Video Management Software (VMS)

Smart Video Management System

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M3S+

M3S+ Video Management Software

M3S+ is our core technology platform for all video management solutions. This platform can be used as a standard application and also to create solutions, specific to the customer's requirements / situations. M3S+ platform along with its suite of applications and modules is self-sufficient to deliver end to end solution, however it integrates and works with various niches and third party systems to deliver a unified user experience, thanks to its flexible and open architecture design.

The platform is modular and scalable in nature, making it suitable for simple standalone video applications to large scale citywide deployments. It is also designed as a make/brand agnostic when it comes to camera hardware and uses off the shelf IT hardware.

Following Solutions/Applications are offered on our core Platform M3S+.

- Video Management System
- Suite of Video Analytics for a variety of Applications
- Automatic Number Plate Recognition (ANPR) System
- Red Light Violation Detection (RLVD) System
- Dynamic Incident Detection (DID) System
- Command and Control Centre Application
- APIs for Third-party Integrations

3rd Party Integration

Due to the open architecture, our system provide integration with other software applications through Application Programming Interface (API). Such applications include wide variety of applications such as access control, video analytics, and other alarm and sensor inputs.

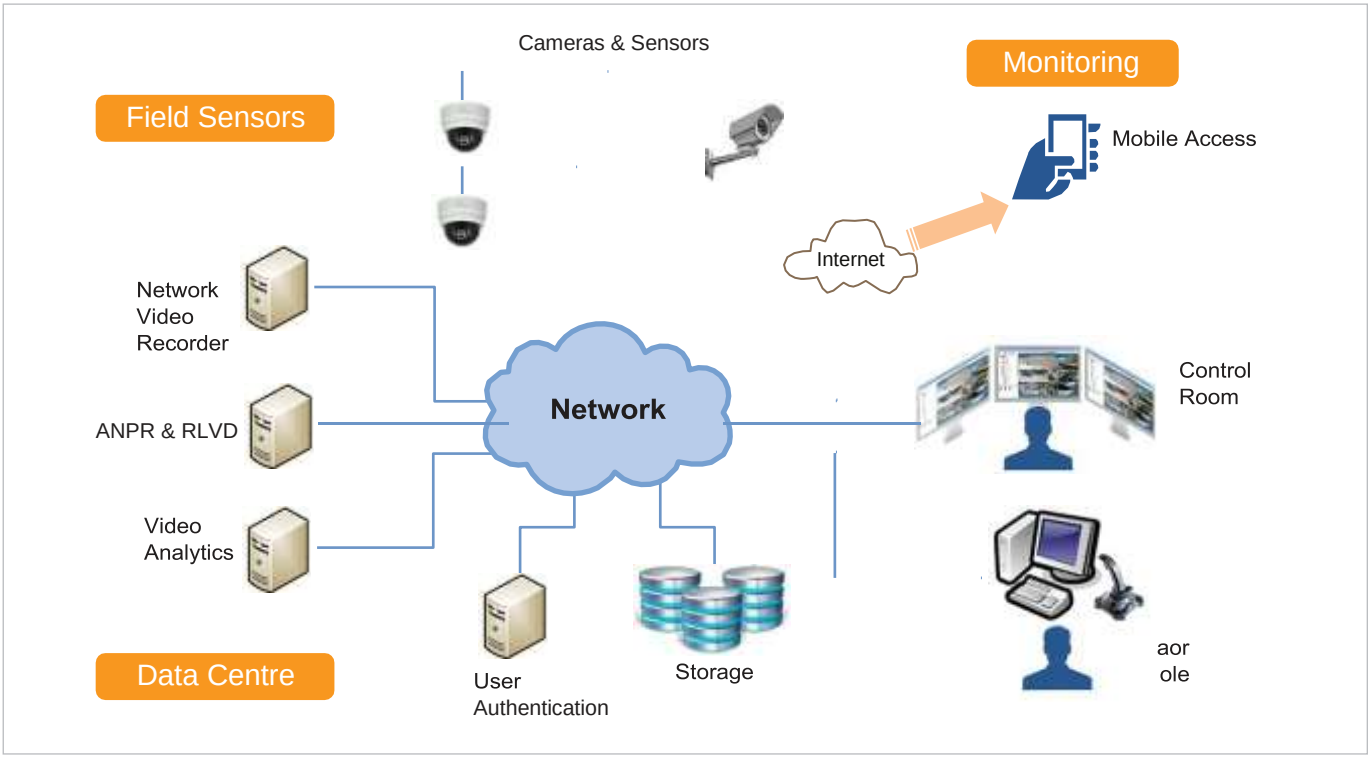
A Smart VMS Needs To Be...

M3S+

- Modular and Scalable
- Easily Configurable & User Friendly ☑
- Should have Intuitive Features and User Selectable Themes ☑
- Should Meet International Standards ☑
- Proven in Indian Conditions ☑
- Should use off the shelf IT Hardware ☑
- Should be able to work with different Camera Makes ☑
- Easy Integration with third party systems / applications ☑
- Should have lesser overall cost of ownership ☑
- Should have inbuilt Analytics Modules ☑

To discover more about M3S+, get in touch with us.

Typical M3S+ Solution Architecture



The M3S+ VMS is a high performance Video Management System which is based on open standard distributed architecture. It provide a scalable and reliable platform to enable customized, network-based surveillance applications. It supports multiple vendor IP cameras and encoder manufacturers within the same system. As the system is Onvif Profile S & G certified, it support integration of ONVIF compliant cameras. It supports cameras which provides edge based motion and tamper detection.

M3S+ VMS is scalable and based on open architecture to support live viewing (For Public - Private Community inclusion and Collaborative monitoring) and automatic transfer of video recorded to the cloud on demand basis based on the age of the video for future scalability. The hosted Cloud Platform can be among the approved vendors as per the GI Cloud initiative from Government of India. The proposed application can provide a single interface to monitor, collaborate and action for both on premises and cloud devices like cameras, ANPR devices etc.

The M3S+ VMS can effectively monitor all the critical operational areas of the locations & fully cover all the access points. This system can be used to achieve following objectives:

1. Access points monitoring with motion detection alarms

2. Enhancement of operational control by covering critical areas

3. Recording of camera outputs for analysing critical events

4. Enabling intelligence on Live and recorded video through video analytics

Key Features

User Defined Matrix layout

M3S+ has unlimited and user defined matrix creation and selection. Any unique matrix can be created by the user and the same can be selected on the fly which is an industry first. The conventional method is to have standard templates of matrix, however, given the dynamic nature of the situations being monitored; a user defined matrix with complete flexibility is a big advantage. The system also has the option to assign layouts to multiple users, user groups, remotely and centrally as well.

Device Discovery

M3S+ VMS supports plug and play feature for automatic hardware discovery mechanism. The system can detect video surveillance devices (cameras) as soon as they are attached to the network. This discovery is supported on different network segments, including the Internet, and across routers with or without network address translation (NAT) capabilities. The automatic discovery and configuration support enables the system to recognize the camera as a video endpoint when any camera is connected to network. It then uses smart port macros to set the right network parameters for the video stream on the network.

Onscreen Tools for Easy and Efficient Operation

M3S+ provides easy tools for customization of Matrix Windows. The application can be configured to allow simultaneous viewing of up to 25 cameras per workspace, and up to 48 cameras per workstation. It can be used to create video matrix windows for display in separate monitors. The application can be configured in video wall mode and to handle unattended workstations. It can easily use to View cameras, video, view and manage alerts locally and based on graphical map. It allows simultaneous viewing of multiple video panes up to 25 cameras with the 64-bit version of internet explorer.

Map Support

M3S+ VMS Supports Map integration with Features:

(a) Adding Image Layers to the location map (b) Area Location on Map (c) Add Cameras to Layers on Map (d) Add Image Layers to Map (e) Add Map Server (f) Support Raster Format Images of JPEG/JPG & PNG File & Vector (Shape Files)

Data Security

M3S+ provides security mechanism such as the use of advanced 256 bit AES data encryption, digital certificates or Watermarking and claims-based authentication to ensure that only authorized personnel have access to critical information, prevent man-in-the middle attacks, and that the data is kept private. The system can be accessed without installing dedicated client software through the use of web browser such as Internet Explorer.

Architecture

It runs in a client server architecture where multiple servers can be added to handle thousands of camera. The system has no limitation on no. of cameras and it is simply dependent on the underlying hardware. With suitable hardware, it can be easily expanded to 10,000 cameras.

To minimize the hardware footprint for the project, M3S+ VMS supports deployment on virtual servers.

The system allows users to access video streams at remote sites from remote servers that have limited outbound bandwidth by optimizing the bandwidth on Wide Area Network (WAN). The video can be delivered to multiple users without placing additional load on the remote locations.

Camera Stream Viewing, Recording & Retrieval

Our VMS system is based on a distributed architecture which includes different clients (Operator Console) and servers (Video Recording server) to run on different machines. It supports video streams for 30 FPS or higher. For video recordings, the amount of used disk space can be configured to meet the user requirements.

Our system support multiple options to store video on multiple devices such as Servers, direct attached and can augment server internal storage. The video surveillance storage system can store video in loops, one-time archives, or event clips triggered by alarm systems. It also support for RAID 5/6 storage. It support VBR based smart recording which reduces the bandwidth in case of static scene (scene is not changing). The system can be configured to record in high quality in the day or during higher movement and reduce FPS in case of no or less motion.

The system facilitates viewing of live and recorded images and controlling of all cameras by authorized users. The Video Clip Management allow users to view, download and delete clips that are stored on the server.

Application USPs:

1. Allow important video sequences to be protected against normal disk clean-up routines. The protection can be done based on different settings such as - date based, days based or forever.
2. M3S+ VMS is Onvif Profile G certified which allow edge-based recording and retrieval capabilities. This include recording on camera's local storage device (such as an SD card) and retrieval from it. The offloading of video from camera can be schedule based, event based or manual.
3. Supports live view of surveillance cameras along with recording playback.
4. Supports advanced navigation tools such as high speed playback, keyboard based hotkey support, timeline browser and video thumbnail support on the timeline slider.
5. Highly configurable recording scheduler (continuous or manual or motion based) for various settings such as recurrence pattern (daily, weekly, specific time and dates) and by specific time ranges (all day, time range, daytime, night time etc.)
6. Supports digital Pan-Tilt-Zoom (PTZ) on live video.
7. Supports Bulk Action to allow to search and perform administration activities on multiple camera.
8. Supports Bulk import of cameras from file such as Excel/ .CSV, or other standard file format.
9. Provides mobile application for Android & Apple devices. App features includes recorded video playback, thumbnail video preview, and user profiles that allow multiple users to share a single device.
10. Capable to handle both IPv4 and IPv6 Unicast and Multicast traffic with both PIM-SM and PIM-DM support. It can operate in multicast or unicast bandwidth throttling protocol to minimize the network bandwidth. Our system can utilize and support the existing network infrastructure.

Camera Configuration

The M3S+ VMS system supports a very detailed level device configuration independently for different camera recording. This includes -

a. Key Frame interval (I-Frame) in seconds or number of frames.
b. Frame rate, bit rate and camera resolution.
c. Choice of various compression formats such as H.264, H.265, and MJPEG.
d. The System supports camera template to define the resolution, frame rate, recording duration, and then apply to a group of cameras. The modification of the template will be reflected to all the cameras under the template.

User & Role Management

The M3S+ VMS system supports user access authentication, user rights and privileges of all operators through Active Directory and Lightweight Directory Access Protocol (LDAP) server.

The access rights and privileges consist of:

a. Visibility of devices, live view, playback, AVI/ ASF/ MP4 export, JPEG export, database export, sequences, smart search, input status, output control
b. PTZ control, PTZ priority, PTZ preset control
c. Smart/Remote Client live playback/setup, status API, service registration API and
d. Privileges for the map feature.
e. Flexible access rights which allow each user to be assigned in several roles where each role define access rights to cameras.

The system allows views to be created which are only accessible to the user, or to groups of users based on different layouts optimized for 4:3 and 16:9 display ratios. It is able to create and switch between an unlimited number of views and able to display video up to 64 cameras from multiple servers at a time.

The system supports Role Based Access to Entire System where various users can access the system using role based single sign-in. Different roles could be defined such as Administrator, Supervisor, Officer, Operator, etc. Apart from role-based access, the system is also able to define access based on location. Other features supported in the Role Based Authentication Systems are as follows:

a. The Management Module is able to capture basic details of the Personnel & other personnel requiring Viewing /Administration rights to the system. Our system provides interface to change these details, after proper authentication.
b. Rights to different modules/Sub-Modules/Functionalities are be role based and proper log report is maintained by the system for such access.
c. Surveillance System can map the cameras to the Personnel from different Monitoring Stations.
d. The PTZ cameras have provision to specify hierarchy of operators/officers for control of the cameras from various locations.

Server Configuration

The M3S+ VMS system allows configuring the Recording server in hot standby mode to provide Failover and Fallback Management feature in different configurations (N:N or N:1). The switching of a server in case the primary server fails is fully automatic and does not require any manual monitoring or action from the operator. The data synchronization process is also automatic both for the recording server and database server to ensure maximum uptime and high reliability. All system configurations are stored in a database in the management server computer or on the network.

To make the system more reliable, the system also provides clustering of processing and memory load across different machines so that the failure of any single server will not cause the entire system to fail. The system is compatible with single and multiple processor servers to maximize the CPU utilization. This makes the system highly reliable especially for the available recordings while optimizing the server processor & hardware in all cases. All the camera recordings have camera ID and location or area of recording and which can be configured by the system administrator with user ID and password.

Storage

1. The storage solution supported by ours system is modular enough to ensure compliance to the changes in storage/recording policy, as per the deployment of the system.
2. The Recording Servers/System, once configured, can run independently of the Video Management system and continue to operate in the event that the Management system is off-line.
3. The system supports the use of separate networks, VLANs or switches for connecting the cameras to the recording servers to provide physical network separation from the clients and facilitate the use of static IP addresses for the devices.
4. The system supports automatic failover for Recording Servers. This functionality is accomplished by Failover Server as a standby unit that takes over in the event that one of a group of designated Recording Servers fails. Recordings can be synchronized back to the original Recording Server once it is back online. The system support multiple Failover Servers for a group of Recording Servers.
5. The system can be configured to provide X number of days of storage on the Primary Storage for all camera feeds (Fixed, box, PTZ, RLVD, and ANPR) based on the storage size.
6. The system can record the native frame rate and resolution supplied by the camera or as configured by the operator from the System Administration Server.
7. The system does not restrict amount of storage to be allocated for each connected device.
8. The online archiving capability is transparent and allow Clients to browse and archive recordings without the need to restore the archive video to a local hard drive for access.
9. The system allows for the frame rate, bit rate and resolution of each camera to be configured independently for recording.
10. The Recording Server offers different codec and frame rate (CIF, 4CIF, QCIF) options for managing the bandwidth utilization for live viewing on the Client systems for Bandwidth optimization. The Client systems have the option to have video images continually streamed or only updated on motion to conserve bandwidth between the Client systems and the Recording Server.
11. The Recording Server support the PTZ protocols of the Onvif Profile S supported devices.
12. The system supports full two-way audio between Client systems and remote devices.

M3S+ VMS Management Console

1. VMS Server Management Console can be used by system administrators to perform administration tasks on a single physical or virtual machine. For example, use the management console to complete the initial server setup wizard, monitor system logs and resources, troubleshoot hardware and system software issues, and gather information about the installed hardware and software components.
2. VMS server management console user interface is available for each instance of system software installed on either a physical server or as a virtual machine.
3. VMS server management systems supports Network Time Protocol (NTP) on server, which automatically sets the server time and date.
4. VMS server management console support configurable in a High Availability (HA) arrangement that should allow a primary server to be paired with additional failover, redundant, or long term storage media server.
5. These HA servers support the primary server with hot standby, redundant stream storage and playback, and long term recording storage to help ensure that functionality and recordings are not lost if the primary server goes offline.

M3S+ VMS Features:

1. It provides the ability to save any alarm event such as video motion detection, video loss or input received in a manner in which cannot be overwritten.
2. It can be integrated with any video wall for to video display.
3. System Registration allows for online activation and offline activation of licenses.
4. The Monitoring module provides a real-time overview of alarm status or technical problems while allowing for immediate visual verification and troubleshooting. It also allow for continuous monitoring of the operational status and event- triggered alarms from servers, cameras and other devices.
5. The Alert Log record alerts are triggered by rules which are searchable by Alert type, Source and Event type.
6. The System Log is searchable by Level, Source and Event Type.
7. The No. of operators can be defined to be independent of software licenses. The system can be configured in such a way that it can handle emergency situation, threats, natural catastrophe where the control room is able to reconfigure the VMS by adding more operators without any issue.
8. The system provides a windows based command and control style operator console for supporting standard and high definition IP-based cameras. The video is stored in temper-proof MP4 file format which can be played in a stand-alone windows utility player. The temper proof files can be protected by a password which is required to open and view the video file. In this way the system ensures that once recorded, the video cannot be altered; ensuring the audit trail is intact for evidential purposes.
9. The system provides recorded and live video playback support via desktop based application (thick client) for local viewing and browser based player (thin client) for remote viewing. Both the thin and thick client provides the capability of viewing single or multiple live and archive cameras, control PTZ camera.

M3S+ VMS Operator

1. VMS operations management console provides browser-based configuration and administration tool used to manage the devices, video streams, archives, and policies for video management system deployment.
2. It can manage physical devices to Add, configure and monitor the cameras, servers, and encoders that provide live and recorded video.
3. It can manage server services to Configure, enable or disable server services, such as the recording servers that manage video playback and recording.
4. It supports backup and restore to backup the system configuration, and optionally include historical data (such as alerts).
5. If required, VMS operations management console can be configured as a redundant pair for HA to ensure uninterrupted system access for users and administrators.
6. The System provide storage monitoring facility for the total storage and used storage on the server. It also provides Camera Count Features to calculate the number of cameras currently added on the server.
7. The system administrators have rights to hide live or recorded video from operator for specific cameras. The system allows to hide all live video streams, all recorded video, or recorded video for specific time spans.
8. It allows to pause live video streams and it can be configured as the default option. If required, system administrator can disable this feature. This feature can be assigned to a user group level which allow users of this group to Pause Live Video when viewing live video streams.
9. Supports Desktop based video clip player which can be used to view video clip files. The Video player application includes these workspaces: Video workspace & Wall workspace.
10. Provides video clip management to view, download and delete MP4 clips that are stored on the server.
11. The recording and event policies can used to create recording schedules, define event-triggered actions, and configure motion detection and other features.
12. Camera recording management supports recording management to view the recordings available on a camera's local storage device (such as an SD card), and copy them to the server.
13. Camera recording management system have option to merge recorded primary & secondary streams. A camera's recordings from Stream A and Stream B can be played through a single timeline. For example, application can record continuous video throughout the night at a lower quality, but also record high quality video whenever an event occurs. Both these video can be displayed in a single timeline.
14. The Health Dashboard provides an overall snapshot of the recording servers, cameras and encoders added in the system. The dashboard provide overall information, information about a specific device, or the estimated number of cameras that can be added to a recording Server, and other information.
15. The application can be launched in Video wall mode which launches the application in monitoring mode for unattended workstations. The unattended mode allows video monitoring windows to display video walls without access to the monitoring console configuration interface. The unattended screens can remain open even is the keyboard and mouse are disconnected, and can (optionally) re-appear when the workstation is rebooted.
16. Allows to add users, views and video walls available in the desktop application.
17. Allow to configure the camera, streams and recording schedules.
18. The Client application is a full-featured monitoring application which provide access to the cameras and video from a single screen. It includes the following workspaces and features:
    a) Video workspace, Wall workspace, Alert workspace and Maps workspace support.
    b) Forensic analysis tools such as thumbnail search (can be provided on request) to quickly locate specific scenes or events in recorded video without fast-forwarding or rewinding. Thumbnail search display a range of video as thumbnail images, which allow to identify a portion of the recording to review.

Advantages of Working with HFCL…

For Customers and End Users

- HFCL adopts both direct and indirect channels to serve its customer and decision is purely based on the best model to serve
- HFCL brings in a very strong domain expertise
- One among the very few OEMs who take entire system/solution responsibility
- HFCL collaborates with other ecosystem partners to serve its customers

For System Integrators

- HFCL believes in long term partnership with mutual benefits
- Offers comprehensive solutions covering VMS, Video Analytics, ANPR, RLVD, SVD etc.
- In-country Research and Development team to assist partners with customizations/modifications
- Offers Global expertise with Indian competitiveness

For Government Agencies and Consultants

- HFCL offers support in conceptualizing, designing and implementation
- Has strong System Integration/Field Experience
- Can take up developmental activities to meet unique requirements

Our Expertise and Unique Advantages

Conceptualizing, designing & Implementation support for solutions based on M3S+ platform	Strong R&D Focus	In-country Technology teams for Customization and Localization
Player with strong background of System Integration/Fieldwork	Best of Global expertise and Indian entrepreneurship	Pan India Presence and Infrastructure
Comprehensive solution covering VMS, Analytics, ANPR, RLVD,SVD etc.	Partnership approach with all stake holders	Long-term Player with over two decades of Global Experience

International and Indian Installations of M3S+ Includes

About HFCL

Himachal Futuristic Communications Ltd. Specializes in manufacturing of telecommunication equipment, optical fiber cables and software surveillance solutions. At HFCL, our core activity is to provide comprehensive security and safety solutions and integration of products, systems and services. Our services are backed by a highly skilled software R&D team adept in software application development in advance technology domain of Security Surveillance. In India we operate in Delhi, Goa, Chambaghat, Jaipur, Lucknow , Jhansi, Allahabad, Tundla, and Raipur with our head office in Gurgaon (NCR).

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