Global and Metro Mirror Data Replication over WDM
Using Nortel Optical Metro 5000

Testing Template:

This document will be used to describe, from a technical perspective, the elements that were included as part of the IBM TotalStorage Proven testing. It is intended to give an overall picture of the technical elements of the configuration, with a brief description of the results of the testing including any specific highlights of the interoperability results.

High-level architecture/description, include a list of products that meet the compatibility requirements ("Approved Product(s)") as well as a list of the IBM storage products with which the Approved Products meet the compatibility requirements ("Qualified IBM Storage Products"):

Nortel's Optical Metro 5000 (OM5000) family of WDM products provides the foundation for SBC's leading FibreMAN™ services. These services provide connectivity for IBM's ESS Global Mirror and Metro Mirror applications for small and medium Enterprises Business Continuity / Disaster Recovery and Business Continuity / Disaster Recovery Hosted services. Using existing fiber services with Carrier-Grade SLA's (Service Level Agreements) can improve the business case for Storage Extension and Hosted Storage services and increase the scope of a Storage Extension or Hosting Solution. TotalStorage Proven™ (TSP™) Certified Carrier Infrastructures enables cookie-cutter connectivity at attractive price points to engineer leading Storage Extension and Hosting Networks.

The Optical Metro 5000-series includes the OM5200 and the OM5100 systems that use wavelength division multiplexing (WDM) technology to combine several wavelengths onto a single fiber.

IBM Storage products used in this test consisted of Z800 and pSeries server and Enterprise Storage Server (ESS).

The testing scenario consisted of a Z800 server and pSeries server connected to an Enterprise Storage Server (ESS) on site A and ESS on the other site. Please see diagram #1

The 2 sites were interconnected using the OM5200 with a distance of 160kms with a Fibre Channel signal of 1G and 2G.

For the first test @ 2G, the ESS-2105 on site A was separated from the ESS at site B using the OM5200 with a distance of 160kms using full rate FC-200. The interface used to interconnect the ESS-2105 was the 2.5G Flex OTR (transponder card). The system was tested in a protected (diagram #2) and unprotected (diagram #3) configuration.

For the second test @ 1G, the ESS-2105 on site A was separated from the ESS at site B using the OM5200 with a distance of 160kms using full rate FC-100. The interface used to interconnect the ESS-2105 was the GFSRM (Gigabit Ethernet/Fibre Channel Sub Rate Multiplexer). The system was tested in a protected (diagram #4) and unprotected (diagram #5) configuration.

A comprehensive set of tests based on TSP™ certification requirements was performed.

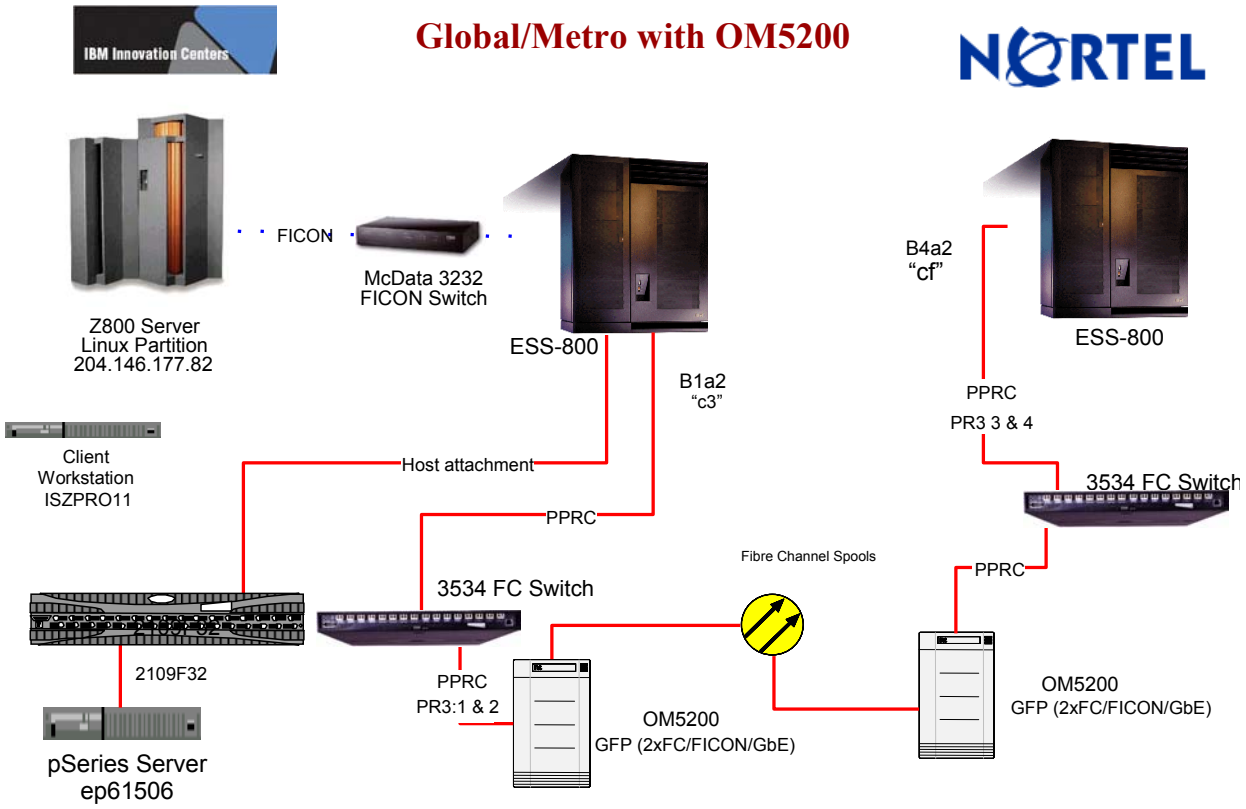

Diagram #1

FibreMAN Network Protection (OTR)

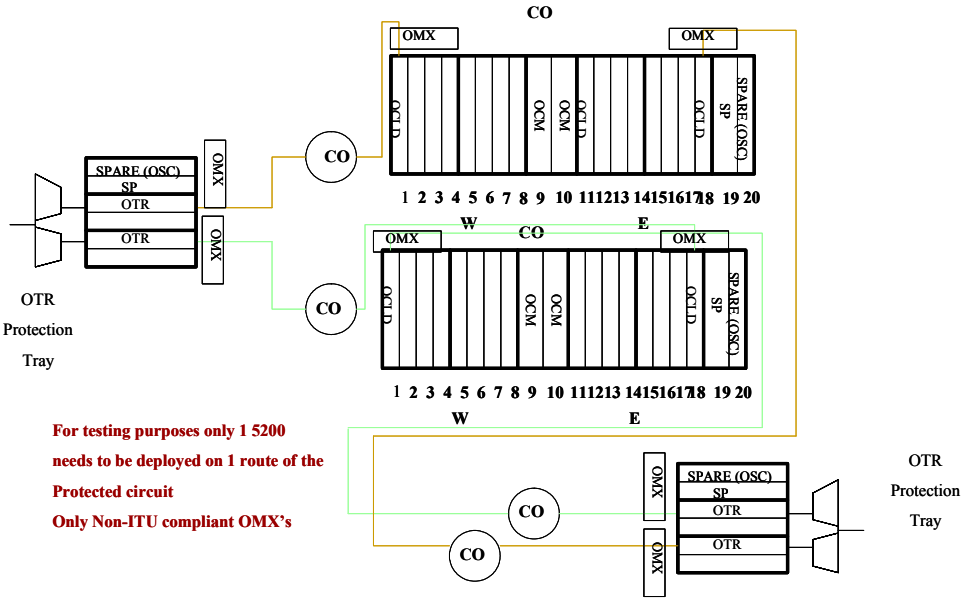

Diagram #2

FibreMAN Config unprotected (OTR's)

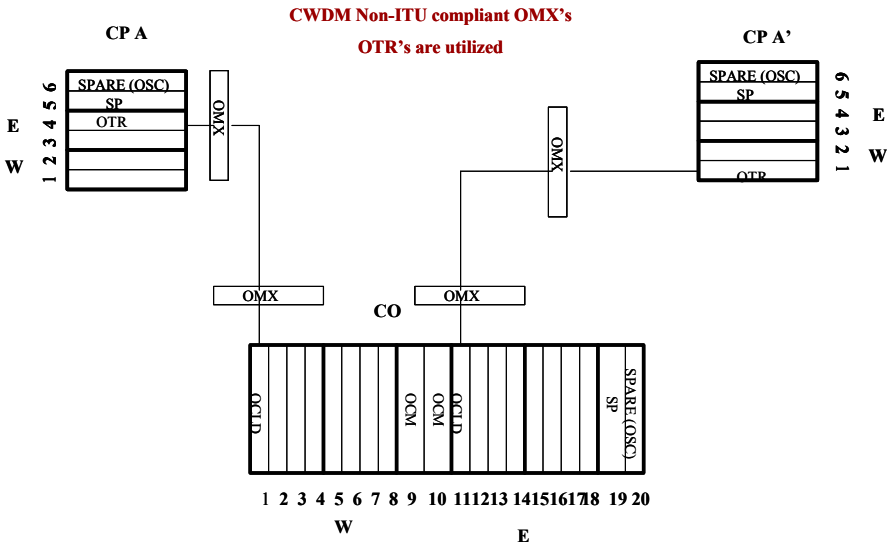

Diagram #3

FibreMAN Network Protection (OCI/OCLD)

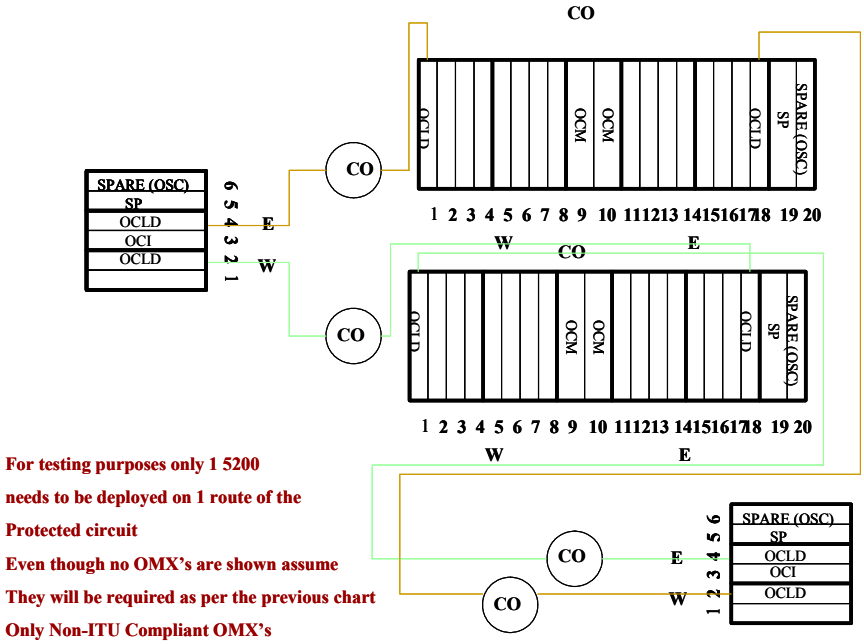

Diagram #4

Unprotected FibreMAN config (OCI/OCLD)

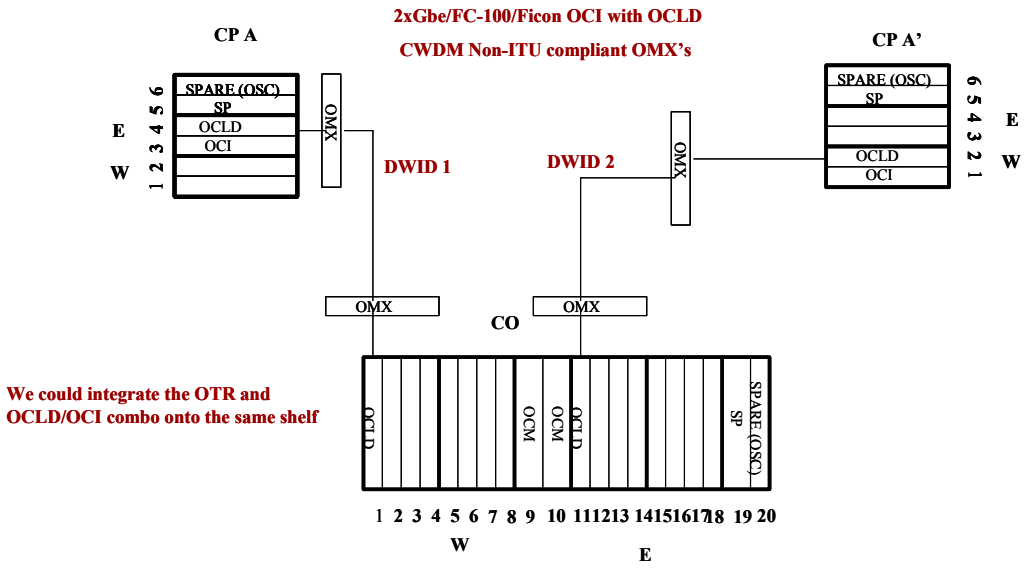

Diagram #5

Hardware Details:

1. Server type(s) and quantity: z800, ep615
2. Host Bus Adapter (HBA) vendor model(s)
    a. z800 Server:
        Firmware Level:
            Fibre Channel Subsystem Part Number 11P1178,
                Engineering Change J11206
        Firmware Level:
            Ficon Bridge 11P4583, Engineering Change J11201
        Firmware Channel Port:
            Fibre Channel Port 44P0827, Engineering Change J11233

    b. ep615 Server:
        i. HBA Option 6228
        ii. Firmware : devices.fcp.disk.array.ret 5.2.0.10, devices.fcp.disk.rte 5.2.0.10

Storage Product(s) Used:

1. Model Name and Number: ESS-2105
2. Version: 800
3. Number of Drives: 32
4. Drive Type:36GB
5. Microcode Level: 2.4.0.245

Nortel Hardware Used:

1. Model Name and Number: Optical Metro 5000
2. Version: OM5000 Release 6.1
3. Number of Drives: 32
4. Adapters: 2.5G flex OTR for FC200
5. Adapters: 2 port GFSRM for FC100

Switch:

1. Vendor: IBM
2. Model Name and Number: 2109F32
3. Version: 4.1.0
4. Microcode Level:
5. Vendor: McData
6. Model Name and Number: Spherion 3232

Software Details:

1. OS Version: AIX 5.2, Linux (SUSE)

Test Results

Test Dates: Oct 26th to Nov 5th, 2004

Interconnectivity between the Enterprise Storage Servers (ESS) was verified over the OM5000 with both 2.5G Flex OTR and GFSRM circuit packs. Initial test was performed over a distance of 40kms to ensure that the solution was working properly. Then the distance was incremented to 160kms to test both FC-100 and FC-200 protocols.

Initial performance indicated that the Global and Metro mirror solution functionality are not affected by the introduction of the OM5000 to provide distance extension. Both Metro and Global Mirror PPRC solutions worked without any problems for the 72hrs test. To verify that the solution behaved as expected, PPRC was stopped and reinitiated. That caused the volumes to get out of synch. PPRC worked as expected and got the volumes in synch again. As part of the test, a data recovery and integrity test was performed successfully.

Technical customer support information

- All Nortel Optical Metro 5000 Technical Support is provided by the local IBM Customer Engineering support teams.

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