



The 101 Casino Doesn't Gamble on Security

Pivot3 High-Definition Storage Helps California Card House Deploy a Unique Set of Critical Applications

It might be called the “gaming industry,” but operating a casino is serious business. This very competitive industry is highly regulated by state governments and gaming commissions. Casinos must operate under specific regulations that ensure the games of chance are not intentionally skewed to favor any particular party. For example, video surveillance on the gaming floor is required to reduce disputes over payouts and eliminate theft.

Surveillance is also used throughout a casino’s premises for general safety and security applications, to support guest hospitality systems, and to help the casino identify and mitigate risks. A good surveillance system can prevent people from “taking the gamble out of gambling.” In this business, cheating is hard to detect and harder still to prosecute, so the extra eyes and the precise memory of video are critical.

Challenge

- Building a cost-effective state-of-the-art digital video surveillance system for a large casino undergoing extensive renovations
- Feeding all the video from multiple applications and dozens of high resolution cameras into one highly scalable storage area network
- Providing the highest reliability for capturing, playing back and preserving video images of the gaming tables and casino premises

Solution

- Pivot3 High-Definition Storage, which enables the casino to store more than a petabyte of data on a system with unmatched affordability and high reliability
- Break-through RAIGE 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

- Pivot3 High-Definition Storage is the single storage repository for three key video-capture applications
- The casino saves significant money by not having to purchase and manage three separate storage systems for the three separate applications
- The casino can easily expand the storage capacity if and when needed, and not pay for unused capacity

When The 101 Casino in Petaluma, California, recently underwent a complete renovation, casino general manager Randy Yapple took the opportunity to install a state-of-the-art digital surveillance system using best-of-breed applications and components. "We wanted a very advanced system that could improve our operations in several ways," says Yapple. "We've improved our overall security while actually lowering the cost of operating our surveillance system."

There wasn't even a question of analog versus digital for the system. "Digital is clearly the way to go," explains Yapple. "The IP-based cameras give us the highest quality images, and we can categorize, search and review our video very easily. We've done away with the need to load and store thousands of videotapes. Now, we simply retrieve the precise images we're looking for when we need to go back in time." Yapple says there's definitely a good return on investment in his new surveillance system.

Building a 'first of its kind' surveillance system

The 101 Casino has three main applications that comprise the video surveillance system. "This is a really unique system because of the infrastructure," says Yapple. "To my knowledge, this configuration is the first of its type. We run multiple applications using IP cameras, manage the video with one central management system, and store the video on one shared storage network."

The casino uses alarm management and access control software from Lenel Systems International Inc. This software identifies when something unusual happens and associates an alarm with a segment of video that can be reviewed and analyzed.

The second major application in use is a player information system from Tangam Gaming Inc. This solution allows the casino to track, manage and improve player profiling, game security, operational efficiency and dealer performance. It offers instant and predictive analysis over table game play, with a goal toward increasing the profitability of the games.

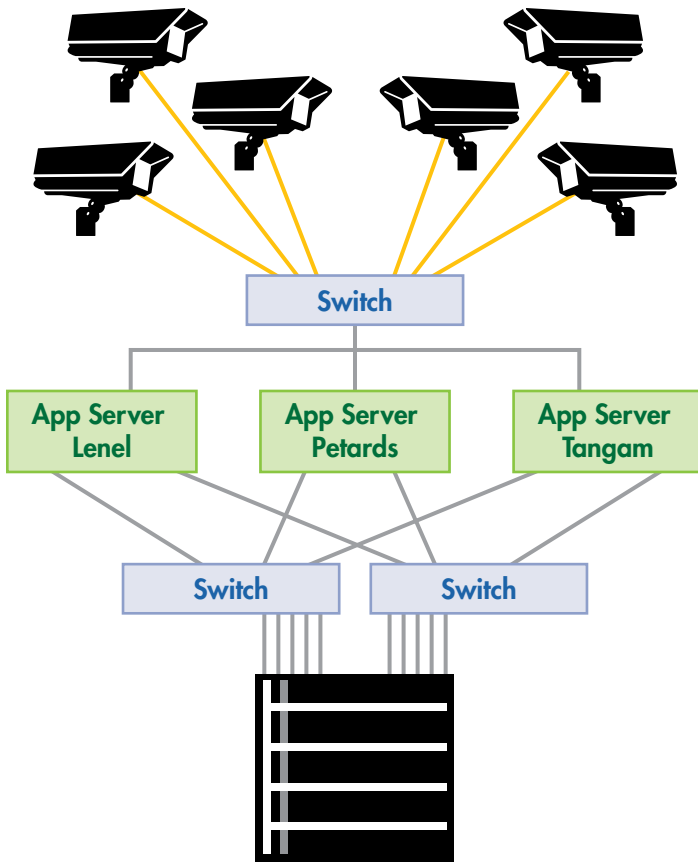
The Universal Video Management System (UVMS) from Petards, Inc. is the third and largest of the applications. UVMS provides the ability to record and control all aspects of gaming surveillance, as well as general premises security surveillance. The casino's security staff can monitor all activities from a central control room featuring a three-screen display integrated with a 46-inch video virtual matrix that provides full situational awareness. The security officers can view live and recorded data by drag-and-drop camera icons, apply an integrated smart search or instantly record evidential video.

What makes The 101 Casino surveillance system so unique is that all three of the software applications store their video data on the same storage area network (SAN) from Pivot3, Inc. "This is unprecedented," says Weston Perry, regional director of sales for Pivot3. "Traditionally, each software application would require its own separate storage system. The fact that we could design an infrastructure that allows three applications with streaming video to utilize just one storage system will vastly lower the cost of ownership in the long run."

High-Definition storage is optimized for video

"Video places unique demands on storage systems," according to Perry. "Unlike database applications, video is streaming, always on, and sequential. It stresses the bandwidth of every piece of the system. Just one megapixel camera can generate a terabyte of data in a few days. This necessitates a massively scalable storage solution."

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Today, the casino has 66 cameras, 40 of which are megapixel cameras for very high resolution images. The cameras communicate to switches, which in turn are connected to four application servers—three for primary use and one for redundancy. All four of these servers file their data on the block-based storage system from Pivot3.

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 Pivot3 High-Definition Storage Cluster actually improves with the addition of each new Databank.

“The Pivot3 architecture aggregates all the ports together so it looks like one big port to the cameras,” says Perry. “With so much bandwidth available to the video applications, writing video to the storage array is extremely fast. And when you add another Databank for more storage capacity, you get the additional benefit of even more bandwidth.”

The Pivot3 High-Definition Storage Cluster also provides high availability without increasing the cost. There is no single point of failure with any of the components. The RAIGE architecture ensures continuous data access in case of network failures, drive failures, and even the failure of an entire Databank. Because the video images are distributed and replicated across multiple Databanks, no data is ever lost if a Databank fails. The system dynamically rebuilds itself without missing a beat.

With The 101 Casino using the Pivot3 storage system as the backend to multiple applications, the casino is able to centralize and virtualize the storage to manage applications and data more efficiently and effectively. “Pivot3 gives them a storage infrastructure that allows a lot of options,” according to Perry. “The casino has the ability to add or change out software applications if they choose to do so in the future. The storage system looks more like a regular network, where the applications that plug in can vary.”

“I’m very happy with the ‘industry standard’ nature of the system we’ve designed,” says Yaple. “The components we’ve assembled, including the cameras, the applications and the storage, enable us to expand

That’s exactly what Pivot3 delivers. The clustered architecture of the Pivot3 High-Definition Storage Cluster is distinctly different than other SAN solutions. The Pivot3 RAIGE (RAID Across Independent Gigabit Ethernet) architecture provides direct, parallel access from the video servers to a series of inexpensive networked nodes, called Databanks. This creates a high-performance storage cluster where the video data is distributed, protected and accessed in parallel across multiple Databanks connected via common gigabit Ethernet. This unique configuration breaks the limit of physical RAID devices by using a totally virtualized environment.

This virtual architecture allows performance and capacity scaling that is unmatched in comparably priced SANs. Databanks can be added linearly when needed to grow capacity to over a petabyte. Because a Databank is basically an industry standard server, each additional Databank in the array adds processing power, cache and network ports

and upgrade our surveillance system over the long term. I expect to get many years of service from this solution without having to make big investments every few years.”

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Lab simulations provide proof of concept

Pivot3 and Petards did extensive testing and integration work before delivering their joint solution to The 101 Casino. “Pivot3 has an incredible system with a high degree of reliability. It’s extremely fast, too,” says Petards president Frank Baitman. “Pivot3 is a great answer for video surveillance systems, and it’s much cheaper than an enterprise storage system.”

Pivot3 hot-staged almost the entire configuration of cameras, servers, software and storage in the company’s lab before installing it at the casino. Pivot3 systems engineer Jat Treadwell explains, “Since this was a new configuration for us, we wanted to be very sure we could support the workload. We simulated the worst case environment, where all of the cameras were continuously capturing data and sending it through UVMS to the storage system. Then we simulated failure conditions to see how well the storage system would recover.”

Treadwell says the tests proved the integrated configuration could handle the load. Following the successful tests, the staged equipment was sent to the casino. “The implementation was very smooth,” says Treadwell. “It was a matter of ‘One, two, three, and done.’ People were amazed at how easy it was.”

“I’m very excited about what we’ve put together,” says Yaple. “The open nature of the platform gave us many choices. We’re able to run multiple best-of-breed applications with a single shared, networked, and expandable storage solution. All of my vendor partners worked well together to stage, test and install the system, and I’ve been given great support. What more could I ask for?”

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