

NLT's Nearchive Architecture

Introduction

This brief is written to describe how the [Nearchive](#) system functions, its system interfaces, and hardware requirements. NLT's Nearchive Appliance is designed to provide an automated means to backup video clips which are cataloged in Avid's Interplay and physically located on the Avid Video SAN (UNITY).

The problem Nearchive solves is one that has been created by the industries move from video tape acquisition to a file based format. Previously videotape was used with Professional ENG Cameras to acquire video. In order to edit this video it needed to be transferred to disk drives so that nonlinear editing and play out systems could more efficiently produce video content for distribution (we'll concentrate on news in this brief). Moving to a file based camera (Panasonic P2 or Sony XDCAM EX, ET AL) made this process more efficient since the video digitization step was done during acquisition by the camera.

It seemed as if this was the Holy Grail, all file-based and no more videotape. However the videotape played an important function which was providing a backup copy. Since many news stations of the mid and smaller size have limited budgets, the size of the Avid Video San is only sufficient to produce 24 hours of news content. So content is purged often and the space reused. Unfortunately the cameras flash based media is also reused since it is expensive as well. At the end of the day, a very efficient news production process, but no video backup exists.... and we all know yesterday's news is tomorrow's news.

Hence the issue Nearchive is designed to solve: an automated backup of the file based video ingested today, stored on cost effective commercial storage. Further the metadata describing the video clips must be searchable using standard Avid tools which are 1) existing and 2) familiar to operators. Users want to use familiar tools to manage video clips (not manage a bunch of computer generated filenames).

Architecture

NLT's Nearchive appliance architecture is designed to be simple to implement while providing "relatively" high performance. Two interfaces exist to the Avid system.

1. HTTP based web services interface to the PAM (Interplay)
2. High Performance SAN interface to the Avid video storage

The HTTP connection is Ethernet based while the SAN connection is 4G fiber or 1Gbe. Avid has qualified the ATTO 41ES fiber card and the Intel PRO1000 series card to access the SAN. I have

mentioned that we want to provide a “relatively” high performance solution. Given the performance of today’s commercial storage arrays we do not want to offer a 10Gbe solution as this would consume too much of the Avid SAN’s bandwidth, so some solution balance is needed.

The storage arrays are selected to provide hot swappable drive sleds, redundant power and cooling, and high performance connection management between the expander and the controller. An integrated storage enclosure to controller management channel is desirable. The array is built using RAID 6 technology, array size is dependent upon the final size required. Multiple OS volumes are built on top of these arrays.

Nearchive Software

The Nearchive software in its simplest description is a data mover. It moves video files from the Avid San to commercial storage and back as requested. When new content is ingested to Avid the server receives a message that new video is available. Nearchive queries Interplay for its location and copies the new video files to near-line storage. The video on the Avid SAN remains to be used with the customer’s standard workflow. Additional information is also kept on the Nearchive storage such that if Interplay failed the video clips can be fully recreated in Interplay.

Nearchive also has background synchronization actions that maintain coherence with metadata changes made within Interplay. The main concept of Nearchive is to “backup” the Interplay clips and maintain metadata coherence with the clips in Interplay.

Users search the Nearchive storage using Interplay metadata queries that are familiar to them. When content is found Interplay shows the content as available on the AVID SAN (online) or in Nearchive (offline). If the content is offline then a restore request can be made to Nearchive to restore the video clip (Nearchive will do a disk to disk transfer).

Since the Nearchive can become full, a delete function is also available using the Interplay tools. Again using metadata to find the clips to be deleted, these assets are stored in a purge folder. As Nearchive deletes the clips they are removed from the Interplay database so future searches for these clips will fail (unless they are still on the Avid SAN).

Nearchive Hardware

Nearchive's CPU performance requirements are modest; Nearchive has been demonstrated on an Intel ATOM 1.8Ghz processor using WINXP with 2GB of memory, a 4G fiber card and a single INTEL 1Gbe connection. Data movement of 120MB/SEC was observed. Nearchive's biggest requirement is good PCI bus performance to handle the Ethernet, Fiber and SAS connections. Given today's servers and processors, even a low end server can be a good platform for Nearchive.

The ProLiant DL120 G7 (model [628691-001](#)) is a good starting point for a Nearchive Server. This model has good PCIe expansion with x4 and x16 slots available.

Storage arrays which employ higher end expander modules, redundant power and fan modules are the preferred storage enclosure. Enterprise class drives used such as the Hitachi Ultrastar or Toshiba series are preferred. The drives are configured in RAID 6 configurations.

Summary

Nearchive is an appliance that has modest server requirements, its main hardware attribute is reliability and low cost. The Nearchive software is designed to allow the user to restore previously deleted video clips without altering their existing workflow, using familiar tools.

