

# IBM TotalStorage Proven™ program

## Lakeview Technology H.A. Clusters™



### **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”):

H.A. Clusters™ is the high availability solution that monitors server hardware and application software, detects failure, automatically initiates recovery, and restarts multiple failed services. H.A. Clusters™ eliminates disruptions and ensure availability by transparently monitoring all servers sharing the same disk subsystem.

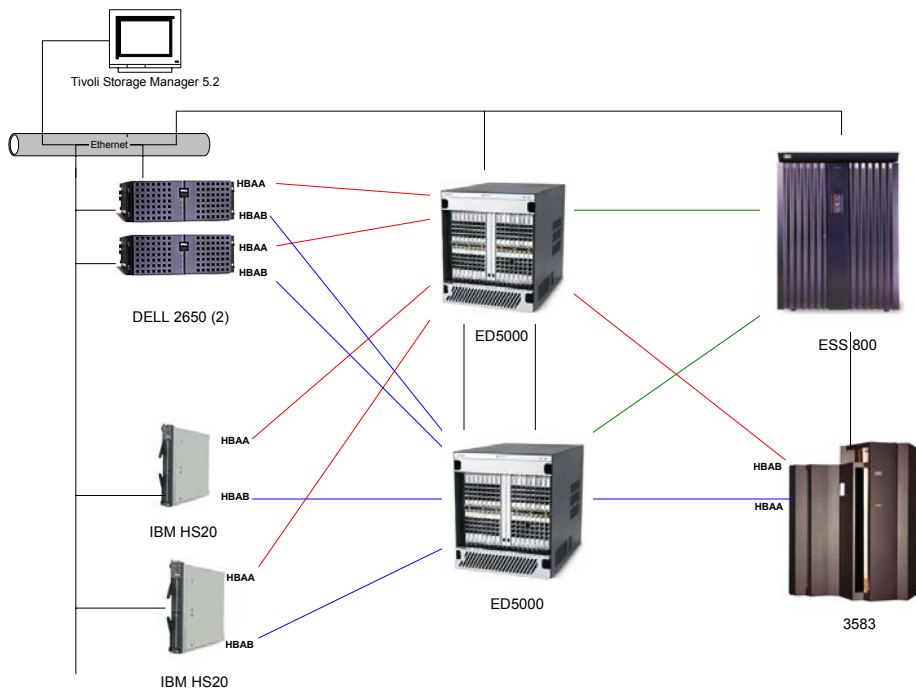
Two Dell PowerEdge2650s and two IBM HS20 blade servers were attached to an Enterprise Storage Server (ESS) 800 storage device and an IBM 3583 Tape Library via two McData ED-5000 switches.

A “heartbeat” monitors server status and initiates appropriate action when a server or communications failure is detected. Multiple communications paths may be used. Failure of a single communications path does not initiate fail over if alternate communications paths are available.

Loss of server or communications is detected by H.A. Clusters™ and failover is initiated. During testing, power failures were initiated for the servers. H.A. Clusters™ successfully detected the failures, properly failed over, and resumed operations with the active equipment.

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The actual testing scenario:



Testing level achieved: **Standard**

The standard test consists of install, configuration, load, exercise I/O, and backup/restore testing.

Testing:

H.A. Clusters™ was installed on each of the two Dell PowerEdge 2650 servers and the two IBM HS20 blade servers. Two independent libraries were created on the ESS800, one for the Dell cluster and one for the IBM cluster. “Heartbeat” connections were established within the Dell and IBM clusters for status monitoring.

Server power failures initiated on both clusters. H.A. Clusters™ successfully detected the failed server and switched to the remaining active server. Access to data via the failover server was identical to access via the primary server.

Backups were performed under the above scenarios using Tivoli Storage Manager and IBM 3583 Tape Library. Backups and restores were successful for the primary and failover servers.

Storage related benefits of H.A. Clusters™ solution include:

- Simultaneously supports multiple server and storage models.
- Supports flexible server and storage configurations for one or more active servers to failover to standby or active servers
- Detects failovers within two seconds.

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- Prevents false failovers.
- Supports all RDBMS systems and stateless applications.
- Client is automatically connected to standby or alternate active server when failover is detected.

### Test Configuration:

#### Hardware Details:

Server type(s) and quantity: (2) IBM Blade Server HS20

Host Bus Adapter (HBA) vendor model(s): 48P7062

Firmware level: 1.35

Driver level: v6.05.0

Network Interface Card (NIC) vendor: IBM

Model(s) 48P7054

Firmware levels: v7.0.00 Bios: V1.35

Server type(s) and quantity: (2) Dell PowerEdge 2650

Host Bus Adapter (HBA) vendor model(s): Qlogic: QLA2342/L

Firmware level: 1.35

Driver level: V6.05beta9

Network Interface Card (NIC) vendor: Broadcom

Model(s) NetXtreme A01

Firmware levels: v.7.0.0 Bios: 1.35

#### Storage Product(s) Used:

IBM (2) 3583 Tape Library

Version: L36-36

Number of Drives: 6

Drive Type: Ultrium 2 08L9870 LTO

Capacity: 200/400GB

Microcode Level: v5.14\_01

Comments: Tape drive will be connected via fibre channel to fabric

IBM ESS 800

Version: 2105

Number of Drives: 16

Drive Type: 36.4 GB

Capacity: Raid Group 1: 245 GB (7+P) RAID 5; Raid Group 2: 245 GB (7+P) RAID 5

Microcode Level:

Comments: ESS 800 will be connected to fabric with dual connections for redundant zoning from fibre channel fabric. Need license for version 2.1.0 for Linux support.

#### Switches:

McData ED-5000 (2)

Version: V.3.2

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### Software Details:

IBM Tivoli Storage Manager  
Release level(s): 5.2  
Description: Tivoli Storage Manager for backup and archive.  
OS Version: Linux

### Middleware Used:

Vendor Name: Lakeview Technology  
Middleware Name: H.A. Clusters™  
Release level(s): V6.0

### Test Results:

Standard H.A. Clusters™ installation procedures were initiated for all servers. Two independent H.A. Clusters™ libraries were created on the ESS800 – one library for the Dell cluster and one for the IBM cluster. Backups and restores were made from/to all servers and the two H.A. Clusters™ libraries using Tivoli Storage Manager and IBM 3583 Tape Library. No data exceptions or other problems noted.

H.A. Clusters™ “heartbeat” monitors were established within the Dell and IBM clusters for status monitoring. Various hardware components were disabled by simulating power failures. H.A. Clusters™ detected the failures and switched to the remaining server. User access was verified. Backups and restores were performed with no exceptions. The disabled equipment was reactivated and the process repeated in the reverse direction. All server failures were detected and properly failed over with no loss of connectivity to storage environments.

H. A. Clusters™ status screens correctly documented the various status conditions in the testing scenarios.

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