Imperative Networks
Imperative 802

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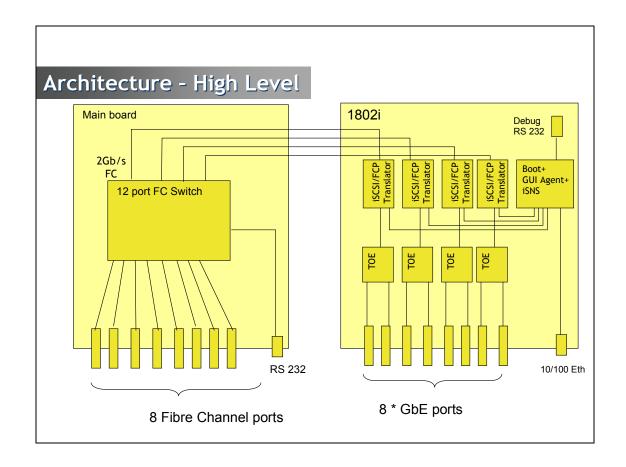
High-level architecture/description, include a list of products that meet the compatibility requirements ("Approved Product(s)") as well as a list of the IBM storage products with which the Approved Products meet the compatibility requirements ("Qualified IBM Storage Products"):

ImperativeNetworks 802 Proven Testing:

This document describes, from a technical perspective, the ImperativeNetworks 802 Fibre Channel switch that was included as part of the IBM TotalStorage Proven testing. It gives an overall picture of the ImperativeNetworks 802 testing configuration, with a description of the results of the testing including specific highlights of the interoperability results.

High-level architecture

Imperative 802 high level architecture:

Architecture – High Level

Main board		1802i	Debug RS 232
2Gb/s FC			
12 port FC Switch		iSCSI/FCP Translator (×4)	Boot+ GUI Agent+ iSNS
		TOE (×4)	
	RS 232		10/100 Eth
8 Fibre Channel ports		8 * GbE ports	

Testing scenario

1.1   Hardware Details:
1. Server type: Server: xSeries Model 330
2. Host Bus Adapter (HBA) vendor model: Qlogic 2312

1.2   Storage Product Used:
1. Vendor: IBM
2. Model Name and Number: DS4300 / 1722-600
3. Capacity: 36GB

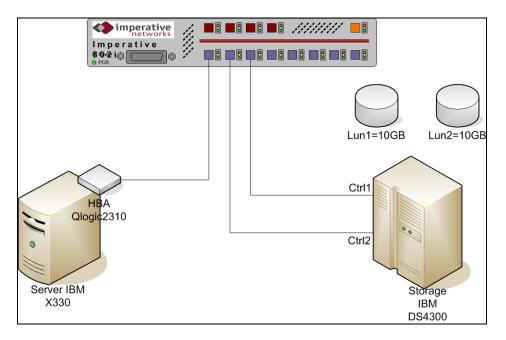**1.3   Switch:**
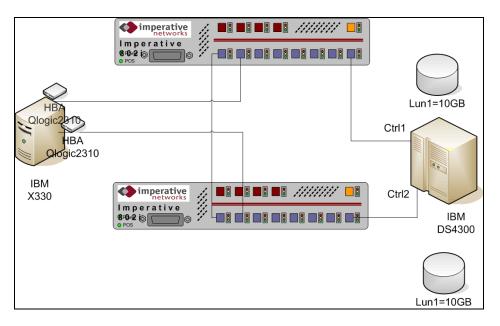1. Vendor: Imperative Networks
2. Model Name and Number: Imperative802

1.4   Software Details:
1. Software Vendor: Imperative Networks
2. Software Name: Imperative-MGMT

1.5 Basic testing configuration:

1.6 High-Availability Configuration:

Testing level achieved

- Standard: The standard test consists of elements like install, configuration, load, exercise I/O, and backup/restore testing.
- Comprehensive: High availability tests were performed – multi-path and failover scenarios.

v6.20.02

Testing specification

1.7   Basic Functionality Tests

100N - Power on all devices

This step is simply powering on the equipment to assure that no startup failures occur.

120N - Proper security enforced (access controls function as designed)

If the solution includes security features such as user logins, this step assures that the security is functioning as expected.

1.8   Stress Tests

230N - Switch Failure/Exception Tests

Generate switch failures where possible, such as blade failures, control module failovers, etc. This test also includes cable pulls to force path failover where applicable. This test is targeted at highly available and fault tolerant solutions, and must be attempted on both host- and storage-sides of the solution, such as with the SAN Volume Controller.

1.9   Installation Tests

300N - Initial standard installation

This is a normal installation of all products in the solution, in a typical configuration.

320N - Upgrades

This covers the installation of upgrades, as supported by the solution. This is targeted at solutions that allow online upgrades, such as with an IBM Enterprise Storage Server.

1.10 Test for Software Installed on our Box

Primarily directed at solutions involving IBM's NAS and SAN level systems

400N - Regression test of existing on-the-box software

This test is to verify that the solution functions properly with the included software on the IBM systems, such as copy services functionality or automated backups.

1.11 Verify primary functions and interoperability

500N - IBM Storage Product

The solution should function properly with the basic features of the IBM storage, as supported in the solution.

510N - Vendor's Hardware/Software

The solution should function properly with all the features of the vendor's hardware or software. All applicable features should be checked to verify that they interoperate with the IBM storage.

520N - Storage product features as applicable

The solution should function normally with all of the features of the IBM storage product. This includes copy services, a variety of supported RAID levels, etc. This includes features outside the normally supported scope of the solution to verify that they don't adversely affect the rest of the solution when implemented.

1.12 Ensure data integrity/data protection
    600N - Validate Data Integrity
        An I/O generator that performs read/write/verify must be used wherever possible during the tests to assure that data is not only transferred, but is transferred without logical errors.

1.13 Exception Handling Behavior
    700N - Failures of Storage product
        This is to verify that drive failures, host-side port failures, power supply failures, etc., don't affect the rest of the solution. This includes both host-side and storage-side failures in products such as the SAN Volume Controller. An example for the SAN File system would be killing one metadata server while the application is running, and assuring that operation continues properly.
    720N - validate redundant IP paths functions properly by disabling primary path.

1.14 Reliability/Availability/Serviceability
    800N – Diagnostics
        The diagnostics capabilities of the solution must function properly, as expected. Supported error reporting must be accurate and timely.

1.15 Documentation
    900N - Document any known limitations/workarounds. Document supported versions of products

1.16 Performance
    1000N - Baseline Test to ensure adequate performance
    1010N - Formal performance benchmarks

Testing specification

1.17   Hardware Details:
1. Server type and quantity:
   - Server: xSeries Model 330
   - Microsoft Windows 2000 Server, Sp4
2. Host Bus Adapter (HBA) vendor model: Qlogic 2312
   - Firmware level: 3.01.10
   - Bios level: 1.35
   - Driver level: 8.1.5.60

1.18   Storage Product(s) Used:
1. Vendor: IBM
2. Model Name and Number: DS4300 / 1722-600
3. Version: Storage Manager 9.10.G5.02
4. Number of Drives: 14
5. Drive Type: Fibre Channel
6. Capacity: 36GB
7. Microcode Level:

- Firmware version: 06.10.11.00
- NVSRAM version: N1722F600R910V03

1.19   Switch:
1. Vendor: Imperative Networks
2. Model Name and Number: Imperative802
3. Version: 508B

1.20   Software Details:
1. Software Vendor: Imperative Networks
2. Software Name: Imperative-MGMT
3. Release level(s): 1.0.0.14
4. Description: Management software of Imperative802

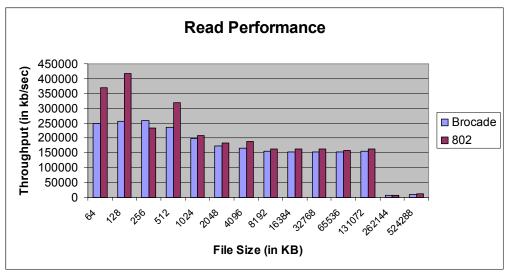# 2   Testing results obtained

2.1   Test date
March 20th, 2005
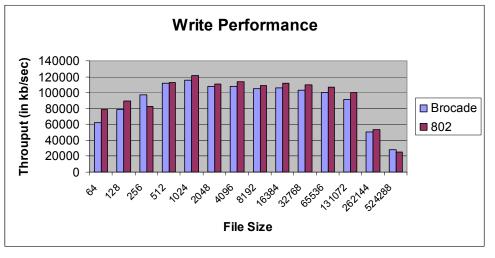
2.2   Test location
IBM Innovation Center, Israel

Performance tests results obtained
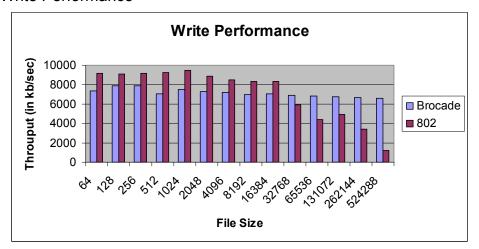
Windows 2003

Read Performance

Write Performance

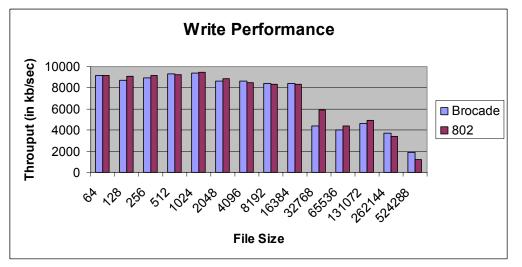**Write Performance**

Red Hat Linux Enterprise Edition 3.0

Read Performance

Read Performance

Write Performance

Write Performance

Solaris 9

Read Performance

Write Performance

Participant support contacts

2.3   Company Information:
1. Company Name: Imperative Networks
2. Company Web Page: http://www.imperativenetworks.com
3. Customer support E-mail: support@imperativenetworks.com
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2.4   Contact Information:
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