

CASE STUDY

Large Canadian Retailer

Large retail company manages growth and meets 24-hour customer service demands with IPStor SAN

About the Company

The company featured in this case study operates a chain of retail outlets in Canada. It is one of Canada's largest retailers, with approximately 6400 listed products and over 3300 employees.

Business Need

In an effort to meet customer service demands and partner commitments, the company had to implement a scaleable and robust data storage and management system as part of its IT infrastructure – as soon as possible.

With an estimated annual growth rate of 30%, limited administrative staff, and 24-hour-per-day uptime requirement, adding storage and managing data backups in the company's direct attached storage environment was becoming very challenging. They had to manage 2 Terabytes of distributed storage direct-attached to its many application servers. It was increasingly time consuming for administrators to backup, restore, and provision additional disk space on-demand (i.e., in real time).

At the same time, two large-scale projects involving the implementation of a new Retail Management System and a corresponding Data Warehouse System were being planned. These were going to put even *more* demands on an already exhausted and inefficient storage environment. The company therefore decided to introduce a Storage Area Network (SAN) solution to allow for more efficient use of existing and additional storage resources and personnel within the company's IT environment.

FalconStor Solution

FalconStor and IBM came together to architect a highly available, easily manageable IPStor-based Fibre Channel SAN that offers centralized storage management and Snapshot Copy capabilities, to provide enhanced backup and testing functionality for company's various Oracle databases and Windows-based data volumes. The solution combines IBM Enterprise Storage Servers running FalconStor's award winning IPStor software and an IBM FastT500 Storage Array to provide a superior architecture that has exceeded the company's requirements. This solution provides the company with a high performance, highly scalable, and highly available storage infrastructure for their HP UNIX and Microsoft Windows 2000 servers.

IPStor enterprise storage infrastructure and services software from FalconStor delivered on the company's strategy to satisfy evolving data storage requirements and improve the quality of storage services to its customers and partners, while solving its requirement for simplified storage management and seamless, boundless scalability. **Existing investments are protected, and cost savings from managing the environment have already provided the anticipated return on investment.**

Industry

Retail distribution

Application

Retail Management System (RMS) and Data Warehouse System

IT Challenges

- Ever-increasing workload on current IT administrative staff due to direct-attached storage
- Difficulty meeting backup window and reducing impact on production systems
- Proposed RMS and data warehousing projects would require a more scaleable and robust data storage and management facility

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IPStor Software Deployed

IPStor Base Fibre Channel
IPStor SAN Clients
DynaPath Agent
Synchronous Mirroring Option
Snapshot Agents for Oracle
Active-Active Failover Option
Snapshot Copy Option

Benefits

- High availability through no-single-point-of-failure (NSPOF) architecture
- Simplified, centralized storage management and consolidated storage
- Enhanced performance through load balancing
- High scalability and future-proof architecture
- Point-in-time Snapshot Copy eliminates impact of backup, reporting, and testing operations on production servers
- Modular design allows the company to purchase additional functionality as and when needed

High Availability and Fault Tolerance for 24x7xForever Uptime

The company's Head Office Computer Centre in Vancouver houses a pair of IPStor appliances configured in an active-active cluster enabled by IPStor's **Active-Active Failover Option**. Should one of the IPStor appliances stop functioning due to a hardware issue or scheduled maintenance, the other member in the cluster immediately and transparently takes over its companion's workload servicing its application servers (failover). When the IPStor appliance is back in service, its partner will detect the status and automatically transfer the workload back to its original owner (failback). A **DynaPath Agent** (DynaPath/FC Agent for Windows or DynaPath/FC Agent for HP-UX-) was installed at each of the respective application servers to ensure the highest degree of data availability and I/O performance. DynaPath Agents harness multiple Fibre Channel HBAs to provide parallel active paths to the storage device and transparently reroute server traffic without interruption in the event of a HBA or switch failure (failover and failback). Optimal I/O performance of the SAN is also realized by distributing server traffic across those parallel storage paths (load balancing).

Synchronous Mirroring was implemented to guard against drive, channel, and cabinet-level failure by duplicating the 'write' to two separate disks (which can be from different manufacturers with different I/O interfaces) attached to the IPStor appliances. Should one of the disks in the mirrored pair fail to function, IPStor immediately notifies the IT manager via SNMP alert and transparently utilizes the failed disk's mirror to continue to serve the I/O requests originating from the application servers. IPStor takes full advantage of the mirror configuration to accelerate 'read' operations by spreading the read request over two spindles simultaneously. The DynaPath Agents, Active-Active Failover server cluster, and Synchronous Mirroring are the cornerstones of IPStor's no-single-point-of-failure (NSPOF) architecture, which ensures that the company has the highest degree of business continuance and can withstand disk, channel, switch, IPStor appliance and HBA failure within its data center.

Improved Backup, Testing, and Reporting Capabilities

For scheduled tape backups and testing or reporting functionality, IPStor's **Snapshot Copy Option** enables the company's storage administrators to create, full point-in-time snapshot copies of an active SAN drive. Snapshot Copy integrates with IPStor's application-specific **Snapshot Agents for Oracle** to ensure transactional integrity and point-in-time consistency during the snapshot process so that recovered files are transactionally accurate and have point-in-time integrity. This sets the stage for phase II of the deployment, wherein an automated snapshot process supports a ZeroImpact Backup architecture which further minimizes management overhead and eliminates impact of backups or testing on production servers.

Centralized Storage Management and Automated Alerts

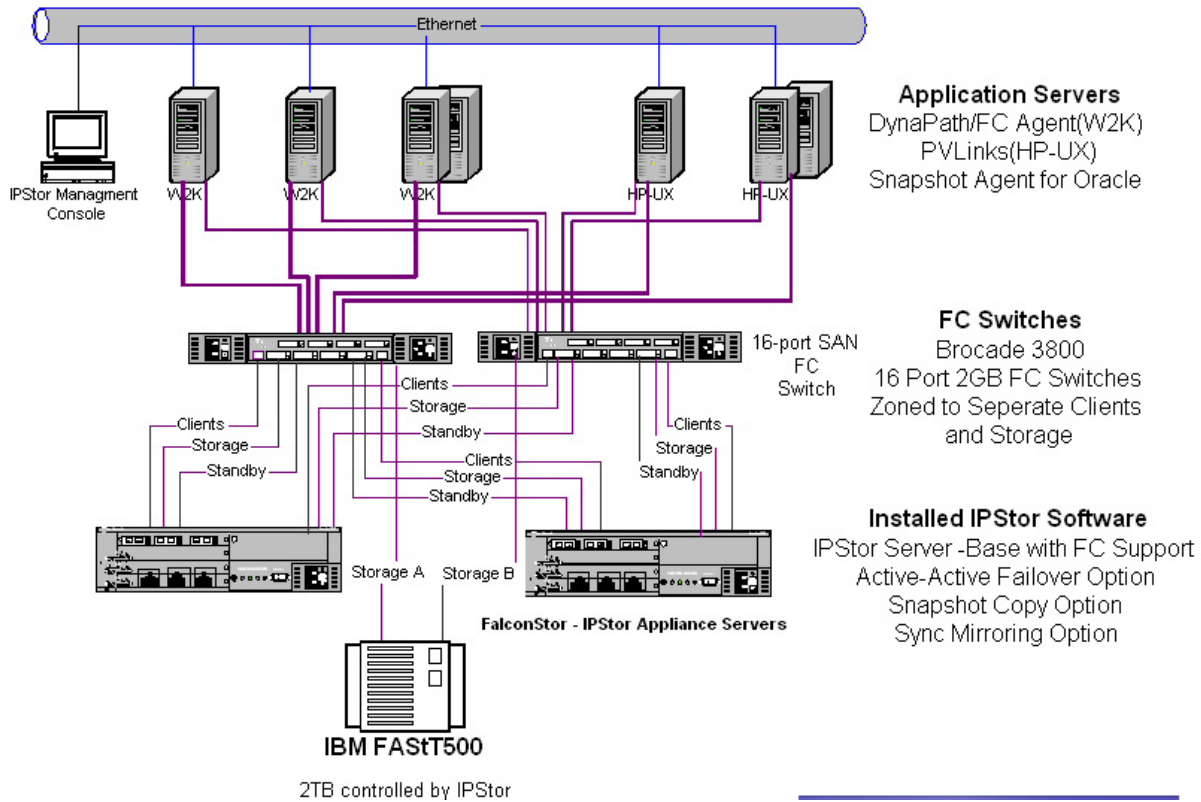
Management of all SAN storage and storage services is centralized and simplified at a single easy-to-use Java-based **IPStor Console**. Now administrators can manage much larger amounts of storage with great ease. Given that IPStor is in full compliance with the SNMP standard and is pre-integrated with many enterprise management frameworks, the company's IT staff can receive IPStor alerts automatically.

Pooled Storage Capacity for Maximized Utilization and Storage On-the-Fly

Pooled storage capacity allows the company's administrators to provision storage when and where it is needed, eliminating fears of out-of-space downtime and dramatically easing administrative tasks. Storage capacity utilization is maximized, performance of the storage network is improved, and rapid storage growth and reconfiguration (via "soft" re-cabling done with a few mouse clicks at the IPStor Console) are possible without unnecessary downtime.

Deployment Details

IPStor SAN Hardware Configuration	
(2) IPStor Appliances (IBM Enterprise Storage Server 2105 FC20) Intel-based motherboard-Dual Xeon 1.5Ghz Red Hat Linux 7.2 (4) 64 bit 66 MHz PCI/PCI-X slots (2) 133 bit 100 MHz PCI-X/PCI slots 2GB RAM (2) 36GB Internal Disk Drives Dual Power Supply On-Board10/100 NIC (6) QLogic 2300F HBAs <i>Each IPStor appliance connected to Ethernet LAN for management through IPStor Console</i>	Switches (2) Brocade 3800 2GB Fibre Channel Switches Storage IBM FAStT500 Storage Array, 2TB (Expandable to 16TB) (10) Application Servers: (5) HP-UX 11.x (2) Emulex LP9200L HBA's in each HP-UX Server (5) Window 2000 Server/SP2 (2) QLogic QLA2300FL in each W2K Server (5) Oracle Database on HP-UX



Summary

The large Canadian retailer featured in this case study is now reaping the benefits of its IPStor-based enterprise SAN storage solution that features no single point of failure, an enhanced backup and testing strategy, and unlimited potential for growth. The company has been able to leverage all of its existing hardware while streamlining storage, software licensing, and management costs. As its business continues to expand, the organization is in a solid position to manage that growth in a cost-effective way, with a well-planned infrastructure that keeps its data always available.