



SECURITY

WHITE PAPER

FAQ:
**Where Do SSDs Fit With Security and
Surveillance Systems?**

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The video surveillance market is continuing to transition from analog to digital, with sales of IP-based solutions growing at about double the rate of analog systems.¹ The shift to digital, along with the need for higher image quality, increased mobility and faster access, is creating a need for manufacturers and users of video surveillance equipment to explore newer storage technologies—in particular, solid-state drives (SSDs).

SSDs costs have come down considerably in price during the past few years, to the point where they are now making traditional rotating hard disk drives (HDDs) nearly obsolete in certain environments and applications. In addition, because they don't have mechanical parts, SSDs are much more durable and rugged than HDDs, which make them particularly attractive for video surveillance environments, particularly where weather conditions and mobility are important considerations.

Because HDDs are more oriented toward applications that require high levels of storage capacity, they can continue to have a place in video surveillance solutions. HDDs remain cost efficient for archiving and other areas within video surveillance that stress capacity.

However, SSDs will be much more effective and cost-efficient in applications that require performance, quality, resiliency, ruggedness or reliability. Additionally, SSDs are proving to be far more reliable and applicable in surveillance systems where there is a need for short-term storage—vehicle video cameras is one such example.

For manufacturers of video surveillance systems, as well as their customers, it is important to understand where and how SSDs can make a difference in improving security, providing faster access to critical information, increasing uptime and enhancing the overall value and benefits of video surveillance solutions.

In this white paper, we examine some of the important questions video surveillance vendors and users are posing about where and how SSDs can strengthen security and how they fit in with their overall solutions.

Q: What are the differences between HDDs and SSDs?

A: SSDs are built using NAND semiconductor technology so, unlike legacy HDDs, they don't have moving/mechanical parts. The lack of moving parts translates into several key advantages for SSDs. These include:

- **Speed:** Since there are no moving parts, SSDs can access data much faster than HDDs. This translates primarily into IOPS, where SSDs can deliver performance gains that are orders of magnitude greater than HDDs. It also means less latency in high-bandwidth applications, such as the high-definition video that is increasingly part of video security and surveillance systems. Using SSDs will typically result in higher quality of video images.
- **Reliability:** SSDs fail much less frequently than HDDs. Research shows that the failure rates of HDDs are more than three times those of SSDs.² This means there is more uptime, which can be critical in video surveillance, and there is less of a need to send technicians out into the field to do maintenance and repairs.
- **Durability:** SSDs can be utilized in locations that require more rugged construction, such as surveillance systems that are located outdoors or at sites where there is the possibility that they would be subject to vandalizing. Also, the better durability of SSDs can be an important factor in mobile applications, such as on video surveillance systems on vehicles.

¹ "The Video Surveillance Industry—Market Size," CameraManager.com

² "SSD Failure Rates Around 1.5%," Slashdot, Sept. 12, 2013

Q: What about costs? Aren't SSDs much more expensive than HDDs?

A: While it is true that SSDs have been more expensive than HDDs, the differential between the two has come down in recent years. In fact, when total cost of ownership (TCO) is analyzed over the lifetime of a solution, there are often cost savings to be achieved by using SSDs versus HDDs.

First of all, the price disparity is not nearly as great as it used to be. Increased volume, vertical integration and improvements in SSD technologies by market leaders such as SanDisk have led to a sharp decline in SSD prices during the past several years. In fact, when measured on the basis of overall performance—cost-per-IOPs versus cost-per-gigabyte—SSDs are actually less expensive than HDDs.

In video surveillance environments where there is a need for short-term storage, as opposed to higher capacity, SSDs will likely be a far more cost-efficient solution than HDDs. This is partly because you won't have to pay for extra capacity that you won't need, and partly because you will reap other benefits in increased uptime, reduced power consumption, less maintenance, a longer product lifecycle and longer battery life, among others.

Q: What are some of the benefits of HDDs versus SSDs that would be important in building or designing a video surveillance system?

A: The short answer is “all of the above”—i.e., the previously described benefits that lead to:

- Improved uptime and reliability;
- Higher quality of digital images;
- No latency, with faster recording and access;
- Reduced total cost of ownership;
- Greater durability to support a wider range of geographic locations and mobile use cases.

In video surveillance systems, the confluence of these factors often comes down to one critical factor: Using the right technology solution for the right use case will offer the opportunity to dramatically reduce risk.

Risk management, after all, is what security and surveillance is all about. When a security system goes down or is inoperative, the ramifications can be devastating. Crimes can be committed without the accumulation of important evidence, which can lead to business and/or legal losses.

Furthermore, there are many instances where the speed of the technology is absolutely critical: Think about law enforcement agents responding to crimes or terrorist threats, or engaging in high-speed chases. The ability to deliver real-time information with no latency and the highest levels of clarity can be absolutely vital in video surveillance applications.

Q: What are some of the use cases where SSDs can be most beneficial?

A: SSDs can be extremely beneficial at the point of image capture, where reliability, ruggedness, durability and performance are critical. This would include digital cameras, particularly in applications/locations where images are downloaded more frequently and/or solutions that are not operating 24/7, seven days a week.

One such example is vehicle camera systems, such as those found in police cars, ambulances, public transportation systems or school buses. A website focused on vehicle video cameras recently had this to say about SSDs:

“Within the next five years, we will see the sun set on hard-drive technology in digital bus video systems, and a new dawn of 100% Solid State Drive (SSD) will provide the school bus video market the extreme durability and uncompromising data integrity those districts deserve for their tax dollars.

“Hard disk drive failure is a common occurrence in this age of desktop computers, but when you move the same technology to a mobile application, the incidence of failure and damage to the fragile drive mechanism of a conventional hard drive can increase exponentially. Risking your district’s bus video liability protection to a fragile recording mechanism that could fail when you need it most does not make sense.”³

Mobile solutions and rugged environments are key areas where SSDs can provide major benefits, particularly where the storage requirements are relatively short-term. That’s why school buses and police vehicles make so much sense—because they typically operate in shifts where capacity is not an issue for the storage solution, but reliability and performance are paramount.

In addition, the enhanced reliability of SSDs can be critical in any business or institution where surveillance failure could result in massive liability issues. Think of government institutions such as courtrooms or government buildings; healthcare facilities; shopping malls and universities.

SSDs will also prove their value in use cases where performance and responsiveness are critical factors. One such example is video surveillance storage systems, which are the storage devices connected to the camera to save and record the feed. In instances where an SSD is in the actual surveillance device and transmits data to the storage systems, the write cycles to the storage systems are much faster compared with an HDD.

These video surveillance storage solutions are helping government organizations and departments, according to recent research by MarketsandMarkets, which notes that: “The homeland security and city surveillance departments are using these storage systems for analysis and monitoring. Along with the government, large enterprises are also using these systems for storing the video surveillance data.”⁴

Q. What are the key features and characteristics to look for in SSDs for video surveillance solutions?

A: Video surveillance solutions are complex systems that not only require peak-performance storage devices, but also reliable mechanisms that are less prone to failures because of no moving parts. Fewer rates of failure mean higher overall savings in cost of ownership, as well as more quality and a seamless user experience.

In today’s video surveillance market, finding a storage solution that supports diverse feature sets and also satisfies performance and power requirements is critical in developing state-of-the-art products. SanDisk SSDs offer low capacity points while developing fast sequential/random performance and solid-long-term endurance.

³ [“The Future of Vehicle Camera Systems is ‘Solid-State Drive,’”](#) VehicleVideoCameras.com

⁴ [“Video Surveillance Storage Market – Worldwide Market Forecasts and Analysis \(2013-2018\),”](#) MarketsandMarkets, Feb. 5, 2014

Where Do SSDs Fit With Security and Surveillance Systems?

SanDisk SSDs are available in a range of capacity sizes and form factors. A benefit of using SanDisk solutions is that the company is vertically integrated and makes its own drives, giving it more control over costs and supply.

SanDisk SSDs deliver high SATA 6Gbps performance at great value, supporting a diverse feature set that also satisfies performance and power requirements for digital surveillance systems. Options are available in a range of capacities and form factors: 32, 64, 128 and 256 GB capacities for 2.5-inch 7mm and mSATA form factors, depending on the configuration you choose.

Q: How can our organization take the next step in evaluating SSDs for video surveillance?

A: Whether your company is a builder of video surveillance solutions or is an end customer, you want to make sure that your solution is state-of-the-art, using SSDs to deliver improvements in performance, reliability, image quality, durability and mobility.

One of the myths in the SSD market is that all SSDs are the same. They are not. In evaluating potential solutions for digital surveillance systems, look for solutions that offer a wide range of capacities, features and form factors.