



## Managing Business Data More Efficiently: ILM helps reduce costs and improve performance in a tiered-storage environment by migrating data to lower cost storage.

iQstor Customer: Long Beach Transit Authority

### Situation Overview

The secure storage and timely access to critical data via the network center is essential to the efficient operation of any organization. In recent years, the ongoing escalation of misdemeanors and suspected crimes in major cities have caused state and county run organizations to place a higher priority on surveillance and the need to upgrade legacy IT systems to cope with the ever increasing deluge of data brought on by the proliferation of monitoring equipment. An example of this requirement is presented by the Long Beach Transit Authority (LBT), which manages a fleet of approximately 220 vehicles in Orange County, California.

With a data record comprising of a vehicle's performance and trip parameters, location, route changes, deviations, etc. being written every 10 seconds for all 220 vehicles - the need for an optimal IT infrastructure with priority placed on storage consolidation and management becomes paramount. The LBT's IT infrastructure comprise of multiple enterprise applications used to handle daily operations (email, file management, ERP) residing on a corporate network of 35 servers. In addition, a mix of real-time transponder data (location and service data) and uploaded surveillance video from the vehicles in the fleet is supported by a separate transmission and storage system.

This case study outlines the LBT's decision to purchase iQstor Networks' iQ1000 FC-FC Storage Platform and iQ1200 FC-SATA Storage Platform to consolidate their storage needs, protect and manage their high-value data throughout its lifecycle, serve business continuity requirements, reduce backup and restore times and support future Information Lifecycle Management (ILM) initiatives.

### The Business Challenge

Each of the 35 application and file servers on the corporate network initially had their own dedicated storage (100GB typical). Without a centralized networked storage system (SAN), the LBT's enterprise application and file server network, with each server operating independently, had to be managed separately.

"Since going live, our nightly backup process has improved from an average of 12-15 hours in late 2005, to taking less than 6 hours in early 2Q2006. Quantitative benefits are also significant - the IT staff efficiency has improved by an average of 2 man-hours per day; and the enterprise system availability has increased by 6 hours per day."

Patrick Pham

Vice President and Executive  
Director of Information Technologies  
Long Beach Transit

### Business Challenge:

The Long Beach Transit Authority needed to enhance data integrity, accessibility, reliability, performance and to decrease the turnaround time on issue resolution.

### Solution:

iQstor iQ1000 FC-FC storage system was used for enterprise applications and the iQ1200 FC-SATA storage platform was used for video and data archive management.

This inefficiency resulted in repeated system delays and performance issues, data integrity problems, and extremely long nightly backups that severely impacted daily operations. Clearly, a plan to consolidate and manage the myriad of autonomous systems and associated data was needed.

#### iQ1000 FC-FC Storage System



- Affordable storage solution for workgroup and departmental servers
- Optional advanced storage services including storage virtualization, snapshots, replication
- High performance 2 Gb/s Fibre Channel host and drive interface
- Ensure high availability by using redundant, hot swappable components
- LUN masking and LUN mapping virtualization features enforce storage access policies
- Active-active storage processors support transparent fail-over/fail-back
- Supports both in-band and out-of-band storage management
- Scales to 36TB of storage capacity per subsystem

A second dedicated network, not connected to the corporate LAN, handled the daily capturing and recording of real-time vehicle location data generated by on-board GPS, as well as the daily uploading, backup, and archiving of video data from surveillance cameras mounted in buses. Operators can 'tag' (time-stamp) the video data at will, with the system 'auto-tagging' the video during an accident or life threatening incident. Real-time data records are written every 10 seconds, across all 220 vehicles. Along with GPS data, a real-time record is kept of engine parameters, route changes, deviations from plan, and other events. The surveillance video is transferred when buses re-enter the yard, either via 802.11b wireless link, or by direct connection to the video ingest server. With limited storage from legacy systems, a plan to integrate a scalable video SAN to accommodate the needs of the growing video network was sought - in a manner that would be cost-effective and extensible.

#### The Solution

The LBT data consolidation project was undertaken to improve data integrity and accessibility throughout the information lifecycle, improve system reliability and performance, and reduce the turnaround time on issue resolution. A further key reason for the project was to improve the efficiency of the backup process.

Requests for proposals were generated and responses were received from iQstor Networks, EMC, Hitachi, and several other high-end storage system vendors. When the LBT finished its vendor and product evaluations of value and performance ratings, the combination of features, performance and functionality offered by iQstor Networks led the field. Site visits were made to several of the candidate vendors, including iQstor. The LBT also spoke with the nearby Orange County Transit Authority (OCTA), who also recently selected iQstor storage systems for their SAN requirements. After significant due diligence, the LBT selected two iQstor systems, the iQ1000 for the enterprise applications network and the iQ1200 for the data/video archive network.

#### Enterprise Applications Solution

Situated at the LBT headquarter, the SAN for the enterprise applications, iQstor Networks' iQ1000 FC-FC storage platform, provides both centralized storage for the enterprise applications servers as well as handling the daily backup requirements for the LBT's user community.

The iQ1000 is connected to the main corporate network via FC through a QLogic SANbox 5200 switch and also has front and back-side interfaces to support a disk-to-disk-to-tape backup architecture.

Online storage in this environment is 1TB, supporting 30 Windows® servers and 5 Unix servers. 15 of the main Windows servers connected to the iQ1000 handle email, exchange server, file shares, and the enterprise-wide SQL databases. User data and user environment files are also maintained on the iQ1000. Approximately 800GB is the daily allocation and about 10-20% of the storage is refreshed on any given day, with a 30 day FIFO priority. ERP applications (Oracle database) run on the Unix servers, which will be upgraded and connected to the iQstor SAN in late 2006.

For daily backup operations, the iQ1000 feeds an Overland near-line tape library. Each backup operation fills three 400GB tape cartridges. Using the iQ1000 has reduced the backup window from 12 hours to 6 hours, with a future goal of 2 hours.

### **Video and Data Archive Management**

The dedicated tiered storage system for the video and data archive is the iQ1200 with 4TB of storage, connected to a video SAN server, which receives transponder data from each vehicle. There are two main types of data maintained and managed on the dedicated network in separate partitions:

- AVL (Automatic Vehicle Locator) data records, transmitted in real-time, every ten seconds by systems installed in each of the 220 vehicles. Approximately 1TB is dedicated for backup of this sub-system.
- Video surveillance data (for rider protection) uploaded from the on-board DVR daily, when each of the buses return to the yard at the end of their service day (either by pulling out and docking the DVR, or wirelessly using 802.11b).

The tiered storage architecture is managed by agent-less ILM software that dynamically allocates space on the SAN, based on "keep/delete" rules run on data aged 14-days or more.

### **The Benefits**

Some of the immediate benefits of the data consolidation and backup process improvement project were results of the architecture (higher availability, more efficient backup and restore, system performance) and other benefits were due to selection of iQstor Networks as the supplier (support and quality, high performance per price, trouble-free operation).

**iQ1200 FC-SATA Storage System**



- iQ1200 is well suited to tiered storage uses, especially for applications that require storage with varying performance, availability, and cost characteristics such as virtual tape library, disk-to-disk-to-tape, and pre-staging for final archive.
- iQstor's iQ1200 delivers business a robust and economical Serial ATA (SATA I & II) solution with the availability, manageability, data integrity and enterprise-level functionality

### Tiered Storage and Information Lifecycle Management (ILM)



- Enables the creation of highly affordable infrastructures with policy-based applications that manage and safeguard valuable data throughout its productive life span.
- Gives maximum information availability and data protection, moving production files via policy to the most effective storage - regardless of location and without distance limitations.
- Allows administrators the opportunity to automate the movement of data that has not been accessed over time to lower cost storage.

"As a public utility, the LBT is careful to look for both a fast breakeven and a high ROI on capital expenditures," said Patrick Pham, Director of IT for LBT. "iQstor's pre and post sales support is superlative while their solutions are truly easy to install and use. The systems were procured in September 2005, and the two iQstor storage platforms have performed well and with an excellent maintenance-free record. Since going live, our nightly backup process has improved from an average of 12-15 hours in late 2005, to taking less than 6 hours in early 2Q2006, with a near-term goal of between 1.5 to 2 hours."

Users and the IT support staff now spend their time more efficiently, as less time is consumed with backup logistics of locating and mounting the myriad of tapes produced daily, along with verification and restore operations. Quantitative benefits are significant - the IT staff efficiency has improved by an average of 2 man-hours per day; and the enterprise system availability has increased by 6 hours per day.

Additional improvements are possible with the new system. A 'serverless backup' process is planned, bypassing the network and switch, in an enhancement that will reduce the backup time from 6 hours per day to between 1.5 and 2.0 hours per day.

### Plans for the Future

In addition to adding more capacity in a staged rollout, a server consolidation project is planned that will migrate 10-12 servers to IBM and Dell blades, supported by additional network storage from iQstor Networks. Another iQ1000 will be installed to provide fail-over protection, as part of LBT's disaster recovery strategy. LBT also plans to move the AVL (auto vehicle locator) data to the iQstor iQ1200 by 4Q2006. "iQstor and their storage platforms have proven their merit for our time-critical applications and we look forward to using more of their storage solutions in the future," concluded Pham.

### About iQstor Networks, Inc.

A privately-held company based in Newbury Park, CA, iQstor is a leader in the innovative design of storage solutions with embedded enterprise level functionality to channel partners worldwide. Its storage solutions include the iQ1000 Storage System, policy-based storage management, data services software, professional services, support and training.

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# Long Beach Transit Network Structure

