

## **Battening Down the Hatches: IP Video Surveillance and Access Control**

A guide for security and IT leaders on the advantages integrating IP video surveillance and access control.

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## Introduction

IP networking has transformed both video surveillance and access control. But perhaps the most exciting thing about this IP revolution is how it enables you to connect these two security essentials through your organization's network. Such integration adds exciting new capabilities to both video surveillance and access control – as well as new cost efficiencies and management improvements for you.

It doesn't take much imagination to see the advantage of synchronizing a video clip with each person showing their card to a proximity system as they enter a building. Add facial recognition capabilities to verify identity and you've seriously amped up your security.

Playing a major role in this integration of video surveillance and access control is IP video surveillance management software. Products like Milestone XProtect Enterprise enable these systems to work together under a "common roof" and improve both your control and management of them.

The benefits of the teaming up access control systems and video surveillance under IP networking are too many to ignore.

1. Dramatically improves the security they provide as separate systems.
2. Supplies better evidence for investigation and prosecution.
3. Enables new cost savings by allowing you to leverage your organization's IT knowledge and resources.
4. Future proofs your investment through open platform solutions.
5. Provides easier installation, greater scalability and better reliability.

This paper will discuss the advantages of IP networking for access control systems and video surveillance, and the advantages of integrating these systems through a network. We also include two brief case studies that illustrate many of these advantages.

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## Advantages of IP networking for video surveillance and access control

It's easy to understand why both access control and video surveillance systems are moving to IP networking. For one thing, they're expensive to install. Analog video surveillance (also known as closed circuit TV or CCTV) requires expensive coaxial cable to analog cameras. Access control systems require expensive copper cable to access control panels. Another big problem is they both generally are proprietary systems. Most access control panels and analog video surveillance equipment (such as "black box" digital video recorders – DVRs) are unique to their manufacturer. That means any time you want to expand or upgrade, you have only one place to go. And it's not going to be cheap.

Ed Telders, CSO of PEMCO Insurance, noted in an article in CSO Magazine that "if a DVR goes out, it could cost five grand. If a [server] disk goes out, it costs \$150."<sup>1</sup>

IP technology enables you to break out of this "proprietary jail." IP-based systems are open platform. They give you freedom of choice in hardware, software, and other components. By choosing IP, you're assured of being able to choose from the best products and pricing, selecting equipment from suppliers based on your needs and not because you're locked into a particular system or platform.

Here's a brief look at the many other advantages of IP networking.

### ***Future Proofs Your Investment***

Because IP-based systems enable the use of interoperable (open platform) components, they make it easy to take advantage of new advances in cameras, access control systems, and other components. IP technology also makes it easy to gradually replace legacy systems, such as analog cameras and card entry systems, with IP network cameras and biometric systems. Instead of having to junk the older equipment, you can maximize your investment in older technology by adapting legacy devices to IP technology. For instance, by using IP video encoders you can view and manage your analog cameras through your IP video surveillance management software system. Then, as these analog cameras reach their natural end of life, or budget allows, you can then replace them with IP-based equipment.

Open platform systems also make it easy to add new software components such as video analytics<sup>2</sup> and facial recognition. This allows

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<sup>1</sup> Datz, Todd, "Convergence: The Payoff ... the Pain," CSO Magazine, April 2005.

<sup>2</sup> Video analytics allows video surveillance systems to do the watching for you by using software algorithms to evaluate incoming video for specific information about the content of that video. Examples of video analytics applications include door movement; determining location, speed and direction of travel; identifying suspicious movement of people or packages; license plate identification; facial recognition; and much more. Video analytics provides the

you to add new capabilities as you need them without having to replace your entire system.

### ***Installs and Scales Easily***

If you already have an IP network, you already have most of the infrastructure you need for an IP access control system or video surveillance system. IP networking enables you to leverage existing infrastructure such as servers, switches and cabling. All you add is your new access control or video surveillance system's software and hardware. For an IP video surveillance system, that would basically be the IP video surveillance management software and IP network cameras.

Need to put in a new camera or access panel? No problem. They can be placed almost anywhere using cost-efficient standard Ethernet cable and wireless technologies such as IEEE 802.11b. No more power issues either. IP network cameras, card readers, door locks, and more can be run by Power over Ethernet (PoE). This makes it less expensive and easier to install equipment in areas lacking power sources.

### ***Remote Monitoring***

Because they're IP-based, both IP video surveillance and IP access control systems can be accessed and managed via desktop computer, laptop, PDA and even cellular phone. Security staff needn't be tied to a monitoring room — upon an alarm, they can view in seconds what is happening and respond to the situation.

### ***Greater Archiving Capabilities***

IP-based systems improve data and storage reliability through easy network transfer to off-site storage and the ability to inexpensively set up redundant systems. IP technology also enables you to take advantage of the most cost-effective network storage solutions now, and when something better comes along, add or switch to that.

### ***Better Reliability***

Both IP access control and IP video surveillance systems tend to be more reliable than traditional systems. With multi-door controllers and analog video surveillance systems, a single point of failure can cause the system to become inoperable. IP-based systems, on the other hand, allow for layers of redundancy so that if a network component fails, there are backup communications paths that can reroute the event transmissions around the problem component.

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necessary intelligent to provide early alerts on incidents needing attention from security or other personnel and relieves security staff from having to watch monitors for hours on end.

## Centralized management and monitoring

IP networking enables you to control all points of an access control or video surveillance system from one common user interface. No longer do you have a hodgepodge of management systems to operate the access control system in this building, the access control system at another building, and likewise for each video surveillance system you may own. IP-based systems are network-centric solutions that can incorporate many legacy systems and allow you to manage all your access control systems and video surveillance cameras from the same computer.

Network-centric solutions enable you to physically centralize management. For instance, a security staff in Chicago could monitor all access control and video surveillance systems for an organization with locations all over the world. If a situation merits an alert, the Chicago staff could contact the local security staff through the Internet in seconds.

But that doesn't mean your local security staff won't be able to access these systems as well. IP networking makes it easy for staff to access IP-based security systems with any Internet device (desktop computer, laptop, PDA and even cellular phone) wherever they are. A hierarchy of authorization levels based on user accounts and profiles allow easy control of access privileges.

One big advantage of having both an IP access control system and an IP video surveillance system is that a comprehensive IP video surveillance management software solution like Milestone Systems XProtect Enterprise can manage both.

### ***Simplified User Records***

A key advantage of centralized management for access control systems is the ability of a user to enroll at a single location and have their template uploaded to other locations depending on access rights. Administration of a user record such as deletion of a user or changes in their access profile need only be entered into the system at one location. One of the primary reasons the John Jay School for Criminal Justice installed its IP access control system was for the ability to automatically load cardholders and assign access privileges to the student, faculty, and staff population via downloads from the university's registrar system.<sup>3</sup> This was no small advantage for a school with more than 20,000 students, faculty, and staff at three college buildings in New York City.

### ***More Efficient Operation***

There are many operational advantages to having centralized management of all an organization's access control and video surveillance systems. These include:

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<sup>3</sup> Dirk, Brent, "John Jay School of Criminal Justice Deploys IP-Based Access Control System," Campus Technology, March 9, 2007.

- **Digital search and retrieval functions are much faster.** Whereas video tape has to be searched sequentially, requiring hours of viewing, digital technology enables quick searches by time or incident, enabling fast information retrieval for intelligent response or evidence. With access control systems, centralized management makes finding user records a snap.
- **Video and users records can be instantaneously shared and distributed with other locations or to the nearest security officer so he/she knows what to look for.** For example, consider how valuable it can be to have emergency response personnel in different areas of an airport all view the same footage simultaneously from their respective locations and make coordinated decisions.
- **A camera's pan/tilt/zoom (PTZ) controls are easily accessed through the video surveillance management software to enable staff to take control of individual cameras and zoom in on an activity.** Some cameras' zoom capabilities enable reading a cigarette pack from as far as 1,000 feet away. Door access controls can likewise be managed from hundreds or thousands of miles away.

## The advantages of having access control and video surveillance work together

Obviously one big advantage of having both IP access control and IP video surveillance is the opportunity to have them work together to achieve a greater degree of security. For instance, consider the benefits of having a video clip taken every time an access card or biometric device is used to activate an entry. This video backup will provide an additional layer of security against anyone finding a way to circumvent your access control system. Even better, in installations with a comprehensive video surveillance system, you can capture not only an intruder's entry, but also automatically follow his or her movements throughout the premises.

Many organizations are already deploying integrated video surveillance and access systems. For instance, the Niagara Falls Bridge Commission (NFBC) oversees three bridges handling 12 million passages and \$26 million in trade. Three levels of security have been established for 92 access points. The highest level integrates card readers, biometric access control, and video surveillance.

Such systems can be set up so if a door opens to a secure area, a camera can automatically zoom in and record the images for a set amount of time, or – with video analytics – until the person has left the range of the camera. The Hotel Northampton in Massachusetts, for instance, uses wireless door position sensors integrated with video surveillance so that front desk and night staff can instantly receive alarms and view what is setting the alarm off. Hotel general manager Mansour Ghalibaf often tunes in from home.<sup>4</sup>

One recommended setup is to use intrusion sensors to trip video verification responses to confirm whether an alert merits action. Such a system can use video analytics to determine if the sensor was tripped by a cat or by a human. Confirmed alarms can activate pager or other forms of alerts to roving guards. At the United Kingdom data center operations of TSYS, the largest third-party processor of international card payments for banks and retailers in the world, if something breaks the infrared beam on the perimeter, the access control system records an alarm and activates the nearest camera, giving a view of the incident on monitors thousands of miles away in Georgia. There, security can make a decision whether to call in UK authorities based on what they see.

### ***Better evidence for investigation and prosecution***

Solutions coupling IP video surveillance with access control systems can provide much higher quality video for identification and prosecution of intruders than the analog video surveillance systems of the past. IP network cameras are digital and provide up to 16 times the resolution of traditional analog cameras. This enables IP network

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<sup>4</sup> Kohl, Geoff, "Wirelessly Integrating Cameras and Doors at the Hotel Northampton," SecurityInfoWatch.com, March 6, 2006.

## Milestone White Paper

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cameras to provide rich detail (such as facial features or the numbers on a license plate), rather than blurry, hard-to-read images. For superior digital zoom capabilities, you can select PTZ network cameras.

## **A look at an open platform solution for integrating access control systems**

IP surveillance management software solutions like Milestone XProtect Enterprise and XProtect Corporate provide an open platform for seamlessly integrating doors sensors, location tracking devices, access control systems and communications systems with your video surveillance. Built-in motion detection automatically activates video at access points when someone enters or leaves.

Both these software solutions include XProtect Central, a management console for alarm centers and security monitoring stations that provides a complete overview of alarms and possible technical problems, allowing immediate visual verification and troubleshooting to resolve incidents fast. Other security systems, such as access control and intruder alarms, can easily integrate with XProtect Central to provide security staff with a full overview of all access points and enable them to visually verify alarms. The multi-level architecture and customizable alarm priorities allow the operator to differentiate alarms based on their criticalness, which ensures that important alarms get attention first.

A particular advantage of an IP video surveillance solution is that IP network cameras have digital inputs and outputs (I/O). Through the inputs, alarm devices or sensors can trigger cameras to transmit images to a select destination for recording, or request that e-mail alerts be sent, for example, to a mobile phone. Digital outputs can be used to enable cameras to, upon alarm or other cue, activate switches to close or open doors, turn lights on or off, or other actions. Authorizations and rules can be set up to match needs using a variety of notification and response protocols. Escalations and device control can be automated using rule conditions.

## The ROI of an integrated access and video surveillance system

Using IP networking to integrate IP video surveillance and access control can provide real return on investment (ROI) through centralizing security operations and making them more efficient. For instance, PEMCO Financial Services, headquartered in Seattle, Washington, reported \$2 million in annual savings primarily in security guard expenses through the integration of video, access control, silent alarms, vault alarms and intrusion alarms under one centralized security management system complete with automated notifications.<sup>5</sup>

A good example of this integration boosting efficiency can be found at the San Diego International Airport. This busy airport is using wireless and fiber-optic networks to link access control and video surveillance and boost efficiency. For example, the airport is now allowing airport workers to move through certain controlled doors as groups. The first person through presents an ID card and opens the door, then monitors the rest of the team as they enter. Each must show an access card to a reader and get a green light, but the system speeds progress because it does not require the door to close for each person. Video analysis is used to note each person that has come through the door and if an invalid card or no card is presented, the video surveillance system will alarm and post a video of the event in the security center. In this way, it catches "tailgating."

Another example of increasing efficiency comes from the Naval Amphibious Base in Norfolk Virginia. This base provides support services and operational and training facilities to 15,000 personnel of 27 home-ported ships. To prevent traffic jams when lines of vehicles need to pass through secured gated lanes, the facility uses a system integrating video surveillance, license plate recognition, and an integrated security management system. For pedestrian traffic on its three piers, extended card reader pedestals with Common Access Card proximity readers have been installed and integrated with cameras and PTZ controls. Guards no longer need to monitor pedestrian traffic.

Some organizations are integrating badge entry systems with video surveillance system that match faces with ID badges as they are scanned. This allows guards to concern themselves with other work, such as badging visitors, rather than visually checking the ID of everyone that walks by.

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<sup>5</sup> Datz, Todd, "Convergence: The Payoff ... the Pain," CSO Magazine, April 2005.

## **The whole is greater than the parts**

Advances in IP security products are fueling a convergence of IT and security systems that is enabling greater levels of security to be achieved. These converged systems are bringing new cost efficiencies, higher ROI, and – through open platform solutions – greater protection against obsolescence.

Organizations can take advantage of many of the benefits now. A good place to start is with your video surveillance and access control system. Through IP networking, these can be easily integrated and controlled through an sophisticated IP video surveillance management solution.

## Case study: Smyrna Airport ramps up safety

### 1. The Challenge

Smyrna Airport had only six analog Pelco cameras running over coaxial cables to videotapes that yielded poor quality video and required lots of manual operation. Because they had no fiber optic cable around the 1,700 acre facility, installing a networked system would be challenging, particularly since they also wanted to beef up their access control.

### 2. The Solution

The challenge was easily met with a wireless IP video surveillance solution featuring a mix of IP network cameras, PTZ IP network cameras, and existing analog cameras converted to digital imaging by running through video servers. For access control, the airport installed a system employing video verification to show who is coming in through the gates and doors. The video is compared to photo badging on file in the access control system. The access control system is installed and integrated with the Milestone XProtect Enterprise IP video surveillance software.

### 3. The Advantages

The airport Public Safety Officers have gained full overview of the widespread facilities via one system that is flexible and scalable, making efficient re-use of existing hardware while introducing the IP

platform that will serve them well for planned future growth. The Milestone XProtect securely encrypted evidence has already proven useful for sharing images with other authorities to handle prosecutions or to resolve other issues.

Mike Guerra, the airport's Public Safety Officer who handles all the networking, access and video system management, says "I spent about seven months looking at several different systems for the airport. About halfway through the search I came across the Milestone system. I was greatly pleased with the user-friendly interface, its ease of operation, and its capabilities for expansion."



## Case study: Animal Health Trust integrates video with access control

### 1. The Challenge

In 2004 Leigh Harvey, IT Support Engineer for the Animal Health Trust, was tasked with looking at security on the site. There had been no major issues with security, but Harvey quickly concluded that with the amount of separate buildings on the site, it would be easier to monitor and control use of doors with an electronic access control system. Harvey was also interested in recording camera images against entry events.



### 2. The Solution

The site already had Net2, a PC-based system from Paxton Access that controlled two doors. Since this was an IP-networkable solution that was easy to expand, the Trust chose to continue with Net2. For a video surveillance solution that could incorporate the existing analog cameras and allow the Trust to add IP network cameras, Harvey chose Milestone Systems video surveillance management software.

### 3. The Advantages

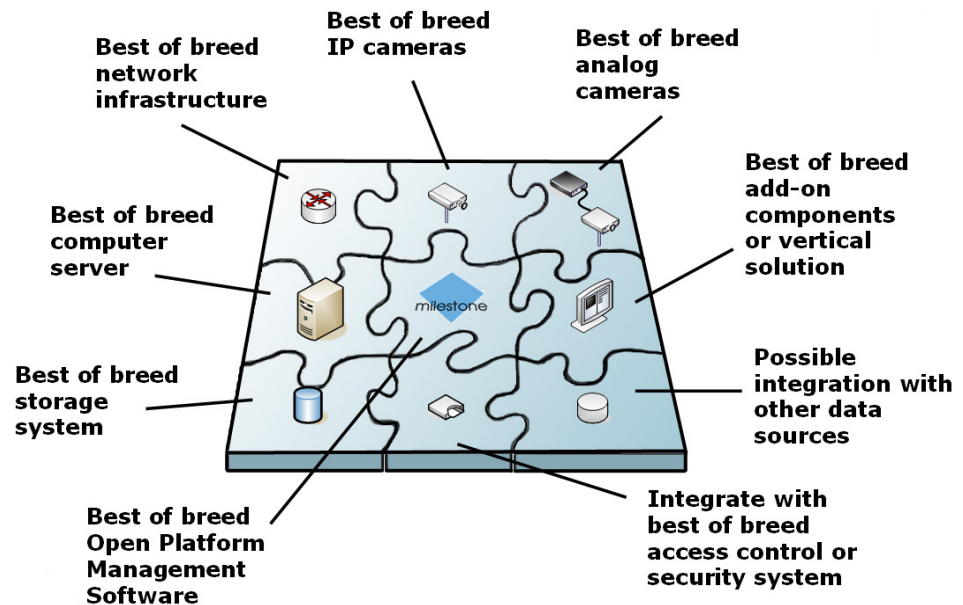
At the Visitors' Center, where the external door is unlocked in normal working hours, an infrared beam goes across the opening and triggers the IP camera every time someone enters or leaves. Three IP networks cameras view exterior entrances. When a Net2 token is presented to enter the building, the event is recorded in the Net2 software and the camera image is recorded in the Milestone software. Harvey notes, "It's great having the camera images associated with Net2 events available instantly.... The integration works really well, and as we expand the Net2 system to all of the other buildings, we will also install IP cameras linked to Net2 and Milestone Software." Harvey is really happy with the system. "It runs over our networks avoiding expensive cabling. The easy expandability, combined with the flexibility of software, is great. Our security, which is already good, will be further enhanced, giving us greater control and traceability."

## Milestone Systems

**Innovator.** Milestone Systems is internationally recognized as an innovator and thought leader in open platform IP video management software. Milestone's XProtect products operate as the core of surveillance systems: connecting, sharing and managing all devices through a single interface that is easy to learn and operate.

**Easy to use.** The XProtect platform is easy to use, proven in operation and scales to support unlimited devices. XProtect products support the widest choice of network video hardware and are designed with an Application Programming Interface (API) that integrates seamlessly with other manufacturers' systems.

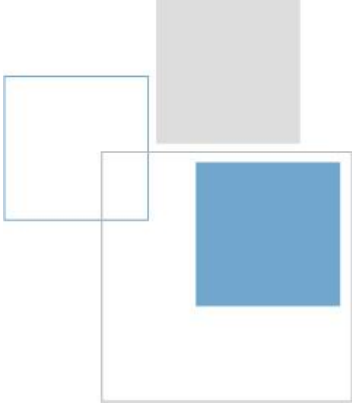
**Best-of-breed.** Using XProtect, you can build scalable, "best of breed" solutions to reduce cost, optimize processes, protect assets and ultimately increase value in a company's products and services.



## Milestone White Paper

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Milestone Systems is the industry leader in developing true open platform IP video management software. The XProtect™ platform gives users a powerful surveillance solution that is easy to manage, reliable and proven in more than 35,000 customer installations worldwide.

With support for the industry's widest choice in network hardware and integration with other systems, XProtect provides best-of-breed solutions to "video enable" organizations – reducing costs, optimizing processes, and protecting assets.

Milestone software is sold through authorized partners in approximately 90 countries.

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