

## Cost Savings In Digital Video Archive Systems

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### ***The Problem***

Legacy analog video archives are no longer cost-effective. Limited access, inefficient and expensive duplication and real-time operation can no longer be tolerated. Digital Video Archive Systems (VAS) leverage the latest storage technologies to address legacy archive shortcomings. This white paper explains the dramatic savings in money, time and resources that implementing a Qualstar VAS can deliver.

### ***Background***

As broadcast facilities convert to High Definition they are faced with a dilemma: what to do with their existing video archive library. These libraries are of considerable value, but limited accessibility and incompatibility with the new station automation equipment renders them less valuable while still occupying valuable space and consuming scarce control room operator time. Fortunately this situation can be remedied easily and inexpensively by installing a digital Video Archive System (VAS).



**Fig. 1 Typical Video Tape Library**

A rapidly growing number of studio cameras no longer use tape, instead using an IEEE 1394 direct connection, while many new field cameras use only optical, solid state or hard disk storage. Many stations now also process video directly from the camera to their Non Linear Editing (NLE) systems, requiring new workflows and methods to retain work in process (WIP) and to archive both raw and finished content. Now is the ideal time to invest in a digital VAS to manage new content being

generated and to convert the legacy video archive library so that its content can be readily accessed and re-purposed.

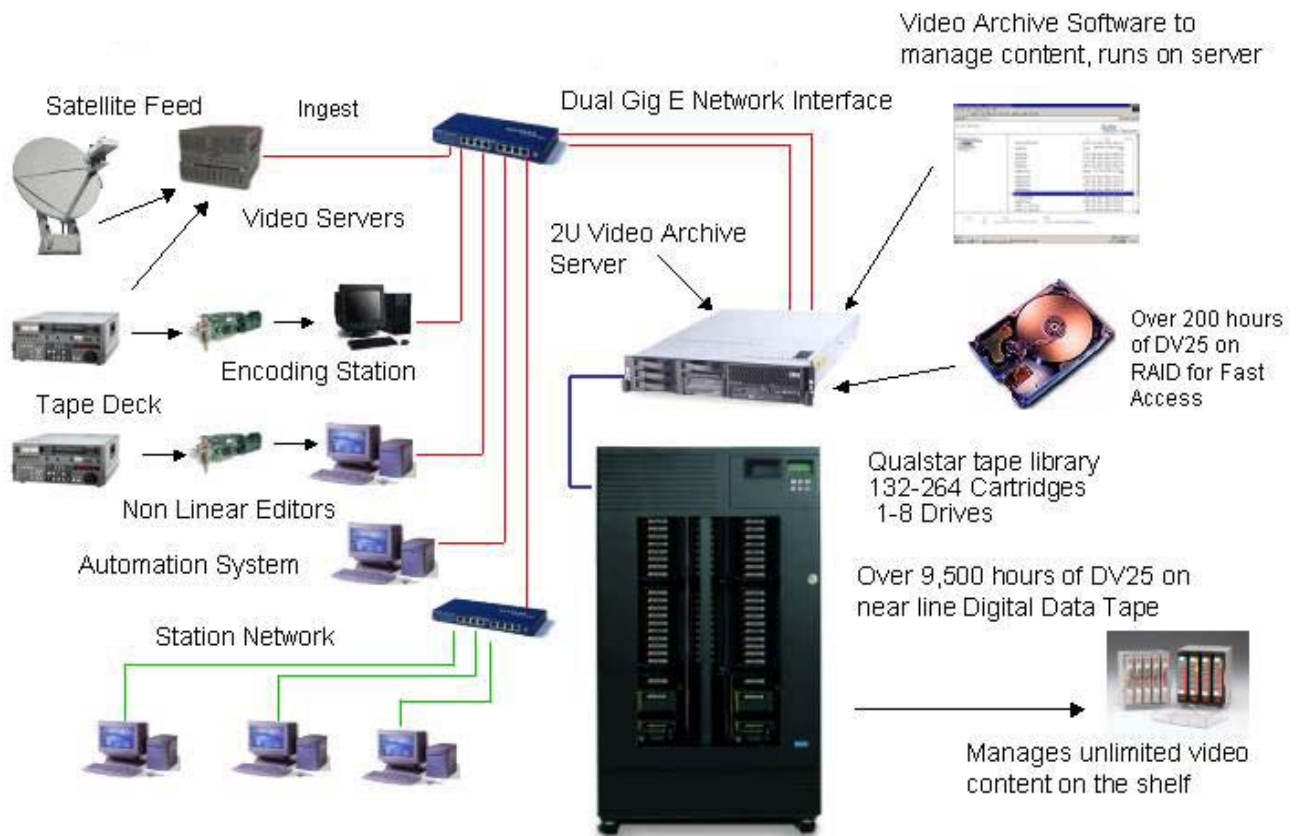
A Digital VAS leverages the latest computer digital tape format and combines it with RAID disk and dedicated software to deliver a managed storage system that saves money, time and space. These systems can often pay for themselves within the first year of operation. That is a Return On Investment (ROI) that every television station and broadcast facility should find persuasive.

### The Solution

Legacy video libraries often consist of content recorded on video tape at varying storage densities. More often than not, the video tapes are not completely filled as it is a common industry practice to only store one program on a tape cartridge. Consequently, a 1 hour video tape may only have a 30 minute program stored on it. This is very inefficient for physical storage space and cost, but necessary to be able to index and locate video content. Using a digital video archive system enables the user to dramatically reduce or eliminate:

- The floor space needed for the video library
- The manpower cost to find and copy a video clip, and to re-file the master
- Media cost of storing, duplicating and physically distributing video content

Figure 2 gives an overview of the components and workflow of a typical inexpensive VAS:



**Fig. 2 Inexpensive Video Archive System**

Video content is managed on one of several different BQ-Series Video Archive Systems available from Qualstar. These fully integrated systems store video digitally on a combination of hard disk RAID and LTO computer digital data tapes that reside in a robotic cartridge tape library. A dedicated, optimized server hosts a video software program, such as Xendata, to automatically track the video content and manage its location, enabling station personnel to rapidly locate and transfer video clips directly over their network.

Small television stations often generate 3 news programs a day, at a minimum. If these are 30 minute long, then recording just these shows for the archive will result in 1.5 hours of content per day. Over a year's time, this totals 548 hours of new content for this alone. Adding commercials, specials, spots and bumpers easily raises the number of hours to be archived to over 600. Most television stations will far exceed this number, but for the purposes of our analysis we will use this figure as the base to show how a VAS can benefit even the smallest stations.

The majority of stations and broadcast facilities store content as one program per tape. Consequently, the video tape capacity is not optimized, so the number of tapes used to store 600 hours of content will be considerably higher. Let's assume that each tape is half full, a very conservative estimate resulting in the generation of a total of 900 new tapes per year. In practice, the number of tapes required will far exceed this figure, particularly when duplicate tapes are made from the library master for editors to use. Depending on the video format, the cost of these tapes will vary, from \$8 to \$10 each for low capacity Beta tapes to \$35- \$45 each for DigiBeta or DV tapes. Television stations are rapidly transitioning to a DV standard requiring higher density recording and more costly tapes. In this white paper we will assume an average cost of \$25 per video tape, resulting in the station purchasing \$22,500 worth of video tapes each year.

Using 25 Mbit/sec DV as the standard, a single LTO 4 data tape in a Qualstar VAS can store 71 hours of content. Putting this into perspective, the 600 hours of content on 900 video tapes can be stored on just 9 LTO 4 digital tapes. An LTO-4 tape has a current street cost of \$135, or \$1,215 for nine, resulting in an annual cost saving to the station of \$21,285 on media alone

As impressive as this is, the savings do not stop there. Stations do not allow their valuable content to leave the confines of the video archive, with good reason. Consequently, it is common to generate duplicate tapes for production use and for editing content to re-purpose it. More duplicate tapes are also made due to wear and tear of the video tape masters. Video quality can degrade significantly after only 10-25 passes in a video tape deck, requiring replacement copies to be generated.

Conservatively, 10% of the content generated will be duplicated each year. This requires an additional 90 video tapes per year at a cost to the station of \$2,250. This duplication cost is eliminated using a digital VAS.

Installing a VAS eliminates the need to make duplicate copies, and since modern digital data tapes are good for 5,000 passes there is no need to replace frequently accessed tapes at all. Since content is stored digitally and transferred electronically between the video archive, editing stations and video servers routine duplication simply doesn't occur. This eliminates the duplication costs that a station typically will incur. Additional savings result from eliminating additional decks and expensive repairs normally required to duplicate tapes in a legacy archive.

The Video Archive System not only saves on media costs but also on tape deck maintenance, station floor space and tape storage shelving. Video tape decks are expensive to own and maintain. A typical refurbished DigiBeta tape deck costs around \$31,000, while rebuilt heads cost at least \$4,000 each. By contrast, the IBM digital tape drives used in all Qualstar VASs are

relatively inexpensive, have extraordinary life expectancies and require only the occasional use of a cleaning tape for maintenance.

Using their current tape library, the station in our example will generate 900 new video tapes each year, and these need to be stored safely. Floor space in most stations is at a premium and video archives can consume a lot of room in the broadcast facility. Heavy duty movable cabinetry is often used to minimize floor space, but at a cost.

Consider a video library of 3,000 tapes (less than a 4 year archive in this example) that will reside in multiple movable cabinets. These cabinets will cost at least \$13,000 and occupy 50 square feet of floor space. The equivalent digital video archive using a small Qualstar VAS requires only 43 digital tapes that are stored in the system's robotic tape unit, occupying just 12 inches of rack space in the control room. Assuming an average cost of \$5 per square foot of floor space, a station can save an additional \$2,500 annually, and put 50 square feet of valuable station real estate to better use.

The purchase cost for the Qualstar VAS used in this example is \$43,000, including hardware, media, software to manage the archive, and the first year's service and support for both software and hardware in North America. While this is only slightly more than the cost of an additional DV tape deck, the savings are much, much greater since each different format of tape stored on the shelf would require its own special format tape deck

The net savings for a television station is over \$35,000 in the first year, with additional savings of more than \$25,000 in each subsequent year. Over the first 5 years of operation the station can save more than \$136,000 by installing a Qualstar VAS, as shown in Figure 3:

Typical Cost Savings for Television Stations Using Qualstar BQ Video Archive System				
		Video Tape	Digital Archive	Cost Savings
<b>Annual Variable Costs</b>				
<b>New video content tape cost</b>	600 hours per year x 1.5 Assumed cost of \$25 per video tape; \$135 per LTO 4 tape	\$22,500	\$1,215	\$21,285
<b>Duplication and dubs</b>	Assume 10% of annual content is duplicated or copied	\$2,250	\$0	\$2,250
<b>Tape deck head repair</b>	Assume head replacement (\$4,000) every 4 <sup>th</sup> year	\$1,000	\$0	\$1,000
<b>Cost of floor space</b>	Assumes a 500 tape library, \$5 per sq ft	\$2,500	\$0	\$2,500
<b>Annual software support</b>		\$0	\$1611	-\$1611
<b>Total Annual Savings</b>				<b>\$25,424</b>
<b>Initial Fixed Costs Savings</b>				
<b>Purchase additional Digibeta Tape deck for copying</b>	Assumes a refurbished Digibeta tape deck	\$31,000		\$31,000
<b>Purchase additional Beta Tape deck for copying</b>	Assumes a refurbished Beta tape deck	\$9,000	\$0	\$9,000
<b>Digital Archive System</b>	Includes server, library, software, media, etc.	\$0	\$43,275	-\$43,275
<b>Video library storage cabinets</b>	To store 3000 video tapes	\$13,100	\$0	\$13,100
<b>Total 1<sup>st</sup> Year Fixed Cost Savings</b>				<b>\$9,825</b>
<b>Total Savings Over 5 Years</b>				<b>\$136,945</b>

**Fig. 3 Cost Savings Using Qualstar VAS**

***Indirect Savings***

Money isn't the only savings realized. The facility can dramatically reduce the space needed to host a video archive. Each year the station adds to the legacy archive means additional cabinets and the floor space to house them. By utilizing modern digital data tape the station can reallocate the legacy library floor space to more productive uses. A typical television station generating 600 hours of new content each year can realize a saving of \$12,500 over a 5 year period.

Similarly, a station no longer needs to set aside space for tape decks for duplication. Both editorial and production people can easily make digital working copies by retrieving the video clips directly from the VAS. The need for physical duplication is eliminated. "Lost" master tapes can never occur since all content is now stored and distributed digitally. The station also benefits by having a far more secure library since digital data tapes cannot be played back on any videotape deck in the facility.

### ***Time, time and more time***

The savings in time for a television station installing a VAS is significant. In small stations, people often perform several jobs: searching the physical archive, retrieving a tape, setting up the clip in and out points and copying the clip are all very time consuming. The amount of time saved will vary from facility to facility but the savings are considerable.

Transfers between video decks are in real time, so one hour of video takes one hour to transfer to a system or to another tape. The Video Archive Server transfers video at speeds up to 960 Mbits/sec, which is approximately 35x real time. This means that a 30 minute show takes roughly one minute to transfer from the archive. This enhanced efficiency will off-load a tremendous amount of work simply by making the clips accessible via a network. For example, Non Linear Editors can access a read-only copy of the clip directly, without requiring any effort from the control room staff. The time freed up from creating physical copies can allow the control room personnel to transfer the existing video library into the digital VAS.

### ***Conclusion***

A Qualstar Video Archive System will dramatically reduce a broadcast facility's operating cost. A VAS can deliver a 100% Return On Investment within the first year of operation. It will reduce the size of the video archive to the point where it can be kept near-line electronically in just inches of rack space or a few square feet of space for a particularly large archive. It will also substantially reduce the time spent managing video assets, freeing people to work more efficiently on high-value projects.

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