

Multi-Tier Storage for Video Surveillance

Video surveillance is creating a growing demand for data storage. Not only are there more surveillance cameras being installed worldwide but, as image quality improves, each camera generates more data. Furthermore, data retention times are increasing for many end-users. The result is a rapidly increasing need for high capacity, cost effective video surveillance storage.

Camera Technology and Analytics Drive Image Quality

Digital camera technology is moving at a rapid rate which means high resolutions and image quality for less cost. Just one or two years ago, most customers were asking for solutions with 720p and 1080p cameras; but today there are many deployments with 10 to 20-megapixel cameras due to the rapid price drops of these high-end cameras.

It is not just a case of wanting high image quality because it is available, there are real benefits. The huge advances in analytics from companies like IronYun (www.ironyun.com) take advantage of the high image quality, providing license plate recognition, facial recognition, sophisticated intrusion detection, object detection and more.



Sony 4K surveillance camera

Factors Driving Longer Retention Periods

The industry is trending towards longer periods of video data retention. One of the factors driving this is legal departments within companies and organizations requesting longer periods to prevent evidence from being destroyed after, say, 31 days. Also, video is now finding many uses outside the security market, including business intelligence and customer service applications, among others. These non-traditional applications typically require longer retention periods because this provides a larger dataset for post-recording analytics. Every customer has different reasons for the longer retention, but regardless of that reason, the defining factor is capturing full ROI - Return on Investment – by keeping the content for longer.

Multi-Tier Storage – More Data for Longer

Multi-tier storage allows more data to be retained for longer on a given budget.

The term multi-tier storage refers to data storage systems that use different storage media with different costs per terabyte. These systems pull the different tiers together into a unified platform where the data locations are changed automatically by pre-defined policies. These policies match the likelihood of the content being reviewed and reflect how the value of the data changes over time.

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A multi-tier storage system will typically have front-end disk which is where the video content is initially retained. Sometimes there will be two tiers of disk storage: highest performance with lower capacity combined with lower performance but higher capacity. For the next tier, data tape cartridges now provide a very cost effective way to keep huge volumes of video files for long term retention. The market leading data tape cartridge type is LTO – Linear Tape Open – which provides a very stable and reliable storage medium at an attractive cost per TB. Today LTO cartridges are available with capacities up to 6 TB. Recently Sony entered the market with a new storage option: optical disc archive cartridges with capacities up to 3.3 TB. By combining disk storage and LTO or disk and Sony optical, together with smart data migration policies, the overall cost of the video surveillance storage system is reduced typically by 30-40%.

But multi-tier storage systems deliver more than just cost reduction. They are more scalable, support taking content offline, provide greater data protection and offer new compliance options.

A tiered storage system with a robotic LTO or Sony optical library can be made highly scalable, avoiding the difficulties associated with expanding RAID systems. With many libraries, the capacity may be easily expanded many times over with an associated increase in available capacity.



The XenData multi-tier storage system shown here is easily scaled from 420 TB to 3.3 PB

Multi-tiered systems with either LTO or Sony optical libraries have barcoded data cartridges that can be exported from the main system for long term retention 'on the shelf'. This process is often called vaulting and the main storage system will normally keep track of and manage the offline content held on the vaulted cartridges. Also, many multi-tier systems can also automatically replicate video content on data cartridges creating clone cartridges that can be exported from the storage system and retained in an offsite location for additional data protection.



Data cartridges are exported from a robotic library via a 'mail slot'

Yet another option with many multi-tier storage systems is to use unalterable WORM – Write Once Read Many – data cartridges. WORM cartridges are available for LTO and Sony optical systems and ensure that the video content cannot be accidentally erased delivering the ultimate in data security.

Adding Cloud as a Tier

Cloud storage has lots of great attributes for video surveillance but lowest cost is not one of them. The total cost of ownership is usually much lower for on-premise LTO compared to cloud storage.

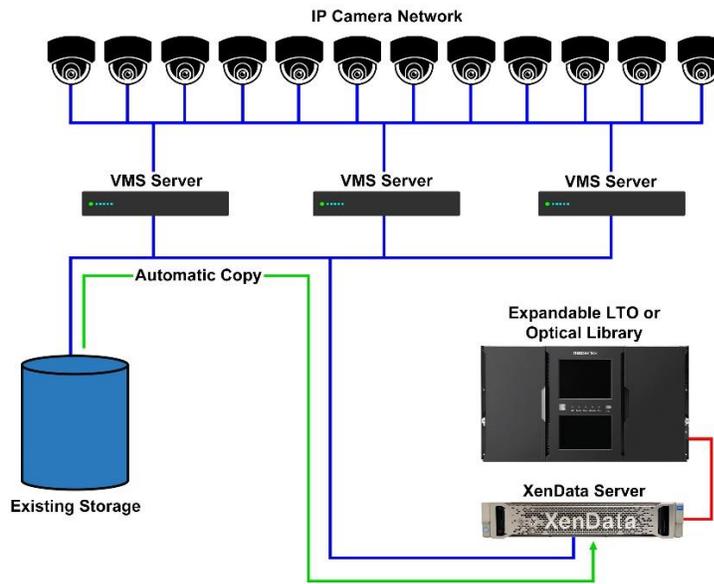
The cloud is ideal when there is a need for multi-site uploading or downloading. One example is storage of police body camera content; in this case the ability to upload from multiple locations is an overwhelming advantage that comes with associated cost savings.

When cloud storage is a tier combined with on-premises storage, it offers a number of advantages including replication of content in multiple physical locations for strong data protection with minimal need for hands-on intervention. Storing critical content on premises overcomes limitations of the cloud because it provides very fast access to content not limited to Internet bandwidths and it means that content is available even if the Internet connection is lost.

Converting an Existing System to Multi-Tier

Often there is a need to expand existing video surveillance storage, perhaps due to addition or upgrade of the surveillance cameras or to a new requirement to retain content for longer. The existing storage can often be expanded by adding additional lower cost storage tiers. This is especially applicable when the need for expansion is due to longer retention requirements, as often there is minimal access needed to the older content.

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Implementing a lower cost LTO or optical storage tier can often be simple

In Conclusion

Technological advances in cameras and analytics are putting ever increasing demands on storage for video surveillance. For larger systems, keeping content on a single tier of storage is no longer cost effective and the next generation of storage is multi-tier. In general, these systems combine multiple data storage media types – disks, LTO and optical data cartridges – both on-premises and in the cloud. Not only do they offer lower total cost of ownership but they scale more easily; support very long retention times when required; and replication of data across on-premises locations, off-premises locations and the cloud.

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