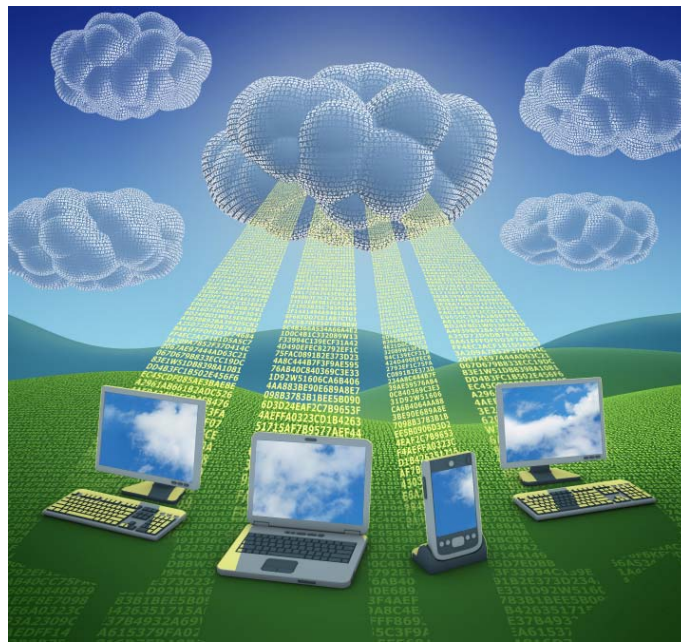


TECHNOLOGY SOLUTIONS

Cloud Video Management (CVM)



The Evolution of Video Surveillance

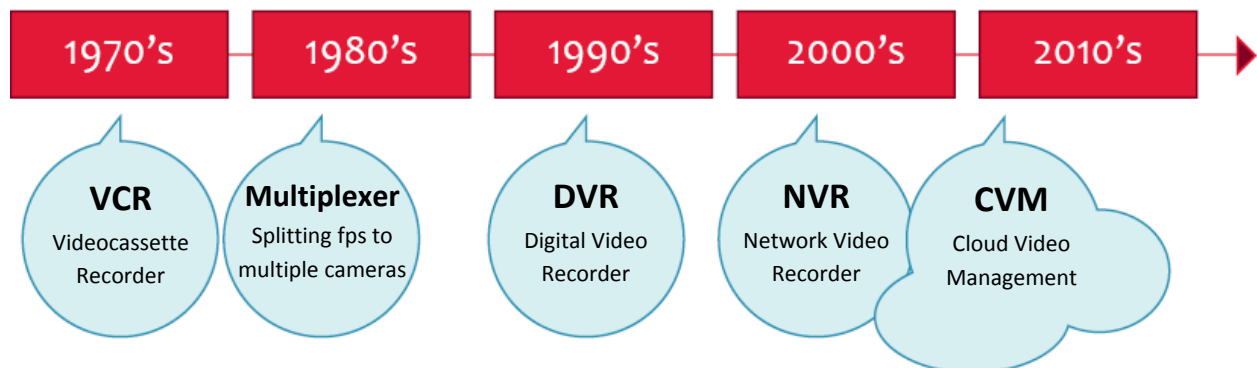
Video surveillance technology has evolved over the last four decades.

Affordable video recording started in the 1970's with VCRs (Videocassette Recorders). These systems demanded hardware at every location and each VCR could only record from a single camera. Soon after, the process of splitting video became the standard with Quad processors capable of recording four smaller images at the same time. Next came multiplexing technology capable of jumping from one video stream to the next in fractions of a second. This gave you fewer frames per second per image, but up to 16 cameras could be recorded on a single VCR.

Digital video advanced with DVRs and NVRs in the 1990's and 2000's. This gave security professionals more freedom to manage multiple cameras per system at higher frame rates. However, they still required maintenance and the expense of network hardware and video management software.

Cloud computing became available on a wide basis in the late 2000's. The next logical step for security camera systems was to utilize cloud software to manage an unlimited number of cameras while being free from dealing with server/hardware issues or software updates.

Timeline of Video Recording Technology



Cloud Video Management Defined

In general, cloud computing is defined as...

Using a network of remote servers hosted on the internet to store, manage, and process data.

You can expand this definition to include...

Delivering computing or software applications over the internet rather than using software that is installed on your personal computer. This is also known as Software as a Service, or SaaS.

Cloud Video Management is a form of SaaS in that it provides Video Content Management Software over the internet rather than on a DVR or NVR. The following functions are common across CVM providers.

- No software other than an internet browser is required on your personal computing device (PC, tablet, smart phone). Optionally, you may install viewing software on your device for advanced functionality.
- To gain access to video, you log into a website (your private cloud portal) with your username and password.
- Inside the portal, you can view a live stream or access recorded video that comes directly from a video camera without the use of a DVR or local NVR.

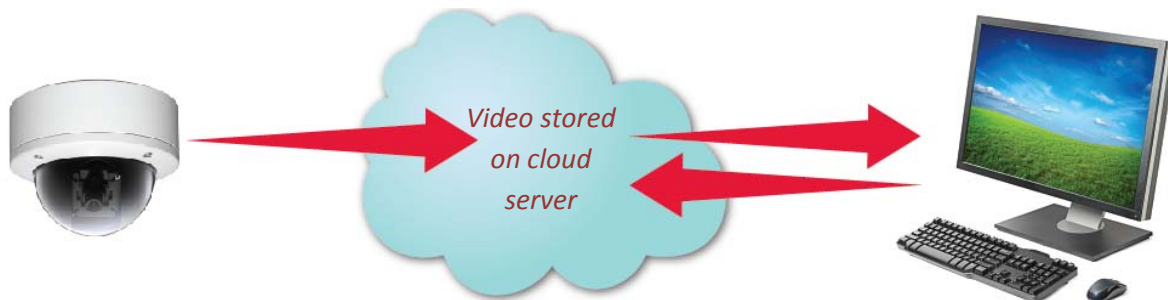
The advantages of CVM over older technologies include

- **Flexible system size.**
Systems can be 1 camera at 1 location or 1,000 cameras at many locations, all managed through one interface online. This is opposed to DVR/NVR hardware which comes with limits as to the number of cameras and overall processing capability.
- **Easy to expand.**
Simply add another camera and give it access to the internet and power. If you have an old DVR/NVR system that is maxed out, you can add a cloud camera to easily and inexpensively expand your number of cameras.
- **Access your video from anywhere.**
Use any device that has access to the internet.
- **Low cost.**
There's no need to buy expensive DVR/NVR hardware.
- **IT friendly.**
There's no software to install for the basic system. Maintenance and upgrades are handled by the cloud server's owner.
- **Easily Upgraded.**
Add functionality and convenience to your system by installing apps on your tablet or smart phone. Or install pro-user viewing software on your PC. These upgrades do not interfere with browser access and are commonly free.

Two Common Approaches to CVM

1. Hosted Video Storage in the Cloud

This method of CVM has each camera immediately streaming its video to a cloud server where it is stored.



Pros

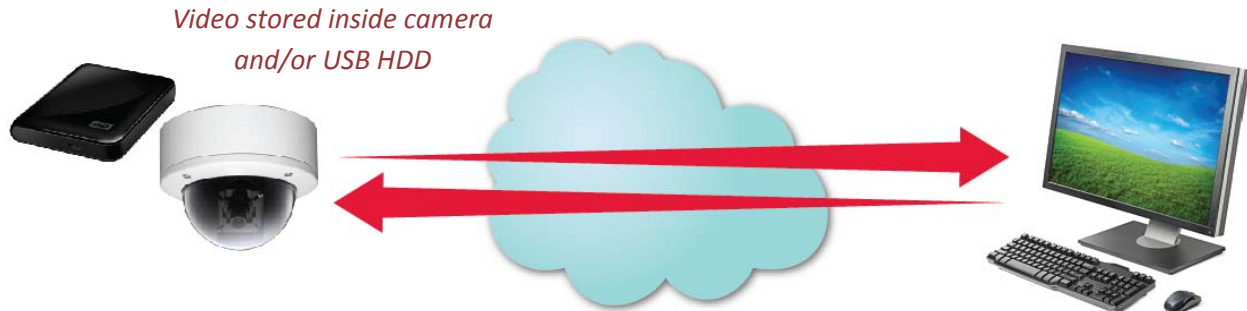
- Video is backed up remotely and not accessible to burglars

Cons

- The constant stream of video from all cameras creates bandwidth issues resulting in missing frames and video lapses
- To avoid bandwidth issues, video is often streamed in a lower resolution and slower frame rate meaning that high resolutions are not available even when you have a high resolution camera.
- The security of cloud servers varies with the procedures of the server's owner. Video stored on cloud servers may be prone to hacking.
- Storing video on a cloud server can be expensive because there are fees based on bandwidth usage

2. Local Storage Accessed Through a Cloud Portal

This method of CVM stores video locally, inside the camera and/or on a local hard drive connected to the router.



Pros

- A dual stream of video on demand and adjustable bit rate accommodates higher quality video with faster frame rates dependent on the end user's device
- There are no bandwidth issues since video is only streamed on demand
- There are no cloud server security issues since video is not stored in the cloud
- The cloud portal is inexpensive or free because there are no storage fees
- Uneducated burglars will look for a DVR, and not realize that video is stored inside the camera or at the router

Cons

- Video may be lost if a camera is destroyed and/or the local USB drive is stolen

Live Video Stream and Camera Controls

Viewing live video and controlling the camera such as PTZ, image brightness, recording setting, etc. are handled similarly in both methods outlined above.

About e-Line

e-Line is a manufacturer of equipment and technology for the electronics and security industries. They have pioneered the U.S. technology used to integrate a camera's internal video storage with a cloud portal.

The SNIPER line of Cloud IP Cameras has dome, bullet, full body, and PTZ models with VGA or MegaPixel resolutions, and hardwire or wireless options. The e-Line cloud portal is free with the purchase of a SNIPER camera.

e-Line partners with TP-Link routers and antennas to provide expanded local storage at the router, and long-distance wireless systems that transmit video up to 15 miles between the camera and the router.

Visit the e-Line website at www.el-usa.com for a list of distributors.

“Cloud Video Management is a natural progression with technology improvements. Smaller and faster processors and storage devices enable systems to be put together like Legos™. Build the system you need as you need it. View and manage through the web. These are the advantages that CVM offers our customers.”

—Mike Davis, President of e-Line

