Application Brief

Deploying a Robust, Cost-Effective Solution for Video Streaming and Rich Media Applications

May 2004

IMPORTANT INFORMATION

Overview

As companies seek to find ways to deploy rich media delivery solutions at the lowest operational costs, the ability to combine leading encoding/decoding and video server technology with cost-effective Serial ATA (SATA) storage networks allows the creation of robust, scalable solutions for streaming video, video on demand (VOD), corporate training, distance learning and other content-rich applications. Using components that allow flexibility in implementation and operation, and scalability to meet changing broadcast and streaming requirements, forward-looking companies are able to deploy storage network-based solutions that deliver investment protection and lower total costs of ownership.

Making the Choice: Fibre Channel or Serial ATA

To deploy highly competitive rich media distribution systems, administrators need to determine whether they require Fibre Channel or SATA products to serve as their content storage pool. In the past, the only option for effective content delivery was to use Fibre Channel disk systems; over the last year, however, SATA storage products have evolved to become a very competitive alternative to Fibre Channel systems, with SATA delivering strong functionality at greatly reduced costs. In this application brief, we will focus on pairing intelligent SATA with an integrated encoder/decoder/video server to create an extremely cost-effective video streaming solution.

Integrated Encoding, Decoding and Video Serving

For the encoding/decoding and video serving component of our solution we have chosen Vela's RapidAccess MPEG-2 video server, which delivers unparalleled operational flexibility in-studio or video streaming use. Combining off-the-shelf hardware with state-of-the-art software, RapidAccess provides flexible operation with an affordable, open architecture and easily expanded solution. Using an open system, such as Vela's product, means that expansions and upgrades – from removable media add-ons to network upgrades – can be done with off-the-shelf components for significant savings.

RapidAccess also comes with a powerful suite of software applications giving administrators the ability to control recording, management of media (database information, searches, archiving, retrieval), and playback in one integrated package. Moving away from the traditional linear playlist approach, RapidAccess provides numerous options that are ready to run at the touch of a key. RapidAccess features confidence monitoring; the ability to immediately monitor files while they are being recorded, and play back one to four other streams simultaneously. RapidAccess also brings the ability to play back media on any channel immediately after recording with no transfer delays, caching or unnecessary file duplication.

RapidAccess offers a unique file structure for efficient content management. The system provides the flexibility for easy-to-use multiple playlists based on last-minute changes in scheduling, programming or content flow.

Cost-Effective SATA to Create the Rich Media SAN

To provide the storage component for this solution, iQstor's iQ1200 SATA Storage System is used to create a robust storage area network (SAN). iQ1200 is a self-contained storage system that brings an intelligent, yet affordable solution for use where cost is of a concern. Combining proven enterprise-level features with cost-effective Serial ATA (SATA) disk drives, The iQ1200 enables storage administrators to quickly and cost-effectively optimize storage solutions for diverse fixed content applications in digital media, imaging and content distribution.

The iQ1200 is a full-featured 2Gb storage system that includes embedded data services that allow administrators to intelligently manage, virtualize and protect valuable data while providing maximum flexibility, scalability and cost-effectiveness. With all key internal components being hot-swappable and redundant, the iQ1200 supports up to fifteen SATA disk drives providing 3.75TB of storage capacity (with 250GB drives), providing up to 1800 hours of MPEG-2 content per enclosure.

Implementation

Creating the SAN is simple and straightforward. Vela's RapidAccess is connected to the iQ1200 with 1.2TB of SATA storage. Activating iQstor's embedded Volume Manager based Virtualization (VMV), a storage pool is created from the SATA storage. With VMV, IT administrators can easily and efficiently allocate storage based on needs of users and applications with flexible, intelligent and non-disruptive storage provisioning; they can quickly consolidate and optimize storage resources to maximize capacities, allowing effective data storage management with less manpower, reducing costs; they can add or expand additional storage space by creating virtual disks in a non-disruptive manner; all bringing workflow efficiencies and cost savings. With SVS, users can easily add cost-effective diskless servers or new servers with different operating systems and different applications in a single consolidated storage array with no downtime.

Next, using iQstor's SAN Manager, administrators dynamically configure and manage the SAN through a centralized, policy-based tool. With the SAN Manager, administrators are guided through discovery of the RapidAccess encoder/server; all other workstations on the network are configured.

Loading Media

Using Vela's RapidRecord™ software simplifies the entire recording operation and makes loading media a straightforward process. Live recording can be initiated automatically via manual controls or based on time-of-day clocks. For previously recorded material on videotape, RapidRecord will control VTRs following timecode for mark-in/mark-out points.

Specially designed encoding templates can be customized through a Windows NT™-based interface to set up and save specific recording parameters, such as bit rate, GOP structure, etc. Multiple templates can be created to handle different input sources and MPEG parameters. The result is fast and efficient control over the available encode parameters.

Making the Play

Simple interactive management of media and playback operation is accomplished through playlists, which contain one or more pieces of video content. Vela's RapidPlayback™ gives the user the flexibility to move or modify multiple playlists at any time — even while a playlist is running — to accommodate last-minute changes in scheduling, programming, or content flow.

Automation

Vela's RapidAccess software suite provides a variety of tools to give most facilities all the control they need. In some broadcast applications, however, a specialized automation system may be desired, and for those instances, RapidAccess remains the best choice. RapidAccess operates with most Video Disk Communication Protocol (VDCP) compliant devices, and so can be used with the industry's leading automation systems.

Features

Implementing the Vela/iQstor SATA solution delivers a powerful video streaming solution at an extremely cost-effective price. The combination of the two tightly integrated systems provides top features that include:

Recording and Playback

- Broadcast-quality MPEG-2 encoding and decoding, up to 15 Mb/s using 4:2:0 (ML@MP) and up to 50 Mb/s using 4:2:2 (ML@PP)
- Inputs include serial digital (SMPTE 259M) and analog composite(NTSC/PAL) with four analog or digital (AES/EBU) audio channels

- Time and date controlled recording events
- Optional GPI I/O triggers
- One-button linking of independent playback channels form unique Master/Slave channel relationships
- DVB compliant

User Interface (Video Server)

- Built-in clip browsing and confidence monitoring on VGA and/or separate video monitor
- Simple drag-and-drop playlist creation and editing
- Automatic creation of a record list to guarantee proper playback of required spots
- Importing of traffic lists automatically generates record and playlists
- As-run logs export for reconciliation
- Video and audio levels, diagnostics and other operating parameters are easily controlled through password-protected maintenance window

Storage

- Shared centralized storage pool enables media playback on any channel immediately after recording, with no transfer delays, caching or unnecessary file duplication
- Varied clip bit rate reduces storage requirements – decoders automatically adjust
- Four 2Gb Fibre Channel host interfaces, 200MB/s each (800MB/s total)
- Single or dual storage controllers
- Up to 2GB cache memory per storage controller (4GB total)
- Enterprise-level cache vaulting and active cache scrubbing
- Parity accelerator to boost RAID performance
- 256 LUNs
- RAID levels 0, 1, 3, 5 and 1+0

- On-line RAID expansion
- Multiple RAID sets
- Multiple LUNs
- Hot swap disk drives
- Global hot spare disks
- Automatic drive failure detection and rebuild
- Automatic reallocation of bad sectors
- Up to 15 SATA disk drives, maximum capacity 3.75TB per enclosure (1800 hours MPEG-2)

System Architecture

- Completely modular design – systems can be expanded to tens of channels, multiple workstations, and thousands of hours of storage
- Truly open architecture using Windows NT sporting an attractive, easy-to-use graphical user interface along with Microsoft SQL Server for database management
- Sony® 9-pin (BVW-75) machine interface to control input devices
- Supports Video Disk Control Protocol (VDCP)

iQstor Networks, Inc.
2001 Corporate Center Drive | Newbury Park, CA 91320

805-376-1010 | 805-376-1011 Fax | info@iqstor.com
www.iqstor.com