White Paper

Video Integrations
MIP SDK Decision
Guide
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Target audience

This document is intended to assist decision makers and solution architects in the process of evaluating how to integrate video with Milestone XProtect VMS.

Integration overview

Video integrations can be done in many ways. Video can be sent to Milestone XProtect VMS or video can be retrieved from Milestone XProtect VMS.

You send video to Milestone XProtect VMS from a mobile application or other occasional use, or when the source of the video is actually an application generating the video.

You retrieve video from Milestone XProtect VMS:

- to perform analytics on the video
- to display video together with other information
- to add video display to your own mobile application
- to de-warp 360 image into viewable image
- to perform color enhancement for improved clarity

Following is an overview of the system architecture and where to integrate video with Milestone XProtect VMS.

The above drawing shows a number of different ways to use video from Milestone XProtect VMS or to provide video to Milestone XProtect VMS.

This document describes the integration with XProtect Corporate and XProtect Expert products. The integration to XProtect Professional and XProtect Expert are similar, where the configuration is only slightly different.
Terminology

This document describes two types of video integration:

- Retrieve video from Milestone XProtect VMS
- Send video to Milestone XProtect VMS

Integration methods

To provide maximum flexibility and allow optimal integration of different types of systems and applications, the Milestone Integration Platform offers three main integration options:

- **Protocol Integration**: A basic integration method particularly suited for integration of applications running in non-Windows environments.
- **Component Integration**: Lets you integrate MIP components into your application, which is useful when you want to use libraries provided by Milestone in your Windows-based application.
- **Plug-in Integration**: The most advanced integration method. This allows you to embed your Milestone Solution Partner plug-in in the XProtect application environment, and run your plug-in as an integrated part of the XProtect software and its client applications.

Common features

The integrations described in this document typically use the following features:

- **XProtect Smart Client camera view item** – the rectangle that shows video from one camera in the XProtect Smart Client
- **MIP Driver** – a driver running on the Recording Server to retrieve video from a 3rd party application
- **ImageViewerControl** – a class used in XProtect Smart Client and component solutions to show video in live and playback mode
- **Codec** – all video codecs are handled in the components. Integrations do not need to deal with decoding of codecs or related differences.

XProtect codec and FPS (Frames per second) can change at any time. This can happen as a result of configuration changes, rule actions or import of video. Currently, H.264 and MJPEG are the most commonly used codecs, but others are supported as well. We recommend that you use the MIP SDK components as much as possible for decoding and display.
Retrieve video from Milestone XProtect VMS

Use an XProtect class component to show video
In Milestone XProtect VMS: ImageViewerControl

MIP SDK contains a class (ImageViewerControl), that is easy to construct and start. It displays video in live mode or playback mode.
The component is available for .Net based applications.
For playback mode, the MIP SDK also contains two other relevant classes:
- PlaybackUserControl – to show where video has been recorded and able to control when to show video, for example, previous / next functions as well as drag on the timeline
- PlaybackController – that handles the speed of playback, the direction and more.

Integrates to:
- Any components-based solution, using MIP SDK as a component
- XProtect Smart Client plug-in, making own viewitem or workspace

More documentation:
- MIP SDK: For using MIP SDK to show video – See under “Component Integration”
- MIP SDK: Search for ImageViewerControl
Use XProtect mobile protocol to show video
In Milestone XProtect VMS: Utilizing Mobile Server

MIP SDK contains sample Jscript and HTML to be used for any browser to display video. The sample and related documentation also shows how a mobile application could retrieve video from the mobile server as MJPEGs. It can be used on any browser for HTML/Jscript use or in own mobile application.

Integrates to:
- Any browser
- Any application that needs video as JPEGs or needs to show video over the internet

More documentation:
- MIP SDK: See under “Protocol Integration” and “Mobile Server protocol”
- MIP SDK: Samples starting with “Mobile ...”

Use an XProtect component to process video
In Milestone XProtect VMS: Media Toolkit

An analytics service can retrieve video from Milestone XProtect VMS to analyze the video and either store the result in its own database or send Analytics Events back to XProtect VMS for further operator actions.

The MIP SDK contains a comprehensive media toolkit to perform a large number of functions in relation to the video, such as:
- Video decoding of all formats supported by Milestone XProtect VMS
- Scaling to requested size
- Color conversion to requested format (RGB, YCbCr, Grey scale, and more)
- Encoding to JPEG
- Export of video clips

The media toolkit is provided for .Net development as well as for C++ development, running in Microsoft Windows.

Integrates to:
- Application or service developed with Microsoft Visual Studio

More documentation:
- MIP SDK documentation: Under Component Integration, MultiMedia Toolkit
- MIP SDK documentation: Under Component Integration, Samples starting with “Media ...”

**Process video as plug-in in XProtect Smart Client**

In Milestone XProtect VMS: Media Toolkit

You can retrieve video for further processing and display using an XProtect Smart Client plug-in. The MIP SDK contains a comprehensive multimedia toolkit to perform a large number of functions in relation to the video, such as:
- Video decoding of all formats supported by Milestone XProtect VMS
- Scaling to requested size
- Color conversion to requested format (RGB, YCbCr, Grey scale, and more)
- Encoding to JPEG
- Export of video clips

It is possible to develop with both C++ and C# in the same plug-in.

Integrates into:
- 360 de-warp plug-ins
- Color enhancement
Send video to Milestone XProtect VMS

Push video to Milestone XProtect VMS using the MIP driver
In Milestone XProtect VMS: Using the MIP driver

Server generated video stream

For normal cameras, Milestone XProtect VMS uses a large set of XProtect drivers to retrieve video in various formats, store on disk and forward to client applications.
For unsupported devices or applications, you can send video into Milestone XProtect VMS.
Typical solutions:
- Server applications that generate a specific video stream
- Screen captures

More documentation:
- MIP SDK documentation: MIP SDK Component Integration: Video and Metadata Provider
Push video to Milestone XProtect VMS using the Mobile Server protocol

In Milestone XProtect VMS: Using the Mobile Server protocol

Milestone XProtect VMS supports a number of mobile devices and can push video from these into an XProtect server. But if video push is required from other mobile apps, the video push can be done towards the XProtect Mobile Server using a protocol integration.

Typical solutions:
- Video push from own mobile apps

More documentation:
- MIP SDK documentation: MIP SDK Protocol Integration: Mobile Server Protocol
- MIP SDK documentation: MIP SDK Protocol Integration: Mobile Server protocol sample
Milestone Systems is a leading provider of open platform video management software; technology that helps the world see how to ensure safety, protect assets and increase business efficiency. Milestone enables an open platform community that drives collaboration and innovation in the development and use of network video technology, with reliable and scalable solutions that are proven in more than 150,000 sites worldwide. Founded in 1998, Milestone is a stand-alone company in the Canon Group.