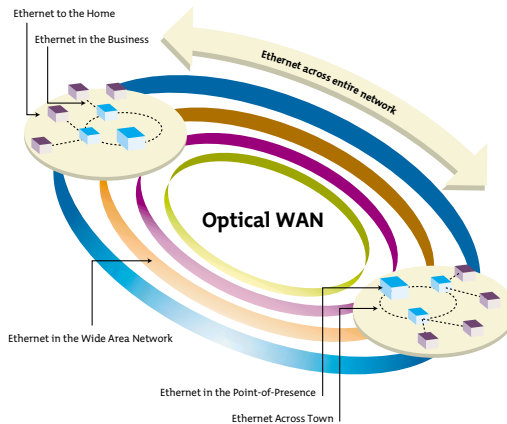
## ■ Optical

# Optical Ethernet Solution

### Customer Needs

- Remove bottlenecks and limitations of traditional WAN
- Provide inter-office bandwidth ranges from 1Mbps to 1000Mbps
- Simplify LAN and WAN networking
- Provide network support for multimedia adoption including VoIP and desktop video
- Provide the ability to adopt centralised computing models – such as terminal / thin client computing
- Improve usage of data centres for centralised storage and content distribution
- Provide a comprehensive, high performance and easily accessible disaster recovery / dark-site solution

### Nortel Networks Solution



The End-to-End Ethernet concept

The end-to-end Ethernet, known as the optical Ethernet, allows large Enterprises with access to optical fibre, to establish next generation networks that deliver simplicity, low cost and reliability through extending the popular Ethernet protocol into the MAN and WAN, taking with it cost points, performance and familiarity.

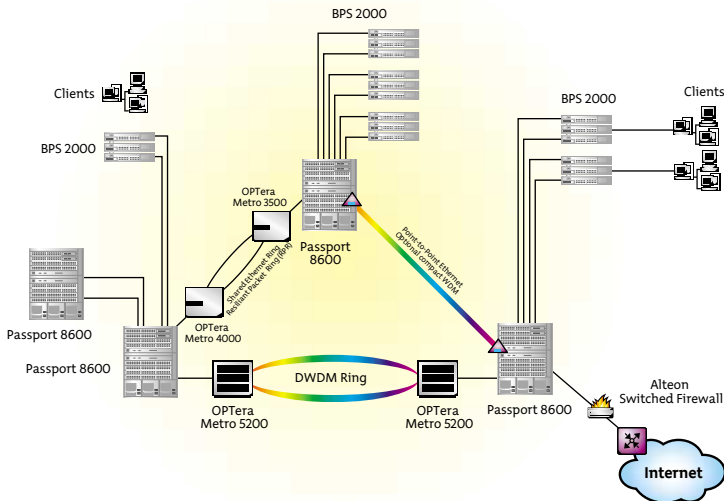
Nortel Networks Optical Ethernet solutions are varied and provide the implementing Enterprise with many options for flexibility, based on the scale

of the network, the performance required and the mix of applications. At the heart of the Nortel Networks solution are three critical elements:

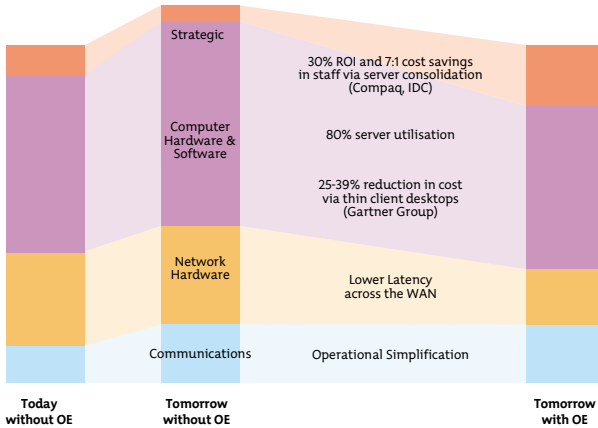
- **The Business Policy Switch 2000** – an advanced layer 2 switching device, the BPS2000 brings all the benefits and strengths of the Baystack line of stackable Ethernet solutions while combining the intelligent quality of service mechanisms to set application traffic priorities at the network edge

- **The Passport 8600 Ethernet Routing Switch** – delivering layer 2-7 intelligence that enables not only the switch and routing of frames and packets, but the manipulation of content flows across servers. The Passport 8600 brings leading scalability, port density and performance, while providing the depth for new multimedia application demands through extensive multicasting capability and extended prioritisation and queuing mechanisms
- **The OPTera Metro 5200** – intelligent metropolitan optical solution, enabling Enterprises to extend the capacity and capability of their fibre assets. The OPTera Metro uses DWDM and CWDM technologies to increase the number of wavelengths traversing a fibre, and through its protocol and bit rate transparency, can support any optical service up to 10Gbps – IP, ATM, Ethernet, ESCON, Fibre Channel, FICON, PDH, SDH, SONET, Digital Video etc. Wavelength efficiency is achieved by a rich set of sub rate multiplexer cards. The OPTera Metro 5200 allows Enterprises to extend fibre capacity up to 240Gbps if required, while preserving the ability to offer individual wavelengths 50mS protection switching for high availability applications.

Nortel Networks provides end-to-end service connectivity through the integration of its OE and IP Services portfolios. Applying the scenario in the diagram below, in-building LANs are interconnected using the Business Policy Switch 2000 (BPS 2000) and the Passport 8600 Ethernet Routing Switch. The BPS2000 collects the floor-by-floor Ethernet connections and after applying QoS measures, performs layer 2 switching of the packet to the Passport 8600 through a gigabit uplink. The Passport 8600 enables internal routing between BPS2000s, further QoS and queuing mechanisms and provides the external connection to the network at rates up to 10Gbps. Metropolitan connectivity can be achieved through clustering of Passport 8600s over dark fibre connections, or by interfacing localised Ethernet deployments onto an optical backbone with Ethernet on SDH supported by OPTera Metro 4000, or DWDM with the OPTera Metro 5000 series of metropolitan optical transport solutions.



## Solution Value Proposition



Projected future IT cost models with and without Nortel Networks Optical Ethernet

- Optical Ethernet attacks the total cost of ownership, by impacting the costs of LAN and MAN/WAN, providing the catalyst for cost reduction in computing and support models, giving rise to greater efficiencies. The end result is a compound fiscal benefit to the Enterprise ownership of IT that ultimately affects the total user cost and consequently improves earnings and profitability. Optical Ethernet allows Enterprises to implement the networks of tomorrow while maintaining the costs at levels equal or better to those of current modes of operation.
- All branches and inter-site connections are just like the connection to another floor in the same building
- Access bandwidth to the site has the same high capacity, scalability and low latency as the LAN
- MAN/WAN network becomes as simple to manage as the campus
- Creates a simpler, more efficient network
- Enables fundamental change in computing services models
- IT users receive faster access to corporate data and applications
- Reduces IT cost
- Simplifies network architecture (layer 3 to layer 2)
- Reduces support costs (fewer routers in the WAN)
- Consolidates computing support resources
- Ethernet traffic remains the same end-to-end
- Positions for outsourcing of high-value applications and services
- Enables new applications to be introduced
- Provides internal efficiencies for programs such as staff training
- Familiarity and skills requirements are consistent with existing office LANs
- Increases profitability and corporate efficiency through new business models

For further information please contact your local Nortel Networks representative.