

IBM TotalStorage Proven™ program

QLogic Corporation SANbox5602 QLogic SANbox 5602 Fibre Channel fabric switch



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”):

High-level architecture/description:

The SANbox® 5602 stackable switch delivers the seamless scalability and 4 Gb performance of a chassis switch, in an easy-to-manage, pay-as-you-grow solution. Now the benefits of stackable IP switches are available for high performance 4Gb SANs. With sixteen 1Gb/2Gb/4Gb ports plus a four-pack of high-speed 10Gb ISL ports, and entry as low as 8 ports with 4-port software-keyed increments and included graphical user interface (GUI) wizards, each SANbox 5602 stackable switch provides maximum flexibility for configuring, managing and scaling SANs.

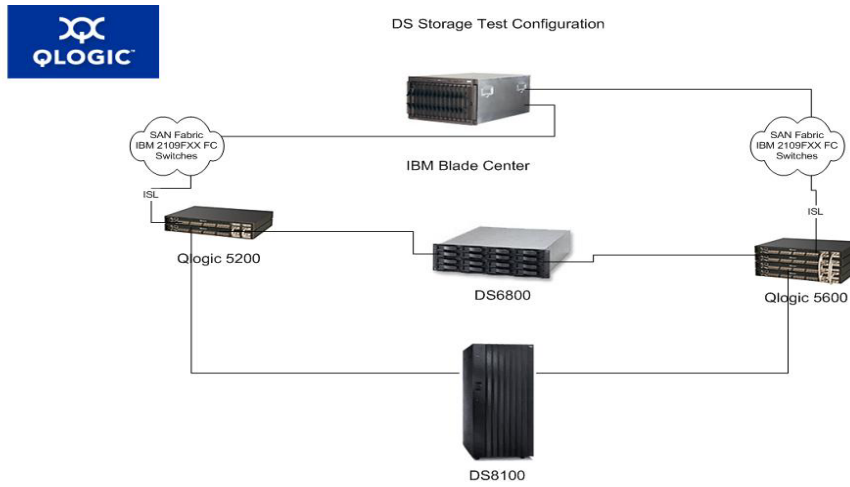
For more information regarding the QLogic SANbox 5602, please refer to www.qlogic.com/products/sanbox/sanbox_5600.asp

The SANbox 5602 was tested at the IBM San Mateo labs with a variety of IBM storage products (detailed below) and successfully met the requirements for IBM TSP Comprehensive status.

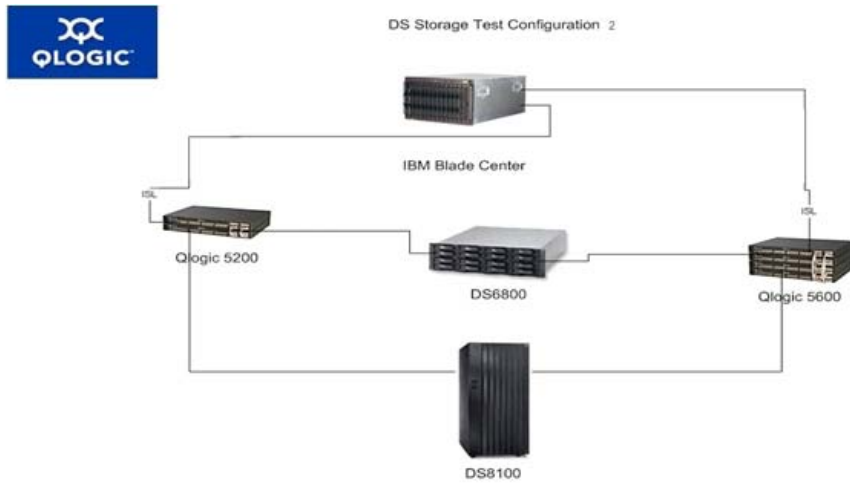
IBM TotalStorage Proven™ program

The actual testing scenario:

- ◆ **Multi-Vendor Fabric**

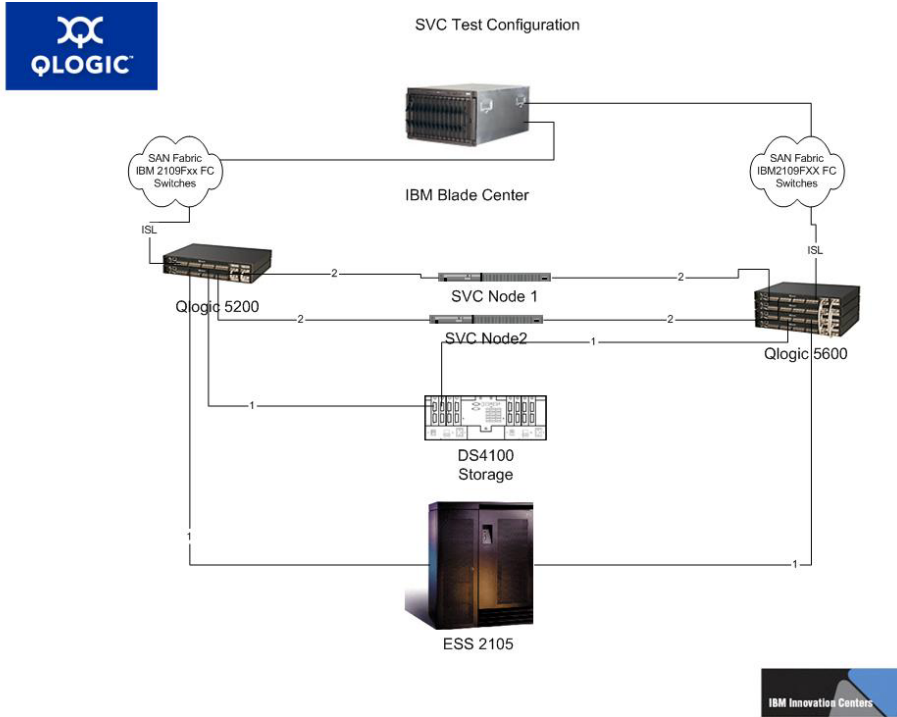


- ◆ **QLogic only Fabric**

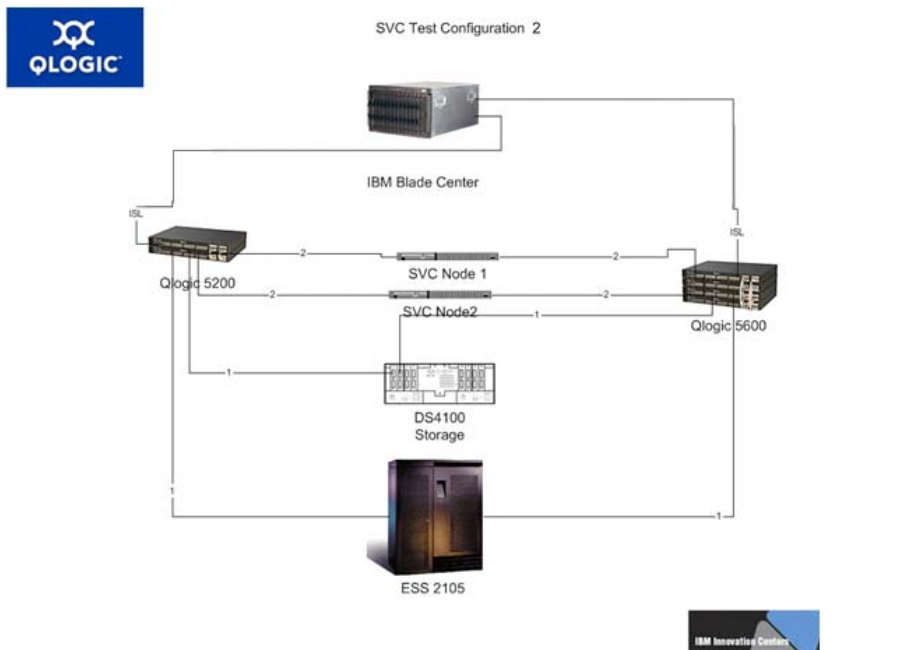


IBM TotalStorage Proven™ program

◆ Multi-Vendor Fabric (SVC)



◆ QLogic only Fabric (SVC)



Testing level achieved: **Comprehensive**

IBM TotalStorage Proven™ program

Test Objective and Specifications:

The objective of this testing is to qualify and achieve a Total Storage Proven status of Comprehensive for the configurations and devices illustrated in the above diagram and detailed in the tables below.

Interoperability tests focused on installation & configuration, heavy I/O load with data verification at various frame sizes 512b – 1MB, as well as exception and failover handling.

- ♦ Installation & Configuration section tested and verified the procedures documented in respective Install Users manuals.
- ♦ I/O load with data verification testing ensured basic functionality and proper fabric routing between the tested components.
- ♦ Exception handling focused on the components ability to handle and recover from the following conditions, all of which have the propensity to disrupt data traffic and or device and fabric operations.
 - Natural fabric occurrences such as RSCN and Loop Initializations (LIP)
 - Fabric administration functions such as firmware updates, zone changes, fabric migration
 - Hard errors such as cable failures, storage controller failures, and fabric failure

Switch fabric features tested were device NameServer registration, Zoning (all types), fabric Operating Modes, Port Configuration (all supported port types and speeds), Non-Disruptive Code Load and Activation (NDCLA), and RSCN suppression. Hosts and Storage were placed at opposite ends of the SAN configuration to ensure switch routing occurred via ISLs between fabrics.

Test Equipment Specifics

Servers:

Server Model	OS	Version	Adapter	Driver	Firmware
HS20 Blade	Linux	RH 3.0 Update4	QLogic 23xx	7.05.00	3.03.11
HS20 Blade	Windows	2000 SP4	QLogic 2312	SCSI Miniport 8.1.5.63	3.01.18
HS20 Blade	Windows	2000 SP4	QLogic 2312	SCSI Miniport 8.1.5.63	3.01.18
HS20 Blade	Windows	2003 SP1	QLogic 2312	SCSI Miniport 8.2.0.10	3.01.19

IBM TotalStorage Proven™ program

Storage:

IBM Storage Devices	Model	Driver/Firmware	Number of Drives	Drive Type
DS4100	1724	5.42.03.00	3	232 GB
DS6800	1750	5.0.3.0264c	8	
DS8100	2107	5.0.3.0277	8	72 GB 15KRPM
SVC	2145	2.1.0.2	NA	
ESS	2105-800	2.4.0.245	8	36 GB 15 KRPM
Tape	Ultrium-2 - 3580	Windows Driver 6.0.8.2 / FW 38D0	2	Ultrium 2
Library	ULT-3582-TL	Windows Driver 6.0.8.2 / FW 227B		

Fabric Switches

Vendor	Model	Firmware
QLogic	SANbox 5602	5.0.0.17
QLogic	SANbox 5202	5.0.0.17
QLogic / IBM	FCSM (Switch Blade Module)	2.0.0.22-0
Brocade / IBM	2109F32	V4.1.2f
Brocade / IBM	2109F16	V3.1.2a

Test Results:

The products were tested from July 10, 2005 – July 21, 2005.

No deviation from default parameters was required for the components to interoperate. The parameters were modified throughout testing to ensure customizable functionality.

The test environment originally contained Fibre Channel switches from multiple vendors as seen in the above diagram, including dual QLogic / IBM eServer BladeCenter FCSMs. The comprehensive testing was performed on both a multi-vendor SAN as well as a QLogic only SAN.

The migration to a single vendor SAN was tested and achieved by removing the non-Qlogic switches from SAN. Moreover, this was performed during heavy I/O traffic. To accomplish this migration, the test relied on the dual port HBAs, redundant SANs, and IBM's SDD failover software. No errors or interruptions were encountered during the migration.

IBM TotalStorage Proven™ program

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