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MIP SDK

Getting started guide

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This product may make use of third-party software for which specific terms and conditions may apply. When that is the case, you can find more information in the file `3rd_party_software_terms_and_conditions.txt` located in your Milestone system installation folder.

About this guide

This guide is targeted at software developers and partners in the Milestone Technology Partner Program who want to build their own integrated solution or customize their Milestone XProtect VMS surveillance solution.

The guide helps you get an overview of various integration scenarios and the types of integrations that the Milestone Integration Platform (MIP) offers. It serves as a point of reference for documentation and helps you get started developing integrations and customizations.

The guide is divided into three sections:

- A common section that provides an overview of the MIP SDK.
- A section for MIP SDK developers that provides instructions about how to set up your development environment.
- A section for business decision makers that provides information about the advantages of the Milestone Technology Partner Program and the Technology Partner Finder.

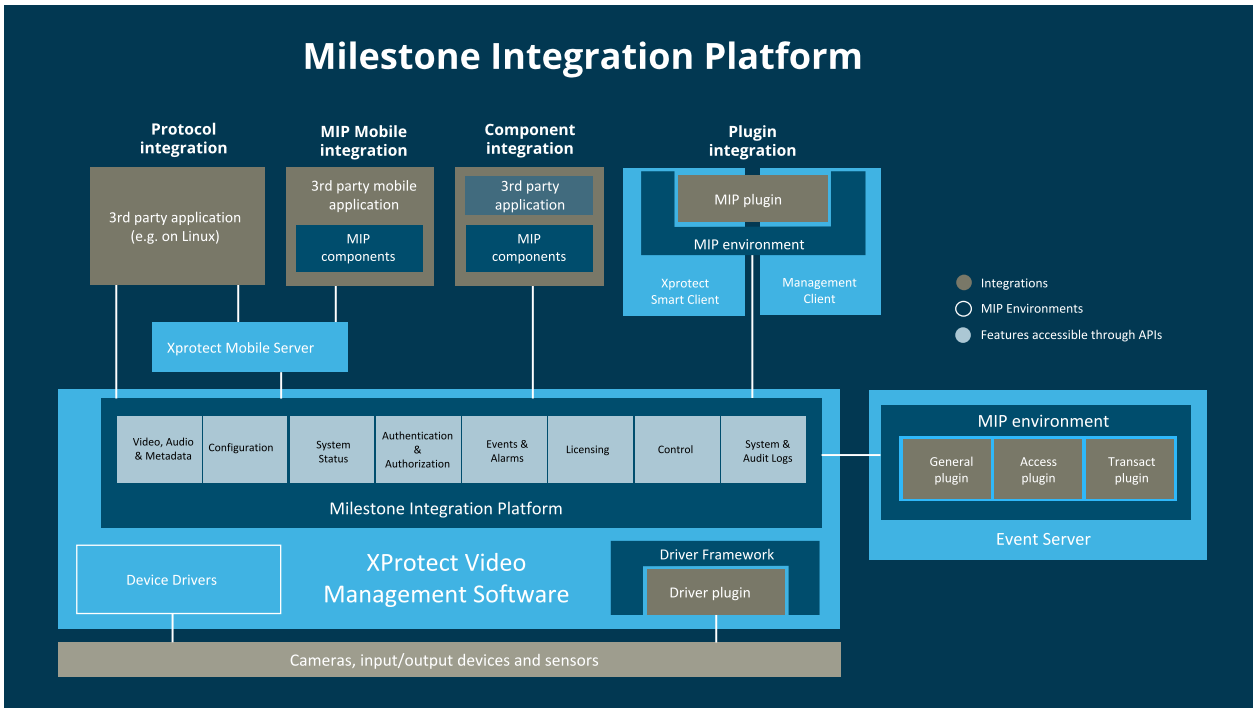
Overview of the MIP SDK

Milestone Integration Platform and the MIP SDK

The Milestone Integration Platform enables fast and flexible integration between Milestone XProtect VMS, applications available from Technology Partner Finder, and other third-party applications and devices.

Using the MIP SDK, developers are able to perform actions ranging from simple ones, such as straightforward exchanges of events, to more complex ones, such as complete integration of databases. With these actions, developers can create powerful seamlessly integrated solutions that meet the diverse needs of customers.

The MIP SDK includes a suite of protocols, components, and plug-in environments that facilitate integration:



Integration scenarios

There are many scenarios for integrating to XProtect VMS. Based on the MIP SDK, developers and partners can create solutions that integrate systems in the areas of, for example:

Areas of integration	Some of the possibilities
Video	Retrieve and display live or recorded video or single frame JPEG images. Place overlay information on live or recorded video.
Video processing and analytics	Object detection, perimeter tripwires, license plate recognition, and facial recognition.
Audio	Retrieve and play audio streams, push audio to devices.
Metadata and search	Storage, playback, retrieval, and sending of metadata.
Access control	Plug-in for event server via XProtect Access framework.
Business systems	Integrate point of sale systems via XProtect Transact framework or enterprise resource systems.
Events, alarms, analytics, and status	Trigger internal or external events and alarms. Retrieve analytics events.
I/O systems (Building management)	Create a plug-in for event server. Exchange events programmatically and provide object status and interaction through maps in the XProtect Smart Client.
Control of XProtect VMS	Send and retrieve PTZ commands and positions from cameras. Send a start or stop recording event from a device. Retrieve edge recordings. Activate external output. Smart Wall functionality.
XProtect configuration automation	Retrieve and set configuration of the XProtect VMS through an API.

There are many more types of integration that you can develop using the MIP SDK. These could be, for example:

- Custom device drivers
- Message communication
- Matrix control
- Licensing
- Getting statistics
- Smart Client enhancements

Choosing an integration approach

This table gives you an overview of the advantages and disadvantages of the different types of integrations.

Integration type	Advantages	Disadvantages
Plug-in	Fast development of functionality without the need to build the hosting environment. Direct integration inside Milestone's client and server environments through the Milestone Integration Platform: Smart Client, Management Client, and Event Server.	Requires .NET environment.
Component	Easy development of new applications. Easy integration into third-party application.	Requires .NET environment.
Protocol	Operating system- and development environment-agnostic. Can enable high performance.	High complexity and low developer output. Limited support for AD user login.
MIP SDK Mobile	Adds value to existing Milestone services and functionality while enabling existing web and mobile solutions to integrate better with the Milestone VMS through the Mobile Server. Includes SDK libraries for: • iOS • Android	

Integration type	Advantages	Disadvantages
	• .NET • Web	
MIP VMS RESTful and WS APIs	OpenAPI-based services ease cloud integration while providing full functionality. Operating system- and development environment-agnostic.	Currently, not all APIs are available.
Milestone AI Bridge	GraphQL-based service provides easy integration for intelligent video analytics and ML applications. Operating system- and development environment-agnostic.	

Plug-in integration

Your application can be hosted by the XProtect Management Client, the XProtect Event Server, as well as the XProtect Smart Client. This allows for improved ease of use and also helps provide a common look and feel for end users.

A MIP plug-in is able to run in a number of Milestone XProtect products, making it easy to support multiple products with a single developed plug-in.

Why choose plug-in integration?

- Unified environment
- Runs inside MIP Environment
    - XProtectManagement Client
    - XProtect Event Server
    - XProtect Smart Client

Operation

Enables plug-in developers to create an operational interface directly integrated into XProtect Smart Client.

Management

Enables plug-in developers to create the configuration of the integration into XProtect Management Client.

Events

Enables server logic (non-UI logic) to be run inside the event server, for example to automatically react to events from either XProtect or third-party systems.

MIP Environment

- Unifies the environment for the MIP plug-ins
- The MIP environment uses .NET, and all samples are written in C#

This is true for the MIP environment, but the MIP SDK contains several parts that do not require .NET or C#.

The MIP environment lets developers:

- Add simple ways of system control, for example for handling devices with PTZ, events, and outputs
- Define, store, and share configuration data between applications
- Assign identical administrator look and feel for XProtect products
- Add specific user controls in XProtect Smart Client
- Add customized options menu configuration for common parameters, for example for using private and shared views between all users
- Impose customized graphic overlays on live or recorded video, for example for video content analysis (analytics) applications
- Access recorded images for post-processing management

Plug-in via XProtect Access

XProtect Access is an add-on product to XProtect VMS.

XProtect Access enables integration of access control systems with the XProtect VMS. Both video cameras and access control can then be controlled from one centralized interface. XProtect Access works in installations of all sizes.

The following are some of the extensions to MIP SDK with features dedicated to access control integration into XProtect:

- XProtect Access integration plug-in architecture on XProtect Event Server
- Generic configuration of access control integrations in Management Client
- Built-in features to support access control integration
- Smart Client access control workspace

- Smart Client live monitoring
- Smart Client map support
- Smart Client access request handling
- Alarm configuration based on access control events

The following are some of the key features of XProtect Access:

Monitor

- Live Access Monitoring
- Live Overview
- Live State And Event
- Alarm Handling

Assist

- Access Request Fly-out
- Automatic Triggering Of Actions And Commands

Investigate

- Investigate Events
- Generate Reports
- Filter Events/Doors

Administer

- Cardholder Administration

Configure

- Configuration UI

Plug-in integration samples

Plug-in integration samples in the MIP SDK cover the following application areas:

- Access control
- Transact
- Device drivers
- Video and audio
- Search
- Licensing
- Video overlay

- Smart Client control
- Smart Client data handling
- Message communication
- Others

Component integration

End user applications can use MIP components to interact with a XProtect VMS. Use component integration when you want access to video and want to share data with XProtect, but you don't need or want presence in the native XProtect applications.

Third-party .NET application

- This could be any Windows- and .NET Framework-based application.

Why choose component integration?

- Faster development
- Send events to Milestone VMS
- Issue control commands to Milestone VMS or related devices, for example cameras with PTZ or associated output
- Access the Milestone VMS configuration
- Display live and recorded video
- Get live video streams

Available components

- MIP .NET Library
    - Access to Milestone server configuration
    - Logon dialog
    - View video
    - Listen to audio
    - Control commands
    - Event triggering

Component integration samples

Component integration samples in the MIP SDK cover the following areas:

- Accessing configuration and status
- Access and show video, audio and metadata
- Control and data injection
- Logon and environment choices

Protocol integration

You can access the Milestone VMS configuration, get live or recorded video, and send control commands as well as events to the Milestone server from applications running on a non-Microsoft operating system or developed using a non-.NET supported language.

Why choose protocol integration?

- Network-based
- Any operating system
- Any programming language
    - Only requires network access (TCP/IP, SOAP and other protocols)
    - Accessible from Java, Linux, and more
- High performance

Available protocols

- The ServerCommandService is used for authentication, configuration management, bookmark management and event generation.
- The ServiceRegistrationService provides access to a dictionary of services available in a given installation.
- The RecorderCommandService offers commands for controlling individual devices, like cameras, speakers, microphones etc.
- The RecorderStatusService is used for getting status and events in real time.
- The AlarmCommand service allow you to create events and alarms, manage alarms, query existing events and alarms, and retrieve alarm history and statistics.
- The ConfigurationAPI service provides comprehensive access to system and device configuration.
- The ImageServer protocol provides access to live and recorded video and audio, and also provides some camera device commands.
- Generic Events provides a simple way of generating events from any device that can transmit TCP or UDP packets.
- The Analytics Event protocol for generating new events

- The Mobile Server protocol allows mobile and web clients to access XProtect servers, even when the clients are accessing these servers over the public internet.
- The API Gateway is a front-end that serves as a common entry point to services implemented by the other VMS services. For more information, see MIP VMS API on page 17.
- The Milestone AI Bridge is an API Gateway made specifically for Video Analytics and Artificial Intelligence Applications.

Protocol integration samples

Protocol integration samples in the MIP SDK covers the following areas:

- Login, ServerCommandService or OAuth
- Alarms and events
- Accessing video
- Bookmarks
- RESTful configuration, alarms, and events
- WebSocket messaging, events and state
- Browser-based (JavaScript) WebRTC

MIP SDK Mobile

The MIP SDK Mobile is a set of software development tools that enable you to interface with the XProtect Mobile Server.

The communication channel to the Mobile Server uses an XML based request-respond pattern. Dedicated commands for each functionality are provided by the server. There is an atomic granularity of commands, and different sets of commands are used to accommodate specific tasks.

The video channel is invoked by a set of commands in the communication channel. A data connection is used for downloading and uploading video frames.

The MIP SDK Mobile provides APIs that are easy to use and based on user scenarios. Structured according to workflow, they aggregate the atomic commands into sets, simplifying the integration.

The MIP SDK Mobile supports multiple platforms and provides you with native libraries based on:

- Swift
- Java
- .NET
- JavaScript

These libraries are aligned, to provide the same functionality, and they have similar syntax and workflow.

MIP VMS API

The Milestone XProtect VMS has offered integration options through the MIP SDK plug-in architecture, native .NET components and libraries, and various protocols since 2011.

The Milestone Integration Platform VMS API will include RESTful APIs and other industry standard protocols that expose the functionality currently available through the MIP SDK native .NET libraries and various proprietary protocols.

The API Gateway is a front-end that serves as a common entry point to services implemented by the other VMS services. Currently (2024 R1), the following APIs are available through the API Gateway:

- RESTful APIs:
    - Configuration API
    - Events API (beta)
    - Alarms API (beta)
- WebSock APIs:
    - Events and State (beta)
    - Messaging (beta)
- WebRTC for streaming live video from cameras.

Milestone AI Bridge

The Milestone AI Bridge is an API Gateway made specifically for Video Analytics and Artificial Intelligence Applications. It simplifies the integration and deployment of AI and video analytics applications and ensures access to video and the return of events and metadata.

Milestone AI Bridge for the NVIDIA EGX Enterprise platform

The initial version of the Milestone AI Bridge is developed and specifically aimed at the NVIDIA EGX Enterprise Platform. Sitting between the Milestone XProtect VMS and EGX, the AI Bridge provides an API front-end that makes it easier for AI and analytics providers to integrate, access video, and return events and metadata. This version of Milestone AI Bridge is specifically enabled for XProtect Corporate and XProtect Expert and requires to be run on the EGX server as part of the application deployment.

Get help: MIP SDK resources

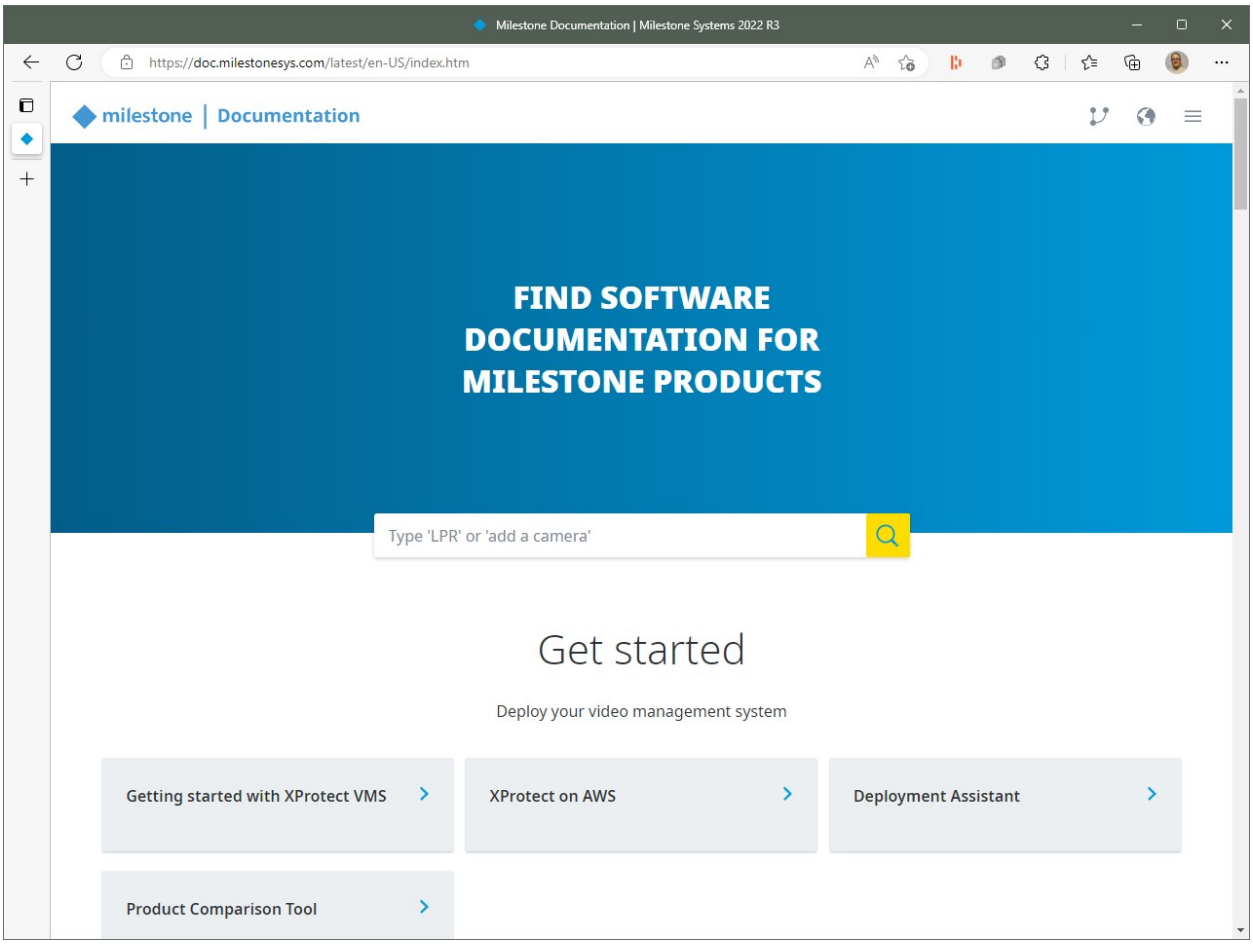
The MIP SDK is accompanied by a number of reference and learning resources that will help you make use of the MIP SDK.

Resource	Description
Milestone Documentation[1]	User documentation for Milestone products.
MIP SDK product page[2]	Starting point that links to most of the resources relevant for MIP SDK-based development (including the following resources).
MIP SDK Documentation[3]	The main resource for MIP SDK functionality overview and MIP SDK API reference documentation.
MIP SDK Mobile documentation[4].	The main resource for MIP SDK Mobile functionality overview and MIP SDK Mobile reference documentation.
MIP VMS API overview[5]	RESTful APIs and other industry standard protocols.
Milestone AI Bridge[6]	Milestone Developer Forum group and information about how to get started.
Milestone Developer Forum[7]	Ask questions and share comments and experiences with the other developers and Milestone employees.
Milestone Learning Portal[8]	Provides free online training on Milestone products and features.

[1] https://doc.milestonesys.com/
[2] https://www.milestonesys.com/support/for-developers/sdk/
[3] https://doc.developer.milestonesys.com/html/index.html
[4] https://doc.developer.milestonesys.com/mipsdkmobile/index.html
[5] https://doc.developer.milestonesys.com/mipvmsapi/api-overview/
[6] https://developer.milestonesys.com/s/group/0F93X000000MQrUSAW/milestone-ai-bridge-prerelease
[7] https://developer.milestonesys.com/
[8] https://learn.milestonesys.com/index.htm

Milestone Documentation

User documentation for Milestone products is available at Milestone Documentation[1].



Useful documents for getting started

The following documents will be helpful if you are new to XProtect VMS:

- Getting started with XProtect VMS[2]
- XProtect Smart Client user manual[3]
- XProtect VMS administrator manual[4]
- XProtect VMS system architecture[5]

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[1] https://doc.milestonesys.com/
[2] https://doc.milestonesys.com/latest/en-US/portal/htm/chapter-page-mc-gsg.htm
[3] https://doc.milestonesys.com/latest/en-US/portal/htm/chapter-page-sc-user-manual.htm
[4] https://doc.milestonesys.com/latest/en-US/portal/htm/chapter-page-mc-administrator-manual.htm
[5] https://doc.milestonesys.com/latest/en-US/portal/htm/chapter-page-system-architecture-doc.htm

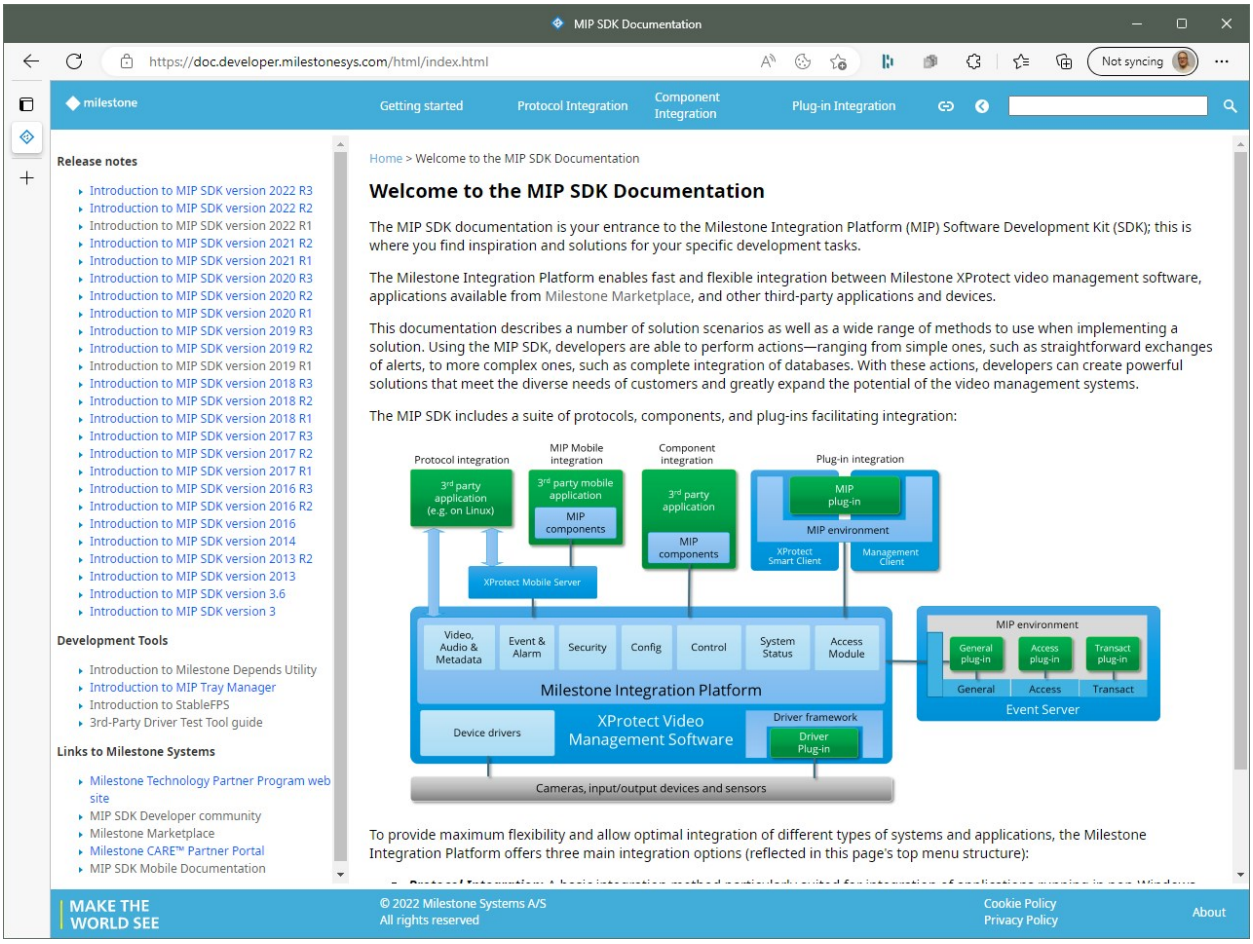
Context-sensitive help

When you are using the Smart Client or the Management Client, press **F1** to access context-sensitive help. A relevant topic will open in your browser, served either from Milestone Documentation or, if Milestone Documentation cannot be reached, from the XProtect VMS.

MIP SDK documentation

The MIP Documentation is available online at MIP SDK Documentation[1].

- Search across notes and API documentation.
- The *Getting started* section useful to get acquainted with the terminology and basics of frequently used topics in the MIP SDK.
- Documentation divided on key development approach: Protocol, Component and Plug-in.



[1] https://doc.developer.milestonesys.com/

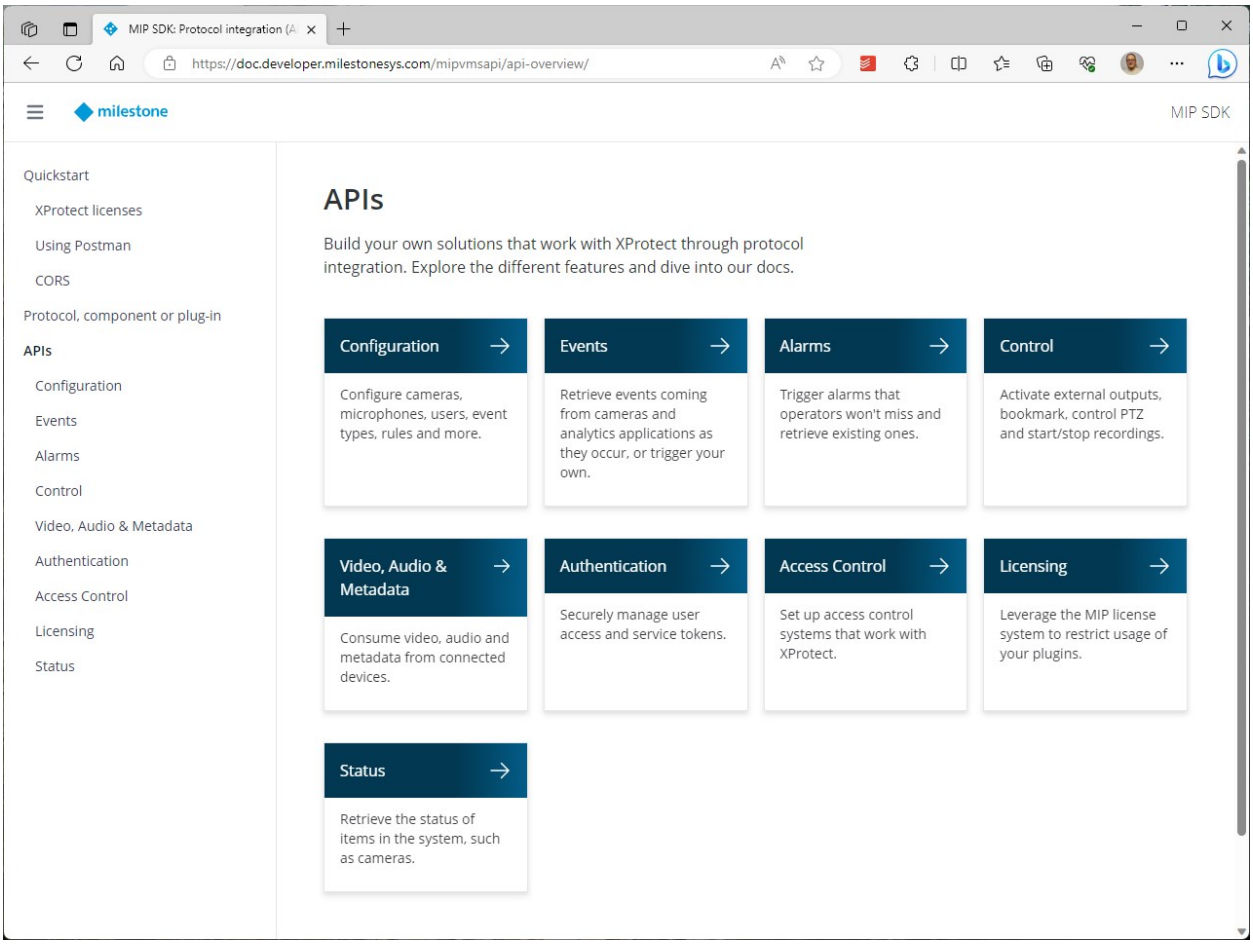
MIP SDK Mobile documentation

The MIP SDK Mobile documentation is available online at MIP SDK Mobile Documentation[1].

[1] https://doc.developer.milestonesys.com/mipsdkmobile/

MIP VMS API documentation

An overview of the MIP VMS API documentation is available online at MIP VMS API overview[1].



Milestone AI Bridge documentation

For more information about how to get access to Milestone AI Bridge for the NVIDIA EGX Enterprise platform, please go to the Milestone AI Bridge Pre-release group[2] on the Milestone Developer Forum.

[1] https://doc.developer.milestonesys.com/mipvmsapi/api-overview/

[2] https://developer.milestonesys.com/s/group/0F93X000000MQrUSAW/milestone-ai-bridge-prerelease

Milestone Developer Forum

Join the Milestone Developer Forum[1], where you can ask questions and share comments and experiences with the other developers and Milestone engineers. This is a meeting place for solving development issues related to the MIP SDK and for meeting others in the Open Platform Community. We encourage you to help each other out, share ideas and implementations, browse through a variety of development topics, Knowledge Base articles, guides and other helpful resources.

Use your My Milestone log-in to:

- Write questions or answers and add likes.
- See and update your own profile including email notifications.
- Find other developers, see their profiles and acknowledge them.

Milestone Learning Portal

The Milestone Learning Portal provides free online training on Milestone products and features.

Milestone Learning & Performance has created a training track for new developers. It's a collection of self-paced online courses that cover both the basics of IP-based video surveillance topics, what XProtect VMS is, and how to get started with the MIP SDK. Access the Developer Learning Path and other courses on the Milestone Learning Portal:

- Developer Learning Path[2]
- Milestone Learning Portal[3]

See the playlists for MIP SDK development on the Milestone Systems Learning YouTube channel:

- Developing MIP SDK Plug-In Integrations[4]
- Developing MIP SDK Component Integrations[5]

[1] https://developer.milestonesys.com/
[2] https://learn.milestonesys.com/home_path_developer.htm
[3] https://learn.milestonesys.com/index.htm
[4] https://www.youtube.com/playlist?list=PLS7f00cHFaFMsUQfcBgr9JXOUwsfvLxFf
[5] https://www.youtube.com/playlist?list=PLS7f00cHFaFPxtrtl1B_MiSB0I-1kmUW2

Setting up a development environment

Prerequisites

Before you begin installing and exploring the MIP SDK, consider systems requirements and which XProtect features you want to make use of.

System requirements

- .NET Framework 4.7.2
- .NET 6
- Microsoft Windows 10 Pro 64-bit or newer
- Visual Studio 2022, 2019 or 2017
- An XProtect VMS product

For more information about system requirements for XProtect, please refer to Milestone product system requirements.[1]

Selecting an XProtect VMS product

Depending on which XProtect features you want to use in your integration, you need one of the product variants:

- XProtect Corporate
- XProtect Expert
- XProtect Professional+
- XProtect Express+
- XProtect Essential+

Select XProtect Essential+ if you just want to get started with the MIP SDK. The free license supports up to 8 cameras, an unrestricted number of users, and unrestricted video retention time. You can upgrade to another product variant in case you need access to more features.

If you are a Milestone Technology Partner, you can get a test license to test your integration. Contact Milestone[2] for inquiries about test licenses.

For more information about the Milestone Technology Partner program, please refer to:

[1] https://www.milestonesys.com/support/help-and-documentation/system-requirements/
[2] https://www.milestonesys.com/support/contact-us/contact-us/

- The Milestone Technology Partner Program on page 47
- What is the Milestone Technology Partner Program?[1]

For more information about product features, please refer to these product feature comparisons:

- Milestone product index[2]
- XProtect® Product Comparison Tool[3]

Deploying a development XProtect VMS environment

Milestone recommends that you install the MIP SDK on a computer in a development environment, and not on a computer in a production XProtect VMS environment.

Having a small (not many cameras) XProtect VMS system on the development PC itself is very handy for debugging.

For larger scale testing, install the MIP SDK on a development PC, and install XProtect VMS system components on separate test servers.

If developing Smart Client or Management Client plug-ins, install the clients in which the plug-in should be loaded on the development PC for easy debugging.

For more information about deploying XProtect VMS systems, please refer to the XProtect Deployment Best Practice Guide and the Milestone Deployment Assistant, both available from:

- Milestone Deployment Assistant and Deployment Best Practice[4]

[1] https://www.milestonesys.com/partners/become-a-partner/technology-partner/
[2] https://www.milestonesys.com/products/software/xprotect-comparison/
[3] https://www.milestonesys.com/products/software/compare-xprotect/variants/
[4] https://learn.milestonesys.com/tools/deployment-assistant/

Parts of the MIP SDK

You can install the parts of the MIP SDK that you need from online distribution formats.

The MIP SDK installer

The MIP SDK was available since the initial release as a single installer file, comprising documentation, API reference, code samples, libraries, and tools. As of MIP SDK 2022 R2, all parts of the MIP SDK are available in online distribution formats, and the MIP SDK installer has been discontinued.

MIP SDK online distribution

MIP SDK part	Description	Site
Documentation	MIP architecture overview, API introductions and references, and sample descriptions.	MIP SDK Documentation[1]
Samples, source code	Sample source code that demonstrates integration and customization options	GitHub[2]
Templates	Visual Studio templates for MIP SDK projects	Visual Studio Marketplace[3]
Libraries	.NET and other libraries for MIP SDK projects as NuGet packages.	NuGet[4]
Tools	Tools and utilities that help you during development of MIP integrations and customizations	Milestone software download[5]

Each part is described in more detail in the following sections.

[1] https://doc.developer.milestonesys.com/
[2] https://github.com/milestonesys
[3] https://marketplace.visualstudio.com/items?itemName=milestonesys.mipsdk-templates
[4] https://www.nuget.org/profiles/milestonesys
[5] https://www.milestonesys.com/my-milestone/download-software/?prod=1702&type=11&lang=27

Install and use the MIP SDK templates for Visual Studio

The MIP SDK templates get you started building integrations and customizations for the Milestone Integration Platform. The extension package contains Visual Studio templates for these types of solutions:

Template name	Solution type
MIPAccessControl	Access Control integration
MIPDriver	MIP Driver Framework-based drivers
MIPLibrary	Stand-alone (component) integration
MIPPlugin	MIP plug-in integration
MIPSearch	Smart Client Search plug-in

Install the MIP SDK templates

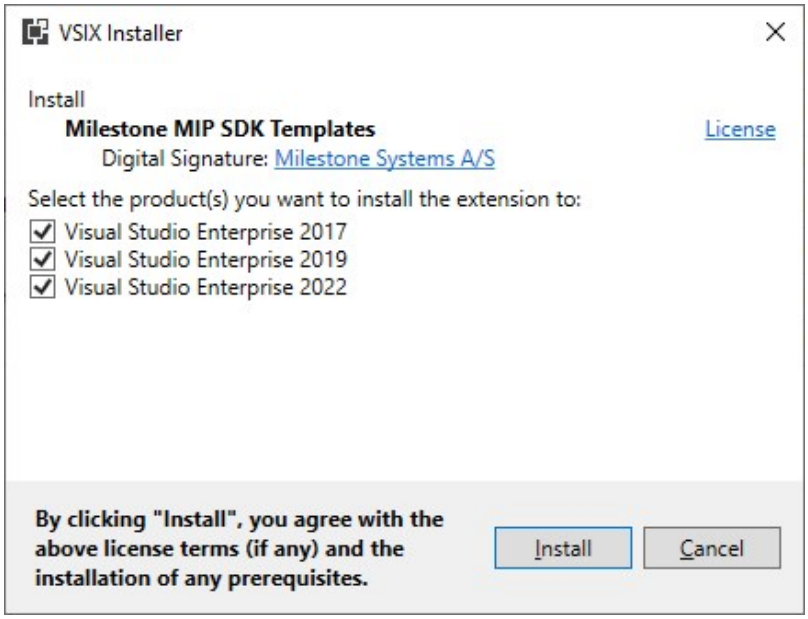
You can download and install the MIP SDK templates from within Visual Studio or from Visual Studio Marketplace.

To install from Visual Studio Marketplace

1. Go to https://marketplace.visualstudio.com/items?itemName=milestonesys.mipsdk-templates.
2. Select **Download**.
3. You may be able to run the extension installer immediately without selecting a download folder, depending on your browser and your preferences. If not, select a download folder and then run the

extension installer.

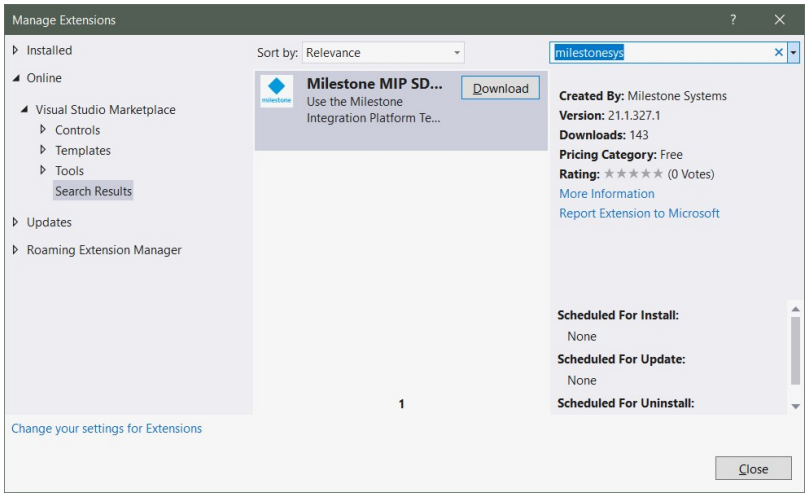
4. When prompted, select the products you want to install the extension to.



To install from within Visual Studio

1. To manage extensions:
    - In Visual Studio 2022 and 2019
        a. Select the menu **Extensions**.
        b. Select **Manage Extensions**.
    - In Visual Studio 2017
        a. Select the menu **Tools**.
        b. Select **Extensions and Updates...**.
2. In the left-hand side column of the dialog, select **Online**.
3. In the search box in the right-hand side column, enter "milestonesys".

4. In the extension list, find **Milestone MIP SDK Templates** and select **Download**.

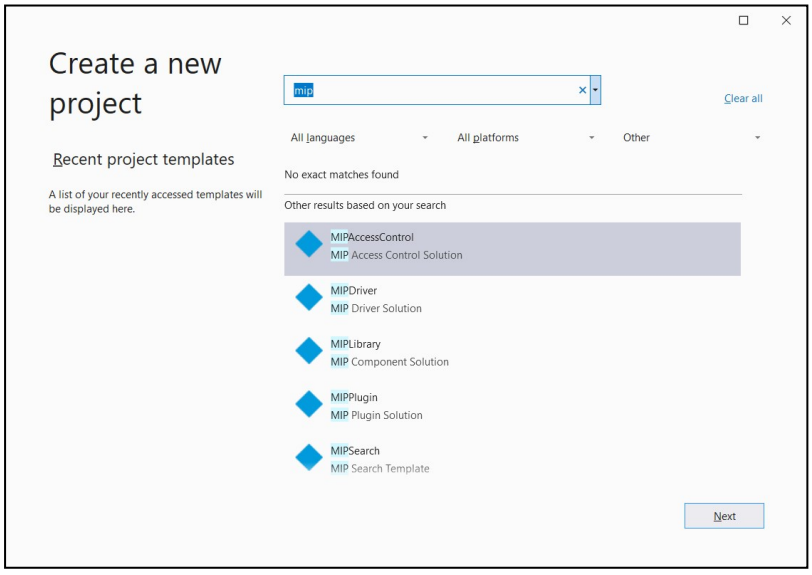


5. Visual Studio will download and schedule the extension for installation.

Using the MIP SDK templates

After installation, the templates are available when you create a new project.

1. In Visual Studio, press Ctrl+Shift+N to open the **Create a new project** page (Visual Studio 2022 and 2019) or **New Project** dialog (Visual Studio 2017).
2. In the search box, enter "mip".
3. Choose the template that suits the project type you want to create.



4. Continue creating the project as you would normally do in Visual Studio

Install and use MIP SDK NuGet packages

MIP SDK .NET libraries are referenced from the sample projects and Visual Studio templates in MIP SDK in different ways, depending on the MIP SDK release:

MIP SDK release	MIP SDK library references
2021 R1 and later	Package references to NuGet packages.
2020 R3 and earlier	Locally installed MIP SDK .NET libraries.

You are recommended to begin using NuGet package references.

MIP SDK .NET libraries for MIP SDK 2020 R2 and later are available as NuGet packages from https://www.nuget.org/profiles/milestonesys.

Milestone MIP SDK NuGet packages are owned by the profile `milestonesys`, and their names are prefixed by `MilestoneSystems`. Use either term when searching or browsing for packages in your NuGet package manager.

For information about product lifecycle, please refer to Milestone Product Lifecycle[1].

Available MIP SDK NuGet packages

The following MIP SDK NuGet packages are available:

Package	Dependencies
`MilestoneSystems.VideoOS.Platform`: Plug-in integration development	
`MilestoneSystems.VideoOS.Platform.SDK`: Standalone application development	`MilestoneSystems.VideoOS.Platform`

[1] https://www.milestonesys.com/support/tools-and-references/product-lifecycle/

Package	Dependencies
`MilestoneSystems.VideoOS.Platform.SDK.Debug`: Debugging standalone applications	`MilestoneSystems.VideoOS.Platform`
`MilestoneSystems.VideoOS.Platform.AccessControl`: Access Control plug-in development	`MilestoneSystems.VideoOS.Platform`
`MilestoneSystems.VideoOS.Platform.Transact`: Transact plug-in development	`MilestoneSystems.VideoOS.Platform`
`MilestoneSystems.VideoOS.Platform.DriverFramework`: Driver development	
`MilestoneSystems.VideoOS.ConfigurationAPI`: Configuration integration development	
`MilestoneSystems.VideoOS.Mobile.SDK`: Mobile Server .NET-integration	

NuGet manages dependencies between packages. For packages that depend on the `MilestoneSystems.VideoOS.Platform` package, you do not have to explicitly install this package. Dependencies will be installed automatically, and will not appear in the **References** list (unless explicitly installed).

Package content and compatibility

Most of these packages each contains one DLL corresponding to the package name.

The packages for standalone application development, `MilestoneSystems.VideoOS.Platform.SDK` and `MilestoneSystems.VideoOS.Platform.SDK.Debug` contain:

- DLLs for the `VideoOS.Platform.SDK` namespace
- DLLs for several other `VideoOS` namespaces
- 3rd-party dependencies needed for standalone MIP applications

The package for Mobile Server .NET integration, `MilestoneSystems.VideoOS.Mobile.SDK`, contains DLLs for various mobile .NET platforms.

The major.minor versions of these packages correspond to MIP SDK releases. For example, `20.3.1` is the first patch release of a library initially released with MIP SDK 2020 R3.

In general, MIP SDK libraries are backwards compatible, and you can safely use the latest version of MIP SDK NuGet packages.

NuGet package management formats

Visual Studio has two formats in which a project can use NuGet packages: `PackageReference` and `packages.config`.

- The `packages.config` format uses an XML file separate from the project file.
- The `PackageReference` format manages NuGet dependencies within project files and offers more options for specifying package versions.

Samples and Visual Studio templates in MIP SDK 2021 R1 and later use the `PackageReference` format.

To set the default package management format for new projects in Visual Studio, select **Tools** > **Options...** > **NuGet Package Manager**.

Install MIP SDK NuGet package in a new project

1. In **Solution Explorer**, right-click either a project name or the project **References** node, and select **Manage NuGet Packages...**.
2. Select the **Browse** tab and search for `milestonesys` packages.
3. Select the desired package and the desired version. It is generally recommended to select the latest version.
4. Select the **Install** button, select **OK** in the **Preview changes** dialog, and select **I Accept** in the **License Acceptance** dialog.

Upgrade an existing project to use the NuGet packages

1. In **Solution Explorer**, locate and select the project.
2. Expand the **References** node and make a note of existing `VideoOS...` references.
3. Delete the existing `VideoOS...` references.
4. Right-click the project name and select **Properties** to open the project properties pages. Select the **Build Events** page. If there is a Post-build event command line for copying MIP DLLs to the project target, delete it.
5. Install the corresponding MIP SDK NuGet packages.

   Some MIP SDK NuGet packages depend on the `MilestoneSystems.VideoOS.Platform` package. For these packages, you do not have to explicitly install the `MilestoneSystems.VideoOS.Platform` package. NuGet package dependencies will be installed automatically (but will not appear in the **References** list unless explicitly installed).

Troubleshooting NuGet package restore problems

Here are some common problems that might occur when you use Visual Studio to build projects that reference NuGet packages.

For further information, see Restore packages using Package Restore[1] and Troubleshooting package restore errors[2].

NuGet restore is currently disabled

If NuGet restore is disabled, you will see a message similar to this:

```
NuGet restore is currently disabled. To enable it, open the Visual Studio
Options dialog, click on the NuGet Package Manager node and check 'Allow
NuGet to download missing packages during build.' You can also enable it by
setting the environment variable 'EnableNuGetPackageRestore' to 'true'.
```

Enable package restore by choosing **Tools** > **Options** > **NuGet Package Manager**. Under **Package Restore** options, select **Allow NuGet to download missing packages**.

The package ... with version ... could not be found

If a referenced package is not already installed, you might see a message similar to this:

```
The package MilestoneSystems.VideoOS.Platform with version 20.3.0 could not be found
in C:\Users\Username\.nuget\packages\. Run a NuGet package restore to download the
package. VideoViewer
```

You can either enable automatic check and restore of packages during build, or restore missing packages manually.

Enable automatic package restore	Choose **Tools** > **Options** > **NuGet Package Manager**, and then select **Automatically check for missing packages during build in Visual Studio** under **Package Restore**.
Restore packages manually	In **Solution Explorer**, right click the solution and select **Restore NuGet Packages**.

[1] https://docs.microsoft.com/en-us/nuget/consume-packages/package-restore

[2] https://docs.microsoft.com/en-us/nuget/consume-packages/package-restore-troubleshooting

Related information

Resource	Description
NuGet documentation[1]	Microsoft NuGet learning and reference resources
https://www.nuget.org/profiles/milestonesys	Milestone Systems NuGet packages

[1] https://docs.microsoft.com/en-us/nuget/

Installing Milestone SDK Tools

Milestone SDK Tools comprise the following tools and utilities:

Tool	Description
Milestone Depends	Milestone Depends scans Windows assemblies (.exe or .dll) and displays dependencies. It is useful for troubleshooting errors related to loading and executing dependencies.
MIP SDK Tray Manager	The MIP SDK Tray Manager helps you manage MIP plug-ins.
3rd-Party Driver Test Tool	The 3rd-Party Driver Test Tool simplifies development and verification of MIP Driver Framework-based drivers.
Visual Studio F1 Help	You can look up reference information about MIP classes and members from within Visual Studio just by pressing F1.

Install Milestone SDK Tools

To download and install the Milestone SDK Tools:

1. If not already logged in to your My Milestone account, log in by going to My Milestone[1].
2. Go to Milestone software download[2].

   Select **Product**: MIP SDK (Docs and tools).
3. Locate and select Milestone SDK Tools in the list. The download will begin.
4. You may be able to run the installer immediately without selecting a download folder, depending on your browser and your preferences. If not, select a download folder and then run the installer.
5. The setup wizard appears. Select **Next** to continue.
6. Read the Milestone End-user License Agreement. Select the **I accept the terms in the License Agreement** check box and select **Next**.

[1] https://www.milestonesys.com/my-milestone/

[2] https://www.milestonesys.com/my-milestone/download-software/?prod=1702&type=11

7. Select **Install** to begin the installation.
8. Accept all warnings.
9. When the installation is complete, select **Finish** to exit the setup wizard.

Milestone Depends

You can start Milestone Depends from the Windows Start menu. Search for "Milestone Depends".

Milestone Depends is installed in `%ProgramFiles%\Milestone\MIPSDK\Tools\MDepends`, for example `C:\Program Files\Milestone\MIPSDK\Tools\MDepends`.

Please refer to Milestone Depends Utility[1] for further information.

MIP SDK Tray Manager

MIP SDK Tray Manager is installed as a Startup program and will run minimized in your system tray. You can also start MIP SDK Tray Manager from the Windows Start menu. Search for "MIP SDK Tray Manager".

MIP SDK Tray Manager is installed in `%ProgramFiles%\Milestone\MIPSDK\Tools\TrayManager`, for example `C:\Program Files\Milestone\MIPSDK\Tools\TrayManager`.

Please refer to MIP Tray Manager[2] for further information.

3rd-Party Driver Test Tool

You can start 3rd-Party Driver Test Tool from the Windows Start menu. Search for "3rd Party Driver Test Tool".

3rd-Party Driver Test Tool is installed in `%ProgramFiles%\Milestone\MIPSDK\Tools\3rdPartyDriverTestTool`, for example `C:\Program Files\Milestone\MIPSDK\Tools\3rdPartyDriverTestTool`.

Please refer to 3rd Party Driver Test Tool guide[3] for further information.

---

1 https://doc.developer.milestonesys.com/html/index.html?base=gettingstarted/milestonedependsutility.html&tree=tree_4.html

2 https://doc.developer.milestonesys.com/html/index.html?base=gettingstarted/miptraymanager.html&tree=tree_4.html

3 https://doc.developer.milestonesys.com/html/index.html?base=gettingstarted/3rdpartydrivertesttoolguide.html&tree=tree_4.html

Visual Studio F1 Help

You can look up reference information about MIP classes and members from within an editor window in Visual Studio (similarly to the way you look up reference information about language constructs and Microsoft .NET classes and members), just by pressing **F1**.

Enable lookup of online help content

If the Help Viewer component has been installed in Visual Studio, you can select whether to lookup help in Help Viewer (local content) or in your browser (online content). To enable lookup of online help content, select **Help** > **Set Help Preference** > **Launch in Browser**.

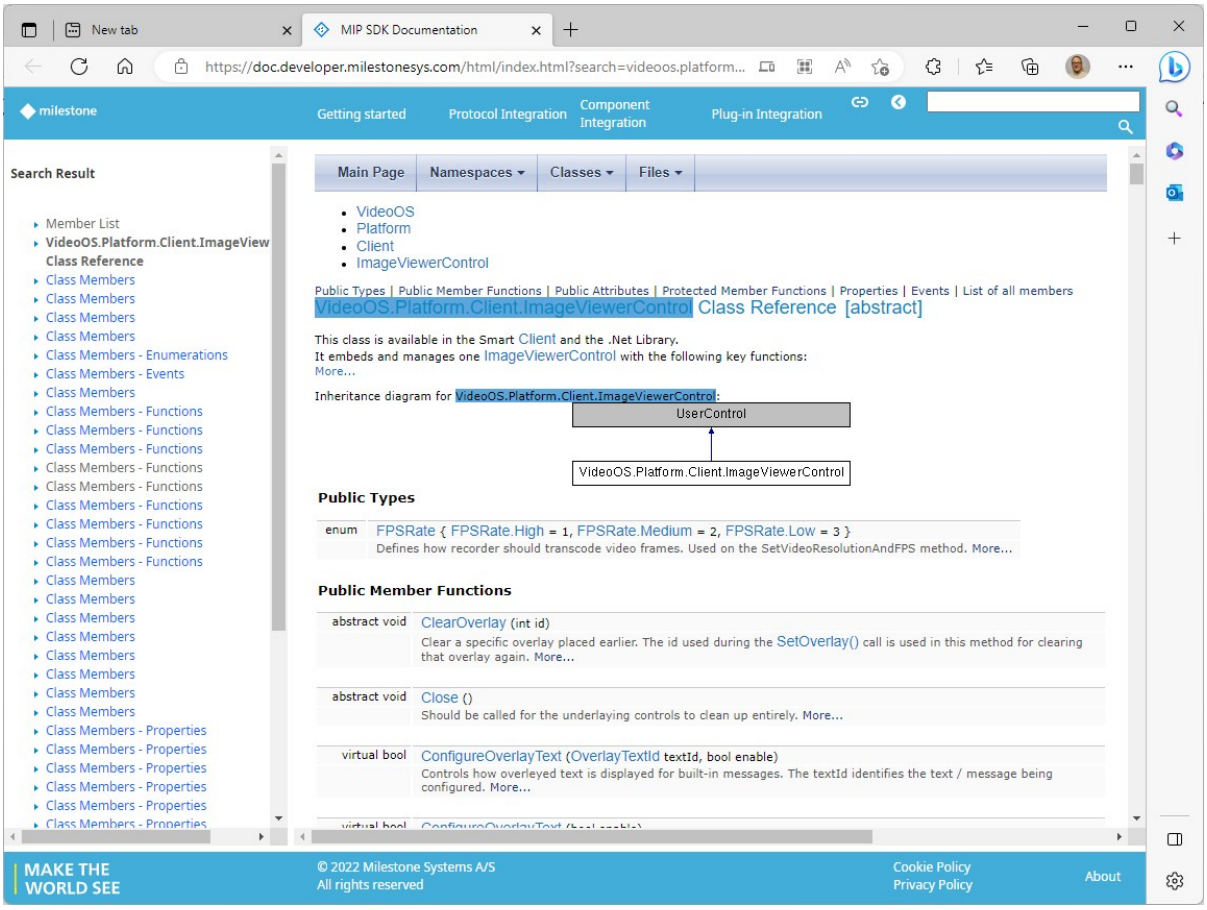
Use F1 help

For example, with the cursor on `ImageViewerControl` in `MainForm.cs` in the VideoViewer Component sample:

```
using VideoOS.Platform.Client;
using VideoOS.Platform.Messaging;
using VideoOS.Platform.UI;

namespace VideoViewer
{
	public partial class MainForm : Form
	{
		private Item _selectItem1;
		private ImageViewerControl _imageViewerControl1;
		private Item _selectItem2;
```

press **F1** to open `https://doc.developer.milestonesys.com` in your default browser with a query for `videoos.platform.client.imageviewercontrol`. Select a search result in the left-hand frame to go to the corresponding API reference information:


New tab
MIP SDK Documentation
https://doc.developer.milestonesys.com/html/index.html?search=videoos.platform...
milestone
Getting started
Protocol Integration
Component Integration
Plug-in Integration
Search Result
Member List
VideoOS.Platform.Client.ImageView
Class Reference
Class Members
Class Members - Enumerations
Class Members - Events
Class Members - Functions
Class Members - Properties
Main Page
Namespaces
Classes
Files
VideoOS
Platform
Client
ImageViewerControl
Public Types | Public Member Functions | Public Attributes | Protected Member Functions | Properties | Events | List of all members
VideoOS.Platform.Client.ImageViewerControl Class Reference [abstract]
This class is available in the Smart Client and the .Net Library.
It embeds and manages one ImageViewerControl with the following key functions:
More...
Inheritance diagram for VideoOS.Platform.Client.ImageViewerControl:
UserControl
VideoOS.Platform.Client.ImageViewerControl
Public Types
enum
FPSRate { FPSRate.High = 1, FPSRate.Medium = 2, FPSRate.Low = 3 }
Defines how recorder should transcode video frames. Used on the SetVideoResolutionAndFPS method. More...
Public Member Functions
abstract void
ClearOverlay (int id)
Clear a specific overlay placed earlier. The id used during the SetOverlay() call is used in this method for clearing that overlay again. More...
abstract void
Close ()
Should be called for the underlaying controls to clean up entirely. More...
virtual bool
ConfigureOverlayText (OverlayTextId textId, bool enable)
Controls how overleyed text is displayed for built-in messages. The textId identifies the text / message being configured. More...
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About

Installing Milestone StableFPS

Milestone StableFPS is a highly configurable XProtect driver that can provide video, audio, and metadata streams at stable framerates from disk files.

Download and install Milestone StableFPS

To download and install Milestone StableFPS:

1. If not already logged in to your My Milestone account, log in by going to My Milestone[1].
2. Go to Milestone software download[2]

   Select **Product**: MIP SDK (Docs and tools).
3. Locate and select **Milestone StableFPS** in the list. The download will begin.
4. You may be able to run the installer immediately without selecting a download folder, depending on your browser and your preferences. If not, select a download folder and then run the installer.
5. The setup wizard appears. Select **Next** to continue.
6. Read the Milestone End-user License Agreement. Select the **I accept the terms in the License Agreement** check box and select **Next**.
7. Select **Install** to begin the installation.
8. Accept all warnings.
9. When the installation is complete, select **Finish** to exit the setup wizard.

Installing the StableFPS driver to your XProtect VMS

The installer does not install the StableFPS driver to your XProtect VMS.

The installer puts the StableFPS driver and media files in `%ProgramFiles%\Milestone\MIPSDK\Tools\StableFPS`, for example `C:\Program Files\Milestone\MIPSDK\Tools\StableFPS`.

Please refer to StableFPS overview[3] and ReadMe StableFPS (PDF)[4] for installation and configuration instructions.

---

[1] https://www.milestonesys.com/my-milestone/

[2] https://www.milestonesys.com/my-milestone/download-software/?prod=1702&type=11

[3] https://doc.developer.milestonesys.com/html/index.html?base=gettingstarted/stablefps.html&tree=tree_home.html

[4] https://doc.developer.milestonesys.com/html/gettingstarted/READ_ME_StableFPS.pdf

Cloning MIP SDK samples from GitHub

Milestone hosts MIP SDK samples in these GitHub repositories:

Repository	Description
mipsdk-samples-component[1]	Samples that demonstrate how to integrate stand-alone applications using the MIP .NET libraries.
mipsdk-samples-plugin[2]	Samples that demonstrate how the MIP environment in XProtect Management Client, Event Server or Smart Client can host your application.
mipsdk-samples-protocol[3]	Samples that demonstrate how to integrate applications for any operating system with an XProtect VMS system using the MIP network APIs.
mipsdkmobile-samples-dotnet[4]	Samples that demonstrate MIP SDK Mobile .NET integration.
mipsdkmobile-web[5]	Samples that demonstrate MIP SDK Mobile Mobile Web (JavaScript) integration.
mipsdk-mobile-android[6]	Samples showcasing how you can integrate Android applications that connect to an XProtect VMS system through XProtect Mobile Server.
mipsdk-mobile-ios[7]	Samples showcasing how you can integrate iOS applications that connect to an XProtect VMS system through XProtect Mobile Server.

For most mipsdk-samples-* repository, a Visual Studio solution file in the `src` folder of the repository includes a Visual Studio project for each sample.

[1] https://github.com/milestonesys/mipsdk-samples-component
[2] https://github.com/milestonesys/mipsdk-samples-plugin
[3] https://github.com/milestonesys/mipsdk-samples-protocol
[4] https://github.com/milestonesys/mipsdkmobile-samples-dotnet
[5] https://github.com/milestonesys/mipsdkmobile-web
[6] https://github.com/milestonesys/mipsdk-mobile-android
[7] https://github.com/milestonesys/mipsdk-mobile-ios

Contributions

Milestone does not currently accept contributions through pull request. In case you want to comment on or contribute to the samples, please reach out through the Milestone Developer Forum[1].

Clone MIP SDK samples from GitHub

If you are already familiar with cloning GitHub repositories, you can just continue using your favorite Git tool and ignore this section.

Visual Studio

You can clone and open a project from a GitHub repository using Visual Studio. The steps depend on the version of Visual Studio.

Cloning a repository from GitHub within Visual Studio requires a GitHub account. You will be asked to authorize GitCredentialsManager to access your GitHub account.

Visual Studio 2022 and 2019

If you have previously created or cloned a Git repository within Visual Studio 2022 or 2019, in the **Git** menu, select **Clone Repository...**.

If you have just opened Visual Studio 2022 or 2019, the **Start window** is probably displayed. If not, in the **File** menu, select **Start Window**. In the **Start window**, select **Clone a repository**.

The details in the following steps depend on your version of Visual Studio. For more information about Git support in:

- Visual Studio 2022, go to Visual Studio version control docs.[2]
- Visual Studio 2019, go to Visual Studio version control docs[3].

Visual Studio 2017

Git support isn't quite as well integrated in Visual Studio 2017 as in Visual Studio 2022 and 2019. For step-by-step instructions, go to Clone a Git repository in Visual Studio[4].

---

[1] https://developer.milestonesys.com/

[2] https://docs.microsoft.com/en-us/visualstudio/version-control/?view=vs-2022

[3] https://docs.microsoft.com/en-us/visualstudio/version-control/?view=vs-2019

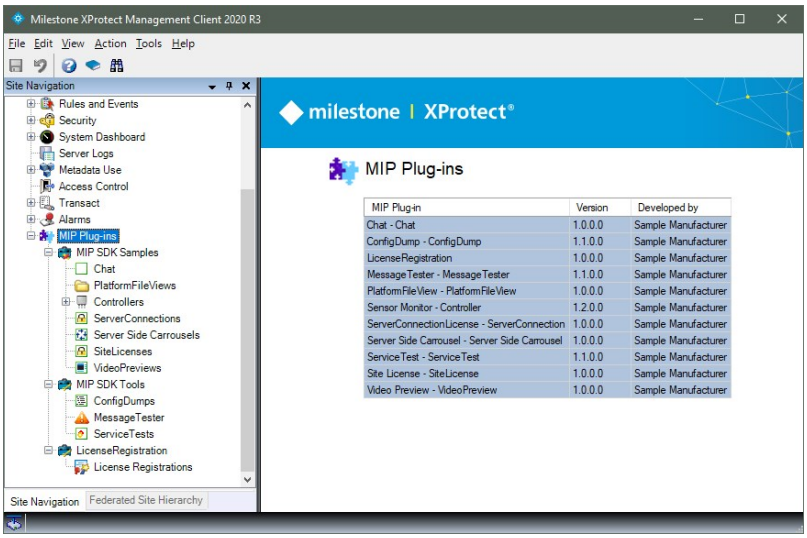
[4] https://learn.microsoft.com/en-us/previous-versions/visualstudio/visual-studio-2017/version-control/git-clone-repository?view=vs-2017

MIP SDK sample plug-ins in Milestone clients

If you have previously installed the MIP SDK using the MIP SDK installer (discontinued after MIP SDK 2022 R1), pre-compiled MIP sample plug-ins are visible in the XProtect Management Client and the XProtect Smart Client.

XProtect Management Client

In XProtect Management Client, the MIP Plug-ins are added to the **Site Navigation** pane.



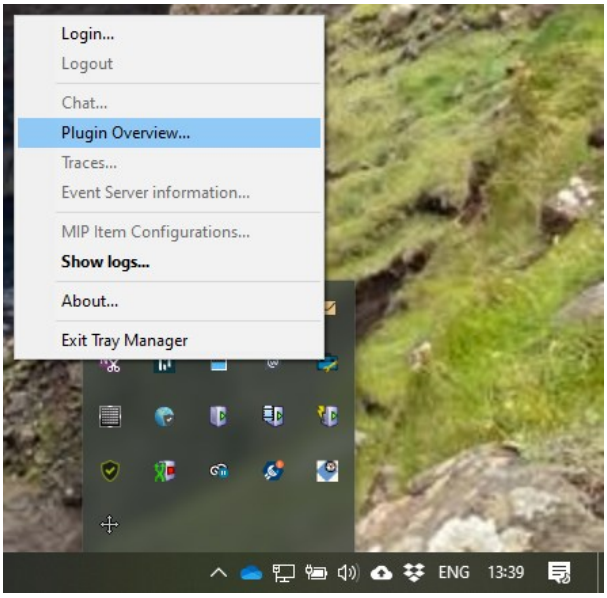
XProtect Smart Client

In XProtect Smart Client, MIP sample plug-ins add UI controls and camera views in a number of places. For example, a **WorkSpace Plugin** tab is added along with the **MIP Plug-ins** pane.

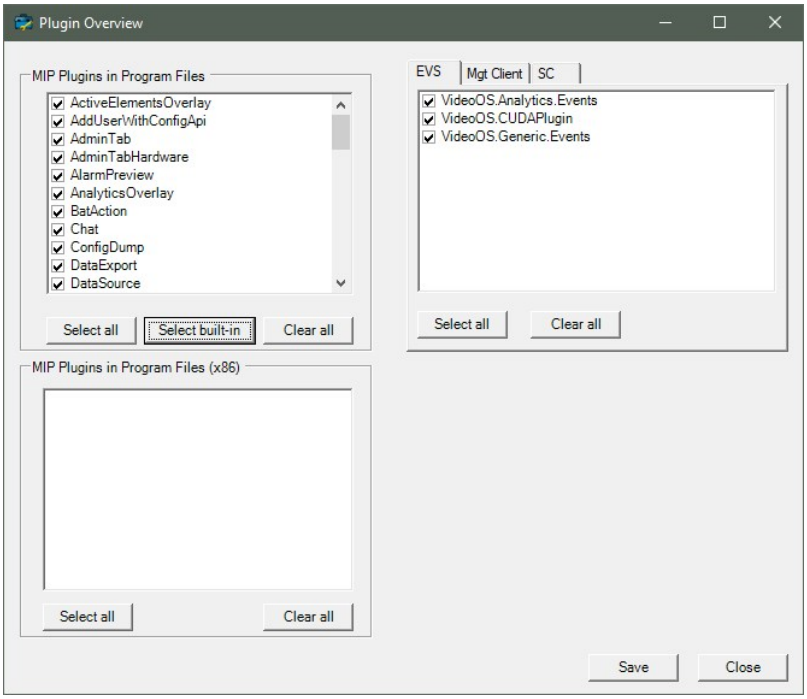
MIP SDK Tray Manager

Milestone recommends that you remove all plug-ins that you are not actively using or testing. You can do this from the MIP SDK Tray Manager, installed with the Milestone SDK Tools. See Installing Milestone SDK Tools on page 37.

Locate and right-click the **MIP SDK Tray Manager** from the Windows system tray, and then select **Plugin Overview...**:



In the **Plugin Overview** window, click **Select built-in** to disable the plug-ins installed with the MIP SDK. Then re-select the plug-ins that you want to use. Click **Save** before you close the window.



XProtect integration projects, from plan to market

Integration 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-users operate the system.
3. Make an architectural drawing of the integration solution.
4. Consider involving Milestone in a review of the suggested architecture.
5. Implement and test your solution.
6. Review Milestone test scenarios.
7. Add your solution to Milestone Technology Partner Finder[1].

[1] https://www.milestonesys.com/partners/technology-partners/technology-partner-finder/

The Milestone Technology Partner Program

While you are not required to join the Milestone Technology Partner Program to review the MIP SDK or to develop internal solutions, there are clear benefits of becoming a Technology Partner.

The Technology Partner Program is for any company that wants to develop applications and product offerings for Milestone XProtect VMS.

Technology Partner Program tracks

The Technology Partner Program has five tracks, each designed for a group of technologies. Technology Partners can choose to be part of more than one track, depending on their offerings.

Track	Description
Application Track	The Application Track is for partners who develop software-based applications and systems that integrate with the Milestone XProtect VMS platform via the MIP SDK.
Device Track	The Device Track is optimized for vendors with cameras and other IoT devices that provide media and metadata information. Partners in the Device Track work with the Milestone video management platform through the device driver layer, the open ONVIF standard, and the MIP Driver Framework.
Hardware Track	The Hardware Track is for partners who provide IT infrastructure technology needed to build video surveillance installations.
System Builder Track	The System Builder Track is a dedicated track for hardware vendors who offer hardware and appliances pre-installed with the Milestone XProtect VMS.
Service Track	The Service Track is for companies that provide various types of engineering services linked to the Milestone XProtect VMS. These partners are skilled in the XProtect VMS technology and the use of the MIP SDK, and offer their services to both Milestone channel partners and other technology partners

Why you should become a Milestone Technology Partner

Partners can leverage the Milestone brand and Milestone's global market channel, and they can benefit from a wide range of co-branding activities.

Technology synergy and co-innovation	Drive innovation and explore the synergy between your application, device, hardware, or service and the Milestone XProtect video management platform.
Short time to market	Bring your technology offering to the market faster with an extensive toolset and support for building and verifying your joint technology offerings.
Extended market reach	Benefit from an extensive menu of marketing options and utilize Milestone's extensive global channel network of trained and qualified channel partners.

How the Technology Partner Program works

The Technology Partner Program helps partners bring technology offerings to the market in three steps:

Build	Start building your competence on the XProtect VMS technology and develop the joint technology offering.
Verify	Verify your technology's compatibility and performance with XProtect, to ensure that it is ready for the market.
Market	Market your technology offering with several available marketing tools and opportunities, and leverage Milestone's global market channel (see Milestone Technology Partner Finder on page 50).

Learn more about the benefits and requirements of the Milestone Technology Partner Program:

- Milestone Technology Partner Program[1]

[1] https://www.milestonesys.com/community/become-a-partner/technology-partner-program/

Installed Integration Insights

Installed Integration Insights makes it possible to register which of your solutions are used and how many installations it is installed on. In a nutshell, it will enable you to get valuable insights into the use of your integration(s).

How does Installed Integration Insights work?

Since the release of XProtect 2020 R3, the MIP SDK allows registering any new integration to XProtect. You identify your integration and company in the integration code, using the manufacturer name you will use across your different integrations.

With XProtect 2021 R1, this information will be sent to Milestone's licensing web service, where it is centrally stored and aggregated. We believe this information can be valuable for your business, and we are happy to provide you with this data upon your request.

But we only collect, keep and process information for those manufacturer names for which you have allowed us to do so.

How to register for Installed Integration Insights

For more information, please write to partner@milestone.dk.

Milestone Technology Partner Finder

When your integration is complete, you can promote your integration and business on Milestone Technology Partner Finder[1].

Promote your integration globally, expand your network, and attract qualified sales partners on Technology Partner Finder.

Technology Partner Finder is an accelerator that empowers Milestone technology partners to market their applications, hardware, and services – and a gathering place where you can show the world what you have to offer.

With Technology Partner Finder, we harness the power of innovation within our community by connecting technology partners with system integrators.

- **Promote** with Milestone
- **Network** with our community
- **Grow** your business

You must be a Milestone Technology Partner to join Technology Partner Finder (see The Milestone Technology Partner Program on page 47). Our Milestone Technology Partner program takes an active role in driving the industry by supporting and promoting companies that create application, hardware and services that meet customer needs.

As a Technology partner, the Technology Partner Finder allows you to gain access to marketing tools and communicate information about your integration process and offering in an easy-to-understand way. Your application, hardware or service is displayed together with other related technology partners and the optimal level of documentation to gain customers' trust. This encourages system integrators to search for information on the Technology Partner Finder, rather than browse individual websites or search engines.

[1] https://www.milestonesys.com/partners/technology-partners/technology-partner-finder/

helpfeedback@milestone.dk

About Milestone

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 Systems 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 Systems is a stand-alone company in the Canon Group. For more information, visit https://www.milestonesys.com/.