



Georgia Public Broadcasting: Simplifying Web-Content Delivery With Shared File Systems

With a statewide network that encompasses nine public television stations and 16 public radio stations, Georgia Public Broadcasting (GPB) is Georgia educators' source for top-quality educational content. GPB broadcasts educational programming to every public school, regional library, adult technical education center, public college and university in Georgia. It serves over 90,000 teachers and approximately 1.5 million students across the state via open-air broadcasts, satellite and Internet feeds.

DEMAND FOR SMARTER CONTENT DELIVERY

As with all media types, the volume and diversity of educational content available is increasing at a rate that makes it difficult for educators to find the right content at the right time. Traditional satellite and broadcast transmissions, while familiar, are cumbersome for use in the classroom because they do not allow rapid search and play-out of specific program segments.

"The issue educators were running into was that they might have an hour long program on 'Animals of Africa' but only need the segment on big cats for their lesson," said Mike Nixon, director of education and technology services at GPB. As a result, GPB wanted to create a video catalog where educators could easily search and locate the unique content desired for their curriculum. "As we were planning, we realized very quickly that we needed technology that was easy to use and suited for searching, identifying, and accessing clips of program," said Nixon. To this end GPB decided to use a Web based application.

In addition to these objectives, GPB wanted to design the workflow so that data transfers between servers was minimized, allowing web servers to have rapid access to content as it was ingested and cataloged. The solution also needed to minimize their investments in direct attached storage and allow on-the-fly integration of new applications over time.

To accomplish these goals, GPB built a workflow around Quantum's StorNext. Content is encoded, catalogued, and made available over the Web while StorNext is used to integrate all systems into a high speed shared workflow.

A VIDEO-ORIENTED INFRASTRUCTURE

When building the infrastructure for the project, GPB wanted to make sure that it was appropriate for handling processing of video content. "For what we wanted to do, we needed guaranteed performance and the ability to share our content catalog across multiple systems," said Nixon.

A Fibre Channel SAN was used for performance and StorNext was installed on each of the ingest and Web distribution servers, allowing them to share a Hitachi disk resource and its content. StorNext enables multiple servers to share a single volume through the use of shared file system technology.



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SOLUTION OVERVIEW

- Application: simplifying Web content delivery to allow rapid search and play-out of program segments
- Workflow Support: Quantum StorNext File System, Virage
- Storage Infrastructure: Windows 2000, SGI Irix, SuSE Linux, Novell and Solaris operating systems, Hitachi 9980V disk array

KEY BENEFITS

- Simplified workflow operations by enabling ingest, cataloging and play-out applications to share a common data set
- Controlled storage costs and maximized utilization of disk storage
- Provided high performance data access needed for video operations

A shared file system is kernel level code that provides I/O translation and volume management services across many systems. With StorNext, one or more disk resources are presented to the server as a local device (e.g. Windows sees a new D:\ drive). StorNext is heterogeneous – runs on many operating systems - allowing Windows, Linux, UNIX, and Mac* to all share the same data set. Applications send I/O to a StorNext volume just like any other disk device except that StorNext, not the local volume manager, processes the read / write operation. “This was key,” said Nixon. “StorNext provided a level of OS support that allowed us to really leverage our Hitachi disk capacity to its fullest. We were able to share it across every application and know that if we changed OS platforms tomorrow, we wouldn’t have to redesign our whole setup.”

The StorNext file system coordinates access requests to guarantee that no two servers try to write to the same disk location at the same time. Beyond that, each server has direct access to the disk resource. As a result, a single server can go as fast as the infrastructure will allow - even into the multi-GBps range. In addition, the amount of direct attached storage required is minimized, because each server can use the same disk pool. This is of great value in video environments where performance is critical and multiple systems share the same data set.

SERVING OUT THE RIGHT CONTENT EVERY TIME

With the infrastructure designed, applications and workflow processes are layered on top. Local content is ingested into the StorNext content repository via VTR and remote content, including video from United Learning in Chicago, acquired over FTP connections. FTP content is synchronized nightly with the Chicago repository to guarantee availability of the most current footage.

For GPB, the net result was a rotating catalog that includes approximately 2.5 TB of low-res educational video segmented into 69,800 files produced by GPB or acquired for use by third party education vendors. About 300 GB of this is legislative and committee session video and another 200 GB is content of local events.

Once cataloged, the ingest content is immediately accessible to four web servers connected to the shared repository via StorNext and the Fibre Channel SAN. Educators access the content catalog using a Virage web interface that allows search queries based on specific metadata (e.g. lions, Africa). Educators are able to scan the overall catalog, isolate desired content, and download it to their classroom computers for use in lessons.

PLANNING FOR THE FUTURE

The mixture of StorNext and Virage is extremely scalable allowing GPB room to grow with a minimum of disruption to their environment. Storage capacity can be added as needed and additional ingest or web servers can be added on the fly. The Virage software is able to catalog and maintain a wealth of content so that as GPB needs to store more varied educational content they can. “Right now, StorNext is maintaining a 100 percent disk repository,” said Nixon. “Looking forward, we may want to use its archiving capabilities so that we don’t have a situation where we need to reload source tapes.”

* via Apple Xsan

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ABOUT GEORGIA PUBLIC BROADCASTING

Georgia Public Broadcasting is Television, Radio and Education serving all of Georgia. Its mission is to create, produce and distribute high quality programs and services that educate, inform and entertain audiences and enrich the quality of their customers’ lives. GPB’s nine public television stations deliver quality PBS and locally produced programming to every county in Georgia, and to significant portions of surrounding states. Since 1984, its 16-station public radio network has been Georgia’s source for great music and National Public Radio (NPR) news. Georgia Public Broadcasting’s education service is Georgia’s electronically delivered classroom for all Georgia learners, and Georgia educators’ source for top-quality multi-media educational products and services. With a network of 2,428 satellite dishes, GPB broadcasts educational video programming to every public school, regional library, adult technical education center, youth development center, and public college and university in Georgia, serving over 90,000 teachers and approximately 1.5 million students across the state via satellite, the web and open-air broadcasts. <http://www.gpb.org>

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