Introduction

Business intelligence solutions have revolutionized the enterprise, converting a relentless deluge of data into actionable information that can shape strategies, improve processes and boost bottom lines. The core benefit of such solutions is compelling: maximize the value of raw (unstructured) data through rigorous analysis that reveals key trends and correlations hidden within that data.

With the advent of surveillance digital video recorder (SDVR) systems, security professionals now face a similar challenge. While SDVRs and IP-based network DVRs (NDVRs) enable unprecedented access to vast quantities of high-resolution video images, deriving maximum benefit from this wealth of raw surveillance data requires meticulous review and analysis, sometimes on a frame-by-frame basis.

Traditionally, the task of surveillance video review has fallen to trained security personnel. Capable of monitoring a modest number of incoming video streams, such personnel become progressively less effective as the volume of video data grows and overloads the ability of the human eye/brain to process visual details. Exacerbating the problem is sheer fatigue, with long shift hours degrading the monitoring abilities of security staff still further.

Adding more security personnel is a very costly option that, while reducing the number of video streams each security staff member must review, still fails to eliminate the inherent disadvantages (limited attention span, interruptions and distractions, fatigue) that accompany human monitoring of video data.
When the Eyes Don’t Have It

Conventional video surveillance systems can record what they see, but they can’t make sense of what they are viewing. That duty is typically the responsibility of security staff members, who have watched their jobs become increasingly demanding as the average number of surveillance cameras deployed grows.

As one industry expert notes, “In the past, security personnel viewed one camera on a single monitor. Now it is not uncommon to find them looking at 20 cameras linked to a single display. After 20 minutes of surveying, the human attention to video detail degenerates to an unacceptable level and video surveillance becomes meaningless. Traditional video surveillance can no longer meet the increased demands of the industry.”

Of course, some surveillance systems employ cameras that utilize video motion detection, but depending on how and where they are deployed, such systems can generate frequent false alarms. Motion detection makes no distinction between falling leaves, a leaping cator an adventurous burglar.

IVS software overcomes such limitations, enabling video surveillance equipment manufacturers and system integrators to create intelligent video solutions that see and process visual information similarly to humans. For example, such video analytics systems can distinguish between a person and a car. These systems can be programmed to track only objects identified as human and send an alert when the subject violates pre-defined rules, such as climbing over a wall.

Getting Smart With IVS

A recent study from IMS Research predicted the world market for video content analysis (VCA) software will grow at an annual rate of over 40% from 2008 to 2013.1 Forecasts also indicate VCA market growth from roughly US$50 million in 2008 to US$140 million in 2012.2 Such remarkable growth projections are hardly surprising, given the many ways intelligent video surveillance systems can pay dividends in a broad range of security environments, from shopping centers and airports to corporate headquarters and manufacturing plants.

As can be seen below, the value proposition of IVS systems is comprehensive, encompassing greater cost-effectiveness and higher-quality surveillance, as well as greater scalability:

- **More Cost-Effective**
  Conventional video surveillance environments require security personnel to spend many hours watching live or recorded video to analyze/identify suspicious events. By contrast, IVS systems can scan many thousands of hours of video data without human intervention.
  Should the IVS system encounter questionable activity, it can automatically notify security personnel for further investigation. By increasing the number of video streams that can be handled by each security team member, IVS systems can significantly cut personnel costs. In addition, IVS systems free up more surveillance personnel to conduct key non-monitoring security tasks. Customer ROI reports from one IVS vendor show the software paying for itself in under six months.

- **More Accurate**
  A variety of tests have shown that humans lose anywhere from 50% to 90% of their visual perceptivity after 20 minutes of continuous video monitoring. The more video streams a person is required to monitor in a given period, the sooner impairments in visual perception manifest themselves.
  By contrast, IVS systems are immune to the fatigue, distractions and memory lapses that plague human beings. Live and recorded video review and analysis by IVS systems continuously scour video images for user-selected behaviors and patterns (for example, intruders, license plate numbers, unattended baggage), while ignoring the extraneous data that leads human monitors to generate false alarms.

- **More Scalable**
  Security environments are dynamic, changing both in size and character as a business grows. Thus any video surveillance solution must be able to scale and adapt as needs dictate. With a conventional security system that means hiring and training more personnel to monitor any additional camera streams, a costly and time-consuming process.

Intelligent video surveillance (IVS) systems make expanding a company’s video surveillance area literally a snap; simply plug in more cameras and the system’s intelligent video software immediately goes to work monitoring and analyzing the newly-added video data. Scalability is effectively unlimited—simply deploy more cameras and additional hard drives to store that video data.

---

Security Gets Smarter
With Intelligent Video Surveillance Systems

IVS Storage Profile: Voracity for Capacity

Not surprisingly, IVS systems require enormous storage capacity to house the vast quantity of high-resolution video data necessary to exploit the power of IVS technology.

For example, a 24x7 stream of surveillance video data recorded at 30 frames per second (fps), 1280x1024 (NTSC) resolution and utilizing H.264 compression offers a great deal of video detail for the IVS system to work with—but it can fill a 500GB hard drive in only seven days. IVS systems typically perform their analysis on recorded video, not live streams; thus, sufficient drive space must be available to store video until it can be analyzed.

Furthermore, the value of such video data persists after that first IVS analysis. While security personnel may initially configure the IVS system to focus on one type of suspicious activity, months later that same video data can be re-analyzed for a different set of patterns or behaviors should security priorities change. Such extended usability of video data demonstrates the value of longer archival periods and the need for more archival storage capacity.

Fortunately, hard drive storage capacities continue to rapidly grow while cost per GB plummets. Cost-effective, high-capacity surveillance drives help reduce the overall expense of deploying an IVS system, thus putting the benefits of IVS technology within the financial grasp of more security professionals.

To be sure, the benefits of surveillance hard drives go well beyond their enormous capacity. PC-based drives are designed for data integrity, while the drives used in personal video recorders are biased towards streaming integrity. However, IVS systems require a blend of smooth streaming, high data integrity and superior reliability that is only available from drives expressly engineered for dedicated surveillance use.

Seagate® SV35 Series™ Drives:
Focused Hard Drive Storage for IVS Systems

The Seagate SV35 Series drive was the first of its kind—surveillance-optimized to withstand the rigors of around-the-clock recording of multiple video streams, a key operational characteristic of intelligent video surveillance systems.

Specially designed for use in SDVR environments, the SV35 Series drive boasts class-leading reliability, advanced power management, superior performance and enormous capacity. This comprehensive suite of features makes the SV35 Series drive the ideal storage solution for all SDVR-based intelligent video surveillance systems. (For network DVR-based intelligent video environments, the enterprise-class Seagate Constellation® ES drive is the optimal choice.)

Key Features and Benefits

- Up to 42 days of stored video at 24x7 operation (H.264 compressed video, 1280x1024, 30fps)
- 24x7 operational capability with one million hours MTBF
- Surveillance-optimized for high-write workloads typical in video surveillance
- Highly customizable via ATA-7 streaming commands
- 1TB, 2TB and 3TB capacity in a single 7200-RPM drive significantly expands potential camera count and coverage area of IVS security system
- Perpendicular recording technology boosts capacity and reliability
- AcuTrac™ technology delivers higher reliability and greater storage capacities
- SATA interface with 6Gb/s transfer rates