

# IBM TotalStorage Proven™ program

## Topio Inc. Topio Data Protection Suite



### **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”):

### **Solution Overview:**

Topio Data Protection Suite (TDPS) was used to achieve asynchronous data replication between two datacenter sites. The primary data site represented a production DB2 DPF configuration. Routers provided connectivity between the sites over IP. The primary site consisted of four (4) Windows 2000 SP4 servers and each server was connected to IBM’s SAN Volume Controller (SVC). All volumes from the SVC were connected over a dual attached redundant SAN Fabric. Also included was a backup server and tape library running Tivoli Storage Manager (TSM).

### **Test Scenario**

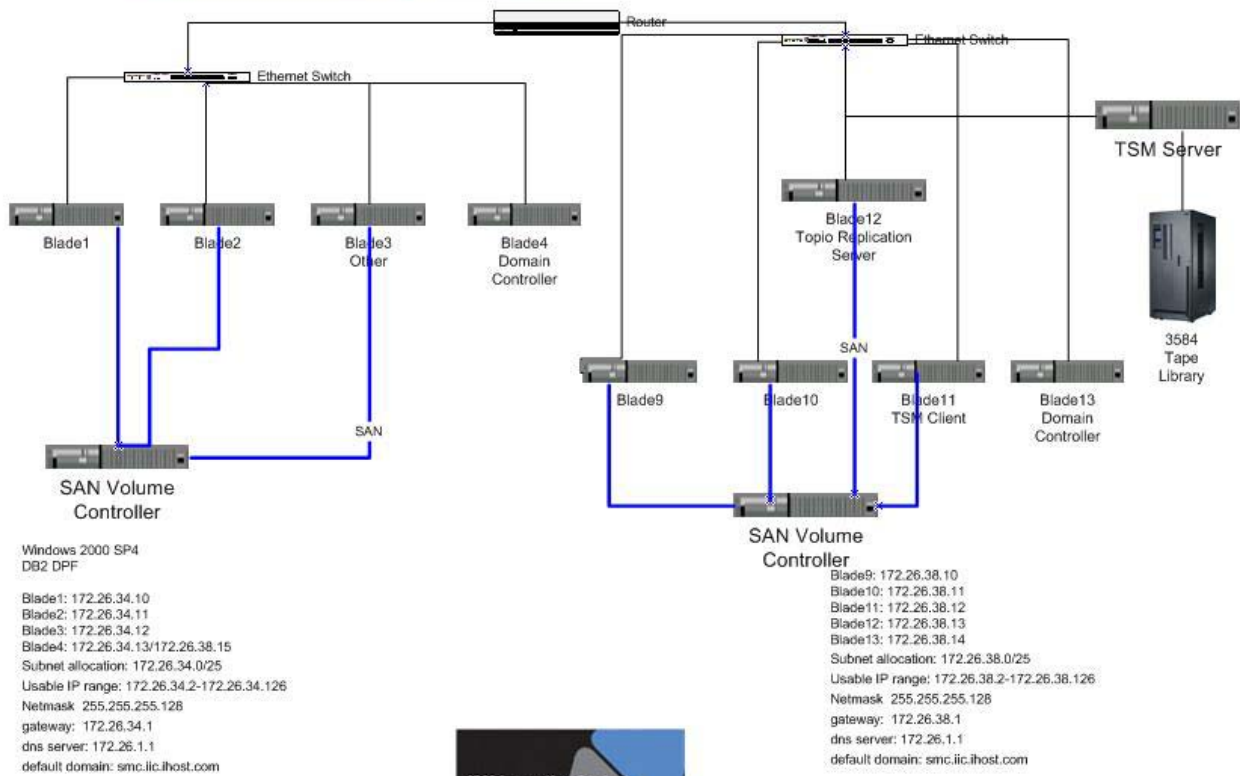
Blade1 and Blade2 participated in a DB2 DPF configuration. In this configuration, each server had a partition of the database and corresponding log files. Given that the DB2 data was partitioned across both servers, Topio’s data consistency engine was required to keep write-order fidelity during the replication process. The distributed volumes were replicated to the remote site over TCP/IP. Topio software running on Blade12 was then responsible capturing these updates and creating an exact Replica at the remote site. To recover data at the remote site, IBM FlashCopy on SVC was used. Flash copies of the replicas were made available on Blade10 and Blade11 at the recover site. On each of these servers, data was verified, backed up using TSM, and restored to

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Blade1 and Blade2. All recovery tests provided a consistent, recoverable image of data with data currency within seconds.

In addition, disruptive testing was completed including:

- Disk Path Failure
- Complete Data Center & Power Loss
- Network Failure
- Server & Process Crash



### Testing Level

Topio completed the Comprehensive testing level.

In addition:

- Application restore back to the primary of replicated DB2 DPF data. Data verification on Blade1 and Blade2 confirmed data currency to the second of the partitioned database.
- Backup integration with TSM also tested and backups were performed.

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- FlashCopy integration with replicated data. Consistency and recoverability were all confirmed

### Testing Details

There were several tests performed which fall into three major categories:

- Data Consistency and Recovery
- Disruptive/Disaster Testing
- Integration Testing with IBM Products

#### Data Consistency and Recovery

During all the tests data was verified for recoverability and currency. To verify the currency of the replicated data, a SQL script was written on the primary database to insert incremental values to the database tables. The numeric values were then compared from the source original to the replica. In all cases, data was current to the second.

#### Disruptive/Disaster Testing

Full Site Failure and Power loss was tested by removing power to all servers participating in the replication process.

Path failure to storage devices tested by removing cable connections within the SAN environment.

#### Integration Testing

Along with SVC, FlashCopy and TSM were also included in the test environment for integration with the Topio's replication solution.

- FlashCopy: Replicated copies at the recovery site were made with FlashCopy after issuing the Topio Freeze command. The Freeze command is specifically designed to integrate with point-in-time copy technology and integrated with FlashCopy seamlessly.
- TSM: Backups were made from the FlashCopy volumes to test consolidation of backup integration. Here again, both FlashCopy and Topio's Freeze command provided a consistent point-in-time replica for TSM to backup. All backups and restores were completed successfully.

### Product Versions and Configuration

#### Hardware Details

1. Server type(s) and quantity: Blade Center Blades (9)
2. Host Bus Adapter (HBA) vendor model(s): Qlogic 2312
  - a. Firmware level: 3.01.18
  - b. Driver level: SCSIport 8.1.5.63 (W2K IP)
3. Network Interface Card (NIC) vendor:
  - a. Model(s) : Broadcom NetXtreme Gigabit Fibre WOL
  - b. Driver levels: 3.30.0.0

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### Storage Product(s) Used

1. IBM SAN Volume Controller
2. Version: 2.1
3. IBM 3584 Tape Library
4. Number of Drives: 4
5. Drive Type: Ultrium 2, 3592
6. Capacity: 200GB/300GB
7. Microcode Level: 4770/04E6

### Switch(es)

1. Vendor: IBM 2109Fxx

### Software Details

1. Topio Data Protection Suite
2. Release level(s): 2.1
3. Description: block-level asynchronous data replication over IP networks
4. OS Version: Windows 2000 SP4

### Middleware Used

1. Tivoli Storage Manager

### Database Used

1. IBM DB2
2. DBM Product: DPF
3. Release level(s): 8.1.7
4. Other comments: DPF Configuration on blade 1 and 2

## **Test Results**

All functional, interoperability and data integrity/consistency tests were completed successfully. To fully recover DB2 DPF on Windows, it is necessary to have information specific to the original machine to recover the database. This requires replication of the Windows system partition. Topio's unique ability to replicate the system partition provides an exact image of the server and database partitions at the recovery site.

In general, data was replicated at the speed of disk over 1Gb Ethernet connections so no software or network bottlenecks were present in replication processing.

System overhead on the primary servers remained very low. CPU utilization of 1% to 3%, and 16MB of memory space were observed during peak load periods.

All data currency tests showed data was up to the second on the replica.

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### Technical Support

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