

## IBM TotalStorage Proven™ program

### **EASTEL Systems** **BC/DR Solutions over MegaLight Metro Plus DWDM**



#### **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”):

The MegaLight Metro Plus Multiservice Platforms that use WDM technology to combine different wavelengths into a single fiber. The MegaLight Metro Plus is based in dense wavelength division multiplexing(DWDM) technology.

The testing 1 scenario : ESS to ESS PPRC

The actual testing scenario used IBM ESS F20 Sharks, Brocade SAN switches, IBM pSeries ( 6F1 and F80 ) servers and IBM xSeries (x335) Servers, Emulex Host Bus Adapters and Qlogic Host Bus Adapters. The database used was Oracle 9i. Fiber spools were 80Km for PPRC replication over ESCON channels.

The testing 2 scenario : SVC to SVC PPRC

The actual testing scenario used IBM SVC 2Clusters, IBM ESS F20 Shark, IBM DS4300Tubo, Brocade SAN switches, IBM pSeries ( 6F1 and F80 ) servers and IBM xSeries (x335) Servers, Emulex Host Bus Adapters and Qlogic Host Bus Adapters. The database used was Oracle 9i. Fiber spools were 80Km for PPRC replication over Fibre channels.

All testing, including error conditions and performance was successful.

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Testing level was Comprehensive.

The testing 1 scenario included the following equipment:

### Hardware Details:

#### IBM pSeries 6F1 (Local AIX server)

1. Server type(s) and quantity: pSeries 6F1 (AIX 5.2 ML6)
2. Host Bus Adapter (HBA) vendor model(s): FC6228  
Firmware level: 3.91A1  
Driver level: devices.pci.df1000f9.rte.5.2.0.30
3. SDD Version: v1.6.0.2
4. SDD Host attachment script: v32.6.100.24

#### IBM pSeries F80 (Remote AIX server)

1. Server type(s) and quantity: pSeries F80 (AIX 5.2 ML6)
2. Host Bus Adapter (HBA) vendor model(s): FC6228  
Firmware level: 3.91A1  
Driver level: devices.pci.df1000f9.rte.5.2.0.30
3. SDD Version: v1.6.0.2
4. SDD Host attachment script: v32.6.100.24

#### IBM xSeries 335 (Local/Remote xSeries server)

1. Server type(s) and quantity: Windows 2000 Server SP4
2. Host Bus Adapter (HBA) vendor model(s): Qla2340-IBM-SP  
Firmware level: BIOS 1.43  
Driver level: IBM driver 9.0.1.61
3. SDD Version: v1.6.0.3-1
4. I/O Meter

### Storage Product(s) Used:

#### IBM ESS (Local/Remote RAID disk)

1. Model Name and Number: 2105-F20
2. Version: 2.2.0.693
3. Number of Drives: Four RAID rank was used for this test
4. Drive Type: RAID 5 FBA
5. Capacity: 18GB HDD RAID5 (105GB/Rank)

### Switch:

#### IBM 2005-H16 (Local/Remote SAN switch)

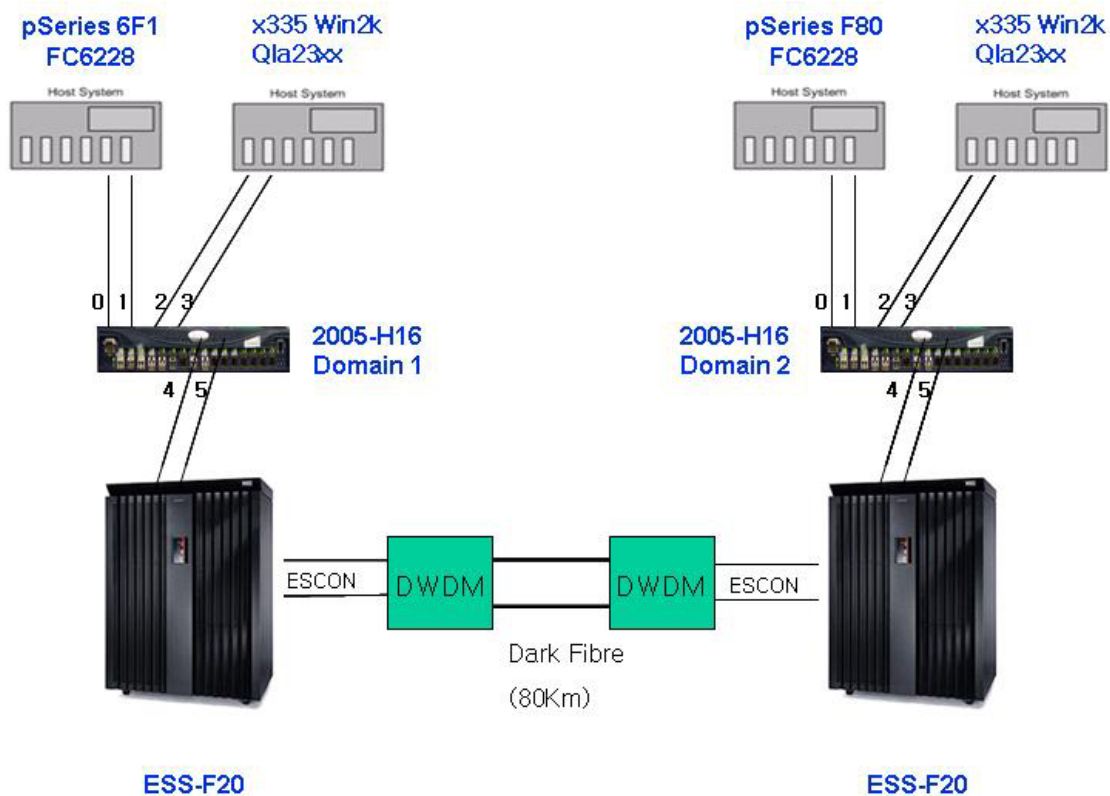
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1. Model Name and Number: 2005-H16
2. Version: 4.4.0c

DWDM:

Eastel Systems MegaLight Metro Plus

1. Vendor: EASTEL Systems
2. Model Name : MegaLight Metro Plus
3. Version: 1.0 for ESCON



The testing 2 scenario included the following equipment:

Hardware Details:

IBM pSeries 6F1 (Local AIX server)

1. Server type(s) and quantity: pSeries 6F1 (AIX 5.2 ML6)
2. Host Bus Adapter (HBA) vendor model(s): FC6228  
Firmware level: 3.91A1  
Driver level: devices.pci.df1000f9.rte.5.2.0.30

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3. SDD Version: v1.6.0.2
4. SDD Host attachment script: v1.0.0.0

### IBM pSeries F80 (Remote AIX server)

1. Server type(s) and quantity: pSeries F80 (AIX 5.2 ML6)
2. Host Bus Adapter (HBA) vendor model(s): FC6228  
Firmware level: 3.91A1  
Driver level: devices.pci.df1000f9.rte.5.2.0.30
3. SDD Version: v1.6.0.2
4. SDD Host attachment script: v1.0.0.0

### IBM xSeries 335 (Local/Remote xSeries server)

1. Server type(s) and quantity: Windows 2000 Server SP4
2. Host Bus Adapter (HBA) vendor model(s): Qla2340-IBM-SP  
Firmware level: BIOS 1.43  
Driver level: IBM driver 9.0.1.61
3. SDD Version: v1.6.0.3-1
4. I/O Meter

### Storage Product(s) Used:

#### IBM SAN Volume Controller (Local SVC Cluster)

1. Model Name and Number: 2145-4F2
2. Version: 2.1.0.1
3. Number of Drives: ESS mdiskgroup (40GB x 4)

#### IBM SAN Volume Controller (Remote SVC Cluster)

1. Model Name and Number: 2145-4F2
2. Version: 2.1.0.1
3. Number of Drives: FAStT mdiskgroup (40GB x 4)

#### IBM ESS (Local RAID disk under SVC)

1. Model Name and Number: 2105-F20
2. Version: 2.2.0.693
3. Number of Drives: Four RAID rank was used for this test
4. Driver Type: RAID 5 FBA
5. Capacity : 18GB HDD RAID5 (105GB/Rank)

#### IBM DS4300Turbo (Remote RAID disk under SVC)

1. Model Name and Number: 1722-60U
2. Version: FSM v9.12 (fw) 06.12.30.00 (nvram) N1722F600R912V05
3. Number of Drives: 11 drives (including 1 spare)
4. Drive Type: RAID5 (9D+P)
5. Capacity: 72GB HDD

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## Switch:

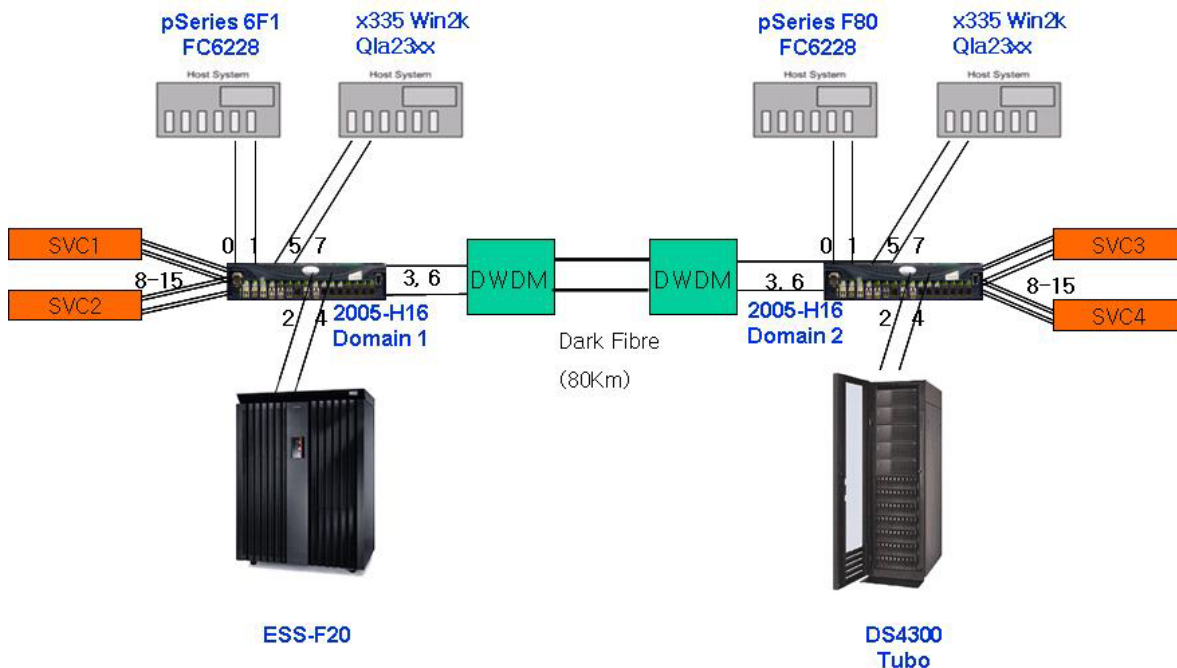
IBM 2005-H16 (Local/Remote SAN switch)

1. Model Name and Number: 2005-H16
2. Version: 4.4.0c

## DWDM:

EASTEL Systems MegaLight Metro Plus

1. Vendor: EASTEL Systems
2. Model Name : MegaLight Metro Plus
3. Version: 1.0 for Fibre Channel



## Test Results:

### Test Scenario 1

All basic interoperability of the devices tested was verified.

All failure mode and recovery scenarios were tested successfully with no related PPRC issues.

Disk I/O stress testing was tested successfully with no related PPRC issues.

Performance testing was tested with the following results:

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## Test results

Test 1 75% Read; 0% random

Device	# of jobs	Block size (KB)	PPRC with MegaLight			PPRC without MegaLight			Non-PPRC		
			MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps
ESS	1	4	3.478237	2.572315	0.905921	4.596862	3.404837	1.192025	7.843729	5.799631	2.044098
	1	32	9.158471	6.770151	2.38832	10.501916	7.772561	2.729356	12.706272	9.446351	3.259921
	1	128	14.929699	11.062104	3.867595	17.017566	12.628205	4.389361	18.960012	14.035404	4.924608
	4	4	11.31829	8.369266	2.949024	16.622008	12.312465	4.309542	23.839789	17.642283	6.197506
	4	32	28.980792	21.414754	7.566039	32.48036	24.078399	8.401961	36.951462	27.318018	9.633444
	4	128	50.982212	37.717961	13.264251	59.578818	44.303552	15.275266	64.859058	47.961347	16.89771

Test 1 75%read 100%random

Device	# of jobs	Block size (KB)	PPRC with MegaLight			PPRC without MegaLight			Non-PPRC		
			MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps
ESS	1	4	0.506255	0.383995	0.12226	0.525172	0.399396	0.125776			
	1	32	2.963867	2.208678	0.75519	3.046866	2.288661	0.758205			
	1	128	7.393721	5.556737	1.836984	7.786455	5.78018	2.006275			
	4	4	1.9747	1.481258	0.493442						
	4	32	11.360292	8.510854	2.849438	11.762226	8.833159	2.929067			
	4	128	28.762575	21.594653	7.167922	29.820135	22.32278	7.497356			

## Test Scenario 2

All basic interoperability of the devices tested was verified.

All failure mode and recovery scenarios were tested successfully with no related SVC or PPRC issues.

Disk I/O stress testing was tested successfully with no related SVC or PPRC issues.

Performance testing was tested with the following results:

# IBM TotalStorage Proven™ program

## Test results

Test 2 75% Read; 0% random

Device	# of jobs	Block size (KB)	PPRC with MegaLight			PPRC without MegaLight			Non-PPRC		
			MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps
SVC	1	4	7.342961	5.43325	1.909711	11.695297	8.652355	3.042942	13.604922	10.067661	3.537261
	1	32	26.035459	19.274536	6.760923	32.108143	23.792115	8.316028	33.673672	24.932568	8.741105
	1	128	36.195752	26.753321	9.44243	37.346067	27.776467	9.5696	32.321872	23.927328	8.394544
	4	4	21.853892	16.16327	5.690622	30.674317	22.694519	7.979798	35.543651	26.305942	9.237708
	4	32	50.120007	37.078316	13.041691	50.518347	37.362396	13.155951	50.376543	37.314666	13.061876
	4	128	70.062131	51.834364	18.227766	69.307236	51.21807	18.089166	68.606805	50.774396	17.832409

Test 2 75%read 100%random

Device	# of jobs	Block size (KB)	PPRC with MegaLight			PPRC without MegaLight			Non-PPRC		
			MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps	MBps	Read MBps	Write MBps
SVC	1	4	0.672853	0.511142	0.16171	0.689433	0.525334	0.164099			
	1	32	4.186183	3.147701	1.038481	4.201208	3.168638	1.032569			
	1	128	11.247147	8.41021	2.836937	11.363478	8.500928	2.86255			
	4	4	2.127841	1.600991	0.52685	2.205517	1.652024	0.553493			
	4	32	12.091708	9.08036	3.011348	12.30343	9.219464	3.083965			
	4	128	29.098604	21.837829	7.260776	29.50324	22.113903	7.389336			

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