CASE STUDY

# Preserving irreplaceable video evidence

## Pivot3 RAIGE™ Cluster Solution is the Preferred Means to Store Video Images Used as Evidence in Criminal Cases

There's no margin for error when it comes to public safety. Metropolitan police departments all across the country are doing their best to deter criminal activity. When it can't be prevented, the agencies want to apprehend and help to successfully prosecute the perpetrators. With human resources stretched thin, video surveillance has become a critical tool in the war on crime. Video surveillance puts thousands of extra "eyes" on the street 24 hours a day, seven days a week.

Insight Video Net, LLC (IVN) has emerged as a leading provider of digital media software and services to capture and manage video, especially for the public safety market. IVN has developed software called the Central Management System, or CMS, to store, retain and manage the video that comes from "fixed" as well as "mobile" cameras. CMS makes sense of huge amounts of raw video and turns it into indisputable evidence admissible in court.

### Challenge

- Providing the highest reliability for storing and preserving video images for evidence in criminal cases
- Delivering very high performance at a reasonable cost for citywide video surveillance systems with large input requirements

### Solution

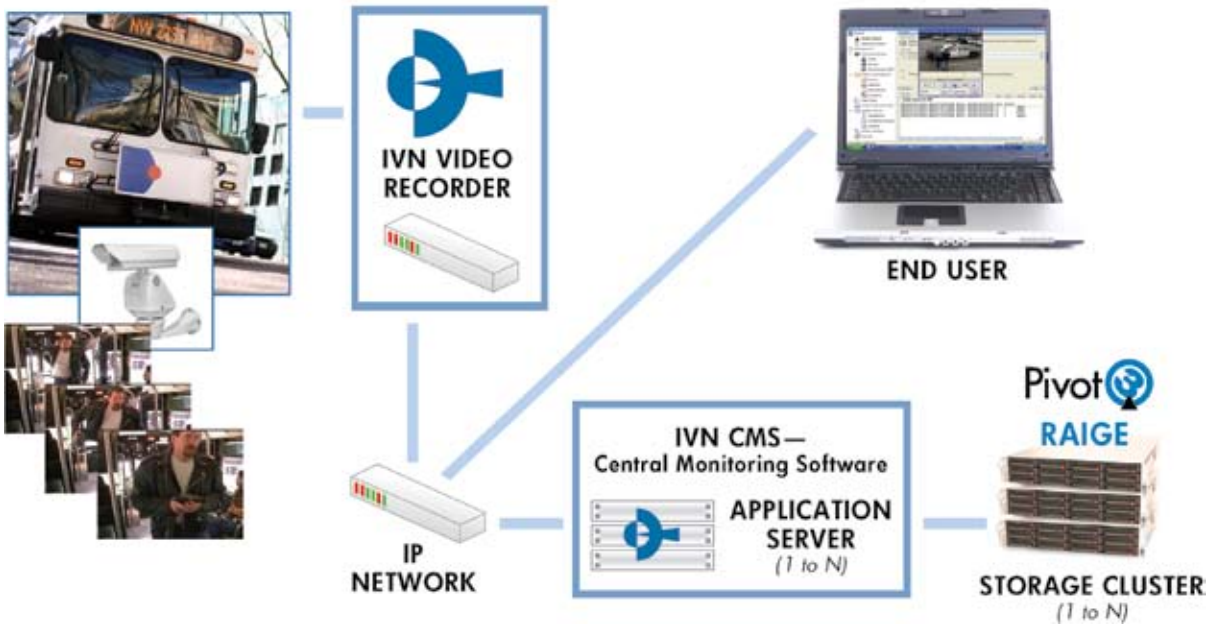
- The Pivot3 RAIGE Storage Cluster, which enables businesses to store hundreds of terabytes of data on a system with unmatched affordability and high reliability
- Break-through technology provides distributed RAID for always-on availability, scalable performance through workload distribution, parallel throughput for fast data transfers, and simple installation and administration of the RAIGE controller

### Results

- The Pivot3 RAIGE Storage Cluster is an integral component to Insight Video Net's Central Management System for managing and preserving video footage
- The affordable, scalable storage system provides IVN with a strong competitive advantage in the pursuit of municipal contracts

## Preserving video evidence is critical to law enforcement and the judicial system

IVN works with a select group of partners such as IBM, Safety Vision, Panasonic and Pivot3 to create turnkey citywide solutions for video surveillance. Such a solution captures live video feeds from cameras located on and in buildings, at intersections and other public places, and in mobile units such as buses, trains and police cars. The video from thousands of cameras spread across an entire metropolitan area feeds into local digital video recorders (DVRs), which in turn input their relevant video of incidents into CMS. Using sophisticated analysis techniques, CMS catalogs the video according to client, case and other criteria before carefully storing and preserving the video for later use in criminal trials. Storage can be local at the client site, or the video files can be moved to a centralized storage system.




Evidence is catalogued in CMS and stored on Pivot3 RAIGE Storage Cluster for later viewing

In developing the Central Management System, IVN worked closely with police departments, district attorneys and other members of the judicial system to understand how video needs to be handled in order to become valid evidence in a trial. The chain of custody is especially important so that jurists know that the video has been handled in a scrupulously careful manner. "Evidence is irreplaceable," says David Carreon, IVN's Vice President of Sales. "Preserving it and making it available when needed is critical to the clients we serve."

With that in mind, an essential element of the chain of custody is the video storage system. IVN has chosen to partner with Pivot3, Inc. for the vital storage component of the Central Management System. Pivot3, a storage company with headquarters in Houston, Texas, provides IVN with the perfect blend of high availability and great performance at a very reasonable price.

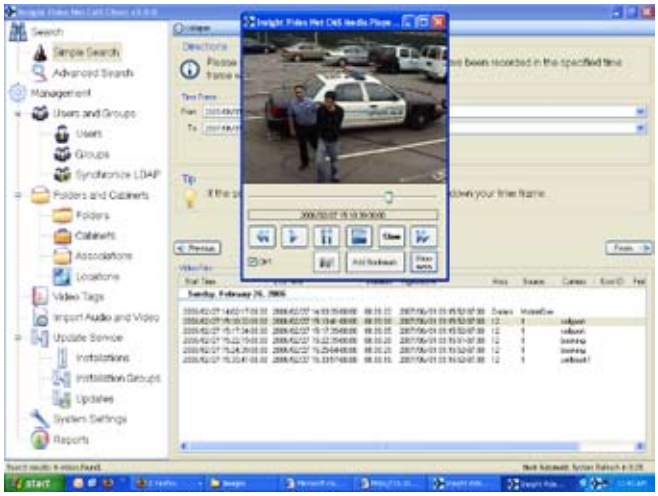
"We chose Pivot3's high performance RAIGE™ clustered storage solution for two primary reasons," says Miles Cowan, Chief Technology Officer for Insight Video Net. "First of all, the failsafe nature of the system gives us confidence that the video will always be available. The redundancy built into the current RAIGE system, as well as what we see on Pivot3's roadmap, is very exciting. Pivot3 is completely in sync with our needs."

Cowan adds, "The second reason we picked Pivot3 is because the price/performance ratio of the solution is unbeatable. The unique architecture of the storage system allows us to double the number of cameras feeding live, real-time video into our system at no extra cost. Each server can handle about 150 cameras as opposed to the typical 70 or so. This is a real competitive advantage for us."

## A different approach to storage yields a new industry benchmark for price/performance

RAID (Redundant Array of Inexpensive Disks) data protection has been at the heart of storage systems for more than two decades. By taking a different approach, some of the inventors of the original RAID architecture—now the lead engineers at Pivot3—have designed a better method for providing cost-effective data protection using inexpensive networked nodes, reducing infrastructure costs by 50 percent or more. The Pivot3 RAIGE Storage Cluster™ is the result of years of research and development.

The patent-pending RAIGE (RAID Across Gigabit Ethernet) operating system drives redundant switches, which in turn connect to a series of inexpensive networked nodes, called Databanks, which are virtually clustered. This creates a high performance storage cluster where data is distributed, protected and accessed in parallel across multiple Databanks connected via common gigabit Ethernet. The unique configuration breaks the limit of physical RAID devices by using a totally virtualized environment.



CMS allows you to easily capture and manage video data

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This virtual architecture allows performance and capacity scaling along with flexible and dynamically changeable data protection levels and volume definitions. There are no hardware limits; Databanks are added linearly to scale capacity to hundreds of terabytes, allowing enterprise scaling with affordable industry-standard drives.

Each Databank adds processing power, cache, and network ports contributing to an overall increase in performance and bandwidth. So, contrary to most storage systems whose performance degrades as capacity is added, the performance of a RAIGE Storage Cluster actually improves with the addition of each new Databank.

Most importantly to IVN and other companies seeking high availability, the system has inherent redundancy at every level. Because the data is distributed and replicated across multiple Databanks, no data is ever lost if a Databank fails. The system dynamically rebuilds itself without missing a beat. This feature provides pure peace of mind to any enterprise storing mission-critical information.

The RAIGE Storage Cluster has a multi-threaded capability that enables sequential "reads" and "writes." This feature is ideal for applications such as video streams that are feeding vast amounts of information at a rapid pace. There is no bottleneck to hold up the transfer of data to and from CMS, making performance of the system extremely fast.

Prior to selecting Pivot3 as a technology partner, IVN conducted lab tests to simulate a typical working environment. "We did tests to simulate the ingestion of video from up to 200 cameras," says Carreon. "We found that Pivot3's solution could ingest huge amounts of data at once—establishing a new industry benchmark. We performed these same tests with other storage server solutions and found they couldn't even approach what

Pivot3 does. After about 70 cameras, the other systems were maxed out and began to lose pixels, which of course affects the quality of the images. We can't have that."

## Buy only what you need, pay for only what you use, and grow when needed

"We worked with other storage vendors in the past," says Cowan, "but their solutions can't begin to compare to the price/performance measurement of what Pivot3 provides." Carreon concurs, adding "Now our bids for new projects are much more competitive. We consider this our strategic advantage. We offer a complete solution that includes our own CMS and the Pivot3 storage backend, and we feel we are offering high functionality at a very competitive price point."

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The Pivot3 storage solution provides another distinct advantage when included in an IVN bid for a new customer. Because it's so easy to increase storage capacity, the customer can start with a modest configuration and add Databanks as necessary to scale up. There is no re-cabling required; Databanks are automatically discovered and can be assigned to a new virtual array, added to an existing virtual array, or change membership for maximum asset flexibility. In this way, the customer pays only for what he needs, when he needs it, and there is always a path for growth.

"We feel very comfortable with this product. We see this as a low risk business decision for IVN," says Carreon. He adds, "What more can we say about Pivot3? We love these guys!"

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