Understanding Video Management

Surveon Whitepaper

Surveon
Complete Megapixel Solutions

Video management is the core of the security system. Know the different managing functionalities and the relevant software level can help you find the cost-efficient video management software and devices.

What is the main core of the video management?

The core of network video surveillance is video management software and Network Video Recorder (NVR), different from traditional analog solution's Digital Video Recorder (DVR). Starting with the most confusing terms, VMS, CMS and NVR, general explanations will be stated below.

Briefly speaking, VMS installed on a PC is a NVR or DVR. When multiple NVRs are deployed, CMS will be needed for central management.

Since CMS and VMS can be used together, users can be confused easily by their diversity. Some VMS architecture can control multi-sites so that CMS is not needed for cases like this. Take Milestone VMS as an example, its client/server architecture supports multiple NVRs and over thousands of cameras. While conventional VMS, such as Geovision VMS, will require plug-in CMS to control multiple NVRs and act as a central control center.

VMS Architecture and Main Features

Network camera is not designed to plug and play. Thus in the early stage, network camera manufacturers tended to enclose software with their shipments, for example Axis' Camera Station. And VMS can be generated to various forms, for instance, upgraded from DVR (NVR from Geovision), accompanied with NAS (QNAP), professional VMS (Milestone / Genetec) and advanced PSIM (Physical Security Information Management) (Verint / NiceVision / Bosch). These VMS solutions' positioning and pricing are reflected on the software functionalities and architectures. For instance, most of the software came along with the network cameras are with basic functionalities and can only work with their own cameras.

For simple SOHO projects, NAS will be sufficient. While for advanced applications, users can deploy open-platform, professional VMS or PSIM solutions according to their integration levels.

VMS main features can be divided as the followings:

Live View & Monitoring

The basic functionality of NVR is multi-window live view. Since megapixel cameras involve compression at the front end and decompression at the rear end, it is required to have better decompression capability. Therefore, the ability to support real time images in multi-channels, for example 32 channels of megapixel cameras, is a key to the NVR overall performance.

For other functionalities, such as instant playback, zoom in, various image formats, pan, tilt, HTML, and looping are not unusual to be seen.

When there are too many cameras to look at, they become decoration or just a passive warning. To solve this problem, some vendors provide intelligent video analytics, detecting functionalities and video clips, so that security team can be notified instantly and act on the specific event to turn monitoring from passive to active.

Graphical management and multilayer E-map are basic functionalities for professional VMS. Some manufacturers offer advanced functionalities such as live view on multi-monitor from 1 to 8 channels and with CMS, even multi-monitor wall can be supported.

Playback & Investigation

Playback is the basic functionality for NVR. The biggest challenge for high image quality project is if the system can support multi-channel recording and ensure no video loss. This part will be discussed later in the video storage section.

The 3 basic functionalities of playback include date and time search, video intelligence and advanced event search. Advanced search can be done on different cameras, time zones, locations, and events, for example videos of every car passing by the front door at 10 PM Monday to Friday.

Advanced VMS manufacturers provide bookmarking and video clips functionalities for an easier search. Some of the high tech surveillance from CSI, the TV series, are already happening in the enterprise grade VMS. Playbacks technological details can be also seen in the speedy playback, play forward, playbacks on multi-channel simultaneously, video export, and watermark on the image.

Integrations between Devices and Other Managing Functionalities

Besides live view and playback, there are other functionalities that a full VMS should cover, for instance, 1) NVR server related functionalities, such as camera management, alarm rule settings, and schedule settings, 2) camera related functionalities, such as image quality, video analytics, subnet mask (router related settings, subnet mask distinction and its domain), 3) Network functionalities, port forwarding, web client, mobile client, bandwidth monitoring, and black/white list. The VMS level can be determined by checking the aforementioned functionalities.

CMS and Scalability

There are several levels of scalability 1) All In One, this category is for small-scale surveillance projects, 2) All In One + Remote Client, this category supports remote controls via network, such as basic and advanced operations including access to a specific client to have a full control, 3) multiple NVRs and VMS, this category is similar to the CMS architecture. Some basic VMS can cover category 1, 2, and for cases like a franchised store with 10 NVRs, 1 store manager, 1 district manager, 1 general district manager, and these personnel with different monitoring privileges. The differences of the first and the second categories are remote control, what remote control can do concerning network, all clients, onsite, and functionalities. Some remote controls only include live view and playback; that cannot be considered as a full control.

Some more professional VMS manufacturers design their software under a client/server architecture so that the software can be modulated according to different application requirement. This is the most flexible and functional architecture.

Megapixel cameras require better decompression, but a couple of personal computers can hardly handle 20 channels of cameras. That is when we need CMS' advanced features. Taking advantage of the network cameras' scattered characteristics, TV client can have remote controls over multi-monitor wall and support analog matrix architecture to hundreds of megapixel channels on the multi-monitor wall simultaneously. Use PC-based solution is more flexible and can save overall costs. For other managing features such as central alarm are also common expandable functionalities.

Take Milestone VMS as an example, their open platform software can meet different requirements from various levels of installations. For high-end surveillances, all clients' authorities and licenses are issued and managed by the unified server. For

large-scale surveillances, Milestone even provides full scalable and managing functionalities such as multi-monitor walls which make network video distribution possible, totally different from the conventional and expensive matrix system.

3rd Party Integration

For high security projects, not only video monitoring is a must, other security devices should also be included, such as access control, fire alarm, detecting devices and so on. Some of the integrated devices are for professional sectors, for example, POS for retails, ATM for banking, and event as well as thermal managements for manufacturing sites. For advanced security projects such as transportation and airport surveillance, are tailor-made solutions and more devices need to be integrated.

The security industry giants or PSIM manufacturers, who have been involved in large-scale security projects, such as Honeywell, BOSCH, Nicevision, Verint, can be regarded as models. Before the deployment of Verint's security solution initiated in the American Banks, with high complexity and particularity, Verint needed to make sure the integrations among ATM, image analysis, and other devices can work smoothly.

Lots of VMS new manufacturers, such as Milestone, Genetec, and ONSSI, are solution providers for enterprises. They position themselves as open platform software providers, not just offering video monitoring software but also furnishing with opportunities to support third-party hardware and software. That is why for large-scale surveillance projects, Milestone and Genetec all have their own skilled SI (System Integrator) who can seamlessly integrate the network video and the deployed devices to make the whole security system work but also retain their own calls.

After the introduction on VMS, users can learn the VMS better, including their positioning and differences, basic and more advanced categories, such as solutions from PSIM manufacturers and also know more about its functionalities, live view, playback and scalability.