



NAS/DAS/SAN – What's the Best Archive for IP Video Surveillance?

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Executive Summary

Few physical security technologies have advanced over the last 10 years as rapidly as video surveillance. Analog equipment has evolved into all-digital ecosystems. Video sensors continually gain higher levels of resolution.

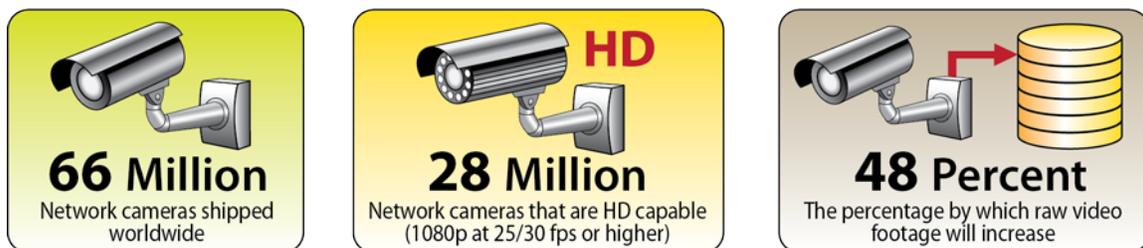
Black and white has been replaced with color. Organizations install cameras in greater numbers and in a greater variety of locations than ever before.

As a result, the amount of video data that security professionals must manage has exploded astronomically and the challenges are many. How do organizations store, index, search, and retrieve all this video footage, regardless of whether it runs limited numbers of cameras in a few areas, or manages enterprise-level deployments of thousands of cameras operating across multiple facilities?

This white paper covers the drivers behind the growth of video surveillance data, as well as the primary criteria organizations should use to select a video storage solution. Finally, it examines major storage technologies, and explains why network-attached storage (NAS) represents the best balance of scalability, usability, and affordability.

Data: The Present and Future of Video Surveillance

When it comes to video surveillance, the proverbial writing is on the wall. Actually, the writing is on the hard disk array. Since the first digital cameras arrived on the market, the volume of footage being recorded, indexed, and stored has soared. Look at the numbers as of November 2016:



There are multiple operational demands driving this hunger for video surveillance. The primary drivers include:

- The unprecedented growth in security programs since 9/11
- The recognition that video surveillance replaces the need to send people into remote or dangerous locations
- New technology innovations, such as 4K video, IR/thermal systems, and reliable wireless connectivity

This last point indicates that the demand for video is unlikely to slow any time soon. Drones and bodycams are just beginning to have an impact on physical security operations. Traffic management, license plate identification, and facial recognition represent entirely new security applications that require constant flows of high-quality video to be effective.

Additionally, high-definition (HD) cameras are now the norm, with 4K systems soon to become mainstream. Black-and-white systems have been replaced by color. Infrared and thermal systems enable video to be



recorded in low light, nighttime conditions, rain, and fog – conditions that have limited video’s effectiveness in the past.

These pressures and innovations add up to two inescapable challenges for video surveillance professionals. First, more video data is being collected and stored than ever before, and the amount of data will continue to increase for the foreseeable future. Second, this footage must be quickly and automatically stored, indexed, and recalled for a wide variety of needs, including:

- Real-time or near-real-time security review
- Federal and state compliance requirements
- Evidence, either for prosecution or for liability defense
- Forensic investigation
- Training/performance review

Fast, efficient, and affordable video storage is essential for today’s video surveillance demands. The challenge comes from determining the best way to do it.

Managing Video Data Overload with Digital Storage Technologies

Organizations seeking a video storage solution must address three key needs:



Scalability – The ability to quickly and easily add storage capacity as the organization grows, as new uses or technological innovations generate more data, and as new security requirements demand additional cameras and coverage



Usability – The ability to store, index, and retrieve video without requiring overwhelming amounts of specialized technical expertise to operate the system



Affordability – The ability to pay for storage requirements, both today and in the future

Clearly, a comprehensive understanding of these three elements will directly affect the type of storage system an organization selects. Three distinct types of video storage currently dominate the market:

- Direct-Attached Storage (DAS), such as that included with network video recorders (NVRs)
- Storage Area Networking (SAN)/Software Defined Storage (SDS)
- Network-Attached Storage (NAS)

Direct-Attached Storage (DAS)

DAS is storage that comes onboard within video capture devices – either in the camera itself or on the network video recorder (NVR) used to link multiple cameras together into a video management system (VMS). This



storage is convenient and affordable, in that no additional equipment is needed. In many cases, these systems have limited expansion capability, such as slots for SD cards and similar removable media.

The downside of DAS is that its scalability is limited, and coordinating storage across many devices in an enterprise environment is extremely difficult and complex to achieve. Security staff must know in advance which camera or NVR contains desired footage in order to locate important content in a timely manner. In addition, the security protecting that content is only as robust as what ships with the system (and probably not the highest priority for the provider).

Storage Area Networks (SAN)/Software Defined Storage (SDS)

SAN and SDS video storage systems apply iSCSI protocols for block-level data storage and retrieval across Ethernet networks. In other words, SAN/SDS turns rack-mounted hard drive arrays into shared pools of storage. The amount of storage set aside for each type of use can be changed dynamically through software, rather than requiring physical drives or drive arrays to be connected and reformatted for each application.

Scalability limitations only improve marginally with SAN/SDS video storage solutions. The operating systems used by SAN/SDS limit the size of each actual iSCSI storage unit (logical unit number or LUN) to 64TB. With video storage requirements easily reaching multiple petabytes in size, managing dozens or hundreds of LUNs quickly becomes an operational and administrative nightmare.

The result is that SAN/SDS is expensive when compared to other video storage solutions – both in terms of purchasing the system and for daily operations. It is difficult to manage, and cannot easily meet future demands for scalability.

Network-Attached Storage (NAS)

NAS systems provide the ideal combination of scalability, usability, and affordability for video storage. It is important to note that this implementation of NAS is not the single drives or small-scale disk arrays designed for consumer or small business use. Rather, these solutions are enterprise-grade, high-performance NAS solutions, purpose built for high-volume, highly-secure business applications.

For example, Spectra Logic's Verde NAS video storage technology is easily scalable from 48TB to 10.7PB. The intelligence necessary to deliver the storage solution is built into the storage arrays themselves, so that these rack-mounted units need no additional software layers or applications to operate. Increasing capacity is as simple as plugging new storage arrays into the network, with new units typically needing 30 minutes or less to bring online – something that no competing technology can match.

Spectra Logic's storage systems protect IP video from accidental or intentional damage or loss, without requiring additional software or services. Multiple RAID options (striping, mirroring, double parity, and triple parity) and continuous checksum verification enable intelligent data rebuilds.

NAS, as exemplified by Spectra Logic, is extremely easy to use. In effect, these NAS solutions deliver shared pooled data storage without the complexity, capacity limitations, or expense of SAN/SDS. The storage and management limitations that SAN/SDS suffers at the LUN level simply don't exist. Security staff view stored video through the VMS they are already trained to use. The storage system itself is managed through a streamlined, intuitive interface that is easy to use for both IT staff and technical security personnel.

Spectra Logic Video Surveillance Workflow



Finally, and critically, NAS systems are extremely affordable – as low as 10¢ per GB. These systems are designed for power efficiency, which also translates to electricity and cooling cost savings compared to other technologies. Additionally, a Spectra Logic Verde NAS system can be operated without requiring specialized training or dedicated staff members.

Conclusion: The Spectra Logic NAS Video Storage Advantage

Organizations must consider many criteria for handling their rapidly growing video surveillance data. It's not just a matter of selecting a vendor. The NAS approach to video storage, as evidenced by Spectra Logic's solutions, delivers simple, low-cost, easy-to-use video data management solutions with the scalability and security that is essential for any video surveillance environment.

In short, NAS, as executed by Spectra Logic, provides the scalability, usability, and affordability that organizations need to meet their video storage needs, now and in the future.



Scalability – Storage capacities up to 10.7PB, with aggregated recording and search bandwidth up to 800MB/sec per master node



Usability – Intuitive management software and robust security that requires little or no supplemental training to operate



Affordability – Storage costs as little as 10¢ per GB, with an energy-efficient design that minimizes electrical and cooling demands

The selection of an appropriate video storage solution is much more than a technological purchase. It affects the safety and security of employees and premises. It carries direct impact on physical security budgets. Spectra Logic's purpose-built solutions, designed by security and video professionals and constructed from the ground up for video storage, remove the complexity and cost from video surveillance storage, enabling security professionals to concentrate on what they do best – protecting people and property.



Quotes

- Spectra Logic's units have reduced our data backup process from 31 hours to 1.4 hours – a 95.5% time savings. - John Coakley, Director of Information Systems, Community Health Choice
- Spectra Logic is a purpose-built system engineered for this high-capacity file storage use case, not a converted general-purpose storage system filled with high-capacity drives. – StorageSwitzerland
- By eschewing the obligatory list of “checkbox” features for those that are essential, Spectra Logic has created a storage system that's simple enough for any user, affordable enough for any data and reliable enough for any company. – Storage Switzerland

About Spectra Logic

Spectra Logic develops data storage solutions that solve the problem of short- and long- term digital preservation for business and technology professionals dealing with exponential data growth. Dedicated solely to storage innovation for 40 years, Spectra Logic's uncompromising product and customer focus is proven by the adoption of its solutions by industry leaders in multiple vertical markets globally. Spectra enables affordable, multi-decade data storage and access by creating new methods of managing information in all forms of storage—including archive, backup, cold storage, private cloud and public cloud. To learn more, visit www.SpectraLogic.com.

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