Milestone Systems

XProtect® Integration Overview

MIP SDK Decision Guide
To support the vision about the open platform community, Milestone provides the Milestone Integration Platform Software Development Kit (MIP SDK).

This guide shows you some of the many possible integrations that can be developed using the MIP SDK. It is aimed for Milestone solution partners who want to build their own integrated solution or customize their Milestone XProtect® VMS surveillance solution.

It refers to additional sources where you can learn how to implement many of the integrations that are possible with the MIP SDK.

This document is intended to be used by decision makers and program managers.
What is the MIP SDK?

MIP
The open platform is integrated in the following Milestone XProtect system components and applications:

• XProtect Smart Client
• XProtect Management Client
• XProtect Management Application
• Management Server
• Event Server

MIP SDK
To have a truly open platform and a community around it Milestone provides the SDK that contains:

• The tools for developing integrations
• Documentation of a set of interfaces
• A set of wrapper .NET DLLs providing an easy interface to a variety of functionality
• A large collection of samples demonstrating different ways of using the MIP SDK
• Short descriptions and how-to guides
• A small application to display links to this information
• Libraries

The MIP SDK is also used internally by Milestone software development teams.
Project overview

The following steps describe the process of developing a solution using the MIP SDK:

1. Conduct a feasibility study to identify the needs and the areas of integration (video, events, metadata, analytics, and so on).
2. Identify where the end-user operates the system.
3. Make an architectural drawing of integration solution.
4. Consider to involve Milestone in the review of the suggested architecture.
5. Implement and test your solution.
6. Review Milestone test scenarios.
7. Consider to have your solution certified.
8. Add your solution to the Milestone solution finder.
Feasibility study

The first step of a successful integration process is a feasibility study. Here, you investigate the business aspects and the technical aspects of your project.

Business aspects

From a business perspective, Milestone recommends the following:

- If your integration comes with some hardware, then we suggest that the integration is free of charge.
- If your integration is a middle-ware, a license fee can be piggybacked on the Milestone license system.

Technical aspects

Most integration designs use one or more of the following options:

- Display of video – can retrieve, decode and display video
- Play of audio – can retrieve, decode and play an audio stream
- Media Toolkit – can receive, decode and transform video
- Export Toolkit – can create a copy of video and audio in a specified format

There are many ways to integrate to XProtect VMS. The following sections provide an overview of a possible integration scenario.

You can find greater technical detail for each scenario in the associated documentation.

Video integrations

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.

You can find technical details in the Video Integrations: MIP SDK Decision Guide.

**Audio integrations**

Audio integrations can be related to microphones or loudspeakers that are attached to a camera.

For microphones that are attached to a camera, you can play the sound from the microphone alone or together with video. You can also export microphone audio.

For loudspeakers that are attached to a camera, you can transmit sound from an application or service, and play it on the loudspeaker. Both live audio from the local microphone on a PC and WAV files can be transmitted to a loudspeaker.

Following is an overview of the two types of audio devices to integrate.

You can connect loudspeakers and microphones to a Milestone XProtect VMS.

Loudspeakers and microphones can be stand-alone devices but can also be an integrated part of a camera.

**Loudspeaker Integrations**
Microphone Integrations

The illustrations above show a number of different ways to connect microphones and loudspeakers attached to cameras to a Milestone XProtect VMS.

You can find technical details in the Audio Integrations: MIP SDK Decision Guide.

Metadata integrations

You can integrate metadata streams as either streams being sent into the XProtectRecording Server or being received from the XProtectRecording Server.

You send metadata into the XProtectRecording Server in order to get it stored, archived and deleted following common definitions in Milestone XProtect VMS.

You retrieve metadata from the XProtectRecording Server in order to search for specific information and to display specific parts on top of video.

Following is an overview of the system architecture and where to integrate a metadata provider or a metadata consumer with Milestone XProtect VMS.

The drawing below shows different ways of providing metadata to Milestone XProtect VMS or using metadata from Milestone XProtect VMS.

Metadata integration is currently available with XProtect Corporate and XProtect Expert products.

You can find technical details in the Metadata Integrations with Milestone XProtect: MIP SDK Decision Guide.
Access control

Access control systems can be integrated via the Milestone XProtect Access framework. This framework provides a set of standard components for administration, control and display – allowing the integration partner to focus on integrating the communication between the access control system and Milestone XProtect Access.

Following is an overview of the system architecture and where to integrate your Access control system.

The green figure illustrates an Access control system integrated via the Access control plug-in in the XProtect Event Server.

The integration provides a number of built-in functions for event handling, map display with state display, as well as automatic rule actions.

You can find technical details in the Integration of Access Control Systems: MIP SDK Decision Guide.

Event, analytics and status integrations

Milestone XProtect VMS can both receive and send events. There are multiple ways you can send events into Milestone XProtect VMS, such as:

- User defined events
- Generic events
- Analytics events
- Milestone Analytics Definition (MAD) events
- Alarms

A simple event can be something like an input trigger, while an analytics event will contain extra information about the source and reason for the event.
All events are converted into a uniform format within Milestone XProtect VMS, so events that are retrieved from Milestone XProtect VMS comply with this format. This includes operational status events.

A simple event integration may only require configuration, while most informative integrations will require some programming.

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

The drawing above shows incoming events that are forwarded through Milestone XProtect VMS to the rule evaluation (top right image) and the event and alarm list in the XProtect Smart Client (bottom right image). You can find technical details in the XProtect Events & Analytics Integrations: MIP SDK Decision Guide.

**I/O systems (Building management)**

Building management systems can be integrated via plug-in technology in the XProtect Event Server. This ensures a 24/7 operation, using the standard XProtect Smart Client user interface for the display of maps, events and alarms.

An XProtectEvent Server plug-in can provide icons for map display, and can control what icon to display and control the state of the object represented by the icon.

Following is an overview of the system architecture and where to integrate non-video systems into Milestone XProtect VMS.

These non-video systems that integrate with Milestone XProtect VMS could be, for example building management systems, I/O boxes or sensors, or many other devices.
The green figure illustrates a system with I/O that is integrated via a plug-in in the XProtect Event Server. By exposing the system to the XProtect Event Server, the XProtect Smart Client operator is able to navigate via the map to see state and run commands in the system, as well as manage alarms coming from the system. The plug-in in the XProtect Event Server can control the specific icons displayed on a map, and can dynamically change icons to best inform the operator of the current state. If required, the plug-in in the XProtect Event Server can also communicate with a plug-in loaded in the XProtect Management Client or XProtect Smart Client for event handling.

You can find technical details in the XProtect Integrations with I/O Systems: MIP SDK Decision Guide.

**Control of Milestone XProtect**

You can make integrations to control devices, control the recordings and control output triggers.

Use the control integration to control where a PTZ camera should be moved via presets or joystick-like commands. You can use it to trigger auxiliary outputs for turning features on and off in a device (for example, a wiper).

You can also use the control integration for controlling when to record video, retrieve edge recordings or start a rule.

Following is an overview of the system architecture and functionality you want to control in your Milestone XProtect VMS.

The illustration shows the three areas of control.

You can find technical details in the Integration for Controlling Milestone XProtect: MIP SDK Decision Guide.

**Configuration automation**

The Configuration API is available for XProtect Corporate and XProtect Expert.

It is possible for XProtect Corporate and XProtect Expert customers to change their configuration via an API. This API covers a large part of the normal day-to-day changes, though not all configurations can be done via this API.

Use the API to have more programmatic control and less human interface for keeping the configuration up to date.
It enables applications to perform automated configuration tasks and thereby offload human interaction.

You can find technical details in the Integration for Configuration Automation: MIP SDK Decision Guide.

**Miscellaneous integrations**

There are many more types of integration that you can develop using the MIP SDK. For example, you can find information about the following integration types in the MIP SDK documentation:

- Message Communication
- Matrix control
- Licensing
- Getting statistics
- Smart Client enhancements
How to get started

Do the following steps to get started using the MIP SDK.

1. Download XProtect Corporate.
2. Contact Partner@Milestonesys.com for a developer license.
3. Sign up and download the MIP SDK.
4. Install the MIP SDK on a developer computer.
5. Ensure Microsoft Visual Studio 2013 (or later) is available.
6. Check that you have access to the MIP developers' forum.
7. Implement the integration as chosen.
About Milestone Systems

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. For more information, visit: http://www.milestonesys.com.