



## The Shift From Analog to Digital Surveillance Solutions — Brings Migration from Tape-Based to Disk-Based Systems

*3ware SATA RAID controllers from AMCC enable high-capacity digital video storage, ultra reliability and improved performance — the benefits of more expensive systems without the high price tag.*

Public demand for effective security has never been greater. Travelers need to feel secure, whether going short distances or long, on vacation or on business. Companies that monitor airports and other public places for security purposes have encountered post-9/11 requirements that challenge traditional analog image storing and handling approaches.

3ware high-performance Serial ATA (SATA) controllers provide the necessary speed, capacity and reliability to eliminate physical VCR tape storage and the problems that go with it. SATA controllers provide the foundation for affordable and reliable image acquisition, fast data access and digital screening, and enhanced pattern recognition capabilities for new, more performance-demanding security service contracts.

### Market Background

As demand for video security increases daily, many organizations are migrating to solutions that use digital video recording (DVR). Digital surveillance with hard drive-based recording systems are now preferred to traditional video-tape. Benefits of DVR technology include better picture quality, increase the potential for the quantity of active cameras and storage archiving, provide faster recording and access capabilities, and deliver much greater reliability. Today's surveillance systems use Internet protocol-based (IP) networks to transfer data to a central repository from remote digital cameras and other types of low-cost detection devices.

To serve this growing market, Value Added Resellers have developed highly specialized image compression and video management techniques that maximize the efficiency of video acquisition, archiving, time coding and review. VARs have also qualified individual hardware components in order to deliver a proven and complete solution. The result gives users the flexibility and scalability they need for a broad range of security scenarios.

Highly specialized software applications can extract critical data from digital video streams and identify particular events that trigger alerts, as well as enhance the resolution and recording speeds of the raw digital streams. With today's compression algorithms, high-resolution video streams can be significantly compressed and occupy less disk space than ever before.

### Market Challenges

New contracts often require companies to extend and enhance both storage and video access services. Remote high-frame-rate images must be stored for 30 to 90 days, presenting image densities that threaten to fill legacy physical tape archives to the bursting point. Analog

images also tend to degrade during storage, and breakage-prone Mylar tape cannot support repeated runs of pattern-recognition software against imaged moving crowds.

Today's more intelligent software puts great demands even on the recording and storage capacities of high-capacity hard disk drive storage arrays. A single camera records from 1.5 Mega bits per second (Mbps) to 14 Mbps, depending on the capture rate and the resolution of the images. In order to maximize available storage, IT managers set different capture rates. Typical settings record images at 6 frames per second (fps) on stationary cameras or 15, 20 or even 30 fps on cameras recording event-driven motion or busy "high-traffic" areas where a greater amount of detail may be needed for review at any given time.

A single, full-motion camera stores from 16 to 150 GB of information every day. Multi-camera systems require disk subsystems that can scale to meet these performance and capacity demands. The optimum solution will provide the fast, reliable, high-capacity, low-maintenance digital image storage required by the new contracts.

The foundation of modern digital video surveillance structures is RAID storage, in systems that act as "video vaults," virtual repositories for everything the cameras see and record. On-demand data storage and retrieval systems based on 3ware SATA RAID-5 controllers provide the traditionally high-end data storage and performance required, but shave thousands of dollars off the overall costs, using off-the-shelf, inexpensive SATA drives. These new SATA systems perform flawlessly, scale as needed to fit a given installation, and provide greatly enhanced data storage and handling without the high cost of SCSI-based storage solutions.



## Range of Applications

Organizations use video surveillance equipment in a variety of environments, from corner convenience stores to multistory department stores; from business buildings to amusement parks, and from airports to city freeways, streets and sidewalks. Depending on the environment, the size and performance specifications for video surveillance, video vaults can vary dramatically, but any digital video application needs reliable, performance-ready storage, the best current solution being RAID disk drive arrays. Serial ATA drives now give system designers the ability, for the first time, to deploy off-the-shelf hard drive-based RAID systems that are as effective as much more expensive SCSI systems at a fraction of the price.

How these systems are deployed, and with what specifications, varies widely, depending largely on the type of video application being supported.

## Lower Frame Rates, Stationary Cameras

Point-of-sale, retail, banking and other scenarios where fixed cameras record content during both peak and off-peak hours may not require high resolution or full-motion video for normal archiving and review. These systems permit capture of video streams at lower frame rates that require, after compression, much less hard drive space than systems that demand full-motion video. Lower frame rates are effective in such applications because, if an event occurs, they provide sufficient detail for later review without overtaxing the system with a flood of unnecessary data. An affordable SATA storage array can increase the number of "eyes" watching for events in such systems, and increase the archiving period from 30 or 60 days to months or even years, at minimal cost. The return on a small investment is greater security and protection from liability in the event of theft, injury, or opportunistic lawsuits.

## Higher Frame Rates, Stationary or Moving Cameras

Environments with a risk of mass disruption or a requirement for regular close monitoring may require high-frame-rate, real-time remote image acquisition, surveillance and storage solutions. Companies that can provide such services for large apartment complexes, public buildings, city streets and parks, and urban airports have seen a burgeoning demand by an increasingly security-aware public.

New security contracts for such environments present image-handling requirements that far exceed the capabilities of traditional analog systems, but high-end digital storage solutions would make the service bids of most companies uncompetitive.

3ware SATA RAID controllers enable VARs to deploy higher capacity, more cost-effective RAID arrays that permit users to scale smoothly with the needs of their environments. Whether adding cameras or significantly increasing the fast-access video archiving period, 3ware controllers provide the industry's highest performance with up to 12 ports per controller. The resulting performance enhancement allow high frame rates and longer archiving without limiting the ability to deploy and expand systems for more effective digital video surveillance.

## The AMCC Storage Solution: Why 3ware Controllers Make the Difference

AMCC-supported image transmission and storage systems meet today's security challenges with room to spare. Systems with 3ware SATA RAID controllers permit fast, reliable retrieval of images, sound, time and interval data, and all related transaction details. Video is stored without degradation over any required period of time, while access can be provided remotely and securely using standard Internet protocols over any distance. Software can extract critical data from the digital video streams and look for particular events or patterns that trigger alerts.

Digital images do require huge amounts of digital "space" and high bandwidth to access, since a single camera can record from 1.5 Mbps to 14 Mbps, depending on the capture rate and the desired resolution. A single digital surveillance camera can capture 16 to 150 GB of full-motion data information each day, and a large airport might have hundreds of such cameras installed.

While cost often is not a primary factor since the 9/11 attacks, a company's overall savings on new SATA-based systems is usually a nice bonus and a good selling point for VARs. 3ware SATA RAID controllers provide more than 3 TB of storage with up to 12 ports each dedicated to a single disk drive, which makes data writing and access quick and cost-efficient.

The AMCC solution scales flawlessly, using a point-to-point topology to eliminate bus sharing and deliver 1.5 Gb/sec to each hard drive in the array. An onboard processor offloads the drain on central CPU capacity and onboard battery backup protects important data from power failures, even those suddenly and intentionally induced.

3ware controllers utilize the company's innovative StorSwitch™ architecture, which applies network packet switching technology to large-scale data storage. The non-blocking switched fabric allows data to be simultaneously routed to multiple hard disk drives with the highest efficiency, delivering the performance and reliability customers expect from enterprise solutions, with the added benefit of affordable Serial ATA storage.

## The Bottom Line

AMCC is the only SATA RAID supplier with a reliable and effective approach to high-capacity, high-performance, value-priced RAID data storage solutions.

Low-cost SATA hard drives and high-performance 3ware controllers in RAID-5 storage installations can range from 500 GB to 3+ TB and above, providing storage, bandwidth and access capabilities more than adequate for the busiest international airport.

3ware-enabled Serial ATA storage answers the call for an affordable storage solution while delivering the level of performance and capacity necessary for effective security surveillance at any location with high traffic density and demanding security requirements.

# AMCC

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