

Recent advancements in VMS provide solid foundation for future systems

By David Jackson

Despite the explosive growth of the IP camera market over the past few years, a significant majority of end users are still using DVRs and analog cameras. While these users are undoubtedly interested in the high resolution images offered by megapixel cameras, they still need the ability to view, control and manage recorded video from existing DVRs and associated analog cameras and their new NVRs and IP cameras – without requiring separate systems for each. In short they also need a robust and reliable platform that can maximize their existing analog infrastructure and be able to expand using new technology for many years into the future.

These requirements have borne new systems that bring recorded video from DVRs and NVRs and associated analog and IP video streams into one cohesive user interface. A unified interface offers a more comprehensive picture of the overall surveillance landscape while saving time, simplifying training time, and lowering costs for maintenance and updates.

Benefits

1. Tech-savvy searching

Unified systems provide faster search results during a forensic investigation. By combining together a range of cameras, DVRs and NVRs, unified systems allow for searches for vehicles, people, objects and other events regardless of camera source or the underlying technology. Advanced systems such as VideoEdge capture the motion metadata in real-time from cameras. This enables operators to conduct SmartSearches where they can search days of video in seconds, clearly a much more efficient manner than traditional frame-by-frame review.

2. Greater control of the video

Unified systems allow for a single point of control of video content, which is critical to protecting a brand and company's reputation. By limiting views to specific employees or restricting access to sensitive areas of a facility, policy management can help thwart rogue Internet postings or other inappropriate uses outside of the security system. In many cases, the risk of tarnishing the brand of a company can be magnitudes more damaging than loss of assets from a facility.

3. Heading toward command and control

Video management systems are quickly becoming the central management point in an organization for many security related functions, such as access control, intrusion, and fire. A single interface that brings together the collective consciousness of an organization's security and life safety functions can eliminate duplications in hardware and reduce strain on personnel.

Challenges

1. Standardizing H.264

H.264 has become the industry's standard compression technology because of its highly efficient methods of transmitting video and maximizing the number of days video can be storage.

However, a good VMS system should not only be able to flawlessly handle megapixel technology but also sufficiently and simultaneously leverage other existing codecs – MPEG, MPEG4 – to again leverage previous investments in their surveillance system.

The trade-off to H.264's benefits is the additional processing power needed to code and decode the video. This exists both on the camera as well as within the client. In regards to evaluating VMS systems, understanding the total number of H.264 video streams that can be displayed concurrently is critical. Newer workstations have more powerful CPUs and higher performance capabilities. However, H.264 performance is greatly impacted by the manufacturer's implementation and video display technology. Customers need to ask questions such as how many videos can be simultaneously displayed? What is the resolution for each camera, 4 CIF or 1080p? And what is the fps (frames per second) of each camera? These questions need to be understood before purchase and deployment.

To drive more H.264 video at higher resolutions and at real time fps, some VMS designers have taken advantage of an often underutilized resource – the video cards on each PC workstation. Microsoft's Windows Presentation Foundation (WPF), a graphical system for rendering user interfaces in Windows-based applications, provides a unique opportunity. VMS systems built on this framework are able to divide the video rendering workload between the PC's CPU and the Graphical Processor Unit (GPU) which powers the video card. Using WPF in a VMS, the intensive video processing – video bit and texture mapping, skeletal frame and image quality – is done on the GPU/video card, leaving the CPU free to decode the video.

VMS systems designed using the WPF architecture can also offer other functionalities such as the ability to have multiple surveillance tabs for mixing live and recorded video, 'Snap and Dock' windows, and more.

While it's important that newer VMS systems be able to handle the latest in compression technologies like H.264, the realities of the market are that most installations are upgrades to existing surveillance systems in various stages of migration to IP, vs. a greenfield installation unencumbered by any legacy technology. A good VMS system should not only be able to flawlessly handle megapixel technology but also sufficiently and simultaneously leverage other existing codecs – MPEG, MPEG4 – to give users a comprehensive and cohesive view of their surveillance system.

2. Building with the right parts

No other part of a video management and recording solution takes more abuse than the actual hard drives that physically record the video data. In fact, hard drives are the most common point of failure in a surveillance system. Most VMS solutions are designed to accommodate the hot swapping of hard drives to replace a defective drive or substitute a larger hard disk for additional storage, a feature seen as crucial as part of enterprise storage requirements.

Most solutions employ SATA drives, known for their speed, storage densities and low cost per gigabyte for near-line storage functions, like archiving and backups. In an average corporate, non-video environment, these drives function well as an 8 a.m. to 5 p.m. solution that can handle documents, images and other items found in the typical business environment. Adding redundancy with additional drives can help alleviate data loss due to a hard drive failure, but it also adds additional costs and complexity to the overall system.

With video's data intensive, 24/7 requirements, however, higher-grade components are beginning to creep their way into today's enterprise-grade NVRs. Tier 2 Near Line SAS drives, which are designed for that around-the-clock usage and the demands of high bit rate and constant throughput, are one solution to stem the flow of hard drive replacements over the life of the system.

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