Milestone Systems

Milestone XProtect Administrator Guide

milestone

Contents

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XProtect VMS administrator manual

The administrator manual is a comprehensive guide designed to assist administrators in managing the Milestone XProtect VMS video management software. It provides detailed instructions on various system aspects, including the installation, configuration, and maintenance of XProtect VMS.

The manual ensures administrators have all the necessary information to effectively manage and optimize the XProtect VMS system. It includes step-by-step instructions for installing and configuring system components like the the XProtect Management Client, the XProtect Smart Client, and recording servers.

By following the instructions, administrators can accomplish tasks such as the following:

- Secure the system through user roles and permissions
- Preserve privacy with user profiles and privacy masking
- Enable encryption and set up databases securely
- Enable diverse authentication methods
- Handle failover
- Troubleshoot issues related to various system components

The intended audience for this document includes system administrators, IT professionals, and technical staff responsible for installing, configuring, and maintaining Milestone XProtect VMS.

What's new?

In Management Client 2025 R3

Audit logging

Audit logging in the XProtect VMS has been modernized by integrating OpenTelemetry, enabling audit logs to be treated as telemetry data and exported using standardized pipelines.

The changes simplify the architecture and open the door to using modern observability frameworks.

XProtect Access

The **Access Control** node consists of two options:

- From **Systems**, view and manage your access control systems.
- From **Groups**, group your access control units for more granular permission management.

In Management Client 2025 R2

No updates for this version.

In Management Client 2025 R1

XProtect supports identity synchronization through System for Cross-site Identity Management (SCIM). SCIM enables automatic user provisioning and changes to user permissions are instantly reflected in the VMS without requiring a new login.

In Management Client 2024 R2

XProtect Management Client

Show disabled devices device filter renamed and inverted

The filter logic for the **Show disabled devices** hardware device filter option, in the **Overview** pane has been inverted and renamed **Hide disabled devices**. The filter option is cleared by default, which means the device tree now displays all devices, including disabled devices, by default.

Specified device filter criteria are now persisted but are reset if the Management Client is restarted. Users still manually remove device filter criteria to reset the filters. As a result, the **F5** shortcut key no longer resets device filter criteria.

Previously, newly created but disabled devices could be difficult to locate, as the **Show disabled devices** filter was cleared by default and could easily be overlooked.

New XProtect Management Client images

Images in the technical documentation have been updated to reflect the current environment.

No longer supported

The following options are no longer supported:

- Multiple Recording Server instances

  Multiple Recording Server instances is no longer supported. See this knowledge-based article that describes how to update an installation using multiple Recording Server instances.

- Management Client installed help files

  The Management Client now relies on online help from the Milestone web site and installed help files are no longer available. If a workstation running the Management Client does not have internet access, a link to the relevant help topic will be available in the client. The help files can be downloaded and installed manually, if needed. See Help files.

- Support for Microsoft SQL Server 2014

  Extended support for Microsoft SQL Server 2014 ended on 9th of July 2024. There are no more security updates from Microsoft on that server.

- JPEG transcoding in the Smart Client

  The setting for JPEG transcoding (image quality) in setup mode is no longer available from the properties pane. Use adaptive streaming instead.

- SMTP camera events

  Allowing cameras to upload an image to the XProtect VMS using SMTP has been disabled by default in the system. This feature was used by some old camera models. Due to current security standards, having open ports for non-encrypted communication is not secure.

In Management Client 2024 R1

XProtect Management Client

Russian Management Client documentation

The help for the Management Client is now also available in Russian.

Failover recording server / recording server installation

When you install a recording server or failover recording server, the files of each respective server are now placed within separate folders in the Milestone folder: **XProtect Failover Server** and **XProtect Recording Server**.

If you are upgrading XProtect, these folders are also created during the upgrade process and the files for each server type are located in the folders.

Previously, the files of the failover recording server and recording server were installed in the same folder, which could cause issues when you were scaling products or running on different Microsoft .NET versions.

In Management Client 2023 R3

XProtect Management Client

Azure Active Directory can now be used for authentication. During installation you can choose between **Windows Authentication** and **Azure Active Directory Integrated** for integrated security.

For more information about how to install XProtect with Azure integrated security, see Install your system - Custom option.

XProtect Management Client

A (do not trust server certificate) option is now available for Windows Authentication and for Azure Active Directory Integrated. For Azure Active Directory Integrated, this option is mandatory. The (do not trust server certificate) option ensures that server certificates are validated and verified before installation.

XProtect Management Client:

A new **Edit alarm settings** user permission for alarms has been introduced that enables administrators to edit alarm definitions, alarm states, alarm categories, alarm sounds, alarm retention, and event retention. The corresponding editing permissions for alarm definitions have been removed from the existing **Manage** user permission, and administrators will require both user permissions (**Edit alarm settings** and **Manage**) to manage alarm settings.

The new **Edit alarm settings** user permission is not applied to existing users and must be manually assigned to users that require administrator-level access to configure alarms after installation or upgrade.

For information about the custom installation, see Roles (Security node)

In Management Client 2023 R2

XProtect Management Client:

Adaptive streaming can now be configured for use in playback mode. This method is referred to as adaptive playback. For more information, see Adaptive playback (explained).

XProtect Management Client:

When you install the XProtect components, you can now select to use a pre-created database as part of a custom installation. For information about the custom installation, see Install your system - Custom option

XProtect Management Client:

New user permissions for video restrictions have been introduced that enable administrators to configure and assign create, view, edit and delete rights to users. For more information see Roles (Security node)

In Management Client 2023 R1

XProtect Incident Manager:

- To comply with GDPR or other applicable laws concerning personal data, administrators of XProtect Management Client can now define a retention time for incident projects. See also Define the retention time for your incident projects.

In Management Client 2022 R3

XProtect Incident Manager:

- The XProtect Incident Manager extension is now also compatible with XProtect Expert, XProtect Professional+, and XProtect Express+ version 2022 R3 or later.
- XProtect Incident Manager can now show more than 10,000 incident projects.

In Management Client 2022 R2

XProtect Incident Manager:

- The first release of this extension.
- The XProtect Incident Manager extension is compatible with XProtect Corporate version 2022 R2 and later and with XProtect Smart Client version 2022 R2 and later.

XProtect LPR:

- License plate styles, which are part of country modules, are now listed in one place. See License plate styles
- To make license plate styles easier to manage, you can group them into aliases according to your license plate recognition needs. See Aliases
- Match lists now support aliases. See Add match list items

In Management Client 2022 R1

Event server encryption:

- You can encrypt the two-way connection between the event server and the components that communicate with the event server, including the LPR Server.

  For more information, see Enable event server encryption.

Logging in via an external IDP:

- You are now able to log on to the Milestone XProtect VMS using an external IDP. Logging on via an external IDP is an alternative to logging on as an Active Directory user or as a basic user. With the external IDP logon method you can bypass the setup requirements of a basic user and still be authorized to access the components and devices in XProtect.

  For more information, see External IDP (explained).

Update hardware data

- You can now see the current firmware version for the hardware device that is detected by the system in the Management Client.

  For more information, see Update your hardware data.

XProtect Management Server Failover

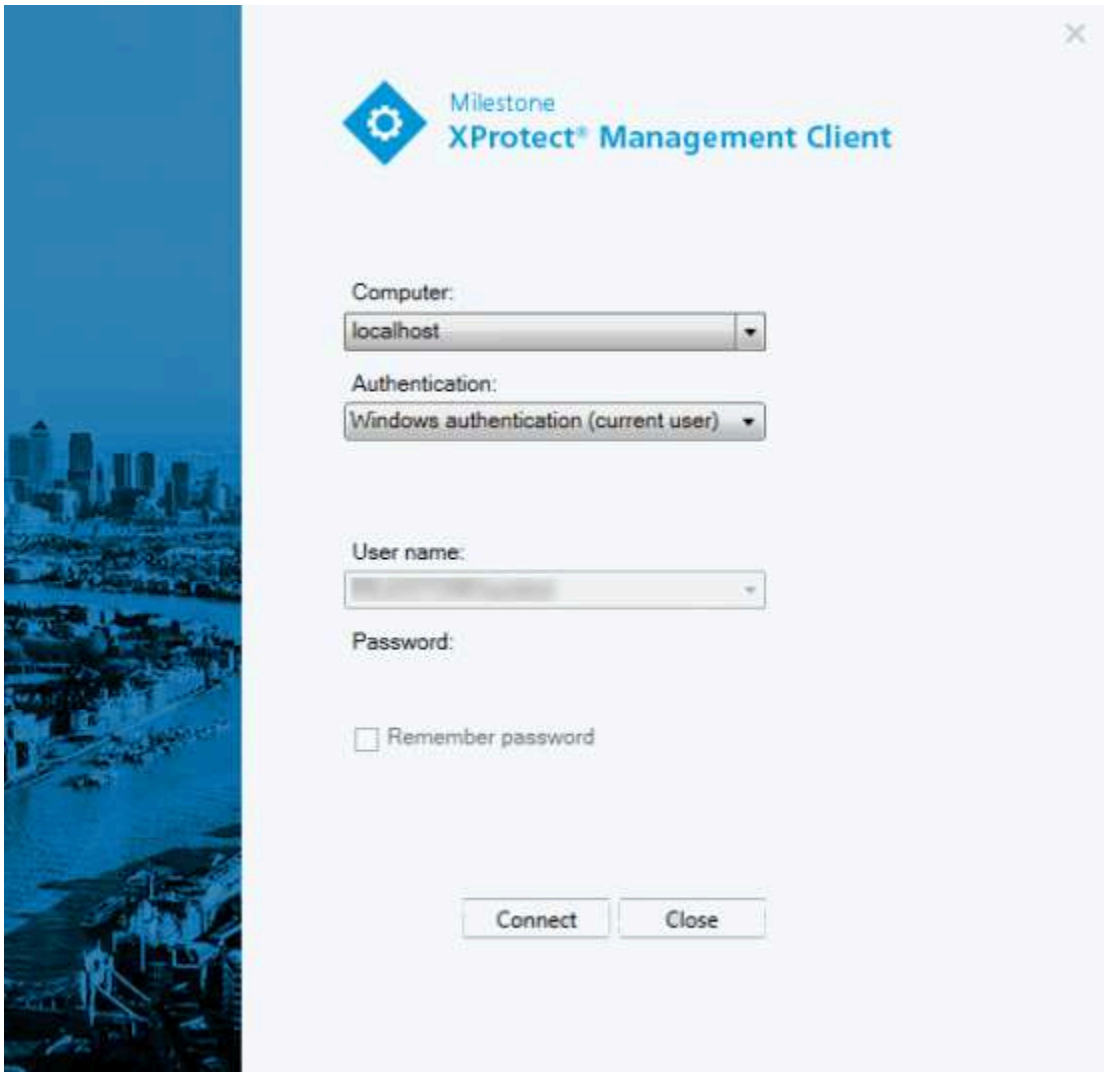
- You can now achieve high availability of your system by configuring a failover management server between two redundant computers. If the computer that runs the management server fails, the second one takes over. The real-time data replication ensures that the databases of the management server, log server, and event server are identical on both computers.

  For more information, see XProtect Management Server Failover.

Logging in (explained)

When you launch the Management Client, you must first enter your login information to connect to a system.

With XProtect Corporate 2016 or XProtect Expert 2016 or newer installed, you can log into systems that run older versions of the product after installing a patch. The supported versions are XProtect Corporate 2013 and XProtect Expert 2013 or newer.



Login authorization (explained)

The system allows administrators to set up users so they can only log into a system if a second user with sufficient permissions authorizes their login. In this case, XProtect Smart Client or the Management Client asks for the second authorization during login.

A user associated with the built-in **Administrators** role has always permission to authorize and is not asked for a second login, unless the user is associated with another role that requires a second login.

Users logging in via an external IDP cannot be set up with a requirement to be authorized by a second user.

To associate login authorization with a role:

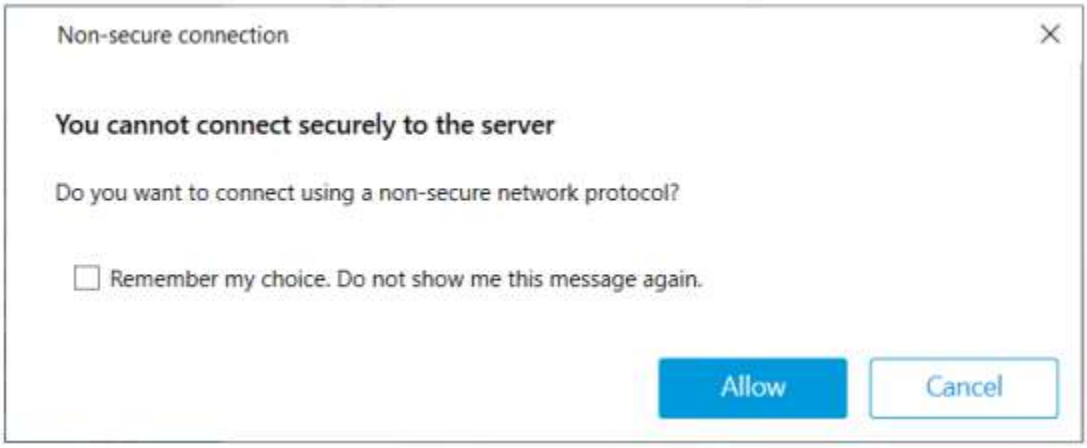
- Set **Login authorization required** for the selected role on the **Info** tab (see Roles settings) under **Roles**, so that the user is asked for additional authorization during login
- Set **Authorize users** for the selected role on the **Overall Security** tab (see Roles settings) under **Roles**, so that the

user can authorize other users' logins

You can choose both options for the same user. This means that the user is asked for additional authorization during login, but can also authorize other users' logins, except for his/her own.

Log in using a non-secure connection

When you log in to the Management Client, you might be asked if you want to log in using a non-secure network protocol.



- Click **Allow** to log in disregarding the notification. To avoid getting this notification in the future, either select **Remember my choice. Do not show me this message again** or click **Tools** > **Options** and then select **Allow non-secure connection to the server (restart of Management Client required)**.

For information about secure communication, see Secure communication (explained).

Change your basic user password

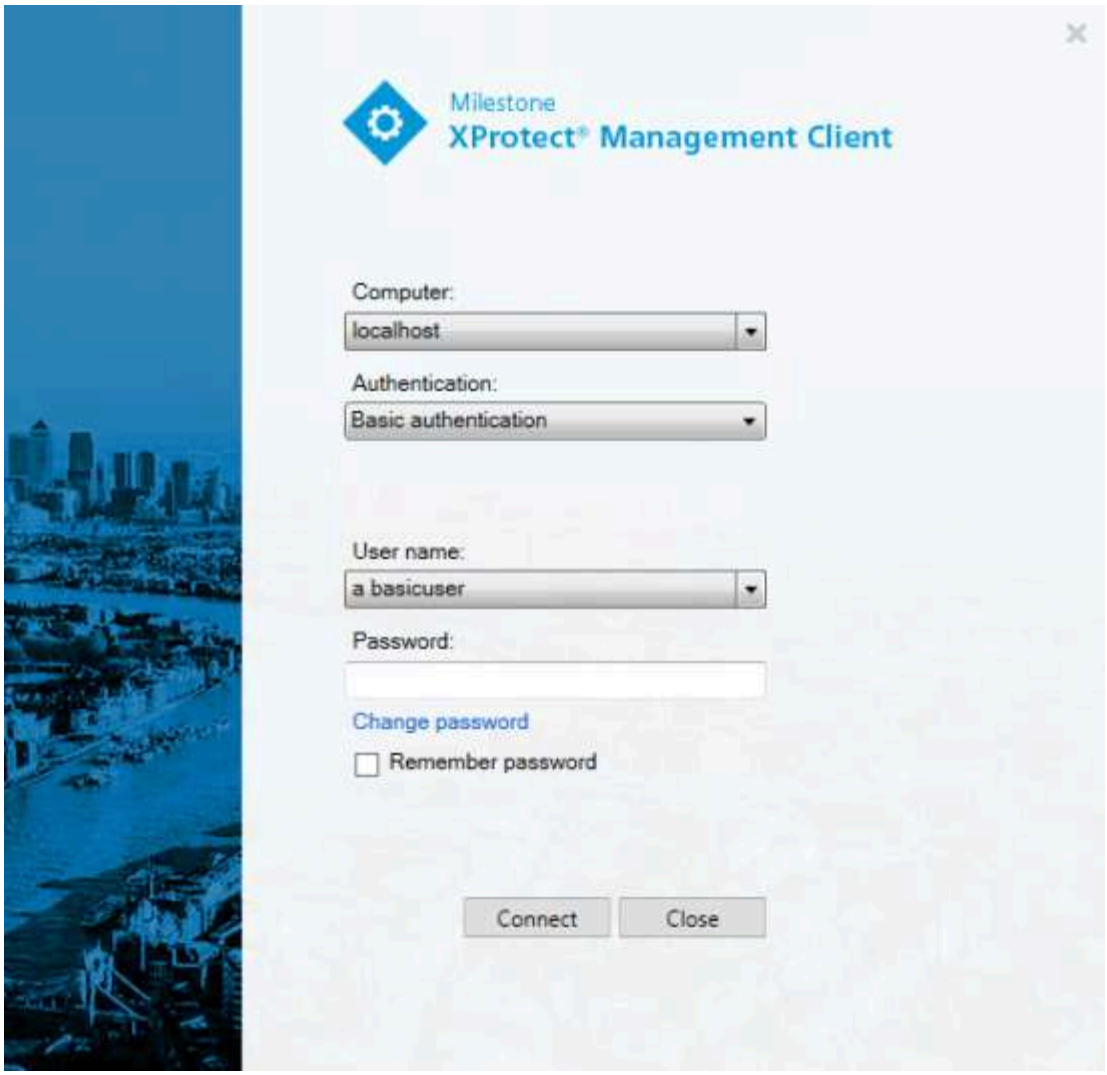
If you log in as a **Basic user**, you can change your password. If you choose a different authentication method, only your system administrator can change your password. Changing your password often increases the security of your XProtect VMS system.

Requirements

The version of your XProtect VMS system must be 2021 R1 or later.

Steps:

1. Start Management Client. The login window opens.
2. Specify your login information. In the **Authentication** list, select **Basic authentication**. A link with the text **Change password** appears.



3. Click the link. A browser window opens.
4. Follow the instructions and save your changes.
5. Now you can log into Management Client using your new password.

Product overview

The XProtect VMS products are video management software designed for installations of all shapes and sizes. Whether you want to protect your store from vandalism or you want to manage a multi-site, high security installation, XProtect makes it possible. The solutions offer centralized management of all devices, servers, and users, and provide an extremely flexible rule system driven by schedules and events.

Your system consists of the following main components:

- The **management server** - the center of your installation, consists of multiple servers
- One or more **recording servers**
- One or more installations of **XProtect Management Client**
- **XProtect Download Manager**
- One or more installations of **XProtect® Smart Client**
- One or more uses of **XProtect Web Client** and/or installations of **XProtect Mobile** client if needed

Your system also includes fully integrated Matrix functionality for distributed viewing of video from any camera on your surveillance system to any computer with XProtect Smart Client installed.

You can install your system on virtualized servers or on multiple physical servers in a distributed setup. See also A distributed

system setup.

The system also offers the possibility of including the standalone XProtect® Smart Client – Player when you export video evidence from the XProtect Smart Client. XProtect Smart Client – Player allows recipients of video evidence (such as police officers, internal or external investigators and more) to browse and play back the exported recordings without having to install any software on their computers.

With the most feature-rich products installed (see Product comparison), your system can handle an unrestricted number of cameras, servers, and users and across multiple sites if required. Your system can handle IPv4 as well as IPv6.

Management server (explained)

The management server is the central VMS component. It stores the configuration of the surveillance system in a SQL Server database, either on SQL Server on the management server computer itself or on separate SQL Server on the network. It also handles user authentication, user permissions, the rule system and more.

To improve system performance, you can run several management servers as a Milestone Federated Architecture™. The management server runs as a service and is typically installed on a dedicated server.

Users connect to the management server for initial authentication, then transparently to the recording servers for access to for video recordings, etc.

SQL Server installations and databases (explained)

The management server, the event server, the log server, XProtect Incident Manager, and the Identity Provider store, among others, the system configuration, alarms, events, and log messages in the following SQL Server databases:

- **Surveillance: Management and event server**
- **Surveillance_IDP: IDP**
- **Surveillance_IM: Incident Manager**
- **LogserverV2: LogServer**

The management server and the event server share the same SQL Server database while the log server, XProtect Incident Manager, and the Identity Provider each have their own SQL Server database. The default location of the databases is `C:\Program Files\Microsoft SQL Serv-er\MSSQL16.MSSQLSERVER\MSSQL\DATA` where {nn} is the SQL Server version.

The system installer includes Microsoft SQL Server Express which is a free edition of SQL Server.

For very large systems or systems with many transactions to and from the SQL Server databases, Milestone recommends that you use the Microsoft® SQL Server® Standard or Microsoft® SQL Server® Enterprise edition of SQL Server on a dedicated computer on the network and on a dedicated hard disk drive that is not used for other purposes. Installing SQL Server on its own drive improves the entire system performance.

To see a list of supported SQL Server versions, go to https://www.milestonesys.com/systemrequirements/.

For more information about the Identity Provider, see Identity Provider (explained).

For more information about the XProtect Incident Manager database and logging, see Logging and SQL Server databases.

Recording server (explained)

The recording server is responsible for communicating with the network cameras and video encoders, recording the retrieved audio and video as well as providing client access to both live and recorded audio and video. The recording server is also responsible for communicating with other Milestone products connected via the Milestone Interconnect technology.

Device drivers

- Network cameras and video encoders communicate through a device driver developed specifically for individual devices or a series of similar devices from the same manufacturer
- From the 2018 R1 release, the device drivers are split into two device packs: the regular device pack with newer drivers and a legacy device pack with older drivers
- The regular device pack is installed automatically when you install the recording server. Later, you can update the drivers by downloading and installing a newer version of the device pack
- The legacy device pack can only be installed if the system has a regular device pack installed. The drivers from the legacy device pack are automatically installed if a previous version is already installed on your system. It is available for manual download and installation on the software download page (https://www.milestonesys.com/download/)

Media database

- The recording server stores the retrieved audio and video data in the tailor-made high-performance media database optimized for recording and storing audio and video data
- The media database supports various unique features like; multistage archiving, video grooming, encryption, and adding a digital signature to the recordings

The system uses recording servers for recording of video feeds, and for communicating with cameras and other devices. A surveillance system typically consists of several recording servers.

Recording servers are computers where you have installed the Recording Server software, and configured it to communicate with the management server. You can see your recording servers in the **Overview** pane when you expand the **Servers** folder and then select **Recording Servers**.

Backward compatibility with recording server versions older than this version of the management server is limited. You can still access recordings on recording servers with older versions, but if you want to change their configuration, make sure they match this version of the management server. Milestone recommends that you upgrade all recording servers in your system to the same version as your management server.

The recording server supports encryption of data streams to the clients and services:

- Enable encryption to clients and servers
- View encryption status to clients

The recording server also supports encryption of the connection with the management server:

- Enable encryption to and from the management server

You have several options related to management of your recording servers:

- Add hardware
- Move hardware
- Delete all hardware on a recording server
- Remove a recording server

When the Recording Server service is running, it is very important that Windows Explorer or other programs do not access Media Database files or folders associated with your system setup. If they do, it is likely that the recording server cannot rename or move relevant media files. This might bring the recording server to a halt. To restart a stopped recording server, stop the Recording Server service,

close the program accessing the relevant media file(s) or folder(s), and restart the Recording Server service.

Mobile server (explained)

The mobile server is responsible for giving XProtect Mobile client and XProtect Web Client users access to the system.

In addition to acting as a system gateway for the two clients, the mobile server can transcode video, since the original camera video stream in many cases are too large to fit the bandwidth available for the client users.

If you are performing a **Distributed** or **Custom** installation, Milestone recommends that you install the mobile server on a dedicated server.

Event server (explained)

The event server handles various tasks related to events, alarms, and maps and perhaps also third-party integrations via the MIP SDK.

Events

- All system events are consolidated in the event server so there are one place and interface for partners to make integrations that utilize system events
- Furthermore, the event server offers third-party access to sending events to the system via the Generic events or Analytics events interface

Alarms

- The event server hosts the alarm feature, alarm logic, alarm state as well as handling the alarm database. The alarm database is stored in the same SQL Server database that the management server uses

Messages

- Message communication is handled by the event server, allowing plugins to send messages in real time between environments, such as XProtect Smart Client, Management Client, event server and standalone services.

Maps

- The event server also hosts the maps that are configured and used in XProtect Smart Client

MIP SDK

- Finally, third-party-developed plug-ins can be installed on the event server and utilize access to system events

Log server (explained)

The log server stores all log messages for the entire system in a SQL Server database. This log messages database can exist on the same SQL Server as the management server's system configuration database or on separate SQL Server. The log server is typically installed on the same server as the management server but can be installed on a separate server for increased performance of the management and log servers.

API Gateway (explained)

The MIP VMS API provides a unified RESTful API, based on industry standard protocols such as OpenAPI, for accessing XProtect VMS functionality, simplifying integration projects and serving as a basis for cloud connected communication.

The XProtect VMS API Gateway supports these integration options through the Milestone Integration Platform VMS API (MIP VMS API).

The API Gateway is installed on-premise and is intended to serve as a front-end and common entry point for RESTful API and WebSocket Messaging API services on all the current VMS server components (management server, event server, recording servers, log server, etc). An API Gateway service can be installed on the same host as the management server or separately, and more than one can be installed (each on their own host).

The RESTful API is implemented in part by each specific VMS server component, and the API Gateway can simply pass-through these requests and responses, while for other requests, the API Gateway will convert requests and responses as appropriate.

Currently, the configuration API, hosted by the management server, is available as a RESTful API. The RESTful Events API, Websockets messaging API, and the RESTful Alarms API, hosted by the event server, are also available.

For more information, see the API Gateway administrator manual and the Milestone Integration Platform VMS API reference documentation.

Failover management server

The management server is the central VMS component. It stores the configuration of the surveillance system in a SQL Server database, either on SQL Server on the management server computer itself or on separate SQL Server on the network. It also handles user authentication, user permissions, the rule system and more.

To minimize system downtime, you can configure a failover management server by installing the management server in a cluster. The cluster will then ensure that another computer take over the management server function should the first computer fail.

You can install the management server in a cluster using:

XProtect Management Server Failover

XProtect Management Server Failover is an XProtect VMS extension that can help you when:

- A server fails – you can run the system components from another computer while you resolve the problems.
- You need to apply system updates and security patches – applying security patches on a standalone management server can be time-consuming, resulting in extended periods of downtime. When you have a failover cluster, you can apply system updates and security patches with minimal downtime.
- You need seamless connection – users get continuous access to live and playback video, and to the system's configuration at all times.

To configure XProtect Management Server Failover, you install the management server, log server, and event server on two computers. If the first computer stops working, the VMS components start running on the second computer. Additionally, you can benefit from a secure real-time replication of the VMS databases when SQL Server runs in the failover cluster.

Windows Server Failover Clustering (WSFC)

WSFC is a feature of the Microsoft Windows Server operating system for fault tolerance and high availability (HA) of applications and services. It enables several computers to host shared services, and if the services fail on one node, the remaining nodes automatically take over the hosting of the services.

You can install the management server a minimum of two nodes within a cluster. One node runs the Management Server and Data Collector Server and exchanges heartbeats with the other cluster nodes. If the active management server and its related

services stop running on a node or run very slowly, the VMS services start running on another node in the cluster.

Failover recording server (explained)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

A failover recording server is an extra recording server which takes over from the standard recording server if this becomes unavailable. You can configure a failover recording server in two modes, as a **cold standby server** or as a **hot standby server**.

You install failover recording servers like standard recording servers (see Install a failover recording server through Download Manager). Once you have installed failover recording servers, they are visible in the Management Client. Milestone recommends that you install all failover recording servers on separate computers. Make sure that you configure failover recording servers with the correct IP address/host name of the management server. The user permissions for the user account under which the Failover Server service runs are provided during the installation process. They are:

- Start/Stop permissions to start or stop the failover recording server
- Read and Write access permissions to read or write the RecorderConfig.xml file

If a certificate is selected for encryption, then the administrator must grant read access permission to the failover user on the selected certificate private key.

If the failover recording server takes over from a recording server that uses encryption, Milestone recommends that you also prepare the failover recording server for using encryption. For more information, see Secure communication (explained) and Install a failover recording server through Download Manager.

You can specify what type of failover support you want on device-level. For each device on a recording server, select full, live only or no failover support. This helps you prioritize your failover resources and, for example, only set up failover for video and not for audio, or only have failover on essential cameras, not on less important ones.

While your system is in failover mode, you cannot replace or move hardware, update the recording server, or change device configurations such as storage settings or video stream settings.

Cold standby failover recording servers

In a cold standby failover recording server setup, you group multiple failover recording servers in a failover group. The entire failover group is dedicated to take over from any of several preselected recording servers, if one of these becomes unavailable. You can create as many groups as you want (see Group failover recording servers for cold standby).

Grouping has a clear benefit: when you later specify which failover recording servers should take over from a recording server, you select a group of failover recording servers. If the selected group contains more than one failover recording server, this offers you the security of having more than one failover recording server ready to take over if a recording server becomes unavailable. You can specify a secondary failover server group that takes over from the primary group if all the recording servers in the primary group are busy. A failover recording server can only be a member of one group at a time.

Failover recording servers in a failover group are ordered in a sequence. The sequence determines the order in which the failover recording servers will take over from a recording server. By default, the sequence reflects the order in which you have incorporated the failover recording servers in the failover group: first in is first in the sequence. You can change this if you need to.

Hot standby failover recording servers

In a hot standby failover recording server setup, you dedicate a failover recording server to take over from **one** recording server only. Because of this, the system can keep this failover recording server in a "standby" mode which means that it is synchronized with the correct/current configuration of the recording server it is dedicated to and can take over much faster

than a cold standby failover recording server. As mentioned, you assign hot standby servers to one recording server only and cannot group it. You cannot assign failover servers that are already part of a failover group as hot standby recording servers.

Failover recording server validation

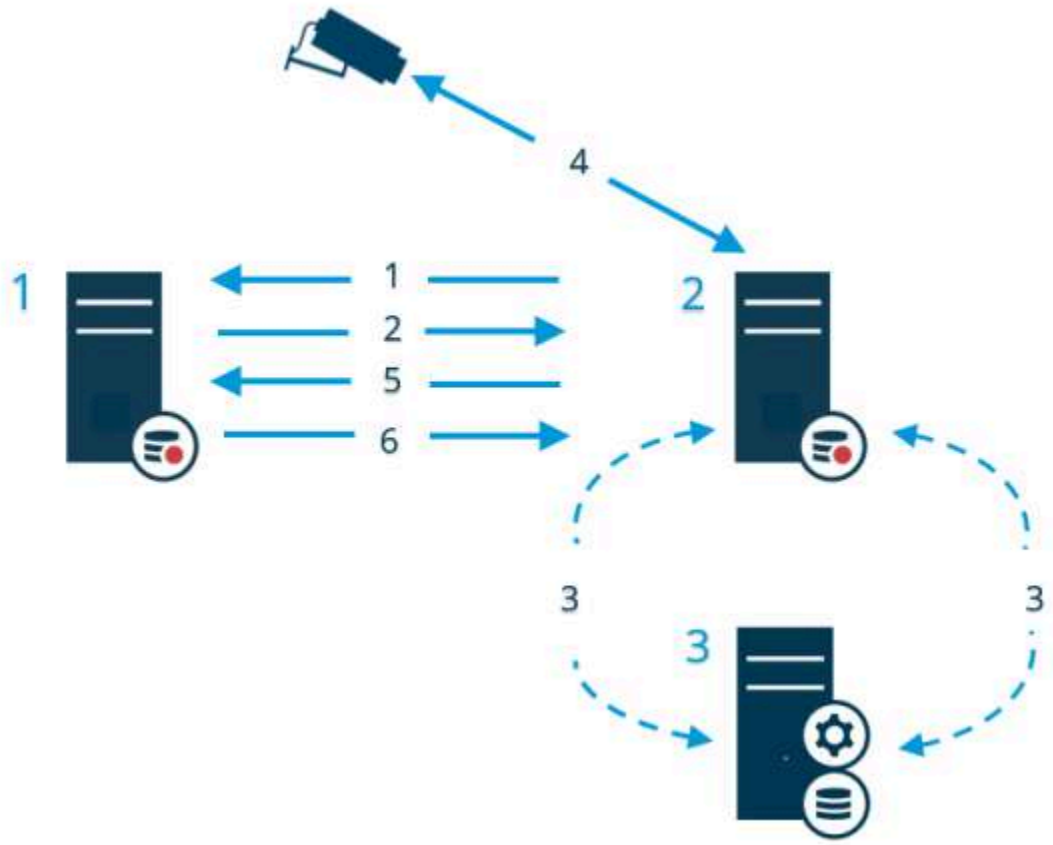
To validate a merge of video data from the failover server to the recording server, you must make the recording server unavailable by either stopping the recording server service or shutting down the recording server computer.

Any manual interruption of the network that you can cause by pulling out the network cable or blocking the network using a test tool is not a valid method.

Failover recording server functionality (explained)

- A failover recording server checks the state of relevant recording servers every 0.5 seconds. If a recording server does not reply within 2 seconds, the recording server is considered unavailable and the failover recording server takes over
- A cold standby failover recording server takes over for the recording server that has become unavailable after five seconds plus the time it takes to connect to the cameras. In contrast, a hot standby failover recording server takes over faster because the Recording Server service is already running with the correct configuration and only has to start its cameras to deliver feeds. During the startup period, you can neither store recordings nor view live video from affected cameras
- When a recording server becomes available again, it automatically takes over from the failover recording server. Recordings stored by the failover recording server are automatically merged into the standard recording server's databases. The time it takes to merge, depends on the amount of recordings, network capacity and more. During the merging process, you cannot browse recordings from the period during which the failover recording server took over
- If a failover recording server must take over from another recording server during the merging process in a cold standby failover recording server setup, it postpones the merging process with recording server A, and takes over from recording server B. When recording server B becomes available again, the failover recording server takes up the merging process and allows both recording server A and recording server B to merge back recordings simultaneously.
- In a hot standby setup, a hot standby server cannot take over for an additional recording server because it can only be hot standby for a single recording server. But if that recording server fails again, the hot standby takes over again and keeps the recordings from the previous period. The recording server keeps recordings until they are merged back to the primary recorder or until the failover recording server runs out of disk space
- A failover solution does not provide complete redundancy. It can only serve as a reliable way of minimizing the downtime. If a recording server becomes available again, the Failover Server service makes sure that the recording server is ready to store recordings again. Only then is the responsibility for storing recordings handed back to the standard recording server. So, a loss of recordings at this stage of the process is very unlikely
- Client users hardly notice that a failover recording server is taking over. A short break occurs, usually only for a few seconds, when the failover recording server takes over. During this break, users cannot access video from the affected recording server. Client users can resume viewing live video as soon as the failover recording server has taken over. Because recent recordings are stored on the failover recording server, they can play back recordings from after the failover recording server took over. Clients cannot play back older recordings stored only on the affected recording server until that recording server is functioning again and has taken over from the failover recording server. You cannot access archived recordings. When the recording server is functioning again, a merging process takes place during which failover recordings are merged back into the recording server's database. During this process, you cannot play back recordings from the period during which the failover recording server took over
- In a cold standby setup, setting up a failover recording server as backup for another failover recording server is not necessary. This is because you allocate failover groups and do not allocate particular failover recording servers to take over from specific recording servers. A failover group must contain at least one failover recording server, but you can add as many failover recording servers as needed. If a failover group contains more than one failover recording server, more than one failover recording server can take over.
- In a hot standby setup, you cannot set up failover recording servers or hot standby servers as failover for a hot standby server

Failover steps (explained)



Description
Involved servers (numbers in blue): 1. Recording Server 2. Failover Recording Server 3. Management Server
Failover steps for **Cold standby** setups: 1. To check whether it is running or not, a failover recording server has a non-stop TCP connection to a recording server. 2. This connection is interrupted. 3. The failover recording server requests the current configuration of the recording server from the management server. The management server sends the requested configuration, the failover recording server receives the configuration, and starts recording on behalf of the recording server. 4. The failover recording server and the relevant camera(s) exchange video data. 5. The failover recording server continually tries to re-establish connection to the recording server. 6. When the connection to the recording server is re-established, the recording server fetches video data (if any) recorded during its downtime and the video data is merged back in to the recording server database.

Description
Failover steps for **Hot standby** setups: 1. To check whether it is running or not, a hot standby server has a non-stop TCP connection to its assigned recording server. 2. This connection is interrupted. 3. From the management server, the hot standby server already knows the current configuration of its assigned recording server and starts recording on its behalf. 4. The hot standby server and the relevant camera(s) exchange video data. 5. The hot standby server continually tries to re-establish connection to the recording server. 6. When the connection to the recording server is re-established and the hot standby server goes back to hot standby mode, the recording server fetches video data (if any) recorded during its down-time and the video data is merged back in to the recording server database.

Failover recording server services (explained)

A failover recording server has two services installed:

- A Failover Server service, which handles the processes of taking over from the recording server. This service is always running, and constantly checks the state of relevant recording servers
- A Failover Recording Server service, which enables the failover recording server to act as a recording server.

  In a cold standby setup, this service is only started when required, that is when the cold standby failover recording server takes over from the recording server. Starting this service typically takes a couple of seconds, but may take longer depending on local security settings and more.
  In a hot standby setup, this service is always running, allowing the hot standby server to take over faster than the cold standby failover recording server.

High availability of the SQL Server databases

The XProtect services store data in different SQL Server databases:

- **Surveillance** for the Management Server and Event Server services
- **Surveillance_IDP** for the Identity Provider
- **Surveillance_IM** for XProtect Incident Manager
- **LogserverV2: LogServer** for the ILog Server service.

To provide redundancy for the SQL Server databases, you must ensure that the services and components can access their databases. Depending on your needs, you can consider different high-availability options:

Always On availability groups

Always On availability groups (AGs) help protect databases by keeping copies of the databases on other hosts, called replicas, which can take over if the primary host fails.

To learn more about AGs, see What is an Always On availability group?

Failover cluster instances

Failover Cluster Instances (FCIs) provide high availability for the entire SQL Server instance, ensuring that all components, including databases and jobs, move to another host if a failure occurs.

To learn more about FCIs, see Always On failover cluster instances (SQL Server).

Log shipping

With SQL Server Log shipping, you can copy the transaction log file from one SQL Server instance to another.

To learn more about log shipping, see About log shipping (SQL Server).

Management Client (explained)

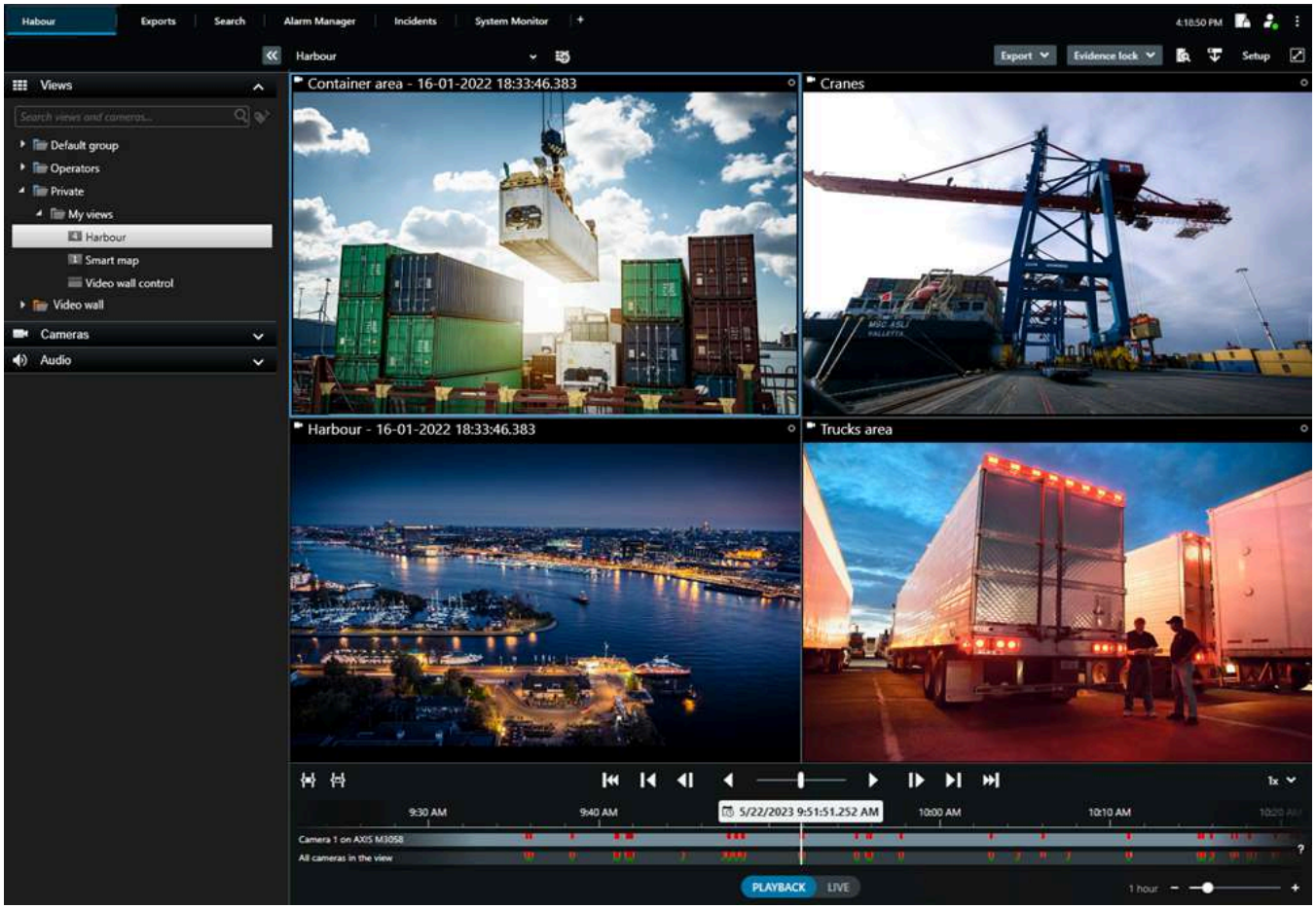
The Management Client is a feature-rich administration client for configuration and day-to-day management of the system. Available in several languages.

Typically installed on the surveillance system administrator's workstation or similar.

XProtect Smart Client (explained)

XProtect Smart Client is a desktop application designed to help you manage your IP surveillance cameras. It provides intuitive control over security installations by giving users access to live and recorded video, instant control of cameras and connected security devices, and the ability to make advanced searches for recordings and metadata.

Available in multiple local languages, XProtect Smart Client has an adaptable user interface that can be optimized for individual operators' tasks and adjusted according to specific skills and authority levels.



The interface allows you to tailor your viewing experience to specific working environments by selecting a light or dark theme. It also features work-optimized tabs and a main timeline for easy surveillance operation.

Using the MIP SDK, users can integrate various types of security and business systems, and video analytics applications, which you manage through XProtect Smart Client.

XProtect Smart Client must be installed on operators' computers. Surveillance system administrators manage access to the surveillance system through the Management Client. Recordings viewed by clients are provided by your XProtect system's Image Server service. The service runs in the background on the surveillance system server. Separate hardware is not required.

XProtect Mobile client (explained)

XProtect Mobile client is a mobile surveillance solution closely integrated with the rest of your XProtect system. It runs on your Android tablet or smartphone or your Apple® tablet, smartphone or portable music player and gives you access to cameras, views and other functionality set up in the management clients.

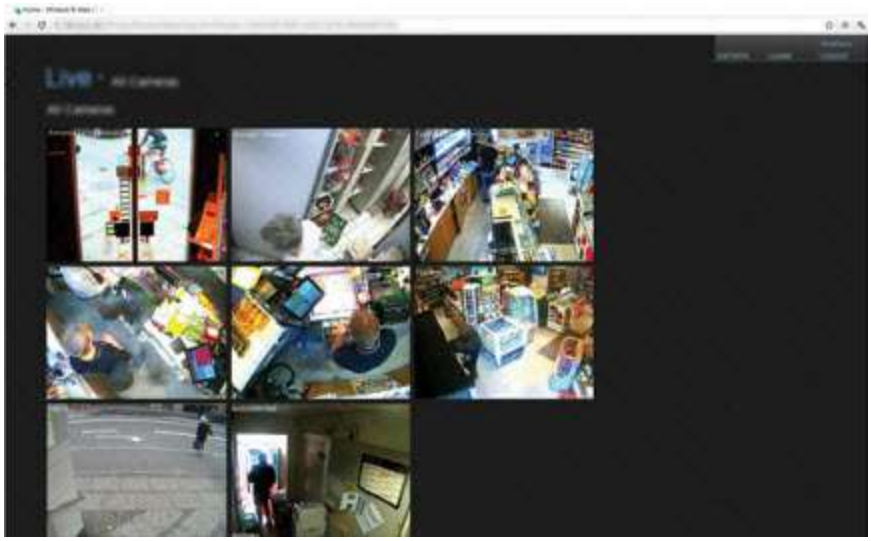
Use the XProtect Mobile client to view and play back live and recorded video from one or multiple cameras, control pan-tilt-zoom (PTZ) cameras, trigger output and events and use the Video push functionality to send video from your device to your XProtect system.

If you want to use the XProtect Mobile client with your system, you must have a XProtect Mobile server to establish the connection between the XProtect Mobile client and your system. Once the XProtect Mobile server is set up, download the XProtect Mobile client for free from Google Play or App Store to start using XProtect Mobile.

You need one device license per device that should be able to push video to your XProtect system.

XProtect Web Client (explained)

XProtect Web Client is a web-based client application for viewing, playing back and sharing video. It provides instant access to the most commonly used surveillance functions, such as viewing live video, play back recorded video, print and export evidence. Access to features depends on individual user permissions which are set up in Management Client.



To enable access to the XProtect Web Client, you must have a XProtect Mobile server to establish the connection between the XProtect Web Client and your system. The XProtect Web Client itself does not require any installation itself and works with most Internet browsers. Once you have set up the XProtect Mobile server, you can monitor your XProtect system anywhere from any computer or tablet with Internet access (provided you know the correct external/Internet address, user name and password).

About XProtect extensions

Milestone has developed various extensions. Extensions are products that extend the XProtect VMS products' functionality with additional specialized functionality.

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

XProtect Access for administrators

XProtect Access is an extension of XProtect. If a dedicated XProtect plug-in exists for that access control system, it enables organizations to integrate their access control systems with XProtect.

To use this extension, you must purchase:

- 1 (one) base license for each XProtect system you want to use with XProtect Access.
- 1 (one) door license for each door you want to control through XProtect.

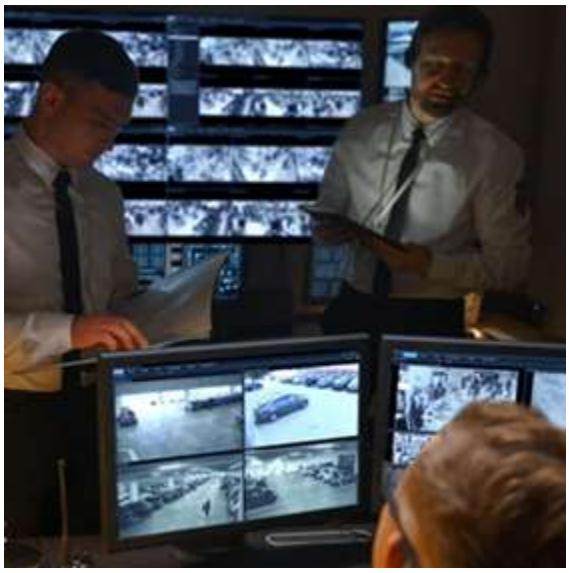
XProtect Access includes:

- A shared user interface for access control systems in XProtect Smart Client.
- Powerful integration of access control systems.
- Live monitoring of events at access points.
- Operator-assisted access requests.
- Integrations with maps.
- Alarm definitions for access control events.
- Investigation of events at access points.
- Centralized overview and control of door states.
- Cardholder information and management.

Whenever a user in XProtect Smart Client takes any access-related action, such as opening a door or denying entry, the system records it in the **Audit log**.

XProtect Incident Manager for administrators

XProtect Incident Manager is an extension that enables organizations to document incidents and combine them with sequence evidence (video and, potentially, audio) from the XProtect VMS.



Users of XProtect Incident Manager can besides video save all the incident information in incident projects. From the incident projects, they can track the status and activities of each incident. In this way, the users can manage incidents effectively and easily share strong incident evidence, both internally with colleagues and externally with authorities.

XProtect Incident Manager helps organizations gain an overview and understanding of the incidents happening in the areas they survey. This knowledge enables the organizations to implement steps to minimize the chance that similar incidents happen in the future.

In XProtect Management Client, the administrators of an organization's XProtect VMS can define the available incident properties in XProtect Incident Manager to the organizations' needs. The operators of XProtect Smart Client start, save, and manage incident projects and add various information to the incident projects. This includes free text, incident properties that the administrators have defined, and sequences from the XProtect VMS. For full traceability, the XProtect VMS logs when administrators define and edit incident properties and when operators create and update the incident projects.

XProtect LPR for administrators

XProtect LPR enables you to use video-based content analysis (VCA) and recognition of vehicle license plates that interacts with your surveillance system and your XProtect Smart Client.

To read the characters on a plate, XProtect LPR uses optical character recognition on images aided by specialized camera settings.

You can combine LPR (license plate recognition) with other surveillance features such as recording and event-based activation of outputs.

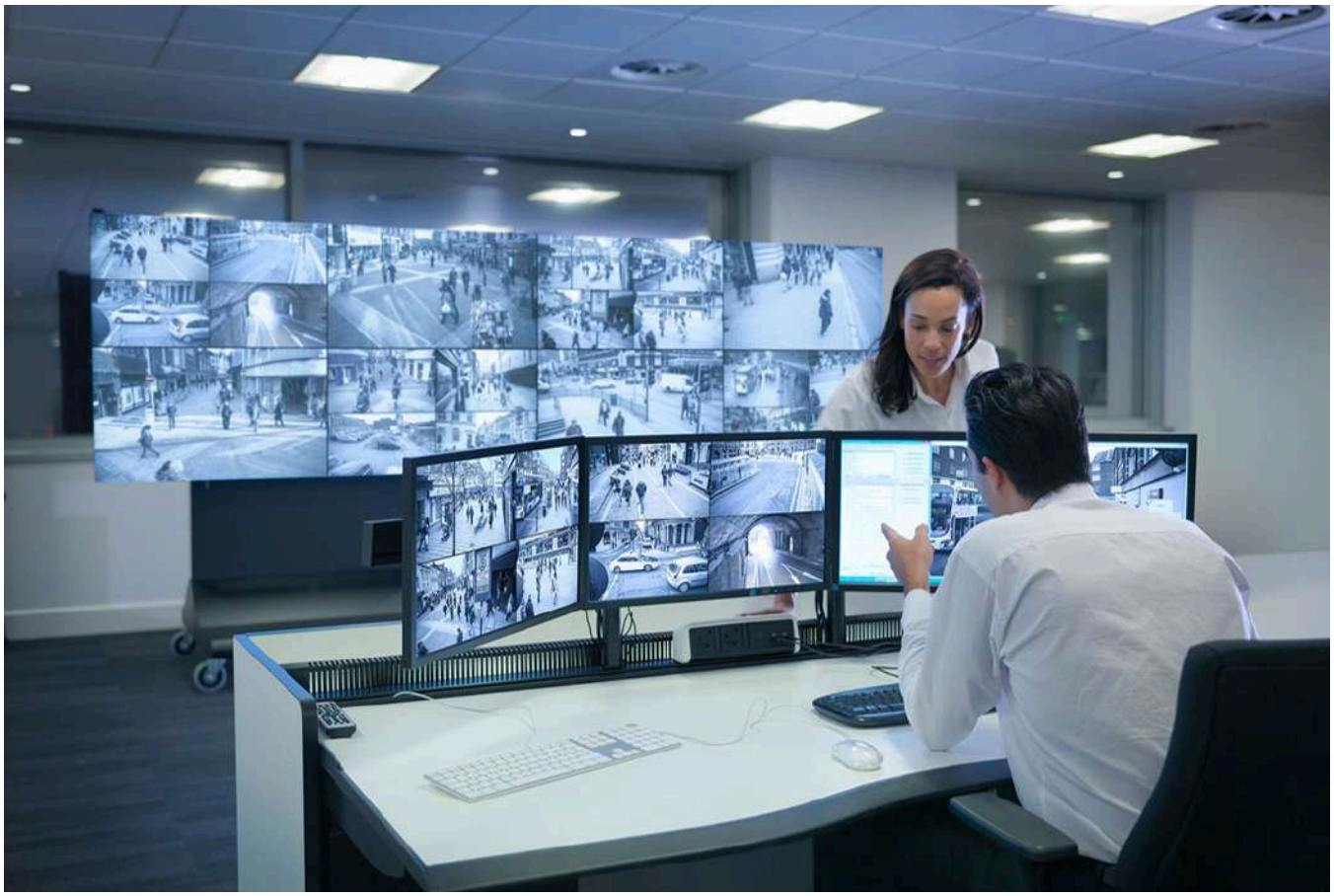
Examples of events in XProtect LPR:

- Activate recordings in a particular quality
- Trigger alarms
- Match against positive and negative match lists
- Open gates
- Switch on lights
- Automatically display incident footage on the screens of designated security staff
- Send text messages to mobile phones.

With an event, you can activate alarms in XProtect Smart Client.

XProtect Smart Wall for administrators

XProtect Smart Wall is an advanced extension that enables organizations to create video walls that meet their specific security demands. XProtect Smart Wall provides an overview of all the video data in the XProtect VMS system and supports any amount or combination of monitors.



XProtect Smart Wall allows operators to view static video walls as defined by their system administrator with a fixed set of cameras and monitor layout. However, the video wall is also operator-driven in the sense that operators can control what is being displayed. This includes:

- Pushing cameras and other types of content to the video wall, for example images, text, alarms, and smart map
- Sending entire views to the monitors
- In the course of certain events, applying alternate presets

See also The Smart Wall control.

Finally, display changes can be controlled by rules that automatically change the presets based on specific events or time schedules.

XProtect Transact for administrators

XProtect Transact is an extension to Milestone's IP video surveillance solutions that lets you observe ongoing transactions and investigating transactions in the past. The transactions are linked with the digital surveillance video monitoring the transactions, for example to help you prove fraud or provide evidence against a perpetrator. There is a 1-to-1 relationship between the transaction lines and video images.

The transaction data may originate from different types of transaction sources, typically point of sales (PoS) systems or automated teller machines (ATM). When selecting a transaction line, a video still frame from each of the associated cameras is displayed in a preview area that allows you to review the recordings. Below the preview area, the transaction associated with the selected line is displayed as a receipt.

XProtect Management Server Failover

If a standalone computer running the management server or SQL Server has a hardware failure, it does not affect recordings or the recording server. However, these hardware failures can result in downtime for operators and administrators who have not logged in to the clients.

XProtect Management Server Failover is an XProtect VMS extension that can help you when:

- A server fails – you can run the system components from another computer while you resolve the problems.
- You need to apply system updates and security patches – applying security patches on a standalone management server can be time-consuming, resulting in extended periods of downtime. When you have a failover cluster, you can apply system updates and security patches with minimal downtime.
- You need seamless connection – users get continuous access to live and playback video, and to the system's configuration at all times.

To configure XProtect Management Server Failover, you install the management server, log server, and event server on two computers. If the first computer stops working, the VMS components start running on the second computer. Additionally, you can benefit from a secure real-time replication of the VMS databases when SQL Server runs in the failover cluster.

XProtect Hospital Assist

XProtect Hospital Assist is designed exclusively for hospital units caring for patients in need of 24/7 or situational observation.

This XProtect VMS extension is a dedicated solution to remotely monitor patients which allows the hospital to:

- Increase staff efficiency.
- React to incidents rapidly.
- Provide high-quality patient care.

With this XProtect extension, XProtect Smart Client users can:

- Add a sticky note to camera views using Sticky Notes.
- Blur the live video stream using Privacy Blur.
- Receive an alarm when a patient fall with Fall Detection.
- Listen to multiple rooms and speak with a patient remotely using Multiroom Audio.

Husky IVO System Health

Husky IVO System Health helps you to get a quick overview of the general status of all Husky IVO units you have specifically connected to XProtect management server in order to report system health data.

System health data for Husky IVO units that have not been connected to the XProtect management server specifically for sending system health data will not be displayed.

The status of the connected Husky IVO units is displayed in the Husky IVO System Health node in XProtect Management Client. The Husky IVO System Health only displays system health data from Husky IVO units.

Plug-in installation required

The Husky IVO System Health node is only accessible after the Husky IVO System Health plug-in has been installed on the XProtect management server.

Beta version

Husky IVO System Health is currently released as a beta version. The appearance and function of the final version may differ from the beta version.

System health status indicators

The general status indicators displayed on the Husky IVO System Health overview node are:

- **All is fine**: No discovered issues to report.
- **Needs Attention**: One or more issues have been detected that require your attention.
- **Missing Data**: The status cannot be reported due to insufficient data.

Check the system health of a specific unit

The system health data of specific Husky IVO units can also be displayed. Select a unit name in the system health overview node to open a new page where key system health statistics for that unit are displayed.

The system health data for individual units will typically display these key status indicators:

- **Data storage status**: The status of the machine's storage as well as the selected storage management option.
- **RAM usage**: The total RAM capacity in GB as well as the current free RAM capacity in GB.
- **CPU load**: The current load on the CPU, measured as a percentage of the maximum theoretical load.
- **CPU temperature**: The CPU temperature in Celsius and Fahrenheit
- **Network**: The online/offline status of all registered NIC slots on the unit.

Some system health data will depend on the unit's hardware, for example power supply data will be displayed for units that contain dual (redundant) power supply options and GPU load and GPU temperature data will be displayed for units that contain discrete GPU cards.

Connecting to Husky System Health

Each Husky IVO unit must manually be connected to the management client using its local Husky Assistant software.

The following Husky IVO revisions can connect to the Husky IVO System Health node:

• Milestone Husky IVO 150D, revision 2 or later

• Milestone Husky IVO 350T, revision 3 or later

• Milestone Husky IVO 350R or later

• Milestone Husky IVO 700R, revision 2 or later

• Milestone Husky IVO 1000R, revision 2 or later

• Milestone Husky IVO 1800R or later

As the system health connection process is started on the **System Health** page in the Husky Assistant, you may have to update the Husky Assistant on individual Husky IVO units to the newest version in order to access the **System Health** page.

It is not possible to mass-connect or automatically connect multiple Husky IVO machines send system health data to the XProtect management server.

To connect a Husky IVO unit, you must click the **Connect** button on the **System Health** page in the Husky Assistant on the Husky IVO unit and provide the address to the machine of the management client as well as administrator credentials.

Troubleshooting Husky IVO issues

You cannot troubleshoot or fix any reported Husky IVO unit issues from the XProtect management server. You must instead directly access the units in question to conduct any mitigation or troubleshooting.

Hardware (explained)

Hardware represents either:

- The physical unit that connects directly to the recording server of the surveillance system via IP, for example a camera, a video encoder, an I/O module
- A recording server on a remote site in a Milestone Interconnect setup

You have several options for adding hardware to each recording server in your system.

If your hardware is located behind a NAT-enabled router or a firewall, you may need to specify a different port number and configure the router/firewall so it maps the port and IP addresses that the hardware uses.

The **Add Hardware** wizard helps you detect hardware like cameras and video encoders on your network and add them to the recording servers on your system. The wizard also helps you add remote recording servers for Milestone Interconnect setups. Only add hardware to **one recording server** at a time.

Hardware pre-configuration (explained)

Certain manufacturers require that credentials be set on out-of-the-box hardware before adding the hardware to a VMS

system for the first time. This is referred to as hardware pre-configuration, and is done through the **Pre-configure hardware devices** wizard that appears when such hardware is detected by the Add hardware wizard.

Some important information regarding the **Pre-configure hardware devices** wizard:

- Hardware that requires initial credentials before being added to a VMS system cannot be added using the typical default credentials, and must be configured through the wizard or by connecting to the hardware directly
- You can only apply credentials (user name or password) to fields that are marked as **not set**
- Once the hardware **status** is set to **configured**, you cannot change the credentials (user name or password)
- Pre-configuration applies to out-of-the-box hardware and needs to be done only once. Once pre-configured, hardware can be managed like any other hardware in Management Client
- After you close the **Pre-configure hardware devices** wizard, pre-configured hardware will appear in the in the Add hardware wizard, and can now be added to your system

It is highly recommended that you add the pre-configured hardware to your system by completing the Add hardware wizard after you close the **Pre-configure hardware devices** wizard. Management Client will not retain the pre-configured credentials if you do not add the hardware to your system.

Devices (explained)

Hardware has a number of devices that you can manage individually, for example:

- A physical camera has devices that represent the camera part (lenses) as well as microphones, speakers, metadata, input and output either attached or built-in
- A video encoder has multiple analog cameras connected that appear in one list of devices that represent the camera part (lenses) as well as microphones, speakers, metadata, input and output either attached or built-in
- An I/O module has devices that represent the input and output channels for, for example, lights
- A dedicated audio module has devices that represent microphones and speaker inputs and outputs
- In a Milestone Interconnect setup, the remote system appears as hardware with all devices from the remote system listed in one list

The system automatically adds the hardware's devices when you add hardware.

For information about supported hardware, see the supported hardware page on the Milestone website (https://www.milestonesys.com/support/tools-and-references/supported-devices/).

The following sections describe each of the device types that you can add.

Cameras

Camera devices deliver video streams to the system that the client users can use to view live video or that the system can record for later playback by the client users. Roles determine the users' permission to view video.

Microphones

On many devices, you can attach external microphones. Some devices have built-in microphones.

Microphone devices deliver audio streams to the system that the client users can listen to live or the system can record for later playback by the client users. You can set up the system to receive microphone-specific events that trigger relevant actions.

Roles determine the users' permission to listen to microphones. You cannot listen to microphones from the Management Client.

Speakers

On many devices you can attach external speakers. Some devices have built-in speakers.

The system sends an audio stream to the speakers when a user presses the talk button in XProtect Smart Client You can also use this feature from XProtect Web Client and XProtect® Mobile. Speaker audio is only recorded when talked to by a user. Roles determine users' permission to talk through speakers. You cannot talk through speakers from the Management Client.

If two users want to speak at the same time, the roles determine users' permission to talk through speakers. As part of the roles definition, you can specify a speaker priority from very high to very low. If two users want to speak at the same time, the user whose role has the highest priority wins the ability to speak. If two users with the same role want to speak at the same time, the first-come first-served principle applies.

Metadata

Metadata devices deliver data streams to the system that the client users can use to view data about data, for example, data that describes the video image, the content or objects in the image, or the location of where the image was recorded. Metadata can be attached to cameras, microphones, or speakers.

Metadata can be generated by:

- The device itself delivering the data, for example a camera that is delivering video
- A third-party system or integration via a generic metadata driver

The device-generated metadata is automatically linked to one or more devices on the same hardware.

Roles determine the users' permission to view metadata.

Inputs

On many devices, you can attach external units to input ports on the device. Input units are typically external sensors. You can use such external sensors, for example, for detecting if doors, windows, or gates are opened. Input from such external input units is treated as events by the system.

You can use such events in rules. For example, you could create a rule specifying that a camera should begin recording when an input is activated, and stop recording 30 seconds after the input is deactivated.

Outputs

On many devices, you can attach external units to output ports on the device. This allows you to activate/deactivate lights, sirens, etc. through the system.

You can use output when creating rules. You can create rules that automatically activate or deactivate outputs, and rules that trigger actions when the state of an output is changed.

Device groups (explained)

Grouping of devices into device groups is part of the **Add Hardware** wizard, but you can always modify the groups and add more groups if needed.

You can benefit from grouping different types of devices (cameras, microphones, speakers, metadata, inputs, and outputs) on your system:

- Device groups help you maintain an intuitive overview of devices on your system
- Devices can exist in several groups
- You can create subgroups and subgroups in subgroups
- You can specify common properties for all devices within a device group in one go
- Device properties set via the group are not stored for the group but on the individual devices
- When dealing with roles, you can specify common security settings for all devices within a device group in one go

- When dealing with rules, you can apply a rule for all devices within a device group in one go

You can add as many device groups as required, but you cannot mix different types of devices (for example cameras and speakers) in a device group.

Create device groups with **less** than 400 devices so you can view and edit all properties.

If you delete a device group, you only delete the device group itself. If you want to delete a device, for example a camera, from your system, do it on the recording server level.

The following examples are based on grouping cameras into device groups, but the principles apply for all devices

Add a device group

Specify which devices to include in a device group

Specify common properties for all devices in a device group

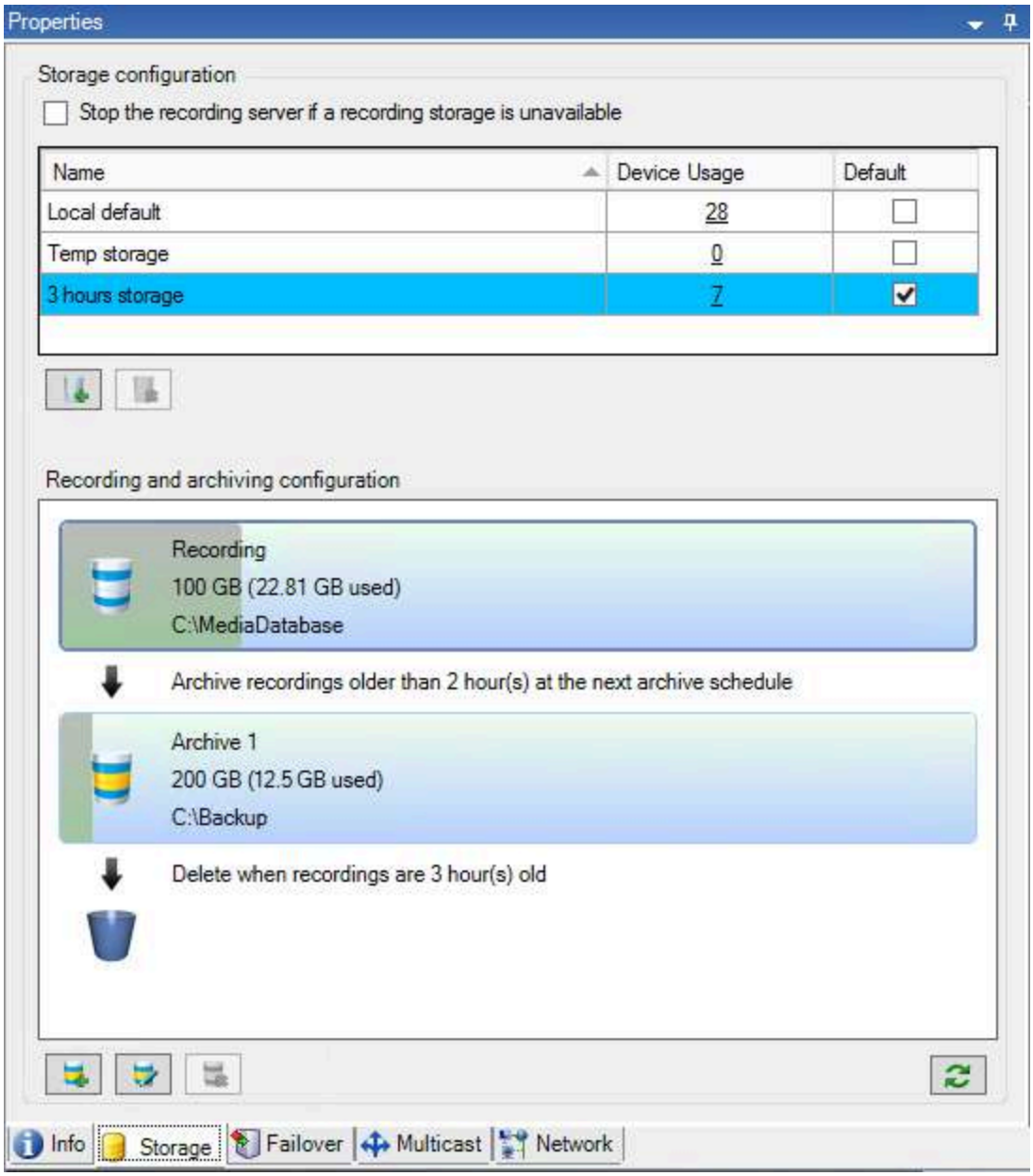
Storage and archiving (explained)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Storage** tab, you can set up, manage and view storages for a selected recording server.

For recording storages and archives, the horizontal bar shows the current amount of free space. You can specify the behavior of the recording server in case recording storages become unavailable. This is mostly relevant if your system includes failover servers.

If you are using **Evidence lock**, there will be a vertical red line showing the space used for evidence locked footage.



When a camera records video or audio, all specified recordings are by default stored in the storage defined for the device. Each storage consists of a recording storage that saves recordings in the recording database **Recording**. A storage has no default archive(s), but you can create these.

To avoid that the recording database runs full, you can create additional storages (see Add a new storage). You can also create archives (see Create an archive within a storage) within each storage and start an archiving process to store data.

Archiving is the automatic transfer of recordings from, for example, a camera's recording database to another location. In this way, the amount of recordings that you can store is not limited to the size of the recording database. With archiving you can also back up your recordings to another media.

You configure storage and archiving on each recording server.

As long as you store archived recordings locally or on accessible network drives, you can use XProtect Smart Client to view them.

If a disk drive breaks and the recording storage becomes unavailable, the horizontal bar turns red. It is still possible to view live video in XProtect Smart Client, but recording and archiving stops until the disk drive is restored. If your system is configured

with failover recording servers, you can specify the recording server to stop running, to let the failover servers take over (see Specify behavior when recording storage is unavailable).

The following mostly mentions cameras and video, but speakers, microphones, audio and sound also apply.

Milestone recommends that you use a dedicated hard disk drive for recording storages and archives to prevent low disk performance. When you format the hard disk, it is important to change its **Allocation unit size** setting from 4 to 64 kilobytes. This is to significantly improve recording performance of the hard disk. You can read more about allocating unit sizes and find help on the Microsoft website (https://learn.microsoft.com/en-us/windows-server/storage/file-server/ntfs-overview).

The oldest data in a database is always auto-archived (or deleted if no next archive is defined) when less than 5GB of space is free. If less than 1GB space is free, data is deleted. A database always requires 250MB of free space. If you reach this limit because data is not deleted fast enough, attempts to write to the database might fail and in that case no more data is written to the database until you free up enough space. The actual maximum size of your database becomes the amount of gigabytes that you specify, minus 5GB.

For FIPS 140-2 compliant systems, with exports and archived media databases from XProtect VMS versions prior to 2017 R1 that are encrypted with non FIPS-compliant cyphers, it is required to archive the data in a location where it can still be accessed after enabling FIPS. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

Attaching devices to a storage

Once you have configured the storage and archiving settings for a recording server, you can enable storage and archiving for individual cameras or a group of cameras. You do this from the individual devices or from the device group. See Attach a device or group of devices to a storage.

Effective archiving

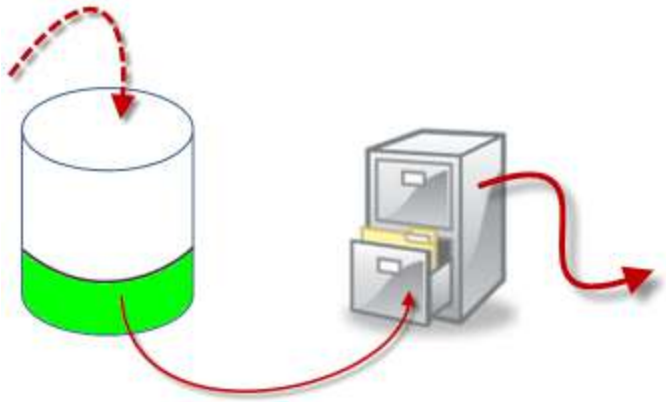
When you enable archiving for a camera or a group of cameras, the content of the recording storage is automatically moved to the first archive at intervals that you define.

Depending on your requirements, you can configure one or more archives for each of your storages. Archives can be located either on the recording server computer itself, or at another location which can be reached by the system, for example on a network drive.

By setting up your archiving in an effective way, you can optimize storage needs. Often, you want to make archived recordings take up as little space as possible, especially on a long-term basis, where it is perhaps even possible to slacken image quality a bit. You handle effective archiving from the **Storage** tab of a recording server by adjusting several interdependent settings:

- Recording storage retention
- Recording storage size
- Archive retention
- Archive size
- Archive schedule
- Encryption
- Frames Per Second (FPS).

The size fields define the size of the recording storage, exemplified by the cylinder, and its archive(s) respectively:



By means of retention time and size setting for the recording storage, exemplified by the white area in the cylinder, you define how old recordings must be before they are archived. In our illustrated example, you archive the recordings when they are old enough to be archived.

The retention time and size setting for archives define how long the recordings remain in the archive. Recordings remain in the archive for the time specified, or until the archive has reached the specified size limit. When these settings are met, the system begins to overwrite old recordings in the archive.

The archiving schedule defines how often and at what times archiving takes place.

FPS determines the size of the data in the databases.

To archive your recordings, you must set all these parameters up in accordance with each other. This means that the retention period of the next archive must always be longer than the retention period of a current archive or recording database. This is because the number of retention days stated for an archive includes all retention stated earlier in the process. Archiving must also always take place more frequently than the retention period, otherwise you risk losing data. If you have a retention time of 24 hours, any data older than 24 hours is deleted. Therefore, to get your data safely moved to the next archive, it is important to run archiving more often than every 24 hours.

Example: These storages (image to the left) have a retention time of 4 days and the following archive (image to the right) a retention time of 10 days. Archiving is set to occur every day at 10:30, ensuring a much more frequent archiving than retention time.

You can also control archiving by use of rules and events.

Archive structure (explained)

When you archive recordings, they are stored in a certain sub-directory structure within the archive.

During all regular use of your system, the sub-directory structure is completely transparent to the system's users, as they browse all recordings with the XProtect Smart Client regardless of whether the recordings are archived or not. Knowing the sub-directory structure is primarily interesting if you want to back up your archived recordings.

In each of the recording server's archive directories, the system automatically creates separate sub-directories. These sub-directories are named after the name of the device and the archive database.

Because you can store recordings from different cameras in the same archive, and since archiving for each camera is likely to be performed at regular intervals, further sub-directories are also automatically added.

These sub-directories each represent approximately an hour's worth of recordings. The one-hour split makes it possible to remove only relatively small parts of an archive's data if you reach the maximum allowed size of the archive.

The sub-directories are named after the device, followed by an indication of where the recordings came from (edge storage or via SMTP), **plus** the date and time of the most recent database record contained in the sub-directory.

Naming structure

...[Storage Path]\[Storage name]\[device-name] - plus date and time of most recent recording]\

If from edge storage:

...[Storage Path]\[Storage name]\[device-name] (Edge) - plus date and time of most recent recording]\

If from SMTP:

...[Storage Path]\[Storage name]\[device-name] (SMTP) - plus date and time of most recent recording]\

Real life example

...F:\OurArchive\Archive1\Camera 1 on Axis Q7404 Video Encoder(10.100.50.137) - 2011-10-05T11:23:47+02:00\

Sub-directories

Even further sub-directories are automatically added. The amount and nature of these sub-directories depend on the nature of the actual recordings. For example, several different sub-directories are added if the recordings are technically divided into sequences. This is often the case if you have used motion detection to trigger recordings.

- **Media**: This folder contains the actual media that is either video or audio (not both)
- **MotionLevel**: This folder contains motion level grids generated from the video data using our motion detection algorithm. This data allows the Smart Search feature in XProtect Smart Client to do very fast searches
- **Motion**: In this folder, the system stores motion sequences. A motion sequence is a time slice for which motion has been detected in the video data. This information is, for example, used in the time line in XProtect Smart Client
- **Recording**: In this folder, the system stores recording sequences. A recording sequence is a time slice for which there are coherent recordings of media data. This information is, for example, used to draw the time line in XProtect Smart Client
- **Signature**: This folder holds the signatures generated for the media data (in the Media folder). With this information, you can verify that the media data has not been tampered with since it was recorded

If you want to back up your archives, you can target your backups if you know the basics of the sub-directory structure.

Examples of backup

To back up the content of an entire archive, back up the required archive directory and all of its content. For example, everything under:

...F:\OurArchive\

To back up the recordings from a particular camera from a particular period of time, back up the contents of the relevant sub-directories only. For example, everything under:

...F:\OurArchive\Archive1\Camera 1 on Axis Q7404 Video Encoder(10.100.50.137) - 2011-10-05T11:23:47+02:00\

Pre-buffering and storage of recordings (explained)

Pre-buffering is the ability to record audio and video before the actual triggering event occurs. This is useful when you want to record the audio or video that leads up to an event that triggers recording, for example, opening a door.

Pre-buffering is possible because the system continuously receives audio and video streams from the connected devices and temporarily stores them for the defined pre-buffer period.

- If a recording rule is triggered, the temporary recordings are made permanent for the rule's configured pre-recording time
- If no recording rule is triggered, the temporary recordings in the pre-buffer are automatically deleted after the defined pre-buffer time

Storage of the temporary pre-buffer recordings

You can choose the storage location of the temporary pre-buffer recordings:

- In the memory; the pre-buffer period is limited to 15 seconds.
- On the disk (in the media database); you can choose all values.

Storage to the memory instead of to disk improves system performance but is only possible for shorter pre-buffer periods.

When recordings are stored in the memory, and you make some of the temporary recordings permanent, the remaining temporary recordings are deleted and cannot be restored. If you need to be able to keep the remaining recordings, store the recordings on the disk.

Active Directory (explained)

Active Directory is a distributed directory service implemented by Microsoft for Windows domain networks. It is included in most Windows Server operating systems. It identifies resources on a network in order for users or applications to access them.

With the Active Directory installed, you can add Windows users from Active Directory, but you also have the option of adding basic users without Active Directory. There are certain system limitations related to basic users.

Users (explained)

The term **users** primarily refers to users who connect to the surveillance system through the clients. You can configure such users in two ways:

- As **basic users**, authenticated by a user name/password combination
- As **Windows users**, authenticated based on their Windows login

Windows Users

You add Windows Users through the use of Active Directory. Active Directory (AD) is a directory service implemented by Microsoft for Windows domain networks. It is included in most Windows Server operating systems. It identifies resources on a network in order for users or applications to access them. Active Directory uses the concepts of users and groups.

Users are Active Directory objects representing individuals with a user account. Example:

Groups are Active Directory objects with several users. In this example, the Management Group has three users:

Groups can contain any number of users. By adding a group to the system, you add all of its members in one go. Once you have added the group to the system, any changes made to the group in Active Directory, such as new members you add or old members you remove at a later stage, are immediately reflected in the system. A user can be a member of more than one group at a time.

You can use Active Directory to add existing user and group information to the system with some benefits:

- Users and groups are specified centrally in Active Directory so you do not have to create user accounts from scratch
- You do not have to configure any authentication of users on the system as Active Directory handles authentication

Before you can add users and groups through the Active Directory service, you must have a server with Active Directory installed on your network.

Basic users

If your system does not have access to Active Directory, create a basic user. For information about how to set up basic users, see Create basic users.

Identity Provider (explained)

Identity Provider app pool (IDP) is a system entity that creates, maintains, and manages identity information for basic users.

Identity Provider also provides authentication and registration services to relying applications or services, in this case: Recording Server, Management Server, Data Collector, and Report Server.

When you log in to XProtect clients and services as a basic user, your request goes to the Identity Provider. When authenticated the user can call the management server.

Identity Provider runs in the IIS as a part of the management server using the same SQL Server with a separate database and is responsible for creating and handling OAuth communication tokens that services use when communicating (Surveillance_IDP).

Identity Provider logs can be found at: `\\ProgramData\Milestone\IDP\Logs`.

External IDP (explained)

IDP is an acronym for Identity Provider. An external IDP is an external application and service where you can store and manage user identity information and provide user authentication services to other systems. You can associate an external IDP with the XProtect VMS.

XProtect supports external IDPs that are compatible with OpenID Connect (OIDC).

User authentication

With an external IDP configured, the XProtect clients support the use of external IDPs as an additional authentication option.

When the computer address in the client login screen points to an XProtect VMS with an external IDP configured, an API call will be triggered and the authentication option for the external IDP will be available on the login screen. The API call is activated when the client is started and whenever the address is changed.

The particular API that the client queries is a public API that does not require any user authentication, so this information can always be read by the client.

Claims

A claim is a statement that an entity such as a user or an application makes about itself.

The claim consists of a claim name and a claim value. For example, the claim name could be a standard name that describes the content of the claim value, and the claim value could be the name of a group. See more example of claims from an external IDP: Example of claims from an external IDP.

Claims are not mandatory. However, they are required in order to automatically link external IDP users to roles in the XProtect VMS in order to determine the users' permissions. The claims are included in the users' ID token from the external IDP and through the association with roles they determine the user's permissions in XProtect.

If claims related to the XProtect VMS roles are not provided for the external IDP users, the external IDP users can be created in the XProtect VMS when they log on for the first time. In this case the external IDP users are not linked to any roles. The XProtect VMS administrator must then manually add the users to roles.

Prerequisites for external IDPs

The following steps should be completed in the external IDP before it is configured in the VMS.

- The client ID and secret for use with the XProtect VMS must have been created in the external IDP. For more information, see Unique user names for external IDP users .
- The authentication authority for the external IDP must be known. For more information, see the information about authentication authority for the external IDP in the **Options** dialog box. must be known.
- The redirect URIs to the XProtect VMS must have been configured in the IDP. For more information, see Add redirect URIs for the web clients.
- Optionally, VMS related claims must have been configured for the users or groups in the IDP.
- The XProtect VMS must be fully configured with certificates to ensure that all communication is done over encrypted https. otherwise, most external IDPs will not accept requests from the XProtect VMS and its clients, or a part of the communication flow and security token exchange will fail.
- It must be possible for the XProtect VMS and all client computers or smart phones that should use the external IDP to contact the external IDPs login address

Enable users to log in to the XProtect VMS from an external IDP

- From the external IDP, create the users and create claims to identify users as external IDP users in the XProtect VMS. The creation of claims is not a mandatory step but this is how you enable automatically linking users to roles. For more information, see Claims.
- From the XProtect VMS, create a configuration that enables the Identity Provider, that is built into the VMS, to contact the external IDP. For more information about how to create a configuration for an external IDP, see Add and configure an external IDP.
- From the XProtect VMS, establish authentication of users by mapping the user claims from the external IDP to XProtect roles. For more information about how to map claims to roles, see Map claims from an external IDP to roles in XProtect.
- Log into an XProtect client using an external IDP for user authentication, see Log in via an external IDP.

Redirect URIs

The redirect URI specifies the page that the user is sent to after a successful authentication. In your external IDP, you must add the address of the management server followed by the **Callback path** you defined in XProtect Management Client. For example, https://management-server-computer.company.com/idp/signin-oidc

Depending on how the XProtect VMS is accessed, how the network, servers and Microsoft Active Directory is configured, several redirect URIs may be needed, you can see some examples below:

Examples

Management server with or without the domain in the URL:

- “https://[server_name]/idp/signin-oidc”
- “https://[server_name].[domain_name]/idp/signin-oidc”

Mobile server with or without the domain in the URL:

- “https://[server_name]:[mobile_port]/idp/signin-oidc”
- “https://[server_name].[domain_name]:[mobile_port]/idp/signin-oidc”

If the mobile server is set up to be accessed over the internet, you must also add the public address and ports.

Unique user names for external IDP users

User names are created automatically for users that log in to Milestone XProtect via an external IDP.

The external IDP provides a set of claims to automatically create a name for the user in XProtect, and in XProtect an algorithm is used to pick a name from the external IDP that is unique in the VMS database.

Example of claims from an external IDP

The claims consist of a claim name and a claim value. For example:

Claim name	Claim value
name	Raz Van
email	123@domain.com
amr	pwd
idp	00o2ghkgazGgi9BIE5d7
preferred_username	321@domain.com
vmsRole	Operator
locale	en-US
given_name	Raz
family_name	Lindberg
zoneinfo	America/Los_Angeles
email_verified	True

Using sequence number of claim to create user names in XProtect

In XProtect, the search priority for when creating a user in the XProtect VMS is controlled by the sequence number of the claims in the table below. The first available claim name will be used in the XProtect VMS:

Claim name	Sequence number	Description
UserNameClaimType	1	Configured mapping with one claim to define the user name. The claim is defined in the **Claim to use to create user name** field on the **External IDP** tab under **Tools** > **Options**.
preferred_username	2	Claim that can come from the external IDP. A standard claim that is normally used for this in Oidc (OpenID Connect).
name	3	
given_name family_name	4	Given name and family name in a combination such as Bob Johnson.
email	5	
First available claim + #(first available number)	6	For example, Bob#1

Defining specific claims to create user names in XProtect

The XProtect administrators can define a specific claim from the external IDP that should be used to create a user name in the XProtect VMS. When an administrator define a claim to use for the creation of the user name in the XProtect VMS, the claim name must be written exactly as the claim name coming from the external IDP.

- The claim to use for the user name can be defined in the **Claim to use to create user name** field on the **External IDP** tab under **Tools** > **Options** .

Deleting external IDP users

Users created in XProtect by an external IDP login are deleted the same way as a basic user and the user can be deleted at any time after the user is created.

If a user is deleted in XProtect and the user logs in again from the external IDP, a new user will be created in XProtect. However, the data associated with the user in XProtect such as private views and roles are lost and this information has to be created again for the user in XProtect.

If an external IDP is deleted in the Management Client, any users connected to the VMS via the external IDP are also deleted.

Roles and permissions of a role (explained)

All users in Milestone XProtect VMS belong to a role.

Roles define users' permissions, including the devices the users can access. Roles also define security and access permissions within the video management system.

The system comes with a default **Administrators** role with full access to all system functionality, but in most cases you need more than one role in your system, to differentiate between users and the access they should have. You can add as many roles as you need. See Assign/remove users and groups to/from roles.

For example, you might need to set up different types of roles for users of XProtect Smart Client, depending on the devices you want them to have access to, or similar types of restrictions that require differentiation between users.

To create a differentiation between users, you must:

- Create and set up the roles that you need to suit your organization's business needs
- Add users and user groups that you assign to the roles they should belong to
- Create Smart Client profiles and Management Client profiles to define what users can see in the XProtect Smart Client and Management Client user interface.

  Roles only control your access permissions, and not what users can see in the user interface in XProtect Smart Client or the Management Client. You do not need create a specific Management Client profile for users that will never use the Management Client.

For the best possible user experience for XProtect Smart Client users or Management Client users with limited access to Management Client functionality, you should ensure that there is consistency between the permissions provided by the role and the user interface elements provided by the Smart Client or Management Client profile.

> To have access to the Management Server, it is important that all roles have the **Connect** security permission enabled. The permission is located in **Role Settings** > **Management Server** > Overall Security tab (roles).

To set up roles in your system, expand the **Security** > **Roles**.

Permissions of a role

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

When you create a role in your system, you can assign that role to a number of permissions to the system components or features which the relevant role can access and use.

For example, you might want to create roles that only have permissions to access functionality in XProtect Smart Client or other Milestone viewing clients, with the permissions to view only certain cameras. If you create such roles, these roles should not have permissions to access and use the Management Client, but only have access to some or all functionality found in XProtect Smart Client or other clients.

To address this need for differentiation, you then set up a role that has some or most typical administrator permissions, for example, the permissions to add and remove cameras, servers and similar functionality. You can create roles that have some or most permissions of a system administrator. This may, for example, be relevant if your organization wants to separate between people who can administrate a subset of the system and people who can administrate the entire system.

Roles give you the possibility to provide differentiated administrator permissions to access, edit, or change a large variety of system functions. For example, the permission to edit the settings for servers or cameras in your system. You specify these permissions on the **Overall Security** tab (see Overall Security tab (roles)). To enable that the differentiated system administrator can launch the Management Client, you must grant read permissions on the management server for the role.

> To have access to the Management Server, it is important that all roles have the **Connect** security permission enabled. The permission is located in **Role Settings** > **Management Server** > Overall Security tab (roles).

You can also reflect the same limitations in the user interface of the Management Client for each role by associating the role with a Management Client profile that has the removed the corresponding system functions from the user interface. See Management Client profiles (explained) for information.

To give a role such differentiated administrator permissions, the person with the default full administrator role must set up the role under **Security** > **Roles > Info tab > Add new**. When you set up the new role, you can then associate the role with your own profiles must similarly to when you set up any other role in the system or use the system's default profiles. For more information, see Add and manage a role.

When you have specified the profiles to associate with the role, go to the **Overall Security** tab to specify the permissions of

the role.

The permissions you can set for a role are different between your products. You can only give all available permissions to a role in XProtect Corporate.

Privacy masking (explained)

Privacy masking (explained)

With privacy masking, you can define which areas of the video from a camera you want to cover with privacy masks when shown in the clients. For example, if a surveillance camera covers a street, you can cover certain areas of a building (could be windows and doors) with privacy masks, to protect the privacy of residents. In some countries, this is a legal requirement.

You can specify privacy masks as either solid or blurred. The masks cover both live, recorded, and exported video.

Privacy masks are applied and locked to an area of the camera image, so the covered area does not follow the pan-til-zoom movements, but constantly covers the same area of the camera image. On some PTZ cameras, you can enable position based privacy masking on the camera itself.

There are two types of privacy masks:

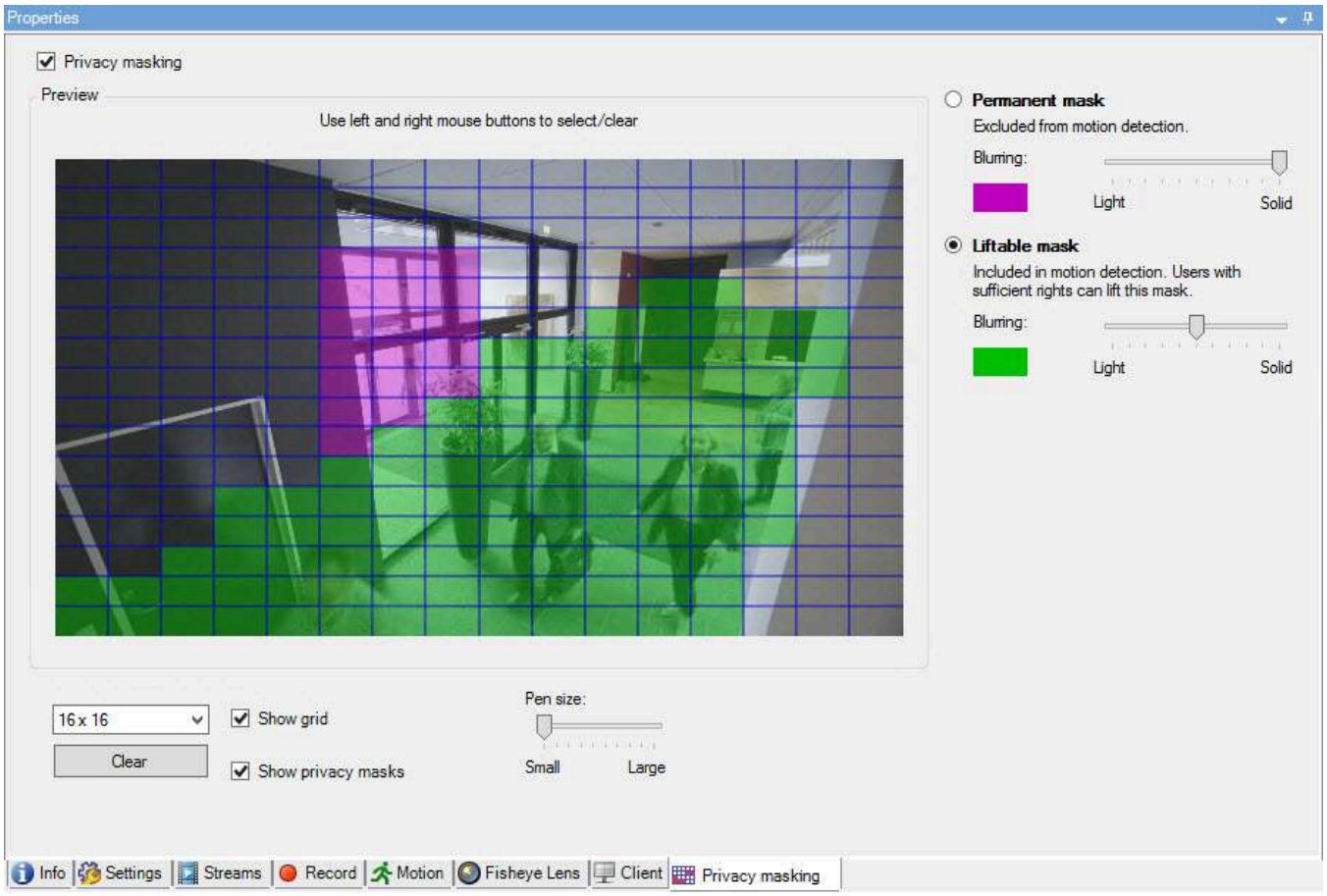
- **Permanent privacy mask**: Areas with this type of mask are always covered in the clients. Can be used to cover areas of the video that never requires surveillance, like public areas, or areas where surveillance is not allowed. Motion detection is excluded from areas with permanent privacy masks
- **Liftable privacy mask**: Areas with this type of mask can be temporarily uncovered in XProtect Smart Client by users with permission to lift privacy masks. If the logged in XProtect Smart Client user does not have the permission to lift privacy masks, the system asks for an authorized user to approve of the lift.
  Privacy masks are lifted until timeout or the user reapply them. Be aware that privacy masks are lifted on video from all cameras that the user has access to

If you upgrade from a 2017 R3 system or older with privacy masks applied, the masks will be converted to liftable masks.

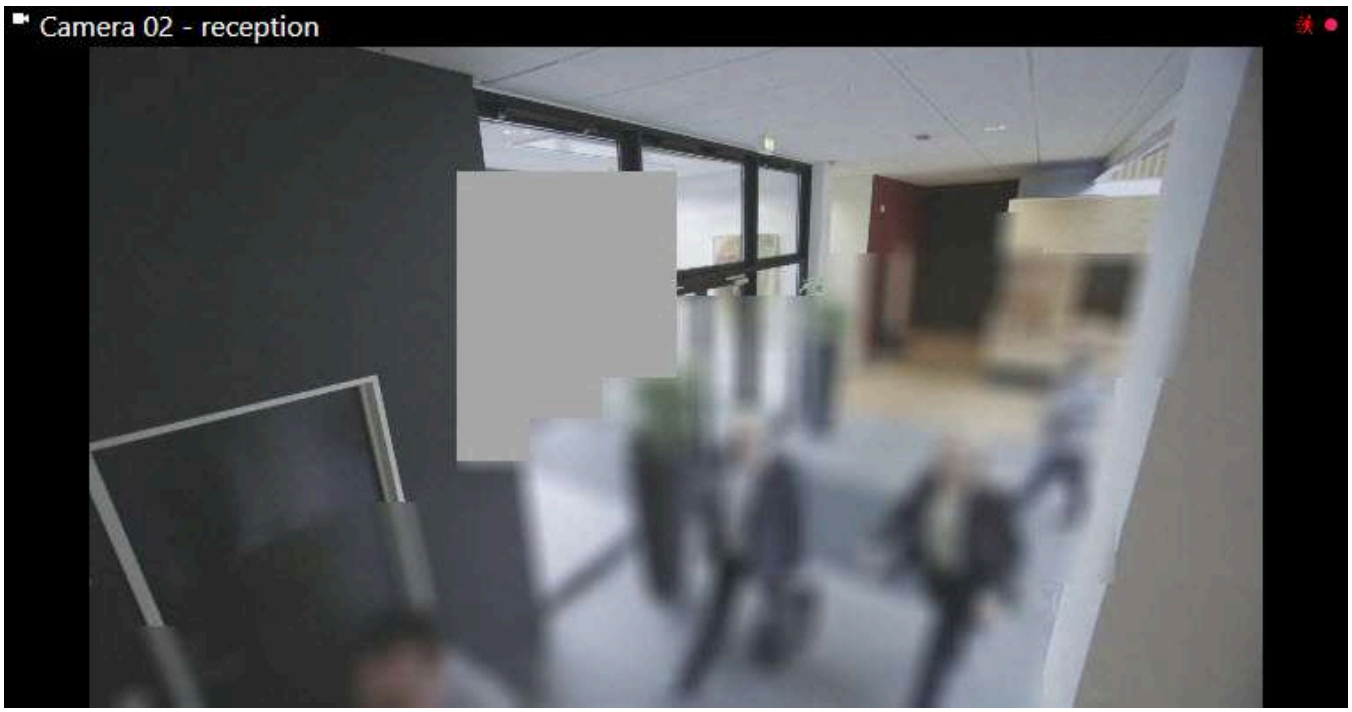
When a user exports or playbacks recorded video from a client, the video includes the privacy masks configured at the time of recording, even if you have changed or removed the privacy masks later. If privacy protection is lifted when exporting, the exported video does **not** include the liftable privacy masks.

If you change privacy masking settings very often, for example once a week, your system can potentially be overloaded.

Example of the **Privacy masking** tab with privacy masks configured:



And this is how they appear in the clients:



You can inform the client users about the settings of permanent and liftable privacy masks.

Management Client profiles (explained)

Management Client profiles allow system administrators to modify the Management Client user interface for other users. Associate Management Client profiles with roles to limit the user interface to represent the functionality available for each administrator role.

Management Client profiles only handle the visual representation of system functionality, not the actual access to it. The overall access to system functionality is granted via the role that individual users are associated with. For information about how to manage overall access to system functionality for a role, see Manage the visibility of functionality for a Management Client profile.

You can change settings for the visibility of all Management Client elements. By default, the Management Client profile can see all functionality in the Management Client.

Smart Client profiles (explained)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

All users in Milestone XProtect VMS belong to a role that has a Smart Client profile connected to it.

Roles define users' permissions and the Smart Client profiles define what users can see in the XProtect Smart Client user interface.

All Milestone XProtect VMS installations include a default Smart Client profile that is set up with a default configuration to display most of the configuration that is available in your organization's system. Some settings are always disabled by default.

In cases where you have several different roles in an organization, you might want to disable functionality that a particular role does not/should not have access to in XProtect Smart Client.

For example, you might have a role whose daily work does not require running any playback of video. For this purpose, you can create a new Smart Client profile for that role where you disable **Playback** mode. When you disable this setting in the Smart Client profile, XProtect Smart Client users with a role that uses this Smart Client profile can no longer see **Playback** mode in their XProtect Smart Client user interface.

It is important to note that Smart Client profiles mostly control what users can see in the XProtect Smart Client user interface and not the role's actual access permissions. Those access permissions, such as access to reading, modifying, or deleting, are controlled by in the role settings. So XProtect Smart Client users can have permissions to functionality through their role which they cannot see in the user interface because it is disabled in the Smart Client profile.

For the best possible user experience for the XProtect Smart Client users, you should ensure that there is consistency between the permissions provided by the role and the user interface elements provided by the Smart Client profile.

To create or edit Smart Client profiles, expand **Client** and select **Smart Client Profiles**.

You can also learn about the relationship between Smart Client profiles, roles and time profiles and how to use these together (see Create and set up Smart Client profiles, roles and time profiles).

Evidence locks (explained)

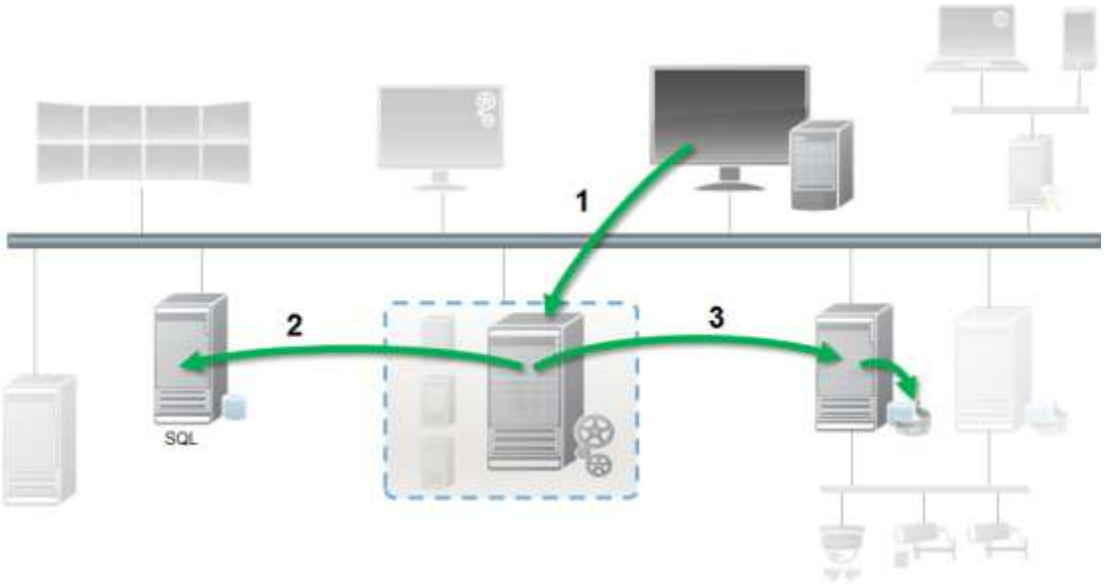
Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

As of XProtect VMS version 2020 R2, when you upgrade the management server from an earlier version, it will not be possible to create or modify evidence locks on recording servers that are version 2020 R1 or earlier, until these recording servers have been upgraded.
This also means that if the hardware has been moved from one recording server (from 2020 R1 or earlier) to another recording server, and it still has recordings on it, then evidence locks cannot be created or modified.

With the evidence lock functionality, client operators can protect video sequences, including audio and other data, from deletion if required, for example, while an investigation or trial is ongoing. For more information, see the user manual for XProtect Smart Client.

When protected, the data cannot be deleted, neither automatically by the system after the system's default retention time or in other situations nor manually by the client users. The system or a user cannot delete the data until a user with sufficient user permissions unlocks the evidence.

Flow diagram for Evidence Lock:



1. A XProtect Smart Client user creates an evidence lock. Information sent to Management Server.
2. Management Server stores information about the evidence lock in the SQL Server database.
3. Management Server informs Recording Server to store and protect the protected recordings in the database.

When the operator creates an evidence lock, the protected data remains in the recording storage that it was recorded to, and is moved to archiving disks together with non-protected data, but the protected data:

- Follows the retention time configured for the evidence lock. Potentially infinitely
- Keeps the original quality of the recordings, even if grooming has been configured for non-protected data

When an operator creates locks, the minimum size of a sequence is the period that the database divides recorded files into, this is by default one-hour sequences. You can change this, but it requires that you customize the RecorderConfig.xml file on the recording server. If a small sequence spans two one-hour periods, the system locks the recordings in both periods.

In the audit log in the Management Client, you can see when a user creates, edits, or deletes evidence locks.

When a disk runs out of disk space, it does not impact the protected data. Instead, the oldest non-protected data will be deleted. If there are no more non-protected data to delete, the system stops recording. You can create rules and alarms triggered by disk full events, so you are automatically notified.

Except for more data being stored for a longer period and potentially affecting disk storage, the evidence lock feature as such does not influence system performance.

If you move hardware (see Move hardware) to another recording server:

- Recordings protected by evidence locks remain on the old recording server with the retention time that was defined when the evidence lock was created
- The XProtect Smart Client user can still protect data with evidence locks on the recordings that were made on a camera before it was moved to another recording server. Even if you move the camera multiple times and the recordings are stored on multiple recording servers

By default, all operators have the default evidence lock profile assigned to them, but no user access permissions to the feature. To specify the evidence lock access permissions of a role, see Device tab (roles) for role settings. To specify the evidence lock profile of a role, see Info tab (roles) for role settings.

In the Management Client, you can edit the properties of the default evidence lock profile and create additional evidence lock profiles and assign these to the roles instead.

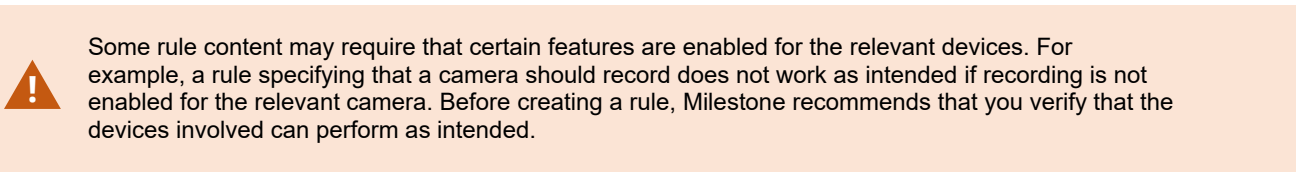
Rules (explained)

Rules specify actions to carry out under particular conditions. Example: When motion is detected (condition), a camera should begin recording (action).

The following are **examples** of what you can do with rules:

- Start and stop recording
- Set non-default live frame rate
- Set non-default recording frame rate
- Start and stop PTZ patrolling
- Pause and resume PTZ patrolling
- Move PTZ cameras to specific positions
- Set output to activated/deactivated state
- Send notifications via e-mail
- Generate log entries
- Generate events
- Apply new device settings, for example a different resolution on a camera
- Make video appear in Matrix recipients
- Start and stop plug-ins
- Start and stop feeds from devices

Stopping a device means that video is no longer transferred from the device to the system, in which case you cannot view live video nor record video. In contrast, a device on which you have stopped the feed can still communicate with the recording server, and you can start the feed from the device automatically through a rule, as opposed to when the device is manually disabled in the Management Client.



Rule complexity

Your exact number of options depends on the type of rule you want to create, and on the number of devices available on your system. Rules provide a high degree of flexibility: you can combine event and time conditions, specify several actions in a single rule, and very often create rules covering several or all the devices on your system.

You can make your rules as simple or complex as required. For example, you can create very simple time-based rules:

Example	Explanation
Very Simple Time-Based Rule	On Mondays between 08.30 and 11.30 (time condition), Camera 1 and Camera 2 should start recording (action) when the time period begins and stop recording (stop action) when the time period ends.
Very Simple Event-Based Rule	When motion is detected (event condition) on Camera 1, Camera 1 should start recording (action) immediately, then stop recording (stop action) after 10 seconds. Even if an event-based rule is activated by an event on one device, you can specify that actions should take place on one or more other devices.
Rule Involving Several Devices	When motion is detected (event condition) on Camera 1, Camera 2 should start recording (action) immediately, and the siren connected to Output 3 should sound (action) immediately. Then, after 60 seconds, Camera 2 should stop recording (stop action), and the siren connected to Output 3 should stop sounding (stop action).
Rule Combining Time, Events, and Devices	When motion is detected (event condition) on Camera 1, and the day of the week is Saturday or Sunday (time condition), Camera 1 and Camera 2 should start recording (action) immediately, and a notification should be sent to the security manager (action). Then, 5 seconds after motion is no longer detected on Camera 1 or Camera 2, the 2 cameras should stop recording (stop action).

Depending on your organization's needs, it is often a good idea to create many simple rules rather than a few complex rules. Even if it means you have more rules in your system, it provides an easy way to maintain an overview of what your rules do. Keeping your rules simple also means that you have much more flexibility when it comes to deactivating/activating individual rule elements. With simple rules, you can deactivate/activate entire rules when required.

Rules and events (explained)

Rules are a central element in your system. Rules determine highly important settings, such as when cameras should record, when PTZ cameras should patrol, when notifications should be sent, etc.

Example - a rule specifying that a particular camera should begin recording when it detects motion:

Events are central elements when using the **Manage Rule** wizard. In the wizard, events are primarily used for triggering actions. For example, you can create a rule which specifies that in the **event** of detected motion, the surveillance system should take the **action** of starting recording of video from a particular camera.

The following types of conditions can trigger rules:

Name	Description
Events	When events occur on the surveillance system, for example when motion is detected or the system receives input from external sensors.
Time interval	When you enter specific periods of time, for example: `Thursday 16th August 2007 from 07.00 to 07.59` or `every Saturday and Sunday`
Failover time interval	Periods of time where failover is active or inactive.
Recurring time	When you set an action to be executed on a detailed, recurring schedule. For example: • Every week on Tuesday every 1 hour(s) between 15:00 and 15:30 • On day 15 every 3 month(s) at 11:45 • Every day every 1 hour(s) between 15:00 and 19:00 The time is based on the local time settings of the server on which Management Client is installed.

You can work with the following under **Rules and Events**:

- **Rules**: Rules are a central element in the system. The behavior of your surveillance system is to a very large extent determined by rules. When creating a rule, you can work with all types of events
- **Time profiles**: Time profiles are periods of time defined in the Management Client. You use them when you create rules in the Management Client, for example to create a rule which specifies that a certain action should take place within a certain time profile
- **Notification profiles**: You can use notification profiles to set up ready-made email notifications, which can automatically be triggered by a rule, for example when a particular event occurs
- **User-defined events**: User-defined events are custom-made events that makes it possible for users to manually trigger events in the system or react to inputs from the system
- **Analytics events**: Analytics events are data received from external third-party video content analysis (VCA) providers. You can use analytics events as basis for alarms
- **Generic events**: Generic events allow you to trigger actions in the XProtect event server by sending simple strings via the IP network to your system

Time profiles (explained)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Time profiles are periods of time defined by the administrator. You can use time profiles when creating rules, for example, a rule specifying that a certain action should take place within a certain time period.

Time profiles are also assigned to roles, along with Smart Client profiles. By default, all roles are assigned the default time profile **Always**. This means that members of roles with this default time profile attached has no time-based limits to their user

permissions in the system. You can also assign an alternative time profile to a role.

Time profiles are highly flexible: you can base them on one or more single periods of time, on one or more recurring periods of time, or a combination of single and recurring times. Many users may be familiar with the concepts of single and recurring time periods from calendar applications, such as the one in Microsoft® Outlook.

Time profiles always apply in local time. This means that if your system has recording servers placed in different time zones, any actions, for example recording on cameras, associated with time profiles are carried out in each recording server's local time. Example: If you have a time profile covering the period from 08.30 to 09.30, any associated actions on a recording server placed in New York is carried out when the local time is 08.30 to 09.30 in New York, while the same actions on a recording server placed in Los Angeles is carried out some hours later, when the local time is 08.30 to 09.30 in Los Angeles.

You create and manage time profiles by expanding **Rules and Events** > **Time Profiles**. A **Time Profiles** list opens. Example only:

For an alternative to time profiles, see Day length time profiles (explained).

Day length time profiles (explained)

When you place cameras outside, you must often lower the camera resolution, enable black/white or change other settings when it gets dark or when it gets light. The further north or south from the equator the cameras are placed, the more the sunrise and sunset time varies during the year. This makes it impossible to use normal fixed time profiles to adjusts camera settings according to light conditions.

In such situations, you can create day length time profiles instead to define the sunrise and sunset in a specified geographical area. Via geographic coordinates, the system calculates the sunrise and sunset time, even incorporating daylight saving time on a daily basis. As a result, the time profile automatically follows the yearly changes in sunrise/sunset in the selected area, ensuring the profile to be active only when needed. All times and dates are based on the management server's time and date settings. You can also set a positive or negative offset (in minutes) for the start (sunrise) and end time (sunset). The offset for the start and the end time can be identical or different.

You can use day length profiles both when you create rules and roles.

Notification profiles (explained)

Notification profiles enable you to set up ready-made email notifications. Notifications can automatically be triggered by a rule, for example when a particular event occurs.

When you create the notification profile, you specify the message text and decides if you want to include still images and AVI video clips in the email notifications.

> ⚠ You may need to disable any email scanners that could prevent the application from sending email notifications.

Requirements for creating notification profiles

Before you can create notification profiles, you must specify mail server settings for email notifications.

You can secure the communication to the mail server, if you install the necessary security certificates on the mail server.

If you want the email notifications to be able to include AVI movie clips, you must first specify the compression settings:

1. Go to **Tools** > **Options**. This opens the **Options** window.
2. Configure the mail server on the **Mail Server** tab (Mail Server tab (options)) and the compression settings on the **AVI Generation** tab AVI Generation tab (options).

User-defined events (explained)

If the event you require is not on the **Events Overview** list, you can create your own user-defined events. Use such user-defined events to integrate other systems with your surveillance system.

With user-defined events, you can use data received from a third-party access control system as events in the system. The events can later trigger actions. This way, you can, for example, begin recording video from relevant cameras when somebody enters a building.

You can also use user-defined events for manually triggering events while viewing live video in XProtect Smart Client or automatically if you use them in rules. For example, when user-defined event 37 occurs, PTZ camera 224 should stop patrolling and go to preset position 18.

Through roles, you define which of your users are able to trigger the user-defined events. You can use user-defined events in two ways and at the same time if required:

Events	Description
For providing the ability to manually trigger events in XProtect Smart Client	In this case, user-defined events make it possible for end users to manually trigger events while viewing live video in XProtect Smart Client. When a user-defined event occurs because a user of XProtect Smart Client triggers it manually, a rule can trigger that one or more actions should take place on the system.
For providing the ability to trigger events through API	In this case, you can trigger user-defined events outside the surveillance system. Using user-defined events this way requires that a separate API (Application Program Interface. A set of building blocks for creating or customizing software applications) is used when triggering the user-defined event. Authentication through Active Directory is required for using user-defined events this way. This ensures that even if the user-defined events can be triggered from outside the surveillance system, only authorized users are to do it. Also, user-defined events can via API be associated with meta-data, defining certain devices or device groups. This is highly usable when using user-defined events to trigger rules: you avoid having a rule for each device, basically doing the same thing. Example: A company uses access control, having 35 entrances, each with an access control device. When an access control device is activated, a user-defined event is triggered in the system. This user-defined event is used in a rule to start recording on a camera associated with the activated access control device. It is defined in the meta-data which camera is associated with what rule. This way the company does not need to have 35 user-defined events and 35 rules triggered by the user-defined events. A single user-defined event and a single rule are enough. When you use user-defined events this way, you may not always want them to be available for manual triggering in XProtect Smart Client. You can use roles to define which user-defined events should be visible in XProtect Smart Client.

Analytics events (explained)

Analytics events are typically data received from an external third-party video content analysis (VCA) provider.

Using analytics events as basis for alarms is basically a three step process:

- Part one, enabling the analytics events feature and setting up its security. Use a list of allowed addresses to control who can send event data to the system and which port the server listens on
- Part two, creating the analytics event, possibly with a description of the event, and testing it
- Part three, using the analytics event as the source of an alarm definition

You set up analytics events on the **Rules and Events** list in the **Site Navigation** pane.

To use VCA-based events, a third-party VCA tool is required for supplying data to the system. Which VCA tool to use is entirely up to you, as long as the data supplied by the tool adheres to the format. This format is explained in the MIP SDK Documentation on analytics events.

Contact your system provider for more details. Third-party VCA tools are developed by independent partners delivering solutions based on a Milestone open platform. These solutions can impact performance on the system.

Generic events (explained)

Generic events allow you to trigger actions in the XProtect event server by sending simple strings via the IP network to your system.

You can use any hard- or software, which can send strings via TCP or UDP, to trigger generic events. Your system can analyze received TCP or UDP data packages, and automatically trigger generic events when specific criteria are met. This way, you may integrate your system with external sources, for example access control systems and alarm systems. The aim is to allow as many external sources as possible to interact with the system.

With the concept of data sources, you avoid having to adapt third-party tools to meet the standards of your system. With data sources, you can communicate with a particular piece of hard- or software on a specific IP port and fine-tune how bytes arriving on that port are interpreted. Each generic event type pairs up with a data source and makes up a language used for communication with a specific piece of hard- or software.

Working with data sources requires general knowledge of IP networking and specific knowledge of the individual hard- or software you want to interface from. There are many parameters you can use and no ready-made solution on how to do this. Basically, your system provides the tools, but not the solution. Unlike user-defined events, generic events have no authentication. This makes them easier to trigger but, to avoid jeopardizing security, only events from local host are accepted. You can allow other client IP addresses from the **Generic Events** tab of the **Options** menu.

Webhooks (explained)

Webhooks are HTTP requests that enable web applications to communicate with each other and facilitates the sending of real-time data from one application to another when a predefined event occurs, for example sending event data to a predefined webhook endpoint when a user logs on to the system or when a camera reports an error.

A webhook endpoint (webhook URL) is the predefined address which the event data is to be sent to, much like a one-way telephone number.

You can use webhooks to build integrations which subscribe to selected events in XProtect. When an event is triggered, an HTTP POST is sent to the webhook endpoint you have defined for that event. The HTTP POST body contains event data in JSON.

Webhooks do not poll the system for data or triggered events, instead, the system pushes event data to the webhook endpoint when an event occurs which makes webhooks less resource-demanding and faster to set up compared to polling-solutions.

Webhooks can be set up to integrate with or without using code scripts.

You should verify that the event data sent from XProtect complies with the existing data and privacy protection legislation of your country.

The Webhooks functionality is by default installed and ready to use on XProtect 2023R1 or later and displays the **Webhooks** action on the **Rules** tab in Management Client.

Alarms (explained)

This feature only works if you have XProtect Event Server installed.

This article describes how to set up alarms to appear in the system, triggered by events.

Based on functionality handled in the event server, the alarms feature provides central overview, control and scalability of alarms in any number of installations (including any other XProtect systems) throughout your organization. You can configure it to generate alarms based on either:

- **Internal system related events**

  For example, motion, server responding/not responding, archiving problems, lack of disk space and more.

- **External integrated events**

  This group consist of several types of external events:

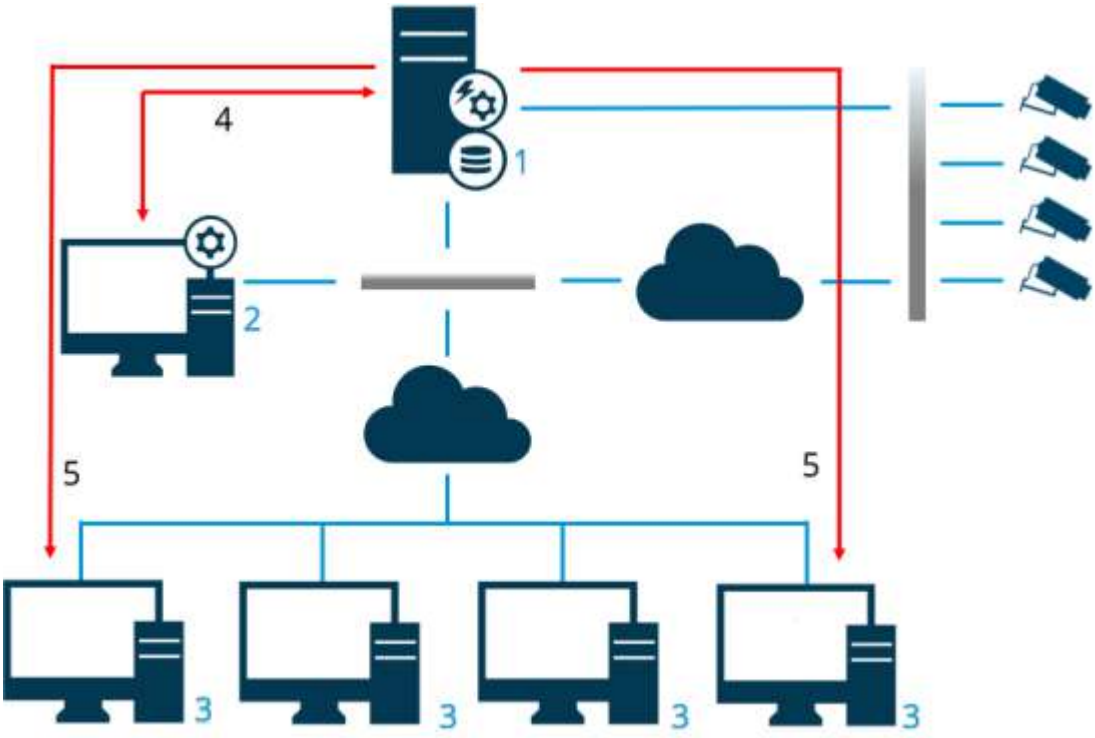
  - **Analytics events**

    Typically data received from an external third-party video content analysis (VCA) providers.

  - **MIP plug-in events**

    Through the MIP SDK a third-party vendor can develop custom plug-ins (for example, integration to external access control systems or similar) to your system.

    Plug-ins that are exported from XProtect Smart Client should always be installed in the C:\Program Files\Milestone\MIPPlugins folder structure to ensure that only authorized users, including administrators, can access the location of the signed and trusted .dll files in your environment. This is to mitigate the risk of unauthorized modifications of .dll files.



Legend:

1. Surveillance system
2. Management Client
3. XProtect Smart Client
4. Alarm configuration
5. Alarm data flow

You handle and assign alarms in the alarm list in XProtect Smart Client. You can also integrate alarms with the XProtect Smart Client's smart map and map functionality.

Alarm configuration

Alarm configuration includes:

- Dynamic role-based setup of alarm handling
- Central technical overview of all components: servers, cameras, and external units
- Setup of central logging of all incoming alarms and system information
- Handling of plug-ins, allowing customized integration of other systems, for example external access control or VCA-based systems

In general, alarms are controlled by the visibility of the object causing the alarm. This means that four possible aspects can play a role with regards to alarms and who can control/manage them and to what degree:

Name	Description
Source/device visibility	If the device causing the alarm is not set to be visible to the user's role, the user cannot see the alarm in the alarm list in XProtect Smart Client.
The right to trigger user-defined events	This permission determines if the user's role can trigger selected user-defined events in XProtect Smart Client.
External plug-ins	If any external plug-ins are set up in your system, these might control users' permissions to handle alarms.
General role rights	Determine whether the user is allowed to only view or also to manage alarms. What a user of **Alarms** can do with alarms depends on the user's role and on settings configured for that particular role.

On the **Alarms and Events** tab in **Options**, you can specify settings for alarms, events and logs.

Smart map (explained)

This feature is only available in certain XProtect VMS systems. For more information, see the product comparison chart: https://www.milestonesys.com/products/software/xprotect-comparison/

In XProtect® Smart Client and inXProtect Mobile, the smart map feature lets you view and access devices at multiple locations around the world in a geographically correct way. Unlike maps, where you had a different map for each location, smart map gives you the big picture in a single view.

The following configuration of the smart map feature is done in Management Client:

- Configure the geographic backgrounds that you can choose for your smart map. This includes integrating your smart map with one of the following services:
  - Bing Maps
  - Google Maps
  - Milestone Map Service
  - OpenStreetMap
- Enable Bing Maps or Google Maps in XProtect Management Client or in XProtect Smart Client
- Enable editing of smart maps, including devices, in XProtect Smart Client
- Position your devices geographically in XProtect Management Client
- Set up your smart map with Milestone Federated Architecture

Smart map integration with Google Maps (explained)

To embed Google Maps into your smart map, you need a Maps Static API key from Google. To get the API key, first you must create a Google Cloud billing account. You are billed in accordance with the volume of map loads per month.

Once you have the API key, you must enter it in XProtect Management Client. See also Enable Bing Maps or Google Maps in Management Client.

If you are behind a restrictive firewall, allowing access to the used domains is important. You may need to allow for outgoing traffic for Google Maps using maps.googleapis.com on each machine on which the Smart Client is running.

For more information, see:

- Google Maps Platform - get started: https://cloud.google.com/maps-platform/
- Guide to Google Maps Platform billing: https://developers.google.com/maps/billing/gmp-billing
- Developer guide for Maps Static API: https://developers.google.com/maps/documentation/maps-static/dev-guide

Add digital signature to Maps Static API key

If you expect the XProtect Smart Client operators to make more than 25,000 maps requests per day, you need a digital signature for your Maps Static API key. The digital signature allows the Google servers to verify that any site generating requests using your API key is authorized to do so. However, regardless of the usage requirements, Google recommends using a digital signature as an additional security layer. To get the digital signature, you must retrieve a URL signing secret. For more information, see https://developers.google.com/maps/documentation/maps-static/get-api-key#dig-sig-manual.

Smart map integration with Bing Maps (explained)

Bing Maps Basic (the free version) expired June 30, 2025 and Bing Maps Enterprise is expected expire June 28, 2028, with Microsoft recommending Bing Maps users to migrate to Azure Maps.

Please note that Azure Maps is not currently supported in Milestone XProtect.

To embed Bing Maps into your smart map, you need a Bing Maps Enterprise license and API key which must be purchased from Microsoft.

Once you have the API key, you must enter it in XProtect Management Client. See Enable Bing Maps or Google Maps in Management Client.

If you are behind a restrictive firewall, allowing access to the used domains is important. You may need to allow for outgoing traffic for Bing maps using *.virtualearth.net on each machine on which the Smart Client is running.

Alternative to Bing Maps

Milestone recommends using OpenStreetMap with Milestone Map Service as an alternative to Bing Maps, see Smart map (explained) and Specify OpenStreetMap tile server as well as Enable Milestone Map Service.

Cached smart map files (explained)

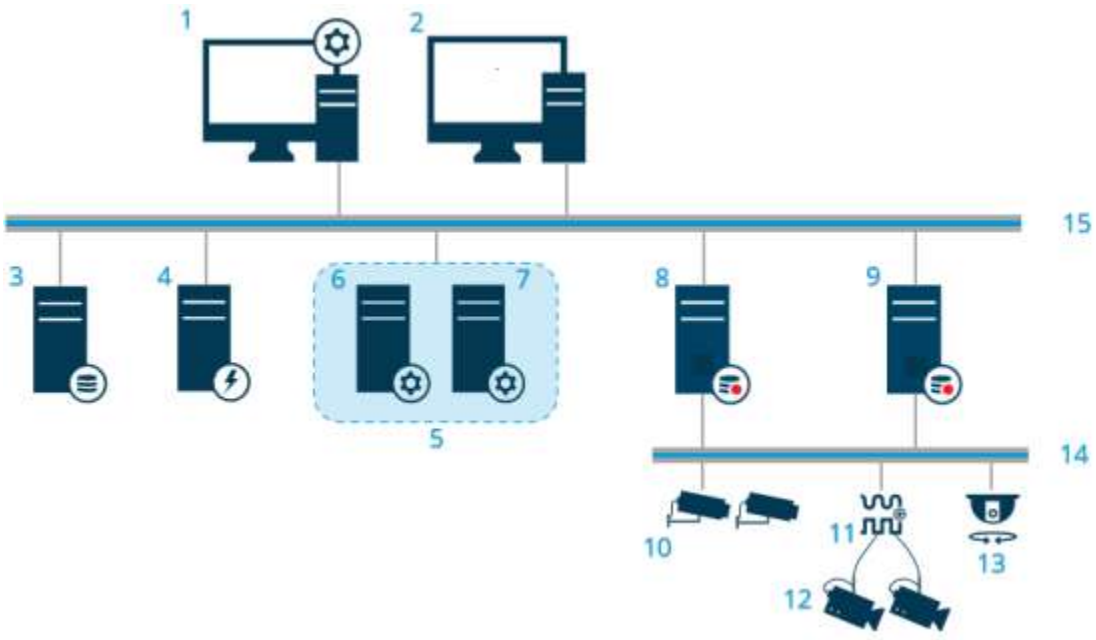
If you are using Google Maps as your geographic background, files are not cached.

The files that you use for your geographic background are retrieved from a tile server. The time that the files are stored in the cache folder depends on the value selected in the **Removed cached smart map files** list in the **Settings** dialog in XProtect Smart Client. The files are stored either:

- Indefinitely (**Never**)
- For 30 days if the file is not used (**When not used for 30 days**)
- When the operator exits XProtect Smart Client (**On exit**)

When you change the tile server address, automatically a new cache folder is created. The previous map files are retained in the associated cache folder on your local computer.

A distributed system setup



Example of a distributed system setup. The number of cameras, recording servers, and connected clients, can be as high as you require.

All computers in a distributed setup must either be on a domain or in a workgroup.

Legend:

1. Management Client(s)
2. XProtect Smart Client(s)
3. Server with SQL Server
4. Event server
5. Microsoft cluster

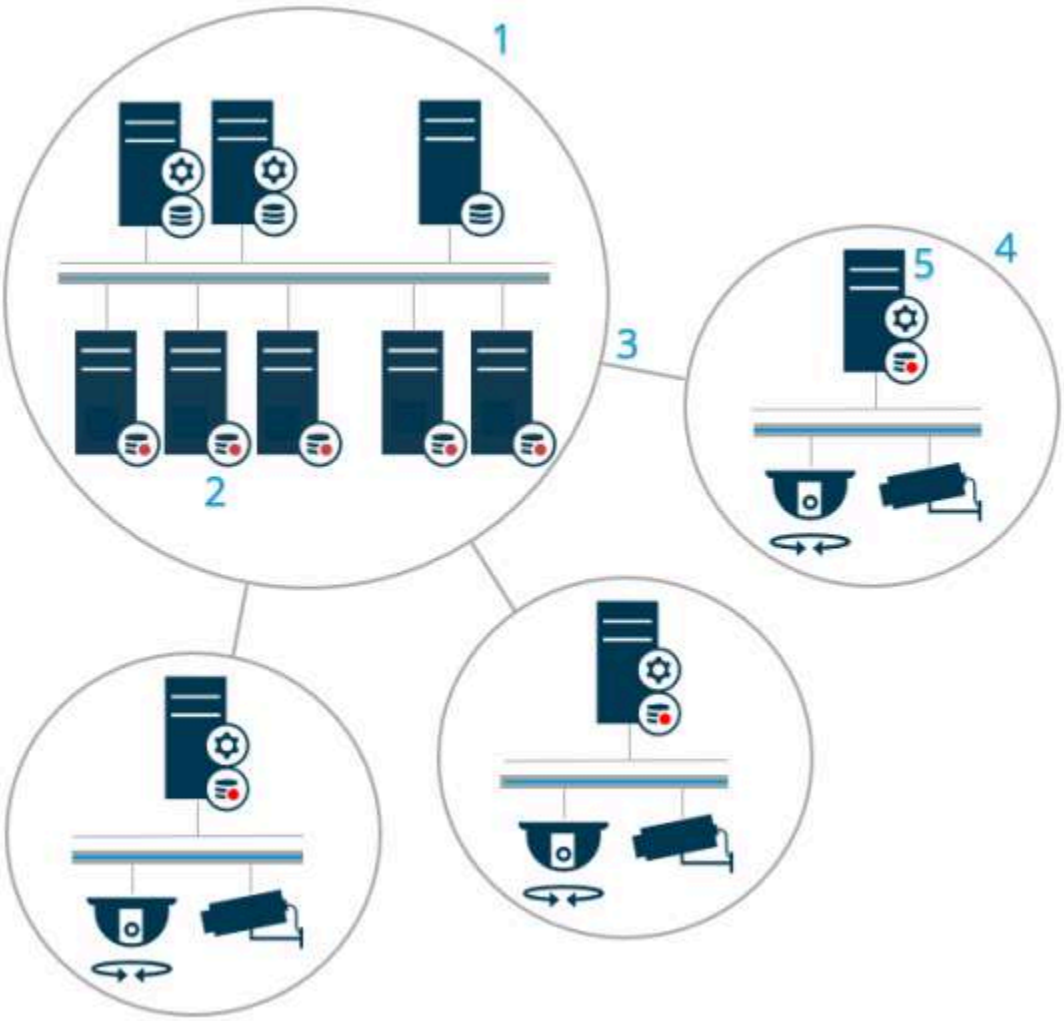
6. Management server
7. Failover management server
8. Failover recording server
9. Recording server(s)
10. IP video cameras
11. Video encoder
12. Analog cameras
13. PTZ IP camera
14. Camera network
15. Server network

Milestone Interconnect (explained)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Milestone Interconnect™ allows you to integrate a number of smaller, physically fragmented, and remote XProtect installations with one XProtect Corporate central site. You can install these smaller sites, called remote sites, on mobile units, for example, boats, busses or trains. This means that such sites do not need to be permanently connected to a network.

The following illustration shows how you could set up Milestone Interconnect on your system:



1. Milestone Interconnect central XProtect Corporate site
2. Milestone Interconnect drivers (handles the connection between the central sites' recording servers and the remote site, must be selected in the list of drivers when adding remote systems via the **Add Hardware** wizard)
3. Milestone Interconnect connection
4. Milestone Interconnect remote site (the complete remote site with system installation, users, cameras and so on)
5. Milestone Interconnect remote system (the actual technical installation at the remote site)

You add remote sites to your central site with the **Add Hardware** wizard from the central site (see Add a remote site to your central Milestone Interconnect site).

Each remote site runs independently and can perform any normal surveillance tasks. Depending on the network connections and appropriate user permissions (see Assign user permissions), Milestone Interconnect offers you direct live viewing of remote site cameras and play back of remote site recordings on the central site.

The central site can only see and access devices that the specified user account (when adding the remote site) has access to. This allows local system administrators to control which devices should be made available to the central site and its users.

On the central site, you can view the system's own status for the interconnected cameras, but not directly the state of the remote site. Instead, to monitor the remote site, you can use the remote site events to trigger alarms or other notifications on the central site (see Configure your central site to respond to events from remote sites).

It also offers you the possibility to transfer remote site recordings to the central site based on either events, rules/schedules, or manual requests by XProtect Smart Client users.

Only XProtect Corporate systems can work as central sites. All other products can act as remote sites including XProtect Corporate. It differs from setup to setup which versions, how many cameras, and how devices and events originating from the remote site are handled - if at all - by the central site. For further details on how specific XProtect products interact in a Milestone Interconnect setup, go to the Milestone Interconnect website (https://www.milestonesys.com/products/expand-your-solution/milestone-extensions/interconnect/).

Selecting Milestone Interconnect or Milestone Federated Architecture (explained)

In a physically distributed system where users on the central site need to access the video on the remote site, you can choose between Milestone Interconnect™ or Milestone Federated Architecture™.

Milestone recommends Milestone Federated Architecture when:

- The network connection between the central and federated sites is stable
- The network uses the same domain
- There are fewer larger sites
- The bandwidth is sufficient for the required use

Milestone recommends Milestone Interconnect when:

- The network connection between the central and remote sites is unstable
- You or your organization want to use another XProtect product on the remote sites
- The network uses different domains or workgroups
- There are many smaller sites

Milestone Interconnect and licensing

To run Milestone Interconnect, you need Milestone Interconnect camera licenses on your central site to view video from hardware devices on remote sites. The number of required Milestone Interconnect camera licenses depends on the streaming activity on the remote sites that you want to receive data from. The requirement is one license per stream. Only XProtect Corporate can act as a central site.

The status of your Milestone Interconnect camera licenses are listed on the **License Information** page of the central site.

Milestone Interconnect setups (explained)

There are three ways to run Milestone Interconnect. How to run your setup depends on your network connection, how to play back recordings, and whether you retrieve remote recordings and to what degree.

In the following, the three most likely setups are described:

Direct playback from remote sites (good network connections)

The most straightforward setup. The central site is continuously online with its remote sites and the central site users play back remote recordings directly from the remote sites. This requires use of the **Play back recordings from remote system** option (see Enable playback directly from remote site camera).

Rule- or XProtect Smart Client-based retrieval of selected remote recording sequences from remote sites (periodically limited network connections)

Used when selected recording sequences (originating from remote sites) should be stored centrally to ensure independence from remote sites. Independence is crucial in case of network failure or network restrictions. You configure remote recordings retrieval settings on the **Remote Retrieval** tab (see Remote Retrieval tab).

Remote recordings retrieval can be started from the XProtect Smart Client when needed or a rule can be set up. In some scenarios, remote sites are online and in others, offline most of the time. This is often industry specific. For some industries it is common for the central site to be permanently online with its remote sites (for example a retail HQ (central site) and a number of shops (remote sites)). For other industries, like transportation, the remote sites are mobile (for example, busses, trains, ships, and so on) and can only establish network connection randomly. Should the network connection fail during a commenced remote recording retrieval, the job continues at next given opportunity.

If the system detects an automatic retrieval, or request for retrieval from the XProtect Smart Client, outside the time interval that you specified on the **Remote Retrieval** tab, it is accepted, but not started until the selected time interval is reached. New remote recording retrieval jobs will queue and start when the allowed time interval is reached. You can view pending remote recording retrieval jobs from **System Dashboard** -> **Current Tasks**.

After connection failure, missing remote recordings are by default retrieved from remote sites

Uses remote sites like a recording server uses the edge storage on a camera. Typically, remote sites are online with their central site, feeding it a live stream that the central site records. Should the network fail for some reason, the central site misses out on recording sequences. However, once the network is reestablished, the central site automatically retrieves remote recordings covering the down-period. This requires use of the **Automatically retrieve remote recordings when connection is restored** option (see Retrieve remote recordings from remote site camera) on the **Record** tab for the camera.

You can mix any of the above solutions to fit your organizations special needs.

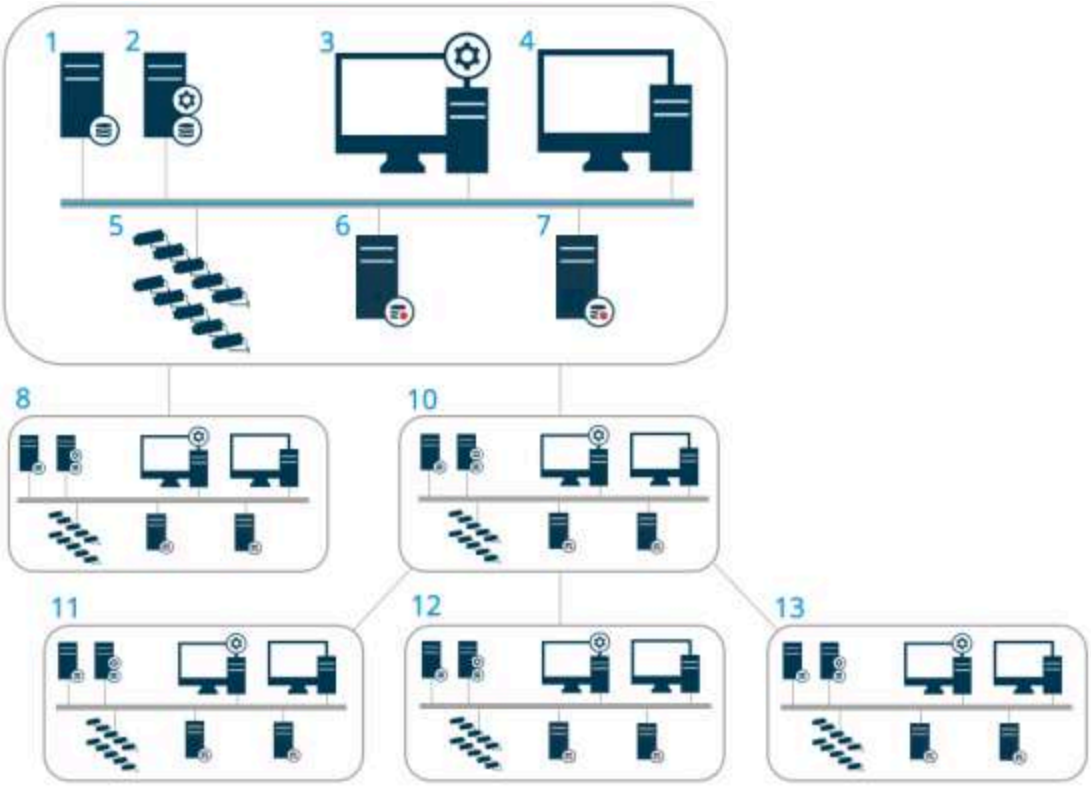
Configuring Milestone Federated Architecture

XProtect Expert can only be federated as child sites.

Milestone Federated Architecture links multiple individual standard systems into a federated site hierarchy of parent/child sites. Client users with sufficient permissions have seamless access to video, audio and other resources across individual sites. Administrators can centrally manage all sites from version 2018 R1 and newer within the federated hierarchy, based on administrator permissions for the individual sites.

Basic users are not supported in Milestone Federated Architecture systems, so you must add users as Windows users through the Active Directory service.

Milestone Federated Architecture is set up with one central site (top site) and an unrestricted number of federated sites (see Set up your system to run federated sites). When you are logged into a site, you can access information about all of its child sites and the child sites' child sites. The link between two sites is established, when you request the link from the parent site (see Add site to hierarchy). A child site can only be linked to one parent site. If you are not the administrator of the child site when you add it to the federated site hierarchy, the request must be accepted by the child site administrator.



The components of a Milestone Federated Architecture setup:

1. Server with SQL Server
2. Management server
3. Management Client
4. XProtect Smart Client
5. Cameras
6. Recording server
7. Failover recording server
8. to 12. Federated sites

Hierarchy synchronization

A parent site contains an updated list of all its currently attached child sites, child sites' child sites and so on. The federated site hierarchy has a scheduled synchronization between sites, as well as a synchronization every time a site is added or removed by the system administrator. When the system synchronizes the hierarchy, it takes place level by level, each level forwarding and returning communication, until it reaches the server that requests the information. The system sends less than 1MB each time. Depending on the number of levels, changes to a hierarchy can take some time to become visible in the Management Client. You cannot schedule your own synchronizations.

Data traffic

The system sends communication or configuration data when a user or administrator views live or recorded video or configures a site. The amount of data depends on what and how much is being viewed or configured.

Milestone Federated Architecture with other products and system requirements

- Opening the Management Client in a Milestone Federated Architecture is supported for three major releases, including the current one being released. In a Milestone Federated Architecture setup beyond that scope, you need a separate Management Client that matches the server version.
- If the central site uses XProtect Smart Wall, you can also use the XProtect Smart Wall features in the federated site hierarchy.

  See also Configuring XProtect Smart Wall.

- If the central site uses XProtect Access and XProtect Smart Client user logs into a site in a federated site hierarchy, access request notifications from the federated sites also appear in XProtect Smart Client
- You can add XProtect Expert 2013 systems or newer to the federated site hierarchy as child sites, not as parent sites
- Milestone Federated Architecture does not require additional licenses
- For more information about use cases and benefits, see the white paper about Milestone Federated Architecture.

Establishing a federated site hierarchy

Before you start building up the hierarchy in the Management Client, Milestone recommends that you map how you want your sites to link together.

You install and configure each site in a federated hierarchy as a normal standalone system with standard system components, settings, rules, schedules, administrators, users, and user permissions. If you already have the sites installed and configured and only need to combine them in a federated site hierarchy, your systems are ready to be set up.

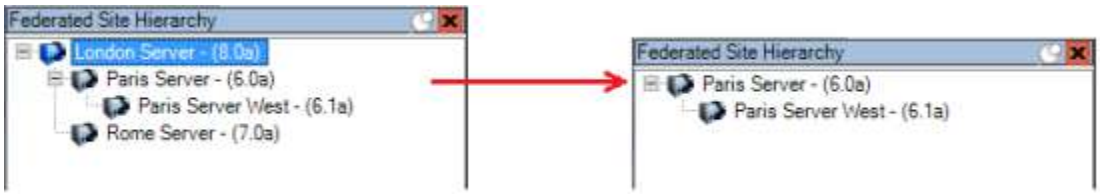
Once the individual sites are installed, you must set them up to run as federated sites (see Set up your system to run federated sites).

To start the hierarchy, you can log into the site that you want to work as the central site and add (see Add site to hierarchy) the first federated site. When the link is established, the two sites automatically create a federated site hierarchy in the **Federated Site Hierarchy** pane in the Management Client to which you can add more sites to grow the federated hierarchy.

When you have created a federated site hierarchy, users and administrators can log into a site to access that site and any federated sites it may have. Access to federated sites depend on the user permissions.

There is no limit to the number of sites you can add to the federated hierarchy. Also, you can have a site on an older product version linked to a newer version and vice versa. The version numbers appear automatically and cannot be deleted. The site that you are logged into is always at the top of the **Federated Site Hierarchy** pane and is called home site.

Below is an example of federated sited in the Management Client. To the left, the user has logged into the top site. To the right, the user has logged into one of the child sites, the Paris Server, which is then the home site.



Status icons in Milestone Federated Architecture

The icons represent the possible states of a site:

Description	Icon
The top site in the entire hierarchy is operational.	
The top site in the entire hierarchy is still operational, but one or more issues need attention. Shown on top of the top site icon.	
The site is operational.	

Description	Icon
The site is awaiting to be accepted in the hierarchy.	
The site is attaching but is not yet operational.	

Ports used by the system

All XProtect components and the ports needed by them are listed below. To ensure, for example, that the firewall blocks only unwanted traffic, you need to specify the ports that the system uses. You should only enable these ports. The lists also include the ports used for local processes.

They are arranged in two groups:

- **Server components** (services) offer their service on particular ports which is why they need to listen for client requests on these ports. Therefore, these ports need to be opened in the Windows Firewall for inbound and outbound connections
- **Client components** (clients) initiate connections to particular ports on server components. Therefore, these ports need to be opened for outbound connections. Outbound connections are typically open by default in the Windows Firewall

If nothing else is mentioned, ports for server components must be opened for inbound connections, and ports for client components must be opened for outbound connections.

Do keep in mind that server components can act as clients to other server components. These are not explicitly listed in this doc.

The port numbers are the default numbers, but this can be changed. Contact Milestone support, if you need to change ports that are not configurable through the Management Client.

Server components (inbound connections)

Each of the following sections list the ports that need to be opened for a particular service. To figure out which ports need to be opened on a particular computer, you need to consider all services running on the computer.

Management Server service and related processes

Port number	Protocol	Process	Connections from...	Purpose
80	HTTP	IIS	All servers and the XProtect Smart Client and the Management Client	The purpose of port 80 and port 443 is the same. However, which port the VMS uses depends on whether you have used certificates to secure the communication. • When you have not secured the communication with certificates, the VMS uses port 80. • When you have secured the communication with certificates, the VMS uses port 443 except for communication from the event server to the management server. The communication
443	HTTPS	IIS		

Port number	Protocol	Process	Connections from...	Purpose
				from the event server to the management server uses Windows Secured Framework (WCF) and Windows authentication on port 80.
445	TCP	Management Server service	Management Server Manager.	Enable Windows Active Directory users to be added to roles.
6473	TCP	Management Server service	Management Server Manager tray icon, local connection only.	Showing status and managing the service.
8080	TCP	Management server	Local connection only.	Communication between internal processes on the server.
9000	HTTP	Management server	Recording Server services	Web service for internal communication between servers.
12345	TCP	Management Server service	XProtect Smart Client	Communication between the system and Matrix recipients. You can change the port number in the Management Client.
12974	TCP	Management Server service	Windows SNMP Service	Communication with the SNMP extension agent. Do not use the port for other purposes even if your system does not apply SNMP. In XProtect 2014 systems or older, the port number was 6475. In XProtect 2019 R2 systems and older, the port number was 7475.

SQL Server service

Port number	Protocol	Process	Connections from...	Purpose
1433	TCP	SQL Server	Management Server service	Storing and retrieving configurations via the Identity Provider.

Port number	Protocol	Process	Connections from...	Purpose
1433	TCP	SQL Server	Event Server service	Storing and retrieving events via the Identity Provider.
1433	TCP	SQL Server	Log Server service	Storing and retrieving log entries via the Identity Provider.

Data Collector service

Port number	Protocol	Process	Connections from...	Purpose
7609	HTTP	IIS	On the management server computer: Data Collector services on all other servers. On other computers: Data Collector service on the Management Server.	System Monitor.

Event Server service

Port number	Protocol	Process	Connections from...	Purpose
1234	TCP/ UDP	Event Server Service	Any server sending generic events to your XProtect system.	Listening for generic events from external systems or devices. Only if the relevant data source is enabled.
1235	TCP	Event Server service	Any server sending generic events to your XProtect system.	Listening for generic events from external systems or devices. Only if the relevant data source is enabled.
9090	TCP	Event Server service	Any system or device that sends analytics events to your XProtect system.	Listening for analytics events from external systems or devices. Only relevant if the Analytics Events feature is enabled.
22331	TCP	Event Server service	XProtect Smart Client and the Management Client	Configuration, events, alarms, and map data.

Port number	Protocol	Process	Connections from...	Purpose
22332	WS/ WSS HTTP/ HTTPS*	Event Server service	API Gateway and the Management Client	Event/State Subscription, Events REST API, Websockets Messaging API, and Alarms REST API.
22333	TCP	Event Server service	MIP Plug-ins and applications.	MIP messaging.

*A 403 error will be returned when accessing HTTP to access an HTTPS-only endpoint.

Recording Server service

Port number	Protocol	Process	Connections from...	Purpose
5210	TCP	Recording Server Service	Failover recording servers.	Merging of databases after a failover recording server had been running. Accessing archived camera video on the original recording server after the camera has been transferred to another recording server. If the port is not open, archived camera video will be inaccessible.
7563	TCP	Recording Server Service	XProtect Smart Client, Management Client	Retrieving video and audio streams, PTZ commands.
8966	TCP	Recording Server Service	Recording Server Manager tray icon, local connection only.	Showing status and managing the service.
9001	HTTP	Recording Server Service	Management server	Web service for internal communication between servers. If multiple Recording Server instances are in use, every instance needs its own port. Additional ports will be 9002, 9003, etc.
11000	TCP	Recording Server Service	Failover recording servers	Polling the state of recording servers.

Port number	Protocol	Process	Connections from...	Purpose
12975	TCP	Recording Server Service	Windows SNMP service	Communication with the SNMP extension agent. Do not use the port for other purposes even if your system does not apply SNMP. In XProtect 2014 systems or older, the port number was 6474. In XProtect 2019 R2 systems and older, the port number was 7474.
65101	UDP	Recording Server service	Local connection only	Listening for event notifications from the drivers.

In addition to the inbound connections to the Recording Server service listed above, the Recording Server service establishes outbound connections to:

- Cameras
- NVRs
- Remote interconnected sites (Milestone Interconnect ICP)

Failover Server service and Failover Recording Server service

Port number	Protocol	Process	Connections from...	Purpose
5210	TCP	Failover Recording Server Service	Failover recording servers	Merging of databases after a failover recording server had been running. Accessing archived camera video on the original recording server after the camera has been transferred to another recording server. If the port is not open, archived camera video will be inaccessible.
7474	TCP	Failover Recording Server Service	Windows SNMP service	Communication with the SNMP extension agent. Do not use the port for other purposes even if your system does not apply SNMP.
7563	TCP	Failover Recording Server Service	XProtect Smart Client	Retrieving video and audio streams, PTZ commands.
8844	UDP	Failover Recording Server	Communication between failover recording server	Communication between the servers.

Port number	Protocol	Process	Connections from...	Purpose
		Service	services.	
8966	TCP	Failover Recording Server Service	Failover Recording Server Manager tray icon, local connection only.	Showing status and managing the service.
8967	TCP	Failover Server Service	Failover Server Manager tray icon, local connection only.	Showing status and managing the service.
8990	HTTP	Failover Server Service	Management Server service	Monitoring the status of the Failover Server service.
9001	HTTP	Failover Server Service	Management server	Web service for internal communication between servers.

In addition to the inbound connections to the Failover Server / Failover Recording Server service listed above, the Failover Server / Failover Recording Server service establishes outbound connections to the regular recorders, cameras, and for Video Push.

Log Server service

Port number	Protocol	Process	Connections from...	Purpose
22337	HTTP	Log Server service	All XProtect components except for the recording server.	Write to, read from, and configure the log server.

This port uses HTTP, but the communication is encrypted with message security which uses the WS-Security specification to secure messages. For more information, see Message Security in WCF.

Mobile Server service

Port number	Protocol	Process	Connections from...	Purpose
8000	TCP	Mobile Server service	Mobile Server Manager tray icon, local connection only.	SysTray application.

Port number	Protocol	Process	Connections from...	Purpose
8081	HTTP	Mobile Server service	Mobile clients, Web clients, and Management Client.	Sending data streams; video and audio.
8082	HTTPS	Mobile Server service	Mobile clients and Web clients.	Sending data streams; video and audio.
40001 - 40099	HTTP	Mobile Server service	Recording server service	Mobile Server Video Push. This port range is disabled by default.

LPR Server service

Port number	Protocol	Process	Connections from...	Purpose
22334	TCP	LPR Server Service	Event server	Retrieving recognized license plates and server status. In order to connect, the Event server must have the LPR plug-in installed.
22334	TCP	LPR Server Service	LPR Server Manager tray icon, local connection only.	SysTray application

Milestone Open Network Bridge service

Port number	Protocol	Process	Connections from...	Purpose
580	TCP	Milestone Open Network Bridge Service	ONVIF clients	Authentication and requests for video stream configuration.
554	RTSP	RTSP Service	ONVIF clients	Streaming of requested video to ONVIF clients.

XProtect DLNA Server service

Port number	Protocol	Process	Connections from...	Purpose
9100	HTTP	DLNA Server Service	DLNA device	Device discovery and providing DLNA channels configuration. Requests for video streams.
9200	HTTP	DLNA Server Service	DLNA device	Streaming of requested video to DLNA devices.

XProtect Screen Recorder service

Port number	Protocol	Process	Connections from...	Purpose
52111	TCP	XProtect Screen Recorder	Recording Server Service	Provides video from a monitor. It appears and acts in the same way as a camera on the recording server. You can change the port number in the Management Client.

XProtect Incident Manager service

Port number	Protocol	Process	Connections from...	Purpose
80	HTTP	IIS	XProtect Smart Client and the Management Client	The purpose of port 80 and port 443 is the same. However, which port the VMS uses depends on whether you have used certificates to secure the communication. • When you have not secured the communication with certificates, the VMS uses port 80. • When you have secured the communication with certificates, the VMS uses port 443.
443	HTTPS	IIS		

Server components (outbound connections)

Management Server service

Port number	Protocol	Connections to...	Purpose
443	HTTPS	The License server that hosts the License Management service. Communication is via https://www.milestonesys.com/ OnlineActivation/ LicenseManagementService.asmx	Activating licenses.

Recording Server service

Port number	Protocol	Connections to...	Purpose
80	HTTP	Cameras, NVRs, encoders Interconnected sites	Authentication, configuration, data streams, video, and audio. Login
443	HTTPS	Cameras, NVRs, encoders	Authentication, configuration, data streams, video, and audio.
554	RTSP	Cameras, NVRs, encoders	Data streams, video, and audio.
7563	TCP	Interconnected sites	Data streams and events.
11000	TCP	Failover recording servers	Polling the state of recording servers.
40001 – 40099	HTTP	Mobile Server service	Mobile Server Video Push. This port range is disabled by default.

Failover Server service and Failover Recording Server service

Port number	Protocol	Connections to...	Purpose
11000	TCP	Failover recording servers	Polling the state of recording servers.

Event Server service

Port number	Protocol	Connections to...	Purpose
80	HTTP	API Gateway and the Management Server	Access the Configuration API from the API Gateway
443	HTTPS	API Gateway and the Management Server	Access the Configuration API from the API Gateway
443	HTTPS	Milestone Customer Dashboard via https://service.milestonesys.com/	Send status, events and error messages from the XProtect system to Milestone Customer Dashboard.

Log Server service

Port number	Protocol	Connections to...	Purpose
443	HTTP	Log server	Forwarding messages to the log server.

API Gateway

Port number	Protocol	Connections to...	Purpose
443	HTTPS	Management Server	RESTful API
22332	WS/WSS HTTP/ HTTPS*	Management Client	Event/State Subscription, Events REST API, Websockets Messaging API, and Alarms REST API.

Cameras, encoders, and I/O devices (inbound connections)

Port number	Protocol	Connections from...	Purpose
80	TCP	Recording servers and failover recording servers	Authentication, configuration, and data streams; video and audio.
443	HTTPS	Recording servers and failover recording servers	Authentication, configuration, and data streams; video and audio.
554	RTSP	Recording servers and failover recording servers	Data streams; video and audio.

Cameras, encoders, and I/O devices (outbound connections)

Port number	Protocol	Connections to...	Purpose
22337	HTTP	Log server	Forwarding messages to the log server.

Only a few camera models are able to establish outbound connections.

Client components (outbound connections)

XProtect Smart Client, XProtect Management Client, XProtect Mobile server

Port number	Protocol	Connections to...	Purpose
80	HTTP	API Gateway and Management Server service	Authentication and other APIs in the API Gateway.
443	HTTPS	API Gateway and Management Server service	Authentication of basic users when encryption is enabled and other APIs in the API Gateway.
443	HTTPS	Milestone Systems A/S (doc.milestonesys.com at 52.178.114.226)	Management Client and Smart Client occasionally check if the online help is available by accessing the help URL.
7563	TCP	Recording Server service	Retrieving video and audio streams, PTZ commands.
22331	TCP	Event Server service	Alarms.

XProtect Web Client, XProtect Mobile client

Port number	Protocol	Connections to...	Purpose
8081	HTTP	XProtect Mobile server	Retrieving video and audio streams.
8082	HTTPS	XProtect Mobile server	Retrieving video and audio streams.

Application pools

The VMS contains standard application pools such as.NET v4.5, .NET v4.5 Classic and the DefaultAppPool. The application pools that are available on your system appear in the Internet Information Services (IIS) Manager. In addition to the standard application pools mentioned above, a set of VideoOS application pools are delivered with the Milestone XProtect VMS.

Application pools in Milestone XProtect

In the table below you can get an overview of the VideoOS application pools that are delivered with Milestone XProtect.

Name	Identity	Purpose
.NET v4.5	ApplicationPoolId	Standard IIS feature
.NET v4.5 Classic	ApplicationPoolId	Standard IIS feature
DefaultAppPool	ApplicationPoolId	Standard IIS feature

Name	Identity	Purpose
VideoOS ApiGateway	NetworkService	Hosts the XProtect API Gateway which is the future public API and gateway to the VMS.
VideoOS Classic	NetworkService	Hosts legacy components such as the local help mainly to comply with backwards compatibility.
VideoOS IDP	NetworkService	Hosts the Identity Provider API. The Identity Provider creates, maintains, and manages identity information for basic users and provides authentication and registration services to relying applications or services.
VideoOS IM	NetworkService	Hosts the XProtect Incident Manager API. The XProtect Incident Manager documents incidents and combine them with sequence evidence (video and, potentially, audio) from their XProtect VMS.
VideoOS Management Server	NetworkService	Hosts the Configuration API, server component APIs and other Management Server services, and manages user authorization.
VideoOS ReportServer	NetworkService	Hosts the web application that is responsible for collecting and creating reports for alarms and events.
VideoOS ShareService	NetworkService	Hosts the service that facilitates bookmarks and live video sharing between the users of XProtect Mobile client.

Working with application pools

From the **Application Pools** page in the **Internet Information Services (IIS)** window you can add application pools or set appplication pool defaults and you can view the applications hosted by each application pool.

Open the Application Pools page

1. From the Windows **Start** menu, open **Internet Information Servces (IIS) Manager**.
2. In the **Connections** pane, click the name of your environment, and then click **Application Pools**.
3. Under **Actions**, click **Add Application Pool** or **Set Application Pool Defaults** to perform any of these tasks.
4. Select an application pool on the **Application Pools** page to display further options under **Actions** for each application pool.

Product comparison

XProtect VMS includes the following products:

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

See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

XProtect Remote Manager

XProtect Remote Manager is an online tool for service providers and end-users to manage and monitor one or more XProtect installations. It enables IT managers and administrators of XProtect VMS to effectively manage large and distributed systems from anywhere and get an instant view of the VMS system's health.

XProtect Remote Manager includes:

- An instant overview of all VMS installations owned by a company account.
- The ability to grant service providers access to monitor specific VMS installations from XProtect Remote Manager.

For more information, go to https://doc.milestonesys.com/xrm/latest/en-US/index.htm

Licenses (explained)

Licenses for XProtect VMS products

Software license file and SLCs

When you purchase your software and licenses, you get:

- An order confirmation and a software license file named after your SLC (Software License Code) and with the .lic extension received per email
- A Milestone Care coverage

Your SLC is also printed on your order confirmation and consists of several numbers and letters grouped by hyphens like:

- Product version 2014 or earlier: xxx-xxxx-xxxx
- Product version 2016 or later: xxx-xxx-xxx-xx-xxxxxx

The software license file contains all information about your purchased VMS products, XProtect extensions, and licenses. Milestone recommends that you store the information about your SLC and a copy of your software license file in a safe place for later use. You can also see your SLC in the **License Information** window in Management Client. You can open the **License Information** window in the **Site Navigation** pane -> **Basics** node -> **License Information**.You may need the software license file or your SLC when you, for example, create a My Milestone user account, contact your reseller for support, or if you need to make changes to your system.

Overall process for installation and licensing

To get started, you download the software from our website (https://www.milestonesys.com/download/). While you are installing (see Install a new XProtect system) the software, you are asked to provide the software license file. You cannot complete the installation without a software license file.

Once the installation is complete and you have added some cameras, you must activate your licenses (see License activation (explained). You activate your licenses from the **License Information** window in Management Client. Here you can also see an overview of your licenses for all installations on the same SLC. You can open the **License Information** window in the **Site Navigation** pane -> **Basics** node -> **License Information**.

License types

There are several license types in the XProtect licensing system.

Base licenses

As a minimum, you have a base license for one of the XProtect VMS products. You may also have one or more base licenses for XProtect extensions.

Device licenses

As a minimum, you have several device licenses. Generally, you need one device license per hardware device with a camera that you want to add to your system. But this can differ from one hardware device to another and depending on the hardware device being a Milestone supported hardware device or not. For more information, see Supported hardware devices and Unsupported hardware devices.

If you want to use the video push feature in XProtect Mobile, you also need one device license per mobile device or tablet that

should be able to push video to your system.

Device licenses are not required for speakers, microphones, or input and output devices attached to your cameras.

Supported hardware devices

Generally, you need one device license per hardware device with a camera that you want to add to your system. But a few supported hardware devices require more than one device license. You can see how many device licenses your hardware devices require, in the list of supported hardware on the Milestone website (https://www.milestonesys.com/support/tools-and-references/supported-devices/).

For video encoders with up to 16 channels, you need only one device license per video encoder IP address. A video encoder can have one or more IP addresses.

However, if the video encoder has more than 16 channels, one device license per activated camera on the video encoder is required - also for the first 16 activated cameras.

Unsupported hardware devices

An unsupported hardware device requires one device license per activated camera using a video channel.

Unsupported hardware devices do not appear in the list of supported hardware on the Milestone website (https://www.milestonesys.com/support/tools-and-references/supported-devices/).

Camera licenses for Milestone Interconnect™

To run Milestone Interconnect, you need Milestone Interconnect camera licenses on your central site to view video from hardware devices on remote sites. The number of required Milestone Interconnect camera licenses depends on the streaming activity on the remote sites that you want to receive data from. The requirement is one license per stream. Only XProtect Corporate can act as a central site.

Licenses for XProtect extensions

Most XProtect extensions require additional license types. The software license file also includes information about your extension licenses. Some extensions have their own separate software license files. You can find more information about extension licenses here:

- XProtect Access (see XProtect Access licenses)
- XProtect LPR (see XProtect LPR licenses)
- XProtect Transact (see Before you start)
- XProtect Smart Wall requires the following video wall-related licenses:
    - A **base license** for XProtect Smart Wall that covers an unrestricted number of monitors displaying video on a video wall

  Use of XProtect Smart Wall is only supported in these products:
    - XProtect Corporate - a base license for XProtect Smart Wall is included in the base license
    - XProtect Expert - purchase a base license for XProtect Smart Wall separately
- XProtect Incident Manager requires the following licenses:
    - A **base license** that covers the full use of XProtect Incident Manager

  Use of XProtect Incident Manager is only supported in the following VMS products and versions:
    - XProtect Corporate 2022 R2 and later: a base license for XProtect Incident Manager is included
    - XProtect Expert and XProtect Professional+ and later: purchase a base license for XProtect Incident Manager separately

Test licenses

Test licenses for the XProtect VMS are used for demonstration and training purposes. You can obtain a test license in one of the following ways:

- From Milestone Customer Dashboard
- From your reseller
- From your local Milestone representative.

A test license supports a limited number of cameras. A test license is valid for 365 days to use with the XProtect VMS and six months for XProtect Remote Manager.

License activation (explained)

Your SLC must be registered prior to the installation (see Register Software License Code). Your different licenses connected with your SLCs must be activated for the installed XProtect VMS and XProtect extensions to work and the individual hardware devices to be able to send data to the system. For an overview of all XProtect license types, see License types.

There are several ways of activating licenses. All of them are available from the **License Information** window. The best way of activating depends on your organization's policies and whether your management server has access to the internet or not. To learn how to activate licenses, see Activate your licenses.

After the initial license activation of your XProtect VMS, you do not have to activate device licenses every time you add a hardware device with a camera because of built-in flexibilities to the XProtect licensing system. For more information about these flexibilities, see Grace period for license activation (explained) and Device changes without activation (explained).

Automatic license activation (explained)

For easy maintenance and flexibility - and when your organization's policies permit it - Milestone recommends that you enable automatic license activation. Automatic license activation requires that the management server is online. For how to enable automatic license activation, see Enable automatic license activation.

Benefits of enabling automatic license activation

- The system activates your hardware devices a few minutes after you have added, removed, or replaced hardware devices or made other changes that affect the use of your licenses. Therefore, you only seldom must manually start a license activation. See the few exceptions in When manual license activation is still required.
- The used number of device changes without activation is always zero.
- No hardware devices are within a grace period and at risk of expiring.
- If one of your base licenses expires within a period of 14 days, your XProtect system will also - as an extra precaution - automatically try to activate your licenses every night.

When manual license activation is still required

If you make the following changes to your system, manual license activation is required.

- Purchase additional licenses (see Get additional licenses)
- Upgrade to a newer version or more advanced VMS system (see Upgrade requirements)
- Buy or renew a Milestone Care subscription
- Receive allowance for more device changes without activation (see Device changes without activation (explained))

Grace period for license activation (explained)

When you have installed your VMS and added devices (hardware devices, Milestone Interconnect cameras, or door licenses), the devices run in a 30-day grace period if you have decided not to enable automatic license activation. Before the end of the 30-day grace period and if you do not have more device changes without activation left, you must activate your licenses, or your devices will stop sending video to your surveillance system.

Device changes without activation (explained)

The functionality device changes without activation gives built-in flexibility to the XProtect licensing system. So even if you have decided to activate licenses manually, you do not necessarily have to activate licenses every time you add or remove hardware devices.

The number of device changes without activation differs from installation to installation and is calculated based on several variables. For a detailed description, see Calculation of available number of device changes without activation (explained).

One year after your last license activation, your used number of device changes without activation is automatically reset to zero. Once the reset happens, you can continue to add and replace hardware devices without activating the licenses.

If your surveillance system is offline for longer periods of time, for example in cases with a surveillance system on a ship on a long cruise or a surveillance system in a very remote place without any Internet access, you can contact your Milestone reseller and request a higher number of device changes without activation.

You must explain why you think you qualify for a higher number of device changes without activation. Milestone decides each request on an individual basis. Should you be granted a higher number of device changes without activation, you must activate your licenses to register the higher number on your XProtect system.

Calculation of available number of device changes without activation (explained)

The available number of device changes without activation is calculated based on three variables. If you have several installations of the Milestone software, the variables apply to each of them separately. The variables are:

- **C%** that is a fixed percentage of the total amount of activated licenses
- **Cmin** that is a fixed minimum value of the number of device changes without activation
- **Cmax** that is a fixed maximum value of the number of devices changes without activation

The number of device changes without activation can never be lower than the **Cmin** value or higher than the **Cmax** value. The calculated value based on the **C%** variable changes according to how many activated devices you have on each installation in your system. Devices added with device changes without activation are not counted as activated by the **C%** variable.

Milestone defines the values of all three variables and the values are subject to change without notification. The values of the variables differ depending on the product.

Examples based on C% = 15%, Cmin = 10 and Cmax =100

You buy 100 device licenses. You then add 100 cameras to the system. Unless you have enabled automatic license activation, the number of device changes without activation is still zero. You activate your licenses and have now 15 device changes without activation.

You buy 100 device licenses. You then add 100 cameras to the system and activate the licenses. Your number of device changes without activation is now 15. You then decide to delete a hardware device from the system. You now have 99 activated devices and the number of device changes without activation has dropped to 14.

You buy 1000 device licenses. You then add 1000 cameras and activates the licenses. Your device changes without activation are now 100. According to the **C%** variable, you should now have had 150 device changes without activation, but the **Cmax** variable only allows you to have 100 device changes without activation.

You buy 10 device licenses. You then add 10 cameras to the system and activates the licenses. Your number of device changes without activation is now 10 because of the **Cmin** variable. If the number was only calculated based on the **C%** variable, you would only have had 1 (15% of 10 = 1.5 rounded off to 1).

You buy 115 device licenses. You then add 100 cameras to the system and activate the licenses. Your device changes without activation is now 15. You add another 15 cameras without activating them, using 15 out of 15 of your device changes without activation. You now remove 50 of the cameras from the system and the number of device changes without activation goes down to 7. This means that 8 of the cameras previously added within the 15 device changes without activation go into a grace period. You now add 50 new cameras. Because you activated 100 cameras on the system last time you activated the licenses, the number of device changes without activation goes back to 15 and the 8 cameras, that were moved into a grace period, move back as device changes without activation. The 50 new cameras go into a grace period.

Milestone Care™ (explained)

Milestone Care is the name of the complete service and support program for XProtect products throughout their lifetime.

Milestone Care gives you access to different types of self-help material like knowledge base articles, guides, and tutorials on our Support website (https://www.milestonesys.com/support/).

For additional benefits, you can purchase more advance Milestone Care subscriptions.

Milestone Care Plus

If you have a Milestone Care Plus subscription, you also have access to free updates to your current XProtect VMS product and can upgrade to more advanced XProtect VMS products at an advantageous price. Milestone Care Plus also offers additional functionality:

- The Customer Dashboard service
- The Smart Connect feature
- The full Push Notification functionality
- XProtect Remote Manager

Milestone Care Premium

If you have a Milestone Care Premium subscription, you can also contact the Milestone support team directly. Please remember to include information about your Milestone Care ID when contacting Milestone support.

Expiration, renewal, and purchase of advanced Milestone Care subscriptions

The expiration date of the more advanced Milestone Care Plus and Milestone Care Premium subscription types is visible in the **License Information** window in the **Installed Products** table. See Installed Products.

If you decide to buy or renew a Milestone Care subscription after you have installed your system, you must manually activate your licenses before the correct Milestone Care information appears. See Activate licenses online or Activate licenses offline.

Licenses and hardware replacement (explained)

If a camera in the system gets faulty or you for other reasons want to replace the camera with a new one, there are some best practices of how it should be done.

If you remove a camera from a recording server, you free a device license, but you also lose full access to all databases (cameras, microphones, inputs, outputs) and the settings of the old camera. To keep access to the databases of the old camera and reuse its settings when replacing it with a new camera, use the relevant option below.

Replace camera with a similar camera

If you replace a camera with a similar camera (manufacturer, brand, and model), and if you give the new camera the same IP address as the old one, you maintain full access to all databases of the old camera. The new camera continues to use the same databases and settings as the old camera. In this case, you move the network cable from the old camera to the new one without changing any settings in Management Client.

Replace camera with a different camera

If you replace a camera with a different camera (manufacturer, brand, and model), you must use the **Replace Hardware** wizard (see Replace hardware) to map all relevant databases of the old camera to the new one and reuse the settings of the old camera.

License activation after hardware replacement

If you have enabled automatic license activation (see Enable automatic license activation), the new camera is automatically activated.

If automatic license activation is disabled, and if all of the available device changes without activation have been used (see Device changes without activation (explained)), you must manually activate your licenses. For more information about manually activating licenses, see Activate licenses online or Activate licenses offline.

Get an overview of your licenses

There are many reasons why you would like to get an overview of your SLCs and your number of purchased licenses and their statuses. Here are a few:

- You want to add one or more new hardware devices, but do you have unused device licenses, or do you have to purchase new ones?
- Is the grace period for some of your hardware devices ending soon? Then you must activate them before they stop sending data to the VMS.
- You know from previous contacts to support that they need information about your SLC and your Milestone Care ID to be able to help you. But which are they?
- You have many installations of XProtect and use the same SLC for all installations, but where are the licenses used and what are their statuses?

You can find all the information above and more in the **License Information** window.

You can open the **License Information** window in the **Site Navigation** pane -> **Basics** node -> **License Information**.

To learn more about the various information and features available from the **License Information** window, see License Information window.

Activate your licenses

There are several ways of activating licenses. All of them are available from the **License Information** window. The best way of activating depends on your organization's policies and whether your management server has access to the internet or not.

You can open the **License Information** window in the **Site Navigation** pane -> **Basics** node -> **License Information**.

To learn more about the various information and features available from the **License Information** window, see License Information window.

Enable automatic license activation

Disable automatic license activation

Activate licenses online

Activate licenses offline

Activate licenses after grace period

Enable automatic license activation

For easy maintenance and flexibility - and when your organization's policies permit it - Milestone recommends that you enable automatic license activation. Automatic license activation requires that the management server is online.

If you want to know all the benefits of enabling automatic license activation, see Automatic license activation (explained).

1. From the **Site Navigation** pane -> **Basics** node -> **License Information**, select **Enable automatic license activation**.
2. Enter the user name and password that you want to use with automatic license activation:
   - If you are an existing user, enter your user name and password to log into the software registration system
   - If you are a new user, click the **Create new user** link to set up a new user account and then follow the registration procedure. If you have not yet registered your Software License Code (SLC), you must do so

   The credentials are saved in a file on the management server.
3. Click **OK**.

If you later want to change your user name and/or the password for automatic activation, click the **Edit activation credentials** link.

Disable automatic license activation

If it is not allowed to use automatic license activation in your organization or simply you have changed your mind, you can disable automatic license activation.

How you disable depends on whether you later plan to use automatic license activation again or not.

Disable but keep the password for later use:

1. From the **Site Navigation** pane -> **Basics** node -> **License Information**, clear **Enable automatic license activation**. The user name and password are still saved on the management server.

Disable and delete password:

1. From the **Site Navigation** pane -> **Basics** node -> **License Information**, click **Edit activation credentials**.
2. Click **Delete password**.
3. Confirm that you want to delete the user name and password from the management server.

Activate licenses online

If the management server has internet access but you prefer to manually start the activation process, this is the easiest license activation option for you.

1. From the **Site Navigation** pane -> **Basics** node -> **License Information**, select **Activate License Manually** and then **Online**.
2. The **Activate Online** dialog box opens:
   - If you are an existing user, enter your user name and password
   - If you are a new user, click the **Create new user** link to set up a new user account. If you have not yet registered your Software License Code (SLC), you must do so
3. Click **OK**.

If you receive an error message during online activation, follow the instructions on the screen to solve the issue or contact Milestone support.

Activate licenses offline

If your organization does not allow that the management server has internet access, you must activate licenses manually and offline.

1. From the **Site Navigation** pane -> **Basics** node -> **License Information**, select **Activate License Manually** > **Offline** > **Export License for Activation** to export a license request file (.lrq) with information about your added hardware devices and other elements that require a license.
2. The license request file (.lrq) is automatically given the same name as your SLC. If you have several sites, remember to rename the files so you can easily identify which file belongs to which site.
3. Copy the license request file to a computer with internet access and log into our website

(https://online.milestonesys.com/) to obtain the activated software license file (.lic).
4. Copy the .lic file you receive to your computer with Management Client. The file has been given the same name as your license request file.
5. From the **Site Navigation** pane -> **Basics** node -> **License Information**, select **Activate License Offline** > **Import Activated License**, and then select the activated software license file to import it and thereby activate your licenses.
6. Click **Finish** to end the activation process.

Activate licenses after grace period

If you have decided to use manual license activation and you have forgotten to activate a license within the grace period (hardware device, Milestone Interconnect camera, door licenses, or others), the device using that license becomes unavailable and cannot send data to the surveillance system

Even if a license's grace period has expired, the device configuration and settings you have made are saved and used when the license is activated.

To enable the unavailable devices again, you activate the licenses manually in your preferred way. For more information, see Activate licenses offline or Activate licenses online.

Get additional licenses

If you want to add or if you have already added more hardware devices, Milestone Interconnect systems, doors or other elements than you currently have licenses for, you must buy additional licenses to enable them to send data to your system:

- To get additional licenses for your system, contact your XProtect product reseller

If you have bought new licenses to your existing surveillance system version:

- Simply activate your licenses manually to get access to the new licenses. For more information, see Activate licenses online or Activate licenses offline.

If you have bought new licenses and an upgraded surveillance system version:

- You receive an updated software license file (.lic) with the new licenses and the new version. You must use the new software license file during the installation of the new version. For more information, see Upgrade requirements

Change the Software License Code

If you run an installation on a temporary Software License Code (SLC) or if you have upgraded to a more advanced XProtect product, you can change your SLC to a permanent or more advanced SLC. You can change your SLC without any un- or reinstallation actions when you have received your new software license file.

You can do this locally on the management server or remotely from Management Client.

From the management server tray icon

1. On the management server, go to the notification area of the taskbar.

2. Right-click the **Management Server** icon and select **Change License**.
3. Click **Import License**.
4. Next, select the software license file saved for this purpose. When done, the selected software license file location is

added just below the **Import License** button.
5. Click **OK** and you are now ready to register SLC. See Register Software License Code.

From Management Client

1. Copy the .lic file you receive to your computer with Management Client.
2. From the **Site Navigation** pane -> **Basics** node -> **License Information**, select **Activate License Offline** > **Import Activated License**, and then select the software license file to import.
3. When opened, accept that the software license file is different from the one currently in use.
4. You are now ready to register SLC. See Register Software License Code.

The software license file is only imported and changed but not activated. Remember to activate your license. For more information, see Activate your licenses.

License Information window

In the **License Information** window, you can keep track of all licenses that share the same software license file both on this site and on all other sites, your Milestone Care subscriptions and decide how you want to activate your licenses.

You can open the **License Information** window in the **Site Navigation** pane -> **Basics** node -> **License Information**.

If you want to have an overall understanding of how the XProtect licensing system works, see Licenses (explained).

Licensed to

This area of the **License Information** window, lists the contact details of the license owner that was entered during the software registration.

If you cannot see the **Licensed to** area, click the **Refresh** button in the lower right corner of the window.

Click **Edit details** to edit the license owner information. Click **End-user license agreement** to see the end-user license agreement that you accepted prior to the installation.

Milestone Care

Here you can see information about your current Milestone Care™ subscription. The expiry dates for your subscriptions are shown in the **Installed Products** table below.

For more information about Milestone Care, use the links or see Milestone Care™ (explained).

Installed Products

Lists the following information about all your installed base licenses for XProtect VMS and XProtect extensions that share the same software license file:

- Products and versions
- The products' software license code (SLC)
- The expiration date of your SLC. Typically, unrestricted
- The expiration date of your Milestone Care Plus subscription
- The expiration date of your Milestone Care Premium subscription

Installed Products

Product Version	Software License Code	Expiration Date	Milestone Care Plus	Milestone Care Premium
XProtect Corporate 20 R	M01-C01-211-01	Unlimited	16-11-20	16-11-20
Milestone XProtect Smart Wall	M01-P03-100-01	Unlimited	Unlimited	
Milestone XProtect Access	M01-P01-011-01	Unlimited	Unlimited	
Milestone XProtect Transact	M01-P08-100-01	Unlimited	Unlimited	

License Overview - All sites

Lists the number of activated device licenses and other licenses in your software license file and the total number of available licenses on your system. Here you can easily see if you can still grow your system without purchasing additional licenses.

For a detailed overview of the status of your licenses activated on other sites, click the **License Details - All sites** link. See the **License Details - Current site** section below for the available information that is shown.

License Overview - All sites License Details - All Sites...

License Type	Activated
Device Licenses	51 out of 100
Milestone Interconnect Camera	0 out of 100
Access control door	9 out of 2002
Transaction source	1 out of 101

If you have licenses for XProtect extensions, you can see additional details about these under the XProtect extension-specific nodes in the **Site Navigation** pane.

License Details - Current Site

The **Activated** column lists the number of activated device licenses or other licenses on this site.

You can also see the number of used device changes without activation (see Device changes without activation (explained)) and how many you have available per year in the **Changes without activation** column.

If you have licenses that you have not yet activated and that therefore run in a grace period, these are listed in the **In Grace Period** column. The expiration date of the first license which expires, appears in red below the table.

If you forget to activate licenses before the grace period expires, they will stop sending video to the system. These licenses are shown in the **Grace Period Expired** column. For more information, see Activate licenses after grace period.

If you have used more licenses than you have available, these are listed in the **Without License** column and cannot be used in your system. For more information, see Get additional licenses.

If you have licenses in a grace period, with an expired grace period or without license, a message will remind you every time you log into your Management Client.

License Details - Current Site: [redacted]

License Type	Activated	Changes without activation	In Grace Period	Grace Period Expired	Without License
Device Licenses	32	0 out of 10	0	0	0
Milestone Interconnect Camera	11	N/A	0	0	0
Access control door	9	N/A	0	0	0
Transaction source	1	N/A	0	0	0

If you have hardware devices that use more than one license, a **Click here to open full device license report** link appears underneath the **License Details - Current Site** table. When you click the link, you can see how many device licenses, each of these hardware devices require.

Hardware devices without licenses are identified by an exclamation mark in the Management Client. The exclamation mark is also used for other purposes. Place your mouse over the exclamation mark to see the purpose.

Features for activating licenses

Below the three tables are:

- A check box for enabling automatic license activation and a link to edit the user credentials for automatic activation. For more information, see Automatic license activation (explained) and Enable automatic license activation.
  If the automatic activation has failed, a failed message will appear in red. For more information, click the **Details** link.
  Some licenses are installed with the automatic license activation enabled, and disabling it is not possible.
- A drop-down list for manually activating licenses online or offline. For more information, see Activate licenses online and Activate licenses offline.
- In the lower right corner of the window, you can see when your licenses were activated last (automatically or manually) and when the information in the window were refreshed. The time stamps are from the server and not from the local computer


Enable automatic license activation
Edit activation credentials...
Activate License Manually...
Online
Offline
Last activated: 17. november 20 15:02:00
Information refreshed: 28. januar 20 11:39:11

Daylight saving time (explained)

Daylight saving time (DST) is the practice of advancing clocks for evenings to have more daylight and mornings to have less. The use of DST varies between countries/regions.

When you work with a surveillance system, which is inherently time-sensitive, it is important that you know how the system handles DST.

> Do not change the DST setting when you are in the DST period or if you have recordings from a DST period.

Spring: Switch from Standard Time to DST

The change from standard time to DST is not much of an issue since you jump one hour forward.

Example:

The clock jumps forward from 02:00 standard time to 03:00 DST, and the day has 23 hours. In that case, there is no data between 02:00 and 03:00 in the morning since that hour, for that day, did not exist.

Fall: Switch from DST to Standard Time

When you switch from DST to standard time in the fall, you jump one hour back.

Example:

The clock jumps backward from 02:00 DST to 01:00 standard time, repeating that hour, and the day has 25 hours. You reach 01:59:59, then immediately revert to 01:00:00. If the system did not react, it would essentially re-record that hour, so the first instance of 01:30 would be overwritten by the second instance of 01:30.

To solve such an issue from happening, your system archives the current video in the event the system time changes by more than five minutes. You cannot view the first instance of the 01:00 hour directly in any clients, but the data is recorded and safe. You can browse this video in XProtect Smart Client by opening the archived database directly.

Time servers (explained)

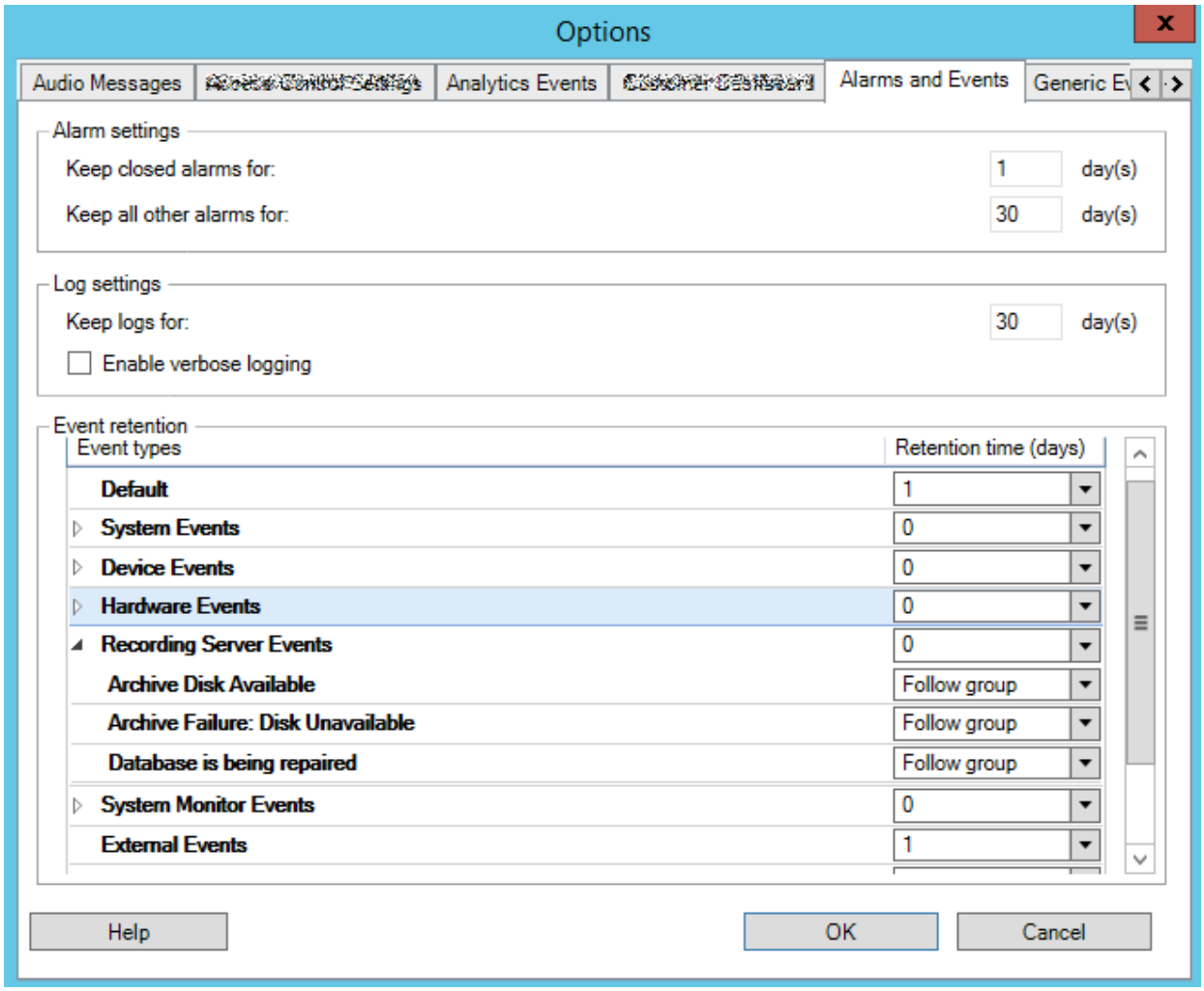
Once your system receives images, they are instantly time-stamped. Since cameras are separate units which may have separate timing devices, camera time and your system time may not correspond fully. This may occasionally lead to confusion. If your cameras support timestamps, Milestone recommends that you auto-synchronize camera and system time through a time server for consistent synchronization.

For information about how to configure a time server, search the Microsoft website (https://www.microsoft.com/) for **'time server'**, **'time service'**, or similar terms.

Limit size of database

To prevent the SQL Server database (see SQL Server installations and databases (explained)) growing to a size that affects the performance of the system, you can specify for how many days the different types of events and alarms are stored in the database.

1. Open the **Tools** menu.
2. Click **Options** > **Alarms and Events** tab.



3. Make the required settings. For more information, see Alarms and Events tab (options).

IPv6 and IPv4 (explained)

Your system supports IPv6 as well as IPv4. So does XProtect Smart Client.

IPv6 is the latest version of the Internet Protocol (IP). The Internet protocol determines the format and use of IP addresses. IPv6 coexists with the still much more widely used IP version IPv4. IPv6 was developed in order to solve the address exhaustion of IPv4. IPv6 addresses are 128-bit long, whereas IPv4 addresses are only 32-bit long.

It meant that the Internet's address book grew from 4.3 billion unique addresses to 340 undecillion (340 trillion trillion trillion) addresses. A growth factor of 79 octillion (billion billion billion).

More and more organizations are implementing IPv6 on their networks. For example, all US federal agency infrastructures are required to be IPv6 compliant. Examples and illustrations in this manual reflect use of IPv4 because this is still the most widely used IP version. IPv6 works equally well with the system.

Using the system with IPv6 (explained)

The following conditions apply when using the system with IPv6:

Servers

Servers can often use IPv4 as well as IPv6. However, if just one server in your system (for example, a management server or recording server) requires a particular IP version, all other servers in your system must communicate using the same IP version.

Example: All of the servers in your system except one can use IPv4 as well as IPv6. The exception is a server which is only capable of using IPv6. This means that all servers must communicate with each other using IPv6.

Devices

You can use devices (cameras, inputs, outputs, microphones, speakers) with a different IP version than that being used for server communication provided your network equipment and the recording servers also support the devices' IP version. See also the illustration below.

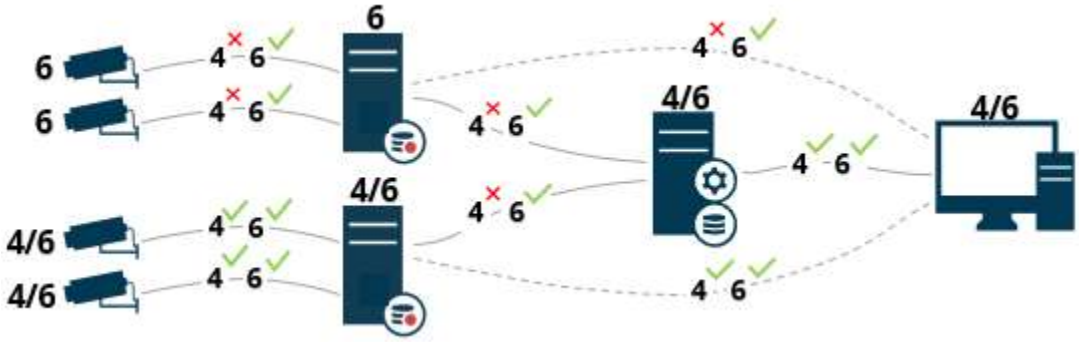
Clients

If your system uses IPv6, users should connect with the XProtect Smart Client. The XProtect Smart Client supports IPv6 as well as IPv4.

If one or more servers in your system can **only** use IPv6, XProtect Smart Client users **must** use IPv6 for their communication with those servers. In this context, it is important to remember that XProtect Smart Client installations technically connect to a management server for initial authentication, and then to the required recording servers for access to recordings.

However, the XProtect Smart Client users do not have to be on an IPv6 network themselves, provided your network equipment supports communication between different IP versions, and they have installed the IPv6 protocol on their computers. See also illustration. To install IPv6 on a client computer, open a command prompt, enter *Ipv6 install*, and press **ENTER**.

Example illustration



Example: Since one server in the system can only use IPv6, all communication with that server must use IPv6. However, that server also determines the IP version for communication between all other servers in the system.

Writing IPv6 addresses (explained)

An IPv6 address is usually written as eight blocks of four hexadecimal digits, with each block separated by a colon.

Example: *2001:0B80:0000:0000:0000:0F80:3FA8:18AB*

You may shorten addresses by eliminating leading zeros in a block. Also, note that some of the four-digit blocks may consist of zeros only. If any number of such 0000 blocks are consecutive, you may shorten addresses by replacing the 0000 blocks with two colons as long as there is only one such double colon in the address.

Example:
2001:0B80:0000:0000:0000:0F80:3FA8:18AB can be shortened to

2001:B80:0000:0000:0000:F80:3FA8:18AB if removing the leading zeros, or to

2001:0B80::0F80:3FA8:18AB if removing the 0000 blocks, or even to

2001:B80::F80:3FA8:18AB if removing the leading zeros as well as the 0000 blocks.

Using IPv6 Addresses in URLs

IPv6 addresses contain colons. Colons, however, are also used in other types of network addressing syntax. For example, IPv4 uses a colon to separate IP address and port number when both are used in a URL. IPv6 has inherited this principle. Therefore, to avoid confusion, square brackets are put around IPv6 addresses when they are used in URLs.

Example of a URL with an IPv6 address:
http://[2001:0B80:0000:0000:0000:0F80:3FA8:18AB], which may of course be shortened to, for example, *http://[2001:B80::F80:3FA8:18AB]*

Example of a URL with an IPv6 address and a port number:
http://[2001:0B80:0000:0000:0000:0F80:3FA8:18AB]:1234, which may of course be shortened to, for example, *http://[2001:B80::F80:3FA8:18AB]:1234*

For more information about IPv6, see, for example, the IANA website (https://www.iana.org/numbers/). IANA, the Internet Assigned Numbers Authority, is the organization responsible for the global coordination of IP addressing.

Virtual servers

You can run all system components on virtualized Windows® servers, such as VMware® and Microsoft® Hyper-V®.

Virtualization is often preferred to better utilize hardware resources. Normally, virtual servers running on the hardware host server do not load the virtual server to a great extent, and often not at the same time. However, recording servers record all cameras and video streams. This puts high load on CPU, memory, network, and storage system. So, when run on a virtual server, the normal gain of virtualization disappears to a large extent, since - in many cases - it uses all available resources.

If run in a virtual environment, it is important that the hardware host has the same amount of physical memory as allocated for the virtual servers and that the virtual server running the recording server is allocated enough CPU and memory - which it is not by default. Typically, the recording server needs 2-4 GB depending on configuration. Another bottleneck is network adapter allocation and hard disk performance. Consider allocating a physical network adapter on the host server of the virtual server running the recording server. This makes it easier to ensure that the network adapter is not overloaded with traffic to other virtual servers. If the network adapter is used for several virtual servers, the network traffic might result in the recording server not retrieving and recording the configured number of images.

Protect recording databases from corruption

Camera databases can become corrupted. Several database repair options exist to resolve such a problem. but Milestone recommends that you take steps to ensure that your camera databases do not become corrupted.

Hard disk failure: protect your drives

Hard disk drives are mechanical devices and are vulnerable to external factors. The following are examples of external factors which may damage hard disk drives and lead to corrupt camera databases:

- Vibration (make sure the surveillance system server and its surroundings are stable)
- Strong heat (make sure the server has adequate ventilation)
- Strong magnetic fields (avoid)
- Power outages (make sure you use an Uninterruptible Power Supply (UPS))
- Static electricity (make sure you ground yourself if you are going to handle a hard disk drive)
- Fire, water, etc. (avoid)

Windows Task Manager: be careful when you end processes

When you work in Windows Task Manager, be careful not to end any processes which affect the surveillance system. If you end an application or system service by clicking **End Process** in the Windows Task Manager, the process is not given the chance to save its state or data before it is terminated. This may lead to corrupt camera databases.

Windows Task Manager typically displays a warning if you attempt to end a process. Unless you are absolutely sure that ending the process is not going to affect the surveillance system, click **No** when the warning message asks you if you really want to terminate the process.

Power outages: use a UPS

The single-most common reason for corrupt databases is the recording server being shut down abruptly, without files being saved and without the operating system being closed down properly. This may happen due to power outages, due to somebody accidentally pulling out the server's power cable, or similar.

The best way of protecting your recording servers from being shut down abruptly is to equip each of your recording servers with a UPS (Uninterruptible Power Supply).

The UPS works as a battery-driven secondary power source, providing the necessary power for saving open files and safely powering down your system in the event of power irregularities. UPSs vary in sophistication, but many UPSs include software for automatically saving open files, for alerting system administrators, etc.

Selecting the correct type of UPS for your organization's environment is an individual process. When you assess your needs, however, bear in mind the amount of runtime you require the UPS to be able to provide if the power fails. Saving open files and shutting down an operating system properly may take several minutes.

SQL Server database transaction log (explained)

Each time a change is written to a SQL Server database, the SQL Server database logs this change in its transaction log.

With the transaction log, you can roll back and undo changes to the SQL Server database through Microsoft® SQL Server Management Studio. By default, the SQL Server database stores its transaction log indefinitely which over time means that the transaction log has more and more entries. The transaction log is by default located on the system drive, and if the transaction log keeps growing, it may prevent Windows from running properly.

To avoid such a scenario, flushing the transaction log regularly is a good idea. Flushing it does not make the transaction log file smaller, but cleans its content and thereby prevents it from growing out of control. Your VMS system does not flush transaction logs. In SQL Server, there are ways of flushing the transaction log. Visit the Microsoft support page https://docs.microsoft.com/en-us/sql/relational-databases/logs/the-transaction-log-sql-server?view=sql-server-2017 and search for Transaction log truncation.

Minimum system requirements

For information about the system requirements for the various VMS applications and system components, go to the Milestone website (https://www.milestonesys.com/systemrequirements/).

Before you start installation

Milestone recommends that you go through the requirements described in the next sections, before you start the actual installation.

Prepare your servers and network

Prepare Active Directory

Installation method

Decide on a SQL Server edition

Select service account

Kerberos authentication (explained)

Virus scanning exclusions (explained)

How can XProtect VMS be configured to run in FIPS 140-2 compliant mode?

Before you install XProtect VMS on a FIPS enabled system

Register Software License Code

Device drivers (explained)

Requirements for offline installation

Prepare your servers and network

Operating system

Make sure that all servers have a clean installation of a Microsoft Windows operating system, and that it is updated with all the latest Windows updates.

For information about the system requirements for the various VMS applications and system components, go to the Milestone website (https://www.milestonesys.com/systemrequirements/).

Microsoft® .NET Framework

Check that all servers have Microsoft® .NET 4.7.2 Framework and Microsoft® .NET 6 Runtime installed.

Network

Assign static IP addresses or make DHCP reservations to all system components and cameras. To make sure that sufficient bandwidth is available on your network, you must understand how and when the system consumes bandwidth. The main load on your network consists of three elements:

- Camera video streams
- Clients displaying video
- Archiving of recorded video

The recording server retrieves video streams from the cameras, which results in a constant load on the network. Clients that display video consume network bandwidth. If there are no changes in the content of the client views, the load is constant. Changes in view content, video search, or playback, make the load dynamic.

Archiving of recorded video is an optional feature that lets the system move recordings to a network storage if there is not enough space in the internal storage system of the computer. This is a scheduled job that you have to define. Typically, you archive to a network drive which makes it a scheduled dynamic load on the network.

Your network must have bandwidth headroom to cope with these peaks in the traffic. This enhances the system responsiveness and general user experience.

Prepare Active Directory

If you want to add users to your system through the Active Directory service, you must have a server with Active Directory installed and acting as domain controller available on your network.

For easy user and group management, Milestone recommends that you have Microsoft Active Directory® installed and configured before you install your XProtect system. If you add the management server to the Active Directory after installing your system, you must reinstall the management server, and replace users with new Windows users defined in the Active Directory.

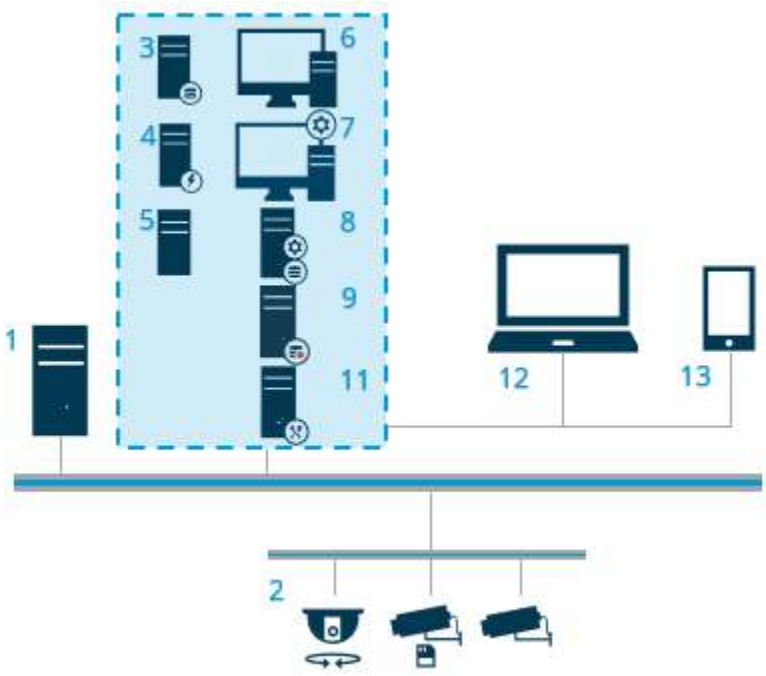
Basic users are not supported in Milestone Federated Architecture systems, so if you plan to use Milestone Federated Architecture, you must add users as Windows users through the Active Directory service. If you do not install Active Directory, follow the steps in Installation for workgroups when you install.

Installation method

As part of the installation wizard, you must decide which installation method to use. You should base your selection on your organization's needs, but it is very likely that you already decided on the method when you purchased the system.

Options	Description
Single Computer	Installs all server and client components, as well as SQL Server on the current computer. When the installation completes, you get the possibility to configure your system through a wizard. If you agree to continue, the recording server scans your network for hardware, and you can select which hardware devices to add to your system. The max number of hardware devices that can be added in the configuration wizard depends on your base license. Also, cameras are preconfigured in views, and a default Operator role is created. After installation, XProtect Smart Client opens, and you are ready to use the system.
Custom	The management server is always selected in the system component list and is always installed, but you can select freely what to install on the current computer among the other server and client components. By default, the recording server is not selected in the component list, but you can change this. You can install the not selected components on other computers afterwards.

Single Computer installation

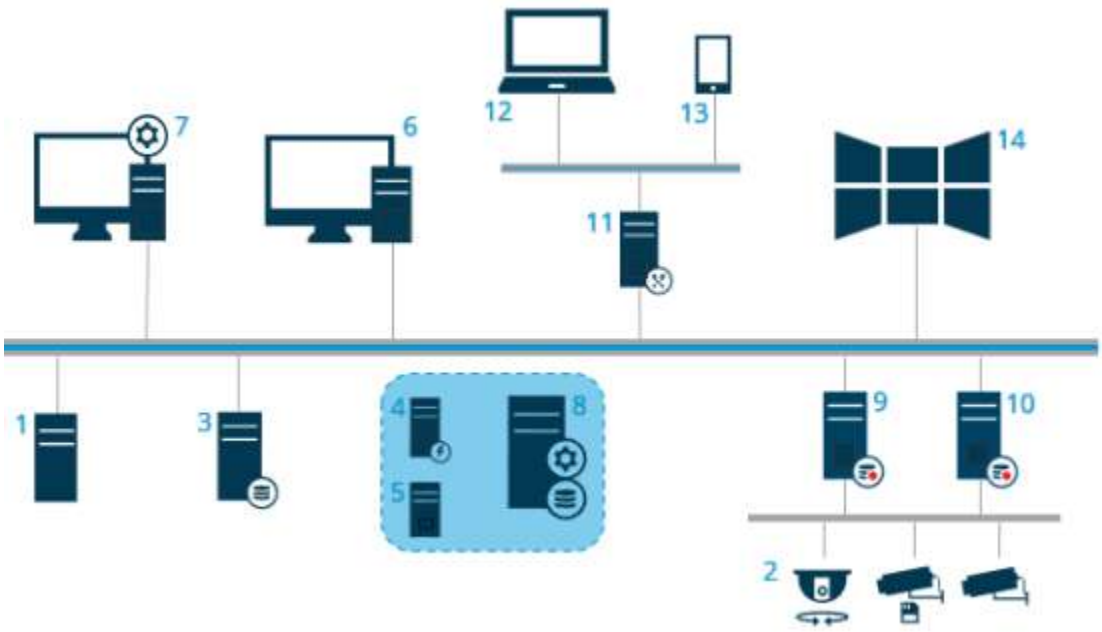


Typical system components in a system:

1. **Active Directory**
2. **Devices**
3. **Server with SQL Server**
4. **Event server**
5. **Log server**
6. **XProtect Smart Client**
7. **Management Client**

8. **Management server**
9. **Recording server**
10. **Failover recording server**
11. **XProtect Mobile server**
12. **XProtect Web Client**
13. **XProtect Mobile client**
14. **XProtect Smart Client with XProtect Smart Wall**

Custom installation - example of distributed system components



Decide on a SQL Server edition

Microsoft® SQL Server® Express is a free edition of SQL Server and is easy to install and prepare for use compared to the other SQL Server editions.

The installation wizard installs Microsoft SQL Server Express 2022 unless SQL Server is already installed on the computer. When you install XProtect VMS as an upgrade, the wizard keeps the previous SQL Server installation.

To check if your system meets the requirements for SQL Server editions, see https://www.milestonesys.com/systemrequirements/.

For very large systems or systems with many transactions to and from the SQL Server databases, Milestone recommends that you use the Microsoft® SQL Server® Standard or Microsoft® SQL Server® Enterprise edition of SQL Server on a dedicated computer on the network and on a dedicated hard disk drive that is not used for other purposes. Installing SQL Server on its own drive improves the entire system performance.

Select service account

As part of the installation, you are asked to specify an account to run the Milestone services on this computer. The services always run on this account no matter which user is logged in. Make sure that the account has all necessary user permissions, for example, the proper permissions to perform tasks, proper network and file access, and access to network shared folders.

You can select either a predefined account, or a user account. Base your decision on the environment that you want to install your system in:

Domain environment

In a domain environment:

- Milestone recommends that you use the built-in Network Service account

  It is easier to use even if you need to expand the system to multiple computers.

- You can also use domain user accounts, but they are potentially more difficult to configure

Workgroup environment

In a workgroup environment, Milestone recommends that you use a local user account that has all necessary permissions. This is often the administrator account.

> If you have installed your system components on multiple computers, the selected user account must be configured on all computers in your installations with identical user name, password, and access permissions.

Kerberos authentication (explained)

Kerberos is a ticket-based network authentication protocol. It is designed to provide strong authentication for client/server or server/server applications.

Use Kerberos authentication as an alternative to the older Microsoft NT LAN (NTLM) authentication protocol.

Kerberos authentication requires mutual authentication, where the client authenticates to the service and the service authenticates to the client. This way you can authenticate more securely from XProtect clients to XProtect servers without exposing your password.

To make mutual authentication possible in your XProtect VMS you must register Service Principal Names (SPN) in the active directory. An SPN is an alias that uniquely identifies an entity such as a XProtect server service. Every service that uses mutual authentication must have an SPN registered so that clients can identify the service on the network. Without correctly registered SPNs, mutual authentication is not possible.

The table below lists the different Milestone services with corresponding port numbers you need to register:

Service	Port number
Management Server - IIS	80 - Configurable
Management Server - Internal	8080
Recording Server - Data Collector	7609
Failover Server	8990
Event Server	22331
LPR Server	22334

The number of services you need to register in the active directory depends on your current installation. Data Collector is installed automatically when installing the Management Server, Recording Server, Event Server or Failover Server service.

You must register two SPNs for the user running the service: one with the host name and one with the fully qualified domain name.

If you are running the service under a network user service account, you must register the two SPNs for each computer running this service.

This is the Milestone SPN naming scheme:

VideoOS/[DNS Host Name]:[Port]

VideoOS/[Fully qualified domain name]:[Port]

The following is an example of SPNs for the Recording Server service running on a computer with the following details:

Hostname: Record-Server1

Domain: Surveillance.com

SPNs to register:

VideoOS/Record-Server1:7609

VideoOS/Record-Server1.Surveillance.com:7609

Virus scanning exclusions (explained)

As is the case with any other database software, if an antivirus program is installed on a computer running XProtect software, it is important that you exclude specific file types and folders, as well as certain network traffic. Without implementing these exceptions, virus scanning uses a considerable amount of system resources. On top of that, the scanning process can temporarily lock files, which could result in a disruption in the recording process or even corruption of databases.

When you need to perform virus scanning, do not scan Recording Server folders that contain recording databases (by default `C:\mediadatabase\`, as well as all subfolders). Also, avoid performing virus scanning on archive storage directories.

Create the following additional exclusions:

- File types: .blk, .idx, .pic
- Folders and subfolders:
  - `C:\Program Files\Milestone` or `C:\Program Files (x86)\Milestone`
  - `C:\ProgramData\Milestone\IDP\Logs`
  - `C:\ProgramData\Milestone\KeyManagement\Logs`
  - `C:\ProgramData\Milestone\MIPSDK`
  - `C:\ProgramData\Milestone\XProtect Data Collector Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Event Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Log Server`
  - `C:\ProgramData\Milestone\XProtect Management Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Mobile Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Recording Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Report Web Server\Logs`
  - `C:\ProgramData\Milestone\XProtect Recording Server\Secure\TablesDb`
- Exclude network scanning on the following TCP ports:

Product	TCP ports
XProtect VMS	80, 8080, 7563, 25, 21, 9000
XProtect Mobile	8081

or

- Exclude network scanning of the following processes:

Product	Processes
XProtect VMS	VideoOS.Recorder.Service.exe, VideoOS.Server.Service.exe, VideoOS. Administration.exe
XProtect Mobile	VideoOS.MobileServer.Service.exe

Your organization may have strict guidelines regarding virus scanning, but it is important that you exclude the above folders and files from virus scanning.

How can XProtect VMS be configured to run in FIPS 140-2 compliant mode?

In order to run XProtect VMS in a FIPS 140-2 mode of operation you must:

- Run Windows operating system in FIPS 140-2 approved mode of operation. See the Microsoft site for information on enabling FIPS.
- Ensure standalone third-party integrations can run on a FIPS enabled Windows operating system
- Connect to devices in a way that ensures a FIPS 140-2 compliant mode of operation
- Ensure that data in the media database is encrypted with FIPS 140-2 compliant ciphers

  This is done by running the media database upgrade tool. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

Before you install XProtect VMS on a FIPS enabled system

While new XProtect VMS installations can be done on computers that are FIPS-enabled, you cannot upgrade XProtect VMS when FIPS is enabled on the Windows operating system.

If you are upgrading, before you install, disable the Windows FIPS security policy on all of the computers that are part of the VMS, including the computer that hosts SQL Server.

The XProtect VMS installer checks the FIPS security policy and will prevent the installation from starting if FIPS is enabled.

But, if you are upgrading from XProtect VMS version 2020 R3 and after, you do not need to disable FIPS.

After you have installed the XProtect VMS components on all of the computers and prepared the system for FIPS, you can enable the FIPS security policy on Windows on all of the computers in your VMS.

For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2

compliance section in the hardening guide.

Register Software License Code

Before you install, you must have the name and location of the software license file that you received from Milestone.

The Software License Code (SLC) is printed on your order confirmation and the software license file is named after your SLC.

Milestone recommends that you register your SLC on our website (https://online.milestonesys.com/) before installation. Your reseller may have done that for you.

Device drivers (explained)

Your system uses video device drivers to control and communicate with the camera devices connected to a recording server. You must install device drivers on each recording server on your system.

From the 2018 R1 release, the device drivers are split into two device packs: the regular device pack with newer drivers and a legacy device pack with older drivers.

The regular device pack is installed automatically when you install the recording server. Later, you can update the drivers by downloading and installing a newer version of the device pack. Milestone releases new versions of device drivers regularly and makes them available on the download page (https://www.milestonesys.com/download/) on our website as device packs. When you update a device pack, you can install the latest version on top of any version you may have installed.

The legacy device pack can only be installed if the system has a regular device pack installed. The drivers from the legacy device pack are automatically installed if a previous version is already installed on your system. It is available for manual download and installation on the software download page (https://www.milestonesys.com/download/).

Stop the Recording Server service before you install, otherwise you need to restart the computer.

To ensure best performance, always use the latest version of device drivers.

Requirements for offline installation

If you install the system on a server that is offline, you need the following:

- The `Milestone XProtect VMS Products 2025 R3 System Installer.exe` file
- The software license file (SLC) for your XProtect system
- OS installation media including the required .NET version (https://www.milestonesys.com/systemrequirements/)

Secure communication (explained)

Hypertext Transfer Protocol Secure (HTTPS) is an extension of the Hypertext Transfer Protocol (HTTP) for secure communication over a computer network. In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS), or its predecessor, Secure Sockets Layer (SSL).

In XProtect VMS, secure communication relies on TLS/SSL with asymmetric encryption (RSA).

A certificate authority (CA) is anyone who can issue certificates for HTTPS services. Each certificate includes the following to authenticate, secure, and manage secure connections:

- Public key: Installed on the clients via a public certificate
- Private key: Used by the server to sign its certificate

Whenever a service client calls the web service, the web service sends the server certificate, including the public key, to the client. The service client can validate the server certificate using the already installed public CA certificate. The client and the server can now use the public and private server certificates to exchange a secret key and thereby establish a secure TLS/SSL connection.

For manually distributed certificates, certificates must be installed before the client can verify the server.

See also: Transport Layer Security (external link).

Certificates have an expiry date. XProtect VMS will not warn you when a certificate is about to expire. If a certificate expires:
• The clients will no longer trust the recording server with the expired certificate and thus cannot communicate with it
• The recording servers will no longer trust the management server with the expired certificate and thus cannot communicate with it
• The mobile devices will no longer trust the mobile server with the expired certificate and thus cannot communicate with it

To renew the certificates, follow the steps in this guide as you did when you created certificates.

For more information, see the certificates guide about how to secure your XProtect VMS installations.

Install a new XProtect system

How you install depends on the size of your system:

Size	Installation process
Small	Install your system - Single computer option
Large	Install your system - Custom option

Install your system - Single computer option

The **Single computer** option installs the server and client components on the current computer.

With XProtect 2025 R3, XProtect Smart Client is not included in the VMS installation package and must be downloaded separately. To download the latest version of XProtect Smart Client, go to the Milestone Software Download site.

Milestone recommends that you read the following section carefully before you install: Before you start installation.

For FIPS installations, you cannot upgrade XProtect VMS when FIPS is enabled on the Windows operating system. Before you install, disable the Windows FIPS security policy on all of the computers that are part of the VMS, including the computer that hosts SQL Server. But, if you are upgrading from XProtect VMS version 2020 R3 and after, you do not need to disable FIPS. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

After initial installation, you can continue with the configuration wizard. Depending on your hardware and configuration, the recording server scans your network for hardware. You can then select which hardware devices to add to your system. Cameras are preconfigured in views, and you have the option to enable other devices such as microphones and speakers. You also have the option of adding users to the system with either an operator role or an administrator role. After installation, XProtect Smart Client opens, and you are ready to use the system.

Otherwise, if you close the installation wizard, XProtect Management Client opens, where you can make manual configurations such as add hardware devices and users to the system.

If you upgrade from a previous version of the product, the system does not scan for hardware or create new views and user profiles.

1. Download the .iso file with the software from the internet (https://www.milestonesys.com/download/). When you download the .iso file, it will be loaded as a DVD drive called XProtect VMS Installer.
2. Run the `Milestone XProtect VMS Products 2025 R3 System Installer.exe` file.
3. The installation files unpack. Depending on the security settings, one or more Windows® security warnings appear. Accept these and the unpacking continues.
4. When done, the **Milestone XProtect VMS** installation wizard appears.
    a. Select the **Language** to use during the installation (this is not the language that your system uses once installed; this is selected later). Click **Continue**.

b. Read the *Milestone End-user License Agreement*. Select the **I accept the terms in the license agreement** check box and click **Continue**.
c. On the **Privacy settings** page, select whether you want to share usage data, and click **Continue**.

> You must not enable data collection if you want the system to have an EU GDPR-compliant installation. For more information about data protection and the usage data collection, see the GDPR privacy guide.

> You can always change your privacy setting later. See also System settings (Options dialog box).

5. Select **Single computer**.

   A list of components to install appears (you cannot edit this list). Click **Continue**.

6. On the **Assign a system configuration password** page, enter a password that protects your system configuration. You will need this password in case of system recovery or when expanding your system, for example when adding clusters.

   > It is important that you save this password and keep it safe. If you lose this password, you may compromise your ability to recover your system configuration.

   If you do not want your system configuration to be password protected, select **I choose not to use a system configuration password and understand that the system configuration will not be encrypted**.

   Click **Continue**.

7. On the **Assign a mobile server data protection password** page, enter a password to encrypt your investigations. As a system administrator, you will need to enter this password to access the mobile server data in case of system recovery or when expanding your system with additional mobile servers.

   > You must save this password and keep it safe. Failure to do so may compromise your ability to recover mobile server data.

   If you do not want your investigations to be password-protected, select **I choose not to use a mobile server data protection password, and I understand that investigations will not be encrypted**.

   Click **Continue**.

8. On the **Specify recording server settings** page, specify the different recording server settings:
   a. In the **Recording server name** field, enter the name of the recording server. The default is the name of the computer.
   b. The **Management server address** field shows the address and port number of the management server: localhost:80.
   c. In the **Select your media database location** field, select the location where you want to save your video recording. Milestone recommends that you save your video recordings in a separate location from where you install the software and not on the system drive. The default location is the drive with the most space available.
   d. In **Retention time for video recordings** field, define for how long you want to save the recordings. You can enter from between 1 and 365,000 days, where 7 days is the default retention time.
   e. Click **Continue**.

9. On the **Select encryption** page, you can secure the communication flows:

   - Between the recording servers, data collectors, and the management server

     To enable encryption for internal communication flows, in the **Server certificate** section, select a

certificate.

> If you encrypt the connection from the recording server to the management server, the system requires that you also encrypt the connection from the management server to the recording server.

- Between the recording servers and clients

  To enable encryption between recording servers and client components that retrieve data streams from the recording server, in the **Streaming media certificate** section, select a certificate.

- Between the mobile server and clients

  To enable encryption between client components that retrieve data streams from the mobile server, in the **Mobile streaming media certificate** section, select a certificate.

- Between the event server and components that communicate with the event server

  To enable encryption between the event server and components that communicate with the event server, including the LPR Server, in the **Event server and extensions** section, select a certificate.

You can use the same certificate file for all system components or use different certificate files depending on the system components.

For more information about preparing your system for secure communication, see:

- Secure communication (explained)
- The Milestone guide about certificates

You can also enable encryption after installation from the Server Configurator in the Management Server Manager tray icon in the notification area.

10. On the **Select file location and product language** page, do the following:

    a. In the **File location** field, select the location where you want to install the software.

    > If any Milestone XProtect VMS product is already installed on the computer, this field is disabled. The field displays the location where the component will be installed.

    b. In **Product language**, select the language in which to install your XProtect product.
    c. Click **Install**.

    The software now installs. If not already installed on the computer, Microsoft® SQL Server® Express and Microsoft IIS are automatically installed during the installation.

11. You may be prompted to restart the computer. After restarting your computer, depending on the security settings, one or more Windows security warnings may appear. Accept these and the installation completes.

12. When the installation completes, a list shows the components that are installed on the computer.

    Click **Continue** to add hardware and users to the system.

    > If you click **Close** now, you bypass the configuration wizard and XProtect Management Client opens. You can configure the system, for example add hardware and users to the system, in Management Client.

13. On the **Enter user names and passwords for hardware** page, enter the user names and passwords for hardware that you have changed from the manufacturer defaults.

The installer scans the network for this hardware as well as hardware with manufacturer default credentials.

Click **Continue** and wait while the system scans for hardware.

14. On the **Select the hardware to add to the system** page, select the hardware that you want to add to the system. Click **Continue** and wait while the system adds the hardware.
15. On the **Configure the devices** page, you can give the hardware descriptive names by clicking the edit icon next to the hardware name. This name is then prefixed to the hardware devices.

    Expand the hardware node to enable or disable the hardware devices, such as cameras, speakers, and microphones.

    Cameras are enabled by default, and speakers and microphones are disabled by default.

    Click **Continue** and wait while the system configures the hardware.

16. On the **Add users** page, you can add users to the system as Windows users or basic users. The users can have either the Administrators role or the Operators role.

    Define the user and click **Add**.

    When you are done adding users, click **Continue**.

17. When the installation and initial configuration are done, the **Configuration is complete** page appears, where you see:
    - A list of hardware devices that are added to the system
    - A list of users who are added to the system
    - Addresses to the XProtect Web Client and XProtect Mobile client, which you can share with your users

    When you click **Close**, XProtect Smart Client opens and is ready to use.

Install your system - Custom option

The **Custom** option installs the management server, but you can select which other server and client components you want to install on the current computer. By default, the recording server is not selected in the component list. Depending on your selections, you can install the not selected system components on other computers afterwards. For more information about each system component and their role, see Product overview. Installation on other computers is done through the management server's download web page named Download Manager. For more information about installation through the Download Manager, see Download Manager/download web page.

Milestone recommends that you read the following section carefully before you install: Before you start installation.

For FIPS installations, you cannot upgrade XProtect VMS when FIPS is enabled on the Windows operating system. Before you install, disable the Windows FIPS security policy on all of the computers that are part of the VMS, including the computer that hosts SQL Server. But, if you are upgrading from XProtect VMS version 2020 R3 and after, you do not need to disable FIPS. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

1. Download the .iso file with the software from the internet (https://www.milestonesys.com/download/). When you download the .iso file, it will be loaded as a DVD drive called XProtect VMS Installer.
2. Run the `Milestone XProtect VMS Products 2025 R3 System Installer.exe` file.
3. The installation files unpack. Depending on the security settings, one or more Windows® security warnings appear. Accept these and the unpacking continues.
4. When done, the **Milestone XProtect VMS** installation wizard appears.
    a. Select the **Language** to use during the installation (this is not the language that your system uses once

installed; this is selected later). Click **Continue**.

b. Read the *Milestone End-user License Agreement*. Select the **I accept the terms in the license agreement** check box and click **Continue**.

c. On the **Privacy settings** page, select whether you want to share usage data, and click **Continue**.

> You must not enable data collection if you want the system to have an EU GDPR-compliant installation. For more information about data protection and the usage data collection, see the GDPR privacy guide.

> You can always change your privacy setting later. See also System settings (Options dialog box).

5. Select **Custom**. A list of components to be installed appears. Apart from the management server, all components in the list are optional. The recording server and the mobile server are by default not selected.

> With XProtect 2025 R3, XProtect Smart Client is not included in the VMS installation package and must be downloaded separately. To download the latest version of XProtect Smart Client, go to the Milestone Software Download site.

> For your system to function properly, you must install at least one instance of XProtect API Gateway.

Select the system components you want to install and click **Continue**.

> In the steps below, all system components are installed. For a more distributed system, install fewer system components on this computer and the remaining system components on other computers. If you cannot recognize an installation step, it is likely because you have not selected to install the system component that this page belongs to. In that case, continue to the next step. See also Installing through Download Manager (explained), Install a recording server through Download Manager, and Installing silently through a command line shell (explained).

6. The **Select a website on the IIS to use with your XProtect system** page is shown only if you have more than one IIS website available on the computer. You must select which website you will use with your XProtect system. Select a website with HTTPS binding. Click **Continue**.

   If Microsoft® IIS is not installed on the computer, it is installed.

7. On the **Select Microsoft SQL Server** page, select the SQL Server that you want to use. See also SQL Server options during custom installation. Click **Continue**.

> If you do not have SQL Server on your local computer, you can install Microsoft SQL Server Express, but in a larger distributed system you would typically use dedicated SQL Server on your network.

8. On the **Select database** (only shown if you have selected existing SQL Server), select or create a SQL Server database for storing your system configuration. If you choose an existing SQL Server database, decide whether to **Keep** or **Overwrite** existing data. If you are upgrading, select to keep existing data so you do not lose your system configuration. See also SQL Server options during custom installation. Click **Continue**.
9. On the **Database settings** page, select either **Let the installer create or recreate a database** or **Use a pre-created database**.
10. To have your databases created or recreated automatically, select **Let the installer create or recreate a database**, and click **Continue**.

11. To use databases that you set up for the purpose or databases that have already been created, select **Use a pre-created database**. You will then see the **Advanced database setup** page.
12. On the **Advanced database setup** page, enter the server and the database name for the XProtect components.
13. Select either **Windows Authentication, do not trust server certificate (recommended)** or **Windows Authentication, trust server certificate** or select **Microsoft Entra Integrated, do not trust server certificate (recommended)**.

    The account to be used for the installation must be created in Microsoft Entra ID or Windows AD depending on the authentication type you want to use. Multi-factor authentication (MFA) is not supported for the accounts.

    The **(do not trust server certificate)** option is recommended for Windows Authentication and mandatory for Microsoft Entra Integrated. This is to ensure that server certificates are validated and verified before installation. More information about invalid server certificates is available in the installation log file. With the **Windows Authentication, trust server certificate** option, you skip the validation of server certificates.

14. Click the icon to verify the connection. By clicking the icon, you also validate server certificates.
15. Click **Continue**
16. On the **Assign a system configuration password** page, enter a password that protects your system configuration. You will need this password in case of system recovery or when expanding your system, for example when adding clusters.

    It is important that you save this password and keep it safe. If you lose this password, you may compromise your ability to recover your system configuration.

    If you do not want your system configuration to be password protected, select **I choose not to use a system configuration password and understand that the system configuration will not be encrypted**.

    Click **Continue**.

17. On the **Assign a mobile server data protection password** page, enter a password to encrypt your investigations. As a system administrator, you will need to enter this password to access the mobile server data in case of system recovery or when expanding your system with additional mobile servers.

    You must save this password and keep it safe. Failure to do so may compromise your ability to recover mobile server data.

    If you do not want your investigations to be password-protected, select **I choose not to use a mobile server data protection password, and I understand that investigations will not be encrypted**.

    Click **Continue**.

18. On the **Select service account for recording server**, select either **This predefined account** or **This account** to select the service account for the recording server.

    If needed, enter a password.

    The user name for the account must be a single word. It must not have a space.

    Click **Continue.**

19. On the **Specify recording server settings** page, specify the different recording server settings:
    a. In the **Recording server name** field, enter the name of the recording server. The default is the name of

the computer.

b. The **Management server address** field shows the address and port number of the management server: localhost:80.
c. In the **Select your media database location** field, select the location where you want to save your video recording. Milestone recommends that you save your video recordings in a separate location from where you install the software and not on the system drive. The default location is the drive with the most space available.
d. In **Retention time for video recordings** field, define for how long you want to save the recordings. You can enter from between 1 and 365,000 days, where 7 days is the default retention time.
e. Click **Continue**.

20. On the **Select encryption** page, you can secure the communication flows:

    - Between the recording servers, data collectors, and the management server

      To enable encryption for internal communication flows, in the **Server certificate** section, select a certificate.

      > If you encrypt the connection from the recording server to the management server, the system requires that you also encrypt the connection from the management server to the recording server.

    - Between the recording servers and clients

      To enable encryption between recording servers and client components that retrieve data streams from the recording server, in the **Streaming media certificate** section, select a certificate.

    - Between the mobile server and clients

      To enable encryption between client components that retrieve data streams from the mobile server, in the **Mobile streaming media certificate** section, select a certificate.

    - Between the event server and components that communicate with the event server

      To enable encryption between the event server and components that communicate with the event server, including the LPR Server, in the **Event server and extensions** section, select a certificate.

    You can use the same certificate file for all system components or use different certificate files depending on the system components.

    For more information about preparing your system for secure communication, see:

    - Secure communication (explained)
    - The Milestone guide about certificates

    You can also enable encryption after installation from the Server Configurator in the Management Server Manager tray icon in the notification area.

21. On the **Select file location and product language** page, select the **File location** for the program files.

    > If any Milestone XProtect VMS product is already installed on the computer, this field is disabled. The field displays the location where the component will be installed.

22. In the **Product language** field, select the language in which to install your XProtect product. Click **Install**.

    The software now installs. When the installation completes, you see a list of successfully installed system components. Click **Close**.

23. You may be prompted to restart the computer. After restarting your computer, depending on the security settings, one or more Windows security warnings may appear. Accept these and the installation completes.

24. Configure your system in Management Client. See Initial configuration tasks list.
25. Depending on your selections, install the remaining system components on other computers through the Download Manager. See Installing through Download Manager (explained).

SQL Server options during custom installation

Decide which SQL Server and database to use with the below options.

SQL Server options:

- **Install Microsoft® SQL Server® Express on this computer**: This option is shown only if you do not have SQL Server installed on the computer
- **Use the SQL Server on this computer**: This option is shown only if SQL Server is already installed on the computer
- **Select a SQL Server on your network through search**: Enables you to search for all SQL Server installations that are discoverable on your network subnet
- **Select a SQL Server on your network**: Enables you to enter the address (host name or IP address) of SQL Server that you might not be able to find through search

SQL Server database options:

- **Create new database**: Mainly for new installations
- **Use existing database**: Mainly for upgrades of existing installations. Milestone recommends that you reuse the existing SQL Server database and keep the existing data in it, so you do not lose your system configuration. You can also choose to overwrite the data in the SQL Server database

Install new XProtect components

Installing through Download Manager (explained)

If you want to install system components on computers other than where the management server is installed, you must install these system components through the Management Server's download website Download Manager.

> With XProtect 2025 R3, XProtect Smart Client is not included in the VMS installation package and must be downloaded separately. To download the latest version of XProtect Smart Client, go to the Milestone Software Download site.

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.
2. Log in to each of the other computers to install one or more of the other system components:
   - Recording Server (For more information, see Install a recording server through Download Manager or Install a recording server silently)
   - Management Client (For more information, see Install a Management Client through Download Manager)
   - Event Server Remember to restart the API Gateway after installation. If you rename the computer at a later date, you must also restart the API Gateway.

     > If you are installing the Event Server in a FIPS-compliant environment, you must disable Windows FIPS 140-2 mode before installation.

   - Log Server (For more information, see Install a log server silently)
   - Mobile Server (For more information, see Install the XProtect Mobile server)
3. Open an internet browser, enter the address of the Management Server's download web page into the address field, and download the relevant installer.
4. Run the installer.

See Install your system - Custom option if in doubt about the selections and settings in the different installation steps.

Install a Management Client through Download Manager

If there are several administrators of the XProtect system or you simply want to manage the XProtect system from multiple computers, you can install the Management Client by following the instructions below.

The Management Client is always installed on the management server.

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.

2. Log into the computer where you want to install the system component.

3. Open an internet browser and enter the address of the Management Server's download web page into the address field and press Enter.
3. Click **All Languages** for the Management Client installer. Run the downloaded file.
4. Click **Yes** to all warnings. Unpacking starts.
5. Select the language for the installer. Click **Continue**.
6. Read and accept the license agreement. Click **Continue**.
7. Select file location and product language. Click **Install**.
8. The installation is complete. A list of successfully installed components is displayed. Click **Close**.
9. Click the icon on the desktop to open the Management Client.
10. The Management Client login dialog appears.
11. Specify the host name or the IP address of your management server in the **Computer** field.
12. Select authentication, enter your user name and password. Click **Connect**. The Management Client launches.

    To read in details about the features in the Management Client and what you can accomplish with your system, click **Help** in the tools menu.

Install a recording server through Download Manager

If your system components are distributed on separate computers, you can install the recording servers by following the instructions below.

The recording server is already installed if you made a **Single Computer** installation, but you can use the same instructions to add more recording servers if you need more capacity.

If you need to install a failover recording server, see Install a failover recording server through Download Manager.

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.

2. Log into the computer where you want to install the system component.

3. Open an internet browser and enter the address of the Management Server's download web page into the address field and press Enter.
4. Download the recording server installer by selecting **All Languages** below the **Recording Server Installer**. Save the installer or run it directly from the web page.
5. Select the **Language** you want to use during the installation. Click **Continue**.
6. On the **Select an installation type** page, select:

Typical to install a recording server with default values, or

Custom to install a recording server with custom values.

7. On the **Specify recording server settings** page, specify the different recording server settings:
   a. In the **Recording server name** field, enter the name of the recording server. The default is the name of the computer.
   b. The **Management server address** field shows the address and port number of the management server: localhost:80.
   c. In the **Select your media database location** field, select the location where you want to save your video recording. Milestone recommends that you save your video recordings in a separate location from where you install the software and not on the system drive. The default location is the drive with the most space available.
   d. In **Retention time for video recordings** field, define for how long you want to save the recordings. You can enter from between 1 and 365,000 days, where 7 days is the default retention time.
   e. Click **Continue**.
8. The **Recording servers IP addresses** page is shown only if you selected **Custom**. Specify the number of recording servers that you want to install on this computer. Click **Continue**.
9. On the **Select service account for recording server**, select either **This predefined account** or **This account** to select the service account for the recording server.

   If needed, enter a password.

   The user name for the account must be a single word. It must not have a space.

   Click **Continue.**
10. On the **Select encryption** page, you can secure the communication flows:

    - Between the recording servers, data collectors, and the management server

      To enable encryption for internal communication flows, in the **Server certificate** section, select a certificate.

      If you encrypt the connection from the recording server to the management server, the system requires that you also encrypt the connection from the management server to the recording server.

    - Between the recording servers and clients

      To enable encryption between recording servers and client components that retrieve data streams from the recording server, in the **Streaming media certificate** section, select a certificate.

    - Between the mobile server and clients

      To enable encryption between client components that retrieve data streams from the mobile server, in the **Mobile streaming media certificate** section, select a certificate.

    - Between the event server and components that communicate with the event server

      To enable encryption between the event server and components that communicate with the event server, including the LPR Server, in the **Event server and extensions** section, select a certificate.

    You can use the same certificate file for all system components or use different certificate files depending on the system components.

    For more information about preparing your system for secure communication, see:

    - Secure communication (explained)
    - The Milestone guide about certificates

You can also enable encryption after installation from the Server Configurator in the Management Server Manager tray icon in the notification area.

11. On the **Select file location and product language** page, select the **File location** for the program files.

> If any Milestone XProtect VMS product is already installed on the computer, this field is disabled. The field displays the location where the component will be installed.

12. In the **Product language** field, select the language in which to install your XProtect product. Click **Install**.

    The software now installs. When the installation completes, you see a list of successfully installed system components. Click **Close**.

13. When you have installed the recording server, you can check its state from the Recording Server Manager tray icon and configure it in Management Client. For more information, see Initial configuration tasks list.

Install XProtect Management Client through Download Manager

If there are several administrators of the XProtect system or you simply want to manage the XProtect system from multiple computers, you can install the Management Client by following the instructions below.

> The Management Client is always installed on the management server.

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.

2. Log into the computer where you want to install the system component.

3. Open an internet browser and enter the address of the Management Server's download web page into the address field and press Enter.
3. Click **All Languages** for the Management Client installer. Run the downloaded file.
4. Click **Yes** to all warnings. Unpacking starts.
5. Select the language for the installer. Click **Continue**.
6. Read and accept the license agreement. Click **Continue**.
7. Select file location and product language. Click **Install**.
8. The installation is complete. A list of successfully installed components is displayed. Click **Close**.
9. Click the icon on the desktop to open the Management Client.
10. The Management Client login dialog appears.
11. Specify the host name or the IP address of your management server in the **Computer** field.
12. Select authentication, enter your user name and password. Click **Connect**. The Management Client launches.

    To read in details about the features in the Management Client and what you can accomplish with your system, click **Help** in the tools menu.

Install a recording server through Download Manager

If your system components are distributed on separate computers, you can install the recording servers by following the instructions below.

> The recording server is already installed if you made a **Single Computer** installation, but you can use the same instructions to add more recording servers if you need more capacity.

If you need to install a failover recording server, see ????

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.

2. Log into the computer where you want to install the system component.

3. Open an internet browser and enter the address of the Management Server's download web page into the address field and press Enter.
4. Download the recording server installer by selecting **All Languages** below the **Recording Server Installer**. Save the installer or run it directly from the web page.
5. Select the **Language** you want to use during the installation. Click **Continue**.
6. On the **Select an installation type** page, select:

   Typical to install a recording server with default values, or

   Custom to install a recording server with custom values.

7. On the **Specify recording server settings** page, specify the different recording server settings:
   a. In the **Recording server name** field, enter the name of the recording server. The default is the name of the computer.
   b. The **Management server address** field shows the address and port number of the management server: localhost:80.
   c. In the **Select your media database location** field, select the location where you want to save your video recording. Milestone recommends that you save your video recordings in a separate location from where you install the software and not on the system drive. The default location is the drive with the most space available.
   d. In **Retention time for video recordings** field, define for how long you want to save the recordings. You can enter from between 1 and 365,000 days, where 7 days is the default retention time.
   e. Click **Continue**.
8. The **Recording servers IP addresses** page is shown only if you selected **Custom**. Specify the number of recording servers that you want to install on this computer. Click **Continue**.

9. On the **Select service account for recording server**, select either **This predefined account** or **This account** to select the service account for the recording server.

   If needed, enter a password.

   The user name for the account must be a single word. It must not have a space.

   Click **Continue.**

10. On the **Select encryption** page, you can secure the communication flows:

    - Between the recording servers, data collectors, and the management server

      To enable encryption for internal communication flows, in the **Server certificate** section, select a certificate.

      If you encrypt the connection from the recording server to the management server, the system requires that you also encrypt the connection from the management server to the recording server.

    - Between the recording servers and clients

      To enable encryption between recording servers and client components that retrieve data streams from the recording server, in the **Streaming media certificate** section, select a certificate.

- Between the mobile server and clients

  To enable encryption between client components that retrieve data streams from the mobile server, in the **Mobile streaming media certificate** section, select a certificate.

- Between the event server and components that communicate with the event server

  To enable encryption between the event server and components that communicate with the event server, including the LPR Server, in the **Event server and extensions** section, select a certificate.

You can use the same certificate file for all system components or use different certificate files depending on the system components.

For more information about preparing your system for secure communication, see:

- Secure communication (explained)
- The Milestone guide about certificates

You can also enable encryption after installation from the Server Configurator in the Management Server Manager tray icon in the notification area.

11. On the **Select file location and product language** page, select the **File location** for the program files.

> If any Milestone XProtect VMS product is already installed on the computer, this field is disabled. The field displays the location where the component will be installed.

12. In the **Product language** field, select the language in which to install your XProtect product. Click **Install**.

    The software now installs. When the installation completes, you see a list of successfully installed system components. Click **Close**.

13. When you have installed the recording server, you can check its state from the Recording Server Manager tray icon and configure it in Management Client. For more information, see Initial configuration tasks list

Install a failover recording server through Download Manager

> If you run workgroups, you must use the alternative installation method for failover recording servers (see Installation for workgroups).

1. From the computer where Management Server is installed, go to the Management Server's download web page. In Windows' **Start** menu, select **Milestone** > **Administrative Installation Page** and write down or copy the internet address for later use when installing the system components on the other computers. The address is typically *http://[management server address]/installation/Admin/default-en-US.htm*.

   Log into the computer where you want to install the system component.

2. Open an internet browser and enter the address of the Management Server's download web page into the address field and press Enter.
3. Download the recording server installer by selecting **All Languages** below the **Recording Server Installer**. Save the installer or run it directly from the web page.
4. Select the **Language** you want to use during the installation. Click **Continue**.
5. On the **Select an installation type** page, select **Failover** to install a recording server as a failover recording server.

6. On the **Specify recording server settings** page, specify the different recording server settings. The name of the failover recording server, the address of the management server, and the path to the media database. Click **Continue**.

7. On the **Select service account for recording server** page and when installing a failover recording server, you must use the particular user account named **This account**. This creates the failover user account. If needed, enter a

password and confirm this. Click **Continue**.

8. On the **Select encryption** page, you can secure the communication flows:

   - Between the recording servers, data collectors, and the management server

     To enable encryption for internal communication flows, in the **Server certificate** section, select a certificate.

     > If you encrypt the connection from the recording server to the management server, the system requires that you also encrypt the connection from the management server to the recording server.

   - Between the recording servers and clients

     To enable encryption between recording servers and client components that retrieve data streams from the recording server, in the **Streaming media certificate** section, select a certificate.

   - Between the mobile server and clients

     To enable encryption between client components that retrieve data streams from the mobile server, in the **Mobile streaming media certificate** section, select a certificate.

   - Between the event server and components that communicate with the event server

     To enable encryption between the event server and components that communicate with the event server, including the LPR Server, in the **Event server and extensions** section, select a certificate.

   You can use the same certificate file for all system components or use different certificate files depending on the system components.

   For more information about preparing your system for secure communication, see:

   - Secure communication (explained)
   - The Milestone guide about certificates

   You can also enable encryption after installation from the Server Configurator in the Management Server Manager tray icon in the notification area.

9. On the **Select file location and product language** page, select the **File location** for the program files.

   > If any Milestone XProtect VMS product is already installed on the computer, this field is disabled. The field displays the location where the component will be installed.

10. In the **Product language** field, select the language in which to install your XProtect product. Click **Install**.

    The software now installs. When the installation completes, you see a list of successfully installed system components. Click **Close**.

11. When you have installed the failover recording server, you can check its state from the Failover Server service tray icon and configure it in Management Client. For more information, see Initial configuration tasks list.

Installing XProtect VMS using non-default ports

An installation of XProtect VMS requires specific ports. In particular, the Management Server and API Gateway run in the IIS, and certain ports must be available. This topic describes how to install XProtect VMS and use non-default ports on the IIS. This also applies when installing only the API Gateway.

For an overview of all the ports that the VMS uses, see Ports used by the system.

If IIS is not yet installed on the system, the XProtect VMS installer installs IIS and uses the default website with default ports.

To avoid using the XProtect VMS default, install the IIS first. Optionally, add a new website or proceed using the default website.

Add a binding for HTTPS, if it does not already exist, and select a valid certificate on the computer (you will need to select it during XProtect VMS installation). Edit the port numbers on both HTTP and HTTPS bindings to available ports of your choosing.

Run the XProtect VMS installer and select a **Custom** installation.

During the installation, the **Select a website on the IIS to use with your XProtect system** page appears if there is more than one website available. You must select which website you will use with your XProtect system. The installer uses the changed port numbers.

Installing silently through a command line shell (explained)

With silent installation, system administrators can install and upgrade the XProtect VMS and Smart Client software over a large network with no user interactions from their part and with as little disturbance to the end users as possible.

The XProtect VMS and Smart Client installers (.exe files) have different command line arguments. They each have their own set of command line parameters that can be invoked directly in a command line shell or through an arguments file. In the command line shell, you can also use command line options with the installers.

You can combine the XProtect installers, their command line parameters and command line options with tools for silent distribution and installation of software, like Microsoft System Center Configuration Manager (SCCM, also known as ConfigMgr). For more information about such tools, visit the manufacturer's website.

Command line parameters and arguments files

During silent installation, you can specify settings that are closely linked to the different VMS system components and their internal communication with command line parameters and arguments files. Command line parameters and arguments files should only be used for new installations because you cannot change the settings that the command line parameters represent during an upgrade.

To see the available command line parameters and to generate an arguments file for an installer, in the command line shell, navigate to the directory where the installer is located and enter the following command:

[NameOfExeFile].exe --generateargsfile=[path]

Example:

MilestoneXProtectRecordingServerInstaller_x64.exe --generateargsfile=c:\temp

In the saved arguments file (Arguments.xml), each command line parameter has a description that explains its purpose. You can modify and save the arguments file so that the command line parameter values suit your installation needs.

When you want to use an arguments file with its installer, use the --arguments command line option by entering the following command:

[NameOfExeFile].exe --quiet --arguments=[path]\[filename]

Example:

Milestone XProtect VMS Products 2025 R3 System Installer.exe --quiet --arguments=C:\temp\arguments.xml

Command line options

In the command line shell, you can also combine installers with command line options. The command line options generally modify the behavior of a command.

To see the full list of command line options, in the command line shell, navigate to the directory where the installer is located and enter [NameOfExeFile].exe --help. For the installation to be successful, you must specify a value for command line options

that require a value.

You can use both command line parameters and command line options in the same command. Use the --parameters command line option and divide each command line parameter with a colon (:). In the example below, --quiet, --showconsole, and --parameters are command line options, and ISFAILOVER and RECORDERNAME are command line parameters:

MilestoneXProtectRecordingServerInstaller_x64.exe --quiet --showconsole --parameters=ISFAILOVER:true:RECORDERNAME:Failover1

Install a recording server silently

When you install silently, you are not notified when the installation is completed. To get notified, include the --showconsole command line option in the command. The Milestone XProtect Recording Server tray icon appears when the installation is completed.

In the command examples below, the text inside square brackets ([ ]) and the square brackets themselves must be replaced with real values. Example: instead of "[path]" you could enter `d:\program files\`, `d:\record\`, or `\\network-storage-02\surveillance`. Use the --help command line option to read about the legal formats of each command line option value.

1. Log in to the computer where you want to install the Recording Server component.
2. Open an internet browser and enter the address of the Management Server's download web page that is targeted at the administrators into the address field and press Enter.

   The address is typically `http://[management server address]:[port]/installation/Admin/default-en-US.htm`.

3. Download the recording server installer by selecting **All Languages** below **Recording Server Installer**.
4. Open your preferred command line shell. To open Windows Command Prompt, open the Windows Start menu and enter cmd.
5. Navigate to the directory with the downloaded installer.
6. Continue the installation depending on one of the two scenarios below:

   Scenario 1: Upgrade an existing installation, or install on server with the Management Server component with default values

   - Enter the following command and the installation starts.

     MilestoneXProtectRecordingServerInstaller_x64.exe --quiet

   Scenario 2: Install in a distributed system

   a. Enter the following command to generate an arguments file with command line parameters.

      MilestoneXProtectRecordingServerInstaller_x64.exe --generateargsfile=[path]

   b. Open the arguments file (Arguments.xml) from the specified path and modify the command line parameter values if needed.
   c. Make sure that you give the command line parameters SERVERHOSTNAME and SERVERPORT valid values. If not, the installation cannot complete.
   d. Save the arguments file.
   e. Return to the command line shell and enter the command below to install with the command line parameter values specified in the arguments file.

      MilestoneXProtectRecordingServerInstaller_x64.exe --quiet --arguments=[path]\[filename]

Install XProtect Smart Client silently

When you install silently, you are not notified when the installation is completed. To get notified, include the --showconsole command line option in the command. A shortcut to XProtect Smart Client appears on the desktop when the installation is completed.

In the command examples below, the text inside square brackets ([ ]) and the square brackets themselves must be replaced with real values. Example: instead of "[path]" you could enter `d:\program files\`, `d:\record\`, or `\\network-storage-02\surveillance`. Use the --help command line option to read about the legal formats of each command line option value.

1. Open an internet browser and enter the address of the Management Server's download web page that is targeted at the end users into the address field and press Enter.

   The address is typically `http://[management server address]:[port]/installation/default-en-US.htm`.

2. Download the XProtect Smart Client installer by selecting **All Languages** below **XProtect Smart Client Installer**.
3. Open your preferred command line shell. To open Windows Command Prompt, open the Windows Start menu and enter cmd.
4. Navigate to the directory with the downloaded installer.
5. Continue the installation depending on one of the two scenarios below:

   Scenario 1: Upgrade an existing installation, or install with default command line parameter values

   - Enter the following command and the installation starts.

     "Milestone XProtect Smart Client 2025 R3 Installer.exe" --quiet

   Scenario 2: Install with customized command line parameter values using an xml arguments file as input

   a. Enter the following command to generate an arguments xml file with command line parameters.

      "Milestone XProtect Smart Client 2025 R3 Installer.exe" --generateargsfile=[path]

   b. Open the arguments file (Arguments.xml) from the specified path and modify the command line parameter values if needed.
   c. Save the arguments file.
   d. Return to the command line shell and enter the command below to install with the command line parameter values specified in the arguments file.

      "Milestone XProtect Smart Client 2025 R3 Installer.exe" --quiet --arguments=[path]\[filename]

Install a log server silently

When you install silently, you are not notified when the installation is completed. To get notified, include the --showconsole command line option in the command.

In the command examples below, the text inside square brackets ([ ]) and the square brackets themselves must be replaced with real values. Example: instead of "[path]" you could enter `d:\program files\`, `d:\record\`, or `\\network-storage-02\surveillance`. Use the --help command line option to read about the legal formats of each command line option value.

1. Log in to the computer where you want to install the Log Server component.
2. Open an internet browser and enter the address of the Management Server's download web page that is targeted at the administrators into the address field and press Enter.

   The address is typically `http://[management server address]:[port]/installation/Admin/default-en-US.htm`.

3. Download the log server installer by selecting **All Languages** below **Log Server Installer**.
4. Open your preferred command line shell. To open Windows Command Prompt, open the Windows Start menu and enter cmd.
5. Navigate to the directory with the downloaded installer.
6. Continue the installation depending on one of the two scenarios below:

   Scenario 1: Upgrade an existing installation, or install with default command line parameter values

   - Enter the following command and the installation starts.

"Milestone XProtect Log Server 2025 R3 Installer.exe" --quiet --showconsole

Scenario 2: Install with customized command line parameter values using an XML arguments file as input

a. Enter the following command to generate an arguments xml file with command line parameters.

   "Milestone XProtect Log Server 2025 R3 Installer.exe" --generateargsfile=[path]

b. Open the arguments file (Arguments.xml) from the specified path and modify the command line parameter values if needed.
c. Save the arguments file.
d. Return to the command line shell and enter the command below to install with the command line parameter values specified in the arguments file.

   "Milestone XProtect Log Server 2025 R3 Installer.exe" --quiet --arguments=[path]\[filename] --showconsole

Install XProtect Smart Client silently

When you install silently, you are not notified when the installation is completed. To get notified, include the --showconsole command line option in the command. A shortcut to XProtect Smart Client appears on the desktop when the installation is completed.

In the command examples below, the text inside square brackets ([ ]) and the square brackets themselves must be replaced with real values. Example: instead of "[path]" you could enter `d:\program files\`, `d:\record\`, or `\\network-storage-02\surveillance`. Use the --help command line option to read about the legal formats of each command line option value.

1. Open an internet browser and enter the address of the Management Server's download web page that is targeted at the end users into the address field and press Enter.

   The address is typically `http://[management server address]:[port]/installation/default-en-US.htm`.

2. Download the XProtect Smart Client installer by selecting **All Languages** below **XProtect Smart Client Installer**.
3. Open your preferred command line shell. To open Windows Command Prompt, open the Windows Start menu and enter cmd.
4. Navigate to the directory with the downloaded installer.
5. Continue the installation depending on one of the two scenarios below:

   Scenario 1: Upgrade an existing installation, or install with default command line parameter values

   - Enter the following command and the installation starts.

     "Milestone XProtect Smart Client 2025 R3 Installer.exe" --quiet

   Scenario 2: Install with customized command line parameter values using an xml arguments file as input

   a. Enter the following command to generate an arguments xml file with command line parameters.

      "Milestone XProtect Smart Client 2025 R3 Installer.exe" --generateargsfile=[path]

   b. Open the arguments file (Arguments.xml) from the specified path and modify the command line parameter values if needed.
   c. Save the arguments file.
   d. Return to the command line shell and enter the command below to install with the command line parameter values specified in the arguments file.

      "Milestone XProtect Smart Client 2025 R3 Installer.exe" --quiet --arguments=[path]\[filename]

Install a log server silently

When you install silently, you are not notified when the installation is completed. To get notified, include the --showconsole command line option in the command.

In the command examples below, the text inside square brackets ([ ]) and the square brackets themselves must be replaced with real values. Example: instead of "[path]" you could enter `d:\program files\`, `d:\record\`, or `\\network-storage-02\surveillance`. Use the --help command line option to read about the legal formats of each command line option value.

1. Log in to the computer where you want to install the Log Server component.
2. Open an internet browser and enter the address of the Management Server's download web page that is targeted at the administrators into the address field and press Enter.

   The address is typically `http://[management server address]:[port]/installation/Admin/default-en-US.htm`.

3. Download the log server installer by selecting **All Languages** below **Log Server Installer**.
4. Open your preferred command line shell. To open Windows Command Prompt, open the Windows Start menu and enter cmd.
5. Navigate to the directory with the downloaded installer.
6. Continue the installation depending on one of the two scenarios below:

   Scenario 1: Upgrade an existing installation, or install with default command line parameter values

   - Enter the following command and the installation starts.

     "Milestone XProtect Log Server 2025 R3 Installer.exe" --quiet --showconsole

   Scenario 2: Install with customized command line parameter values using an XML arguments file as input

   a. Enter the following command to generate an arguments xml file with command line parameters.

      "Milestone XProtect Log Server 2025 R3 Installer.exe" --generateargsfile=[path]

   b. Open the arguments file (Arguments.xml) from the specified path and modify the command line parameter values if needed.
   c. Save the arguments file.
   d. Return to the command line shell and enter the command below to install with the command line parameter values specified in the arguments file.

      "Milestone XProtect Log Server 2025 R3 Installer.exe" --quiet --arguments=[path]\[filename] --showconsole

Install silently using a dedicated service account

If you want to install XProtect VMS unattended, you must start the installer with the arguments in the table below. Arguments must be created and saved in an arguments XML file that you generate prior to the installation.

Argument	Description
`--quiet`	Forces silent installation.
`--arguments`	The path to the arguments XML file with full configuration. The path could be: `C:\Arguments.xml`.
`--license`	The path to the license file.

Using a dedicated service account

This description is based on the use of a dedicated service account for integrated security. The services always run on the dedicated account no matter which user is logged in, and you must make sure that the account has all required permissions

to, for example, perform tasks and to access network, files and shared folders.

The service account must be specified in an argument XML file for the following keys:

`SERVICEACCOUNT`
`SERVICEACCOUNT_NONLOC`

The password for the service account must be specified in plain text in the value for the following key:

`ENCRYPTEDPASSWORD`

Example: command line to start the installation in silent mode:

```
"Milestone XProtect VMS Products 2023 R2 System Installer.exe" --quiet --
arguments=C:\Arguments.xml --license=C:\M01-C01-231-01-ABCDEF.lic
```

Example: Arguments file based on the use of a dedicated service account

```
<?xml version="1.0" encoding="utf-8"?>
<CommandLineArguments xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="htt
p://www.w3.org/2001/XMLSchema" xmlns="urn:milestone-systems">
  <InstallEnvironment>
    <Parameters>
      <KeyValueParametersOfStringString>
        <Value>true</Value>
        <Key>USERACCOUNT</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>domain\sampleaccount</Value>
        <Key>SERVICEACCOUNT</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>domain\sampleaccount</Value>
        <Key>SERVICEACCOUNT_NONLOC</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>sampleaccountpasswordplaintext</Value>
        <Key>ENCRYPTEDPASSWORD</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>%PROGRAMFILES%\Milestone</Value>
        <Key>TARGETDIR</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>true</Value>
        <Key>IsXPCO</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>true</Value>
        <Key>IsDPInstaller</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>false</Value>
```

```
        <Key>LEGACY</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>yes</Value>
        <Key>SQL-KEEP-DATA</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>no</Value>
        <Key>SQL-CREATE-DATABASE</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>True</Value>
        <Key>IS_EXTERNALLY_MANAGED</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>Data Source=server.database.windows.net;Initial Catalog=Surveillance;Persis
t Security Info=True;TrustServerCertificate=True;Authentication=ActiveDirectoryIntegrate
d</Value>
        <Key>SQL_CONNECTION_STRING_MS</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>Data Source=server.database.windows.net;Initial Catalog=Surveillance_IDP;Pe
rsist Security Info=True;TrustServerCertificate=True;Authentication=ActiveDirectoryIntegra
ted</Value>
        <Key>SQL_CONNECTION_STRING_IDP</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>Data Source=server.database.windows.net;Initial Catalog=Surveillance_IM;Per
sist Security Info=True;TrustServerCertificate=True;Authentication=ActiveDirectoryIntegrat
ed</Value>
        <Key>SQL_CONNECTION_STRING_IM</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>Data Source=server.database.windows.net;Initial Catalog=Surveillance;Persis
t Security Info=True;TrustServerCertificate=True;Authentication=ActiveDirectoryIntegrate
d</Value>
        <Key>SQL_CONNECTION_STRING_ES</Key>
      </KeyValueParametersOfStringString>
      <KeyValueParametersOfStringString>
        <Value>Data Source=server.database.windows.net;Initial Catalog=Surveillance_LogSer
verV2;Persist Security Info=True;TrustServerCertificate=True;Authentication=ActiveDirector
yIntegrated;Application Name=Surveillance_LogServerV2</Value>
        <Key>SQL_CONNECTION_STRING_LOG</Key>
      </KeyValueParametersOfStringString>
    </Parameters>
  </InstallEnvironment>
</CommandLineArguments>
```

Prerequisites to be completed prior to performing the installation:

- The service account as well as the account used to perform the installation must be created.
- The service account must be allowed to log on as a service on the computer where the installation is performed. See Log-on-as-a-service.
- The databases to be used by XProtect must be created, and the databases must be named in the arguments XML file, for example:

Database name
`Surveillance`
`Surveillance_IDP`

Database name
`Surveillance_IM`
`Surveillance_LogServerV2`

- The databases must be configured according to the following list:

Database configuration
The default collation must be set to “ `SQL_Latin1_General_CP1_CI_AS` ”
`ALLOW_SNAPSHOT_ISOLATION` must be set to `ON`
`READ_COMMITTED_SNAPSHOT` must be set to `ON`

- An SQL server logon must be created for the service account and for the account used to perform the installation in each of the databases. A database user must be created in each of the databases, and the user must be a member of the db_owner role on each database.

Installation for workgroups

If you do not use a domain setup with an Active Directory server, but a workgroup setup, do the following when you install.

All computers in a distributed setup must either be on a domain or in a workgroup.

1. Log in to Windows. The user account you use here will be added to the XProtect administrator role during the installation.

   Make sure to use the same account on all computers in the system.

2. Depending on your needs, start the management or recording server installation and click **Custom**.
3. Depending on what you selected in step 2, select to install the Management Server or Recording Server service using a common administrator account.
4. Finish the installation.
5. Repeat steps 1-4 to install any other systems you want to connect. They must all be installed using the same system account.

Download Manager/download web page

The management server has a built-in web page. This web page enables administrators and end users to download and install required XProtect system components from any location, locally or remotely.

With XProtect 2025 R3, XProtect Smart Client is not included in the VMS installation package and must be downloaded separately. To download the latest version of XProtect Smart Client, go to the Milestone Software Download site.

Most often the web page is automatically loaded at the end of the management server installation and the default content is

displayed. On the management server, you can access the web page from Windows' **Start** menu, select **Programs** > **Milestone** > **Administrative Installation Page**. Otherwise you can enter the URL:

http://[management server address]:[port]/installation/admin/

[management server address] is the IP address or host name of the management server, and [port] is the port number which you have configured IIS to use on the management server.

The web page has some default content so you can use them straight away after installation. As administrator, however, by using the Download Manager, you can customize what should be displayed on the web page. You can also move components between the two versions of the web page. To move a component, right-click it, and select the web page version you want to move the component to.

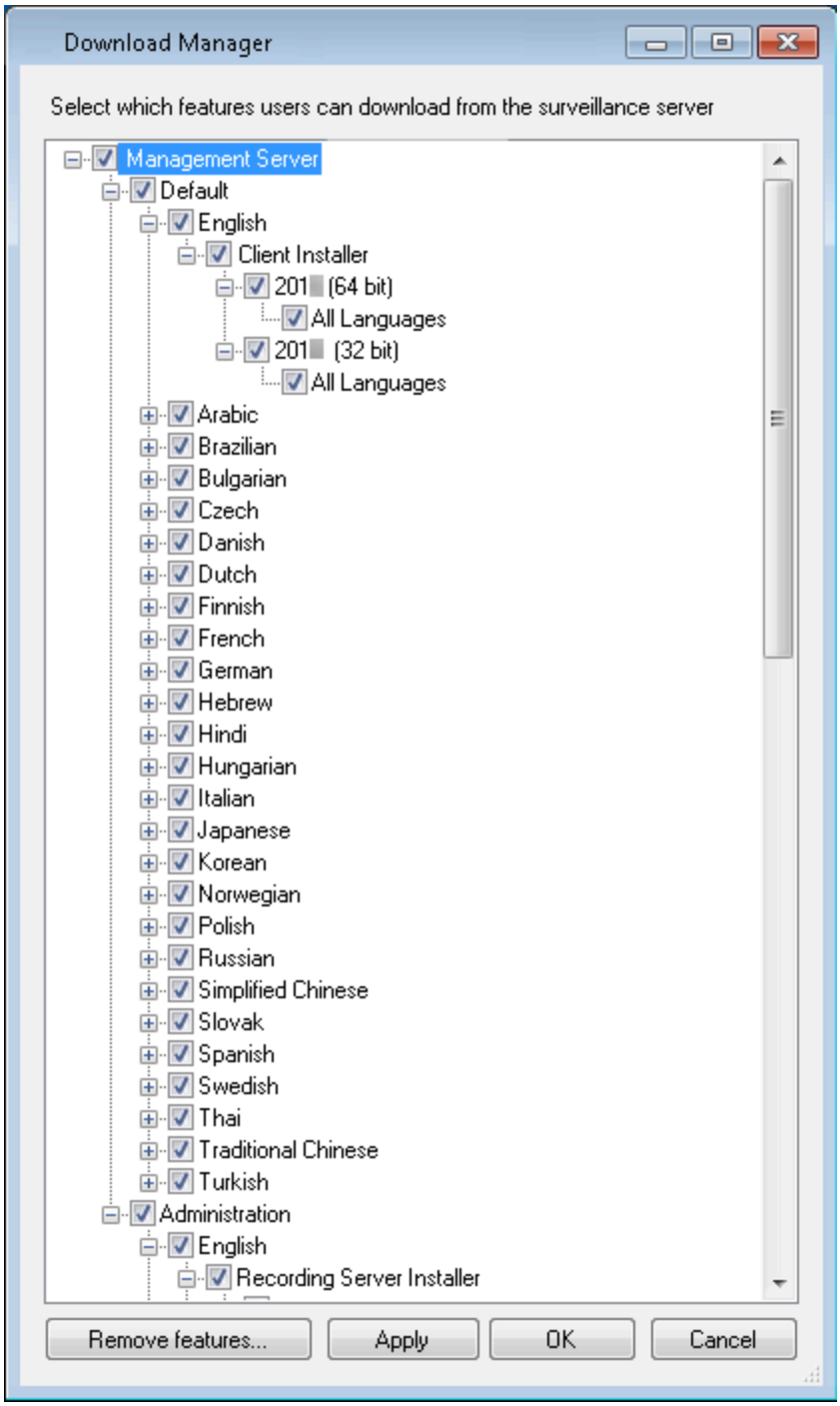
Even though you can control which components users can download and install in Download Manager, you cannot use it as a users' permissions management tool. Such permissions are determined by roles defined in the Management Client.

On the management server, you can access the XProtect Download Manager from Windows' **Start** menu, select **Programs** > **Milestone** > **XProtect Download Manager**.

Download Manager's default configuration

The Download Manager has a default configuration. This ensures that your organization's users can access standard components from the start.

The default configuration provides you a default setup with access to downloading extra or optional components. Usually you access the web page from the management server computer, but you can also access the web page from other computers.



- The first level: Refers to your XProtect product
- The second level: Refers to the two targeted versions of the web page. **Default** refers to the web page version viewed by end users. **Administration** refers to the web page version viewed by system administrators
- The third level: Refers to the languages in which the web page is available
- The fourth level: Refers to the components which are - or can be made - available to users
- The fifth level: Refers to particular versions of each component, which are - or can be made - available to users
- The sixth level: Refers to the language versions of the components which are - or can be made - available to users

The fact that only standard components are initially available - and only in the same language version as the system itself - helps reduce installation time and save space on the server. There is no need to have a component or language version available on the server if nobody uses it.

You can make more components or languages available as required and you can hide or remove unwanted components or languages.

Download Manager's standard installers (user)

By default, the following components are available for separate installation from the management server's download web page targeted at users (controlled by the Download Manager):

- Recording servers, including failover recording servers. Failover recording servers are initially downloaded and installed as recording servers, during the installation process you specify that you want a failover recording server.
- Management Client
- Event server, used in connection with map functionality
- Log server, used for providing the necessary functionality for logging system information
- XProtect Mobile server
- More options may be available in your organization.

For installation of device packs, see Device pack installer - must be downloaded.

Add/publish Download Manager installer components

You must complete two procedures to make non-standard components and new versions available on the management server's download page.

First you add new and/or non-standard components to the Download Manager. Then you use it to fine-tune which components should be available in the various language versions of the web page.

If the Download Manager is open, close it before installing new components.

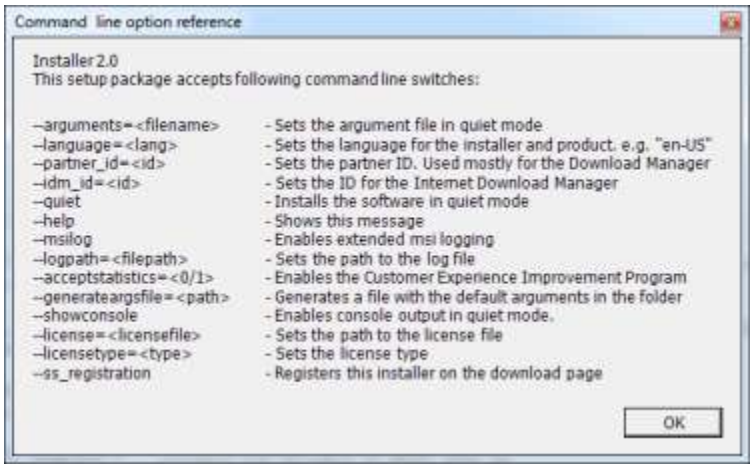
Adding new/non-standard files to the Download Manager:

1. On the computer where you downloaded the component(s), go to Windows' **Start**, enter a *Command Prompt*
2. In the *Command Prompt*, execute the name of the file (*.exe*) with:[space]*--ss_registration*

   Example: *MilestoneXProtectRecordingServerInstaller_x64.exe --ss_registration*

   The file is now added to the Download Manager, but not installed on the current computer.

To get an overview of installer commands, in the *Command Prompt,* enter [space]*--help* and the following window appears:



When you have installed new components, they are by default selected in the Download Manager and are immediately available to users via the web page. You can always show or hide features on the web page by selecting or clearing check boxes in the Download Manager's tree structure.

You can change the sequence in which components are displayed on the web page. In the Download Manager's tree structure, drag component items and drop them at the required position.

Hide/remove Download Manager installer components

You have three options:

- **Hide components** from the web page by clearing check boxes in the Download Manager's tree structure. The components are still installed on the management server, and by selecting check boxes in the Download Manager's tree structure you can quickly make the components available again
- **Remove the installation of components** on the management server. The components disappear from the Download Manager, but installation files for the components are kept at `C:\Program Files (x86)\Milestone\XProtect Download Manager`, so you can re-install them later if required
    1. In the Download Manager, click **Remove features**.
    2. In the **Remove Features** window, select the feature(s) you want to remove.
    3. Click **OK** and **Yes**.
- **Remove installation files for non-required features** from the management server. This can help save disk space on the server if you know that your organization is not going to use certain features

Device pack installer - must be downloaded

The device pack (containing device drivers) included in your original installation is not included on the Download Manager. So, if you need to reinstall the device pack or make the device pack installer available, you must first add or publish the latest device pack installer to the Download Manager:

1. Get the latest regular device pack from the download page on the Milestone website (https://www.milestonesys.com/download/).
2. On the same page, you can download the legacy device pack with older drivers. To check if your cameras use drivers from the legacy device pack, go to this website (https://www.milestonesys.com/support/software/device-packs/).
3. Add/publish it to the Download Manager by calling it with the *--ss_registration* command.

If you do not have a network connection, you can reinstall the entire recording server from the Download Manager. The installation files for the recording server is placed locally on your computer and in this way, you automatically get a reinstall of the device pack.

Installation log files and troubleshooting

During an installation, upgrade or uninstallation, log entries are written to various installation log files: To the main installation log file `installer.log` and to the log files belonging to the different system components you are installing. All log entries have a time stamp and the most recent log entries are at the end of the log files.

You can find all installation log files in the `C:\ProgramData\Milestone\Installer\` folder. Log files that are named *I.log or *I[integer].log are log files about new installations or upgrades while log files named *U.log or *U[integer].log are about uninstallations. If you have bought a server with an already installed XProtect system through a Milestone partner, there might not be any installation log files.

The log files contain information about the command line parameters and command line options and their values used during an installation, upgrade or uninstallation. To find the used command line parameters in the log files, search for Command Line: or Parameter ' depending on the log file.

For troubleshooting, the main installation log file installer.log is the first place to look. If there were any exceptions, errors, or warnings during the installation, these have been logged. Try to search for exception, error, or warning. "Exit code: 0" means a successful installation and "Exit code: 1" the opposite. Your findings in the log files may enable you to find a solution on Milestone Knowledge Base. If not, contact your Milestone partner and share the relevant installation log files.

Initial configuration tasks list

The checklist below lists the initial tasks for configuring your system. Some of them, you may already have completed during installation.

A completed checklist does not in itself guarantee that the system matches the exact requirements of your organization. To make the system match the needs of your organization, Milestone recommends that you monitor and adjust the system continuously.

For example, it is a good idea to test and adjust the motion detection sensitivity settings of individual cameras under different physical conditions, including day/night and windy calm weather, once the system is running.

The setup of rules, which determine most of the actions your system performs, including when to record video, is another example of configuration that you can change according to your organization's needs.

Step	Description
☑	You have finished the initial installation of your system. See Install a new XProtect system.
☑	Change the trial SLC to a permanent SLC (if required). See Change the Software License Code.
☑	Log in to the Management Client. See Logging in (explained).
☐	Verify that each recording server's storage settings meet your needs. See Storage and archiving (explained).
☐	Verify that each recording server's archiving settings meet your needs. See Storage and Recording Settings properties.
☐	Detect the hardware, cameras or video encoders to add to each recording server. See Add hardware.
☐	Configure each recording server's individual cameras. See Cameras (Devices node).
☐	Enable storage and archiving for individual cameras or for a group of cameras. This is done from the individual

Step	Description
	cameras or from the device group. See Attach a device or group of devices to a storage.
☐	Enable and configure devices. See Devices (Devices node).
☐	Rules determine the system's behavior to a large extent. You create rules to define when cameras should record, when pan-tilt-zoom (PTZ) cameras should patrol, and when notifications should be sent, for example. Create rules. See Rules and events (explained).
☐	Add roles to the system. See Roles and permissions of a role (explained).
☐	Add users or groups of users to each of the roles. See Assign/remove users and groups to/from roles.
☐	Activate licenses. See Activate licenses online or Activate licenses offline.

For more information about how to configure the system in the **Site Navigation** pane, see Site Navigation pane.

Change or verify the basic configuration of a recording server

If your Management Client does not list all the recording servers you have installed, the most likely reason is that you have configured the setup parameters (for example, the IP address or host name of the management server) incorrectly during installation.

You do not need to re-install recording servers to specify the parameters of the management servers, but you can change/verify its basic configuration:

1. On the computer that runs the recording server, right-click the **Recording Server** icon in the notification area.
2. Select **Stop Recording Server service**.
3. Right-click the **Recording Server** icon again and select **Change Settings**.

   The **Recording Server Settings** window appears.

4. Verify or change, for example, the following settings:
   - **Management server**: **Address**: Specify the IP address or host name of the management server to which the recording server should be connected.
   - **Management server**: **Port**: Specify the port number to be used when communicating with the management server. You can change this if required, but the port number must always match the port

number set up on the management server. See Ports used by the system.
    - **Recording server**: **Web server port**: Specify the port number to be used when communicating with the recording server's web server. See Ports used by the system.
5. Click **OK**.
6. To start the Recording Server service again, right-click the **Recording Server** icon, and select **Start Recording Server service**.

> Stopping the Recording Server service means that you cannot record and view live video while you verify/change the recording server's basic configuration.

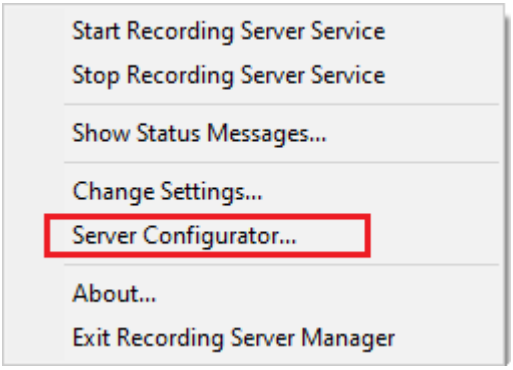
Register a recording server

When you install a recording server, it is automatically registered in most cases. But you need to do the registration manually if:

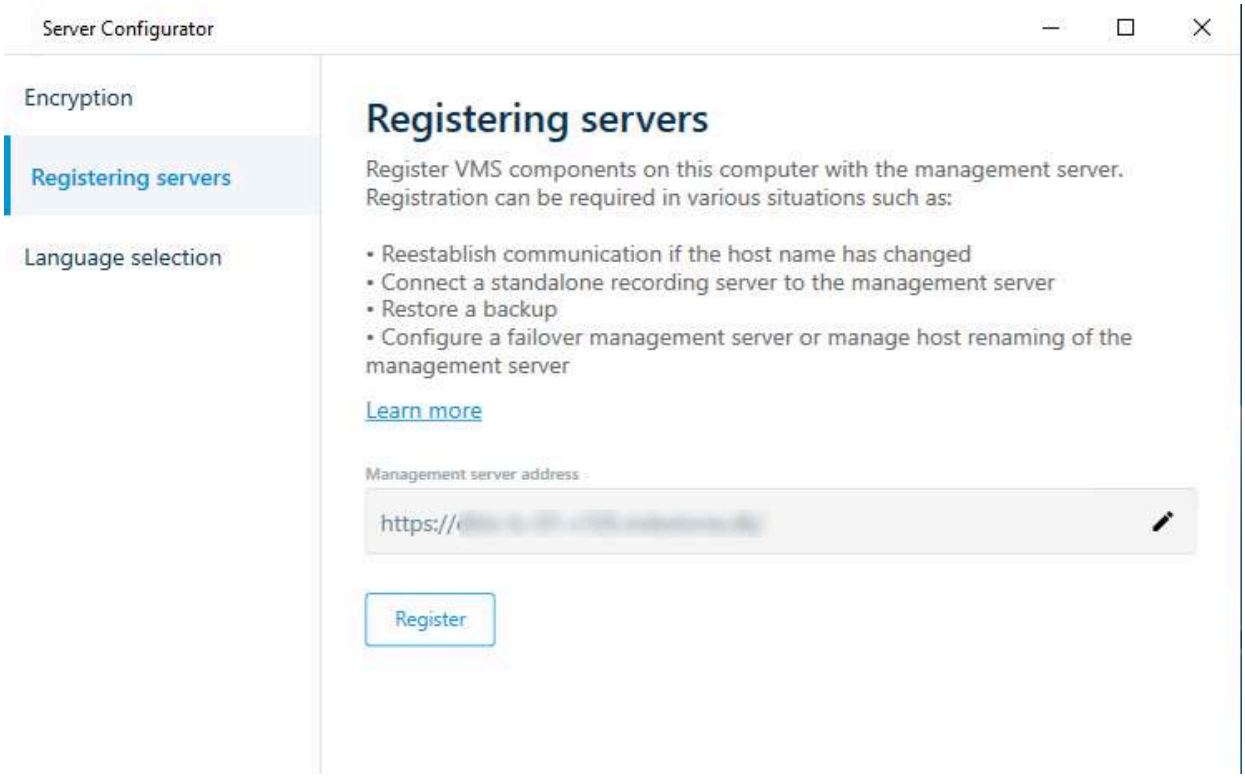
- You have replaced the recording server
- The recording server was installed offline and then added to the management server afterward
- Your management server does not use the default ports. The port numbers depend on the encryption configuration. For more information, see Ports used by the system
- An automatic registration has failed, for example after changing the management server address, changing the name of the computer with the recording server, or after enabling or disabling server communication encryption settings. For more information about changes to the management server address, see Changing the host name of the management server computer.

When you register a recording server, you configure it to connect to your management server. The part of the management server that handles registration is the Authorization Server service.

1. Open the Server Configurator from either the Windows startup menu or from the recording server tray icon.



2. In the Server Configurator, select **Registering servers**.



3. Verify the address of the management server and the scheme (http or https) that you want the servers on the computer to connect to and click **Register**.

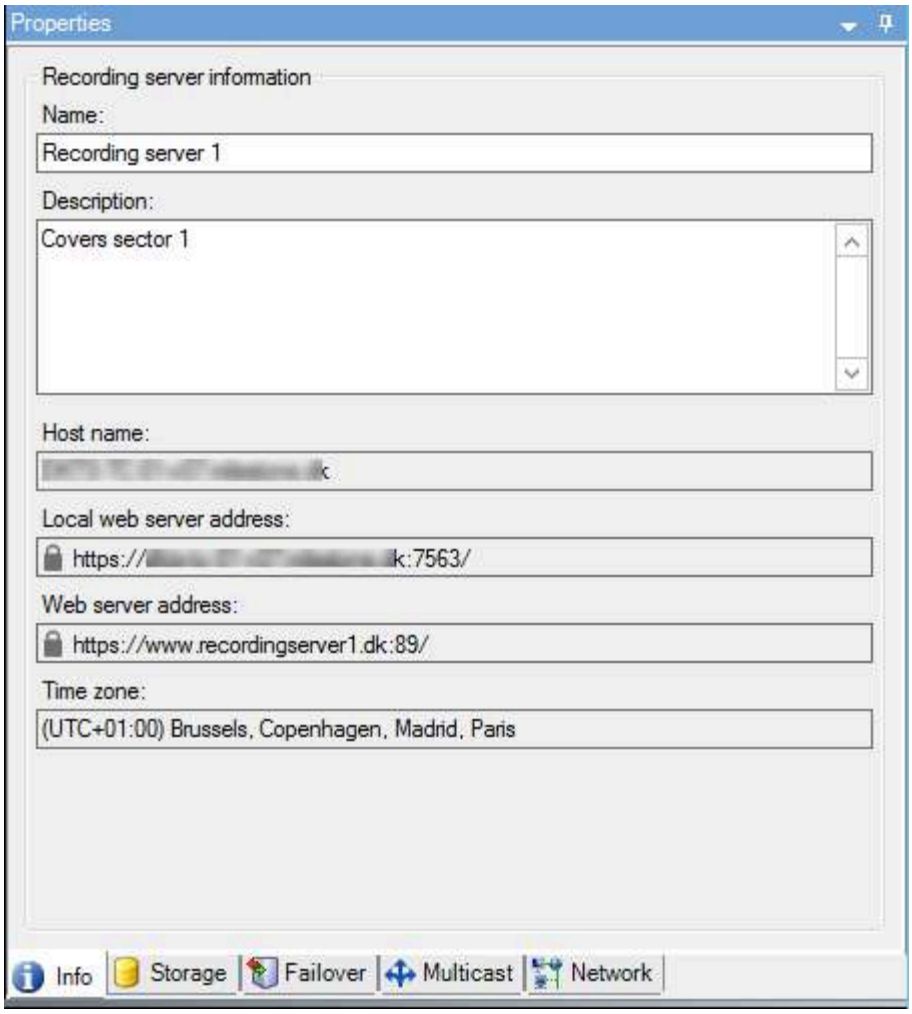
A confirmation appears, stating that registration on the management server has succeeded.

See also Replace a recording server.

View encryption status to clients

To verify if your recording server encrypt connections:

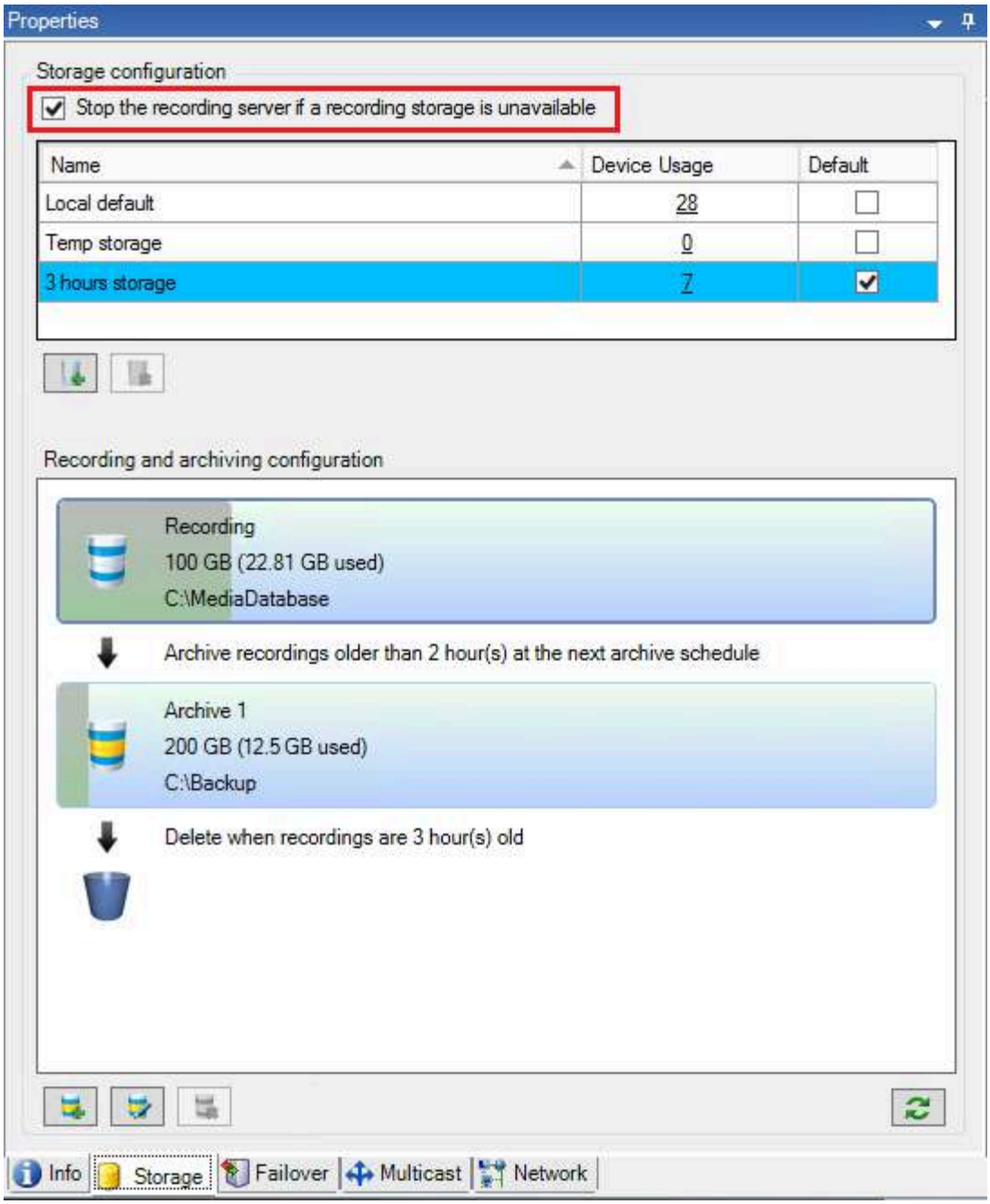
1. Open the Management Client.
2. In the **Site Navigation** pane, select **Servers** > **Recording Servers**. This opens a list of recording servers.
3. In the **Overview** pane, select the relevant recording server and go to the **Info** tab.
   If encryption is enabled to clients and servers that retrieve data streams from the recording server, a padlock icon appears in front of the local web server address and the optional web server address.



Specify behavior when recording storage is unavailable

By default, the recording server keeps running if a recording storage becomes unavailable. If your system is configured with failover recording servers, you can specify the recording server to stop running, to make the failover servers take over:

1. On the relevant recording server, go to the **Storage** tab.
2. Select the **Stop the recording server if a recording storage is unavailable** option.



Add a new storage

When you add a new storage, you always create one recording storage with a predefined recording database named **Recording**. You cannot rename the database. Apart from the recording storage, a storage can contain a number of archives.

1. To add an extra storage to a selected recording server, click the  button located below the **Storage configuration** list. This opens the **Storage and Recording Settings** dialog box.
2. Specify the relevant settings (see Storage and Recording Settings properties).
3. Click **OK**.

If needed, you are now ready to create archive(s) within your new storage.

Create an archive within a storage

A storage has no default archive, but you can create archives as needed.

1. Select the relevant storage in the **Recording and archiving configuration** list.
2. Click the  button below the **Recording and archiving configuration** list.
3. In the **Archive Settings** dialog box, specify the required settings (see Archive Settings properties).
4. Click **OK**.

Attach a device or group of devices to a storage

Once a storage is configured for a recording server, you can enable it for individual devices such as cameras, microphones or speakers or a group of devices. You can also select which of a recording server's storage areas you want to use for the individual device or the group.

1. Expand **Devices** and select either **Cameras**, **Microphones** or **Speakers** as required.
2. Select the device or a device group.
3. Select the **Record** tab.
4. In the **Storage** area, select **Select**.
5. In the dialog box that appears, select the database that should store the recordings of the device and then click **OK**.
6. In the toolbar, click **Save**.

When you click the device usage number for the storage area on the Storage tab of the recording server, the device is visible in the message report that appears.

Disabled devices

All devices, including disabled devices, are by default displayed in the **Overview** pane.

To hide disabled devices, in the top of the **Overview** pane, click **Filter** to open the **Filter** tab and select **Hide disabled devices**.

To display disabled devices again, clear **Hide disabled devices**.

Edit settings for a selected storage or archive

1. To edit a storage, select its recording database in the **Recording and archiving configuration** list. To edit an archive, select the archive database.
2. Click the **Edit Recording Storage** button  located below the **Recording and archiving configuration** list.
3. Either edit a recording database or edit an archive.

If you change the maximum size of a database, the system auto-archives recordings that exceed the new limit. It auto-archives the recordings to the next archive or deletes them depending on archiving settings.

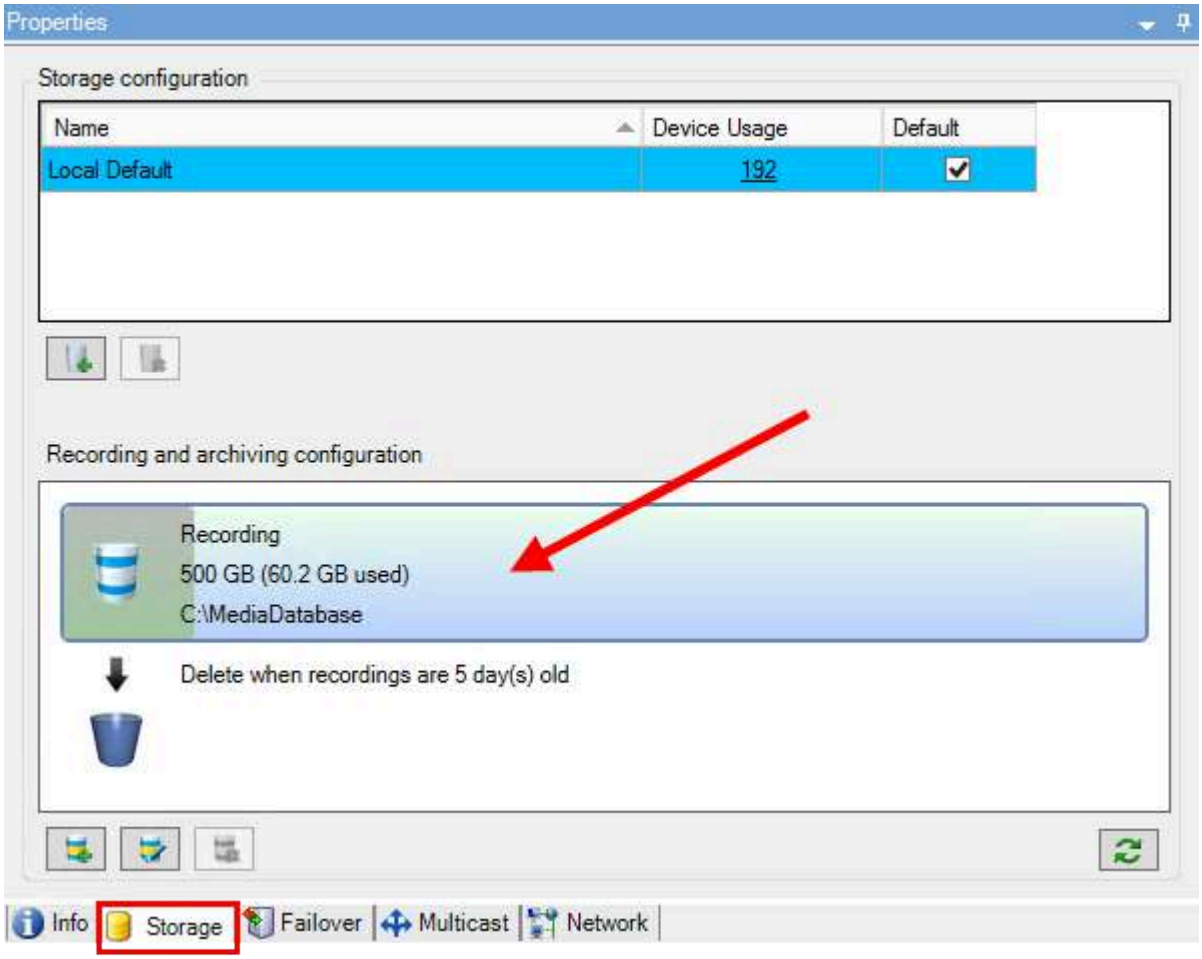
Enable digital signing for export

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

You can enable digital signing for recorded video, so that client users can verify that the recorded video has not been tampered with since it was recorded. Verifying the authenticity of the video is something that the user does in XProtect Smart Client – Player after the video has been exported.

Signing must also be activated in XProtect Smart Client > **Exports** tab > **Export settings** > **XProtect format** > **Include digital signature**. Otherwise, the **Verify Signatures** button in XProtect Smart Client – Player is not displayed.

1. In the **Site Navigation** pane, expand the **Servers** node.
2. Click **Recording Servers**.
3. In the overview pane, click the recording server you want to enable signing for.
4. At the bottom of the **Properties** pane, click the **Storage** tab.



5. In the **Recording and archiving configuration** section, double-click the horizontal bar that represents the recording database. The **Storage and Recording Settings** window appears.
6. Select the **Signing** check box.
7. Click **OK**.

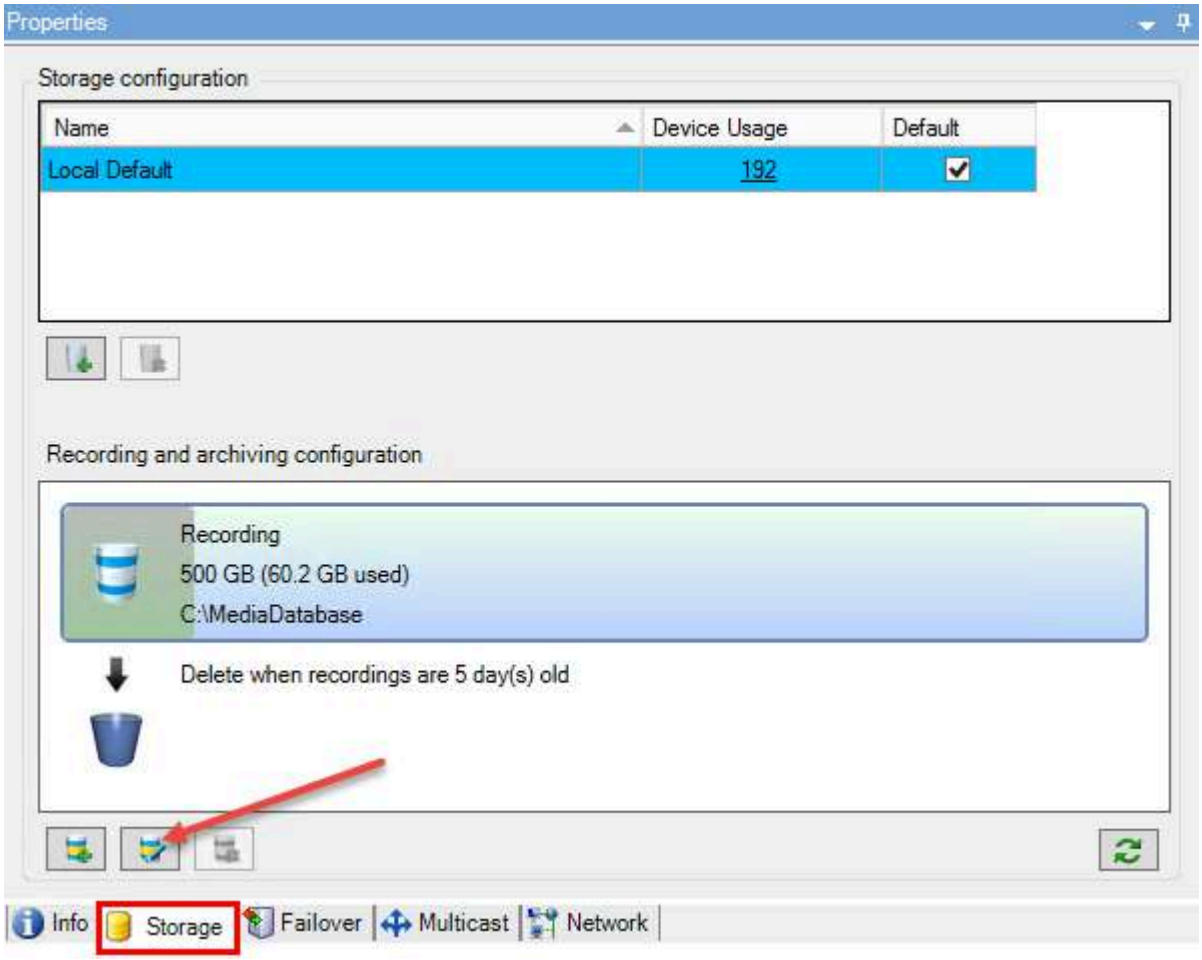
Encrypt your recordings

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

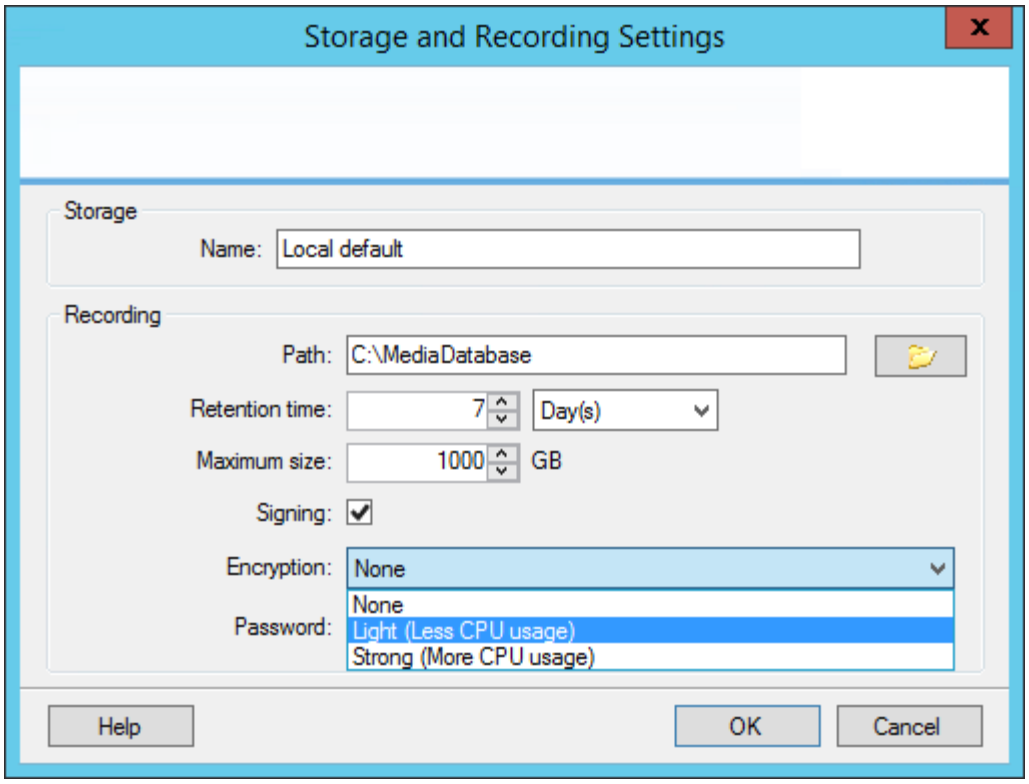
You can secure your recordings by enabling encryption on your recording servers' storage and archives. You can choose between light and strong encryption. When you enable encryption, you must also specify a related password.

Enabling or changing encryption settings or password can potentially be time consuming, depending on the size of the database and performance of the drive. You can follow the progress under **Current Tasks**.
Do not stop the recording server while this task is ongoing.

1. Click the **Edit Recording Storage** button below the **Recording and archiving configuration** list.



2. In the dialog box that appears, specify encryption level.



3. You are automatically directed to **Set Password** dialog box. Enter password and click **OK**.

Back up archived recordings

Many organizations want to back up their recordings by using tape drives or similar. Exactly how you do this is highly individual and depends on the backup media used in your organization. However, the following is worth bearing in mind:

Back up archives rather than camera databases

Always create backups based on the content of archives, not based on individual camera databases. If you create backups based on the content of individual camera databases, you may cause sharing violations or other malfunctions.

When scheduling a backup, make sure the backup job does not overlap with your specified archiving times. To view each recording server's archiving schedule in each of a recording server's storage areas, see the **Storage** tab.

To ensure archiving is not occurring during backup, you can unmount the archive, perform the backup and then mount the archive again. Mounting and unmounting archives is performed through the API Gateway.

Know your archive structure so that you can target backups

When you archive recordings, you store them in a certain sub-directory structure within the archive.

During all regular use of your system, the sub-directory structure is completely transparent to the system's users when they browse recordings with XProtect Smart Client. This is true both with archived and non-archived recordings. It is relevant to know the sub-directory structure (see Archive structure (explained) if you want to back up your archived recordings (see Backing up and restoring system configuration).

Delete an archive from a storage

1. Select the archive from the **Recording and archiving configuration** list.

> It is only possible to delete the last archive in the list. The archive does not have to be empty.

2. Click the  button located below the **Recording and archiving configuration** list.
3. Click **Yes**.
4. For unavailable archives, for example offline archives, it is not possible to verify if the archive contains media with evidence locks but the archive can be deleted after user confirmation.
5. Available archives (online archives) that contain media with evidence locks cannot be deleted.

Delete a storage

You cannot delete the default storage or storages that devices use as the recording storage for live recordings.
This means that you may need to move devices (see Move hardware) and any not yet archived recordings to another storage before you delete the storage.

1. To see the list of devices that use this storage, click the device usage number.

> If the storage has data from devices that have been moved to another recording server, a warning appears. Click the link to see the list of devices.

2. Follow the steps in Move non-archived recordings from one storage to another.
3. Continue until you have moved all devices.
4. Select the storage that you want to delete.

5. Click the  button located below the **Storage configuration** list.
6. Click **Yes**.

Move non-archived recordings from one storage to another

You move recordings from one live recording database to another from the **Record** tab of the device.

1. Select the device type. In the **Overview** pane, select the device.
2. Click the **Record** tab. In the upper part of the **Storage** area, click **Select**.
3. In the **Select Storage** dialog box, select the database.
4. Click **OK**.
5. In the **Recordings Action** dialog box, select if you want to remove already existing - but **non-archived** - recordings to the new storage or if you want to delete them.
6. Click **OK**.

Assign failover recording servers

On the **Failover** tab of a recording server, you can choose between three types of failover setups:

- No failover setup
- A primary/secondary failover setup (cold standby)
- A hot standby setup

If you select **b** and **c**, you must select the specific server/groups. With **b**, you can also select a secondary failover group. If the

recording server becomes unavailable, a failover recording server from the primary failover group takes over. If you have also selected a secondary failover group, a failover recording server from the secondary group takes over in case all failover recording servers in the primary failover group are busy. In this way, you only risk not having a failover solution in the rare case when all failover recording servers in the primary, as well as in the secondary, failover group are busy.

1. In the **Site Navigation** pane, select **Servers** > **Recording Servers**. This opens a list of recording servers.
2. In the **Overview** pane, select the wanted recording server, go to the **Failover** tab.
3. To choose failover setup type, select between:
   - **None**
   - **Primary failover server group**/**Secondary failover server group**
   - **Hot standby server**

   You cannot select the same failover group as both primary and secondary failover group nor select regular failover servers already part of a failover group as hot standby servers.

4. Next, click **Advanced failover settings**. This opens the **Advanced Failover Settings** window, listing all devices attached to the selected recording server. If you selected **None**, the advanced failover settings are also available. The system keeps any selections for later failover setups.
5. To specify the level of failover support, select **Full Support**, **Live Only** or **Disabled** for each device in the list. Click **OK**.
6. In the **Failover service communication port (TCP)** field, edit the port number if needed.

If you enable failover support and the recording server is configured to keep running if a recording storage is unavailable, the failover recording server will not take over. To make the failover support work, you must select the **Stop the recording server if a recording storage is unavailable** option on the **Storage** tab.

Enable multicasting for the recording server

In regular network communication, each data packet is sent from a single sender to a single recipient - a process known as unicasting. But with multicasting you can send a single data packet (from a server) to multiple recipients (clients) within a group. Multicasting can help save bandwidth.

- When you use **unicasting**, the source must transmit one data stream for each recipient
- When you use **multicasting**, only a single data stream is required on each network segment

Multicasting as described here is **not** streaming of video from camera to servers, but from servers to clients.

With multicasting, you work with a defined group of recipients, based on options such as IP address ranges, the ability to enable/disable multicast for individual cameras, the ability to define largest acceptable data packet size (MTU), the maximum number of routers a data packet must be forwarded between (TTL), and so on.

Multicast streams are not encrypted, even if the recording server uses encryption.

Multicasting should not be confused with **broadcasting**, which sends data to everyone connected to the network, even if the data is perhaps not relevant for everyone:

Name	Description
Unicasting	Sends data from a single source to a single recipient.
Multicasting	Sends data from a single source to multiple recipients within a clearly defined group.

Name	Description
Broadcasting	Sends data from a single source to everyone on a network. Broadcasting can therefore significantly slow down network communication.

To use multicasting, your network infrastructure must support the IP multicasting standard IGMP (Internet Group Management Protocol).

- On the **Multicast** tab, select the **Multicast** check box

If the entire IP address range for multicast is already in use on one or more recording servers, you first release some multicast IP addresses before you can enable multicasting on additional recording servers.

Multicast streams are not encrypted, even if the recording server uses encryption.

Enable multicasting for individual cameras

Multicasting only works when you enable it for the relevant cameras:

1. Select the recording server and select the required camera in the **Overview** pane.
2. On the **Client** tab, select the **Live multicast** check box. Repeat for all relevant cameras.

Multicast streams are not encrypted, even if the recording server uses encryption.

Define public address and port

If you need to access the VMS with XProtect Smart Client over a public or untrusted network, Milestone recommends that you use a secure connection through VPN. This helps ensure that communication between XProtect Smart Client and the VMS server is protected.

You define a recording server's public IP address on the **Network** tab.

Why use a public address?

Clients may connect from the local network as well as from the Internet, and in both cases the surveillance system must provide suitable addresses so the clients can get access to live and recorded video from the recording servers:

- When clients connect locally, the surveillance system should reply with local addresses and port numbers
- When clients connect from the internet, the surveillance system should reply with the recording server's public address. This is the address of the firewall or NAT (Network Address Translation) router, and often also a different port number. The address and the port can then be forwarded to the server's local address and port.

1. To enable public access, select the **Enable public access** check box.
2. Define the recording server's public address. Enter the address of the firewall or NAT router so clients that access the surveillance system from the Internet can connect to the recording servers.
3. Specify a public port number. It is always a good idea that port numbers used on the firewall or NAT router are different from the ones used locally.

If you use public access, configure the firewall or NAT router so requests sent to the public address

and port are forwarded to the local address and port of relevant recording servers.

Assign local IP ranges

You define a list of local IP ranges which the surveillance system should recognize as coming from a local network:

- On the **Network** tab, click **Configure**

Filter the device tree

The device tree in the **Overview** pane can become very large if you have many registered devices. You can filter the device tree to easier locate the devices you want to work with.

By providing filter terms that are unique to a few specific devices, you can effectively only display these specific devices.

Filter the device tree

- In the top of the **Overview** pane, click **Filter** to open the **Filter** tab.
- In the **Type here to filter devices** field, enter one or more filter criteria and click **Apply filter** to filter the device list.

Filter criteria characteristics

The filter criteria are applied to the device name, device short name, hardware address (IP), device ID, and hardware ID field values.

Partial filter matches are not displayed when filtering hardware ID and device ID field values. As a result, you must define the complete and exact identification number when filtering by hardware ID or device ID.

Partial filter matches are displayed for device name, device short name, and hardware address field values, so the filter term “camer” will display all devices that contain the word “camera” in the device name.

Filter criteria are not case sensitive, using "camera" or "Camera" as filter criteria will yield the same results.

Specifying multiple filter criteria

You can specify multiple filter criteria and thereby further narrow your filtering of the device tree. When the filter is applied, all defined filter criteria are considered to be co-joined with an AND, meaning they are cumulative.

For example, if you have entered two filter criteria: “Camera” and “Warehouse”, the list will display all devices that contain the words “Camera” and “Warehouse” in the device name but will not display devices that contain the words “Camera” and “Parking Lot” in the device name nor will devices that only contain the word "Camera" in the device name be displayed.

Remove each individual filter criteria from the filter field to broaden your filter if you have specified a filter that is too restrictive. The filter is automatically applied to the device tree when removing filter criteria.

Resetting the filter

If you remove all filter criteria from the filter field, the **Overview** pane is reset and will display all devices once again.

If the Management Client is restarted, the filter criteria will also be reset.

Disabled devices

All devices, including disabled devices, are by default displayed in the **Overview** pane.

To hide disabled devices, in the top of the **Overview** pane, click **Filter** to open the **Filter** tab and select **Hide disabled devices**.

To display disabled devices again, clear **Hide disabled devices**.

Set up and enable failover recording servers

If you have disabled the failover recording server, you must enable it before it can take over from the standard recording servers.

Do the following to enable a failover recording server and edit its basic properties:

1. In the **Site Navigation** pane, select **Servers** > **Failover Servers**. This opens a list of installed failover recording servers and failover groups.
2. In the **Overview** pane, select the required failover recording server.
3. Right-click and select **Enabled**. The failover recording server is now enabled.
4. To edit failover recording server properties, go to the **Info** tab.
5. When done, go to the **Network** tab. Here you can define the failover recording server's public IP address and more. This is relevant if you use NAT (Network Address Translation) and port forwarding. See the standard recording server's **Network** tab for more information.
6. In the **Site Navigation** pane, select **Servers** > **Recording Servers**. Select the recording server that you want failover support for and assign failover recording servers (see Failover tab (recording server)).

To see the status of a failover recording server, hold your mouse over the Failover Recording Server Manager tray icon in the notification area. A tooltip appears containing the text entered in the Description field of the failover recording server. This may help you determine which recording server the failover recording server is configured to take over from.

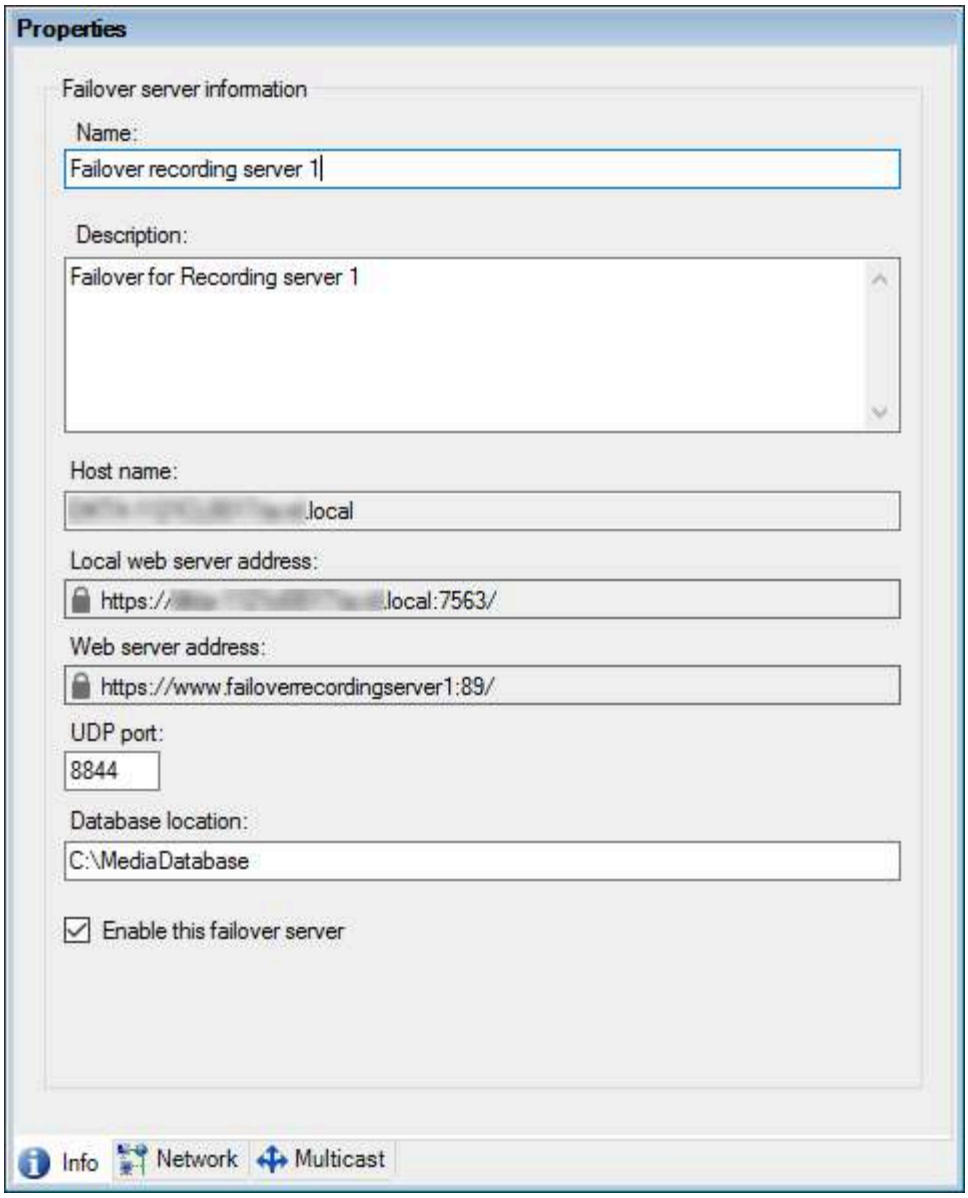
Group failover recording servers for cold standby

1. Select **Servers** > **Failover Servers**. This opens a list of installed failover recording servers and failover groups.
2. In the **Overview** pane, right-click the top-node **Failover Groups** and select **Add Group**.
3. Specify a name (in this example *Failover Group 1*) for and a description (optional) of your new group. Click **OK**.
4. Right-click the group (*Failover Group 1*) you just created. Select **Edit Group Members**. This opens the **Select Group Members** window.
5. Drag and drop or use the buttons to move the selected failover recording server(s) from the left side to the right side. Click **OK**. The selected failover recording server(s) now belongs to the group (*Failover Group 1*) you just created.
6. Go to the **Sequence** tab. Click **Up** and **Down** to set the internal sequence of the regular failover recordings servers in the group.

View encryption status on a failover recording server

To verify if your failover recording server uses encryption, do the following:

1. In the **Site Navigation** pane, select **Servers** > **Failover Servers**. This opens a list of failover recording servers.
2. In the **Overview** pane, select the relevant recording server and go to the **Info** tab.
   If encryption is enabled to clients and servers that retrieve data streams from the recording server, a padlock icon appears in front of the local web server address and the optional web server address.



View status messages

1. On the failover recording server, right-click the **Milestone Failover Recording Server service** icon.
2. Select **Show Status Messages**. The **Failover Server Status Messages** window appears, listing time-stamped status messages.

View version information

Knowing the exact version of your **Failover Recording Server service** is an advantage if you need to contact product support.

1. On the failover recording server, right-click the **Milestone Failover Recording Server service** icon.
2. Select **About**.
3. A small dialog box opens that shows the exact version of your **Failover Recording Server service**.

Add hardware

You have several options for adding hardware to each recording server in your system.

If your hardware is located behind a NAT-enabled router or a firewall, you may need to specify a different port number and configure the router/firewall so it maps the port and IP addresses that the hardware uses.

The **Add Hardware** wizard helps you detect hardware like cameras and video encoders on your network and add them to the recording servers on your system. The wizard also helps you add remote recording servers for Milestone Interconnect setups. Only add hardware to **one recording server** at a time.

1. To access **Add Hardware**, right-click the required recording server and select **Add Hardware**.
2. Select one of the wizard options (see below) and follow the instruction on the screen.
3. After installation, you can see the hardware and its devices in the **Overview** pane.

Certain hardware must be pre-configured when adding the hardware for the first time. An additional **Pre-configure hardware devices** wizard will appear when adding such hardware. See Hardware pre-configuration (explained) for more information.

Add Hardware (dialog)

Hardware represents either:

- The physical unit that connects directly to the recording server of the surveillance system via IP, for example a camera, a video encoder, an I/O module
- A recording server on a remote site in a Milestone Interconnect setup

For more information about how to add hardware to your system, see Add hardware.

Name	Description
Express (Recommended)	The system scans automatically for new hardware on the recording server's local network. Select the **Show hardware running on other recording servers** check box to see if detected hardware is running on other recording servers. You can select this option every time you add new hardware to your network and want to use it in your system. You cannot use this option to add remote systems in Milestone Interconnect setups. To add both HTTP and HTTPS hardware, run **Express** detection with the **HTTPS (Secure)** radio button selected, and then with the **HTTP (Unsecure)** radio button selected.
Address range scanning	The system scans your network for relevant hardware and Milestone Interconnect remote systems based on your specifications of: • hardware user names and passwords. Not needed if your hardware uses the factory default user names and passwords

Name	Description
	• drivers • IP ranges (IPv4 only) • port number (default = 80) You can select this option when you only want to scan a part of your network, for example, when you expand your system.
Manual	Specify details about each hardware and Milestone Interconnect remote systems separately. This can be a good choice if you want to add only a few pieces of hardware, and you know their IP addresses, relevant user names and passwords or if a camera does not support the automatic discovery function.
Remote connect hardware	The system scans for hardware connected via a remotely connected server. You can use this option if you have installed servers for, for example, the Axis One-click Camera Connection. You cannot use this option to add remote systems in Milestone Interconnect setups.

Disable / enable hardware

Added hardware is by default **enabled**.

You can see if hardware is enabled or disabled in this way:

Enabled
Disabled

To disable added hardware, for example, for licensing or performance purposes

1. Expand the recording server, right-click the hardware you want to disable.
2. Select **Enabled** to clear or select it.

Edit hardware

Right-click on added hardware and select **Edit Hardware** to modify the network configuration and user authentication settings of hardware in Management Client.

Edit Hardware (dialog)

For some hardware, the **Edit Hardware** dialog also lets you apply settings directly to the hardware device.

If the **Edit Management Client settings** radio button is selected, the **Edit Hardware** dialog displays the settings which Management Client uses to connect to the hardware. To ensure the hardware device is added to the system properly, enter the same settings you use to connect to the manufacturer's hardware configuration interface:

Name	Description
Name	Displays the name of the hardware alongside its detected IP address (in parenthesis).
Hardware URL	The web address of the manufacturer's hardware configuration interface, typically containing the IP address of the hardware. Specify a valid address in your network.
User name	The user name used to connect to the hardware. The user name that you enter here does not change the user name on the actual hardware device. Select the **Edit Management Client and hardware settings** radio button to modify settings on supported hardware devices.
Password	The password used to connect to the hardware. The password that you enter here does not change the password on the actual hardware device. Select the **Edit Management Client and hardware settings** radio button to modify settings on supported hardware devices. For information about how to change passwords on multiple hardware devices, see Change passwords on hardware devices. As a system administrator, you need to give other users permission to view the password in Management Client. For more information, see Role settings under Hardware.

If the **Edit Management Client and hardware settings** radio button is selected (for supported hardware), the **Edit Hardware** dialog displays settings which are also applied directly to the hardware device:

Applying the settings with this radio button selected will overwrite the current settings on the hardware device. The hardware will momentarily lose connection to the recording server while the settings are applied.

Name	Description
Name	Displays the name of the hardware alongside its detected IP address (in parenthesis).
Network Configuration	The network settings of the hardware. To adjust the network settings, select Configure.
Configure	Specify the Internet Protocol (for supported hardware devices) using the **IP version** dropdown list.

Name	Description
	• For IPv4, the values must be in the format: (0-999).(0-999).(0-999).(0-999) • For IPv6, the values must be in the format of eight groups of hexadecimal digits each separated by a colon. The subnet mask must be a number between 0-128. The **Check** button tests whether there is currently another hardware device in the system that is using the entered IP address. **Check** cannot detect conflicts with hardware devices that are turn off, outside of the XProtect VMS system, or otherwise momentarily not responding.
User name	The user name and level used to connect to the hardware. Select another user from the dropdown list and add a new password using the **Password** field described below. Add or delete users using the underlined actions at the bottom of the **Authentication** section (see Add a user or Delete users). Selecting a user that does not have the highest user level specified by the manufacturer could result in some features not being available.
Password	The password used to connect to the hardware. View the currently entered text using the **Reveal** icon. When changing the password, consult the manufacturer's documentation for the password rules for the specific hardware device, or use the **Generate Password** icon to automatically generate a password that matches the requirements. For information about how to change passwords on multiple hardware devices, see Change passwords on hardware devices. As a system administrator, you need to give other users permission to view the password in Management Client. For more information, see Role settings under Hardware.
Add a user	Select the underlined **Add** link to open the **Add a User** dialog and add a user to the hardware device. Adding a user will automatically set it as the currently active user and overwrite the previously entered credentials. When creating the password, consult the manufacturer's documentation for the password rules for the specific hardware device, or use the **Generate Password** icon to automatically generate a password that matches the requirements. The highest user level detected on the hardware device will automatically be preselected. It is not

Name	Description
	recommended to modify the **User level** from its default value. Selecting a **User level** that is not the highest specified by the manufacturer could result in some features not being available.
Delete users	Select the underlined **Delete** link to open the **Delete Users** dialog and remove users from the hardware device. You cannot delete the currently active user. To set a new user, use the **Add a User** dialog described above, then remove the old user using this interface.

Enable / disable individual devices

Cameras are by default **enabled**.

Microphones, speakers, metadata, inputs and **outputs** are by default **disabled**.

This means that microphones, speakers, metadata, inputs and outputs must be individually enabled before you can use them in the system. The reason for this is that surveillance systems rely on cameras, whereas the use of microphones and so on is highly individual depending on the needs of each organization.

You can see if devices are enabled or disabled (the examples show an output):

Disabled
Enabled

The same method for enabling/disabling is used for cameras, microphones, speakers, metadata, inputs, and outputs.

1. Expand the recording server and the device. Right-click the device you want to enable.
2. Select **Enabled** to clear or select it.

Set up a secure connection to the hardware

You can set up a secure HTTPS connection using SSL (Secure Sockets Layer) between the hardware and the recording server.

Consult your camera vendor to get a certificate for your hardware and upload it to the hardware, before you continue with the steps below:

1. In the **Overview** pane, right-click the recording server and select the hardware.

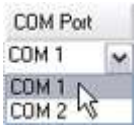
2. On the **Settings** tab, enable HTTPS. This is not enabled by default.
3. Enter the port on the recording server to which the HTTPS connection is connected. The port number must correspond with the port set up on the device's homepage.
4. Make changes as needed and save.

Enable PTZ on a video encoder

To enable the use of PTZ cameras on a video encoder, do the following on the **PTZ** tab:

1. In the list of devices connected to the video encoder, select the **Enable PTZ** box for the relevant cameras:

2. In the **PTZ Device ID** column, verify the ID of each camera.
3. In the **COM Port** column, select which video encoder's COM (serial communications) ports to use for control of the PTZ functionality:



4. In the **PTZ Protocol** column, select which positioning scheme you want to use:

   - **Absolute**: When operators use PTZ controls for the camera, the camera is adjusted relative to a fixed position, often referred to as the camera's home position
   - **Relative**: When operators use PTZ controls for the camera, the camera is adjusted relative to its current position

   The content of the **PTZ protocol** column varies a lot depending on the hardware. Some have 5 to 8 different protocols. See also the camera documentation.

5. In the toolbar, click **Save**.

6. You are ready to configure preset positions and patrolling for each PTZ camera:

   - Add a preset position (type 1)
   - Add a patrolling profile

Change passwords on hardware devices

Available functionality depends on the system you are using. See the complete feature list, which is

available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

You can change passwords on multiple hardware devices in one operation.

Initially, the supported devices are models from Canon, Axis, Bosch, Hanwa, Panasonic, Sony, Hikvision, and ONVIF compatible hardware devices, but the user interface shows you directly if a model is supported or not. You can also go to our website to find out if a model is supported: https://www.milestonesys.com/community/business-partner-tools/supported-devices/

For devices that do not support device password management, you must change the password of a hardware device from its web page and then manually enter the new password in Management Client. For more information, see Edit hardware.

You can choose to:

- Let the system generate individual passwords for each hardware device. The system generates passwords based on the requirements from the manufacturer of the hardware devices.
- Use a single user-defined password for all hardware devices. When you apply the new passwords, the hardware devices lose connection to the recording server momentarily. After you have applied new passwords, the result for each hardware device appears on the screen. For unsuccessful changes, the reason for failure appears if the hardware device supports such information. From within the wizard, you can create a report of successful and failed password changes, but the results are also logged under **Server logs**.

  For hardware devices with ONVIF drivers and multiple user accounts, only an administrator of XProtect with administrative permissions of the hardware device can change passwords from the VMS.

Requirements:

- The hardware device model supports device password management by Milestone.

Steps:

1. In the **Site Navigation** pane, select the **Recording Servers** node.
2. Right-click the relevant recording server or hardware in the overview pane.
3. Select **Change Hardware Password**. A wizard appears.
4. Type the password using lower and upper letters, numbers, and the following characters: ! ( ) * - . _

   The maximum password length is 64 characters.

   The maximum password length for the Bosch FLEXIDOME IP outdoor 5000 MP NDN-50051 camera is 19 characters.

5. Follow the instructions on the screen to complete the changes.

   The **Password last changed** field shows the time stamp of the latest password change based on the local time settings of the computer that the password was changed from.

6. The last page shows the result. If the system could not update a password, click **Failed** next to the hardware device to see the reason.
7. You can also click the **Print report** button to see the full list of successful and unsuccessful updates.

8. In case you want to change the password on the hardware devices that failed, click **Retry**, and the wizard starts over with the failed hardware devices.
9. If you select **Retry**, you can no longer access the report from the first time you completed the wizard.
10. Due to security restrictions, some hardware devices might become unavailable for a certain period if you fail to change password several times in a row. Security restrictions vary for different manufacturers.

Update firmware on hardware devices

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Management Client allows you to update the firmware of hardware that has been added to your VMS system. You can update firmware for multiple hardware devices simultaneously if they are compatible with the same firmware file.

The user interface shows you directly if a model supports firmware updates. You can also go to the Milestone website to find out if a model is supported: https://www.milestonesys.com/community/business-partner-tools/supported-devices/

For devices that do not support firmware updates, you must update the firmware of a hardware device from its web page.

When you update firmware, the hardware devices lose connection to the recording server momentarily.

After you have updated the firmware, the result for each hardware device appears on the screen. For unsuccessful changes, the reason for failure appears if the hardware device supports such information. The results are also logged under **Server logs**.

For hardware devices with ONVIF drivers and multiple user accounts, only an administrator of XProtect with administrative permissions of the hardware device can update firmware from the VMS.

Requirements:

- The hardware device model supports firmware updates by Milestone.

Steps:

1. In the **Site Navigation** pane, select the **Recording Servers** node.
2. Right-click the relevant recording server or hardware in the overview pane.
3. Select **Update hardware firmware**. A wizard appears.
4. Follow the instructions on the screen to complete the changes.
5. You may only update multiple hardware devices that are compatible with the same firmware file. Hardware that is added through the ONVIF driver is found under **other**, rather than its manufacturer name.
6. The last page shows the result. If the system could not update the firmware, click **Failed** next to the hardware device to see the reason.

Milestone does not take responsibility for hardware device malfunction if an incompatible firmware file or hardware device is selected.

Add and configure an external IDP

1. In Management Client, select **Tools** > **Options** and open the **External IDP** tab.
2. In the **External IDP** section, select **Add**. Note, that only one external IDP can be added.

3. Enter the information for the external IDP. For more information about the information that is required, see External IDP tab (options).

For information about how to register which claims from the external IDP that you want to use in the VMS, see Register claims from an external IDP.

Add a device group

1. In the **Overview** pane, right-click the device type under which you want to create a device group.
2. Select **Add Device Group**.
3. In the **Add Device Group** dialog box, specify a name and description of the new device group:

   The description appears when you pause the mouse pointer over the device group in the device group list.

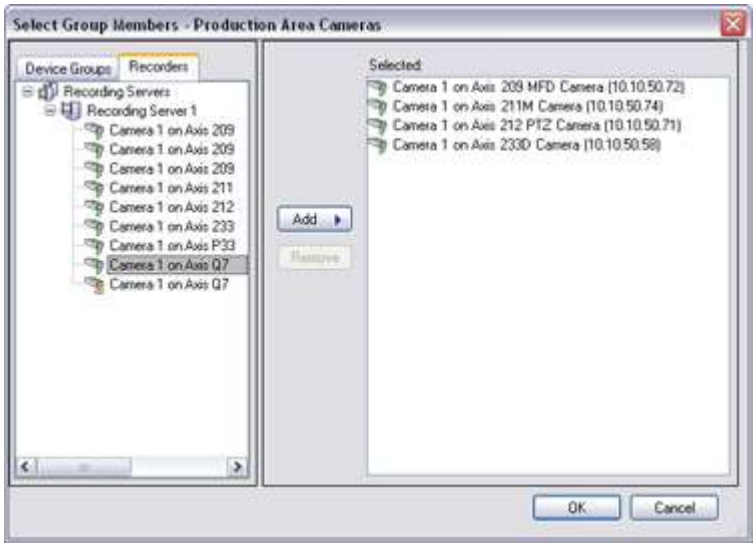
4. Click **OK**. A folder representing the new device group appears in the list.
5. Continue to specify which devices to include in a device group (see Specify which devices to include in a device group).

Specify which devices to include in a device group

1. In the **Overview** pane, right-click the relevant device group folder.
2. Select **Edit Device Group Members**.
3. In the **Select Group Members** window, select one of the tabs to locate the device.

   A device can be a member of more than one device group.

4. Select the devices you want to include, and click **Add** or double-click the device:



5. Click **OK**.
6. If you exceed the limit of 400 devices in one group, you can add device groups as subgroups under other device groups:

Disabled Devices

All devices, including disabled devices, are by default displayed in the **Overview** pane.

To hide disabled devices, in the top of the **Overview** pane, click **Filter** to open the **Filter** tab and select **Hide disabled devices**.

To display disabled devices again, clear **Hide disabled devices**.

Specify common properties for all devices in a device group

With device groups, you can specify common properties for all devices within a given device group:

1. In the **Overview** pane, click the device group.

   In the **Properties** pane, all properties **which are available on all of the device group's devices** are listed and grouped on tabs.

2. Specify the relevant common properties.

   On the **Settings** tab, you can switch between settings for **all** devices and settings for individual devices.

3. In the toolbar, click **Save**. The settings are saved on the individual devices, not in the device group.

Disabled devices

All devices, including disabled devices, are by default displayed in the **Overview** pane.

To hide disabled devices, in the top of the **Overview** pane, click **Filter** to open the **Filter** tab and select **Hide disabled devices**.

To display disabled devices again, clear **Hide disabled devices**.

Enable/disable devices via device groups

You can enable/disable devices only via the configured hardware. Unless manually enabled/disabled in the add hardware wizard, camera devices are by default enabled and all other devices are by default disabled.

All devices, including disabled devices, are by default displayed in the **Overview** pane.

To hide disabled devices, in the top of the **Overview** pane, click **Filter** to open the **Filter** tab and select **Hide disabled devices**.

To display disabled devices again, clear **Hide disabled devices**.

To locate a device via the device groups to enable or disable:

1. In the **Site Navigation** pane, select the device.
2. In the **Overview** pane expand the relevant group and find the device.
3. Right-click the device, and select **Go To Hardware**.
4. Click the plus node to see all devices on the hardware.
5. Right-click the device you want to enable/disable, and select **Enabled**.

View or edit camera settings

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant camera in the **Overview** pane.
3. Open the **Settings** tab.

You can view or edit settings, such as:

- Default frame rate
- Resolution
- Compression
- The maximum number of frames between keyframes
- On-screen date/time/text display for a selected camera, or for all cameras within a device group

The drivers for the cameras determine the content of the **Settings** tab. The drivers vary depending on the type of camera.

For cameras that support more than one type of stream, for example MJPEG and MPEG-4/H.264/H.265, you can use multi-streaming, see Manage multi-streaming.

Preview

When you change a setting, you can quickly verify the effect of your change if you have the **Preview** pane enabled.

- To enable **Preview**, click the **View** menu and then click **Preview Window**.

You cannot use the **Preview** pane to judge the effect of frame rate changes because the **Preview** pane's thumbnail images use another frame rate defined in the **Options** dialog box.

Performance

If you change the settings for **Max. frames between keyframes** and **Max. frames between keyframes mode**, it may lower the performance of some functionalities in XProtect Smart Client. For example, XProtect Smart Client requires a keyframe to start up showing video, so a longer period between keyframes, prolongs the XProtect Smart Client start up.

Adding hardware

For more information about how to add hardware to your system, see Add hardware.

Enable and disable fisheye lens support

The fisheye lens support is disabled by default.

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Fisheye Lens** tab, select or clear the **Enable fisheye lens support** check box.

Specify fisheye lens settings

1. On the **Fisheye Lens** tab, select the lens type.
2. Specify the physical position/orientation of the camera from the **Camera position/orientation** list.
3. Select a Registered Panomorph Lens (RPL) number from the **ImmerVision Enables® panomorph RPL number** list.

   This ensures the identification and correct configuration of the lens used with the camera. You usually find the RPL number on the lens itself or on the box it came in. For details of ImmerVision, panomorph lenses, and RPLs, see the Immervision website (https://www.immervisionenables.com/).

If you select the **Generic dewarping** lens profile, remember to configure the desired **Field of view**.

Enable/disable recording

Recording is by default enabled. To enable/disable recording:

1. In the **Site Navigation** pane, select **Recording Servers**.
2. Select the relevant device in the **Overview** pane.
3. On the **Record** tab, select or clear the **Recording** check box.

You must enable recording for the device before you can record data from the camera. A rule that specifies the circumstances for a device to record does not work if you have disabled recording for the device.

Enable recording on related devices

For camera devices, you can enable recording for related devices, for example, microphones that are connected to the same recording server. It means that the related devices record when the camera records.

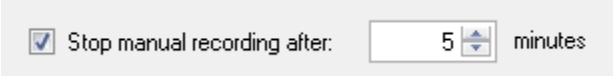
Recording on related devices are enabled by default for new camera devices, but you can disable and enable as you want. For existing camera devices in the system, the check box is cleared by default.

1. In the **Site Navigation** pane, select **Recording Servers**.
2. Select the relevant camera device in the **Overview** pane.
3. On the **Record** tab, select or clear the **Record on related devices** check box.
4. On the **Client** tab, specify the devices that relate to this camera.

If you want to enable recording on related devices that are connected to another recording server, you must create a rule.

Manage manual recording

Stop manual recording after is enabled by default with a recording time of five minutes. This is to ensure that the system automatically stops all recordings started by the XProtect Smart Client users.



1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane.
3. On the **Record** tab, select or clear the **Stop manual recording after** check box.

When you enable it, specify a recording time. The number of minutes you specify must be sufficiently large to accommodate the requirements of the various manual recordings without overloading the system.

Add to roles:

You must grant the permission to start and stop manual recording to the client users on each camera in **Roles** on the **Device** tab.

Use in rules:

The events you can use when you create rules related to manual recording are:

- Manual Recording Started
- Manual Recording Stopped

Specify recording frame rate

You can specify the recording frame rate for JPEG.

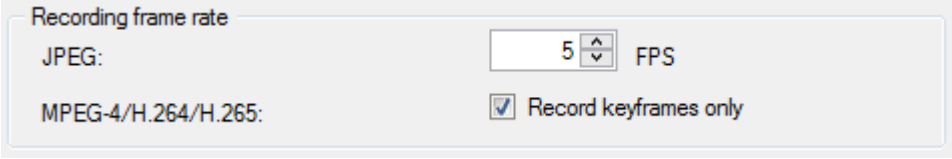
1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane.
3. On the **Record** tab, in the **Recording frame rate: (JPEG)** box, select or enter the recording frame rate (in FPS, frames per second).

Enable keyframe recording

You can enable keyframe recording for MPEG-4/H.264/H.265 streams. It means that the system switches between recording keyframes only and recording all frames depending on your rule settings.

You can, for example, let the system record keyframes when there is no motion in the view and switch to all frames only in case of motion detection to save storage.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane.
3. On the **Record** tab, select the **Record keyframes only** check box.



4. Set up a rule that activates the function, see Actions and stop actions.

Enable recording on related devices

For camera devices, you can enable recording for related devices, for example, microphones that are connected to the same recording server. It means that the related devices record when the camera records.

Recording on related devices are enabled by default for new camera devices, but you can disable and enable as you want. For existing camera devices in the system, the check box is cleared by default.

1. In the **Site Navigation** pane, select **Recording Servers**.
2. Select the relevant camera device in the **Overview** pane.
3. On the **Record** tab, select or clear the **Record on related devices** check box.
4. On the **Client** tab, specify the devices that relate to this camera.

If you want to enable recording on related devices that are connected to another recording server, you must create a rule.

Save and retrieve remote recording

To ensure that all remote recordings are saved in case of network issues, you can enable automatic retrieval of recordings once connection is re-established.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane.
3. Under **Remote recordings**, select **Automatically retrieve remote recordings when connection is restored**. This enables automatic retrieval of recordings once connection is re-established

The remote recording option is only available if the selected camera supports edge storage or is a camera in a Milestone Interconnect setup.

The type of hardware selected determines where recordings are retrieved from:

- For a camera with local recording storage, recordings are retrieved from the camera's local recording storage
- For a Milestone Interconnect remote system, recordings are retrieved from the remote systems' recording servers

You can use the following functionality independently of the automatic retrieval:

- Manual recording
- The **Retrieve and store remote recordings from <devices>** rule
- The **Retrieve and store remote recordings between <start and end time> from <devices>** rule

Delete recordings

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane and select the **Recording** tab.

3. Click the **Delete All Recordings** button to delete all recordings for the device or device group.

This method can only be used if you have added all devices in the group to the same server. Protected data is not deleted.

Adaptive streaming (explained)

Adaptive streaming is a streaming method that is used when multiple live video streams are shown in the same view. It enables the clients to automatically select the live video streams with the best match in resolution to the streams requested by the view items. Adaptive streaming reduces the network load and improves the decoding capability and performance of the client computer.

You can set up the closest match of available video streams for the resolution requested by a view item when you enable adaptive streaming in XProtect Smart Client. For more information, see Enable adaptive streaming.

In XProtect Smart Client, adaptive streaming can be applied in live and in playback mode. In the mobile clients, it is only available in live mode.

When applied in playback mode, the streaming method is referred to as adaptive playback. For more information, see Adaptive playback (explained)

Adaptive playback (explained)

Adaptive playback is a configuration that allows the use of adaptive streaming in playback mode.

Adaptive playback requires two recording streams, a primary and a secondary stream. If both streams are enabled in the Management Client, both streams will be recording.

- If you play back video from a period before the secondary recording was configured, only the primary recordings will be played back.

- If you play back video that was recorded after the secondary recording was configured, the video is played back from the primary or the secondary recording depending on what matches the client view size the best.

Availability

Available functionality depends on the system you are using. See the complete feature list, which is

available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Enable adaptive streaming

You can enable adaptive playback together with adaptive streaming on the **Advanced** tab in **Smart Client profiles** and it must also be enabled in XProtect Smart Client under **Settings** > **Advanced** > **Adaptive streaming**. For more information about enabling adaptive streaming in XProtect Smart Client, see Enable adaptive streaming.

Edge recordings

Optionally, you can use edge recordings for adaptive playback. Edge recordings allow you to view sequences of a stream with a different, usually a higher, resolution than the remainder of the stream. For example, you can record a primary stream with a low resolution and merge recordings from a high-resolution source. You can enable the merged-in edge recordings when browsing the data.

Edge recordings are stored in the media database and the resolution of these recordings is set on individual cameras.

Resolution of played back video

When using adaptive playback, the resolution in the played back video is determined by the current resolution settings for the primary and the secondary recordings. That is, in playback, the choice of either the primary or the secondary stream is based on the resolution that is currently set up for the respective recording streams.

Add a stream

The streams that you add for recording can be viewed in live and in playback mode.

You can also view the recorded video in your view item with adaptive streaming enabled. Adaptive streaming in playback mode is referred to as adaptive playback.

1. On the **Streams** tab, click **Add**. This adds a second stream to the list.
2. In the **Name** column, edit the name of the stream. The name appears in XProtect Smart Client.
3. In the **Live Mode** column, select when live streaming is needed:
   - **Always**: the stream runs even if no XProtect Smart Client users request the stream
   - **Never**: the stream is off. Only use this for recording streams, for example, if you want recordings in high quality and need the bandwidth
   - **When needed**: the stream starts when requested by any client or if the stream is set to record
4. In the **Default live stream** column, select which stream is default and should be used if the client does not request a specific stream and adaptive streaming is disabled.
5. In the **Recording** column, select either **Primary** or **Secondary**. For adaptive playback, you need to create a stream of each type. The video that is played back is sourced from the primary video stream and secondary streaming is included when required. There must always be a primary recording. Also, the stream that you configure as **Primary** is used in different contexts such as for motion detection and for export from XProtect Smart Client.
6. Under **Default playback**, select which stream is default. The default stream will be delivered to the client if adaptive playback is not configured.
7. In the **Use edge recordings** column, select the check box if you want to use edge recordings. For more information about edge recordings, see Edge recordings.
8. Click **Save**.

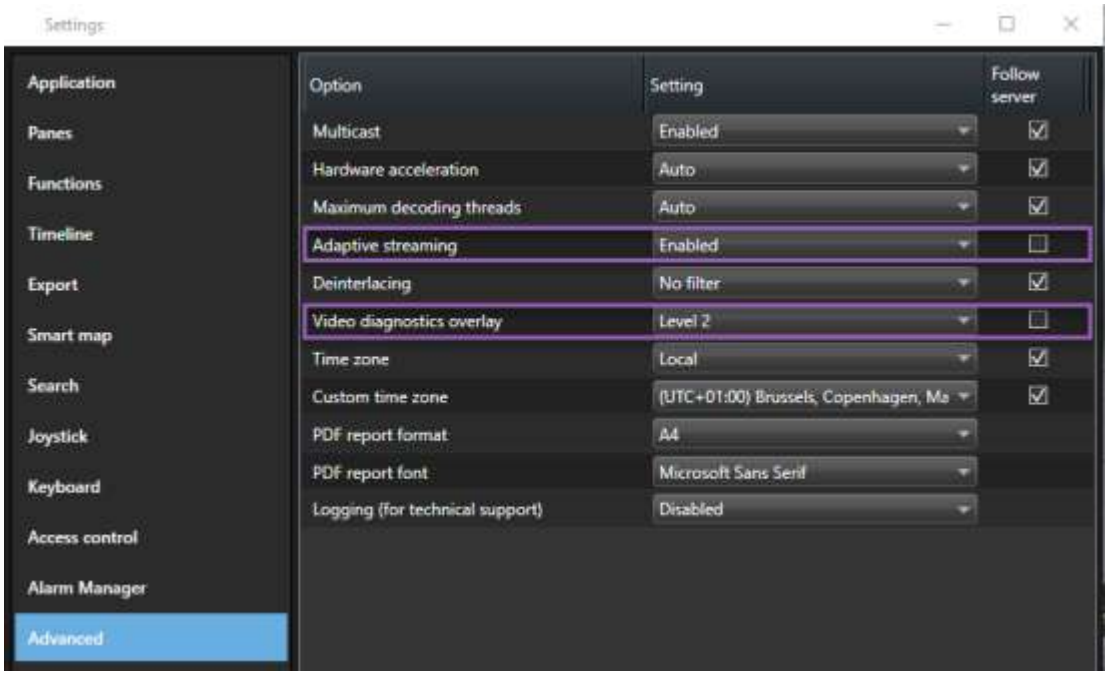
If you do not want the streams to run at all unless someone is viewing live video, you can modify the **Default Start Feed Rule** to start on request with the predefined **Live Client Feed Requested** event.

Enable adaptive streaming

Enable adaptive streaming to improve the performance of computers running XProtect Smart Client.

1. From the **Settings and more** menu, select **Settings**.
2. On the **Advanced** tab, select **Adaptive streaming**.
3. There are two settings for adaptive streaming: **Disabled** and **Enabled**.

   Select **Enabled**.

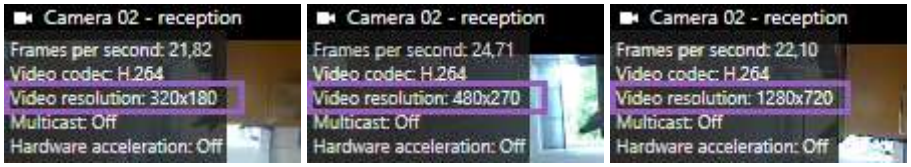


4. Go to **Video diagnostics overlay**.
5. To make the current video resolution of the stream visible, select **Level 2**.

   This setting applies to all view items. The default setting is **Hide**.

6. The video diagnostics overlay should now be **Enabled**.

   Try to resize the view window from small to large, large to small and check if the **Video resolution** value changes.



   If the value doesn't change, continue to examine your available live video streams from your cameras so you can enable adaptive streaming, if possible.

Manage multi-streaming

Viewing live video and playing back recorded video do not necessarily require the same video quality and frame rate.

To change which stream to use for recording

Adaptive playback requires that two streams are set to recording, a primary and a secondary stream. For live streaming, you can set up and use as many live streams as the camera supports.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Streams** tab, select the stream that you want to use for recording.
4. Select the relevant option on the **Live mode** list. The options **When needed**, **Always** and **Never** indicate when the stream should be applied in the client. If nothing is requested from the client, the recording will use the stream where the **Default live stream** check box is selected.
5. To record on one stream, select either **Primary** or **Secondary** on the **Recording** list.
6. To use adaptive playback, set up two streams and set one of the streams to **Primary** and the other one to **Secondary**.
7. To record on a stream, select either the **Primary** or the **Secondary** stream on the **Recording** list.

Limit data transmission

You can set up a set of conditions to ensure that video streams only run when viewed by a client.

To manage streaming and limit unnecessary data transmission, streaming does not start when the following conditions are met:

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Streams** tab, on the **Live Mode** list, select **When needed**.
4. On the **Record** tab, clear the **Recording** check box.
5. On the **Motion** tab, clear the **Motion detection** check box.

If these conditions are met, video streams will only run when viewed by a client.

Examples

Example 1, live and recorded video:

- For viewing **live** video, your organization may prefer H.264 at a high frame rate
- For playing back **recorded** video, your organization may prefer MJPEG at a lower frame rate to preserve disk space

Example 2, local and remote live video:

- For viewing **live video from a local connected operating point**, your organization may prefer H.264 at a high frame rate to have the highest quality of video available
- For viewing **live video from a remotely connected operating point**, your organization may prefer MJPEG at a lower frame rate and quality to preserve network bandwidth

Example 3, adaptive streaming:

- For viewing **live video and decreasing the load on the CPU and GPU of the XProtect Smart Client computer**, your organization may prefer multiple high frame rate H.264/H.265 but with different resolutions to match the resolution requested by XProtect Smart Client when using adaptive streaming. For more information, see Smart Client Profiles (Client node).

If you enable **Live multicast** on the camera's **Client** tab (see Client tab (devices)), it only works on the default video stream.

Even when cameras support multi-streaming, individual multi-streaming capabilities may vary between different cameras. See the camera's documentation for more information.

To see if a camera offers different types of streams, see **Settings tab (devices)**.

Manage pre-buffering

Cameras, microphones and speakers support pre-buffering. For speakers, the streams are only sent when the XProtect Smart Client user uses the **Talk to speaker** function. This means that depending on how your speaker streams are triggered to be recorded there is little or no pre-buffering available.

In most cases, you set up speakers to record when the XProtect Smart Client user uses the **Talk to speaker** function. In such cases, no speaker pre-buffer is available.

To use the pre-buffer function, the devices must be enabled and sending a stream to the system.

Enable and disable pre-buffering

Pre-buffering is enabled by default with a pre-buffer size of three seconds and storage to the memory.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane.
3. On the **Record** tab, select or clear the **Pre-buffer** check box.
4. On the **Client** tab, specify the devices that relate to this camera.

Specify storage location and pre-buffer period

Temporary pre-buffer recordings are stored either in the memory or on the disk:

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane and select the **Record** tab.
3. On the **Location** list, select **Memory** or **Disk**, and specify the number of seconds.
4. If you require a pre-buffer period of more than 15 seconds, select **Disk**.

The number of seconds you specify must be sufficiently large to accommodate your requirements in the various recording rules you define.

If you change the location to **Memory**, the system reduced the period to 15 seconds automatically.

Use pre-buffer in rules

When you create rules that trigger recording, you can select that recordings should start some time before the actual event (pre-buffer).

Example: The below rule specifies that recording should start on the camera 5 seconds before motion is detected on the camera.

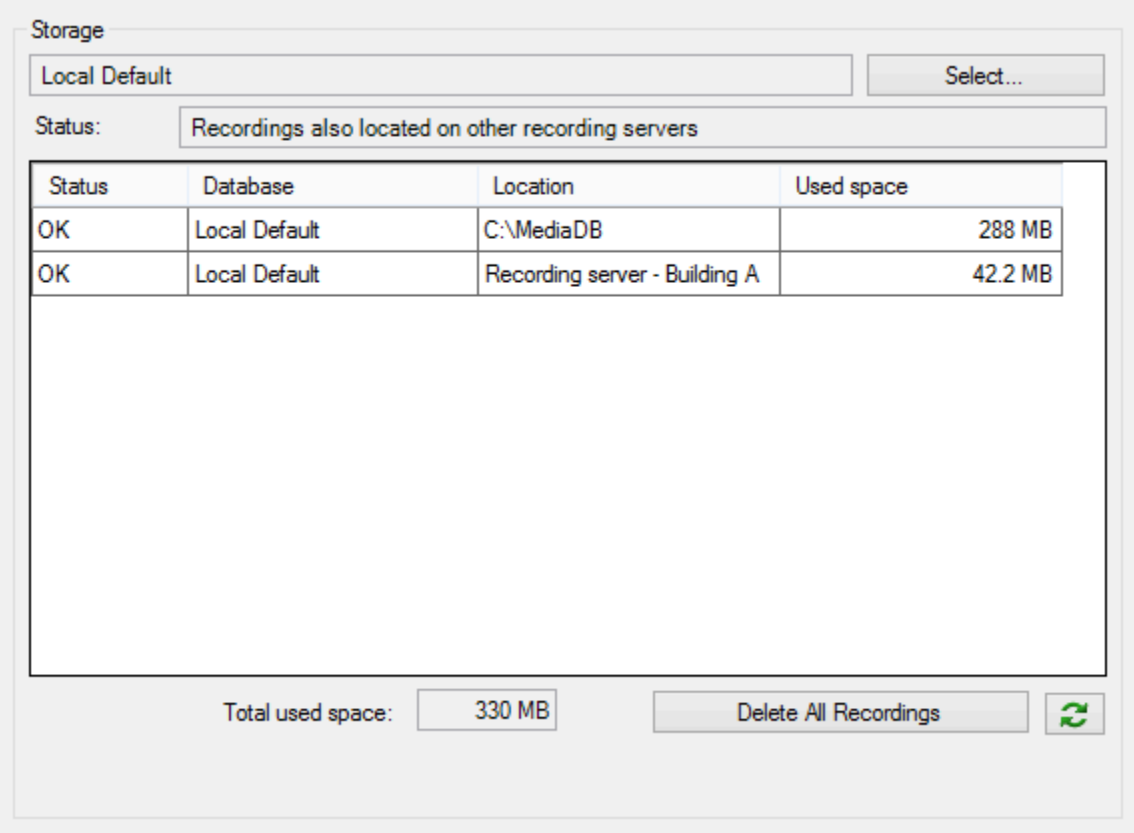
To use the pre-buffer recording function in the rule, you must enable pre-buffering on the device being recorded and you must set the pre-buffer length to at least the same length as specified in the rule.

Monitor the status of databases for devices

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane and select the **Recording** tab.

Under **Storage**, you can monitor and manage the databases for a device or a group of devices added to the same recording server.

Above the table, you can see the selected database and its status. In this example, the selected database is the default **Local Default** and the status is **Recordings also located on other recording servers**. The other server is the recording server in building A.



Possible statuses for selected database

Name	Description
Recordings also located on other recording servers	The database is active and running and has recordings located in storages on other recording servers as well.
Archives also located in old storage	The database is active and running and has archives located in other storages as well.
Active	The database is active and running.
Data for some of the devices chosen is currently moving to another location	The database is active and running and the system is moving data for one or more selected devices in a group from one location to another.
Data for the device is currently moving to another location	The database is active and running and the system is moving data for the

Name	Description
	selected device from one location to another.
Information unavailable in failover mode	The system cannot collect status information about the database when the database is in failover mode.

Further down in the window, you can see the status of each database (**OK**, **Offline** or **Old Storage**), the location of each database and how much space each database uses.

If all servers are online, you can see the total spaced used for the entire storage in the **Total used space** field.

For information about configuration of storage, see Storage tab (recording server).

Move devices from one storage to another

When you select a new location to store recordings, the existing recordings will not be moved. They will remain in the current location, with the conditions defined by the configuration of the storage they belong to.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant device in the **Overview** pane and select the **Recording** tab.
3. Click **Select** under **Storage** to select a recording storage for your devices to record in.

The recordings will archive according to the configuration for the storage that you select.

Motion detection (explained)

Motion detection configuration is a key element in your system: Your motion detection configuration determines when the system generates motion events and typically also when video is recorded.

Time spent on finding the best possible motion detection configuration for each camera helps you later avoid, for example, unnecessary recordings. Depending on the physical location of the camera, it may be a good idea to test motion detection settings under different physical conditions such as day/night and windy/calm weather.

You can specify settings related to the amount of changes required in a camera's view in order for the change to be regarded as motion. You can, for example, specify intervals between motion detection analysis and areas of a view in which motion should be ignored. You can also adjust the accuracy of the motion detection and thereby the load on system resources.

Image quality

Before you configure motion detection for a camera, Milestone recommends that you have configured the camera's image quality settings, for example resolution, video codec and stream settings. You do this on the **Settings** tab in the **Properties** window for the device. If you later change image quality settings, you should always test any motion detection configuration afterwards.

Privacy masks

If you have defined areas with permanent privacy masks, there is no motion detection within these

areas.

Enable and disable motion detection

Specify the default setting of motion detection for cameras

1. On the **Tools** menu, click **Options**.
2. On the **General** tab, under **When adding new camera devices automatically enable**, select the **Motion detection** check box.

Enable or disable motion detection for a specific camera

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Motion tab** tab, select or clear the **Motion detection** check box.

When you disable motion detection for a camera, motion detection-related rules for the camera do not work.

Enable or disable hardware acceleration

Automatic hardware accelerated video decoding for motion detection is the default setting when you add a camera. The recording server is using GPU resources if they are available. This will reduce the CPU load during video motion analysis and improve the general performance of the recording server.

To enable or disable hardware acceleration

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Motion** tab, under **Hardware acceleration** select **Automatic** to enable hardware acceleration or select **Off** to disable the setting.

Use of GPU resources

Hardware accelerated video decoding for motion detection uses GPU resources on:

- Intel CPUs that support Intel Quick Sync
- NVIDIA® display adapters connected to your recording server

Load balancing and performance

The load balancing between the different resources is done automatically. In the **System Monitor** node you can verify if the current motion analysis load on the NVIDIA GPU resources is within the specified limits from the **System Monitor Thresholds** node. The NVIDIA GPU load indicators are:

- NVIDIA decoding
- NVIDIA memory
- NVIDIA rendering

If the load is too high, you can add GPU resources to your recording server by installing multiple NVIDIA display adapters. Milestone does not recommend the use of Scalable Link Interface (SLI) configuration of your NVIDIA display adapters.

NVIDIA products have different compute capabilities.

Hardware accelerated video decoding for motion detection using NVIDIA GPUs requires compute capability version 6.x (Pascal) or newer.

- To find the compute capability version of your NVIDIA product, visit the NVIDIA website (https://developer.nvidia.com/cuda-gpus/).
- To see if video motion detection is hardware accelerated for a specific camera, enable logging on the recoding server log file. Set level to **Debug** and diagnostics is logged to the DeviceHandling.log. The log follows the pattern: [time] [274] DEBUG – [guid] [name] Configured decoding: Automatic: Actual decoding: Intel/NVIDIA

The OS version of the recording server and CPU generation may impact performance of hardware accelerated video motion detection. GPU memory allocation is often the bottleneck with older versions (typical limit is between 0.5 GB and 1.7 GB).

Systems based on Windows 10 / Server 2016 and 6th generation CPU (Skylake) or newer can allocate 50% of system memory to GPU and thereby removing or reducing this bottleneck.

6th generation Intel CPUs does provide hardware accelerated decoding of H.265, so the performance is comparable with H.264 for these versions of CPU.

Enable manual sensitivity to define motion

The sensitivity setting determines **how much each pixel** in the image must change before it is regarded as motion.

1. In the **Site Navigation** pane, select **Devices**, and then select **Cameras**.
2. Select the relevant camera in the **Overview** pane.
3. Select the **Motion** tab's **Manual Sensitivity** check box.
4. Drag the slider to the left for a higher sensitivity level, and to the right for a lower sensitivity level.

   The **higher** the sensitivity level, the less change is allowed in each pixel before it is regarded as motion.

   The **lower** the sensitivity level, the more change in each pixel is allowed before it is regarded as motion.

   Pixels in which motion is detected are highlighted in green in the preview image.

5. Select a slider position in which only detections you consider motion are highlighted.

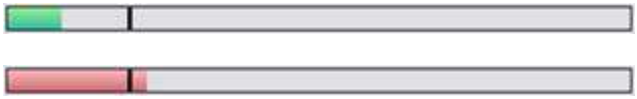
You can compare and set the exact sensitivity setting between cameras by the number in the right side of the slider.

Specify threshold to define motion

The motion detection threshold determines **how many pixels** in the image must change before it is regarded as motion.

1. Drag the slider to the left for a higher motion level, and to the right for a lower motion level.
2. Select a slider position in which only detections that you consider motion are detected.

The black vertical line in the motion indication bar shows the motion detection threshold: When detected motion is above the selected detection threshold level, the bar changes color from green to red, indicating a positive detection.



Motion indication bar: changes color from green to red when above the threshold, indicating a positive motion detection.

Specify exclude regions for motion detection

You can configure all the settings for a group of cameras, but you would typically set the exclude regions per camera.

> Areas with permanent privacy masks, are also excluded from motion detection. Select the **Show privacy masks** check box to display them.

Excluding motion detection from specific areas helps you avoid detection of irrelevant motion, for example if the camera covers an area where a tree is swaying in the wind or where cars regularly pass by in the background.

When you use exclude regions with PTZ cameras and you pan-tilt-zoom the camera, the excluded area does **not** move accordingly because the area is locked to the camera image, and not the object.

1. To use exclude regions, select the **Use exclude regions** check box.

   A grid divides the preview image into selectable sections.

2. To define exclude regions, drag the mouse pointer over the required areas in the preview image while you press the left mouse button. Right mouse button clears a grid section.

You can define as many exclude regions as needed. Excluded regions appear in blue:

The blue exclude areas only appear in the preview image on the **Motion** tab, not in any other preview images in the Management Client or access clients.

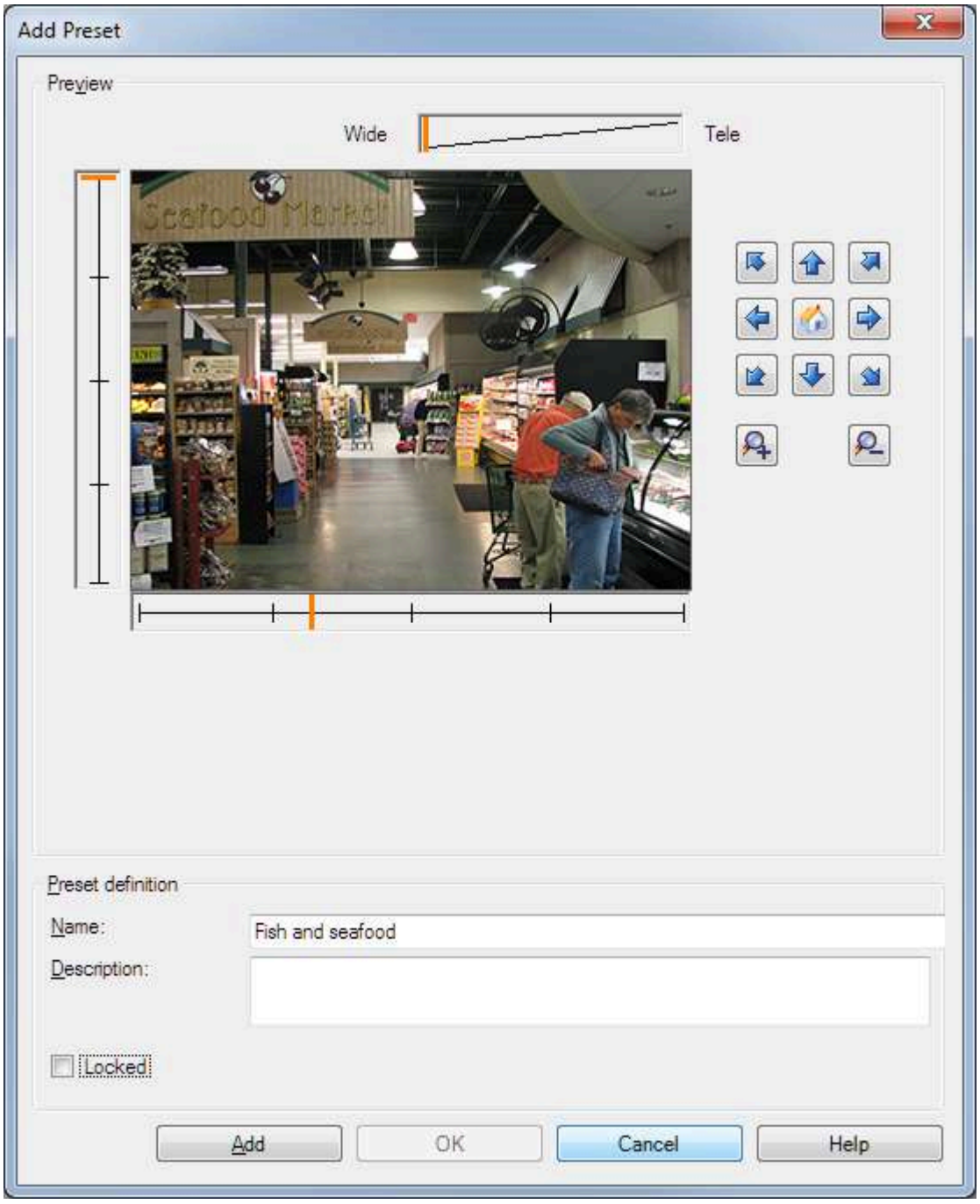
The Home preset position

You define a PTZ camera's **Home** preset position on the camera's homepage. The PTZ capabilities available on the homepage depend on the camera.

Add a preset position (type 1)

To add a preset position for the camera:

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Presets** tab, click **New**. The **Add Preset** window appears:



4. The **Add Preset** window displays a live preview image from the camera. Use the navigation buttons and/or sliders to move the camera to the required position.
5. Specify a name for the preset position in the **Name** field.
6. Optionally, enter a description of the preset position in the **Description** field.
7. Select **Locked** if you want to lock the preset position. Only users with sufficient permissions can unlock the position afterwards.

8. Click **Add** to specify presets. Keep adding until you have the presets you want.
9. Click **OK**. The **Add Preset** window closes, and adds the position to the **Presets** tab's list of available preset positions for the camera.

Use preset positions from the camera (type 2)

As an alternative to specifying preset positions in the system, you can specify preset positions for some PTZ cameras on the camera itself. You can typically do this by accessing a product-specific configuration web page.

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Presets** tab, select **Use presets from device** to import the presets into the system.

   Any presets you have previously defined for the camera are deleted and affect any defined rules and patrolling schedules as well as remove the presets available for the XProtect Smart Client users.

4. Click **Delete** to delete presets that your users do not need.
5. Click **Edit** if you want to change the display name of the preset (see Rename a preset position (type 2 only)).
6. If you later want to edit such device-defined presets, edit on the camera and then re-import.

Assign a camera's preset position as default

If required, you can assign one of a PTZ camera's preset positions as the camera's default preset position.

It can be useful to have a default preset position because it allows you to define rules that specify that the PTZ camera should go to the default preset position under particular circumstances, for example after you have operated the PTZ camera manually.

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Presets** tab, under **Preset positions**, select the preset in your list of defined preset positions.
4. Select the **Default preset** check box below the list.

You can only define one preset position as the default preset position.

If you have selected **Use default preset as PTZ home position** in **Options** > **General**, the default preset position will be used instead of PTZ camera’s defined home position.

Specify the default preset as the PTZ Home position

Management Client and XProtect Smart Client users with the necessary user permissions can set up the system to use the default preset position instead of the home position of PTZ cameras with the **Home** button in a client.

A default preset position must be defined for the camera. If a default preset position is not defined, nothing will happen when activating the **Home** button in a client.

Enable setting the PTZ home position

1. Select **Tools** > **Options**.

2. On the **General** tab, in the **Recording Server** group, select **Use default preset as PTZ home position**.

3. Assign a preset position as the default preset position for the camera.

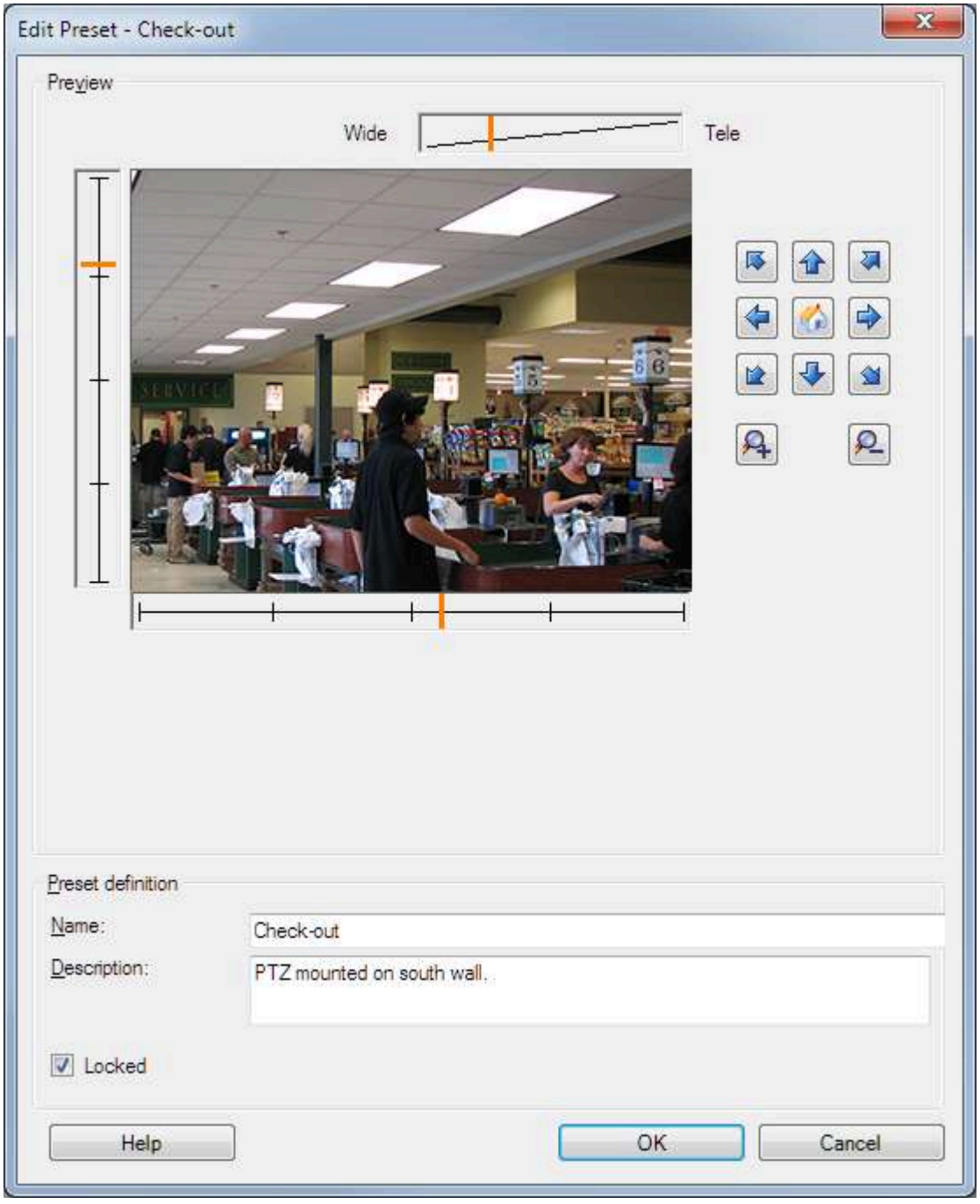
To assign a default preset position, see Assign a camera's preset position as default

See also System settings (Options dialog box)

Edit a preset position for a camera (type 1 only)

To edit an existing preset position defined in the system:

1. In the **Site Navigation** pane, select **Devices**, and then select **Cameras**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Presets** tab, under Preset positions, select the preset position in the list of available preset positions for the camera.
4. Click **Edit**. This opens the **Edit Preset** window:



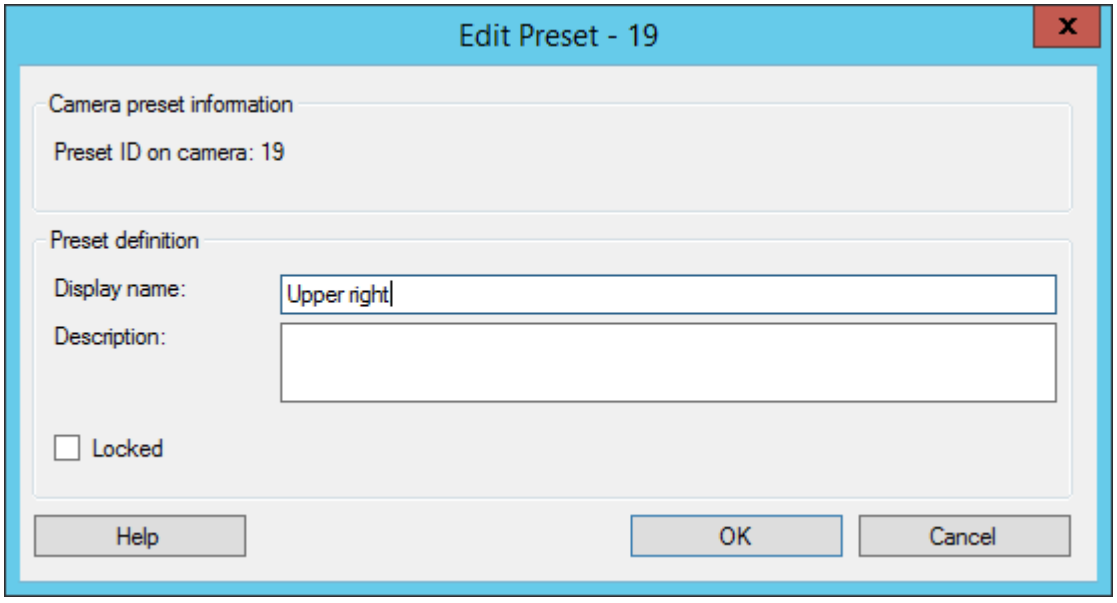
5. The **Edit Preset** window displays live video from the preset position. Use the navigation buttons and/or sliders to change the preset position as required.
6. Change the name/number and description of the preset position if needed.
7. Select **Locked** if you want to lock the preset position. Only users with sufficient permissions can unlock the position

afterwards.
8. Click **OK**.

Rename a preset position for a camera (type 2 only)

To edit the name of a preset position defined in the camera:

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. Select the preset position in the **Presets** tab's list of available presets for the camera.
4. Click **Edit**. This opens the **Edit Preset** window:



5. Change the name and add a description of the preset position if needed.
6. Select **Locked** if you want to lock the preset name. You can lock a preset name if you want to prevent users in XProtect Smart Client or users with limited security permissions from updating the preset name or deleting the preset. Locked presets are indicated with this icon . Only users with sufficient permissions can unlock the preset name afterwards.
7. Click **OK**.

Test a preset position (type 1 only)

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. Select the preset position in the **Presets** tab's list of available preset positions for the camera.
4. Click **Activate**.
5. The camera moves to the selected preset position.

Patrolling profiles and manual patrolling (explained)

Patrolling profiles are the definitions of how patrolling should take place. This includes the order in which the camera should move between preset positions and how long it should remain at each position. You can create an unrestricted number of patrolling profiles and use them in your rules. For example, you may create a rule specifying that one patrolling profile should be used during daytime opening hours and another during nights.

Manual patrolling

Before you apply a patrolling profile in a rule, for example, you can test the patrolling profile with manual patrolling. You can also use manual patrolling to take over patrolling from another user or from a rule-activated patrolling, provided that you have a higher PTZ priority.

If the camera is already patrolling or controlled by another user, you can only start manual patrolling if you have a higher priority.

If you start a manual patrolling while the camera runs a rule-activated system patrolling, the system resumes this patrolling when you stop your manual patrolling. If another user runs a manual patrolling, but you have a higher priority and start your manual patrolling, the other user's manual patrolling is not resumed.

If you do not stop your manual patrolling yourself, it will continue until a rule-based patrolling or a user with a higher priority takes over. When the rule-based system patrolling stops, the system resumes your manual patrolling. If another user starts a manual patrolling, your manual patrolling stops, and will not be resumed.

When you stop your manual patrolling and you have defined an end position for your patrolling profile, the camera returns to this position.

Add a patrolling profile

Before you can work with patrolling, you must specify at least two preset positions for the camera in the **Presets** tab, see Add a preset position (type 1).

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Patrolling** tab, click **Add**. The **Add Profile** dialog box appears.
4. In the **Add Profile** dialog box, specify a name for the patrolling profile.
5. Click **OK**. The button is disabled if the name is not unique.

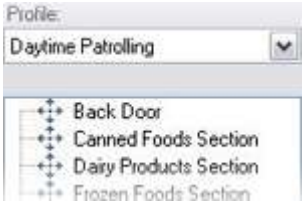
The new patrolling profile is added to the **Profile** list. You can now specify the preset positions and other settings for the patrolling profile.

Specify preset positions in a patrolling profile

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Patrolling** tab, select the patrolling profile in the **Profile** list:

4. Click **Add**.
5. In the **Select PTZ Preset** dialog box, select the preset positions for your patrolling profile:

6. Click **OK**. The selected preset positions are added to the list of preset positions for the patrolling profile:



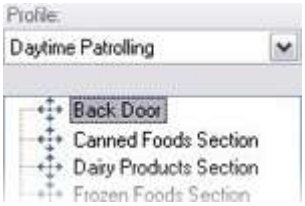
7. The camera uses the preset position at the top of the list as the first stop when it patrols according to the patrolling profile. The preset position in the second position from the top is the second stop, and so forth.

Specify the time at each preset position

When patrolling, the PTZ camera by default remains for 5 seconds at each preset position specified in the patrolling profile.

To change the number of seconds:

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Patrolling** tab, select the patrolling profile in the **Profile** list.
4. Select the preset position for which you want to change the time:



5. Specify the time in the **Time on position (sec)** field.
6. If required, repeat for other preset positions.

Customize transitions (PTZ)

By default, the time required for moving the camera from one preset position to another, known as **transition**, is estimated to be three seconds. During this time, motion detection is by default disabled on the camera, because irrelevant motion is otherwise likely to be detected while the camera moves between the preset positions.

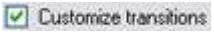
You can only customize speed for transitions if your camera supports PTZ scanning and is of the type where preset positions are configured and stored on your system's server (type 1 PTZ camera). Otherwise the **Speed** slider is grayed out.

You can customize the following:

- The estimated transition time
- The speed with which the camera moves during a transition

To customize transitions between the different preset positions:

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Patrolling** tab, in the **Profile** list, select the patrolling profile .
4. Select the **Customize transitions** check box.



Transition indications are added to the list of preset positions.

5. In the list, select the transition.

6. Specify the estimated transition time (in number of seconds) in the **Expected time (sec)** field.

7. Use the **Speed** slider to specify the transition speed. When the slider is in its rightmost position, the camera moves with its default speed. The more you move the slider to the left, the slower the camera moves during the selected transition.
8. Repeat as required for other transitions.

Specify an end position when patrolling

You can specify that the camera should move to a specific preset position when patrolling according to the selected patrolling profile ends.

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. On the **Patrolling** tab, in the **Profile** list, select the relevant patrolling profile.
4. Select the **Go to specific position on finish** check box. This opens the **Select preset** dialog box.
5. Select the end position and click **OK**.

> You can select any of the camera's preset positions as the end position, you are not limited to the preset positions used in the patrolling profile.

6. The selected end position is added to the profile list.

When patrolling according to the selected patrolling profile ends, the camera moves to the specified end position.

Reserve and release PTZ sessions

Depending on your surveillance system, you can reserve PTZ sessions.

Administrators with security permissions to run a reserved PTZ session can run the PTZ camera in this mode. This prevents other users from taking control over the camera. In a reserved PTZ session, the standard PTZ priority system is disregarded to avoid that users with a higher PTZ priority interrupt the session.

You can operate the camera in a reserved PTZ session both from XProtect Smart Client and the Management Client.

To reserve a PTZ session can be useful, if you need to make urgent updates or maintenance to a PTZ camera or its presets without being interrupted by other users.

Reserve a PTZ session

1. In the **Site Navigation** pane, select **Devices** and then select **Cameras**.
2. Select the relevant PTZ camera in the **Overview** pane.
3. Select the PTZ session in the **Presets** tab, and click **Reserved**.

> You cannot start a reserved PTZ session if a user with a higher priority than yours controls the camera

or if another user has already reserved the camera.

Release a PTZ session

The **Release** button allows you to release your current PTZ session so another user can control the camera. When you click **Release**, the PTZ session ends immediately and will be available for the first user to operate the camera.

Administrators assigned with the security permission **Release PTZ session** have the permissions to release other users' reserved PTZ session at any time. This can, for example, be useful in occasions where you need to maintain the PTZ camera or its presets, or if other users have accidentally blocked the camera in urgent situations.

Specify PTZ session timeouts

Management Client and XProtect Smart Client users with the necessary user permissions can manually interrupt the patrolling of PTZ cameras.

You can specify how much time should pass before regular patrolling is resumed for all PTZ cameras on your system:

1. Select **Tools** > **Options**.
2. On the **Options** window's **General** tab, select the amount of time in the:
    - **Timeout for manual PTZ sessions** list (default is 15 seconds).
    - **Timeout for pause patrolling sessions** list (default is 10 minutes).
    - **Timeout for reserved PTZ sessions** list (default is 1 hour).

    The settings apply for all PTZ cameras on your system.

You can change the timeouts individually for each camera.

1. In the **Site Navigation** pane, click **Camera**.
2. In the Overview pane, select the camera.
3. On the **Presets** tab, select the amount of time in the:
    - **Timeout for manual PTZ session** list (default is 15 seconds).
    - **Timeout for pause patrolling session** list (default is 10 minutes).
    - **Timeout for reserved PTZ session** list (default is 1 hour).

    The settings apply for this camera only.

Add an event for a device

1. In the **Overview** pane, select a device.
2. Select the **Events** tab and click **Add**. This opens the **Select Driver Event** window.
3. Select an event. You can only select one event at a time.
4. If you want to see an entire list of all events, allowing you to add events that have already been added, select **Show already added events**.
5. Click **OK**.
6. In the toolbar, click **Save**.

Delete an event for a device

When you delete an event, it affects all rules that use the event.

1. In the **Overview** pane, select a device.
2. Select the **Events** tab and click **Delete**.

Specify event properties

You can specify properties for each event you have added. The number of properties depends on the device and the event. In order for the event to work as intended, you must specify some or all of the properties identically on the device as well as on the **[Events]** tab.

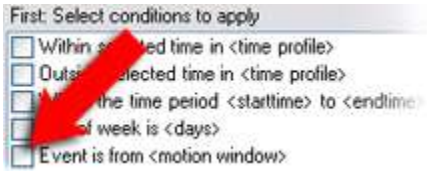
Use several instances of an event

To be able to specify different properties for different instances of an event, you can add an event more than once.

The following example is specific to cameras.

Example: You have configured the camera with two motion windows, called A1, and A2. You have added two instances of the Motion Started (HW) event. In the properties of one instance, you have specified the use of motion window A1. In the properties of the other instance, you have specified the use of motion window A2.

When you use the event in a rule, you can specify that the event should be based on motion detected in a specific motion window for the rule to be triggered:



Enable/disable privacy masking

The privacy masking feature is disabled by default.

To enable/disable the privacy masking feature for a camera:

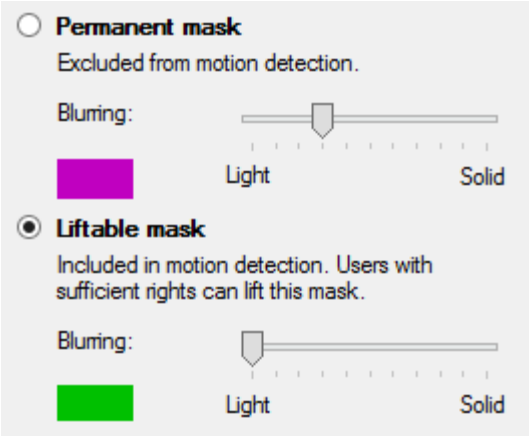
1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant camera device in the **Overview** pane.
3. On the **Privacy masking** tab, select or clear **Privacy masking** check box.

In a Milestone Interconnect setup, the central site disregards privacy masks defined in a remote site. If you want to apply the same privacy masks, you must redefine it on the central site.

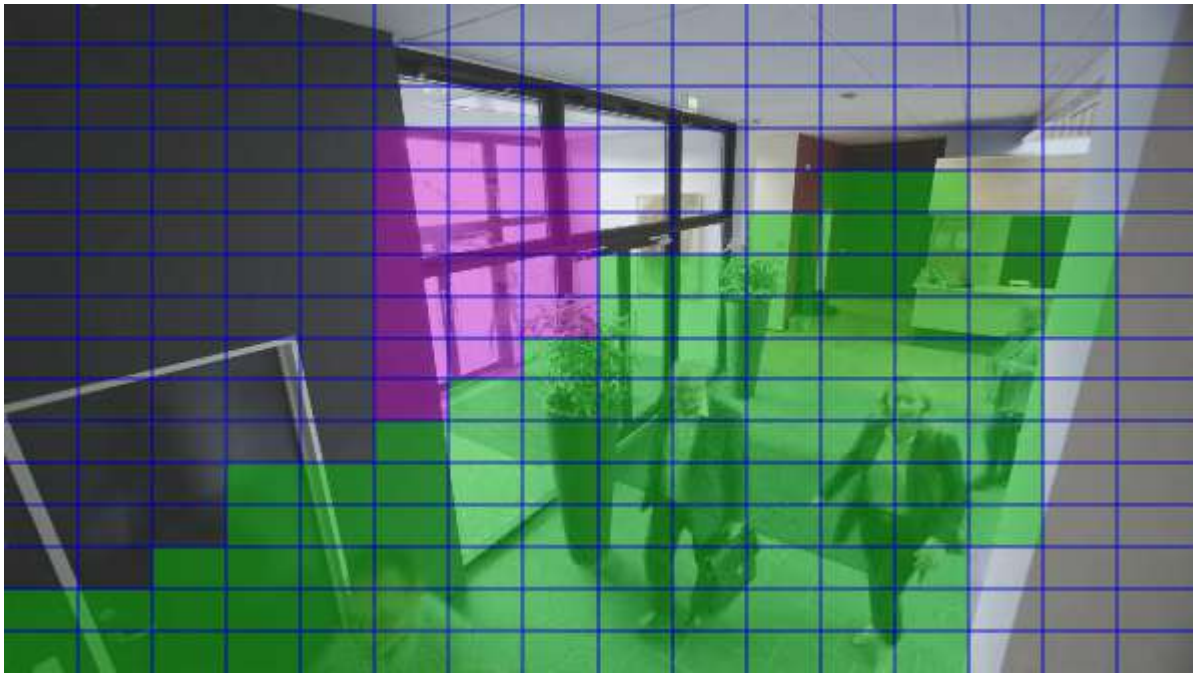
Define privacy masks

When you enable the privacy masking feature on the **Privacy masking** tab, a grid is applied to the camera preview.

1. In the **Site Navigation** pane, select **Devices**.
2. Select the relevant camera in the **Overview** pane.
3. On the **Privacy masking** tab, to cover an area with a privacy mask, first select **Permanent mask** or **Liftable mask** to define if you want a permanent or liftable privacy mask.



4. Drag the mouse pointer over the preview. Left-click to select a grid cell. Right-click to clear a grid cell.
5. You can define as many privacy mask areas as needed. Areas with permanent privacy masks appear in purple and areas with liftable privacy masks in green.



6. Define how the covering of the areas should appear in the video when shown in the clients. Use the sliders to go from a light blurring to a full nontransparent mask.

Permanent privacy masks also appear on the **Motion** tab.

7. In XProtect Smart Client, check that the privacy masks appear as you defined.

Change the timeout for lifted privacy masks

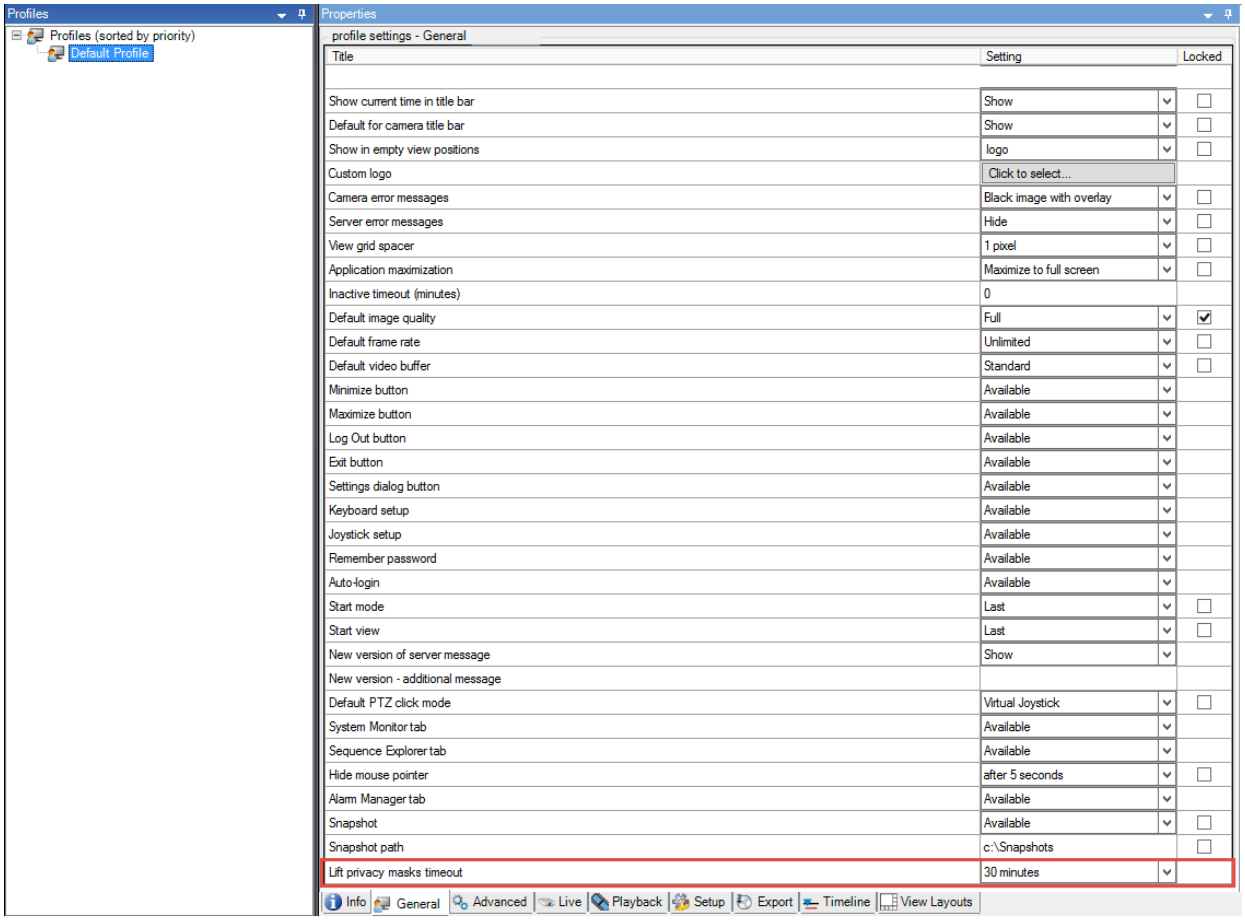
By default, privacy masks are lifted for 30 minutes in XProtect Smart Client and afterwards applied automatically, but you can change that.

When you change the timeout, remember to do it for the Smart Client profile associated with the role

that has the permission to lift privacy masks.

To change the timeout:

1. Under **Smart Client Profiles**, select the relevant Smart Client profile.
2. On the **General** tab, locate **Lift privacy masks timeout**.



3. Select between the values:
   - **2 minutes**
   - **10 minutes**
   - **30 minutes**
   - **1 hour**
   - **2 hours**
   - **Until logged out**
4. Click **Save**.

Give users permission to lift privacy masks

By default, no users have permissions to lift privacy masks in XProtect Smart Client.

To enable/disable the permission:

1. In the **Site Navigation** pane, select **Security** and then select **Roles**.
2. Select the role that you want to give permission to lift privacy masks.
3. On the **Overall Security** tab, select **Cameras**.
4. Select the **Allow** check box for the **Lift privacy masks** permission.

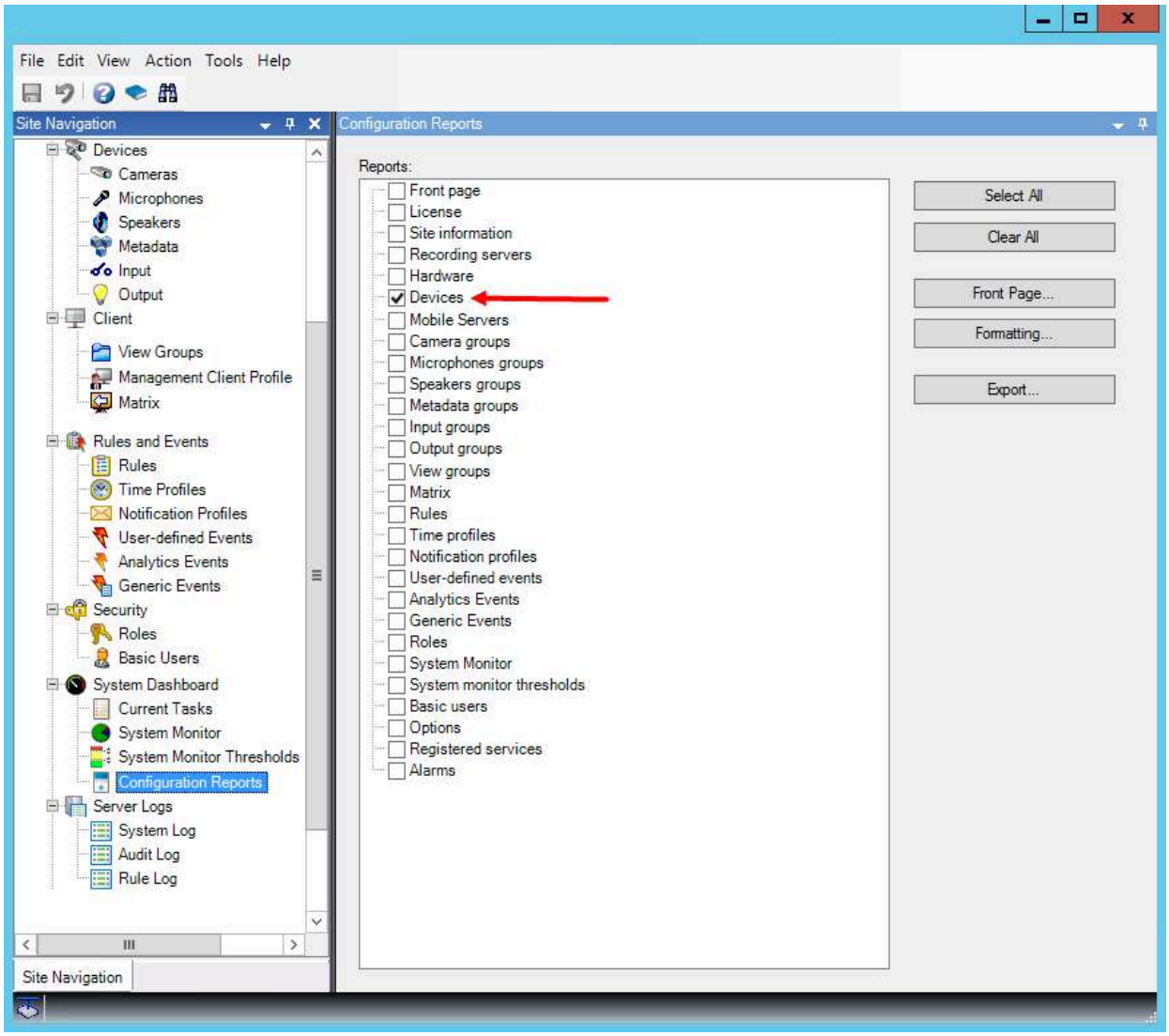
Users that you assign to this role, can lift privacy masks configured as liftable masks for himself/herself as well as authorize the lift for other XProtect Smart Client users.

Create a report of your privacy masking configuration

The devices report include information about your cameras' current privacy masking settings.

To configure a report:

1. In the **Site Navigation** pane, select **System Dashboard**.
2. Under **Configuration Reports**, select the **Devices** report.



3. If you want to modify the report, you can change the front page and the formatting.
4. Click **Export**, and the system creates the report as a PDF file.

For more information about reports, see Print a report with your system configuration.

View groups (explained)

The way in which the system presents video from one or more cameras in clients is called a view. A view group is a container for one or more logical groups of such views. In clients, a view group is presented as an expandable folder from which users

can select the group and the view they want to see:

Example from XProtect Smart Client: Arrow indicates a view group, which contains a logical group (called Amenities), which in turn contains 3 views.

By default, each role you define in the Management Client is also created as a view group. When you add a role in the Management Client, the role by default appears as a view group for use in clients.

- You can assign a view group based on a role to users/groups assigned to the relevant role. You may change these view group permissions by setting this up in the role afterwards
- A view group based on a role carries the role's name.

  Example: If you create a role with the name **Building A Security Staff**, it appears in XProtect Smart Client as a view group called **Building A Security Staff**.

  In addition to the view groups, you get when adding roles, you may create as many other view groups as you like. You can also delete view groups, including those automatically created when adding roles

- Even if a view group is created each time, you add a role, view groups do not have to correspond to roles. You can add, rename or remove any of your view groups if required

If you rename a View group, client users already connected must log out and log in again before the name change is visible.

Add a view group

1. Right-click **View Groups**, and select **Add View Group**. This opens the **Add View Group** dialog box.
2. Enter the name and an optional description of the new view group and click **OK**.

No roles can use the newly added view group until you have specified such permissions. If you have specified which roles that can use the newly added view group, client users that are already connected and who have the relevant roles must log out and log in again before they can see the view group.

Add and configure a Smart Client profile

You must create a Smart Client profile before you can configure it.

1. Right-click **Smart Client Profiles**.
2. Select **Add Smart Client Profile**.
3. In the **Add Smart Client Profile** dialog box, enter a name and description of the new profile and click **OK**.
4. In the **Overview** pane, click the profile you created to configure it.
5. Adjust settings on one, more or all of the available tabs and click **OK**.

Copy a Smart Client profile

If you have a Smart Client profile with complicated settings or permissions and need a similar profile, it might be easier to copy an already existing profile and make minor adjustments to the copy than to creating a new profile from scratch.

1. Click **Smart Client Profiles**, right-click the profile in the **Overview** pane, select **Copy Smart Client Profile**.

2. In the dialog box that appears, give the copied profile a new unique name and description. Click **OK**.
3. In the **Overview** pane, click the profile you just created to configure it. This is done by adjusting settings on one, more, or all of the available tabs. Click **OK**.

Create and set up Smart Client profiles, roles and time profiles

When you work with Smart Client profiles, it is important to understand the interaction between Smart Client profiles, roles and time profiles:

- Smart Client profiles deal with user permission settings in XProtect Smart Client
- Roles deal with security settings in clients, MIP SDK and more
- Time profiles deal with time aspects of the two profiles-types

Together these three features provide unique control and customizing possibilities with regards to XProtect Smart Client user permissions.

Example: You need a user in your XProtect Smart Client setup who should only be allowed to view live video (no playback) from selected cameras, and only during normal working hours (8.00 to 16.00). One way of setting this up could be as follows:

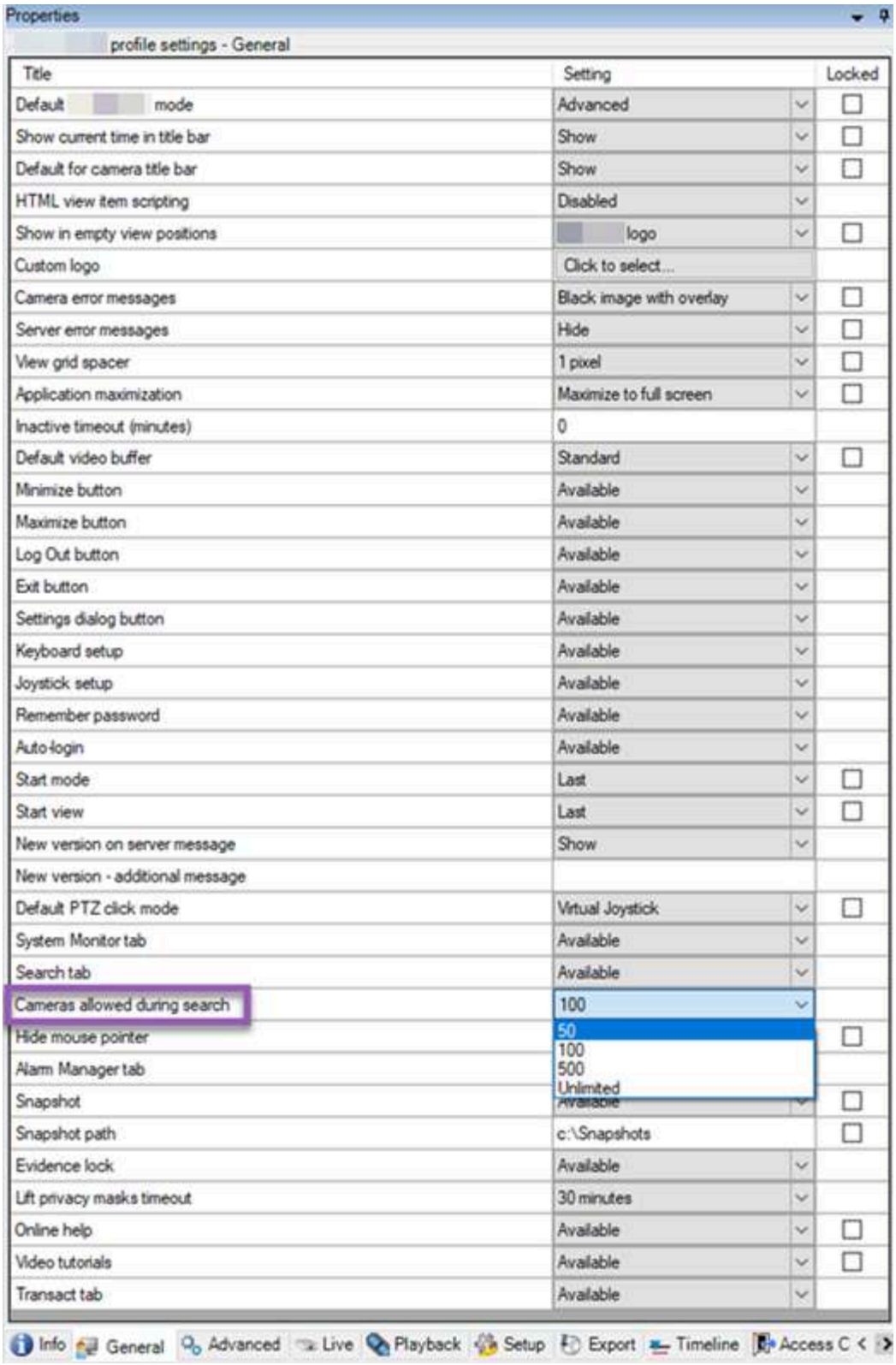
1. Create a Smart Client profile, and name it, for example, **Live only**.
2. Specify the needed live/playback settings on **Live only**.
3. Create a time profile, and name it, for example, **Daytime only**.
4. Specify the needed time period on **Daytime only**.
5. Create a new role and name it, for example, **Guard (Selected cameras)**.
6. Specify which cameras **Guard (Selected cameras)** can use.
7. Assign the **Live only** Smart Client profile and the **Daytime only** time profile to the **Guard (Selected cameras)** role to connect the three elements.

You now have a mix of the three features creating the wanted result and allowing you room for easy fine-tuning and adjustments. You can do the setup in a different order, for example, creating the role first and then the Smart Client profile and the time profile, or any other order you prefer.

Set number of cameras allowed during search

You can configure how many cameras the operators can add to a search in XProtect Smart Client. The default value is **100**. If exceeding the camera limit, the operator receives a warning.

1. In XProtect Management Client, expand **Client** > **Smart Client Profiles**.
2. Select the relevant profile.
3. Click the **General** tab.



4. In the **Cameras** allowed during search, select one of these values:
   - **50**
   - **100**
   - **500**
   - **Unrestricted**
5. Save your changes.

Change the default export settings

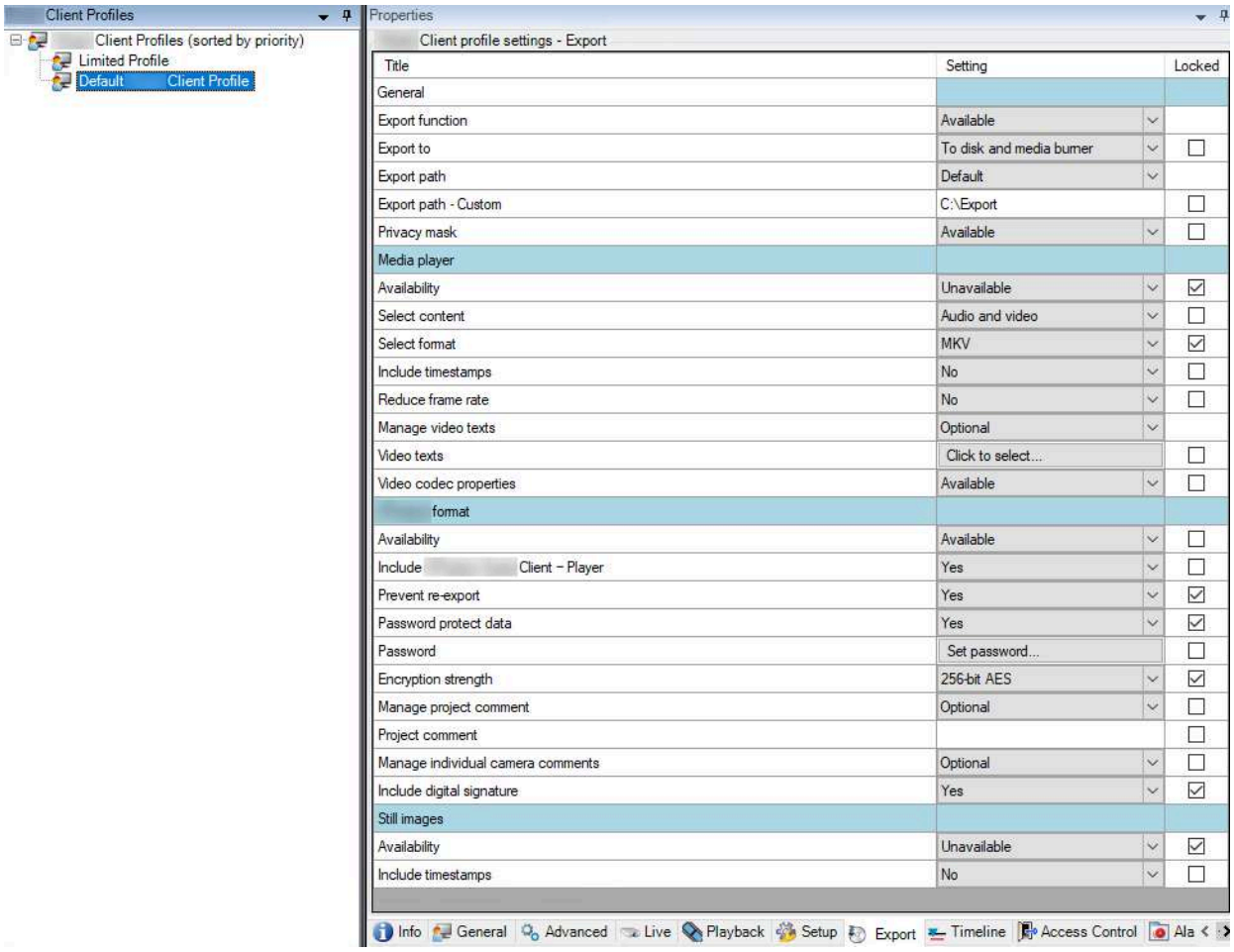
When you install your XProtect VMS system, the default export settings that define the export options in XProtect Smart Client are restricted to ensure the highest level of security. You can change these settings to give operators more options.

Default settings

- Only the XProtect format is available
  - Re-export is prevented
  - Exports are password-protected
  - 256-bit AES encryption
  - Digital signatures are added
- Not possible to export to MKV format or AVI format
- Not possible to export still images

Steps:

1. In XProtect Management Client, expand **Client** > **Smart Client Profiles**.
2. Select **Default Smart Client Profile**.
3. In the **Properties** pane, select the **Export** tab.



4. To make a restricted format available in XProtect Smart Client, find the setting and select **Available**.
5. To enable operators to change a setting in XProtect Smart Client, clear the **Locked** check box next to the relevant setting.
6. If relevant, change other settings.
7. (optional) Log in to XProtect Smart Client to verify that your settings have been applied.

Add and configure a Management Client profile

If you do not want to use the default profile, you can create a Management Client profile before you can configure it.

1. Right-click **Management Client Profiles**.
2. Select **Add Management Client Profile**.
3. In the **Add Management Client Profile** dialog box, enter a name and description of the new profile and click **OK**.
4. In the **Overview** pane, click the profile you created to configure it.
5. On the **Profile** tab, select or clear functionality from the Management Client profile.

Copy a Management Client profile

If you have a Management Client profile with settings that you would like to reuse, you can copy an already existing profile and make minor adjustments to the copy instead of creating a new profile from scratch.

1. Click **Management Client Profile**, right-click the profile in the **Overview** pane, select **Copy Management Client Profile**.
2. In the dialog box that appears, give the copied profile a new unique name and description. Click **OK**.
3. In the **Overview** pane, click the profile and go to the **Info** tab or **Profile** tab to configure the profile.

Manage the visibility of functionality for a Management Client profile

Associate Management Client profiles with roles to limit the user interface to represent the functionality available for each administrator role.

Associate a Management Client profile with a role

1. Expand the **Security** node and click **Roles**.
2. On the **Info** tab in the **Role Settings** window, associate a profile with a role. For more information, see Info tab (roles).

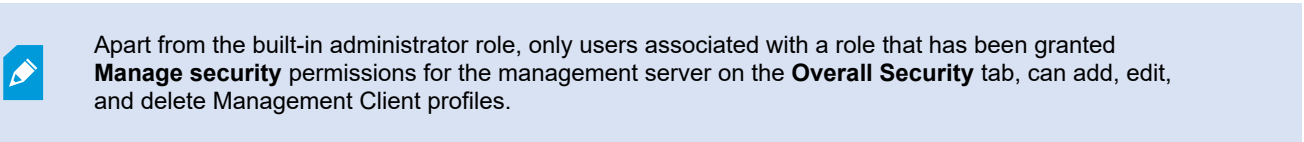
Manage the overall access to system functionality for a role

Management Client profiles only handle the visual representation of system functionality, not the actual access to it.

To manage the overall access to system functionality for a role:

1. Expand the **Security** node and click **Roles**.
2. Click the **Overall Security** tab and select the appropriate check boxes. For more information, see Overall Security tab (roles).

On the **Overall Security** tab, make sure to enable the **Connect** security permission in order to grant all roles access to the Management Server.



Apart from the built-in administrator role, only users associated with a role that has been granted **Manage security** permissions for the management server on the **Overall Security** tab, can add, edit, and delete Management Client profiles.

Limit visibility of functionality for a profile

You can change settings for the visibility of all Management Client elements. By default, the Management Client profile can see all functionality in the Management Client.

1. Expand the Client node and click Management Client Profiles.
2. Select a profile and click the Profile tab.
3. Clear the check boxes for the relevant functionality in order to remove the functionality visually from the Management Client for any Management Client user with a role associated with this Management Client profile.

Matrix and Matrix recipients (explained)

Matrix is a feature for distributing video remotely.

A Matrix recipient is a computer with XProtect Smart Client, that is defined as a Matrix recipient in Management Client.

If you use Matrix, you can push video from any camera on your system's network to any running Matrix recipient.

To see a list of Matrix recipients added in the Management Client, expand **Client** in the **Site Navigation** pane, then select **Matrix**. A list of Matrix configurations is displayed in the **Properties** pane.

In Management Client, you must add each Matrix recipient that you would like to receive Matrix-triggered video.

Define rules sending video to Matrix-recipients

To send video to Matrix-recipients you must include the Matrix recipient in a rule that triggers the video transmission to the related Matrix-recipient. To do so:

1. In the **Site Navigation** pane, expand **Rules and Events** > **Rules**. Right-click **Rules** to open the **Manage Rule** wizard. In the first step, select a rule type and in the second step, a condition.
2. In **Manage Rule**'s step 3 (**Step 3: Actions**) select the **Set Matrix to view <devices>** action.
3. Click the Matrix link in the initial rule description.
4. In the **Select Matrix Configuration** dialog box, select the relevant Matrix-recipient, and click **OK**.
5. Click the **devices** link in the initial rule description and select from which cameras you would like to send video to the Matrix-recipient, then click **OK** to confirm your selection.
6. Click **Finish** if the rule is complete or define if required additional actions and/or a stop action.

If you delete a Matrix-recipient, any rule that includes the Matrix-recipient stops working.

Add Matrix recipients

To add an existing Matrix recipient in Management Client:

1. Expand **Clients**, then select **Matrix**.
2. Right-click **Matrix Configurations** and select **Add Matrix**.
3. Fill out the fields in the **Add Matrix** dialog box.
    a. In the **Address** field enter the IP address or the host name of the required Matrix recipient.
    b. In the **Port** field enter the port number used by the Matrix recipient installation.
4. Click **OK**.

You can now use the Matrix recipient in rules.

Your system does not verify that the specified port number or password is correct or that the specified port number, password, or type corresponds with the actual Matrix recipient. Make sure that you enter the correct information.

Send the same video to several XProtect Smart Client views

You can send the same video to Matrix positions in several of the XProtect Smart Client views, provided the Matrix positions of the views share the same port number and password:

1. In XProtect Smart Client, create the relevant views and Matrix positions that share the same port number and password.
2. In the Management Client, add the relevant XProtect Smart Client as a Matrix-recipient.
3. You may include the Matrix-recipient in a rule.

Add rules

When you add rules, you are guided by the wizard **Manage Rule** which only lists relevant options.

It ensures that required elements are not missing from a rule. Based on your rule's content, it automatically suggests suitable stop actions, that is what should take place when the rule no longer applies, ensuring that you do not unintentionally create a never-ending rule.

Events

When you add an event-based rule, you can select different types of events.

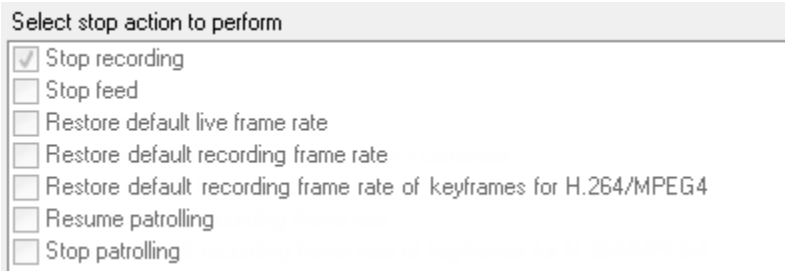
- See Events overview to get an overview and a description of the event types that you can select.

Actions and stop actions

When you add rules, you can select different actions.

Some of the actions require a stop action. For example, if you select the action **Start recording**, recording starts and potentially continues indefinitely. As a result, the action **Start recording** has a mandatory stop action called **Stop recording**.

The **Manage Rule** wizard makes sure you specify stop actions when necessary:



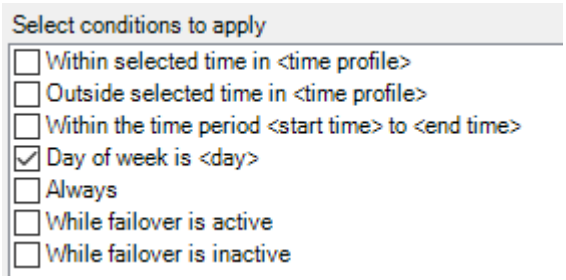
Selecting stop actions. In the example, note the mandatory stop action (selected, dimmed), the non-relevant stop actions (dimmed) and the optional stop actions (selectable).

- See Actions and stop actions for an overview of start and stop actions that you can select.

Create a rule

1. Right-click the **Rules** item > **Add Rule**. This opens the **Manage Rule** wizard. The wizard guides you through

specifying the content of your rule.
2. Specify a name and a description of the new rule in the **Name** and **Description** fields respectively.
3. Select the relevant type of condition for the rule: either a rule which performs one or more actions when a particular event occurs, or a rule which performs one or more actions when you enter a specific period of time.
4. Click **Next** to go to the wizard's second step. On the wizard's second step, define further conditions for the rule.
5. Select one or more conditions, for example **Day of week is <day>**:



Depending on your selections, edit the rule description in the lower part of the wizard window:

Click the underlined items in **bold italics** to specify their exact content. For example, clicking the **days** link in our example lets you select one or more days of the week on which the rule should apply.

6. Having specified your exact conditions, click **Next** to move to the next step of the wizard and select which actions the rule should cover. Depending on the content and complexity of your rule, you may need to define more steps, such as stop events and stop actions. For example, if a rule specifies that a device should perform a particular action during a time interval (for example, Thursday between 08.00 and 10.30), the wizard may ask you to specify what should happen when that time interval ends.
7. Your rule is by default active once you have created it if the rule's conditions are met. If you do not want the rule to be active straight away, clear the **Active** check box.
8. Click **Finish**.

Validate rules

You can validate the content of an individual rule or all rules in one go. When you create a rule, the **Manage Rule** wizard ensures that all of the rule's elements are valid.

When a rule has existed for some time, one or more of the rule's elements may have been affected by other configuration, and the rule may no longer work. For example, if a rule is triggered by a particular time profile, the rule does not work if you have deleted that time profile or if you no longer have permissions to it. Such unintended effects of configuration may be hard to keep an overview of.

Rule validation helps you keep track of which rules have been affected. Validation takes place on a per-rule basis and each rule is validated by themselves. You cannot validate rules against each other, for example in order to see whether one rule conflicts with another rule, not even if you use the **Validate All Rules** feature.

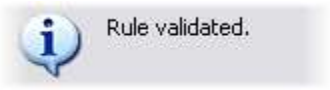
Validate a rule

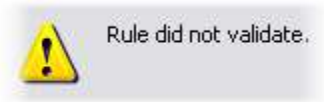
1. Click **Rules** and select the rule you want to validate.
2. Right-click the rule and click **Validate Rule.**
3. Click **OK**.

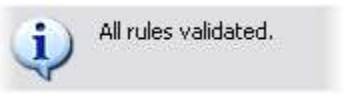
Validate all rules

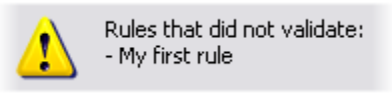
1. Right-click the **Rules** item and then click **Validate All Rules**. .
2. Click **OK**.

A dialog box informs you whether the rule(s) validated successfully or not. If you chose to validate more than one rule and one or more rules did not succeed, the dialog box lists the names of the affected rules.









You cannot validate whether configuration of requirements outside the rule itself may prevent the rule from working. For example, a rule specifying that recording should take place when motion is detected by a particular camera is validated if the elements in the rule itself are correct, even if motion detection, which is enabled on a camera level, not through rules, has not been enabled for the relevant camera.

Edit, copy and rename a rule

1. In the **Overview** pane, right-click the relevant rule.
2. Select either:

   Edit Rule or **Copy Rule** or **Rename Rule**. The wizard **Manage Rule** opens.

3. If you select **Copy Rule**, the wizard opens displaying a copy of the selected rule. Click **Finish** to create a copy.
4. If you select **Edit Rule**, the wizard opens and you can enter changes. Click **Finish** to accept the changes.
5. If you select **Rename Rule**, you can rename the rule name text directly.

Deactivate and activate a rule

Your system applies a rule as soon as the rule's conditions apply which means it is active. If you do not want a rule to be active, you can deactivate the rule. When you deactivate the rule, the system does not apply the rule even if the rule's conditions apply. You can easily activate a deactivated rule later.

Deactivating a rule

1. In the **Overview** pane, select the rule.
2. Clear the **Active** check box in the **Properties** pane.
3. Click **Save** in the toolbar.
4. An icon with a red x indicates that the rule is deactivated in the **Rules** list:

Activating a rule

When you want to activate the rule again, select the rule, select the **Activate** check box, and save the setting.

Specify a time profile

1. In the **Time Profiles** list, right-click **Time Profiles** > **Add Time Profile**. This opens the **Time Profile** window.
2. In the **Time Profile** window, enter a name for the new time profile in the **Name** field. Optionally, enter a description of the new time profile in the **Description** field.
3. In the **Time Profile** window's calendar, select either **Day View**, **Week View** or **Month View**, then right-click inside the calendar and select either **Add Single Time** or **Add Recurring Time**.
4. When you have specified the time periods for your time profile, click **OK** in the **Time Profile** window. Your system adds your new time profile to the **Time Profiles** list. If at a later stage you wish to edit or delete the time profile, you do that from the **Time Profiles** list as well.

Add a single time

When you select **Add Single Time**, the **Select Time** window appears:

Time and date format may be different on your system.

1. In the **Select Time** window, specify **Start time** and **End time**. If the time is to cover whole days, select the **All day event** box.
2. Click **OK**.

Add a recurring time

When you select **Add Recurring Time**, the **Select Recurring Time** window appears:

1. In the **Select Time** window, specify time range, recurrence pattern and range of recurrence.

2. Click **OK**.

A time profile can contain several periods of time. If you want your time profile to contain further periods of time, add more single times or recurring times.

Recurring time

When you set an action to be executed on a detailed, recurring schedule.

For example:

- Every week on Tuesday every 1 hour(s) between 15:00 and 15:30
- On day 15 every 3 month(s) at 11:45
- Every day every 1 hour(s) between 15:00 and 19:00

The time is based on the local time settings of the server on which Management Client is installed.

Edit a time profile

1. In the **Overview** pane's **Time Profiles** list, right-click the relevant time profile, and select **Edit Time Profile**. This opens the **Time Profile** window.
2. Edit the time profile as needed. If you have made changes to the time profile, click **OK** in the **Time Profile** window. You return to the **Time Profiles** list.

In the **Time Profile Information** window, you can edit the time profile as needed. Remember that a time profile may contain more than one time period, and that time periods may be recurring. The small month overview in the top right corner can help you get a quick overview of the time periods covered by the time profile, as dates containing specified times are highlighted in bold.

In this example, the bold dates indicate that you have specified time periods on several days, and that you have specified a recurring time on Mondays.

Create day length time profiles

1. Expand the **Rules and Events** folder > **Time Profiles**.
2. In the **Time Profiles** list, right-click **Time Profiles**, and select **Add Day Length Time Profile**.
3. In the **Day Length Time Profile** window, refer to the properties table below to fill in the needed information. To deal with transition periods between lightness and darkness, you can offset activation and deactivation of the profile. The time and the name of months are shown in the language used your computer's language/regional settings.
4. To see the location of the entered geographic coordinates in a map, click **Show Position in Browser**. This opens a browser where you can see the location.
5. Click **OK**.

Day length time profile properties

Name	Description
Name	The name of the profile.
Description	A description of the profile (optional).
Geo coordinates	Geographic coordinates indicating the physical location of the camera(s) assigned to the profile.
Sunrise offset	Number of minutes (+/-) by which activation of the profile is offset by sunrise.
Sunset offset	Number of minutes (+/-) by which deactivation of the profile is offset by sunset.
Time zone	Time zone indicating the physical location of the camera(s).

Add notification profiles

Before you can create notification profiles, you must specify mail server settings for email notifications. For more information, see Requirements for creating notification profiles.

1. Expand **Rules and Events**, right-click **Notification Profiles** > **Add Notification Profile**. This opens the **Add Notification Profile** wizard.
2. Specify name and description. Click **Next**.
3. Specify recipient, subject, message text and time between emails.
4. To send a test email notification to the specified recipients, click **Test E-mail**.
5. To include pre-alarm still images, select **Include images**, and specify number of images, time between images and whether to embed images in emails or not.
6. To include AVI video clips, select **Include AVI**, and specify the time before and after event and frame rate.

   Notifications containing H.265 encoded video require a computer that supports hardware acceleration.

7. Click **Finish**.

Trigger email notifications from rules

1. Right-click the **Rules** item, and then click > **Add Rule** or **Edit rule**.
2. In the **Manage Rule** wizard, click **Next** to go to the **Select actions to perform** list and select **Send notification to <profile>**.
3. Select the relevant notification profile and select the cameras that recordings to include in the notification profile's email notifications should come from.

You cannot include recordings in the notification profile's email notifications unless something is actually being recorded. If you want still images or AVI video clips in the email notifications, verify that the rule specifies that recording should take place. The following example is from a rule which includes both a **Start recording** action and a **Send notification to** action:

Add a user-defined event

No matter how you want to use user-defined events, you must add each user-defined event through the Management Client.

1. Expand **Rules and Events** > **User-defined Events**.
2. In the **Overview** pane, right-click **Events** > **Add User-defined Event**.
3. Enter a name for the new user-defined event, and click **OK**. The newly added user-defined event now appears in the list in the **Overview** pane.

The user can now trigger the user-defined event manually in XProtect Smart Client if the user has permissions to do so.

If you delete a user-defined event, this affects any rules in which the user-defined event is in use. Also, a deleted user-defined event only disappears from XProtect Smart Client when the XProtect Smart Client users log out.

Rename a user defined event

If you rename a user-defined event, already connected XProtect Smart Client users must log out and log in again before the name change is visible.

1. Expand **Rules and Events** > **User-defined Events**.
2. In the **Overview** pane, select the user-defined event.
3. In the **Properties** pane, overwrite the existing name.
4. In the toolbar, click **Save**.

Add and edit an analytics event

Add an analytics event

1. Expand **Rules and Events**, right-click **Analytics Events** and select **Add New**.
2. In the **Properties** window, enter a name for the event in the **Name** field.
3. Enter a description text in the **Description** field if needed.
4. In the toolbar, click **Save**. You can test the validity of the event by clicking **Test Event**. You can continually correct errors indicated in the test and run the test as many times as you want and from anywhere in the process.

Edit an analytics event

1. Click an existing analytics event to view the **Properties** window, where you can edit relevant fields.
2. You can test the validity of the event by clicking **Test Event**. You can continually correct errors indicated in the test and run the test as many times as you want and from anywhere in the process.

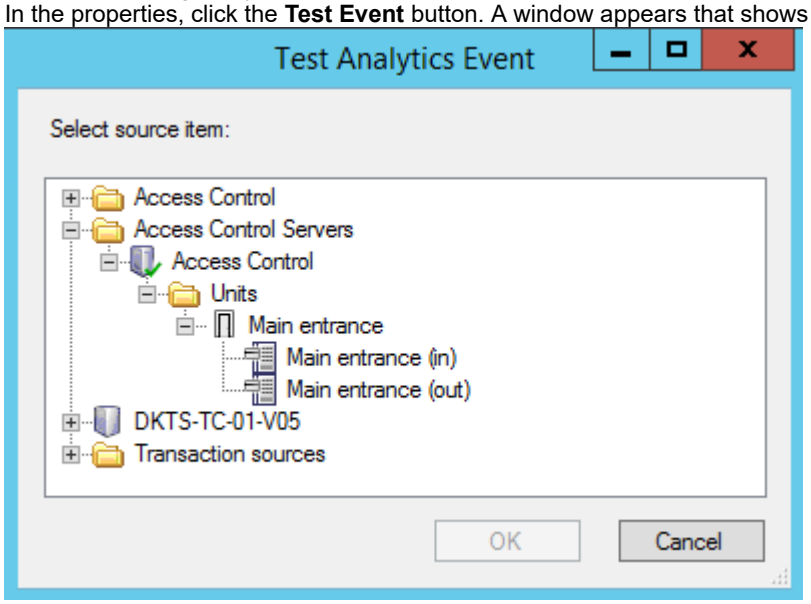
Edit analytics events settings

In the toolbar, go to the **Tools** > **Options** > **Analytics Events** tab to edit relevant settings.

Test an analytics event

After you create an analytics event, you can test the requirements (see Add and edit an analytics event), for example that the analytics events feature has been enabled in Management Client.

1. Select an existing analytics event.
2. In the properties, click the **Test Event** button. A window appears that shows all the possible sources of events.



3. Select the source of your test event, for example a camera. The window is closed and a new window appears that goes through four conditions that must be fulfilled for the analytics event to work.

As an additional test, in XProtect Smart Client you can verify that the analytics event was sent to the event server. To do this, open XProtect Smart Client and view the event in the **Alarm Manager** tab.

Add a generic event

You can define generic events to help the VMS recognize specific strings in TCP or UDP packets from an external system. Based on a generic event, you can configure Management Client to trigger actions, for example to start recording, or alarms.

Requirements
You have enabled generic events and specified the source destinations allowed. For more information, see Generic Events tab (options).

To add a generic event:

1. Expand **Rules and Events**.

2. Right-click **Generic Events** and select **Add New**.
3. Fill in the needed information and properties. For more information, see Generic Events and Data sources (properties).
4. (optional) To validate that the search expression is valid, enter a search string in the **Check if expression matches event string** field that corresponds to the expected packages:
   - **Match** - the string can be validated against the search expression
   - **No match** - the search expression is invalid. Change it and try again

In XProtect Smart Client, you can verify whether your generic events have been received by the event server. You do this in the **Alarm List** on the **Alarm Manager** tab by selecting **Events**.

Register claims from an external IDP

1. In Management Client, select **Tools** > **Options** and open the **External IDP** tab.
2. In the **External IDP** section, select **Add**.
3. In the **Registered claims** section, select **Add**.
4. Enter the information about the claim. For more information, see Register claims.

Automatic user provisioning with an external IDP

XProtect supports identity synchronization between your identity provider and the VMS through System for Cross-site Identity Management (SCIM).

SCIM enables automatic user provisioning when accessing the VMS with an external IDP. Any changes to user permissions are instantly reflected in the VMS without requiring a new login.

To apply SCIM-enabled user provisioning with an external IDP, the identity provider on your system must be configured as an external IDP. For more information, see Add and configure an external IDP.

SCIM exchange and user identity

During SCIM exchange, the users configured in your external IDP are matched with the users of XProtect. The ID property of the user identity is used as the primary identifier. By default, the property has the value of a sub claim, but this can vary depending on the identity provider. A mismatch can result in the user being provisioned twice in the log-in process.

The sub claim is not the same as the claim used as the source of user names created during the configuration of the external IDP.

For more information about how to configure the primary identifier, see SCIM introduction.

Configuration of an Identity Provider (IDP) for SCIM

In general, to configure your Identity Provider (IDP) for SCIM, you configure a client with the SCIM permissions and associate it with an external provider.

If your external IDP is deployed on your local network, you use the URL of the VMS IDP in the external IDP's SCIM configuration to create the association.

If your external IDP is on a network that cannot communicate directly with the network where your VMS is deployed, you can use the URL provided by a communication tunneling tool as an entry point to your VMS' IDP.

Contents of user names

To ensure the correct operation of SCIM's synchronization procedure between your external IDP and the VMS, the names of

provisioned identities must comply with naming conventions in XProtect, and they cannot contain any of the following characters: ?, \, /, [,].

Delete users

To manage user deletions in a way that aligns with their specific policies and requirements, some identity providers may prefer not to delete users permanently from the system. Instead, the users can be disabled which means that they are treated as if they no longer exist.

If a permanent deletion is required in those cases, an XProtect administrator can enable a setting that permanently deletes the users from the VMS after a specified number of days (the default is 30). The setting is enabled, and the time frame can be set through an API. For the steps required to follow, see SCIM introduction.

Map claims from an external IDP to roles in XProtect

On the external IDP site, the administrator must create claims consisting of a name and a value. Subsequently, the claim is mapped to a role in the VMS, and the user's privileges will be determined by the role.

Claims that you want to use on roles must be added to the IDP configuration before they can be selected in the roles. The claims can be added on the **External IDP** tab in the **Options** dialog box. External IDP tab (options). If a claim is not added to the IDP configuration, you will not be able select the claim in the roles.

When using claims to link external IDP users to VMS roles, the external IDP users are actually not added to the roles like regular basic or AD users. Instead they are linked dynamically with each new session based on their current claims.

1. From the **Site Navigation** pane in Management Client, expand the **Security** node and select **Roles**.
2. Select a role, select the **External IDP** tab, and select **Add**.
3. Select an external IDP and a claim name and enter a claim value.

   The claim name must be written exactly as the claim name coming from the external IDP.

4. Select **OK**.

If an external IDP is deleted, all users connected to the VMS via the external IDP are also deleted. All registered claims that are connected to the external IDP are removed and any mappings to roles are removed as well.

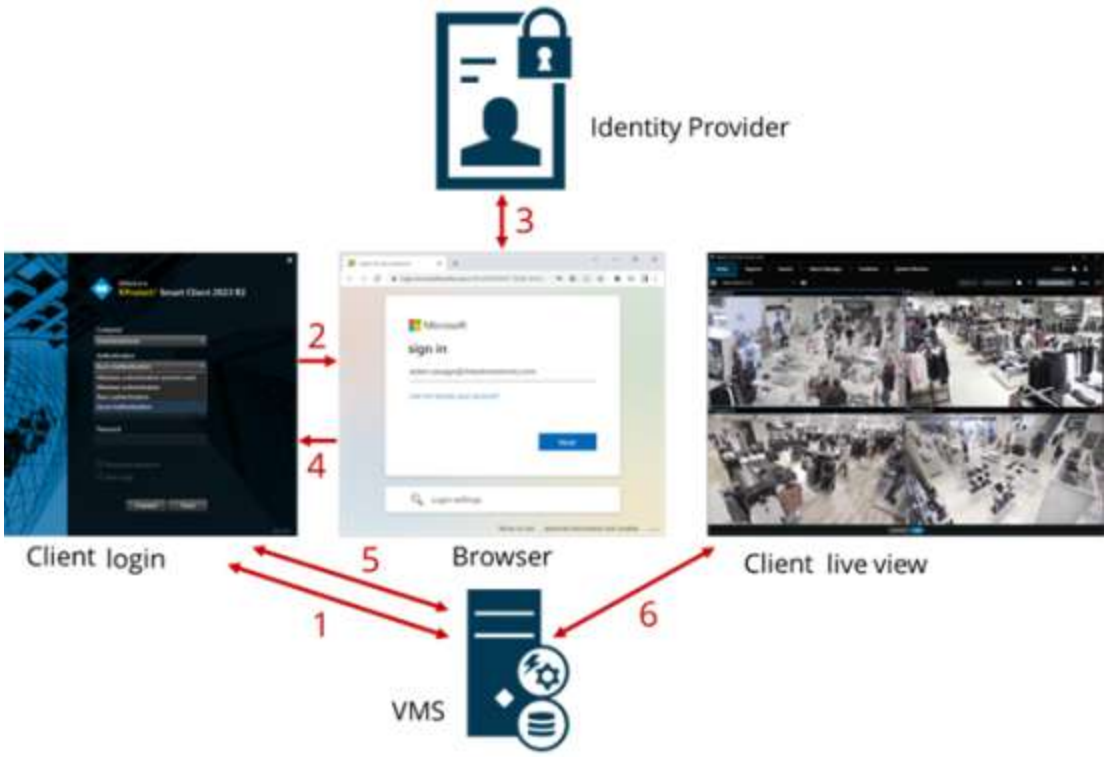
Under **Effective Roles**, you can get an overview of the dynamic role of external IDP users. That is the role membership which is based on the external IDP user's last login session. For more information, see View effective roles.

Log in via an external IDP

You can log in to XProtect Smart Client, XProtect Management Client, XProtect Web Client, and XProtect Mobile client using an external IDP.

External IDP authentication

The following illustration provides an overview of the external IDP authentication flow. The flow uses Microsoft Entra ID (Azure) to illustrate the authentication process.



1. In the **Computer** field in XProtect Smart Client or XProtect Management Client, enter the address of the XProtect VMS computer and select the external IDP under **Authentication**. The **User name** and **Password** fields are disabled.
2. Click **Connect** to open the external IDP's authentication page from a browser.
3. On the authentication page, enter your email address and clicks **Next**.
4. Enter your password, and click the sign-in button.
5. When you get a confirmation that the user authentication is successful, you can close the browser . The VMS client continues the regular login process and when finished, the client is shown and you are logged in.

For more information about logging into XProtect Web Client, see Logging in and about logging into XProtect Mobile, see Log in to the XProtect Mobile app.

Under **Tools** > **Options** > **External IDP**, you can configure the name of the external IDP that is shown on the **Authentication** list.

If the external IDP is disabled by, for example, a restore or a change of password, the option to log in via an external IDP is not available on the **Authentication** list. Also, if the external IDP is disabled, the client secret received from the external IDP disappears from the **Client secret** field on the **External IDP** tab under **Tools** > **Options**.

Add and manage a role

1. Expand **Security** and right-click **Roles**.
2. Select **Add Role**. This opens the **Add Role** dialog box.
3. Enter a name and description of the new role and click **OK**.
4. The new role is added to the **Roles** list. By default, a new role does not have any users/groups associated with it, but it does have a number of default profiles associated.

5. To choose different Smart Client and Management Client profiles, evidence lock profiles or time profiles, click the drop-down lists.
6. You can now assign users/groups to the role, and specify which of the system's features they can access.

For more information, see Assign/remove users and groups to/from roles and Roles (Security node).

Copy, rename or delete a role

Copy a role

If you have a role with complicated settings and/or permissions and need a similar or almost similar role, it might be easier to copy the already existing role and make minor adjustments to the copy than to creating a new role from scratch.

1. Expand **Security**, click **Roles**, right-click the relevant role and select **Copy Role**.
2. In the dialog box that opens, give the copied role a new unique name and description.
3. Click **OK**.

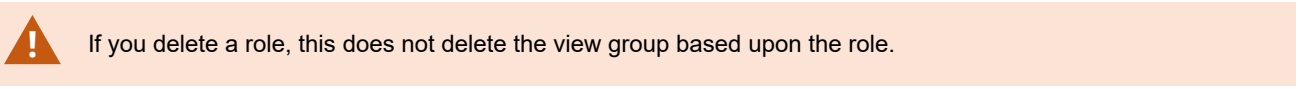
Rename a role

If you rename a role, this does not change the name of the view group based upon the role.

1. Expand **Security**, and right-click **Roles**.
2. Right-click required role and select **Rename Role**.
3. In the dialog box that opens, change the name of the role.
4. Click **OK**.

Delete a role

1. Expand **Security**, and click **Roles**.
2. Right-click the unwanted role and select **Delete Role**.
3. Click **Yes**.



View effective roles

With the Effective Roles feature, you can view all roles of a selected user or group. This is practical if you are using groups and it is the only way of viewing which roles a specific user is a member of.

1. Open the **Effective Roles** window by expanding **Security**, then right-clicking **Roles** and select **Effective Roles**.
2. If you want information about a basic user, enter the name in the **User name** field. Click **Refresh** to display the roles of the user.
3. If you use Windows users or groups in Active Directory, click the **"..."** browse button. Select object type, enter the name, and click **OK**. The user's roles appear automatically.

Assign/remove users and groups to/from roles

To assign or remove Windows users or groups or basic users to/from a role:

1. Expand **Security** and select **Roles**. Then select the required role in the **Overview** pane:
2. In the **Properties** pane, select the **Users and Groups** tab at the bottom.
3. Click **Add**, select between **Windows user** or **Basic user**.

Assign Windows users and groups to a role

1. Select **Windows user**. This opens the **Select Users**, **Computers and Groups** dialog box:
2. Verify that the required object type is specified. If, for example, you need to add a computer, click **Object Types** and mark **Computer**. Also verify that the required domain is specified in the **From this location** field. If not, click **Locations** to browse for the required domain.
3. In the **Enter the object names to select** box, enter the relevant user names, initials, or other types of identifier which Active Directory can recognize. Use the **Check Names** feature to verify that Active Directory recognizes the names or initials that you have entered. Alternatively, use the **"Advanced..."** function to search for users or groups.
4. Click **OK**. The selected users/groups are now added to the **Users and Groups** tab's list of users who you have assigned the selected role. You can add more users and groups by entering multiple names separated by a semicolon (;).

Assign basic users to a role

1. Select **Basic User**. This opens the **Select Basic Users to add to Role** dialog box:
2. Select the basic user(s) that you want to assign to this role.
3. Optional: Click **New** to create a new basic user.
4. Click **OK**. The selected basic user(s) are now added to the **Users and Groups** tab's list of basic users who you have assigned the selected role.

Remove users and groups from a role

1. On the **Users and Groups** tab, select the user or group you want to remove and click **Remove** in the lower part of the tab. You can select more than one user or group, or a combination of groups and individual users, if you need to.
2. Confirm that you want to remove the selected user(s) or and group(s). Click **Yes**.

A user may also have roles through group memberships. When that is the case, you cannot remove the individual user from the role. Group members may also hold roles as individuals. To find out which roles users, groups, or individual group members have, use the **View Effective Roles** function.

Create basic users

There are two user account types in Milestone XProtect VMS: Basic users and Windows users.

Basic users are user accounts that you create in Milestone XProtect VMS. It is a dedicated system user account with a basic user name and password authentication for the individual user.

Windows users are user accounts that you add through Microsoft's Active Directory.

There are some differences between basic users and Windows users:

- Basic users are authenticated by a user name and password combination and are specific to one system/site. Note that even if a basic user created at one federated site has the same name and password as a basic user on another federate site, the basic user only has access to the site it has been created on.
- Windows users are authenticated based on their Windows login and are specific to a machine.

Configure login settings for basic users

You can define the login settings for basic users in a JSON file, which is located here: `\\Program Files\Milestone\Management Server\IIS\IDP\appsettings.json`.

In that file, you can set the following parameters:

LoginSettings

"ExpireTimeInMinutes": 5	Define the length of time (in minutes) a login session will expire if the user takes no action.
LockoutSettings	
"LockoutTimeSpanInMinutes": 5	Define the length of time (in minutes) a user will be locked out.
"MaxFailedAccessAttempts": 5	Define the number of attempts a user will have to log in before being locked out.
PasswordSettings	
"RequireDigit": true	Define whether base digits (0 through 9) are required in the password.
"RequireLowercase": true	Define whether lowercase characters are required in the password.
"RequireNonAlphanumeric": true	Define whether special characters (~!@#$%^&*_-+=`|\(){}[]:;"'<>,.?/) are required in the password.
"RequireUppercase": true	Define whether uppercase characters are required in the password.
"RequiredLength": 8	Define the number of characters that are required in the password. There is a minimum password length of {0} characters and a maximum password length of 255 characters.
"RequiredUniqueChars": 1	Define the minimum number of unique characters that are required in a password. For example, if you set required unique characters to 2, then passwords such as – aaaaaa, aa, a, b, bb, bbbbbbb – will be rejected. Whereas – abab, abc, aaab, and so forth – will be accepted because there are at least two unique characters in the password. Increasing the number of unique characters in a password increases password strength by avoiding repetitive sequences that are easily guessed.

To create a basic user on your system:

1. https://milestonesys365-my.sharepoint.com/:w:/g/personal/dsar_milestone_dk/EUSitkUD9ZlNvuf12BjvQJcB-w4CXj21p__PhLsvC3HR0g?e=HaGTfiExpand **Security** > **Basic Users**.
2. In the **Basic Users** pane, right-click and select **Create Basic User**.
3. Specify a user name and a password. Repeat the password to be sure you have specified it correctly.

   The password must meet the complexity as defined in the **appsettings.json** file (see Configure login settings for basic users).

4. Specify if the basic user should change password on next login. Milestone recommends that you select the check box so that basic users can specify their own passwords when they log in for the first time.

   You should only clear the check box when you create basic users that cannot change their password. Such basic users are, for example, system users, that are used for plug-ins and server services authentication.

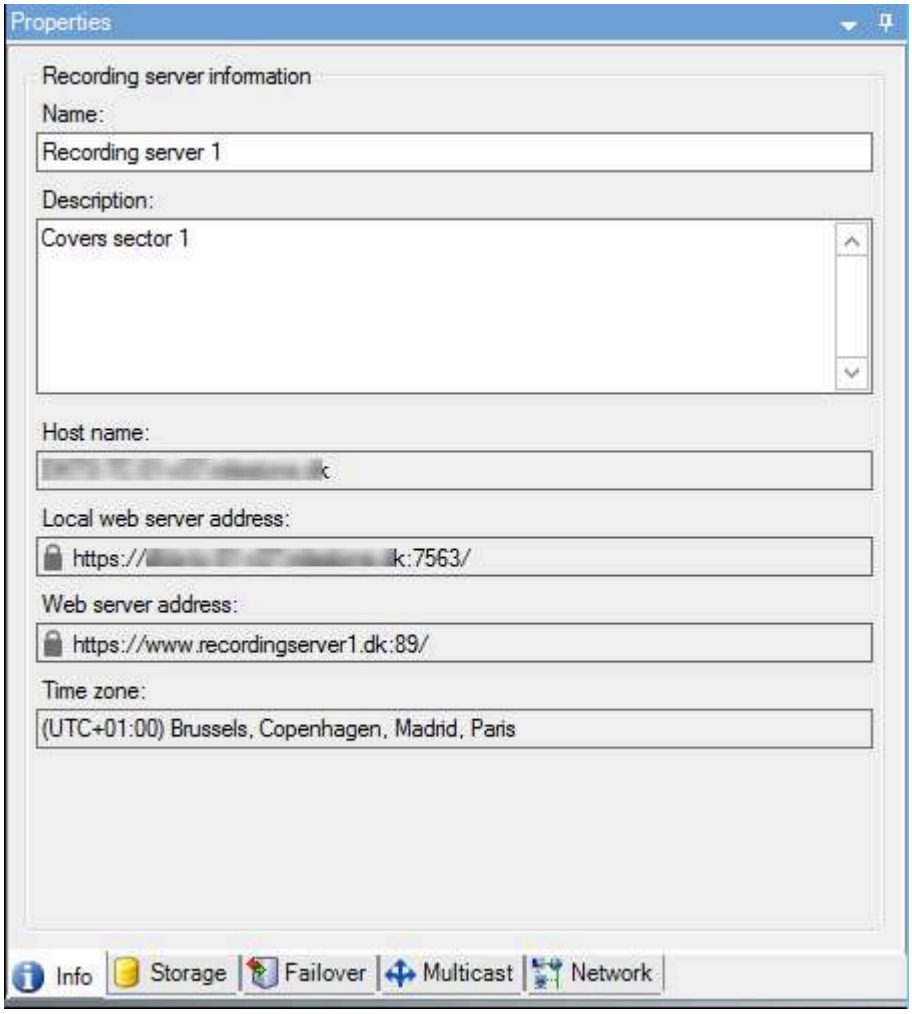
5. Specify the status of the basic user to be **Enabled** or **Locked out**.
6. Click **OK** to create the basic user.

View encryption status to clients

To verify if your recording server encrypt connections:

1. Open the Management Client.
2. In the **Site Navigation** pane, select **Servers** > **Recording Servers**. This opens a list of recording servers.
3. In the **Overview** pane, select the relevant recording server and go to the **Info** tab.
   If encryption is enabled to clients and servers that retrieve data streams from the recording server, a padlock icon

appears in front of the local web server address and the optional web server address.



View currently ongoing tasks on recording servers

The **Current Tasks** window shows an overview of ongoing tasks under a selected recording server. If you have initiated a task that takes a long time and runs in the background, you can open the **Current Tasks** window to see how the task progresses. A few examples of lengthy user-initiated tasks are firmware updates and movement of hardware. You can see information about the task's start-time, estimated end-time, and progress.

If the task is not progressing as expected, you can probably find the cause in your hardware or network. A few examples are server not running, server error, too little bandwidth, or connection loss.

1. In the **Site Navigation** pane, select the **System Dashboard** > **Current Tasks**.
2. Select a recording server to see its current tasks.

The information shown in the **Current Tasks** window is not dynamically updated but is a snapshot of the current tasks from the moment you opened the window. If you have had the window open for some time, refresh the information by selecting the **Refresh** button in the lower right corner of the window.

System monitor (explained)

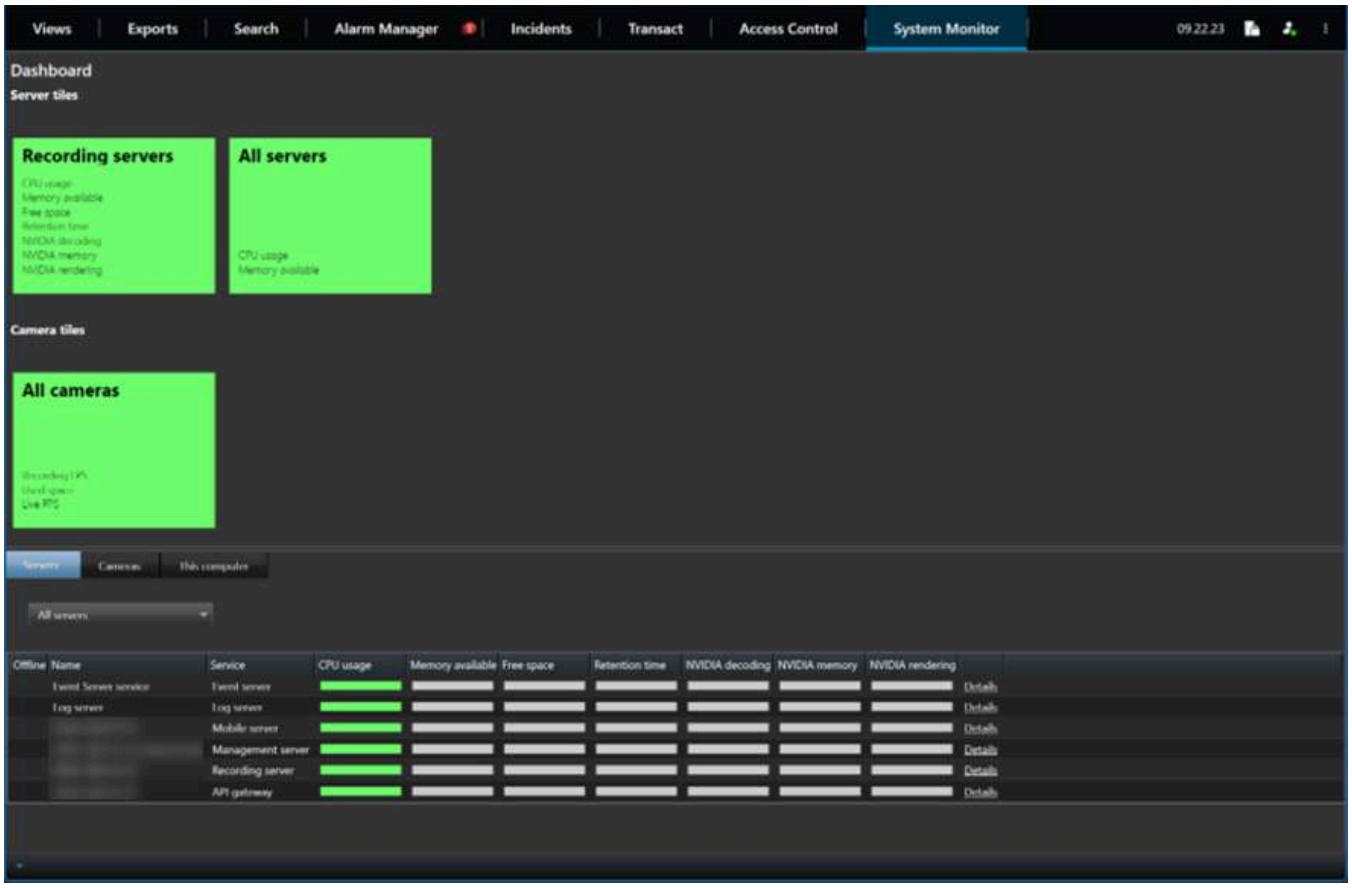
The system monitor functionality requires that the Data Collector service is running and only works on computers that use a Gregorian (Western) calendar.

System monitor dashboard (explained)

On the **System monitor dashboard**, you can easily get an overview of your VMS system's well-being. The state of your hardware is visually represented by tiles and their colors: green (running), yellow (warning), and red (critical). The tiles can also have error or warning icons when one or more hardware pieces in a faulty state.

By default, the system displays tiles that represent all **Recording servers**, **All servers**, and **All cameras**. You can customize the monitoring parameters of these default tiles and create new tiles. For example, you can set up tiles to represent a single server, a single camera, a group of cameras, or a server group.

Monitoring parameters are, for example, CPU usage or memory available for a server. A tile monitors only the monitoring parameters you have added to the tile. See Add a new camera or server tile on the System monitor dashboard, Edit a camera or server tile on the System monitor dashboard, and Delete a camera or server tile on the System monitor dashboard for more information.



System monitor thresholds (explained)

System monitor thresholds allow you to define and adjust the thresholds when tiles on the **System monitor dashboard** should visually indicate that your system hardware changes state. For example, when the CPU usage of a server changes from a normal state (green) state to a warning state (yellow) or from a warning state (yellow) to a critical state (red).

The system has default threshold values for all hardware of the same type so that you can start monitoring the state of your system hardware from the moment your system is installed and you have added hardware. You can also set up threshold values for individual servers, cameras, disks, and storage. To change threshold values, see Edit thresholds for when hardware states should change.

To ensure that you do not see a **Critical** or **Warning** state in cases where the usage of or the load on your system hardware reaches a high threshold value only for a second or similar, use **Calculation interval**. With the correct calculation interval setting, you will not receive false-positive alerts about exceeded thresholds but only alerts about sustained issues with, for example, CPU usage or memory consumption.

You can also set up rules (see Rules (explained)) to perform specific actions or activate alarms when a threshold changes from one state to another.

View the current state of your hardware and troubleshoot if needed

On the **System monitor dashboard**, you can easily get an overview of your VMS system's well-being. The state of your hardware is visually represented by tiles and their colors: green (running), yellow (warning), and red (critical). The tiles can also have error or warning icons when one or more hardware pieces in a faulty state.

You can edit the thresholds for when your hardware is in one of the three states. For more information, see Edit thresholds for when hardware states should change.

The **System monitor dashboard** answers questions like: Are all server services and cameras running? Are the CPU usage and available memory on the different servers sufficient so everything is recorded and available for viewing?

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. If all tiles are green and without warning or error icons, all monitoring parameters and all servers and cameras represented by the tiles are fine and running.
   If one or more tiles have a warning or error icon or are completely yellow or red, select one of these tiles to troubleshoot.
3. In the hardware list with monitoring parameters (bottom of the window), find the hardware that is not running. Place your mouse over the red cross sign next to the hardware to read what the problem is.
4. Optionally, select **Details** to the right side of the hardware to see how long the problem has been there. Enable the collections of historical data to see the state of your hardware over time. For more information, see Collect historical data of hardware states.
5. Find a way to fix the problem. For example, computer restart, server service restart, replacement of a faulty hardware piece or other.

View the historical state of your hardware and print a report

With the **System Monitor** feature, you can easily get an overview of the well-being of your VMS system. Also, over a longer period.

Are there periods where the CPU usage, bandwidth, or other hardware are challenged? Find the answer to this with the System Monitor functionality and decide if you need to upgrade your hardware or buy new to avoid it in the future.

Remember to enable the collection of historical data. See Collect historical data of hardware states.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. In the **System Monitor** window, select a tile with the hardware you want to know the historical well-being of, or from the lower part of the window, select a server or camera.
3. Select **Details** to the right side of the relevant server or camera.

4. For servers, select **History** to the right of the hardware that you want to investigate. For cameras, select the link.
5. If you want to print a report, select the PDF icon.

You can only create historical reports with data from the recording server where the device is currently located.

If you access the system monitor's details from a server operating system, you may experience a message regarding **Internet Explorer Enhanced Security Configuration**. Follow the instructions to add the **System Monitor** page to the **Trusted sites zone** before proceeding.

Collect historical data of hardware states

You can enable the collection of historical data on the system's hardware to see graphs of the states of your hardware over time and print a report. For more information, see View the historical state of your hardware and print a report.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. In the **System Monitor** window, select **Customize**.
3. In the **Customize dashboard** window that opens, select **Collect historical data**.
4. Select a sampling interval. The shorter the interval, the more load on the SQL Server database, bandwidth, or other hardware. The sampling interval of historical data also determines how detailed the graphs are.

Add a new camera or server tile on the System monitor dashboard

If you want to monitor your cameras or servers in smaller groups after their physical location, or if you want to monitor some hardware with different monitoring parameters, you can add additional tiles to the **System Monitor** window.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. In the **System Monitor** window, select **Customize**.
3. In the **Customize dashboard** window that opens, select **New** under **Server tiles** or **Camera tiles**.
4. In the **New server tile/New camera tile** window, select the cameras or servers to monitor.
5. Under **Monitoring parameters**, select or clear check boxes for any parameters to add or remove from the tile.
6. Select **OK**. The new server or camera tile is now added to the tiles displayed on your dashboard.

Edit a camera or server tile on the System monitor dashboard

If you want to monitor your cameras or servers with other monitoring parameters, you can adjust them.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. In the **System Monitor** window, select **Customize**.
3. In the **Customize dashboard** window that opens, select the tile you want to change under **Server tiles** or **Camera tiles** and select **Edit**.
4. In the **Edit dashboard server/camera tile** window, select all cameras or servers, a camera or server group, or individual cameras or servers to change their monitoring parameters.
5. Under **Monitoring parameters**, select the monitoring parameters you want to monitor.
6. Select **OK**.

Delete a camera or server tile on the System monitor dashboard

If you no longer need to monitor the hardware represented by a tile, you can delete the tile.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor**.
2. In the **System Monitor** window, select **Customize**.
3. In the **Customize dashboard** window that opens, select the tile you want to change under **Server tiles** or **Camera tiles**.
4. Select **Delete**.

Edit thresholds for when hardware states should change

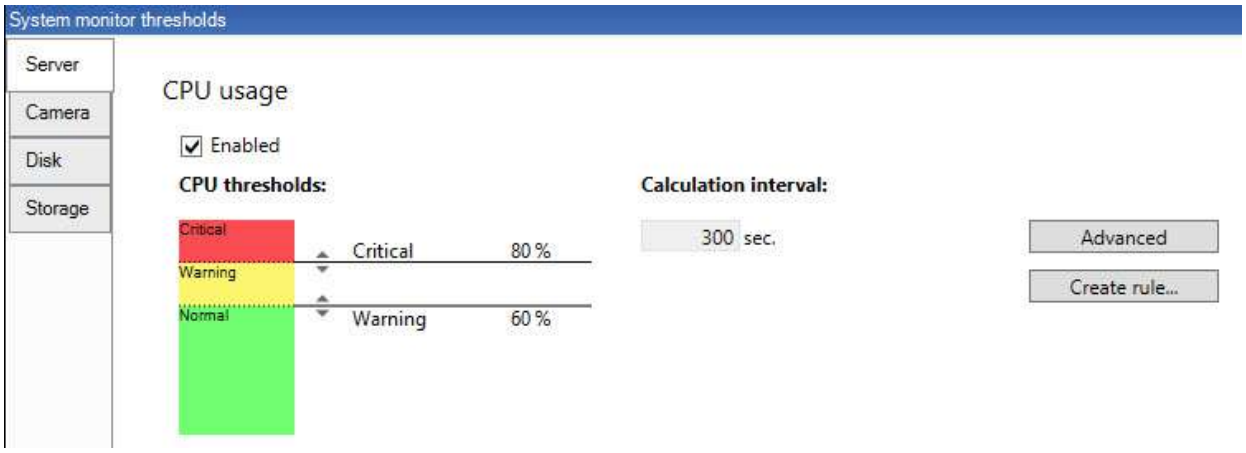
You can edit the thresholds for when your hardware change between the three states on the **System monitor dashboard**. For more information, see System monitor thresholds (explained).

You can change thresholds for different types of hardware. For more information, see System Monitor Thresholds (System Dashboard node).

As a default, the system is set up to show threshold values for all units of the same hardware type, for example, all cameras or servers. You can change these default threshold values.

You can also set up threshold values for individual servers or cameras or a subset of these to allow, for example, that some cameras use a higher **Live FPS** or **Recording FPS** than other cameras.

1. In the **Site Navigation** pane, select **System Dashboard** > **System Monitor Thresholds**.
2. Select the **Enabled** check box for the relevant hardware if you have not already enabled it. The figure below shows an example.



3. Drag the threshold control slider up or down to increase or decrease the threshold value. There are two sliders available for each hardware piece shown in the threshold control, separating the **Normal**, **Warning**, and **Critical** states.
4. Enter a value for the calculation interval or keep the default value.
5. If you want to set values on individual pieces of hardware, select **Advanced**.
6. If you want to specify rules for certain events or within specific time intervals, select **Create rule**.
7. Once you have set the thresholds levels and calculation intervals, select **File** > **Save** from the menu.

View evidence locks in the system

Evidence Lock under the **System Dashboard** node shows an overview of all protected data on the current surveillance system.

Find an evidence lock by filtering after, for example, who created it or when.

1. In the **Site Navigation** pane, select **System Dashboard** > **Evidence Lock**.

2. Get an overview and find the relevant evidence locks. You can filter after and sort the different metadata related to the evidence locks.

All information shown in the **Evidence Lock** window is snapshots. Press F5 to refresh.

Print a report with your system configuration

You make many choices when you install and configure your VMS system, and you may need to document these. Over time it is also hard to remember all the settings you have changed since the installation and initial configuration - or just during the last couple of months. That is why it is possible to print a report with all your configuration choices.

When you create a configuration report (PDF format), you can add any possible elements of your system to the report. You can, for example, include licenses, device configuration, alarm configuration, and much more. You can select the **Exclude sensitive data** option to create a GDPR compliant report (enabled by default). You can also customize the font, the page setup, and the front page.

1. Expand **System Dashboard** and select **Configuration Reports**.
2. Select the elements that you want to include or exclude in your report.
3. **Optional**: If you have selected to include a frontpage, select **Front Page** to customize the information on your front page. In the window that appears, fill in the needed info.
4. Select **Formatting** to customize your font, page size, and margins. In the window that appears, select the wanted settings.
5. When you are ready to export, select **Export** and select a name and save location for your report.

Only users with administrator permissions in the VMS system can create configuration reports.

Show or hide metadata search categories and search filters

Users of XProtect Management Client with administrator permissions can show or hide the default Milestone metadata search categories and search filters in XProtect Smart Client. By default, these search categories and search filters are hidden. Showing them is useful if your video surveillance system meets the requirements (see Metadata search requirements).

This setting affects all XProtect Smart Client users.

This setting does not affect the visibility of:

- Other, non-metadata Milestone search categories and search filters, for example **Motion**, **Bookmarks**, **Alarms**, and **Events**
- Third-party search categories and search filters

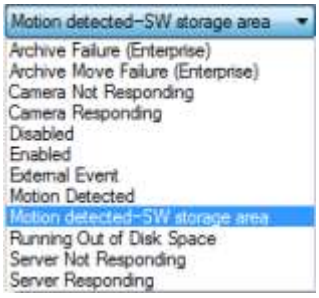
1. In XProtect Management Client, in the **Site Navigation** pane, select **Metadata Use** > **Metadata Search**.
2. In the **Metadata Search** pane, select the search category that you want to change visibility settings for.
3. To enable the visibility of a search category or search filter, select the corresponding check box. To disable the visibility of a search category or search filter, clear the check box.

Add an alarm

To define an alarm, you need to create an alarm definition, where you specify, for example, what triggers the alarm, instructions on what the operator needs to do, and what or when the alarm stops. For detailed information about the settings, see Alarm Definitions (Alarms node).

1. In the **Site Navigation** pane, expand **Alarms**, and right-click **Alarm Definitions**.
2. Select **Add New**.
3. Fill in these properties:
    - **Name**: Enter a name for the alarm definition. The name of the alarm definition appears whenever the alarm definition is listed.

- **Instructions**: You can write instructions for the operator who receives the alarm.
- **Triggering event**: Use the drop-down menus to select an event type and an event message to be used when the alarm is triggered.



A list of selectable triggering events. The one highlighted is created and customized using analytics events.

- **Sources**: Select the cameras or other devices that the event should originate from to trigger the alarm. Your options depend on the type of event you have selected.
- **Time profile**: If you want the alarm to be activated during a specific time interval, select the radio button and then a time profile in the drop-down menu.
- **Event based**: If you want the alarm definition to be activated by an event, select the radio button and specify the event that will activate the alarm definition. You must also specify an event that will deactivate the alarm definition.

4. In the **Time limit** drop-down menu, specify a time limit for when action is required by the operator.
5. In the **Events triggered** drop-down menu, specify which event to trigger when the time limit has passed.
6. Specify additional settings, for example related cameras and initial alarm owner.

Modify the permissions for individual alarm definitions

If you want only specific users to view and manage an alarm, you can modify the permissions for the alarm definition from XProtect Management Client. This way, you can ensure that:

- The users receive only the alarms that are relevant to them.
- No unauthorized users can react to alarms.

Use roles to group users that should have the same permissions for all alarm definitions.

To modify the permissions for an alarm definition:

1. In the **Site Navigation** pane, expand **Security**, and select the role you want to modify the permissions for.
2. Go to the **Alarms** tab and expand **Alarm Definitions** to see the list of the alarms you have defined.
3. Select an alarm definition to modify the permissions.

Enable encryption to and from the management server

You can encrypt the two-way connection between the management server and the Data Collector affiliated when you have a remote server of the following type:

- Recording Server
- Event Server
- Log Server
- LPR Server
- Mobile Server

If your system contains multiple recording servers or remote servers, you must enable encryption on all of them.

When you configure encryption for a server group, it must either be enabled with a certificate belonging to the same CA certificate or, if the encryption is disabled, then it must be disabled on all computers in the server group.

Prerequisites:

- A server authentication certificate is trusted on the computer that hosts the management server

First, enable encryption on the management server.

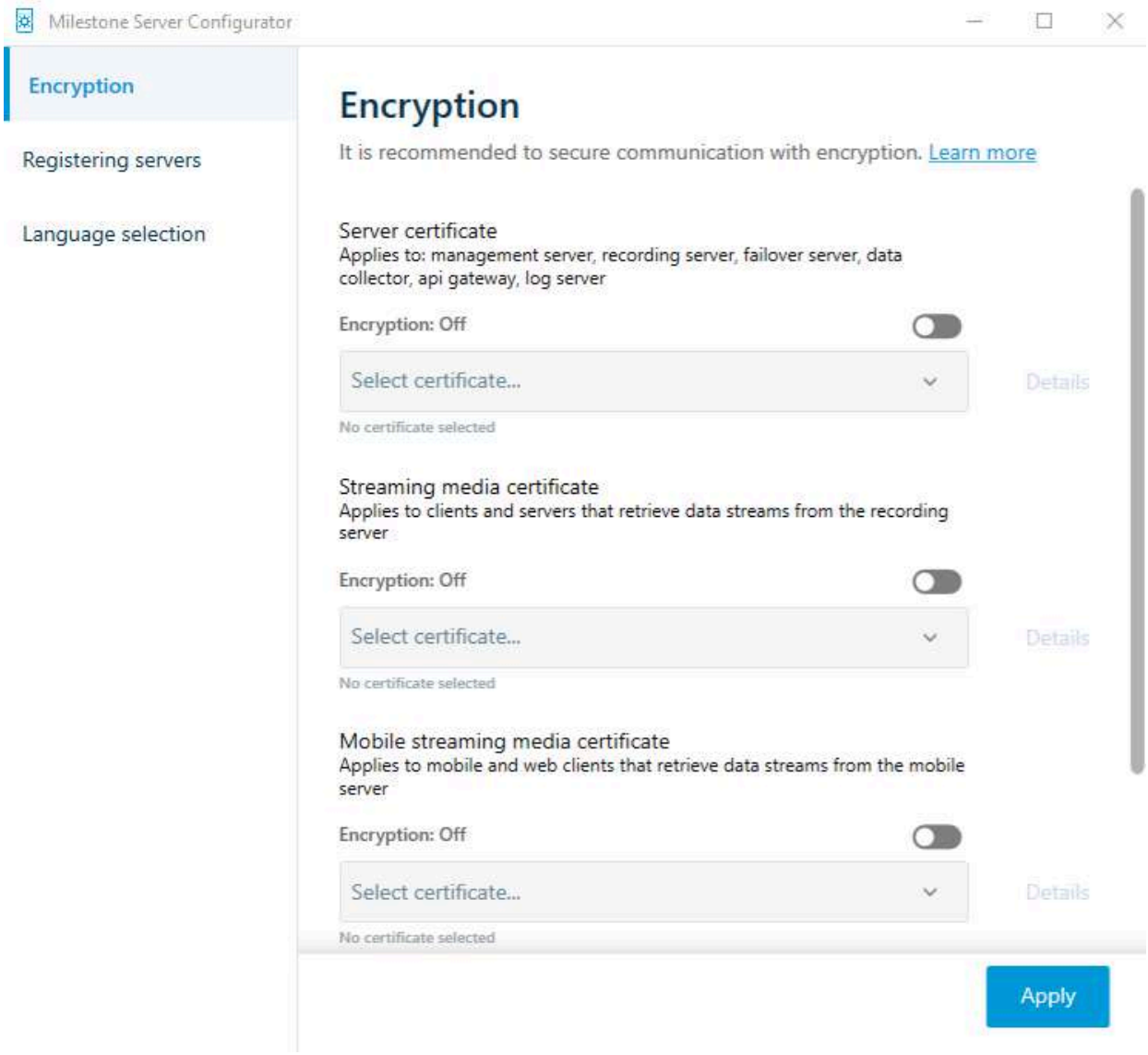
Steps:

1. On a computer with a management server installed, open the **Server Configurator** from:
   - The Windows Start menu

   or

   - The Management Server Manager by right-clicking the Management Server Manager icon on the computer task bar
2. In the **Server Configurator**, under **Server certificate**, turn on **Encryption**.
3. Click **Select certificate** to open a list with unique subject names of certificates that have a private key and that are installed on the local computer in the Windows Certificate Store.
4. Select a certificate to encrypt communication between the recording server, management server, failover server, and Data Collector server.

   Select **Details** to view Windows Certificate Store information about the selected certificate.



5. Click **Apply**.

To complete the enabling of encryption, the next step is to update the encryption settings on each recording server and each server that has a Data Collector (Event Server, Log Server, LPR Server, and Mobile Server).

For more information, see Enable server encryption for recording servers or remote servers.

Enable server encryption for recording servers or remote servers

You can encrypt the two-way connection between the management server and the recording server or other remote servers that use the Data Collector.

If your system contains multiple recording servers or remote servers, you must enable encryption on all of them.

For more information, see the certificates guide about how to secure your XProtect VMS installations.

When you configure encryption for a server group, it must either be enabled with a certificate belonging to the same CA certificate or, if the encryption is disabled, then it must be disabled on all computers in the server group.

Prerequisites:

- You have enabled encryption on the management server, see Enable encryption to and from the management server.

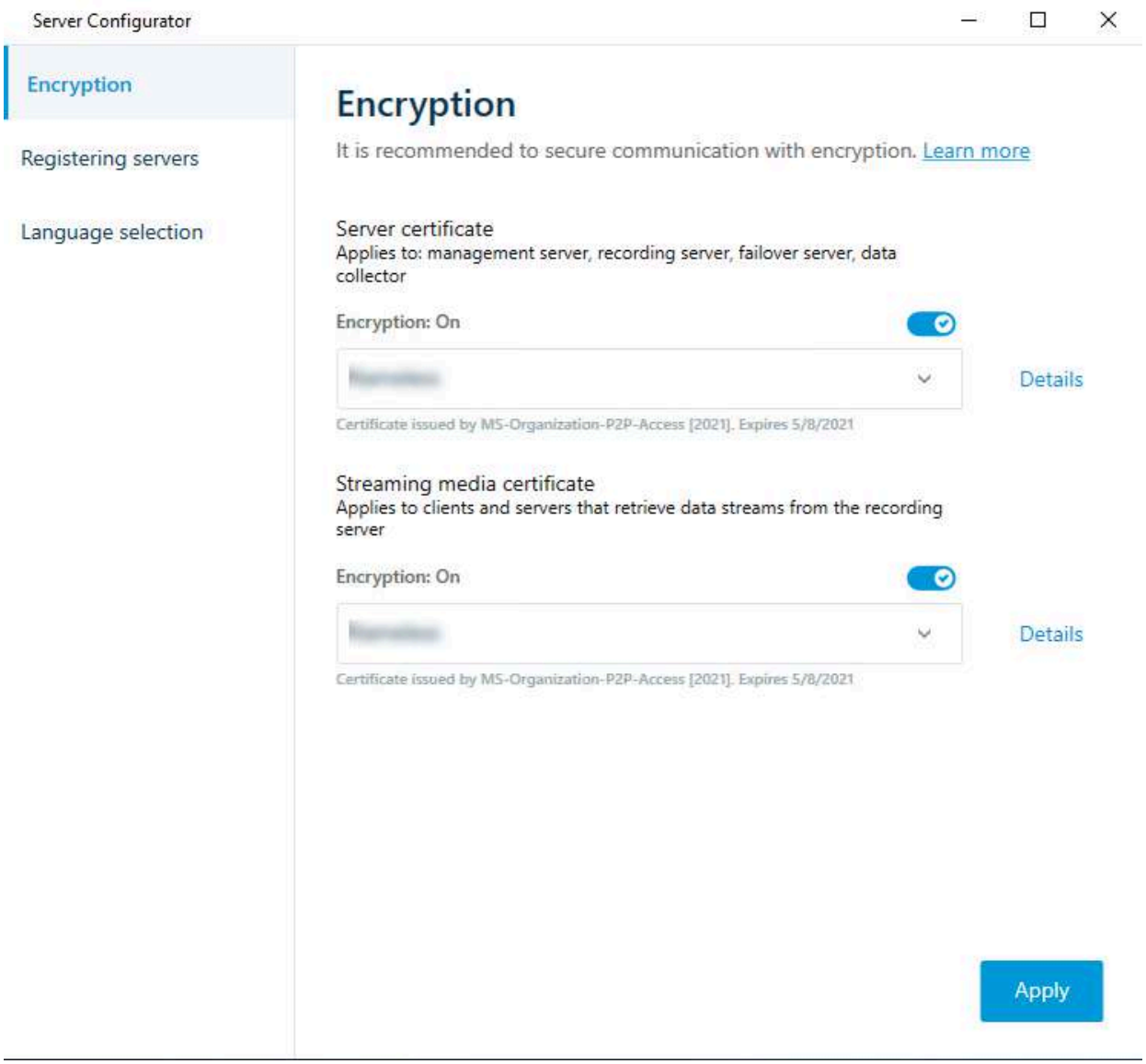
1. On a computer with a Management Server or Recording Server installed, open the **Server Configurator** from:
    - The Windows Start menu

    or

    - The server manager, by right-clicking the server manager icon on the computer task bar
2. In the **Server Configurator**, under **Server certificate**, turn on **Encryption**.
3. Click **Select certificate** to open a list with unique subject names of certificates that have a private key and that are installed on the local computer in the Windows Certificate Store.
4. Select a certificate to encrypt communication between the recording server, management server, failover server, and data collector server.

    Select **Details** to view Windows Certificate Store information about the selected certificate.

    The Recording Server service user has been given access to the private key. It is required that this certificate is trusted on all clients.



5. Click **Apply**.

When you apply certificates, the recording server will be stopped and restarted. Stopping the Recording Server service means that you cannot record and view live video while you are verifying or changing the recording server's basic configuration.

Enable event server encryption

You can encrypt the two-way connection between the event server and the components that communicate with the event server, including the LPR Server.

When you configure encryption for a server group, it must either be enabled with a certificate belonging to the same CA certificate or, if the encryption is disabled, then it must be disabled on all computers in the server group.

Prerequisites:

- A server authentication certificate is trusted on the computer that hosts the event server

First, enable encryption on the event server.

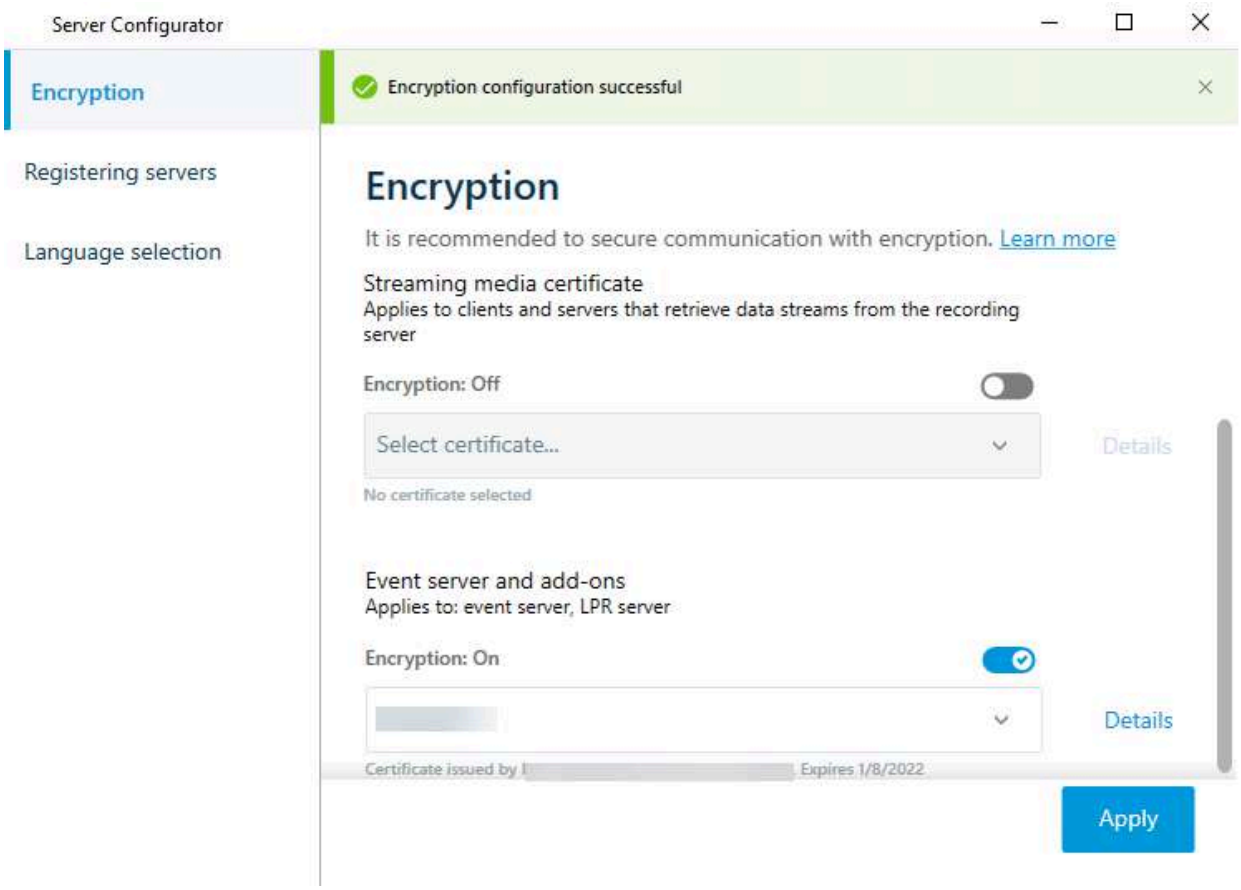
Steps:

1. On a computer with an event server installed, open the **Server Configurator** from:
   - The Windows Start menu

   or

   - The Event Server by right-clicking the Event Server icon on the computer task bar
2. In the **Server Configurator**, under **Event server and add-ons**, turn on **Encryption**.
3. Click **Select certificate** to open a list with unique subject names of certificates that have a private key and that are installed on the local computer in the Windows Certificate Store.
4. Select a certificate to encrypt communication between the event server and related add-ons.

   Select **Details** to view Windows Certificate Store information about the selected certificate.



5. Click **Apply**.

To complete the enabling of encryption, the next step is to update the encryption settings on each related extension LPR Server.

Enable encryption to clients and servers

You can encrypt connections from the recording server to clients and servers that stream data from the recording server.

When you configure encryption for a server group, it must either be enabled with a certificate belonging to the same CA certificate or, if the encryption is disabled, then it must be disabled on all computers in the server group.

Prerequisites:

- The server authentication certificate to be used is trusted on all computers running services that retrieve data streams from the recording server
- XProtect Smart Client and all services that retrieve data streams from the recording server must be version 2019 R1 or later
- Some third-party solutions created using MIP SDK versions earlier than 2019 R1 may need to be updated

Steps:

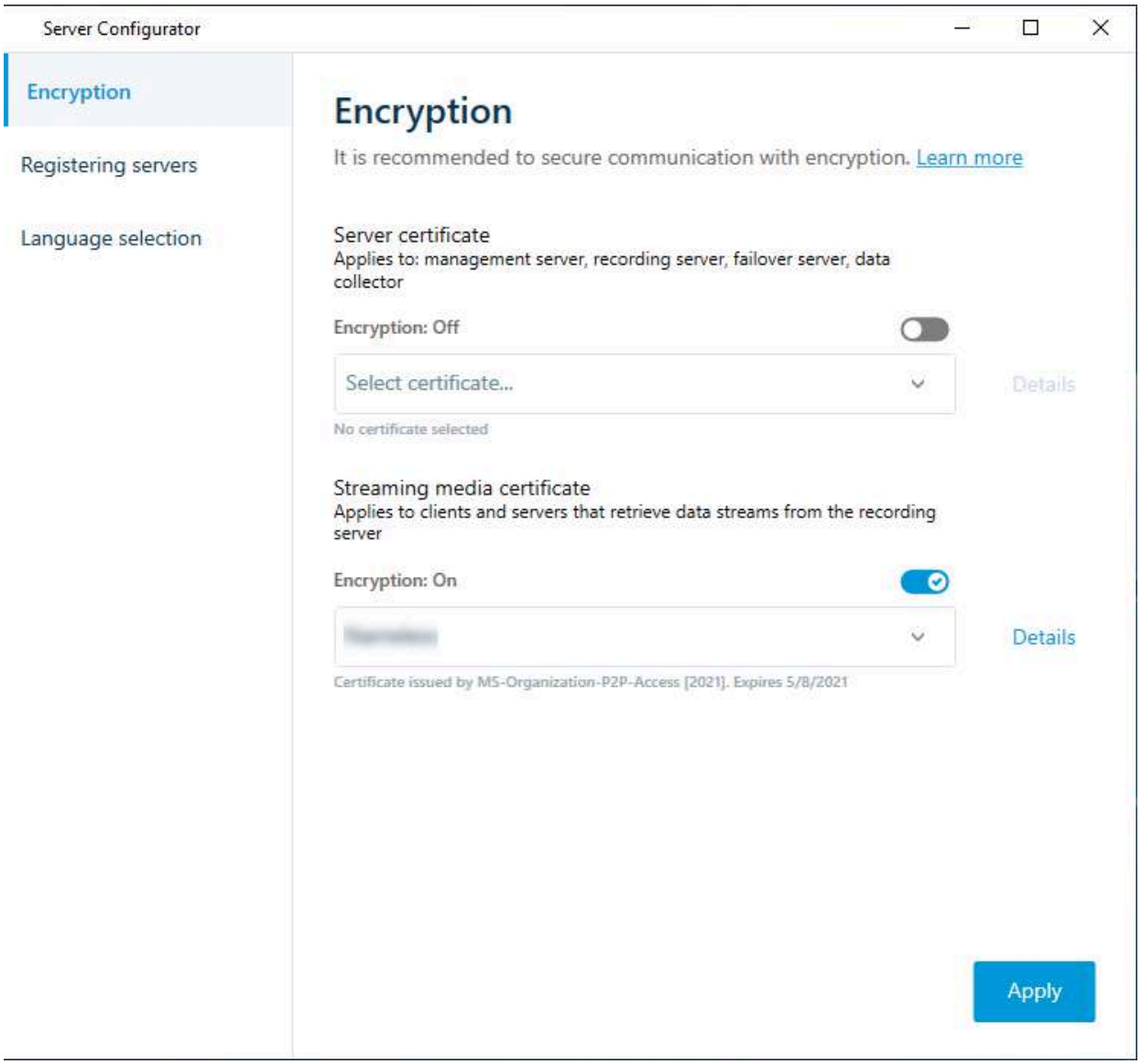
1. On a computer with a recording server installed, open the **Server Configurator** from:
    - The Windows Start menu

    or

    - The Recording Server Manager by right-clicking the Recording Server Manager icon on the computer task bar
2. In the **Server Configurator**, under **Streaming media certificate**, turn on **Encryption**.
3. Click **Select certificate** to open a list with unique subject names of certificates that have a private key and that are installed on the local computer in the Windows Certificate Store.
4. Select a certificate to encrypt communication between the clients and servers that retrieve data streams from the recording server.

    Select **Details** to view Windows Certificate Store information about the selected certificate.

    The Recording Server service user has been given access to the private key. It is required that this certificate is trusted on all clients.



5. Click **Apply**.

When you apply certificates, the recording server will be stopped and restarted. Stopping the Recording Server service means that you cannot record and view live video while you are verifying or changing the recording server's basic configuration.

To verify if the recording server uses encryption, see View encryption status to clients.

Enable encryption on the mobile server

To use an HTTPS protocol for establishing a secure connection between the mobile server and clients and services, you must apply a valid certificate on the server. The certificate confirms that the certificate holder is authorized to establish secure connections.

For more information, see the certificates guide about how to secure your XProtect VMS installations.

When you configure encryption for a server group, it must either be enabled with a certificate

belonging to the same CA certificate or, if the encryption is disabled, then it must be disabled on all computers in the server group.

Certificates issued by CA (Certificate Authority) have a chain of certificates and on the root of that chain is the CA root certificate. When a device or browser sees this certificate, it compares its root certificate with pre-installed ones on the OS (Android, iOS, Windows, etc.). If the root certificate is listed in the pre-installed certificates list, then the OS ensures the user that the connection to the server is secure enough. These certificates are issued for a domain name and are not free of charge.

Steps:

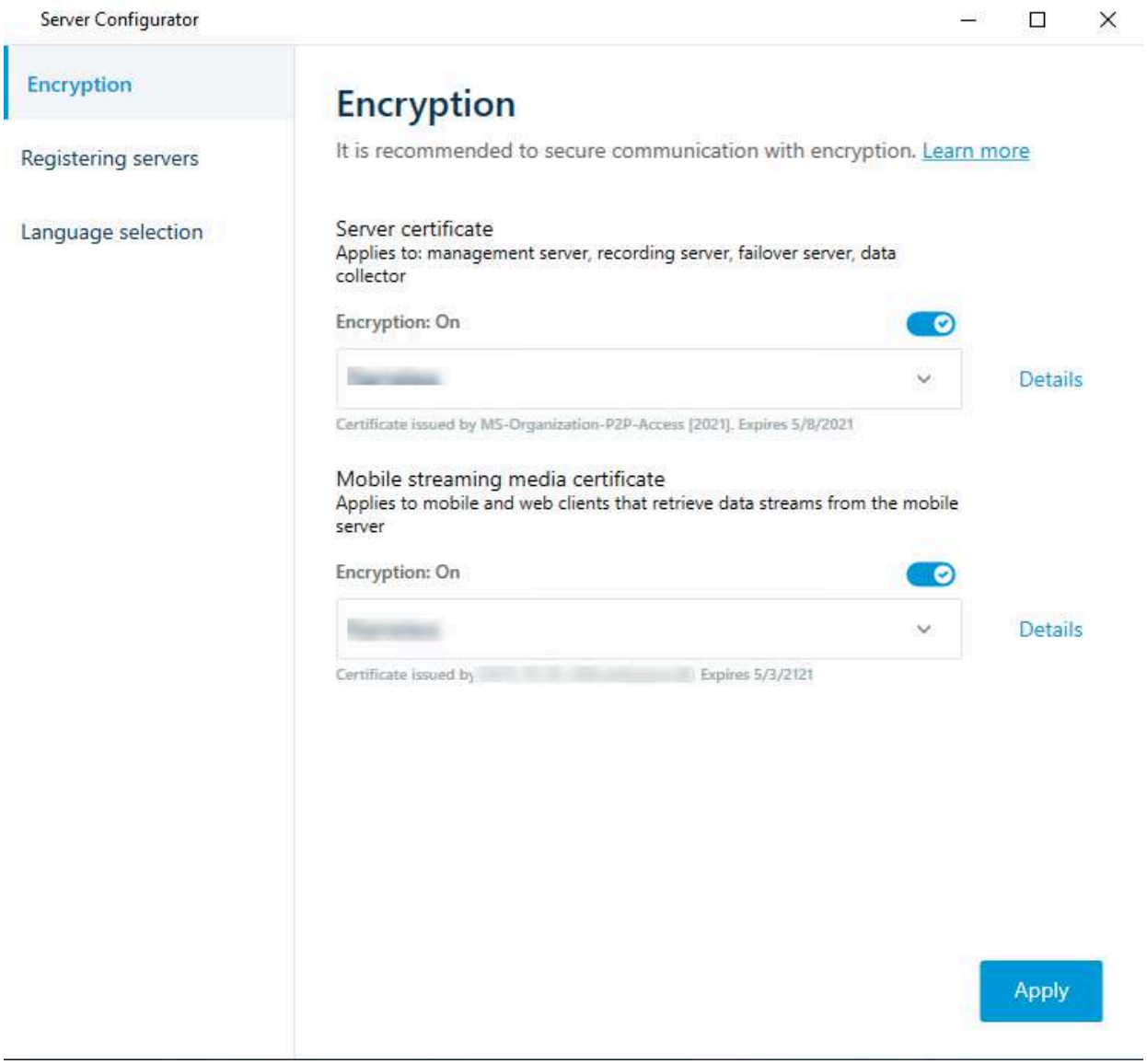
1. On a computer with a mobile server installed, open the **Server Configurator** from:
   - The Windows Start menu

   or

   - The Mobile Server Manager by right-clicking the Mobile Server Manager icon on the computer task bar
2. In the **Server Configurator**, under **Mobile streaming media certificate**, turn on **Encryption**.
3. Click **Select certificate** to open a list with unique subject names of certificates that have a private key and that are installed on the local computer in the Windows Certificate Store.
4. Select a certificate to encrypt the communication of XProtect Mobile client and XProtect Web Client with the mobile server.

   Select **Details** to view Windows Certificate Store information about the selected certificate.

   The Mobile Server service user has been given access to the private key. It is required that this certificate be trusted on all clients.



5. Click **Apply**.

When you apply certificates, the Mobile Server service restarts.

Set up your system to run federated sites

To prepare your system for Milestone Federated Architecture, you must make certain choices when you install the management server. Depending on how your IT infrastructure is set up, choose between three different alternatives.

Alternative 1: Connect sites from the same domain (with a common domain user)

Before you install the management server, you must create a common domain user and configure this user as the administrator on all servers involved in the federated site hierarchy. How you connect the sites depends on the created user account.

With a Windows user account

1. Start the installation of the product on the server to be used as the management server and select **Custom**.
2. Select to install the Management Server service using a user account. The selected user account must be the

administrator account used on all management servers. You must use the same user account when you install the other management servers in the federated site hierarchy.
3. Finish the installation. Repeat steps 1-3 to install any other systems you want to add to the federated site hierarchy.
4. Add site to hierarchy (see Add site to hierarchy).

With a Windows built-in user account (network service)

1. Start the installation of the product on the first server to be used as the management server and select **Single Computer** or **Custom**. This installs the management server using a network service account. Repeat this step for all the sites in your federated site hierarchy.
2. Log into the site that you want as your central site in the federated site hierarchy.
3. In the Management Client, expand **Security** > **Roles** > **Administrators**.
4. On the **Users and Groups** tab, click **Add** and select **Windows User**.
5. In the dialog box, select **Computers** as object type, enter the server name of the federated site and click **OK** to add the server to the **Administrator** role of the central site. Repeat this step until you have added all the federated sites in this way and exit the application.
6. Log into each federated site, and add the following servers to the **Administrator** role, in the same way as above:
   - The parent site server.
   - The child site servers that you want to connect directly to this federated site.
7. Add site to hierarchy (see Add site to hierarchy).

Alternative 2: Connecting sites from different domains

To connect to sites across domains, make sure that the domains trust each other. You set up domains to trust each other in the Microsoft Windows Domain configuration. When you have established trust between the different domains on each site in the federated site hierarchy are placed, follow the same description as described in Alternative 1. For more information about how to set up trusted domains, see the Microsoft website (https://docs.microsoft.com/previous-versions/windows/it-pro/windows-2000-server/cc961481(v=technet.10)/).

Milestone recommends Milestone Interconnect for creating connected multi-site systems with multiple domains.

Alternative 3: Connect sites in workgroup(s)

When you connect sites inside workgroups, the same administrator account must be present on all servers you want connected in the federated site hierarchy. You must define the administrator account before you install the system.

1. Log into **Windows** using a common administrator account.
2. Start the installation of the product and click **Custom**.
3. Select to install the Management Server service using the common administrator account.
4. Finish the installation. Repeat steps 1-4 to install any other systems you want to connect. You must install all of these systems using the common administrator account.
5. Add site to hierarchy (see Add site to hierarchy).

Milestone recommends Milestone Interconnect for creating connected multi-site systems when the sites are not part of a domain.

You cannot mix domain(s) and workgroup(s). This means that you cannot connect sites from a domain to sites from a workgroup and vice versa.

Add site to hierarchy

As you expand your system, you can add sites to your top site and to its child sites as long as the system is set up correctly.

When adding a non-secure site to Milestone Federated Architecture, make sure that **Allow non-secure connections to the server** is enabled under **Tools** > **Options** > **General settings** in Management Client.

1. Select the **Federated Site Hierarchy** pane.

2. Select the site to which you want to add a child site, right-click, and click **Add Site to Hierarchy**.
3. Enter the URL of the requested site in the **Add Site to Hierarchy** window and click **OK**.
4. The parent site sends a link request to the child site and after a while, a link between the two sites is added to the **Federated Site Hierarchy** pane.
5. If you can establish the link to the child site without requesting acceptance from the child site administrator, go to step 7.

   If **not**, the child site has the awaiting acceptance icon until the administrator of the child site has authorized the request.

6. Make sure that the administrator of the child site authorizes the link request from the parent site (see Accept inclusion in the hierarchy).
7. The new parent/child link is established and the **Federated Site Hierarchy** pane is updated with the icon for the new child site.

Accept inclusion in the hierarchy

When a child site has received a link request from a potential parent site where the administrator did not have administrator permissions to the child site, it has the awaiting acceptance icon.

To accept a link request:

1. Log into the site.
2. In the **Federated Site Hierarchy** pane, right-click the site and click **Accept Inclusion in Hierarchy**.

   If the site runs the XProtect Expert version, you right-click the site in the **Site Navigation** pane.

3. Click **Yes**.
4. The new parent/child link is established and the **Federated Site Hierarchy** pane is updated with the normal site icon for the selected site.

> Changes that you make to child sites located far from the parent site can take some time to be reflected in the **Federated Site Hierarchy** pane.

Set site properties

You can view and, possibly, edit properties on your home site and its child sites.

1. In the Management Client, in the **Federated Site Hierarchy** pane, select the relevant site, right-click, and select **Properties**.

2. If needed, change the following:

   General tab (see General tab)

   Parent Site tab (see Parent Site tab) **(available on child sites only)**

   Due to synchronization issues, any changes made to remote children might take some time to be reflected in the **Site Navigation** pane.

Refresh site hierarchy

Regularly the system automatically synchronizes the hierarchy through all levels of your parent/child setup. You can refresh it manually, if you want to see changes reflected instantly in the hierarchy, and do not want to wait for the next automatic synchronization.

You need to be logged into a site to perform a manual refresh. Only changes saved by this site since the last synchronization are reflected by a refresh. This means that changes made further down in the hierarchy might not be reflected by the manual update, if the changes have not reached the site yet.

1. Log into the relevant site.
2. Right-click the top site in the **Federated Site Hierarchy** pane and click **Refresh Site Hierarchy**.

   This will take a few seconds.

Log into other sites in the hierarchy

You can log into other sites and administrate these. The site you are logged into is your home site.

1. In the **Federated Site Hierarchy** pane, right-click the site that you want to log into.
2. Click **Log into Site**.

   The Management Client for that site opens.

3. Enter login information and click **OK**.
4. After login is complete, you are ready to do your administrative tasks for that site.

Update site information of child sites

This section is only relevant if you use XProtect Corporate or XProtect Expert 2014 or newer.

In a large Milestone Federated Architecture setup with a lot of child sites, it is easy to lose the overview and it can be difficult to find the contact information to the administrators of each child site.

Therefore, you can add additional information to each child site and this information is then available for the administrators on the central site.

You can read the information about the site, when you pause your mouse over the site name in the **Federated Site Hierarchy** pane. To update information about the site:

1. Log into the site.
2. Click **Site Navigation** pane and select **Site Information**.
3. Click **Edit** and add the relevant information in each category.

Detach a site from the hierarchy

When you detach a site from its parent site, the link between the sites are broken. You can detach sites from the central site, from the site itself or its parent site.

1. In the **Federated Site Hierarchy** pane, right-click the site, and click **Detach Site from Hierarchy**.
2. Click **Yes** to update the **Federated Site Hierarchy** pane.

   If the detached site has child sites, it becomes the new top site for this branch of the hierarchy, and the normal site icon changes to a top site icon.

3. Click **OK**.

The changes to the hierarchy are reflected after a manual refresh or an automatic synchronization.

Add a remote site to your central Milestone Interconnect site

You add remote sites to the central site with the **Add Hardware** wizard.

Requirements

- Enough Milestone Interconnect camera licenses (see Milestone Interconnect and licensing).
- Another configured and working XProtect system including a user account (basic users, local Windows user or Windows Active Directory user) with permissions for the devices that the central XProtect Corporate system should be able to access
- Network connection between the central XProtect Corporate site and the remote sites with access or port forwarding to the ports used on the remote sites

To add a remote site:

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the **Overview** pane, expand the relevant recording server and right-click.
3. Select **Add Hardware** to start the wizard.
4. On the first page select **Address range scanning** or **Manual** and click **Next**.
5. Specify user names and passwords. The user account must be predefined on the remote system. You can add user names and passwords as needed by clicking **Add**. When ready, click **Next**.
6. Select the drivers to use when you scan. In this case choose between the Milestone drivers. Click **Next**.
7. Specify the IP addresses and port numbers you want to scan. Default is port 80. Click **Next**.

   Wait while your system detects the remote sites. A status indicator shows the detection process. In case of a successful detection, a **Success** message appears in the **Status** column. If you fail to add, you can click the **Failed**

error message to see why.

8. Choose to enable or disable successfully detected systems. Click **Next**.
9. Wait while your system detects hardware and collects device specific information. Click **Next**.
10. Choose to enable or disable successfully detected hardware and devices. Click **Next**.
11. Select a default group. Click **Finish**.
12. After installation, you can see the system and its devices in the **Overview** pane.

    Depending on the user permissions for the selected user on the remote site, the central site gets access to all cameras and functions or a sub-set of them.

Assign user permissions

You configure user permissions for an interconnected camera as you do with other cameras, by creating a role and assigning access to functions.

1. On the central site, in the **Site Navigation** pane, expand **Security** and select **Roles**.
2. In the Overview pane, right-click the built-in administrator role and select **Add Role** (see Add and manage a role).
3. Name the role and configure the settings on the **Device** tab (see Device tab (roles)) and the **Remote Recordings** tab (see Remote recordings tab (roles)).

Update remote site hardware

If the configuration has been changed on a remote site, for example, added or removed cameras and events, you must update the configuration on the central site to reflect the new configuration on the remote site.

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the **Overview** pane, expand the required recording server, select the relevant remote system. Right-click it.
3. Select **Update Hardware**. This opens the **Update hardware** dialog box.
4. The dialog box lists all changes (devices removed, updated and added) in the remote system since your Milestone Interconnect setup was established or refreshed last. Click **Confirm** to update your central site with these changes.

Enable playback directly from remote site camera

If your central site is continuously connected with its remote sites, you can configure your system so that the users playback the recordings directly from the remote sites. For more information, see Milestone Interconnect setups (explained).

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the **Overview** pane, expand the required recording server, select the relevant remote system. Select the relevant interconnected camera.
3. In the Properties pane, select the **Record** tab, and select the **Play back recordings from remote system** option.
4. In the toolbar, click **Save**.

In a Milestone Interconnect setup, the central site disregards privacy masks defined in a remote site. If you want to apply the same privacy masks, you must redefine it on the central site.

Retrieve remote recordings from remote site camera

If your central site is **not** continuously connected with its remote sites, you can configure your system to store remote recordings centrally and you can configure retrieval of remote recordings when the network connection is optimal. For more information, see Milestone Interconnect setups (explained).

To allow users to actually retrieve recordings, you must enable this permission for the relevant role (see Roles (Security)).

To configure your system:

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the **Overview** pane, expand the required recording server, select the relevant remote system. Select the relevant

remote server.
3. In the Properties pane, select the **Remote Retrieval** tab and update the settings (see Remote Retrieval tab).

If the network fails for some reason, the central site misses out on recording sequences. You can configure your system to let the central site automatically retrieve remote recordings to cover the down-period, once the network is reestablished.

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the **Overview** pane, expand the required recording server, select the relevant remote system. Select the relevant camera.
3. In the Properties pane, select the **Record** tab, and select the **Automatically retrieve remote recordings when connection is restored** option (see Save and retrieve remote recording).
4. In the toolbar, click **Save**.

As an alternative, you can use rules or start remote recording retrievals from XProtect Smart Client when needed.

In a Milestone Interconnect setup, the central site disregards privacy masks defined in a remote site. If you want to apply the same privacy masks, you must redefine it on the central site.

Configure your central site to respond to events from remote sites

You can use events defined on the remote sites to trigger rules and alarms on your central site and thereby respond immediately to events from the remote sites. This requires that the remote sites are connected and online. The number and type of events depend on the events configured and predefined in the remote sites.

The list of supported events is available on the Milestone website (https://www.milestonesys.com/).

You cannot delete predefined events.

Requirements:

- If you want to use user-defined/manual events from the remote sites as triggering events, you must first create these on the remote sites
- Make sure that you have an updated list of events from the remote sites (see Update remote site hardware).

Add a user-defined/manual event from a remote site:

1. On the central site, expand **Servers** and select **Recording Servers**.
2. In the Overview pane, select the relevant remote server and the **Events tab**.
3. The list contains the predefined events. Click **Add** to include user-defined or manual events from the remote site in the list.

Use an event on a remote site to trigger an alarm on the central site:

1. On the central site, expand **Alarms** and select **Alarm Definitions**.
2. In the Overview pane, right-click **Alarm Definitions** and click **Add New**.
3. Enter values as needed.
4. In the **Triggering Event** field, you can select between the supported predefined and user-defined events.
5. In the **Sources** field, select the remote server representing the remote site that you want alarms from.
6. Save the configuration when done.

Use an event on a remote site to trigger a rule-based action on the central site:

1. On the central site, expand **Rules and Events** and select **Rules**.
2. In the Overview pane, right-click **Rules** and click **Add Rule**.
3. In the wizard that appears, select **Perform an action on <event>**.
4. In the **Edit the rule description** area, click **event** and select between the supported predefined and user-defined events. Click **OK**.
5. Click **devices/recording server/management server** and select the remote server representing the remote site that you want the central site to start an action for. Click **OK**.
6. Click **Next** to get to the next wizard page.
7. Select the conditions that you want to apply for this rule. If you do not select any conditions, the rule always applies.

Click **Next**.
8. Select an action and specify the details in the **Edit the rule description** area. Click **Next**.
9. Select a stop criterion if required. Click **Next**.
10. Select a stop action if required. Click **Finish**.

Geographic backgrounds (explained)

Before a user of XProtect Smart Client can select a geographic background, first you must configure the geographic backgrounds in XProtect Management Client.

- **Basic world map** - use the standard geographic background provided in XProtect Smart Client. It requires no configuration. This map is intended for use as a general reference, and it does not contain features such as country boundaries, cities, or other details. However, like the other geographic backgrounds, it does contain geo-reference data
- **Bing Maps** - connect to Bing Maps
- **Google Maps** - connect to Google Maps
- **Milestone Map Service** - connect to a free map provider. After you enable Milestone Map Service, no further setup is needed.

  See Enable Milestone Map Service

- **OpenStreetMap** - connect to:
  - A commercial tile server of your own choice
  - Your own, online or local tile server

  See Specify OpenStreetMap tile server

> The Bing Maps and Google Maps options require access to the internet, and you must purchase a key from Microsoft or Google.
>
> Milestone Map Service requires internet access.
>
> Unless you are using your own, local tile server, OpenStreetMap requires internet access.

If you want the system to have a EU GDPR compliant installation, the following services may not be used:

- Bing Maps
- Google Maps
- Milestone Map Service

For more information about data protection and the usage data collection, see the GDPR privacy guide.

By default, Bing Maps and Google Maps display satellite imagery (Satellite). You can change the imagery in XProtect Smart Client, for example to aerial or terrain, to see different details.

Enable Bing Maps or Google Maps in Management Client

You can make a key available to multiple users by entering it for a Smart Client profile in Management Client. All users who are assigned to the profile will use this key.

Steps:

1. In Management Client, on the **Site Navigation** pane, click **Smart Client Profiles**.
2. In the **Smart Client Profiles** pane, select the relevant Smart Client profile.
3. In the **Properties** pane, click the **Smart map** tab:
   - For Bing Maps, enter your Basic Key or Enterprise Key in the **Bing Maps key** field
   - For Google Maps, enter your Maps Static API key in the **Private key for Google Maps** field

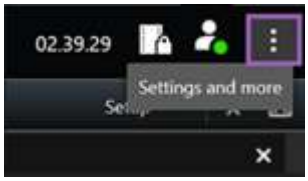
4. To prevent XProtect Smart Client operators from using a different key, select the **Locked** check box.

Enable Bing Maps or Google Maps in XProtect Smart Client

To allow XProtect Smart Client operators to use a different key than the key from the Smart Client profile, you must enter the key in the settings in XProtect Smart Client.

Steps:

1. In XProtect Smart Client, open the **Settings** window.



2. Click **Smart map**.
3. Depending on the map service you want to use, do one of the following:
   - For Bing Maps, enter your key in the **Bing Maps key** field. See also Smart map integration with Bing Maps (explained).
   - For Google Maps, enter your key in the **Private key for Google Maps** field. See also Smart map integration with Google Maps (explained).

Enable Milestone Map Service

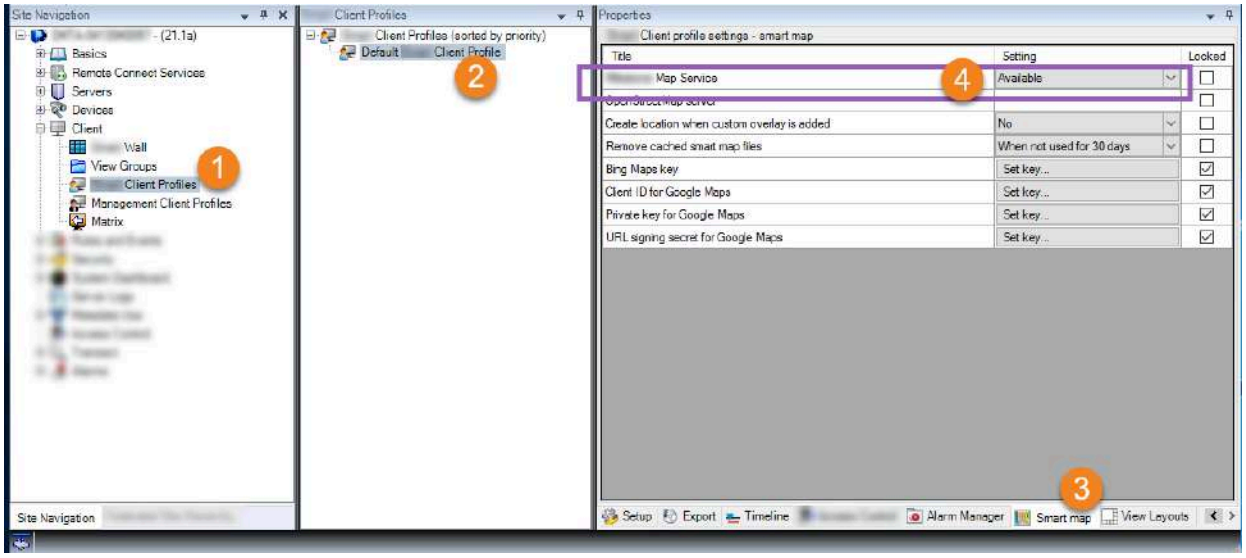
Milestone Map Service is an online service that lets you connect to Milestone Systems's tile server. This tile server uses a free, commercially available map service.

After you enable Milestone Map Service on your smart map, the smart map will use Milestone Map Service as its geographic background.

Steps:

1. In the **Site Navigation** pane, expand the **Client** node and click **Smart Client Profiles**.
2. In the overview pane, select the relevant Smart Client profile.

3. In the **Properties** pane, click the **Smart map** tab.



4. In the **Milestone Map Service** field, select **Available**.

5. To enforce this setting in XProtect Smart Client, select the **Locked** check box. Then the XProtect Smart Client operators cannot enable or disable Milestone Map Service.
6. Save the changes.

You can also enable Milestone Map Service in the **Settings** window in XProtect Smart Client.

Milestone Map Service requires internet access.

If you are behind a restrictive firewall, allowing access to the used domains is important. You may need to allow for outgoing traffic for Milestone Map Service using maps.milestonesys.com on each machine on which the Smart Client is running.

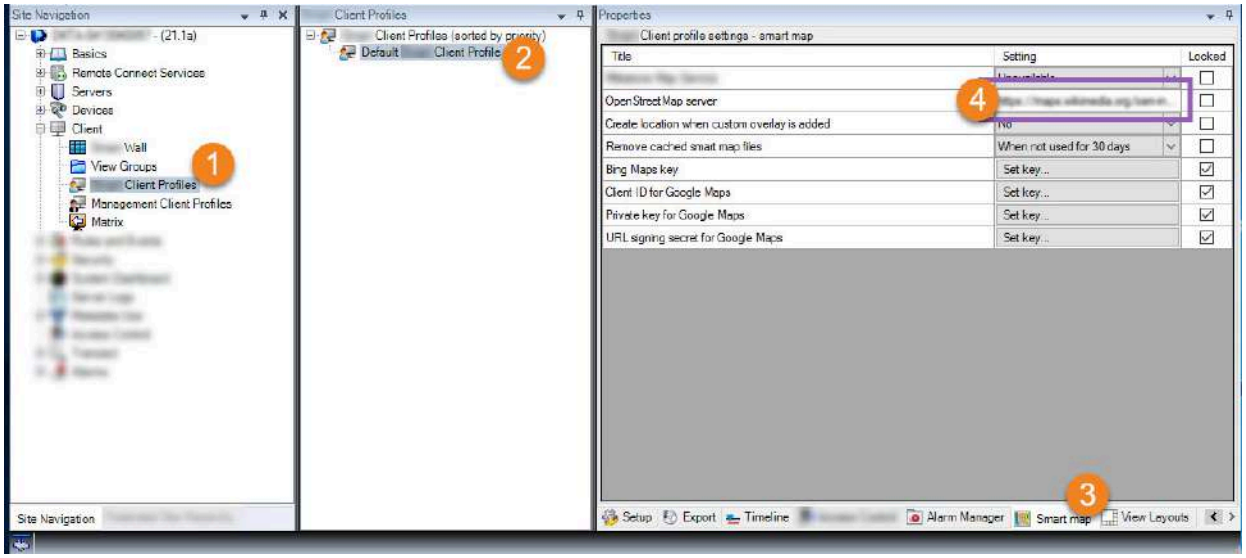
Specify OpenStreetMap tile server

If you use the **OpenStreetMap** option as the geographic background for your smart map, you must specify where the tiled images are retrieved from. You do this by specifying the tile server address, either a commercial tile server or a local tile server, for example if your organization has its own maps for areas such as airports or harbors.

You can also specify the tile server address in the **Settings** window in XProtect Smart Client.

Steps:

1. In the **Site Navigation** pane, expand the **Client** node and click **Smart Client Profiles**.
2. In the overview pane, select the relevant Smart Client profile.
3. In the **Properties** pane, click the **Smart map** tab.



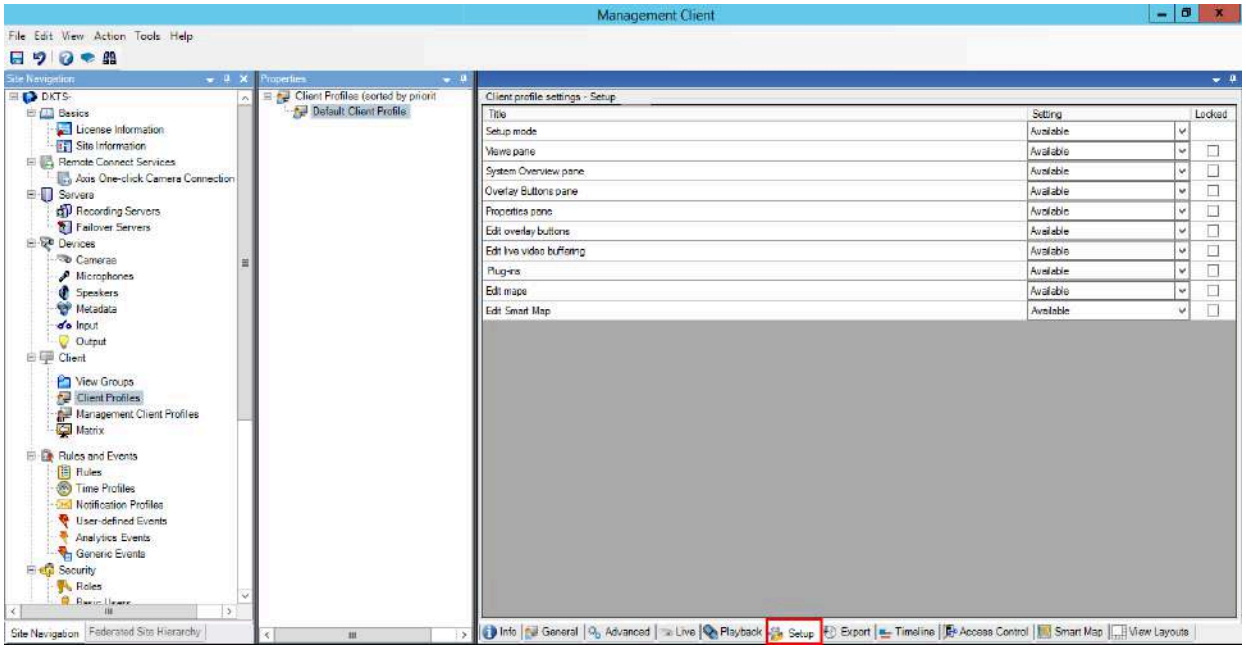
4. In the **OpenStreetMap server** field, enter the address of the tile server.
5. To enforce this setting in XProtect Smart Client, select the **Locked** check box. Then the XProtect Smart Client operators cannot change the address.
6. Save the changes.

Enable smart map editing

Operators can edit smart maps in XProtect Smart Client in setup mode only if editing is enabled in Management Client. If not already enabled, you need to enable editing for each relevant Smart Client profile.

Steps:

1. In the **Site Navigation** pane, expand the **Client** node.
2. Click **Smart Client Profiles**.



3. In the overview pane, select the relevant Smart Client profile.
4. In the **Properties** pane, click the **Setup** tab.
5. In the **Edit smart map** list, select **Available**.
6. Repeat these steps for each relevant Smart Client profile.
7. Save your changes. Next time users assigned to the Smart Client profile you selected log into XProtect Smart Client, they will be able to edit smart maps.

To disable editing, in **Edit smart map** list, select **Unavailable**.

Enable editing devices on smart map

You must enable the editing of devices per role to allow operators to, for example:

- Position an input device or a microphone on a smart map
- Adjust the field of view of a camera on a smart map

Operators can be allowed to edit the following device types on smart maps:

- Cameras
- Input devices
- Microphones

Requirements
Before you start, make sure that smart map editing has been enabled (see Enable smart map editing). You do this on the Smart Client profile that the role of the operator is associated with.

Steps:

1. Expand the **Security** node > **Roles**.
2. In the **Roles** pane, select the role that your operator is associated with.
3. To give the role editing permissions:
    - Select the **Overall Security** tab, and in the **Role Settings** pane, select the device type (for example, **Cameras** or **Input**)

    - In the **Allow** column, select the **Full control** or **Edit** check box
4. Save the changes.

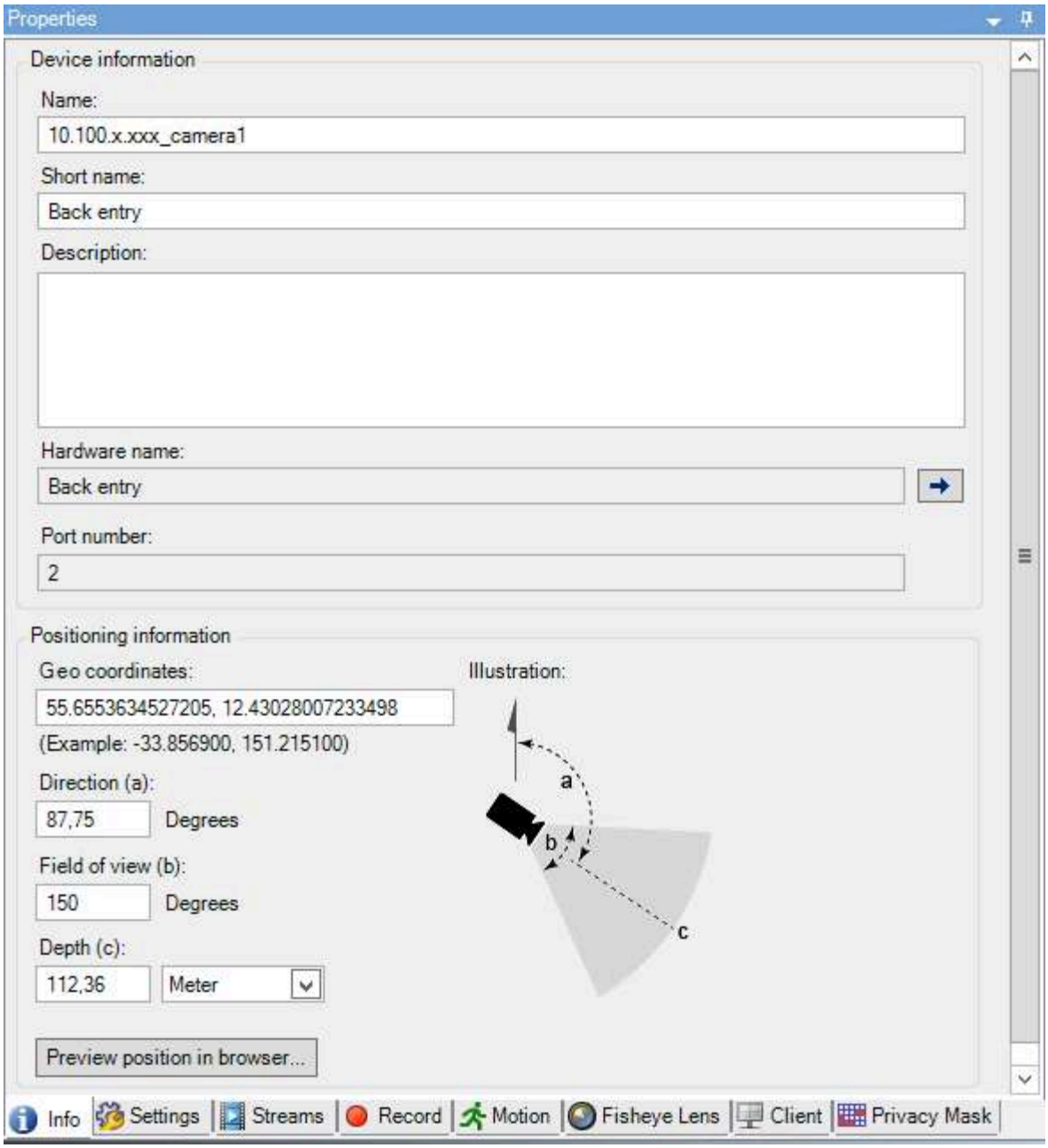
To enable the editing of individual devices, go to the **Device** tab and select the relevant device.

Define device position and camera direction, field of view, depth (smart map)

To ensure that a device is positioned correctly on the smart map, you can set the geographic coordinates of the device. For cameras, you can also set the direction, the field of view, and the viewing depth. Setting any of the above will automatically add the device to the smart map the next time an operator loads the smart map in XProtect Smart Client.

Steps:

1. In Management Client, expand the **Devices** node and select the device type (for example, **Cameras** or **Input**).
2. In the **Devices** pane, select the relevant device.
3. On the **Info** tab, scroll down to **Positioning information**.



4. In the **Geo coordinates** field, specify the latitude and the longitude coordinates, in that order. Use a period as a decimal separator, and use a comma to separate latitude and longitude.

   Adding the geo-coordinates enables the XProtect Smart Client users to go directly to the device on a smart map and when the device is added to a smart map it is automatically positioned correctly on the map.

   - For cameras:

     a. In the **Direction** field, enter a value in the range of 0 and 360 degrees.

     b. In the **Field of view** field, enter a value in the range of 0 and 360 degrees.

     c. In the **Depth** field, enter the viewing depth, either in meters or in feet.

5. Save the changes.

You can also set the properties on the recording servers.

Configure smart map with Milestone Federated Architecture

When you use smart map in a Milestone Federated Architecture, all the devices from the connected sites appear on the smart map. Follow the steps below to set up smart map in a federated architecture.

For general information about Milestone Federated Architecture, see Configuring Milestone Federated Architecture.

1. Before connecting the top site with child sites, make sure that geographic coordinates have been specified on all devices on all sites. Geographic coordinates are added automatically when a device is positioned on the smart map in XProtect Smart Client, but you can also add them manually in Management Client in the device properties. For more information, see Define device position and camera direction, field of view, depth (smart map).
2. You must add the Smart Client operators as Windows users on the parent site and all the federated sites. At least on the top site, the Windows users must have smart map editing permissions. This allows the users to edit the smart map for the top site and for all child sites. Next, you need to determine whether the Windows users on the child sites need smart map editing permissions. In Management Client, first you create the Windows users under **Roles**, and then you enable smart map editing. For more information, see Enable smart map editing.
3. On the top site, add the child sites as Windows users to a role with administrator permissions. When you specify the object type, select the **Computers** check box.
4. On each child site, add the top site as a Windows user to the same administrator role that is used on the top site. When you specify the object type, select the **Computers** check box.
5. On the top site, make sure that you can view the **Federated Site Hierarchy** window. In Management Client, go to **View** and select **Federated Site Hierarchy**. Add each of the child sites to the top site. For more information, see Add site to hierarchy.
6. Now you can test that Milestone Federated Architecture works in XProtect Smart Client. Log in to the top site as an administrator or as an operator, and open a view that contains the smart map. If the setup has been done correctly, all devices from the top site and the child sites appear on the smart map. If you log in to one of the child sites, you will see only the devices from that site and its child sites.

To edit devices on a smart map, for example the camera position and angle, users need device editing permissions. For more information, see Enable editing devices on smart map.

Backing up and restoring system configuration

Milestone recommends that you make regular backups of your system configuration as a disaster recovery measure.

While it is rare to lose your configuration, it can happen under unfortunate circumstances. It is important that you protect your backups, either through technical or organizational measures.

Backing up and restoring your system configuration (explained)

The system offers a built-in feature that backs up all the system configuration you can define in the Management Client. The log server database and the log files, including audit log files, are not included in this backup.

If your system is large, Milestone recommends that you define scheduled backups. This is done with the third-party tool: Microsoft® SQL Server Management Studio. This backup includes the same data as a manual backup.

During a backup, your system stays online.

Backing up your system configuration can take some time. Backup duration depends on:

- Your system configuration
- Your hardware
- Whether you have installed SQL Server, the Event Server and Management Server components on a single server or several servers

Each time you make a backup both manual and scheduled, the transaction log file of the SQL Server database is flushed. For additional information about how to flush the transaction log file see SQL Server database transaction log (explained).

Make sure that you know your system configuration password settings when creating a backup.

For FIPS 140-2 compliant systems, with exports and archived media databases from XProtect VMS versions prior to 2017 R1 that are encrypted with non FIPS-compliant cyphers, it is required to archive the data in a location where it can still be accessed after enabling FIPS. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

Select shared backup folder

Before backing up and restoring any system configuration, you must set a backup folder for this purpose.

1. Right-click the notification area's Management Server service icon and select **Select shared backup folder**.
2. In the window that appears, browse to the wanted file location.
3. Click **OK** twice.
4. If asked if you want to delete files in the current backup folder, click **Yes** or **No** depending on your needs.

Back up system configuration manually

1. From the menu bar, select **File** > **Backup Configuration**.
2. Read the note in the dialog box and click **Backup**.
3. Enter a file name for the .cnf file.
4. Enter a folder destination and click **Save**.
5. Wait until the backup is finished and click **Close**.

All relevant system configuration files are combined into one single .cnf file that is saved at a specified location. During the backup, all backup files are first exported to a temporary system backup folder on the management server. You can select another temporary folder by right-clicking the notification area's Management Server service icon and by selecting Select shared backup folder.

Restore system configuration from a manual backup

Important information

- Both the user who installs and the user who restores must be local administrator of the system configuration SQL Server database on the management server **and** on SQL Server
- Except for your recording servers, your system is completely shut down for the duration of the restore, which can take some time
- A backup can only be restored on the system installation where it was created. Make sure that the setup is as similar as possible to when the backup was made. Otherwise, the restore might fail

- If prompted for a system configuration password during a restore, you must provide the system configuration password that was valid at the time when the backup was created. Without this password, you cannot restore your configuration from the backup

- If you do a backup of the SQL Server database and restore it on clean SQL Server, then the raise errors from the SQL Server database will not work and you will only receive one generic error message from SQL Server. To avoid that, first reinstall your XProtect system using clean SQL Server and then restore the backup on top of that
- If restoring fails during the validation phase, you can start the old configuration again because you have made no changes
  If restoring fails elsewhere in the process, you cannot roll back to the old configuration
  As long as the backup file is not corrupted, you can do another restore
- Restoring replaces the current configuration. This means that any changes to the configuration since last backup are lost
- No logs, including audit logs, are restored
- Once restoring has started, you cannot cancel it

Restoring

1. Right-click the notification area's Management Server service icon and select **Restore Configuration**.
2. Read the important note and click **Restore**.
3. In the file open dialog box, browse to the location of the system configuration backup file, select it, and click **Open**.

   The backup file is located on the Management Client computer. If the Management Client is installed on a different server, copy the backup file to this server before you select the destination.

4. The **Restore Configuration** window opens. Wait for the restore to finish and click **Close**.

System configuration password (explained)

You can choose to protect the overall system configuration by assigning a system configuration password. After you assign a system configuration password, backups are protected by this password. The password settings are stored on the computer that is running the management server in a secure folder. You will need this password to:

- Restore the configuration from a configuration backup that was created with password settings different than the current password settings
- Moving or installing the management server on another computer due to a hardware failure (recovery)
- Configure an additional management server in a system with clustering

The system configuration password can be assigned during installation or after installation. The password must meet the Windows complexity requirements, which are defined by the Windows policy for passwords.

It is important that system administrators save this password and keep it safe. If you have assigned a system configuration password and you are restoring a backup, you may be asked to provide the system configuration password. Without this password, you cannot restore your configuration from the backup.

System configuration password settings

The system configuration password settings can be changed. In system configuration password settings, you have these options:

- Choose to password protect the system configuration by assigning a system configuration password
- Change a system configuration password
- Choose not to password protect the system configuration by removing any assigned system configuration passwords

Change the system configuration password settings

When you change the password, it is important that system administrators save the passwords that are associated with the different backups and keep the passwords safe. If you are restoring a backup, you may be asked to provide the system configuration password that was valid at the time the backup was created. Without this password, you cannot restore your configuration from the backup.

After you change the password, and if your management server and event server are installed on separate computers, you must enter the current system configuration password on the event server, too. For more information, see Enter current system configuration password (event server).

To apply the changes, you must restart the management server services.

1. Locate the management server tray icon and make sure that the service is running.
2. Right-click the notification area's Management Server service icon and select **Change system configuration password settings**.
3. The change system configuration password settings window appears.

Assign a password

1. Type the new password in the **New password** field.
2. Retype the new password in the **Confirm new password** field and select **enter**.
3. Read the notification and click **yes** to accept the change.
4. Wait for the confirmation of change and select **Close**.
5. To apply the changes, you must restart the management server services.
6. After the restart, make sure that the management server is running.

Remove password protection

If you do not need password protection, you can select to opt out:

1. Select the check box: **I choose not to use a system configuration password and understand that the system configuration will not be encrypted** and click **enter**.
2. Read the notification and click **yes** to accept the change.
3. Wait for the confirmation of change and select **Close**.
4. To apply the changes, you must restart the management server services.
5. After the restart, make sure that the management server is running.

Enter the system configuration password settings (recovery)

If the file that is holding the password settings is deleted due to a hardware failure or other reasons, you will need to provide the system configuration password settings to access the database that is holding the system configuration. During installation on your new computer, you will be asked to enter the system configuration password settings.

But if the file that is holding the password settings is deleted or corrupted, and the computer that is running the management server has no other problems, you have the option to enter the system configuration password settings:

1. Locate the management server tray icon.
2. Right-click the notification area's Management Server service icon and select **Enter the system configuration password**.
3. The enter the system configuration password settings window appears.

The system configuration is password-protected

1. Type the password in the **password** field and select **Enter**.
2. Wait for the password to be accepted. Select **Close**.
3. Make sure that the management server is running.

The system configuration is not password-protected

1. Select the check box: **This system does not use a system configuration password** and select **enter**.
2. Wait for the setting to be accepted. Select **Close**.
3. Make sure that the management server is running.

Manually backing up your system configuration (explained)

When you want to perform a manual backup of the management server's database that contains your system configuration, make sure that your system stays online. The default name of the management server's database is **Surveillance**.

Here are a few things to consider before you start the backup:

- You cannot use a backup of the SQL Server database to copy system configurations to other systems
- It can take some time to back up the SQL Server database. It depends on your system configuration, your hardware, and on whether your SQL Server, management server and Management Client are installed on the same computer
- Logs, including audit logs, are stored in the log server's database and are therefore **not** part of a backup of the management server's database. The default name of the log server's database is **SurveillanceLogServerV2**. You back up both SQL Server databases the same way.

Backing up and restoring the event server configuration (explained)

The content of your event server configuration is included when you back up and restore system configuration.

The first time you run the event server, all its configuration files are automatically moved to the SQL Server database. You can apply the restored configuration to the event server without needing to restart the event server, and the event server can start and stop all external communication while the restoration of the configuration is being loaded.

Scheduled backup and restore of system configuration (explained)

The management server stores your system's configuration in a SQL Server database. Milestone recommends that you regularly make scheduled backups of this database as a disaster recovery measure. While it is rare to lose your system configuration, it can happen under unfortunate circumstances. Luckily, it takes only a minute, and backups also have the added benefit that they flush the transaction log of the SQL Server database.

If you have a smaller setup and do not need scheduled backups, you can back up your system configuration manually. For instructions, see Manually backing up your system configuration (explained).

When you back up/restore your management server, make sure that the SQL Server database with the system configuration is included in the backup/restore.

Requirements for using scheduled backup and restore

Microsoft® SQL Server Management Studio, a tool download-able for free from their website (https://www.microsoft.com/en-us/sql-server/sql-server-downloads).

Apart from managing SQL Server and its databases, the tool includes some easy-to-use backup and restoration features. Download and install the tool on your management server.

Back up system configuration with scheduled backup

1. From Windows' Start menu, launch Microsoft® SQL Server Management Studio.
2. When connecting, specify the name of the required SQL Server. Use the account under which you created the SQL Server database.
    a. Find the SQL Server database that contains your entire system configuration, including event server, recording servers, cameras, inputs, outputs, users, rules, patrolling profiles, and more. The default name of this SQL database is **Surveillance**.
    b. Make a backup of the SQL Server database and make sure to:
        a. Verify that the selected SQL Server database is the correct one
        b. Verify that the backup type is **full**
        c. Set the schedule for the recurrent backup. You can read more about scheduled and automated

backups on the Microsoft website (https://docs.microsoft.com/en-us/sql/relational-databases/logs/the-transaction-log-sql-server?view=sql-server-2017
   d. Verify that the suggested path is satisfactory or select alternative path
   e. Select to **verify backup when finished** and to **perform checksum before writing to media**
3. Follow the instructions in the tool to the end.

Also consider backing up the log server's database with your logs by using the same method. The default name for the SQL Server database of the log server is **SurveillanceLogServerV2**.

Restore system configuration from a scheduled backup

Requirements
To prevent system configuration changes being made while you restore the system configuration database, stop the:

- Management Server service (see Managing server services)
- Event Server service (can be done from Windows **Services** (search for **services.msc** on your machine. Within **Services**, locate **Milestone XProtect Event Server**))
- World Wide Web Publishing Service, also known as the Internet Information Service (IIS). Learn how to stop the IIS (https://technet.microsoft.com/library/cc732317(WS.10).aspx/)

Open Microsoft® SQL Server Management Studio from Windows' **Start** menu.

In the tool do the following:

1. When connecting, specify the name of your SQL Server. Use the user account under which the SQL Server database was created.
2. Find the SQL Server database (the default name is **Surveillance**) that contains your entire system configuration, including event server, recording servers, cameras, inputs, outputs, users, rules, patrolling profiles, etc.
3. Make a restore of the SQL Server database and make sure to:
   - Select to back up **from** device
   - Select backup media type **file**
   - Find and select your backup file (**.bak**)
   - Select to **overwrite the existing database**
4. Follow the instructions in the tool to the end.

Use the same method to restore the SQL Server database of the log server with your logs. The default name for the SQL Server database of the log server is **SurveillanceLogServerV2**.

The system does not work while the Management Server service is stopped. It is important to remember to start all the services again once you have finished restoring the database.

Back up log server's database

Handle the log server's database by using the method that you use when handling system configuration as described earlier. The log server's database contains all your system logs, including errors reported by recording servers and cameras. The default name of the log server's database is **SurveillanceLogServerV2**.

The SQL Server database is located on the log server's SQL Server. Typically, the log server and the management server have their SQL Server databases on the same SQL Server. Backing up the log server database is not vital since it does not contain any system configuration, but you may appreciate having access to system logs from before the management server backup/restore.

Backup and restore fail and problem scenarios (explained)

- If, after your last system configuration backup, you have moved the event server or other registered services such as the log server, you must select which registered service configuration you want for the new system. You can decide to keep the new configuration after the system is restored to the old version. You decide by looking at the host names of the services.

- If your restore of the system configuration fails because the event server is not located at the specified destination (for example, if you have chosen the old registered service setup), do another restore.
- If you are restoring a configuration backup and entering a system configuration password that is incorrect, you must provide the system configuration password that was valid at the time when the backup was created.

Moving the management server

The management server stores your system configuration in a SQL Server database. If you are moving the management server from one physical server to another, it is vital that you make sure that your new management server also gets access to this SQL Server database. The system configuration database can be stored in two different ways:

- **Network SQL Server**: If you are storing your system configuration in a SQL Server database on SQL Server on your network, you can point to the location of the database on that SQL Server when installing the management server software on your new management server. In that case, only the following paragraph about management server host name and IP address applies and you should ignore the rest of this topic:

  Management server host name and IP address: When you move the management server from one physical server to another physical server, it is by far the easiest to give the new server the same host name and IP address as the old one. This is because the recording server automatically connects to the host name and IP address of the old management server. If you give the new management server a new host name and/or IP address, the recording server cannot find the management server and you must manually stop each Recording Server service in your system, change their management server URL, register the recording server again and when done, start the Recording Server service.

- **Local SQL Server**: If you are storing your system configuration in a SQL Server database on SQL Server on the management server itself, it is important that you back up the existing management server's system configuration database before the move. By backing up the SQL Server database, and subsequently restoring it on a SQL Server on the new management server, you avoid having to reconfigure your cameras, rules, time profiles, etc. after the move

If you move the management server, you will need the current system configuration password in order to restore the backup, see System configuration password (explained).

Requirements

- **Your software installation file for installation on the new management server**
- **Your software license file (.lic)**, that you received when you purchased your system and initially installed it. You should not use the activated software license file which you have received after a manual offline license activation. An activated software license file contains information about the specific server on which the system is installed. Therefore, an activated software license file cannot be reused when moving to a new server

If you are also upgrading your system software in connection with the move, you have received a new software license file. Simply use this.

- **Local SQL Server users only: Microsoft® SQL Server Management Studio**
- What happens while the management server is unavailable? Unavailable management servers (explained))
- Copy log server database (see Back up log server's database)

Unavailable management servers (explained)

- **Recording servers can still record**: Any currently working recording servers received a copy of their configuration from the management server, so they can work and store recordings on their own while the management server is down. Scheduled and motion-triggered recording therefore works, and event-triggered recording works unless based on events related to the management server or any other recording server because these go through the management server
- **Recording servers temporarily store log data locally**: They automatically send log data to the management server when it becomes available again:
  - **Clients cannot log in**: Client access is authorized through the management server. Without the management server, clients cannot log in
  - **Clients that are already logged in can remain logged in for up to four hours**: When clients log in, they

are authorized by the management server and can communicate with recording servers for up to four hours. If you can get the new management server up and running within four hours, many of your users are not affected
- **No ability to configure the system**: Without the management server, you cannot change the system configuration

Milestone recommends that you inform your users about the risk of losing contact with the surveillance system while the management server is down.

Move the system configuration

Moving your system configuration is a three step process:

1. Make a backup of your system configuration. This is identical to making a scheduled backup. See also Back up system configuration with scheduled backup.
2. Install the new management server on the new server. See scheduled backup, step 2.
3. Restore your system configuration to the new system. See also Restore system configuration from a scheduled backup.

Replace a recording server

If a recording server is malfunctioning and you want to replace it with a new server that inherits the settings of the old recording server:

1. Retrieve the recording server ID from the old recording server:
   a. Select **Recording Servers**, then in the **Overview** pane select the old recording server.
   b. Select the **Storage** tab.
   c. Press and hold down the CTRL key on your keyboard while selecting the **Info** tab.
   d. Copy the recording server ID-number in the lower part of the **Info** tab. Do not copy the term *ID*, only the number itself.

2. Replace the recording server ID on the new recording server:
   a. Stop the Recording Server service on the old recording server, then in Windows' **Services** set the service's **Startup type** to **Disabled**.

> **!** It is very important that you do not start two recording servers with identical IDs at the same time.

   b. On the new recording server, open an explorer and go to `C:\ProgramData\Milestone\XProtect Recording Server` or the path where your recording server is located.
   c. Open the file `RecorderConfig.xml`.
   d. Delete the ID stated in between the tags *<id>* and *</id>*.

   e. Paste the copied recording server ID in between the tags *<id>* and *</id>*. Save the *RecorderConfig.xml* file.
   f. Go to the registry: `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\VideoOS\Recorder\Installation`.
   g. Open **RecorderIDOnMachine** and change the old recording server ID with the new ID.
3. Register the new recording server on the management server. To do that, right- click the Recording Server Manager

tray icon and click **Register**. For more information, see Register a recording server.
4. Restart the Recording Server service. When the new Recording Server service starts up, it has inherited all settings from the old recording server.

Move hardware

You can move hardware between recording servers that belong to the same site. After a move, the hardware and its devices run on the new recording server and new recordings are stored on this server. The move is transparent to the client users.

The recordings on the old recording server remain there until:

- The system deletes them when the retention time expires. Recordings that someone has protected with Evidence Lock (see Evidence locks (explained)) is not deleted until the evidence lock's retention time expires. You define the retention time for evidence locks when you create them. Potentially the retention time never expires
- You delete them from each device's new recording server on the **Record** tab

If you try to remove a recording server that still contains recordings, you receive a warning.

If you move hardware to a recording server that currently has no hardware added to it, the client users must log out and log in to receive data from the devices.

You can use the move hardware feature to:

- **Load balance**: If, for example, the disk on a recording server is overloaded, you can add a new recording server and move some of your hardware
- **Upgrade**: If you, for example, have to replace the server that hosts the recording server with a newer model, you can install a new recording server and move the hardware from the old server to the new server
- **Replace a defective recording server**: If, for example, the server is offline and will never come online again, you can move the hardware to other recording servers and thereby keep the system running. You cannot access the old recordings. For more information, see Replace a recording server.

Remote recordings

When you move hardware to another recording server, the system cancels ongoing or scheduled retrievals from interconnected sites or edge storages on cameras. The recordings are not deleted, but the data is not retrieved and saved in the databases as expected. You receive a warning if this is the case. For the XProtect Smart Client user, who has started a retrieval when you initiate moving the hardware, the retrieval fails. The XProtect Smart Client user is notified and can try again later.

If someone has moved hardware on a remote site, you must manually synchronize the central site with the **Update hardware** option to reflect the new configuration of the remote site. If you do not synchronize, the moved cameras remain disconnected on the central site.

Move hardware (wizard)

To move hardware from one recording server to another, run the **Move hardware** wizard. The wizard takes you through the necessary steps to complete a move for one or more hardware devices.

Requirements
Before you start the wizard:

- Make sure that the new recording server can access the physical camera via the network
- Install a recording server that you want to move hardware to (see Installing through Download Manager (explained) or Install a recording server silently)
- Install the same device pack versions on the new recording server that you run on the existing server (see Device drivers (explained))

To run the wizard:

1. In the **Site Navigation** pane, select **Recording Servers**.

2. In the **Overview** pane, right-click the recording server you want to move hardware from or right-click a specific hardware device.
3. Select **Move Hardware**.

> If the recording server that you move hardware from is disconnected, an error message appears. You should only choose to move hardware from a disconnected recording server if you are sure that it will never come online again. If you move hardware anyway and the server comes back online, you risk an unexpected behavior from the system due to having the same hardware running on two recording servers for a period. Possible issues are, for example, license errors or events that are not sent to the correct recording server.

4. If you started the wizard from the recording server level, the **Select the hardware you want to move** page appears. Select the hardware devices you want to move.
5. On the **Select the recording server you want to move the hardware to** page, select from the list of recording servers installed on this site.
6. On the **Select the storage you want to use for future recordings** page, the storage usage bar indicates the free space in the recording database for live recordings only, not the archives. The total retention time is the retention period for both the recording database and the archives.
7. The system processes your request.
8. If the move was successful, click **Close**. If you select the new recording server in the Management Client, you can see the moved hardware and now recordings are stored on this server.

   If the move failed, you can troubleshoot the issue below.

> In an interconnected system, you must manually synchronize the central site after moving hardware on a remote site to reflect the changes you, or another system administrator, made at the remote site.

Move hardware troubleshooting

If a move did not succeed, one of the following reasons can be the cause:

Error type	Troubleshooting
The recording server is not connected or in failover mode.	Make sure that the recording server is online. You may need to register it. If the server is in failover mode, wait and try again.
The recording server is not the latest version.	Update the recording server so it runs the same version as the management server.
The recording server could not be found in the configuration.	Make sure that the recording server has not been removed.
Updating the configuration or communication with the configuration database failed.	Make sure that your SQL Server and database are connected and running.
Stopping the hardware on the current	Maybe another process has locked the recording server, or the recording

Error type	Troubleshooting
recording server failed	server is in error mode. Make sure that the recording server is running and try again.
The hardware does not exist.	Make sure that the hardware you try to move has not simultaneously been removed from the system by another user. The scenario is quite unlikely.
The recording server that hardware was moved from is back online, but you chose to ignore it when it was offline.	Most likely, you have accepted that the old recording server will never get online again when you started the **Move Hardware** wizard, but during the move, the server came online. Start the wizard again and select **No** when you are asked to confirm if the server comes online again.
The source recording storage is unavailable.	You are trying to move hardware with devices configured with a recording storage which is currently offline. A recording storage is offline if the disk is offline or otherwise unavailable. Make sure that the recording storage is online and try again.
All recording storages on the target recording server must be available.	You are trying to move hardware to a recording server where one or more recording storages are currently offline. Make sure that all recording storages on the target recording server are online. A recording storage is offline of the disk is offline or otherwise unavailable.

Replace hardware

When you replace a hardware device on your network with another hardware device, you must know the IP address, port, user name and password of the new hardware device.

If you have not enabled automatic license activation (see Automatic license activation (explained) and have used all device changes without activation (see Device changes without activation (explained)), you must manually activate your licenses **after** replacing hardware devices. If the new number of hardware devices exceeds your total number of device licenses, you have to purchase new device licenses.

1. Expand the required recording server, right-click the hardware you want to replace.
2. Select **Replace Hardware**.
3. The **Replace Hardware** wizard appears. Click **Next**.
4. In the wizard, in the **Address** field (marked by red arrow in the image), enter the IP address of the new hardware. If known, select the relevant driver from the **Hardware Driver** dropdown list. Otherwise select **Auto Detect**. If port, user name or password data is different for the new hardware, correct this **before starting the auto detect process (if needed)**.

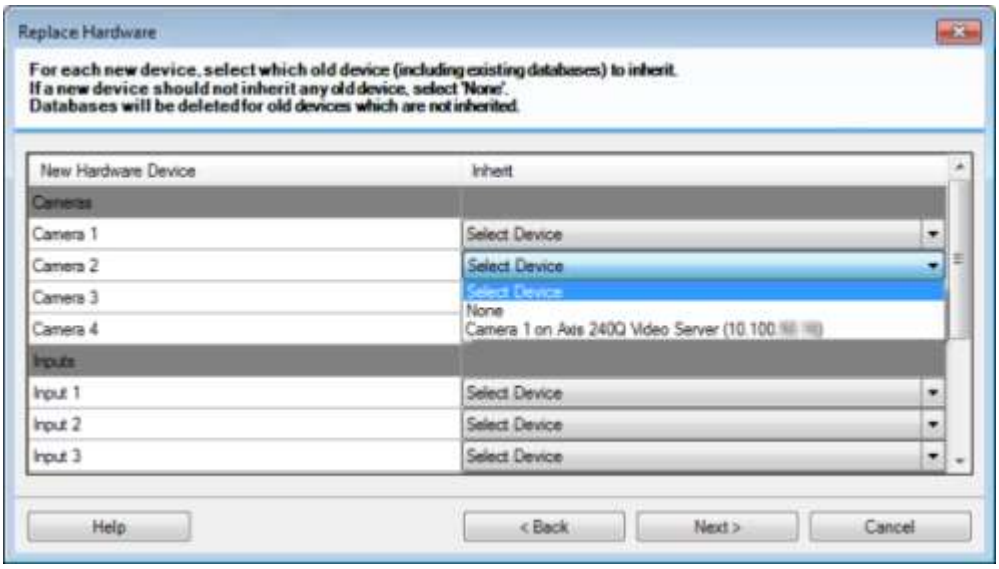
The wizard is pre-filled with data from the existing hardware. If you replace it with a similar hardware device, you can reuse some of this data - for example, port and driver information.

5. Do one of the following:
   - If you selected the required hardware device driver directly from the list, click **Next**
   - If you selected **Auto Detect** in the list, click **Auto Detect**, wait for this process to be successful (marked by a ✓ to the far left), click **Next**

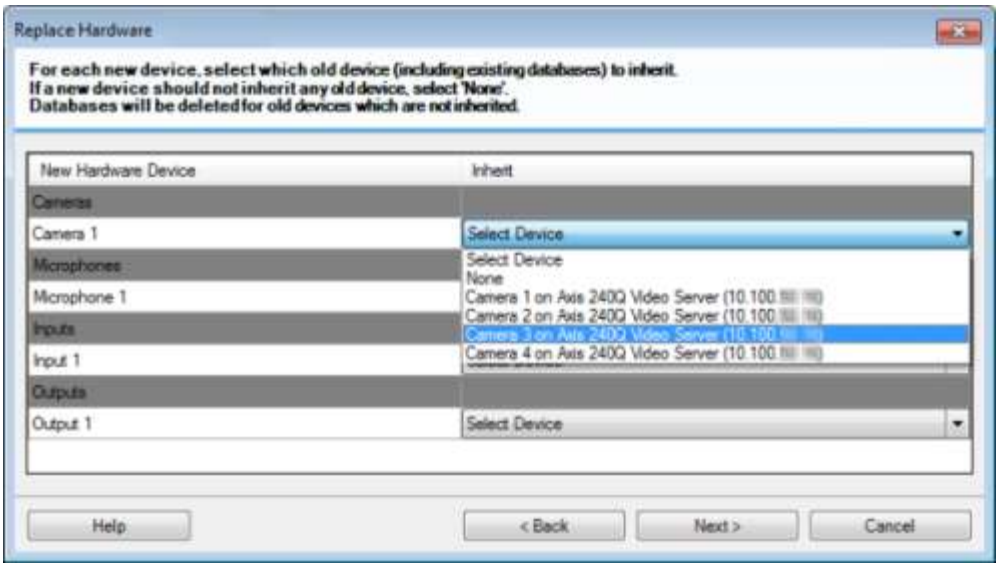
   This step is designed to help you map devices and their databases, depending on the number of individual cameras, microphones, inputs, outputs and so on attached to the old hardware device and the new respectively.

   It is important to consider **how** to map databases from the old hardware device to databases of the new hardware device. You do the actual mapping of individual devices by selecting a corresponding camera, microphone, input, output or **None** in the right-side column.

   > ⚠ Make sure to map **all** cameras, microphones, inputs, outputs, etc. Contents mapped to **None**, are **lost**.



Example of the old hardware device having more individual devices than the new one:



Click **Next**.

6. You are presented with a list of hardware to be added, replaced or removed. Click **Confirm**.
7. Final step is a summary of added, replaced and inherited devices and their settings. Click **Copy to Clipboard** to copy contents to the Windows clipboard or/and **Close** to end the wizard.

Update your hardware data

To make sure that your hardware device and the system are using the same firmware version, you need to manually update the hardware data for the hardware device in the Management Client. Milestone recommends that you update the hardware data after every firmware update to your hardware device.

To get the latest hardware data:

1. In the **Site Navigation** pane, select **Recording Servers**.
2. Expand the required recording server, then select the hardware that you want to get the latest information for.
3. In the **Properties** pane on the **Info** tab, click the **Update** button in the **Hardware data last updated** field.
4. The wizard checks if the system is running the latest firmware for the hardware.

   Select **Confirm** to update the information in the Management Client. When the update is complete, The current firmware version for the hardware device that is detected by the system appears in the **Firmware version** field on the **Info** tab.

Change the location and name of a SQL Server database

The management server, event server, log server, Identity Provider, and XProtect Incident Manager connect to different SQL Server databases using connection strings. These connection strings are stored in the Windows registry. If you have changed the location or name of a SQL Server database, you must edit all connection strings that point to that SQL Server database.

Database	Used by
Surveillance database	• Management Server service

Database	Used by
	• Event Server service • VideoOS Management Server app pool • VideoOS Report Server app pool
Surveillance_IDP	• VideoOS IDP app pool
Surveilance_IM	• VideoOS IM app pool
Surveillance_LogServerV2	• Log Server service

Before you proceed:

- Back up the SQL Server databases and the Windows registry.
- Make sure that the user that runs the related services and app pools is the owner of the database.
- Complete the content migration from the old SQL Server database to the new one.

To update the connection strings with the new location and name of a SQL Server database:

1. Stop all XProtect VMS services and app pools that use the SQL Server database.

   Depending on your system architecture, the services and app pools might run on different computers. You must stop all app pools and services that connect to the same SQL Server database.

2. In Registry Editor, go to `HKEY_LOCAL_MACHINE\SOFTWARE\VideoOS\Server\ConnectionString`.
3. Update the connection strings with the new location and name of the SQL Server database.

   The default connection strings for all SQL Server databases are:

   - **ManagementServer**: `Data Source=localhost;Initial Catalog=Surveillance;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`
   - **EventServer**: `Data Source=localhost;Initial Catalog=Surveillance;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`
   - **ServerService**: `Data Source=localhost;Initial Catalog=Surveillance;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`
   - **ReportServer**: `Data Source=localhost;Initial Catalog=Surveillance;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`
   - **IDP**: `Data Source=localhost;Initial Catalog=Surveillance_IDP;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`
   - **IncidentManager**: `Data Source=localhost;Initial Catalog=Surveillance_IM;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`

- **LogServer**: `Data Source=localhost;Initial Catalog=SurveillanceLogServerV2;Integrated Security=True;Max Pool Size=1000;Encrypt=True;Trust Server Certificate=True`

4. Start all XProtect services and app pools that you have stopped in step 1.

Managing server services

On the computer that runs server services, you find server manager tray icons in the notification area. Through these icons, you can get information about the services and perform certain tasks. This includes, for example, checking the state of the services, viewing logs or status messages, and starting and stopping the services.

Server manager tray icons (explained)

The tray icons in the table show the different states of the services running on the management server, recording server, failover recording server, and event server. They are visible on the computers with the servers installed, in the notification area:

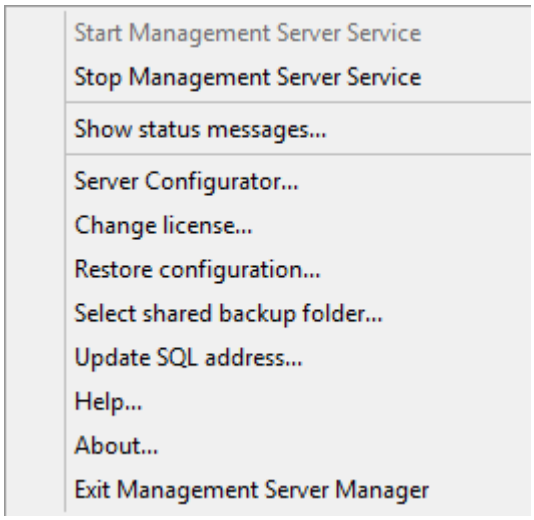
Management Server Manager tray icon	Recording Server Manager tray icon	Event Server Manager tray icon	Failover Recording Server Manager tray icon	Description
				**Running** Appears when a server service is enabled and started. If the Failover Recording Server service is running, it can take over if the standard recording servers fails.
				**Stopped** Appears when a server service has stopped. If the Failover Recording Server service stops, it cannot take over if the standard recording server fails.
				**Starting** Appears when a server service is in the process of starting. Under normal circumstances, the tray icon changes after a short while to **Running**.
				**Stopping**

Management Server Manager tray icon	Recording Server Manager tray icon	Event Server Manager tray icon	Failover Recording Server Manager tray icon	Description
				Appears when a server service is in the process of stopping. Under normal circumstances, the tray icon changes after a short while to **Stopped**.
				**In indeterminate state** Appears when the server service is initially loaded and until the first information is received, upon which the tray icon, under normal circumstances, changes to **Starting** and afterwards to **Running**.
				**Running offline** Typically appears when the Recording Server or Failover recording service is running but the Management Server service is not.

Start or stop the Management Server service

The Management Server Manager tray icon indicates the state of the Management Server service, for example **Running**. Through this icon, you can start or stop the Management Server service. If you stop the Management Server service, you cannot use the Management Client.

1. In the notification area, right-click the Management Server Manager tray icon. A context-menu appears.



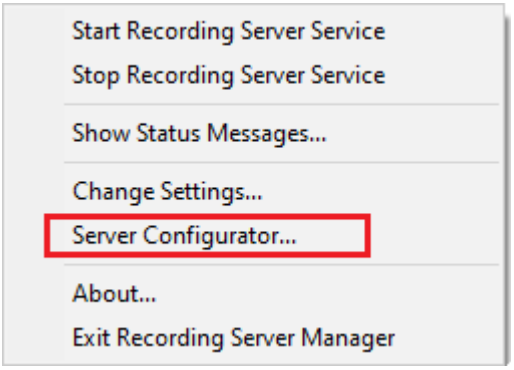
2. If the service has stopped, click **Start Management Server service** to start it. The tray icon changes to reflect the new state.
3. To stop the service, click **Stop Management Server service**.

For more information about the tray icons, see Server manager tray icons (explained).

Start or stop the Recording Server service

The Recording Server Manager tray icon indicates the state of the Recording Server service, for example **Running**. Through this icon, you can start or stop the Recording Server service. If you stop the Recording Server service, your system cannot interact with devices connected to the server. This means you cannot view live video or record video.

1. In the notification area, right-click the Recording Server Manager tray icon. A context-menu appears.

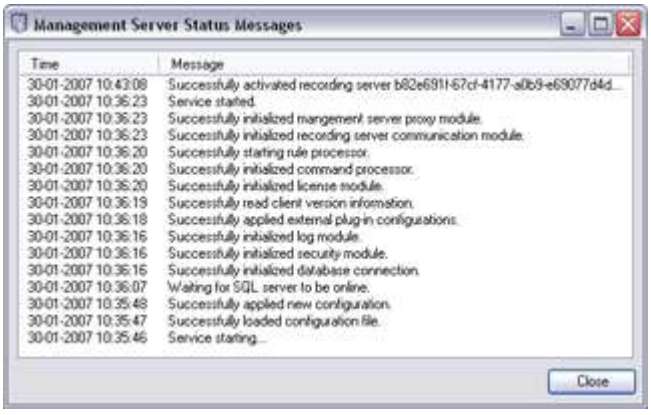


2. If the service has stopped, click **Start Recording Server service** to start it. The tray icon changes to reflect the new state.
3. To stop the service, click **Stop Recording Server service**.

For more information about the tray icons, see Server manager tray icons (explained).

View status messages for Management Server or Recording Server

1. In the notification area, right-click the relevant tray icon. A context-menu appears.
2. Select **Show Status Messages**. Depending on the server type, either the **Management Server Status Messages** or **Recording Server Status Messages** window appears, listing time-stamped status messages:



Manage encryption with the Server Configurator

Use the Server Configurator to select certificates on local servers for encrypted communication and register server services to make them qualified to communicate with the servers.

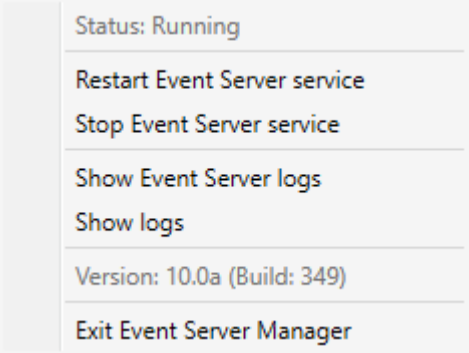
Open the Server Configurator from either the Windows startup menu, from the management server tray icon or from the recording server tray icon. See Server Configurator (Utility).

For more information, see the certificates guide about how to secure your XProtect VMS installations.

Start, stop, or restart the Event Server service

The Event Server Manager tray icon indicates the state of the Event Server service, for example **Running**. Through this icon, you can start, stop, or restart the Event Server service. If you stop the service, parts of the system will not work, including events and alarms. However, you can still view and record video. For more information, see Stopping the Event Server service.

1. In the notification area, right-click the Event Server Manager tray icon. A context-menu appears.



2. If the service has stopped, click **Start Event Server service** to start it. The tray icon changes to reflect the new state.
3. To restart or stop the service, click **Restart Event Server service** or **Stop Event Server service**.

For more information about the tray icons, see Server manager tray icons (explained).

Stopping the Event Server service

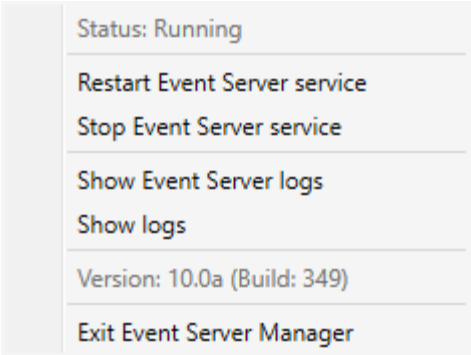
When installing MIP plug-ins in the Event Server, first you must stop the Event Server service and then, afterward, restart it. While the service is stopped, many areas of the VMS system will not function:

- No events or alarms are stored in the Event Server. However, system and device events still trigger actions, for example start recording
- XProtect extensions do not work in XProtect Smart Client and cannot be configured from the Management Client.
- Analytic events do not work
- Generic events do not work
- No alarms are triggered
- In XProtect Smart Client, map view items, alarm list view items, and the Alarm Manager workspace do not work
- MIP plug-ins in the Event Server cannot run
- MIP plug-ins in Management Client and XProtect Smart Client do not work correctly

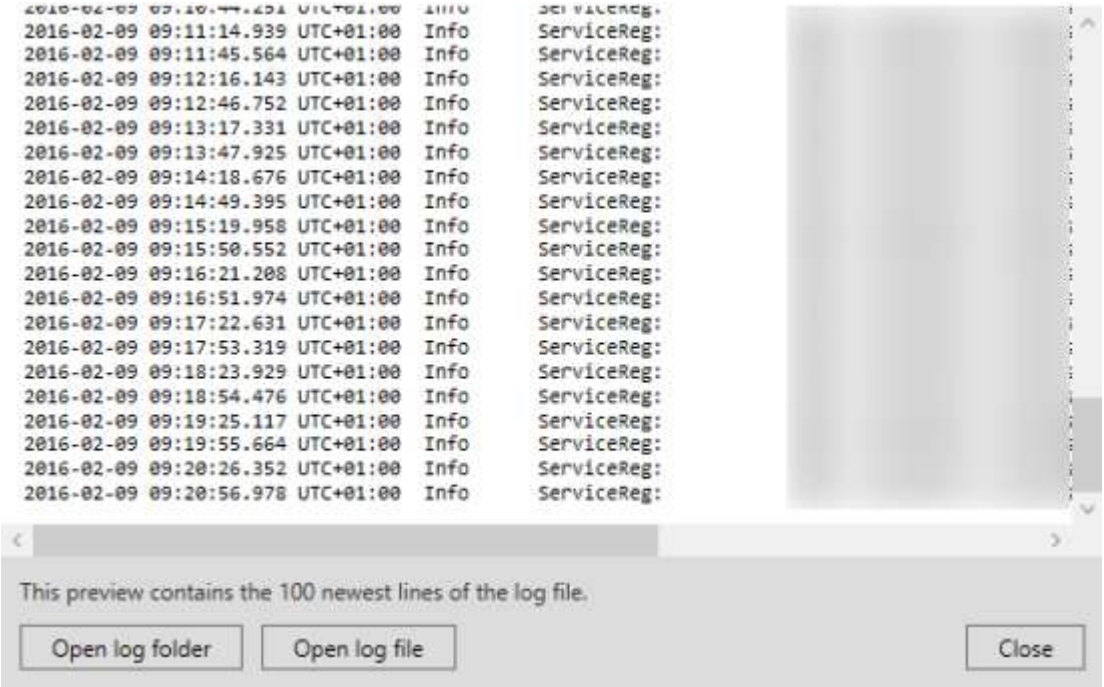
View Event Server or MIP logs

You can view time-stamped information about Event Server activities in the Event Server log. Information about third party integrations is logged in the MIP log in a sub-folder in the **Event Server** folder.

1. In the notification area, right-click the Event Server Manager tray icon. A context-menu appears.



2. To view the 100 most recent lines in the Event Server log, click **Show Event Server Logs**. A log viewer appears.



   a. To view the log file, click **Open log file**.
   b. To open the log folder, click **Open log folder**.
3. To view the 100 most recent lines in the MIP log, go back to the context-menu and click **Show MIP logs**. A log viewer is displayed.

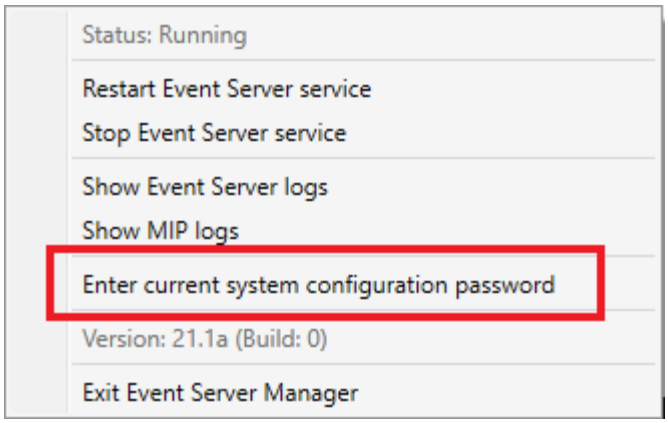
If someone removes the log file from the log directory, the menu items are grayed out. To open the log viewer, first you need to copy the log file back into its folder: `C:\ProgramData\Milestone\XProtect Event Server\logs`.

Enter current system configuration password

If the system configuration password has been changed in the management server, you must enter the current system configuration password in the event server, too.

If you don't enter the current password in the event server, then system components, such as access control, will stop working.

1. In the notification area, right-click the Event Server Manager tray icon. A context-menu appears.



2. To enter the current system configuration password, click **Enter current system configuration password**. A window appears.
3. Enter the same system configuration password that has been entered in the management server.

Managing registered services

Occasionally, you have servers and/or services which should be able to communicate with the system even if they are not directly part of the system. Some services, but not all, can register themselves automatically in the system. Services that can automatically be registered are:

- Event Server service
- Log Server service

Automatically registered services are displayed in the list of registered services.

You can manually specify servers/services as registered services in the Management Client.

Add and edit registered services

1. In the **Add/Remove Registered Services** window, click **Add** or **Edit**, depending on your needs.
2. In the **Add Registered Service** or **Edit Registered Service** window (depending on your earlier selection), specify or edit settings.
3. Click **OK**.

Manage network configuration

With the network configuration settings, you can specify the management server's server LAN and WAN addresses so the management server and the trusted servers can communicate.

1. In the **Add/Remove Registered Services** window, click **Network**.
2. Specify the LAN and/or WAN IP address of the management server.

   If all involved servers (both the management server and the trusted servers) are on your local network, you can simply specify the LAN address. If one or more involved servers access the system through an internet connection, you must also specify the WAN address.

3. Click **OK**.

Registered services properties

In the **Add Registered Service** or **Edit Registered Service** window, specify the following:

Component	Requirement
Type	Prefilled field.
Name	Name of the registered service. The name is only used for display purposes in the Management Client.
URLs	Click **Add** to add the IP address or hostname of the registered service. If specifying a hostname as part of a URL, the host must exist and be available on the network. URLs must begin with *http://* or *https://* and must not contain any of the following characters: *< > & ' " * ? | [ ] "*. **Example** of a typical URL format: *http://ipaddress:port/directory* (where port and directory are optional). You can add more than one URL if required.
Trusted	Select if the registered service should be trusted immediately (this is often the case, but the option gives you the flexibility to add the registered service and then mark it as trusted by editing the registered service later). Changing the trusted state also changes the state of other registered services sharing one or more of the URLs defined for the relevant registered service.
Description	Description of the registered service. The description is only used for display purposes in the Management Client.
Advanced	When a service is advanced, it has specific URI schemes (for example, HTTP, HTTPS, TCP, or UDP) that need to be set up for each host address you define. A host address therefore has multiple endpoints, each with its own scheme, host address and IP port for that scheme.

Removing device drivers (explained)

If you no longer require device drivers on your computer, you can delete the device packs from your system. To do so, follow the standard Windows procedure for removing programs.

If you have multiple device packs installed and have problems deleting the files, you can use the script in the device pack installation folder to delete them completely.

If you remove device drivers, the recording server and the camera devices cannot communicate any longer. Do not remove device packs when you upgrade because you can install a new version on top of an old one. Only if you uninstall the entire system may you remove the device pack.

Remove a recording server

If you remove a recording server, all configuration specified in the Management Client is removed for the recording server, including **all** of the recording server's associated hardware (cameras, input devices, and so on).

1. Right-click the recording server you want to remove in the **Overview** pane.
2. Select **Remove Recording Server**.
3. If you are sure, click **Yes**.
4. The recording server and all of its associated hardware are removed.

Delete all hardware on a recording server

When you delete hardware, all recorded data related to the hardware is deleted permanently.

1. Right-click the recording server on which you want to delete all hardware.
2. Select **Delete All Hardware**.
3. Confirm the deletion.

Changing the host name of the management server computer

If the management server is addressed by its fully qualified domain name (FQDN) or its host name, a change to the host name of the computer will have implications within XProtect that must be considered and dealt with.

In general, a change of the host name of a management server should be planned for carefully due to the amount of clean-up that might be required afterwards.

In the following sections you can get an overview of some of the implications of a change of a host name.

The validity of certificates

Loss of customer data properties for registered services

In Milestone Customer Dashboard, the host name will appear unchanged

A host name change can trigger the change of the SQL Server address

Host name changes in a Milestone Federated Architecture

The validity of certificates

Certificates are used to encrypt communication between services, and the certificates are installed on all the computers that run one or more of the XProtect services.

Depending on how certificates are created, they can be related to the computer they are installed on, and they will only be valid as long as the computer name stays the same.

For more information about how to create certificates, see Introduction to certificates.

If a computer name is changed, the certificates that are used may become invalid, and the XProtect VMS cannot be started.

To get the system up and running again, complete these steps:

- Create new certificates and reinstall them on all of the computers in the environment.
- Apply the new certificates, using the Server Configurator, on each of the computers to enable encryption with the new certificates.

This will trigger the registration of the new certificates and get the system up and running again.

Loss of customer data properties for registered services

If you complete a registration using the Server Configurator after, for example, a change to the management server address, any edits to information for the registered services will be overwritten. So, if you have changed information for the registered services, the changes must be applied again for all the services that are registered to the management server on the computer with the changed name.

The information that can be edited for registered services is located under **Tools** > **Registered Services** > **Edit**:

- Trusted
- Advanced
- External flag
- Any manually added URL

In Milestone Customer Dashboard, the host name will appear unchanged

Milestone Customer Dashboard is a free online tool for Milestone partners, resellers, and XProtect VMS users to manage and monitor Milestone software installations and licenses.

A change of the name of the management server on a system that is connected to Milestone Customer Dashboard will not automatically be reflected in Milestone Customer Dashboard.

The old host name will appear in Milestone Customer Dashboard until a new license activation is completed. The name change, however, will not break anything in Milestone Customer Dashboard and once a new activation takes place, the record is updated in the database with the new host name. For more information about Milestone Customer Dashboard, see Milestone Customer Dashboard (explained).

A host name change can trigger the change of the SQL Server address

If SQL Server is located on the same computer as the management server, and the name of this computer is changed, the address of SQL Server will change as well. This means that the SQL Server address will have to be updated for components located on different computers as well as for components on the local computer that use the computer name rather than localhost to connect to SQL Server. This specifically applies to the Event Server which uses the same database as the Management Server. It might also apply to the Log Server which uses a different database but very likely on the same SQL Server.

See Change the location and name of a SQL Server database.

Host name changes in a Milestone Federated Architecture

Changes to the name of a computer that resides within a Milestone Federated Architecture setup will have the following implications, and this applies both when sites are connected inside work groups and across domains.

The host of the site is the root node in the architecture

If you change the name of the computer that the central site within the architecture is running on, all child nodes will be re-attached automatically to the new address. So in this case, a rename will not require any actions.

The host of the site is a child node in the architecture

To avoid connection issues when changing the name of a computer that one or more federated sites are running on, you must add an alternate address to the affected site, before the computer is renamed. The affected site being the node whose host computer will be renamed. For more information about connection issues due to unprepared or unpredicted host name changes and how to resolve the problems, see Issue: A parent node in a Milestone Federated Architecture setup cannot connect to a child node.

The alternate address must be added in the **Properties** pane in either the **Site Navigation** or the **Federated Site Hierarchy** pane. The following prerequisites must be met:

- The alternate address must be added to be available before the host computer is renamed
- The alternate address must reflect the future name of the host computer (when renamed)

See Set site properties for information about how to access the **Properties** pane.

To ensure the smoothest update possible, stop the Management Client on the node that serve as a parent node to the one whose host name will change. Otherwise, stop and restart the client after the computer has been renamed. For more information, see Start or stop the Management Server service.

Also, make sure the alternate address you provided is reflected in the **Federated Site Hierarchy** pane at your central site and if not, stop and restart the Management Client.

Once the host has been renamed, and you have restarted the computer, the federated site will automatically switch to the new address.

Managing server logs

The following are the types of server logs:

- System log
- Audit log
- Rule-triggered logs

These are used to log the usage of the system. These logs are available in the Management Client under **Server logs**.

For information about logs used for troubleshooting and investigating software errors, see Debug logs (explained).

Identify user activity, events, actions and errors

Use logs to get a detailed record of user activity, events, actions, and errors in the system.

To see logs in the Management Client, go to the **Site Navigation** pane and select **Server Logs**.

Log type	What is logged?
System logs	System-related information
Audit logs	User activity
Rule-triggered logs	Rules in which users have specified the **Make new <log entry>** action. For more information about the <log entry> action, see Actions and stop actions.

To see logs in a different language, see General tab (options) under **Options**.

To export logs as comma-separated values (.csv) files, see Export logs.

To change log settings, see Server Logs tab (options).

Filter Logs

In each log window, you can apply filters to see log entries from, for example, a specific time span, a device, or a user.

Filters are generated from the log entries that are currently visible in the user interface.

1. In the **Site Navigation** pane, select **Server Logs**. By default, the **System logs** tab appears.

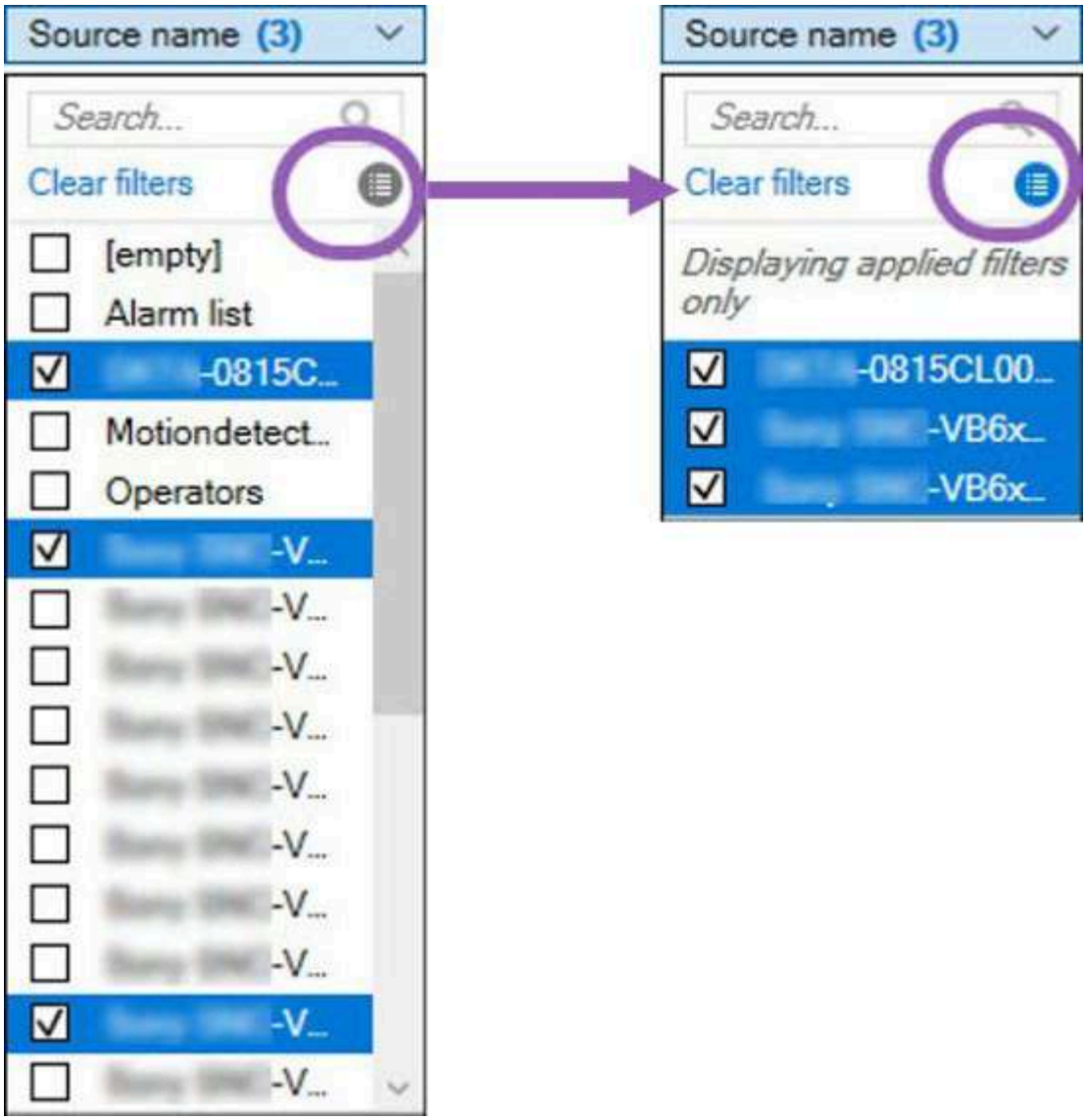
   To navigate between log types, select a different tab.

2. Under the tabs, select a filter group, for example, **Category**, **Source type**, or **User**.

   A list of filters appears. A list of filters shows maximum 1000 filters.

3. Select a filter to apply it. Select the filter again to remove it.

   Optional: In a list of filters, select **Display applied filters only** to see only the filters that you applied.



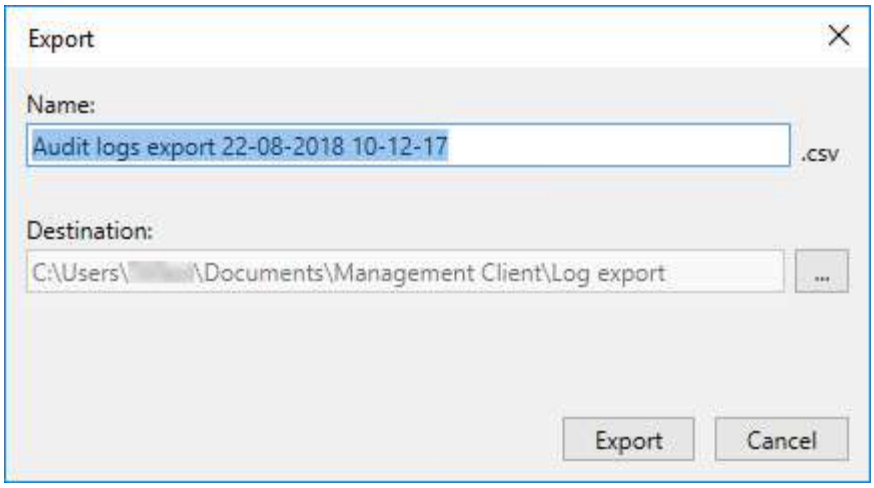
When you export logs, the contents of your export change depending on the filters that you apply. For information about your export, see Export logs.

Export logs

Exporting logs helps you to, for example, save log entries beyond the log retention period. You can export logs as comma-separated values (.csv) files.

To export a log:

1. Select **Export** in the upper-right corner. The **Export** window appears.



2. In the **Export** window, in the **Name** field, specify a name for the log file.
3. By default, exported log files are saved in your **Log export** folder. To specify a different location, select ... to the right of the **Destination** field.
4. Select **Export** to export the log.

The contents of your export change depending on the filters that you apply. For information about your export, see Filter logs.

Search logs

To search a log, use **Search criteria** in the top part of the log pane:

1. Specify your search criteria from the lists.
2. Click **Refresh** to make the log page reflect your search criteria. To clear your search criteria, and return to viewing all of the log's content, click **Clear**.

You can double-click any row to have all details presented in a **Log Details** window. In this way you can also read the log entries that contain more text than can be displayed in a single line.

Change log language

1. At the bottom part of the log pane, in the **Show log in** list, select the wanted language.

2. The log is displayed in the selected language. Next time your open the log, it is reset to the default language.

Allow 2018 R2 and earlier components to write logs

The 2018 R3 version of the log server introduces authentication for added security. This prevents 2018 R2 and earlier components from writing logs to the log server.

Affected components:

- XProtect Smart Client
- XProtect LPR Plug-in
- LPR Server
- Access Control Plug-in

- Event Server
- Alarm Plug-in

If you're using the 2018 R2 or earlier version of any of the components listed above, you must decide whether or not to allow the component to write logs to the new log server:

1. Select **Tools** > **Options**.
2. In the **Options** dialog box, at the bottom of the **Server Logs** tab, find **the Allow 2018 R2 and earlier components to write logs** check box.
    - Select the check box to allow 2018 R2 and earlier components to write logs
    - Clear the check box to not allow 2018 R2 and earlier components to write logs

Debug logs (explained)

Debug logs are used to identify defects and flaws in the system.

For information about logs used for system usage, see Managing server logs.

The following are the location of the log files in the XProtect installation:

- `C:\ProgramData\Milestone\IDP\Logs`

  This is accessible only to IIS user and administrators. If the IIS user is changed, these permissions must be updated.

- `C:\ProgramData\Milestone\MIPSDK`
- `C:\ProgramData\Milestone\XProtect Data Collector Server\Logs`
- `C:\ProgramData\Milestone\XProtect Event Server\Logs`
- `C:\ProgramData\Milestone\XProtect Log Server`
- `C:\ProgramData\Milestone\XProtect Management Server\Logs`
- `C:\ProgramData\Milestone\XProtect Mobile Server\Logs`
- `C:\ProgramData\Milestone\XProtect Recording Server\Logs`
- `C:\ProgramData\Milestone\XProtect Report Web Server\Logs`

Issue: Change of SQL Server and database location prevents database access

If the location of SQL Server and the VMS databases has changed, for example by changing the host name of the computer running SQL Server, the recording server's access to the database is lost.

Solution: Change the connection strings to reflect the change of SQL Server and database. See Change the location and name of a SQL Server database.

Issue: Recording server startup fails due to port conflict

This issue can only appear if the Simple Mail Transfer Protocol (SMTP) service is running as it uses port 25. If port 25 is already in use for, it may not be possible to start the Recording Server service. It is important that port number 25 is available for the recording server's SMTP service.

SMTP Service: Verification and solutions

To verify whether SMTP Service is installed:

1. From Windows' **Start** menu, select **Control Panel**.
2. In the **Control Panel**, double-click **Add or Remove Programs**.
3. In the left side of the **Add or Remove Programs** window, click **Add/Remove Windows Components**.
4. In the **Windows Components** wizard, select **Internet Information Services (IIS)**, and click **Details**.
5. In the **Internet Information Services (IIS)** window, verify whether the **SMTP Service** check box is selected. If so, SMTP Service is installed.

If SMTP Service is installed, select one of the following solutions:

Solution 1: Disable SMTP Service, or set it to manual startup

This solution lets you start the recording server without having to stop the SMTP Service every time:

1. From Windows' **Start** menu, select **Control Panel**.
2. In the **Control Panel**, double-click **Administrative Tools**.
3. In the **Administrative Tools** window, double-click **Services**.
4. In the **Services** window, double-click **Simple Mail Transfer Protocol (SMTP)**.
5. In the **SMTP Properties** window, click **Stop**, then set **Startup type** to either **Manual** or **Disabled**.

   When set to **Manual**, the SMTP Service can be started manually from the **Services** window, or from a command prompt using the command *net start SMTPSVC*.

6. Click **OK**.

Solution 2: Remove SMTP service

Removing the SMTP Service may affect other applications using the SMTP Service.

1. From Windows' **Start** menu, select **Control Panel**.
2. In the **Control Panel** window, double-click **Add or Remove Programs**.
3. In the left side of the **Add or Remove Programs** window, click **Add/Remove Windows Components**.
4. In the **Windows Components** wizard, select the **Internet Information Services (IIS)** item, and click **Details**.
5. In the **Internet Information Services (IIS)** window, clear the **SMTP Service** check box.
6. Click **OK**, **Next**, and **Finish**.

Issue: Recording Server goes offline when switching Management Server cluster node

If you set up a Microsoft cluster for Management Server redundancy, the Recording Server or Recording Servers may go offline when switching Management Server between the cluster nodes.

To correct this, do the following:

When doing configuration changes, on the Microsoft Failover Cluster Manager, pause the control and monitoring of the service so the Server Configurator can make the changes and start and/or stop the Management Server service. If you change the failover cluster service startup type to manual, it should not result in any conflicts with the Server Configurator.

On the Management Server computers:

1. Start the Server Configurator on each of the computers that have a management server installed.
2. Go to the **Registration** page.
3. Click the pencil (✎) symbol to make management server address editable.
4. Change the management server address to the cluster role name hosting the Management Server, for example `http://MyCluster`.
5. Click **Register**.

On computers that have components that use the Management Server (for example, Recording Server, Mobile Server, Event Server, API Gateway):

1. Start the Server Configurator on each of the computers.
2. Go to the **Registration** page.
3. Change the management server address to the cluster role name hosting the Management Server, for example `http://MyCluster`.
4. Click **Register**.

Issue: A parent node in a Milestone Federated Architecture setup cannot connect to a child node

If you have renamed the host computer of a site that acts as a child node in a Milestone Federated Architecture, a parent node will not be able to connect to it.

To reestablish the connection between parent node and site

- Detach the affected site from its parent. For more information, see Detach a site from the hierarchy.
- Re-attach the site using the new name of its host. For more information, see Add site to hierarchy.

To make sure that the changes are in effect, you might want to stop and restart the Management Client on the node that serve as a parent node to the one whose host name has been changed. For more information, see Start or stop the Management Server service.

For more information about the implications of a host name change in a Milestone Federated Architecture setup, see Host name changes in a Milestone Federated Architecture.

Issue: The Recording Server service fails to start when adding hardware

If the Recording Server fails to start when you attempt to add a hardware device, it can be due to the length of the password that is associated with the hardware device.

To avoid this issue, the length of the unencrypted password must not exceed 87 characters.

For more information, see the article:

Recording Server service fails to start with 'Error retrieving complete configuration from Management Server' (troubleshooting)

on the Milestone Support Community.

Issue: Azure SQL Database service is unavailable

If you use Azure SQL Database and you experience a connection issue during installation or during normal operation, the reason could be that the Azure SQL Database service is temporarily unavailable.

Azure SQL Database is a service where most of the traditional database maintenance is taken care of by Microsoft. The service can be unavailable for short periods of time and the is designed to recover up to a certain extent with no user interaction required.

Database errors are written in the XProtect VMS log files with a related incident ID, which can be provided to Microsoft support in the case of an extended Azure SQL Database unavailability.

For more information, see Troubleshoot common connection issues to Azure SQL Database.

Issue: Problems using an external IDP

Login fails

Redirect URIs

The login might fail if, for example, the redirect URI is wrong. For more information, see Add redirect URIs for the web clients.

No Claims or claims not added to roles

If external IDP users do not have claims defined for them that can be used by the XProtect VMS or if claims have not been added to roles in the XProtect VMS, a log-in with one of the clients will fail even if the external IDP user has been successfully authenticated by the external IDP.

It is still possible, though, for external IDP users to access the XProtect VMS even if the external IDP users do not have claims defined for them. In this case, the XProtect VMS administrator must manually add the external IDP users to one or more roles after the external IDP users' initial log in.

The authentication option is not available in the login dialog box

If you enter an incorrect computer address in the log-in dialog box in a client, the client doesn’t get an answer to the API call. The API call is made when the client is started and whenever the address is changed and it queries which authentication options the XProtect VMS installation supports.

If the client doesn't get an answer to the API call when the client is started, the client defaults back to listing the standard

authentication options.

Claims cannot be selected on the roles

Claims that you want to use on roles must be added to the IDP configuration before they can be selected in the roles. The claims can be added on the **External IDP** tab in the **Options** dialog box: External IDP tab (options). If a claim is not added tothe IDP configuration, you will not be able select the claim in the roles.

Issue: Adding Active Directory users to roles fails

It may not be possible to add a Windows Active Directory user to roles from a Management Client that runs on a different computer than the Management Server.

Cause

This can happen, if the Management Server does not have port 445 open for incoming traffic.

Solution

Open port 445 on the XProtect Management Server computer for inbound connections from any workstation running the XProtect Management Client application.

For more information, see Ports used by the system.

Upgrade (explained)

When you upgrade, all components currently installed on the computer are upgraded. It is not possible to remove installed components during an upgrade. If you want to remove installed components, use Windows' **Add and remove programs** functionality before or after an upgrade. During the upgrade, all components, except the management server database, are automatically removed and replaced. This includes the drivers of your device pack.

Backward compatibility with recording servers from XProtect versions earlier than the current version is limited. You can still access recordings on such older recording servers, but to change their configuration, they must be of the same version as this current one. Milestone recommends that you upgrade all recording servers in your system.

When you upgrade including your recording servers, you are asked if you want to update or keep your video device drivers. If you choose to update, it might take a few minutes for your hardware devices to make connect to the new video device drivers after restart of your system. This is due to several internal checks on the newly installed drivers.

If you upgrade from version 2017 R3 or earlier to version 2018 R1 or later, and if your system has older cameras, you must manually download the device pack with legacy drivers from the download page on our website (https://www.milestonesys.com/download/). To see if you have cameras that use drivers in the legacy device pack, visit this page on our website (https://www.milestonesys.com/support/software/device-packs/).

If you upgrade from version 2018 R1 or earlier to version 2018 R2 or later, it is important that you update all recording servers in your system with a security patch before you upgrade. Upgrading without the security patch, will cause the recording servers to fail.

The instructions for installing the security patch on your recording servers are available on our website https://supportcommunity.milestonesys.com/s/article/XProtect-VMS-NET-security-vulnerability-hotfixes-for-2016-R1-2018-R1/.

If you want to encrypt the connection between the management server and the recording servers, all recording servers must be upgraded to 2019 R2 or newer.

For an overview of the recommend upgrade sequence, see Upgrade best practices

Upgrade requirements

- Have your software license file (see Licenses (explained)) (.lic) ready:
  - **Service pack upgrade**: During the installation of the management server, the wizard may ask you to specify the location of the software license file. You can use both the software license file you got after your purchase of your system (or latest upgrade) and the activated software license file you got after your last license activation
  - **Version upgrade**: After you purchased the new version, you receive a new software license file. During the installation of the management server, the wizard asks you to specify the location of the new software license file

  The system verifies the software license file before you can continue. Already added hardware devices and other devices that require licenses will enter a grace period. If you have not enabled automatic license activation (see Enable automatic license activation), remember to activate your licenses manually before the grace period expires. If you do not have your software license file, contact your XProtect reseller.

- Have your **new product version** software ready. You can download it from the download page on the Milestone website.
- Make sure that you have backed up the system configuration (see Backing up and restoring your system configuration (explained))

  The management server stores the system configuration in a SQL Server database. The SQL Server database can be located in a SQL Server instance on the management server machine itself or in a SQL Server instance on the network.

  If you use a SQL Server database in a SQL Server instance on your network, the management server must have administrator permissions on the SQL Server instance whenever you want to create, move or upgrade the SQL Server database. For regular use and maintenance of the SQL Server database, the management server only needs to be a database owner.

- If you plan to enable encryption during installation, you need to have the proper certificates installed and trusted on relevant computers. For more information, see Secure communication (explained).

When you are ready to start the upgrade, follow the procedures in Upgrade best practices.

Upgrade XProtect VMS to run in FIPS 140-2 compliant mode

From version 2020 R3, XProtect VMS is configured to run so that it uses only the FIPS 140-2-certified algorithm instances.

For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

> For FIPS 140-2 compliant systems, with exports and archived media databases from XProtect VMS versions prior to 2017 R1 that are encrypted with non FIPS-compliant cyphers, it is required to archive the data in a location where it can still be accessed after enabling FIPS.

The following process describes what is necessary to configure XProtect VMS to run in FIPS 140-2 compliant mode:

1. Disable the Windows FIPS security policy on all of the computers that are part of the VMS, including the computer that hosts SQL Server.

   When you upgrade, you cannot install XProtect VMS when FIPS is enabled on the Windows operating system.

2. Ensure standalone third-party integrations can run on a FIPS enabled Windows operating system.

   If a standalone integration is not FIPS 140-2 compliant, it cannot be run after you set Windows operating system to operate in FIPS mode.

   To prevent this:

   - Make an inventory of all your standalone integrations to XProtect VMS
   - Contact the providers of these integrations and ask if the integrations are FIPS 140-2 compliant
   - Deploy the FIPS 140-2 compliant standalone integrations
3. Ensure that the drivers, and hence the communication to the devices, adhere to FIPS 140-2 compliance.

   XProtect VMS is guaranteed and can enforce FIPS 140-2 compliant mode of operation if the following criteria are met:

   - Devices use only compliant drivers to connect to XProtect VMS

     See the FIPS 140-2 compliance section in the hardening guide for more information about drivers that can assure and enforce compliance.

   - Devices use device pack version 11.1 or higher

     Drivers from the legacy driver device packs cannot guarantee a FIPS 140-2 compliant connection.

   - Devices are connected over HTTPS and on either Secure Real-Time Transport Protocol (SRTP) or Real

Time Streaming Protocol (RTSP) over HTTPS for the video stream

> Driver modules cannot guarantee FIPS 140-2 compliance of a connection over HTTP. The connection may be compliant, but there is no guarantee that it is in fact compliant.

- The computer that is running the recording server runs Windows OS with FIPS mode enabled

4. Ensure that data in the media database is encrypted with FIPS 140-2 compliant ciphers.

   This is done by running the media database upgrade tool. For detailed information on how to configure your XProtect VMS to run in FIPS 140-2 compliant mode, see the FIPS 140-2 compliance section in the hardening guide.

5. Before you enable FIPS on the Windows operating system, and after you have configured your XProtect VMS system and ensured that all components and devices can run on a FIPS enabled environment, update your existing hardware passwords in the XProtect Management Client.

   To do this, in the Management Client, from the selected recording server in the **Recording Servers** node, right-click and select **Add Hardware**. Progress through the **Add hardware** wizard. This will update all the current credentials and encrypt them to be FIPS-compliant.

You can enable FIPS only after you have upgraded the entire VMS, including all clients.

Upgrade best practices

Read about upgrade requirements (see Upgrade requirements) including backup of the SQL Server databases before you start the actual upgrade.

> Device drivers are now split into two device packs: the regular device pack with newer drivers and a legacy device pack with older drivers. The regular device pack is always automatically installed with an update or upgrade. If you have older cameras that use device drivers from the legacy device pack, and you do not have a legacy device pack installed already, the system does not automatically install the legacy device pack.

> If your system has older cameras, Milestone recommends that you check if the cameras use drivers from the legacy device pack on this page (https://www.milestonesys.com/support/software/device-packs/). To check if you have the legacy pack installed already, look in the XProtect system folders. If you need to download the legacy device pack, go to download page (https://www.milestonesys.com/download/).

If your system is a **Single Computer** system, you can install the new software on top of the existing installation.

In a Milestone Interconnect or Milestone Federated Architecture system, you must start upgrading the central site and afterward the remote sites.

In a distributed system, perform the upgrade in this order:

1. Upgrade the management server with the **Custom** option in the installer (see Install your system - Custom option).
   a. On the wizard page where you choose components, all management server components are preselected.
   b. Specify SQL Server and database. Decide whether to keep the SQL Server database that you are already using and to keep the existing data in the database.

   > When you start the installation, you lose the failover recording server functionality (see Failover recording server (explained)).

> If you enable encryption on the management server, the recording servers are offline until they are upgraded, and you have enabled encryption to the management server (see Secure communication (explained)).

2. Upgrade failover recording servers. From your management server's download web page (controlled by the Download Manager), install Recording Server.

   > If you plan to enable encryption on the failover recording servers and you want to retain the failover functionality, upgrade the failover recording server without encryption and enable it after you have upgraded the recording servers.

   At this point the failover server functionality works again.

3. If you plan to enable encryption from the recording servers or failover recording servers to the clients and it is important that the clients can retrieve data during the upgrade, upgrade all clients and services that retrieve data streams from the recording servers before you upgrade the recording servers. These clients and services are:
   - XProtect Smart Client
   - Management Client
   - Management Server
   - XProtect Mobile server
   - XProtect Event Server
   - DLNA Server Manager
   - Milestone Open Network Bridge
   - Sites that retrieve data streams from the recording server through Milestone Interconnect
   - Some MIP SDK third-party integrations
4. Upgrade the recording servers. You can install recording servers using the installation wizard (see Install a recording server through Download Manager) or silently (see Install a recording server silently). The advantage of a silent install is that you can do it remotely.

   > If you enable encryption and the selected server authentication certificate is not trusted on all relevant computers running, they lose connection. For more information, see Secure communication (explained).

Continue these steps for the other sites in your system.

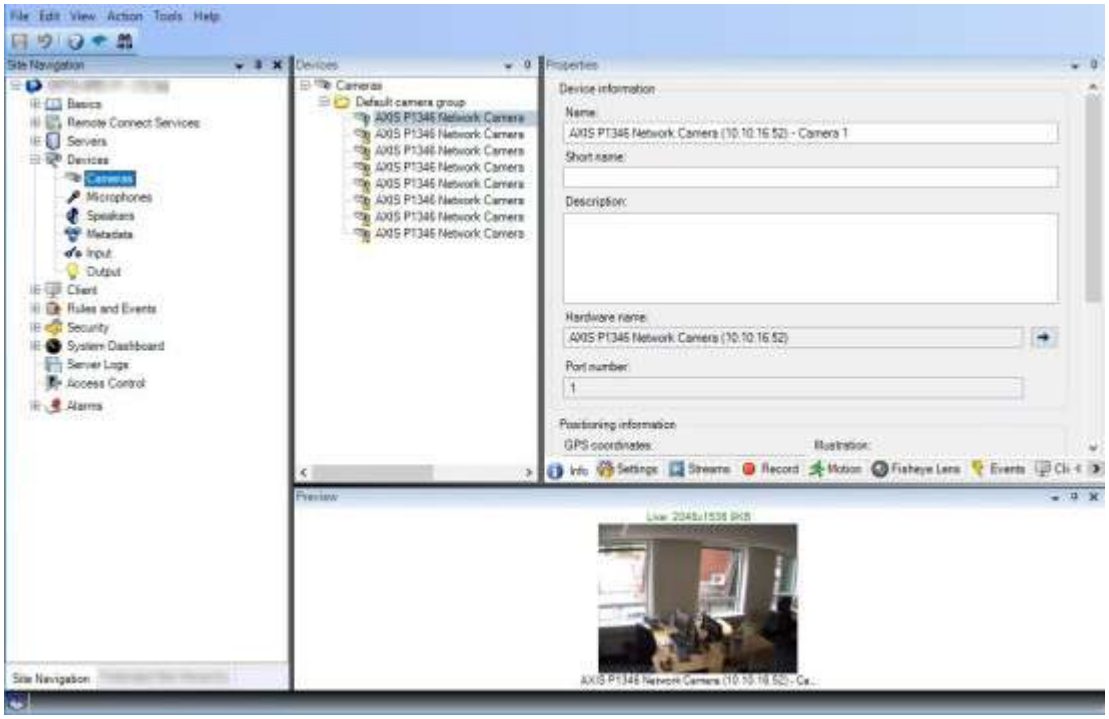
Main window and panes

The Management Client window is divided into panes. The number of panes and layout depend on your:

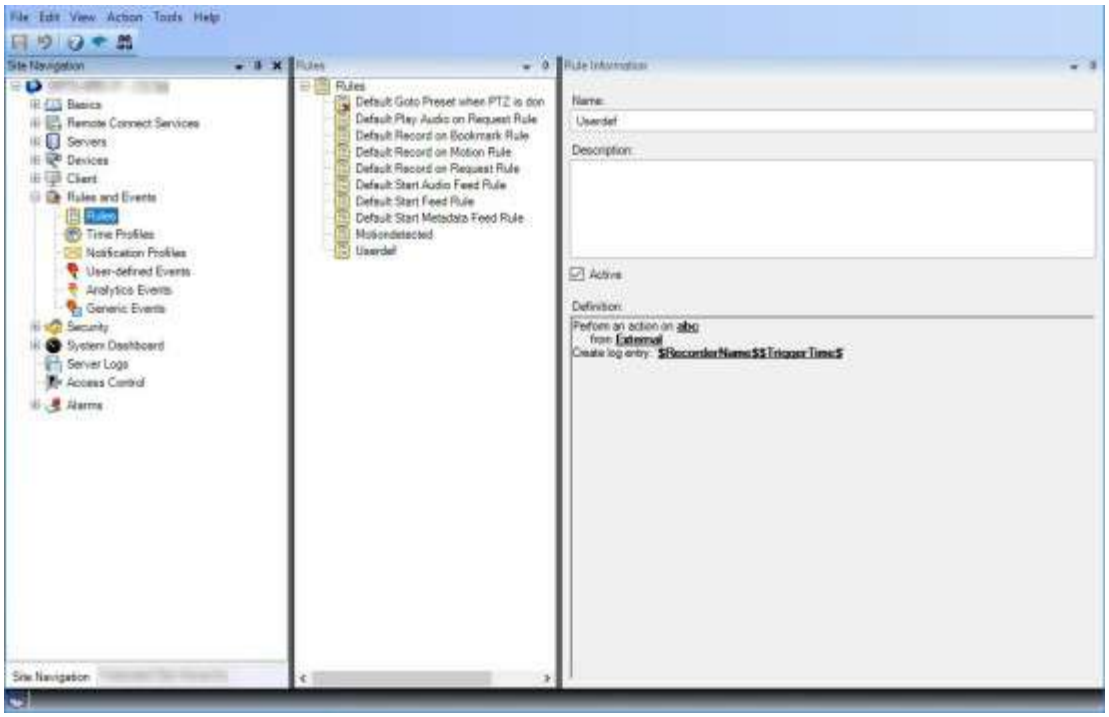
- System configuration
- Task
- Available functions

Below are some examples of typical layouts:

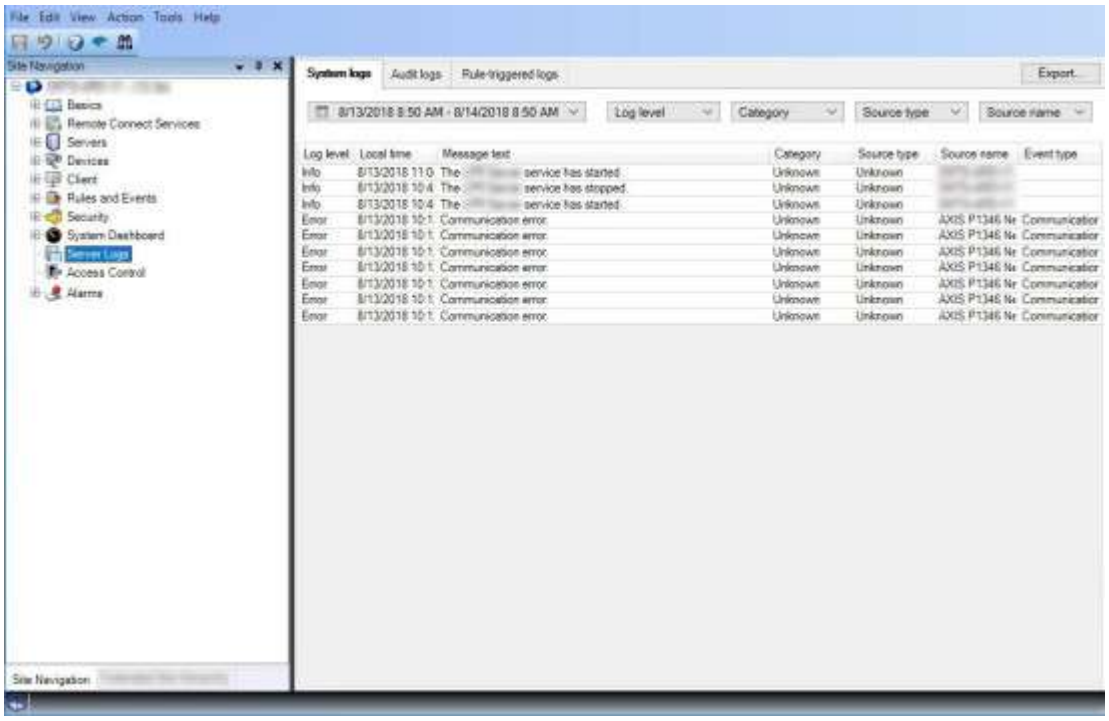
- When you work with recording servers and devices:



- When you work with rules, time and notification profiles, users, roles:

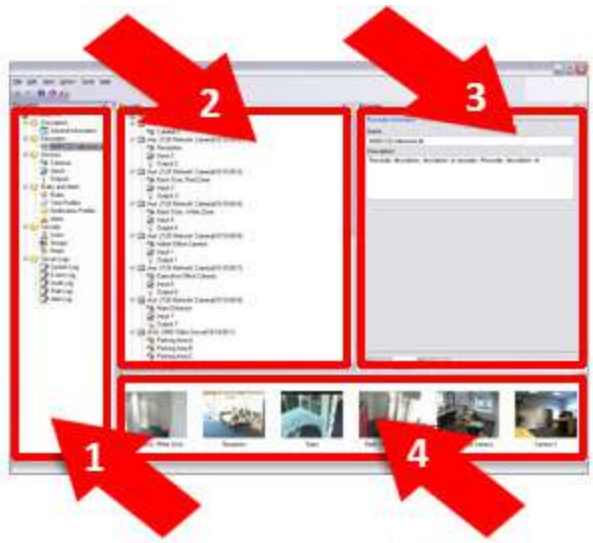


- When you view logs:



Panes layout

The illustration outlines a typical window layout. You can customize the layout so it may look different on your computer.



1. Site Navigation pane and Federated Site Hierarchy pane
2. Overview pane
3. Properties pane
4. Preview pane

Site Navigation pane

This is your main navigation element in the Management Client. It reflects the name, settings and configurations of the site that you have logged into. The site name is visible at the top of the pane. The features are grouped into categories that reflect the functionality of the software.

In the **Site Navigation** pane, you can configure and manage your system so it matches your needs. If your system is not a single-site system, but includes federated sites, note that you manage these sites on the **Federated Site Hierarchy** pane.

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Federated Site Hierarchy pane

This is your navigation element that displays all Milestone Federated Architecture sites in a parent/child site hierarchy.

You can select any site, log into it and the Management Client for that site launches. The site that you are logged into, is always at the top of the hierarchy.

Overview pane

Provides an overview of the element you have selected in the **Site Navigation** pane, for example as a detailed list. When you select an element in the **Overview** pane, it typically displays the properties in the **Properties** pane. When you right-click elements in the **Overview** pane you get access to the management features.

Properties pane

Displays the properties of the element selected in the **Overview** pane. The properties appear on several dedicated tabs:

Preview pane

The **Preview** pane appears when you work with recording servers and devices. It shows preview images from the selected cameras or displays information about the state of the device. The example shows a camera preview image with information about the resolution and data rate of the camera's live stream:

By default, the information shown with the camera preview images concerns live streams. This is displayed in green text above the preview. If you want recording stream information instead (red text), select **View** > **Show Recording Streams** in the menu.

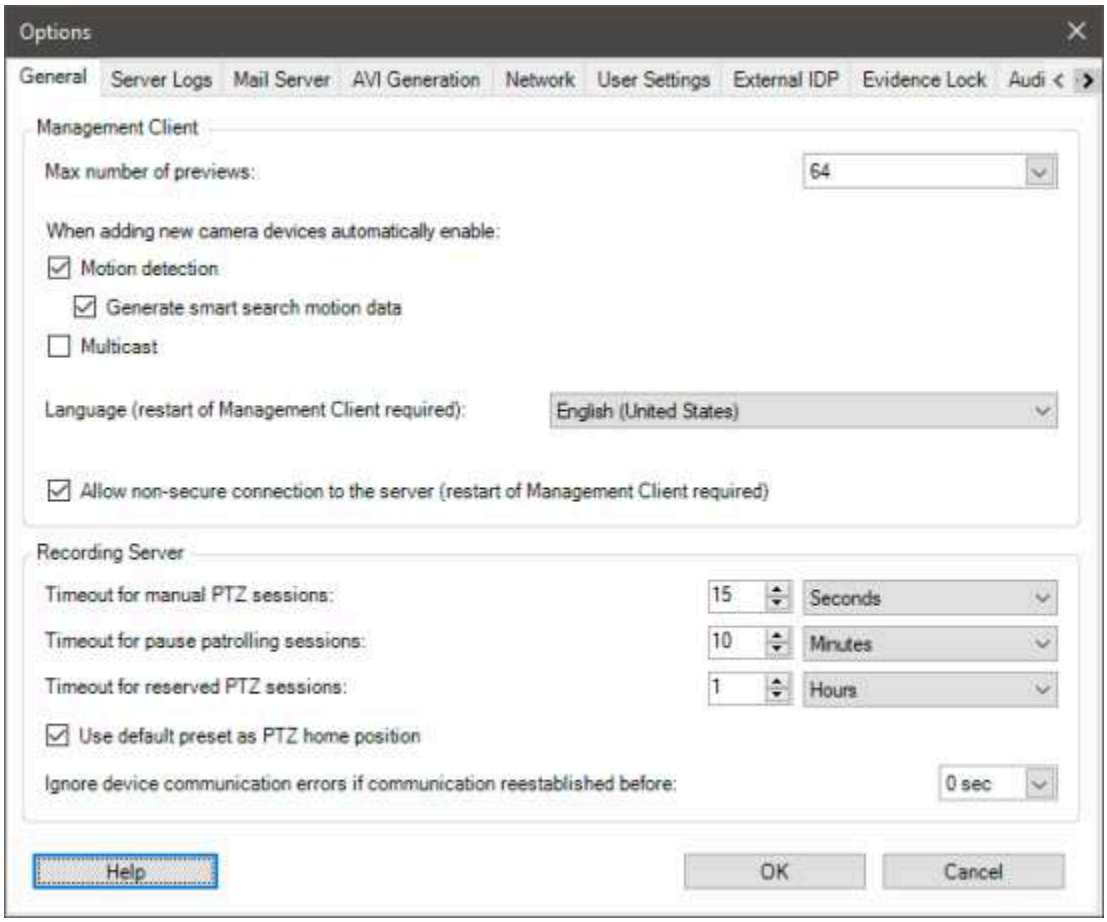
Performance can be affected if the **Preview** pane displays preview images from many cameras at a high frame rate. To control the number of preview images, and their frame rate, select **Options** > **General** in the menu.

System settings (Options dialog box)

In the **Options** dialog box, you can specify a number of settings related to the general appearance and functionality of the system.

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

To access the dialog box, select **Tools** > **Options**.



General tab (options)

Server Logs tab (options)

Mail Server tab (options)

General tab (options)

On the General tab, you can specify general settings for the Management Client and the recording server.

Management Client

Name	Description
Max number of previews	Select the maximum number of thumbnail images displayed in the **Preview** pane. Default is 64 thumbnail images. Select **Action** > **Refresh** from the menu for the change to take effect. A large number of thumbnail images in combination with a high frame rate may slow the system down.
When adding new camera devices automatically enable: **Motion detection**	Select the check box to enable motion detection on new cameras, when you add them to the system with the **Add Hardware** wizard. This setting does not affect motion detection settings on existing cameras. You enable and disable motion detection for a camera on the **Motion** tab for the camera device.
When adding new camera devices automatically enable: **Generate motion data for smart search**	Generation of motion data for smart search requires that motion detection is enabled for the camera. Select the check box to enable generation of smart search motion data on new cameras, when you add them to the system with the **Add**

Name	Description
	Hardware wizard. This setting does not affect motion detection settings on existing cameras. You enable and disable the generation of smart search motion data for a camera on the **Motion** tab for the camera device.
When adding new camera devices automatically enable: **Multicast**	Select the check box to enable multicast on new cameras when you add them with the **Add Hardware** wizard. This setting does not affect multicast settings on existing cameras. You enable and disable live multicasting for a camera on the **Client** tab for the camera device.
Language	Select the language of the Management Client. Restart the Management Client to use the new language.
Allow non-secure connection to the server	Select the check box to allow non-secure server connection by HTTP protocol. (No users are prompted to allow non-secure server connection). Restart the Management Client to use this setting.

Recording server

Name	Description
Timeout for manual PTZ sessions	Client users with the necessary user permissions can manually interrupt the patrolling of PTZ cameras. Select how much time should pass before regular patrolling is resumed after a manual interruption. The setting applies for all PTZ cameras on your system. Default setting is 15 seconds. If you want individual timeouts on the cameras, you specify this on the **Presets** tab for the camera.
Timeout for pause patrolling sessions	Client users with a sufficient PTZ priority can pause patrolling on PTZ cameras. Select how much time should pass before regular patrolling is resumed after a pause. The setting applies for all PTZ cameras on your system. Default setting is 10 minutes. If you want individual timeouts on the cameras, you specify this on the **Presets** tab for the camera.
Timeout for reserved PTZ sessions	Set the default timeout period for reserved PTZ sessions. When a user runs a reserved PTZ session, the PTZ camera cannot be used by others before it is released either manually or when

Name	Description
	the period has timed out. Default setting is 1 hour. If you want individual timeouts on the cameras, you specify this on the **Presets** tab for the camera.
Use default preset as PTZ home position	Select this check box to use the default preset position instead of the home position of PTZ cameras when activating the **Home** button in a client. A default preset position must be defined for the camera. If a default preset position is not defined, nothing will happen when activating the **Home** button in a client. By default, this check box is cleared. To assign a default preset position, see Assign a camera's preset position as default
Ignore device communication errors if communication reestablished before	The system logs all communication errors on hardware and devices, but here you select for how long a communication error must exist before the rule engine triggers the **Communication Error** event.

Server Logs tab (options)

On the **Server Logs** tab, you can specify settings for the system's management server logs.

For more information, see Identify user activity, events, actions and errors.

Name	Description
Logs	Select the log type that you want to configure: • System logs • Audit logs • Rule-triggered logs
Settings	Disable or enable the logs and specify the retention period. Allow 2018 R2 and earlier components to write logs. For more information, see Allow 2018 R2 and earlier components to write logs. For **System** logs, specify the level of messages that you want to log: • All (includes undefined messages) • Information, warnings, and errors • Warnings and errors • Errors (default setting) For **Audit** logs, enable user access logging if you want the system to log all user actions in XProtect Smart Client. These are, for example, exports, activating outputs, and viewing cameras live or in playback.

Name	Description
	Specify: • The length of a playback sequence This means that as long as the user plays back within this period, the system only generates one log entry. When playing back outside the period, the system creates a new log entry. • The number of records (frames) a user has seen before the system creates a log entry

Mail Server tab (options)

On the **Mail Server** tab, you can specify the settings for your system's mail server.
For more information, see Notification profiles (explained).

Name	Description
Sender e-mail address	Enter the email address that you want to appear as the sender of email notifications for all notification profiles. Example: sender@organization.org.
Mail server address	Enter the address of the SMTP mail server that sends e-mail notifications. Example: mailserver.organization.org.
Mail server port	The TCP port used for connecting to the mail server. Default port is 25 for unencrypted connections, Encrypted connections typically use port 465 or 587.
Encrypt the connection to the server	If you want to secure the communication between the management server and the SMTP mail server, select this check box. The connection is secured using the STARTTLS email protocol command. In this mode, the session begins on an unencrypted connectcion, then a STARTTLS command is issued by the SMTP mail server to the management server to switch to secure communication using SSL.
Server requires login	If enabled, you must specify a user name and password for the users to log in to the mail server.

AVI Generation tab (options)

On the **AVI Generation** tab, you can specify compression settings for the generation of AVI video clip files. The settings are required if you want to include AVI files in e-mail notifications sent by rule-triggered notification profiles.

See also Trigger email notifications from rules.

Name	Description
Compressor	Select the codec (compression/decompression technology) that you want to apply. To have more codecs available in the list, install them on the management server. Not all cameras support all codecs.
Compression quality	(Not available for all codecs). Use the slider to select the degree of compression (**0**-**100**) to be performed by the codec. **0** means no compression, generally resulting in high image quality and large file size. **100** means maximum compression, generally resulting in low image quality and small file size. If the slider is not available, the compression quality is determined entirely by the selected codec.
Keyframe every	(Not available for all codecs). If you want to use keyframes, select the check box and specify the required number of frames between keyframes. A keyframe is a single frame stored at specified intervals. The keyframe contains the entire view of the camera, whereas the following frames contain only the pixels that change. This helps greatly reduce the size of files. If the check box is not available, or not selected, every frame contains the entire view of the camera.
Data rate	(Not available for all codecs). If you want to use a particular data rate, select the check box and specify the number of kilobytes per second. The data rate specifies the size of the attached AVI file. If the check box is not available, or not selected, the data rate is determined by the selected codec.

Network tab (options)

On the **Network** tab, you can specify the IP addresses of the local clients, if the clients are to connect to the recording server via the Internet. The surveillance system then recognizes them as coming from the local network.

You can also specify the IP version of the system: IPv4 or IPv6. Default value is IPv4.

Bookmark tab (options)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Bookmarks** tab, you can specify settings for bookmarks, their IDs and function in XProtect Smart Client.

Name	Description
Bookmark ID prefix	Specify a prefix for all the bookmarks that is made by the users of XProtect Smart Client.
Default bookmark time	Specify the default start and end time of a bookmark is set in XProtect Smart Client. This setting needs to be aligned with: • The default bookmark rule, see Rules (Rules and Events node). • The pre-buffer period for each camera, see Manage pre-buffering.

To specify the bookmark permissions of a role, see Device tab (roles).

User Settings tab (options)

On the **User Settings** tab, you can specify user preference settings, for example, if a message should be shown when remote recording is enabled.

External IDP tab (options)

On the **External IDP** tab in Management Client, you can add and configure an external IDP and register claims from the external IDP.

Name	Description
Enabled	The external IDP is by default enabled.
Name	The name for the external IDP. The name appears in the **Authentication** field in the log-in window of your client.
Authentication authority	The URL of the external IDP.
Add	Add and configure an external IDP. When you select **Add**, the **External IDP** dialog box opens and you can enter the information for the configuration, see **Configure an external IDP** below the table.
Edit	Edit the configuration of the external IDP.
Remove	Remove the external IDP configuration. If you remove an external IDP configuration, the users that are authenticated via this external IDP will not be able to log in to the XProtect VMS. If you add the external IDP again, new users will be created on log in because the ID of the external IDP has changed.

Configure an external IDP

- To add an external IDP, select **Add** in the **External IDP** section and enter the information in the table below. You can only add one external IDP:

Name	Description
Name	The name for the external IDP that you enter here appears in the **Authentication** field in the log in window of your client.
Client ID and **Client secret**	Must be obtained from the external IDP. The client ID and the client secret are needed to communicate securely with the external IDP.
Callback path	Part of a URL for the authentication redirect flow to sign in users. The user sign-in flow is initiated in the XProtect VMS. A browser is launched with a sign-in page that is hosted by the external IDP. When the authentication process is completed, the callback path (XProtect login address + /idp/ + callback path), is invoked and the user is redirected to the XProtect VMS. The default value is “/signin-oidc”. The redirect format The callback path is constructed by the login address entered in the client + /idp/ + the callback path configured on the external IDP. The URI is client specific so URIs for, for example, Smart Client and XProtect Web Client will be different. The management server address is the address that you enter in the login dialog box in Smart Client or XProtect Management Client. For the XProtect Web Client and the XProtect Mobile, the redirect address is the entered address + port + /idp/ + callback path.
Prompt for login	Specify to the external IDP if the user should stay logged in or if a verification of the user is required. Depending on the external IDP, the verification can include a password verification or a full log-in.
Claim to use to create user name	Optionally, specify which claim from the external IDP that should be used to generate a unique user name for the auto-provisioned user in the VMS. For more information about unique user names crated by claims, see Unique user names for external IDP users.
Scopes	Optionally, use scopes to limit the number of claims that you get from an external IDP. If you know that the claims that are relevant for your VMS are in a specific scope, you can use the scope to limit the number of claims that you get from the external IDP.

Register claims

When you have registered claims from the external IDP, you can map the claims to roles in the VMS to determine the user privileges in the VMS. For more information, see Map claims from an external IDP.

- To register claims from an external IDP, select **Add** in the **Registered claims** section and enter the information in the table below:

Name	Description
External IDP	The name of the external IDP.
Claim name	Name of the claim as it was defined in the external IDP. In this field, the claim name must be entered exactly as it is set in the external IDP. The claim name does not appear anywhere else in the Management Client.
Display name	The display name of a claim. This is the name that you will see in the roles setup in Management Client.
Case sensitive	Indicates whether the value of a claim is case sensitive. Examples of values that are typically case sensitive: - Textual representations of IDs such as a guid: F951B1F0-2FED-48F7-88D3-49EB5999C923 or OadFgrDesdFesff= Examples of values that are typically not case sensitive: - E-mail addresses - Role names - Group names .
Add, **Edit**, **Remove**	Register and maintain claims. If you modify a claim at the external IDP web site, a new log in to the XProtect client is required by the users. Say, that a user, Bob, needs to be, for example, Operator. The claim is then added to Bob at the external IDP web site, but if Bob is already logged in to XProtect, he must complete a new login for the change to take effect.

Add redirect URIs for the web clients

The redirect URI is the location where the user is redirected after a successful log in. The redirect URIs must be an exact match of the addresses of the web clients. For example, you will not be able to log in via an external IDP if you open XProtect Web Client from https://localhost:8082/index.html and the redirect URI for the web clients you added is https://127.0.0.1:8082/index.html.

Name	Description
URI	The URI of XProtect Web Client in the format https://[mobile server]:[port]/index.html. The redirect URIs are not case sensitive. Enter a redirect URI for each of the addresses that can be used to access the XProtect Mobile server / XProtect Web Client. For example, the redirect URIs might be used both with and without the domain details.

Name	Description
	• https://[device name]:8082/index.html • https://[full device name including domain]:8082/index.html • https://localhost:8082/index.html • https://127.0.0.1:8082/index.html • https://[server_IP]:8082/index.html • https://[public IP for the XProtect Mobile server]:[public port]/index.html • https://[public DNS for the XProtect Mobile server]:[public port]/index.html
Add, **Edit**, **Remove**	Register and maintain redirect URIs. When you remove URIs, you must keep at least one redirect URI for the system to work.

Customer Dashboard tab (options)

On the **Customer Dashboard** tab, you can enable or disable Milestone Customer Dashboard.

Customer Dashboard is an online monitoring service that provides a graphical overview of the current status of your system, including possible technical issues such as camera failures, to system administrators or other people that have been given access to information about your system installation.

You can select or clear the check box to change your Customer Dashboard settings at any time.

Evidence Lock tab (options)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Evidence Lock** tab, you define and edit evidence lock profiles and the duration your client users can select to keep the data protected.

Name	Description
Evidence lock profiles	A list with defined evidence lock profiles. You can add and remove existing evidence lock profiles. You cannot remove the default evidence lock profile, but you can change its time options and its name.

Name	Description
Lock time options	The duration the client users can select to lock evidence. Available time options are hour(s), day(s), week(s), month(s), year(s), indefinite or user-defined.

To specify the evidence lock access permissions of a role, see the Device tab (roles) for role settings.

Audio messages tab (options)

On the **Audio messages** tab, you can upload files with audio messages that are used for broadcasting messages, triggered by rules.

The maximum number of uploaded files is 50 and the maximum size allowed for each file is 1 MB.

Name	Description
Name	Provides the name of a message. You enter the name when you add a message. To upload a message to the system, click **Add**.
Description	Provides a description of the message. You enter the description when you add a message. You can use the description field to describe the purpose or the actual message.
Add	Lets you upload audio messages to the system. Supported formats are standard Windows audio file formats: • .wav • .wma • .flac
Edit	Lets you modify the name and description, or you can replace the actual file.
Remove	Delete the audio message from the list.
Play	Click this button to listen to the audio message from the computer that runs the Management Client.

To create a rule that triggers playback of audio messages, see Add a rule.

To learn more about actions in general that you can use in rules, see Actions and stop actions.

Privacy settings tab

On the **Privacy settings** tab, you can enable or disable usage data collection from

- mobile clients and
- desktop clients and plug-ins.

By enabling usage data collection, you consent to Milestone Systems's use of technology by Google as a third-party provider, with which data processing in the USA cannot be excluded. For more information about data protection and the usage data collection, see the GDPR privacy guide.

Access Control Settings tab (options)

The use of XProtect Access requires that you have purchased a base license that allows you to access this feature.

Name	Description
Show development property panel	If selected, additional developer information appears for **Access Control** > **General Settings**. This setting is only meant to be used by developers of access control system integrations.

Analytics Events tab (options)

On the **Analytics Events** tab, you can enable and specify the analytics events feature.

Name	Description
Enable	Specify if you want to use analytics events. As default, the feature is disabled.
Port	Specify the port used by this feature. The default port is 9090. Make sure that relevant VCA tool providers also use this port number. If you change the port number, remember to change the port number of the providers.
All network addresses or **Specified network addresses**	Specify if events from all IP addresses/hostnames are allowed, or only events from IP addresses/hostnames that are specified in the **Address list** (see below).
Address list	Specify a list of trusted IP addresses/hostnames. The list filters incoming data so that only events

Name	Description
	from certain IP addresses/hostnames are allowed. You can use both Domain Name System (DNS), IPv4 and IPv6 address formats. You can add addresses to your list by manually entering each IP address or host name, or by importing an external list of addresses. • **Manual entering**: Enter the IP address/hostname in the address list. Repeat for each required address • **Import**: Click **Import** to browse for the external list of addresses. The external list must be a .txt file and each IP address or host name must be on a separate line

Alarms and Events tab (options)

On the **Alarms and Events** tab, you can specify settings for alarms, events and logs. Related to these settings, see also Limit size of database.

Name	Description
Keep closed alarms for	Specify the number of days for storing alarms with the state **Closed** in the database. If you set the value to 0, the alarm is deleted after it has been closed. Alarms always have timestamps. If the alarm is triggered by a camera, the timestamp has an image from the time of the alarm. The alarm information itself is stored on the event server, while the video recordings corresponding to the attached image are stored on the relevant surveillance system server. To be able to see the images of your alarms, keep video recordings for at least as long as you intend to keep alarms on the event server.
Keep all other alarms for	Specify the number of days for storing alarms with the state **New**, **In progress**, or **On hold**. If you set the value to 0, the alarm appears in the system, but will not be stored. Alarms always have timestamps. If the alarm is triggered by a camera, the timestamp has an image from the time of the alarm. The alarm information itself is stored on the event server, while the video recordings corresponding to the attached image are stored on the relevant surveillance system server. To be able to see the images of your alarms, keep video recordings for at least as long as you intend to keep alarms on the event server.
Enable verbose logging	To keep a more detailed log for event server communication, select the check box. It will be stored for the number of days specified in the **Keep logs for** field.

Name	Description
Event types	Specify the number of days for storing events in the database. There are two ways of doing this: • You can specify the retention time for an entire event group. Event types with the value **Follow group** will inherit the value of the event group • Even if you set a value for an event group, you can specify the retention time for individual event types. If the value is **0**, the events will not be stored in the database. The external events (user-defined events, generic events, and input events) are set to **0** by default, and you cannot change that value. The reason is that these types of events occur so frequently that storing them in the database may cause performance issues.

Generic Events tab (options)

On the **Generic Events** tab, you can specify generic events and data source related settings.

For more information about how to configure actual generic events, see Generic events (explained).

Name	Description
Data source	You can choose between two default data sources and define a custom data source. What to choose depends on your third party program and/or the hard- or software you want to interface from: **Compatible**: Factory default settings are enabled, echoes all bytes, TCP and UDP, IPv4 only, port 1234, no separator, local host only, current code page encoding (ANSI). **International**: Factory default settings are enabled, echoes statistics only, TCP only, IPv4+6, port 1235, <CR><LF> as separator, local host only, UTF-8 encoding. (<CR><LF> = 13,10). [Data source A] [Data source B] and so on.
New	Click to define a new data source.
Name	Name of the data source.
Enabled	Data sources are by default disabled. Select the check box to enable the data source.
Reset	Click to reset all settings for the selected data source. The entered name in the **Name** field remains.

Name	Description
Port	The port number of the data source.
Protocol type selector	Protocols which the system should listen for, and analyze, in order to detect generic events: **Any**: TCP as well as UDP. **TCP**: TCP only. **UDP**: UDP only. TCP and UDP packages used for generic events may contain special characters, such as @, #, +, ~, and more.
IP type selector	Selectable IP address types: IPv4, IPv6 or both.
Separator bytes	Select the separator bytes used to separate individual generic event records. Default for data source type **International** (see **Data sources** earlier) is **13,10**. (13,10 = <CR><IF>).
Echo type selector	Available echo return formats: • **Echo statistics**: Echoes the following format: **[X],[Y],[Z],[Name of generic event]** **[X]** = request number. **[Y]** = number of characters. **[Z]** = number of matches with a generic event. **[Name of generic event]** = name entered in the **Name** field. • **Echo all bytes**: Echoes all bytes • **No echo**: Suppresses all echoing
Encoding type selector	By default, the list only shows the most relevant options. Select the **Show all** check box to display all available encodings.
Allowed external IPv4 addresses	Specify the IP addresses, that the management server must be able to communicate with in order to manage external events. You can also use this to exclude IP addresses that you do not want data from.
Allowed external IPv6 addresses	Specify the IP addresses, that the management server must be able to communicate with in order to manage external events. You can also use this to exclude IP addresses that you do not want data from.

Management Client menus

File menu

You can save changes to the configuration and exit the application. You can also back up your configuration, see Backing up and restoring your system configuration (explained).

Edit menu

You can undo changes.

View menu

Name	Description
Reset Application Layout	Reset the layout of the different panes in the Management Client to their default settings.
Preview Window	Toggle the **Preview** pane on and off when working with recording servers and devices.
Show Recording Streams	By default, the information shown with preview images in the **Preview** pane concerns live streams of the cameras. If you want information about recording streams instead, select **Show Recording Streams**.
Federated Site Hierarchy	By default, the **Federated Site Hierarchy** pane is enabled.
Site Navigation	By default, the **Site Navigation** pane is enabled.

Action menu

The content of the **Action** menu differs depending on the element you have selected in the **Site Navigation** pane. The actions you can choose from are the same as when you right-click the element.

- The pre-buffer period for each camera, see Manage pre-buffering.

Name	Description
Refresh	Is always available and reloads the requested information from the management server.

Tools menu

Name	Description
Registered Services	Manage registered services. See Managing registered services.
Effective Roles	View all roles of a selected user or group.
Options	Opens the Options dialog box, which lets you define and edit global system settings. For more information see System settings (Options dialog box).

Help menu

You can access the help system and information about the version of the Management Client.

Server Configurator (Utility)

Encryption tab properties

This tab allows you to specify the following properties:

In a cluster environment, you must set up your cluster and ensure that it is running before you create certificates for all the computers in the cluster environment. After that you can install the certificates and do the registration using the Server Configurator for all the nodes in the cluster. For more information, see the certificates guide about how to secure your XProtect VMS installations.

Name	Description	Task
Server certificate	Select the certificate to be used to encrypt the two-way connection between the management server, data collectors, log server, and recording servers.	Enable encryption to and from the management server Enable server encryption for recording servers or remote servers
Event server and extensions	Select the certificate to be used to encrypt the two-way connection between the event server and the components that communicate with the event server, including the LPR Server.	Enable event server encryption
Streaming media certificate	Select the certificate to be used to encrypt communication between the recording servers and all clients, servers, and integrations that retrieve data	Enable encryption to clients and servers

Name	Description	Task
	streams from the recording servers.	
Mobile streaming media certificate	Select the certificate to be used to encrypt communication between the mobile server and the mobile and web clients that retrieve data streams from the mobile server.	Enable encryption on the mobile server

Registering servers

Name	Description	Task
Management server address	The address of the management server typically includes the hostname or the fully qualified domain name (FQDN) of the computer. By default, this address is only active from a computer in the XProtect VMS where the management server is not installed. As a rule of thumb, the management server address should not be changed from a computer that has the management server installed. However, if, for example, you use the Server Configurator in a failover setup, you might have to change the address from the management server computer. This could be within a cluster failover environment or in another failover setup scenario. • To activate the **Management server address** field from a computer with the management server installed, click the pen (🖊) symbol. ⚠ If you update the management server address, you need to access each of the computers that have components installed and update the management server address with the new address information.	Click for more information about the implications of changing the management server address from a computer that has the management server installed: Changing the host name of the management server computer
Register	Register the servers that are running on the computer with the designated management server.	Register a recording server

Language selection

Use this tab to select the language for the Server Configurator. The set of languages for the Server Configurator corresponds to the set of languages for the Management Client.

Name	Description
Choose language	Choose the language of the user interface.

To avoid conflicts between the failover cluster and VMS Server Configurator, pause the cluster before you start tasks in the Server Configurator. The Server Configurator may need to stop services while applying changes, and the failover cluster environment may interfere with this operation.

Tray icon status

The tray icons in the table show the different states of the services running on the servers in the XProtect VMS. The icons are available on computers with the servers installed:

Management Server Manager tray icon	Recording Server Manager tray icon	Event Server Manager tray icon	Failover Recording Server Manager tray icon	Description
				**Running** Appears when a server service is enabled and started. If the Failover Recording Server service is running, it can take over if the standard recording servers fails.
				**Stopped** Appears when a server service has stopped. If the Failover Recording Server service stops, it cannot take over if the standard recording server fails.
				**Starting** Appears when a server service is in the process of starting. Under normal circumstances, the tray icon changes after a short while to **Running**.
				**Stopping**

Management Server Manager tray icon	Recording Server Manager tray icon	Event Server Manager tray icon	Failover Recording Server Manager tray icon	Description
				Appears when a server service is in the process of stopping. Under normal circumstances, the tray icon changes after a short while to **Stopped**.
				**In indeterminate state** Appears when the server service is initially loaded and until the first information is received, upon which the tray icon, under normal circumstances, changes to **Starting** and afterwards to **Running**.
				**Running offline** Typically appears when the Recording Server or Failover recording service is running but the Management Server service is not.

Starting and stopping services from tray icons

Right-click the icons in the notification area to open the tray icons where you can start and stop services.

- Start or stop the Management Server service
- Start or stop the Recording Server service

Management Server Manager (tray icon)

Use the menu items on the Management Server Manager tray icon to perform tasks from the Management Server Manager.

Name	Description
Start Management Server and **Stop Management Server**	Click the appropriate menu item to start or to stop the Management Server service. If you stop the Management Server service, you cannot use the Management Client. The state of the service is reflected by the tray icon. For more information about the states of the tray icons, see Server manager tray icons (explained).
Show status messages	View a list of time-stamped status messages.
Change system configuration password settings	Assign or change a system configuration password. You can also choose not to password protect the system configuration by removing any assigned system configuration passwords.

Name	Description
	Change the system configuration password settings
Enter the system configuration password	Enter a password. This applies if, for example, the file that is holding the password settings is deleted or corrupted. For more information, see Enter the system configuration password settings.
Configure failover management server	Launch the configuration wizard for the failover management server or open the **Manage your configuration** page to manage your existing configuration. For more information about the failover cluster, see XProtect Management Server Failover.
Server Configurator	Open the **Server Configurator** to register servers and manage encryption. For more information about managing encryption, see Manage encryption with the Server Configurator.
Change license	On the management server computer, change the software license code. You would need to enter a new license code to, for example, upgrade your XProtect system. For more information, see Change the Software License Code.
Restore configuration	Open a dialog box from where you can restore the system configuration. Make sure, you read the information in the dialog box, before you click **Restore**. For more information, see Restore system configuration from a manual backup.
Select shared backup folder	Set a backup folder to store your backup in, before you back up any system configuration. For more information, see Select shared backup folder.
Update SQL address	Open a wizard to change the SQL Server address. In the rare event of a host name change, the SQL Server address might need to be aligned with the changes. For more information, see A host name change can trigger the change of the SQL server address.

License Information (Basics node)

In the **License Information** window, you can keep track of all licenses that share the same software license file both on this site and on all other sites, your Milestone Care subscriptions and decide how you want to activate your licenses.

To learn more about the various information and features available from the **License Information** window, see License Information window.

Site Information (Basics node)

In a large Milestone Federated Architecture setup with a lot of child sites, it is easy to lose the overview and it can be difficult to find the contact information to the administrators of each child site.

Therefore, you can add additional information to each child site and this information is then available for the administrators on the central site.

It is possible to add the following information:

- Site name
- Address/location
- Administrator(s)
- Additional information

Axis One-click Camera Connection (Remote Connect Services node)

These are the Axis One-Click Camera connection properties.

Name	Description
Camera password	Enter/edit. Provided with your camera at purchase. For further details, see your camera's manual or go to the Axis website (https://www.axis.com/).
Camera user	See details for **Camera password**.
Description	Enter/edit a description for the camera.
External address	Enter/edit the web address of the ST server to which the camera(s) connect.
Internal address	Enter/edit the web address of the ST server to which the recording server connects.
Name	If needed, edit the name of the item.
Owner authentication key	See **Camera password**.
Passwords (for Dispatch Server)	Enter password. Must be identical to the one received from your system provider.
Passwords (for ST server)	Enter password. Must be identical to the one entered when the Axis One-Click Connection Component was installed.
Register/Unregister at the Axis Dispatch Service	Indicate whether you wish to register your Axis camera with the Axis dispatch service. Can be done at time of setup or later.
Serial number	Hardware serial number as specified by the manufacturer. The serial number is often, but not always, identical to the MAC address.

Name	Description
Use credentials	Select the check box if you decided to use credentials during the installation of the ST server.
User name (for Dispatch Server)	Enter a user name. The user name must be identical to the one received from your system provider.
User name (for ST server)	Enter user name. Must be identical to the one entered when the **Axis One-Click Connection Component** was installed.

Servers (node)

This section describes how to install and configure recording servers and failover recording servers. You also learn how to add new hardware to the system and interconnect other sites.

- Recording Servers (Servers node)
- Failover Servers (Servers node)

Recording Servers (Servers node)

The system uses recording servers for recording of video feeds, and for communicating with cameras and other devices. A surveillance system typically consists of several recording servers.

Recording servers are computers where you have installed the Recording Server software, and configured it to communicate with the management server. You can see your recording servers in the **Overview** pane when you expand the **Servers** folder and then select **Recording Servers**.

Backward compatibility with recording server versions older than this version of the management server is limited. You can still access recordings on recording servers with older versions, but if you want to change their configuration, make sure they match this version of the management server. Milestone recommends that you upgrade all recording servers in your system to the same version as your management server.

Recording Server Settings window

When you right-click the Recording Server Manager tray icon and select **Change settings**, you can specify the following:

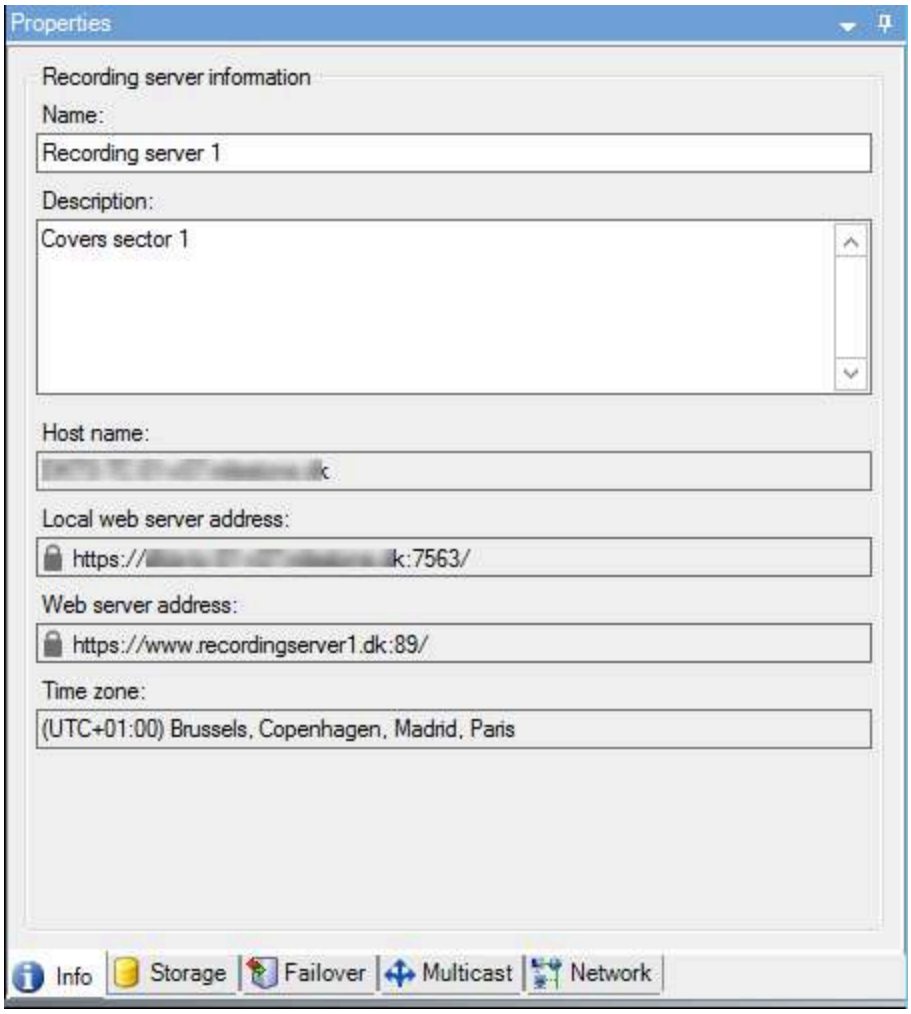
Name	Description
Address	IP address (example: 123.123.123.123) or host name (example: ourserver) of the management server to which the recording server should be connected. This information is necessary so that the recording server can communicate with the management server.
Port	Port number to be used when communicating with the management server. Default is port 9000. You can change this if you need to.
Web server port	Port number to be used for handling web server requests, for example for handling PTZ camera control commands and for browse and live requests from XProtect Smart Client. Default is port 7563. You can change this if you need to.
Encrypt connections from the management server to the recording server	Before you enable encryption and select a server authentication certificate from the list, make sure that you enable encryption on the management server first and that the management server certificate is trusted on the recording server. For more information, see Secure communication (explained).
Encrypt connections to clients and services that stream data	Before you enable encryption and select a server authentication certificate from the list, make sure that the certificate is trusted on all computers running services that retrieve data streams from the recording server. XProtect Smart Client and all services that retrieve data streams from the recording server must be upgraded to version 2019 R1 or later. Some third-party solutions created using MIP SDK versions older than 2019 R1 may need to be updated. For more information, see Secure communication (explained). To verify that your recording server uses encryption, see View encryption status to clients.
Details •	View Windows Certificate Store information about the selected certificate.

Recording servers properties

Info tab (recording server)

On the **Info** tab, you can verify or edit the name and description of the recording server.

You can view the host name and addresses. The padlock icon in front of the web server address indicates encrypted communication with the clients and services that retrieve data streams from this recording server.



Name	Description
Name	You can choose to enter a name for the recording server. The name is used in the system and clients when the recording server is listed. The name does not have to be unique. When you rename a recording server, the name is changed globally in the Management Client.
Description	You can choose to enter a description that appears in a number of listings within the system. A description is not mandatory.
Host name	Displays the recording server's host name.
Local web server address	Displays the local address of the recording server's web server. You use the local address, for example, for handling PTZ camera control commands, and for handling browsing and live requests from XProtect Smart Client. The address includes the port number that is used for web server communication (typically port 7563).

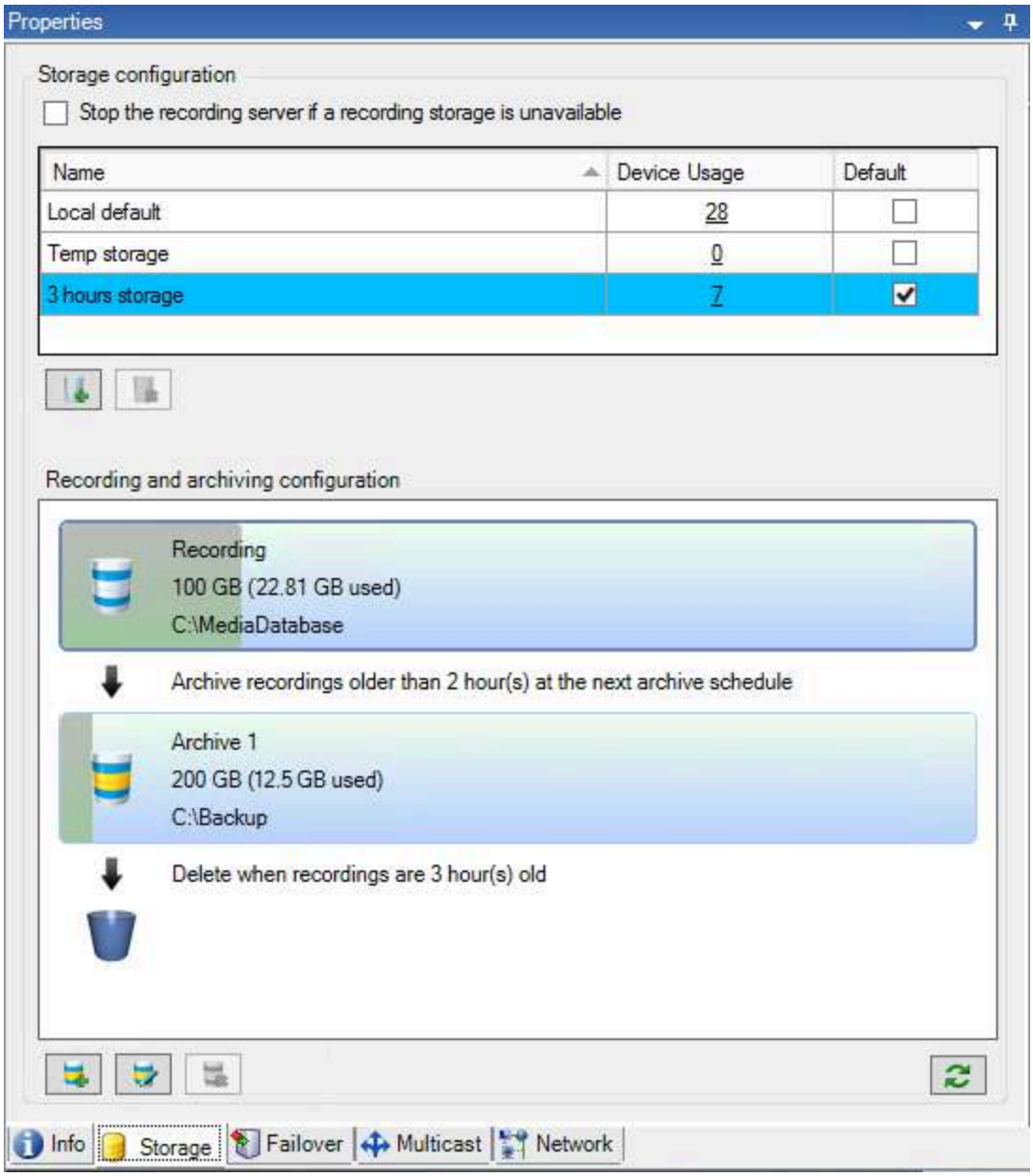
Name	Description
	If you enable encryption to clients and servers that retrieve data streams from the recording server, a padlock icon appears, and the address includes **https** instead of **http**.
Web server address	Displays the public address of the recording server's web server over the internet. If your installation uses a firewall or NAT router, enter the address of the firewall or NAT router so that clients that access the surveillance system on the internet can connect to the recording server. You specify the public address and port number on the **Network** tab. If you enable encryption to clients and servers that retrieve data streams from the recording server, a padlock icon appears, and the address includes **https** instead of **http**.
Time zone	Displays the time zone that the recording server is located in.

Storage tab (recording server)

On the **Storage** tab, you can set up, manage and view storages for a selected recording server.

For recording storages and archives, the horizontal bar shows the current amount of free space. You can specify the behavior of the recording server in case recording storages become unavailable. This is mostly relevant if your system includes failover servers.

If you are using **Evidence lock**, there will be a vertical red line showing the space used for evidence locked footage.



Storage and Recording Settings properties

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

In the **Storage and Recording Settings** dialog box, specify the following:

Name	Description
Name	Rename the storage if needed. Names must be unique.
Path	Specify the path to the directory to which you save recordings in this storage. The storage does not necessarily have to be located on the recording server computer.

Name	Description
	If the directory does not exist, you can create it. Network drives must be specified by using UNC (Universal Naming Convention) format, example: `\\server\volume\directory\`.
Retention time	Specify for how long recordings should stay in the archive before they are deleted or moved to the next archive (depending on archive settings). The retention time must always be longer than the retention time of the previous archive or the default recording database. This is because the number of retention days specified for an archive includes all the retention periods stated earlier in the process.
Maximum size	Select the maximum number of gigabytes of recording data to save in the recording database. Recording data in excess of the specified number of gigabytes is auto-moved to the first archive in the list - if any is specified - or deleted. When less than 5GB of space is free, the system always auto-archives (or deletes if no next archive is defined) the oldest data in a database. If less than 1GB space is free, data is deleted. A database always requires 250MB of free space. If you reach this limit (if data is not deleted fast enough), no more data is written to the database until you have freed enough space. The actual maximum size of your database is the amount of gigabytes you specify, minus 5GB.
Signing	Enables a digital signature to the recordings. This means, for example, that the system confirms that exported video has not been modified or tampered with when played back. The system uses the SHA-2 algorithm for digital signing.
Encryption	Select the encryption level of the recordings: • None • Light (less CPU usage) • Strong (more CPU usage) The system uses the AES-256 algorithm for encryption. If you select **Light**, a part of the recording is encrypted. If you select **Strong**, the whole recording is encrypted. If you choose to enable encryption, you must also specify a password below.
Password	Enter a password for the users allowed to view encrypted data. Milestone recommends that you use strong passwords. Strong passwords do not contain words that can be found in a dictionary or are part of the user's name. They include eight or more alpha-numeric characters, upper and lower cases, and special characters.

Archive Settings properties

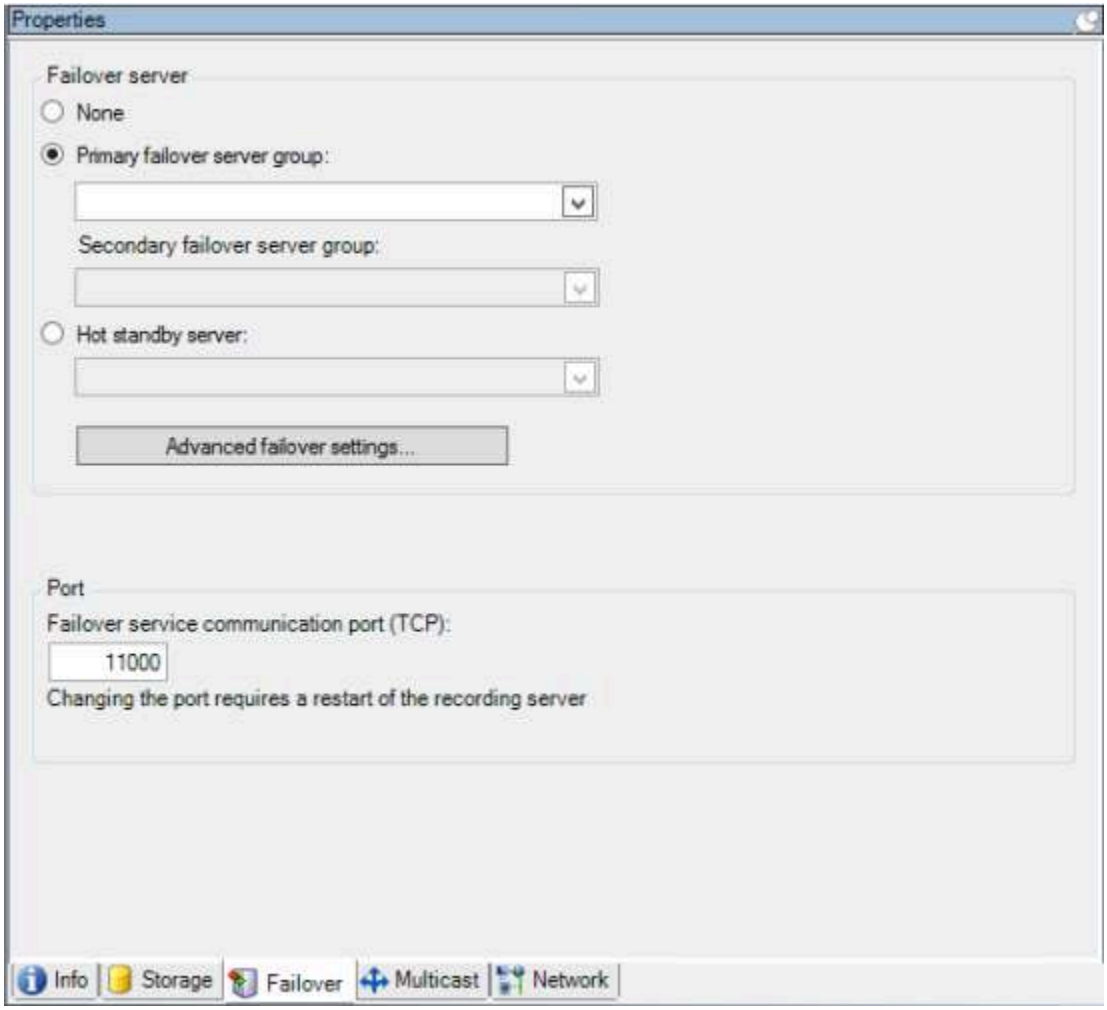
In the **Archive Settings** dialog box, specify the following:

Name	Description
Name	Rename the storage if needed. Names must be unique.
Path	Specify the path to the directory to which you save recordings in this storage. The storage does not necessarily have to be located on the recording server computer. If the directory does not exist, you can create it. Network drives must be specified by using UNC (Universal Naming Convention) format, example: `\\server\volume\directory\`.
Retention time	Specify for how long recordings should stay in the archive before they are deleted or moved to the next archive (depending on archive settings). The retention time must always be longer than the retention time of the previous archive or the default recording database. This is because the number of retention days specified for an archive includes all the retention periods stated earlier in the process.
Maximum size	Select the maximum number of gigabytes of recording data to save in the recording database. Recording data in excess of the specified number of gigabytes is auto-moved to the first archive in the list - if any is specified - or deleted. When less than 5GB of space is free, the system always auto-archives (or deletes if no next archive is defined) the oldest data in a database. If less than 1GB space is free, data is deleted. A database always requires 250MB of free space. If you reach this limit (if data is not deleted fast enough), no more data is written to the database until you have freed enough space. The actual maximum size of your database is the amount of gigabytes you specify, minus 5GB.
Schedule	Specify an archiving schedule that outlines the intervals with which the archiving process should start. You can archive very frequently (in principle every hour all year round), or very infrequently (for example, every first Monday of every 36 months).
Reduce frame rate	To reduce FPS when archiving, select the **Reduce frame rate** check box and set a frame per second (FPS). Reduction of frame rates by a selected number of FPS makes your recordings take up less space in the archive, but it also reduces the quality of your archive. MPEG-4/H.264/H.265 reduces automatically to key-frames as a minimum. 0.1 = 1 frame per 10 seconds.

Failover tab (recording server)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

If your organization uses failover recording servers, use the **Failover** tab to assign failover servers to recording servers, see Failover tab properties.



For details on failover recording servers, installation and settings, failover groups and their settings, see Failover recording server (explained).

Failover tab properties

Name	Description
None	Select a setup without failover recording servers.
Primary failover server group / Secondary failover server group	Select a regular failover setup with one primary and possibly one secondary failover server group.
Hot standby server	Select a hot standby setup with one dedicated recording server as hot standby server.
Advanced failover settings	Opens the **Advanced Failover Settings** window:

Name	Description
	• **Full Support**: Enables full failover support for the device • **Live Only**: Enables only failover support for live streams on the device • **Disabled**: Disables failover support for the device
Failover service communication port (TCP)	By default, the port number is 11000. You use this port for communication between recording servers and failover recording servers. If you change the port, the recording server **must** be running and **must** be connected to the management server.

Multicast tab (recording server)

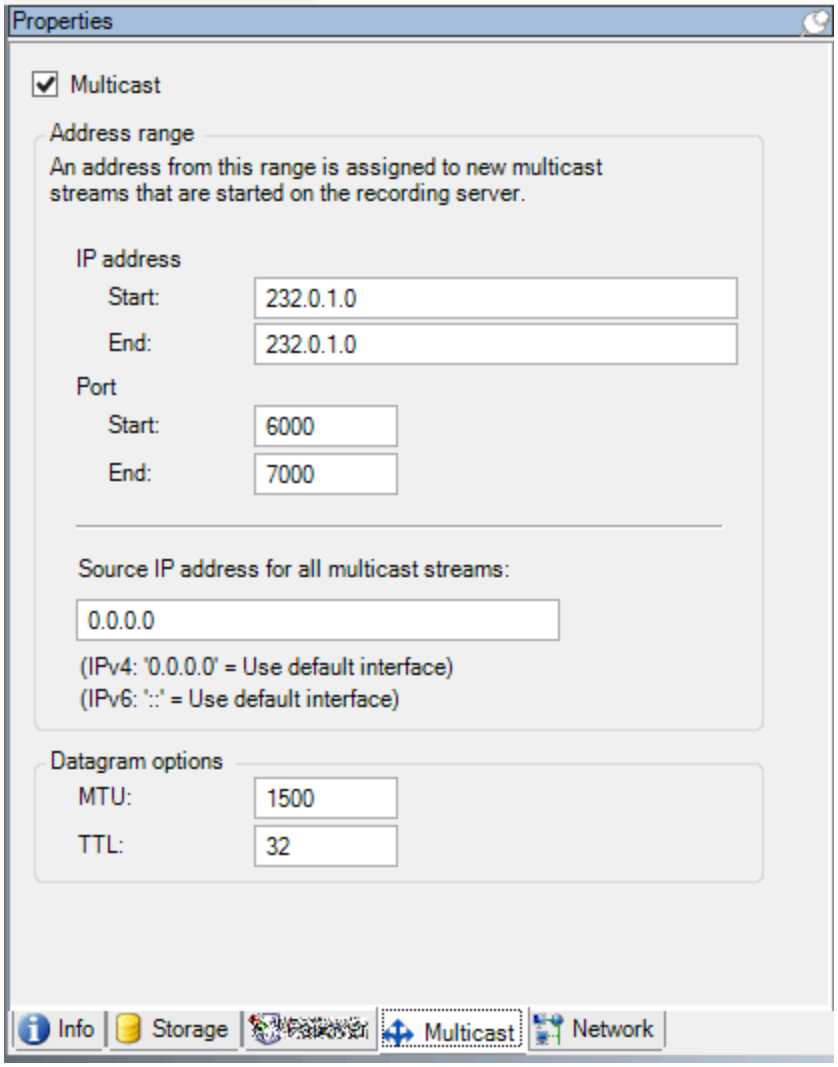
Your system supports multicasting of live streams from recording servers. If multiple XProtect Smart Client users want to view live video from the same camera, multicasting helps saving considerable system resources. Multicasting is particularly useful if you use the Matrix functionality, where multiple clients require live video from the same camera.

Multicasting is only possible for live streams, not for recorded video/audio.

If a recording server has more than one network interface card, it is only possible to use multicast on one of them. Through the Management Client you can specify which one to use.

If you are using failover servers, remember to also specify the IP address of the network interface card on the failover servers (see Multicast tab (failover server)).

The successful implementation of multicasting also requires that you have set up your network equipment to relay multicast data packets to the required group of recipients only. If not, multicasting may not be different from broadcasting, which can significantly slow down network communication.



Assign IP address range

Specify the range you want to assign as addresses for multicast streams from the selected recording server. The clients connect to these addresses when the users view multicast video from the recording server.

For each multicast camera feed, the IP address and port combination must be unique (IPv4 example: 232.0.1.0:6000). You can either use one IP address and many ports, or many IP addresses and fewer ports. By default, the system suggests a single IP address and a range of 1000 ports, but you can change this as required.

IP addresses for multicasting must be within the range defined for dynamic host allocation by IANA. IANA is the authority overseeing global IP address allocation.

Name	Description
IP address	In the **Start** field, specify the first IP address in the required range. Then specify the last IP address in the range in the **End** field.
Port	In the **Start** field, specify the first port number in the required range. Then specify the last port number in the range in the **End** field.

Name	Description
Source IP address for all multicast streams	You can only multicast on one network interface card, so this field is relevant if your recording server has more than one network interface card or if it has a network interface card with more than one IP address. To use the recording server's default interface, leave the value 0.0.0.0 (IPv4) or :: (IPv6) in the field. If you want to use another network interface card, or a different IP address on the same network interface card, specify the IP address of the required interface. • IPv4: 224.0.0.0 to 239.255.255.255. • IPv6, the range is described on the IANA website (https://www.iana.org/).

Specify datagram options

Specify the settings for data packets (datagrams) transmitted through multicasting.

Name	Description
MTU	Maximum Transmission Unit, the largest allowed physical data packet size (measured in bytes). Messages larger than the specified MTU are split into smaller packets before they are sent. The default value is 1500, which is also the default on most Windows computers and Ethernet networks.
TTL	Time To Live, the largest allowed number of hops a data packet should be able to travel before it is discarded or returned. A hop is a point between two network devices, typically a router. Default value is 128.

Network tab (recording server)

If you need to access the VMS with XProtect Smart Client over a public or untrusted network, Milestone recommends that you use a secure connection through VPN. This helps ensure that communication between XProtect Smart Client and the VMS server is protected.

You define a recording server's public IP address on the **Network** tab.

Why use a public address?

Clients may connect from the local network as well as from the Internet, and in both cases the surveillance system must provide suitable addresses so the clients can get access to live and recorded video from the recording servers:

- When clients connect locally, the surveillance system should reply with local addresses and port numbers
- When clients connect from the internet, the surveillance system should reply with the recording server's public address. This is the address of the firewall or NAT (Network Address Translation) router, and often also a different port number. The address and the port can then be forwarded to the server's local address and port.

Failover Servers (Servers node)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/

products/software/xprotect-comparison/).

A failover recording server is an extra recording server which takes over from the standard recording server if this becomes unavailable. You can configure a failover recording server in two modes, as a **cold standby server** or as a **hot standby server**.

You install failover recording servers like standard recording servers (see Install a failover recording server through Download Manager). Once you have installed failover recording servers, they are visible in the Management Client. Milestone recommends that you install all failover recording servers on separate computers. Make sure that you configure failover recording servers with the correct IP address/host name of the management server. The user permissions for the user account under which the Failover Server service runs are provided during the installation process. They are:

- Start/Stop permissions to start or stop the failover recording server
- Read and Write access permissions to read or write the RecorderConfig.xml file

If a certificate is selected for encryption, then the administrator must grant read access permission to the failover user on the selected certificate private key.

If the failover recording server takes over from a recording server that uses encryption, Milestone recommends that you also prepare the failover recording server for using encryption. For more information, see Secure communication (explained) and Install a failover recording server through Download Manager.

You can specify what type of failover support you want on device-level. For each device on a recording server, select full, live only or no failover support. This helps you prioritize your failover resources and, for example, only set up failover for video and not for audio, or only have failover on essential cameras, not on less important ones.

While your system is in failover mode, you cannot replace or move hardware, update the recording server, or change device configurations such as storage settings or video stream settings.

Cold standby failover recording servers

In a cold standby failover recording server setup, you group multiple failover recording servers in a failover group. The entire failover group is dedicated to take over from any of several preselected recording servers, if one of these becomes unavailable. You can create as many groups as you want (see Group failover recording servers for cold standby).

Grouping has a clear benefit: when you later specify which failover recording servers should take over from a recording server, you select a group of failover recording servers. If the selected group contains more than one failover recording server, this offers you the security of having more than one failover recording server ready to take over if a recording server becomes unavailable. You can specify a secondary failover server group that takes over from the primary group if all the recording servers in the primary group are busy. A failover recording server can only be a member of one group at a time.

Failover recording servers in a failover group are ordered in a sequence. The sequence determines the order in which the failover recording servers will take over from a recording server. By default, the sequence reflects the order in which you have incorporated the failover recording servers in the failover group: first in is first in the sequence. You can change this if you need to.

Hot standby failover recording servers

In a hot standby failover recording server setup, you dedicate a failover recording server to take over from **one** recording server only. Because of this, the system can keep this failover recording server in a "standby" mode which means that it is synchronized with the correct/current configuration of the recording server it is dedicated to and can take over much faster than a cold standby failover recording server. As mentioned, you assign hot standby servers to one recording server only and cannot group it. You cannot assign failover servers that are already part of a failover group as hot standby recording servers.

Failover recording server validation

To validate a merge of video data from the failover server to the recording server, you must make the recording server unavailable by either stopping the recording server service or shutting down the recording server computer.

Any manual interruption of the network that you can cause by pulling out the network cable or blocking the network using a test tool is not a valid method.

Info tab properties (failover server)

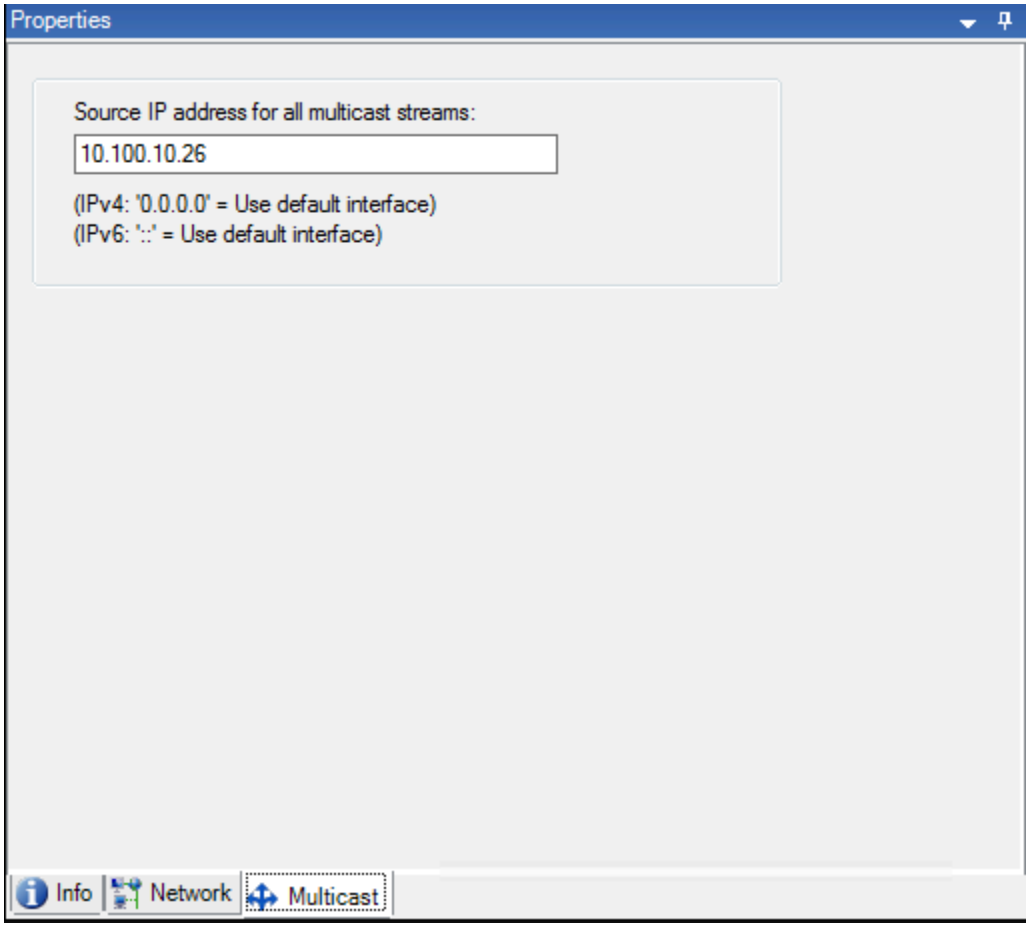
Specify the following failover recording server properties:

Name	Description
Name	The name of the failover recording server as it appears in the Management Client, logs and more.
Description	An optional field that you can use to describe the failover recording server, for example which recording server it takes over from.
Host name	Displays the failover recording server's host name. You cannot change this.
Local web server address	Displays the local address of the failover recording server's web server. You use the local address, for example, for handling PTZ camera control commands, and for handling browsing and live requests from XProtect Smart Client. The address includes the port number that is used for web server communication (typically port 7563). If the failover recording server takes over from a recording server that uses encryption, you also need to prepare the failover recording server to use encryption. If you enable encryption to clients and servers that retrieve data streams from the recording server, a padlock icon appears, and the address includes **https** instead of **http**.
Web server address	Displays the public address of the failover recording server's web server on the internet. If your installation uses a firewall or NAT router, enter the address of the firewall or NAT router so that clients that access the surveillance system on the internet can connect to the failover recording server. You specify the public address and port number on the **Network** tab. If you enable encryption to clients and servers that retrieve data streams from the recording server, a padlock icon appears, and the address includes **https** instead of **http**.
UDP port	The port number used for communication between failover recording servers. Default port is 8844.
Database location	Specify the path to the database used by the failover recording server for storing recordings.

Name	Description
	You cannot change the database path while the failover recording server is taking over from a recording server. The system applies the changes when the failover recording server is no longer taking over from a recording server.

Multicast tab (failover server)

If you are using failover servers, and you have enabled multicasting of live streaming, you must specify the IP address of the network interface card you are using, on both the recording servers and the failover servers.



For more information about multicasting, see Enable multicasting for the recording server.

Info tab properties (failover group)

Field	Description
Name	The name of the failover group as it appears in the Management Client, logs and more.

Field	Description
Description	An optional description, for example the server's physical location.

Sequence tab properties (failover group)

Field	Description
Specify the failover sequence	Use **Up** and **Down** to set the wanted sequence of regular failover recording servers within the group.

Remote server for Milestone Interconnect

Milestone Interconnect™ allows you to integrate a number of smaller, physically fragmented, and remote XProtect installations with one XProtect Corporate central site. You can install these smaller sites, called remote sites, on mobile units, for example, boats, busses or trains. This means that such sites do not need to be permanently connected to a network.

Info tab (remote server)

Name	Description
Name	The system uses the name whenever the remote server is listed in the system and clients. The name does not have to be unique. When you rename a server, the name is changed globally in the Management Client.
Description	Enter a description of the remote server (optional). The description appears in a number of listings within the system. For example, when pausing the mouse pointer over the hardware name in the **Overview** pane.
Model	Displays the XProtect product installed at the remote site.
Version	Displays the version of the remote system.
Software license code	The software license code of the remote system.
Driver	Identifies the driver that handles the connection to the remote server.

Name	Description
Address	The host name or IP address of the hardware.
IE	Opens the default home page of the hardware vendor. You can use this page for administration of the hardware or system.
Remote system ID	The unique system ID of the remote site used by XProtect to, for example, manage licenses.

Settings tab (remote server)

On the **Settings** tab, you can view the name of the remote system.

Events tab (remote server)

You can add events from the remote system to your central site in order to create rules and thereby respond immediately to events from the remote system. The number of events depend on the events configured in the remote system. You cannot delete default events.

If the list appears to be incomplete:

1. Right-click the relevant remote server in the **Overview** pane and select **Update Hardware**.
2. The dialog box lists all changes (devices removed, updated and added) in the remote system since you established or last refreshed the Milestone Interconnect setup. Click **Confirm** to update your central site with these changes.

Remote Retrieval tab

On the **Remote Retrieval** tab, you can handle remote recording retrieval settings for the remote site in a Milestone Interconnect setup:

Specify the following properties:

Name	Description
Retrieve recordings at max	Determines the maximum bandwidth in Kbits/s to be used for retrieving recordings from a remote site. Select the check box to enable limiting retrievals.
Retrieve recordings between	Determines that retrieval of recordings from a remote site are limited to a specific time interval. Unfinished jobs at the end time continue until completion, so if the end time is critical, you need to set it earlier to allow for unfinished jobs to complete. If the system receives an automatic retrieval or request for retrieval from the XProtect Smart Client outside the time interval, it is accepted, but not started until the selected time interval is reached. You can view pending remote recording retrieval jobs initiated by the users from **System Dashboard** -> **Current Tasks**.

Name	Description
Retrieve on devices in parallel	Determines the maximum number of devices from which recordings are retrieved simultaneously. Change the default value if you need more or less capacity depending on your system's capabilities.

When you change the settings, it may take several minutes until the changes are reflected in the system.

None of the above applies to direct playback of remote recordings.
All cameras set to be played back directly is available for direct playback and use bandwidth as needed.

Devices (Devices node)

The devices appear in the Management Client when you add hardware with the **Add Hardware** wizard. See Add hardware.

You can manage devices via the device groups if they have the same properties, see Device groups (explained).

You can also manage the devices individually.

Enabling/disabling and renaming of individual devices take place on the recording server hardware. See Enable/disable devices via device groups.

For all other configuration and management of cameras, expand **Devices** in the Site Navigation pane, then select a device:

- **Cameras**
- **Microphones**
- **Speakers**
- **Metadata**
- **Inputs**
- **Outputs**

In the Overview pane, you group your cameras for an easy overview of your cameras. Initial grouping is done as part of the **Add hardware** wizard.

For information about supported hardware, see the supported hardware page on the Milestone website (https://www.milestonesys.com/support/tools-and-references/supported-devices/).

Status icons of devices

When you select a device, information about the current status appears in the **Preview** pane.
The following icons indicate the status of the devices:

Camera	Microphone	Speaker	Metadata	Input	Output	Description
						**Device enabled and retrieving data**: The device is enabled and you retrieve a live stream.

Camera	Microphone	Speaker	Metadata	Input	Output	Description
						**Device recording**: The device is recording data on the system.
						**Device temporarily stopped or has no feed**: When stopped, no information is transferred to the system. If it is a camera, you cannot view live video. A stopped device can still communicate with the recording server for retrieving events, setting settings etc., as opposed to when a device is disabled.
						**Devices disabled**: Cannot be started automatically through a rule and cannot communicate with the recording server. If a camera is disabled, you cannot view live or recorded video.
						**Device database being repaired**.
						**Device requires attention**: The device does not function correctly. Pause the mouse pointer over the device icon to get a description of the problem in the tooltip.
						**Status unknown**: Status of the device is unknown, for example, if the recording server is offline.
						Some icons can be combined, as in this example where **Device enabled and retrieving data** is combined with **Device recording**.

Cameras (Devices node)

Camera devices are added automatically when you add hardware to the system and are by default enabled.

The system comes with a default start feed rule which ensures that video feeds from all connected cameras are automatically fed to the system. The default rule can be deactivated and/or modified as required.

Follow this configuration order to complete the most typical tasks related to configuration of a camera device:

1. Configure camera settings, see Settings tab (devices).
2. Configure streams, see Streams tab (devices).
3. Configure motion, see Motion tab (devices).
4. Configure recording, see Record tab (devices) and Monitor the databases for devices.
5. Configure the remaining settings as needed.

Microphones (Devices node)

Microphone devices are added automatically when you add hardware to the system. They are by default disabled, so you must enable them before use, either as part of the **Add Hardware** wizard or afterwards. Microphones do not require separate licenses. You can use as many microphones as required on your system.

You can use microphones completely independently of cameras.

The system comes with a default start audio feed rule which ensures that audio feeds from all connected microphones are automatically fed to the system. The default rule can be deactivated and/or modified as required.

You can configure microphone devices on these tabs:

- Info tab, see Info tab (devices)
- Settings tab, see Settings tab (devices)
- Record tab, see Record tab (devices)
- Events tab, see Events tab (devices)

Speakers (Devices node)

Speaker devices are added automatically when you add hardware to the system. They are by default disabled, so you must enable them before use, either as part of the **Add Hardware** wizard or afterwards. Speakers do not require separate licenses. You can use as many speakers as required on your system.

You can use speakers completely independently of cameras.

The system comes with a default start audio feed rule that starts the device so the device is ready to send user activated audio to the speakers. The default rule can be deactivated and/or modified as required.

You can configure speaker devices on these tabs:

- Info tab, see Info tab (devices)
- Settings tab, see Settings tab (devices)
- Record tab, see Record tab (devices)

Metadata (Devices node)

The system comes with a default start feed rule which ensures that metadata feeds from all connected hardware that supports metadata, are automatically fed to the system. The default rule can be deactivated and/or modified as required.

You can configure metadata devices on these tabs:

- Info tab, see Info tab (devices)
- Settings tab, see Settings tab (devices)
- Record tab, see Record tab (devices)

Input (Devices node)

You can use input devices completely independently of cameras.

Before you specify use of external input units on a device, verify that the device itself recognize the sensor operation. Most devices can show this in their configuration interfaces, or via Common Gateway Interface (CGI) script commands.

Input devices are added automatically when you add hardware to the system. They are by default disabled, so you must enable them before use, either as part of the **Add Hardware** wizard or afterwards. Input devices do not require separate licenses. You can use as many input devices as required on your system.

You can configure input devices on these tabs:

- Info tab, see Info tab (devices)
- Settings tab, see Settings tab (devices)
- Events tab, see Events tab (devices)

Output (Devices node)

Output can be triggered manually from the Management Client and XProtect Smart Client.

Before you specify use of external output units on a device, verify that the device itself can control the device attached to the output. Most devices can show this in their configuration interfaces, or via Common Gateway Interface (CGI) script commands.

Output devices are added automatically when you add hardware to the system. They are by default disabled, so you must enable them before use, either as part of the **Add Hardware** wizard or afterwards. Output devices do not require separate licenses. You can use as many output devices as required on your system.

You can configure output devices on these tabs:

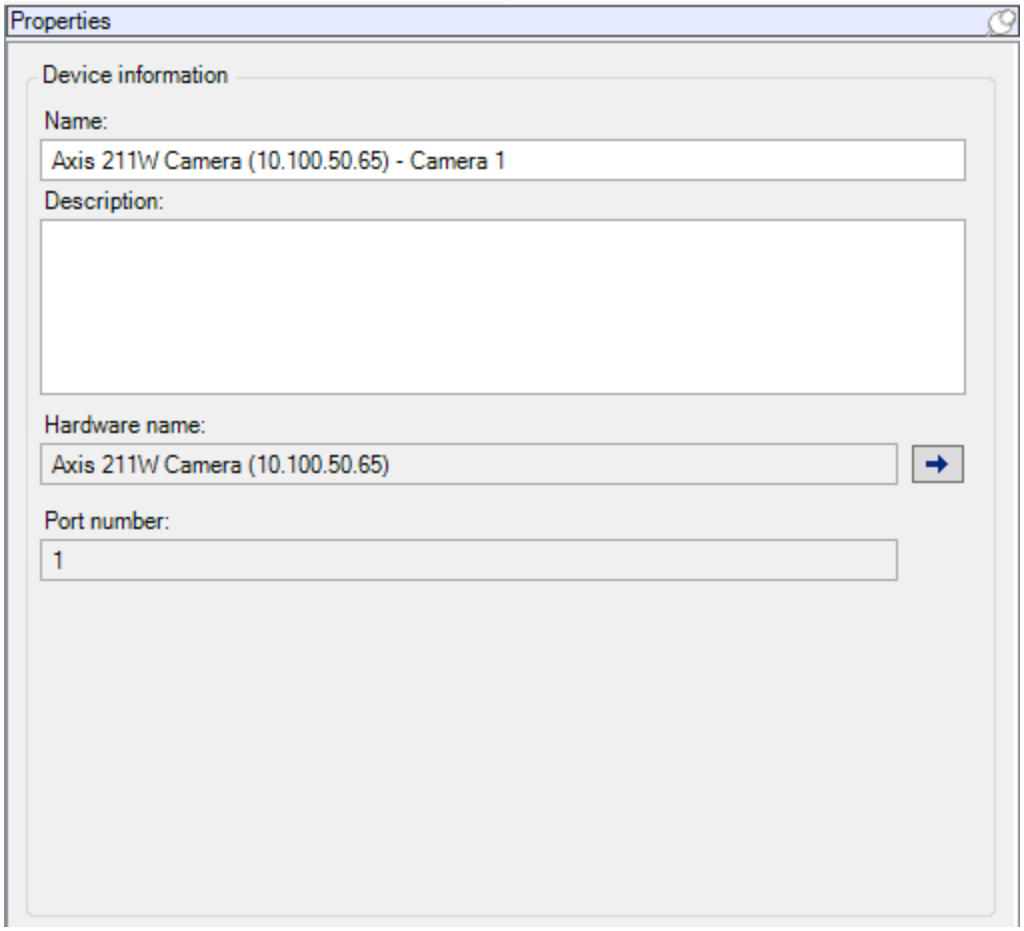
Info tab, see

- Info tab, see Info tab (devices)
- Settings tab, see Settings tab (devices)

Devices tabs

On the **Info** tab, you can view and edit basic information about a device in a number of fields.

All devices have an **Info** tab.



Info tab properties

Name	Description
Name	The name is used whenever the device is listed in the system and clients. When you rename a device, the name is changed globally in the Management Client.
Description	Enter a description of the device (optional). The description appears in a number of listings within the system. For example, when you pause the mouse pointer over the name in the **Overview** pane.
Hardware name	Displays the name of the hardware, with which the device is connected. The field is non-editable from here, but you can change it by clicking **Go To** next to it. This takes you to hardware information where you can change the name.
Port number	Displays the port on which the device is attached on the hardware. For single-device hardware, the port number is typically **1**. For multi-device hardware, such as video servers

Name	Description
	with several channels, the port number typically indicates the channel on which the device is attached, for example **3**.
Short name	To apply a short name for the camera, enter it here. The maximum length of characters is 128. If you are using smart map, automatically the short name is displayed with the camera on the smart map. Otherwise the full name is displayed.
Geo coordinates	Enter the geographic location of the camera in the format latitude, longitude. The value you enter determines the position of the camera icon on the smart map in XProtect Smart Client and XProtect Mobile client.  The field is mainly for Smart Map and third-party integrations.
Direction	Enter the viewing direction of the camera measured against a due north point on a vertical axis. The value you enter determines the direction of the camera icon on the smart map in XProtect Smart Client and XProtect Mobile client. The default value is 0.0.  The field is mainly for Smart Map and third-party integrations.
Field of view	Enter the width of the field of view in degrees. The value you enter determines the angle of the field of view for the camera icon on the smart map in XProtect Smart Client and XProtect Mobile client. The default value is 0.0.  The field is mainly for Smart Map and third-party integrations.
Depth	Enter the depth of the field of view in meters or feet. The value you enter determines the length of the field of view for the camera icon on the smart map in XProtect Smart Client and XProtect Mobile client. The default value is 0.0.  The field is mainly for Smart Map and third-party integrations.
Preview position in browser	To verify that you have entered the correct geographic coordinates, click the button. Google Maps will open in your standard Internet browser on the position you specify.

Name	Description
	The field is mainly for Smart Map and third-party integrations.

Settings tab (devices)

Streams tab (devices)

Record tab (devices)

Motion tab (devices)

Presets tab (devices)

Patrolling tab (devices)

Fisheye lens tab (devices)

Events tab (devices)

Client tab (devices)

Privacy masking tab (devices)

Settings tab (devices)

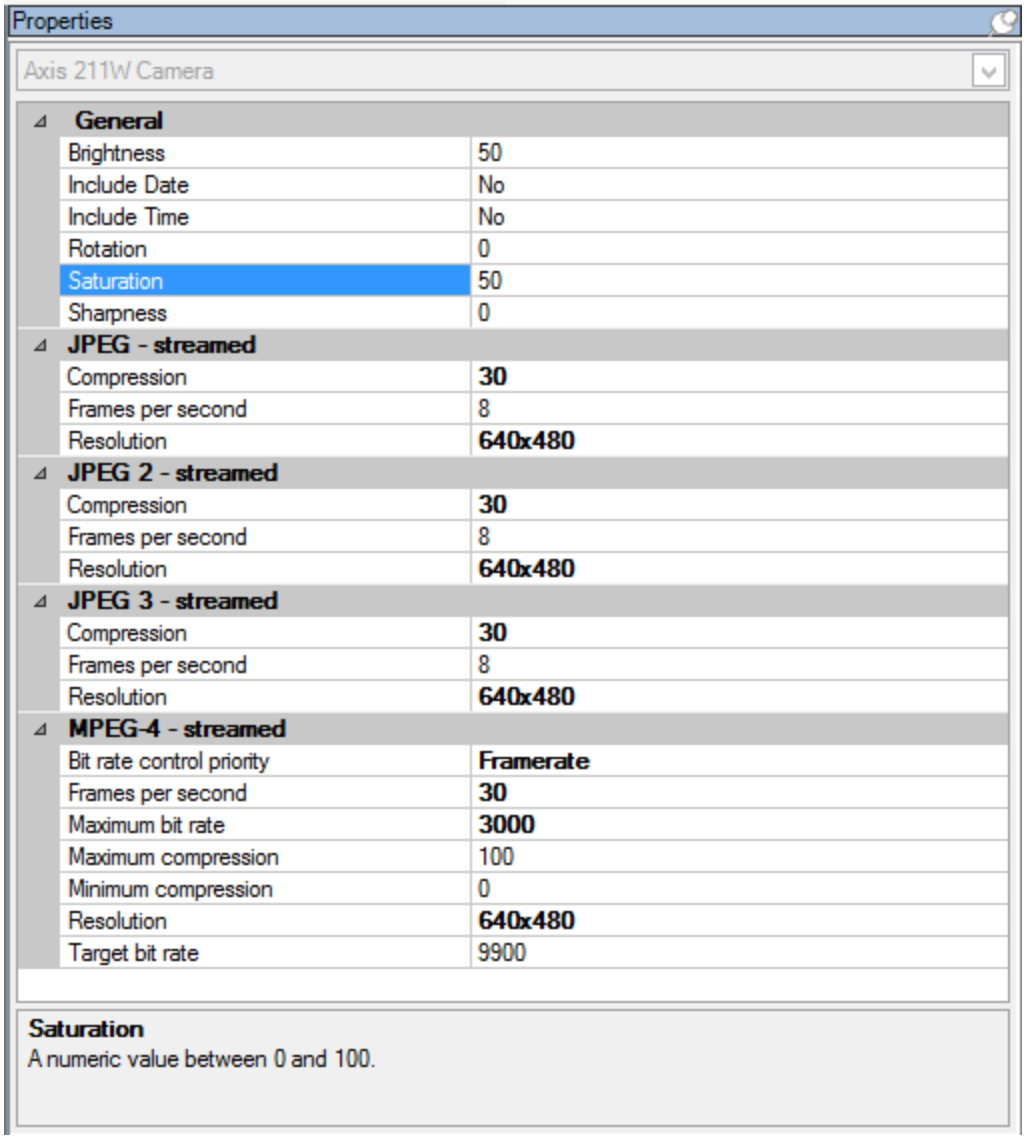
On the **Settings** tab, you can view and edit settings for a device in a number of fields.

All devices have a **Settings** tab.

The values appear in a table as changeable or read-only. When you change a setting to a non-default value, the value appears in bold.

The content of the table depends on the device driver.

Allowed ranges appear in the information box below the settings table:



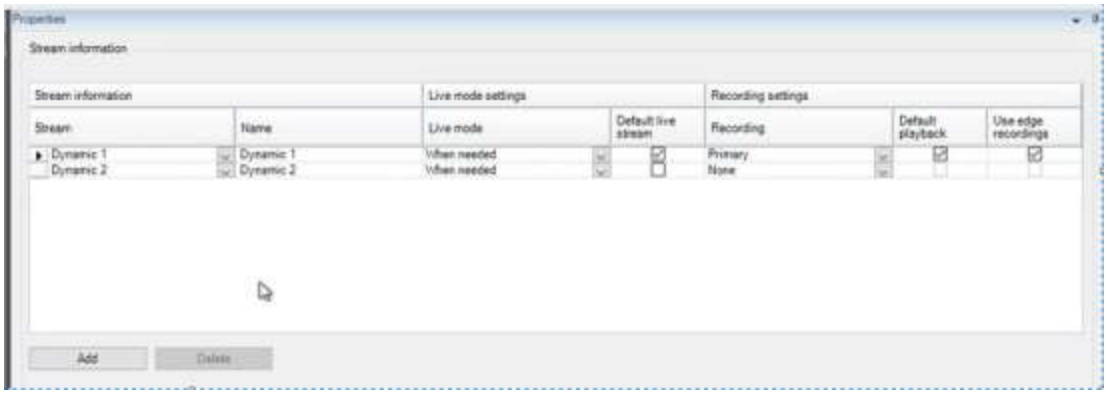
For more information about camera settings, see View or edit camera settings.

Streams tab (devices)

The following devices have a **Streams** tab:

- Cameras

The **Streams** tab lists by default a single stream. It is the selected camera's default stream, used for live and recorded video. If you use adaptive playback, two streams must be created.



Tasks on the Streams tab

Name	Description
Add	Click to add a stream to the list. Add a stream

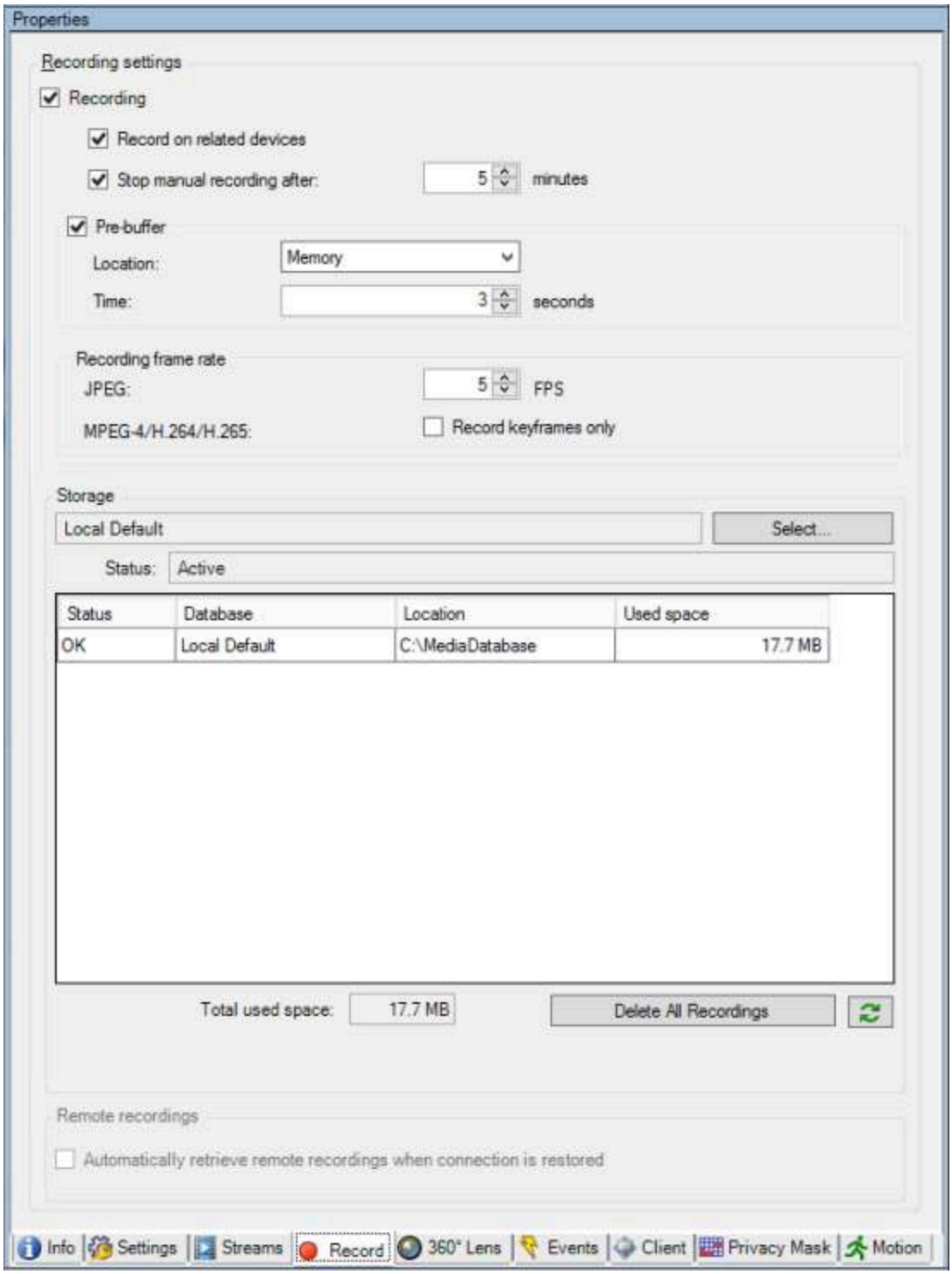
Record tab (devices)

The following devices have a **Record** tab:

- Cameras
- Microphones
- Speakers
- Metadata

Recordings from a device are only saved in the database when you have enabled recording and the recording-related rule criteria are met.

Parameters that cannot be configured for a device are grayed out.



Tasks on the Record tab

Name	Description
Recording	Enable/disable recording

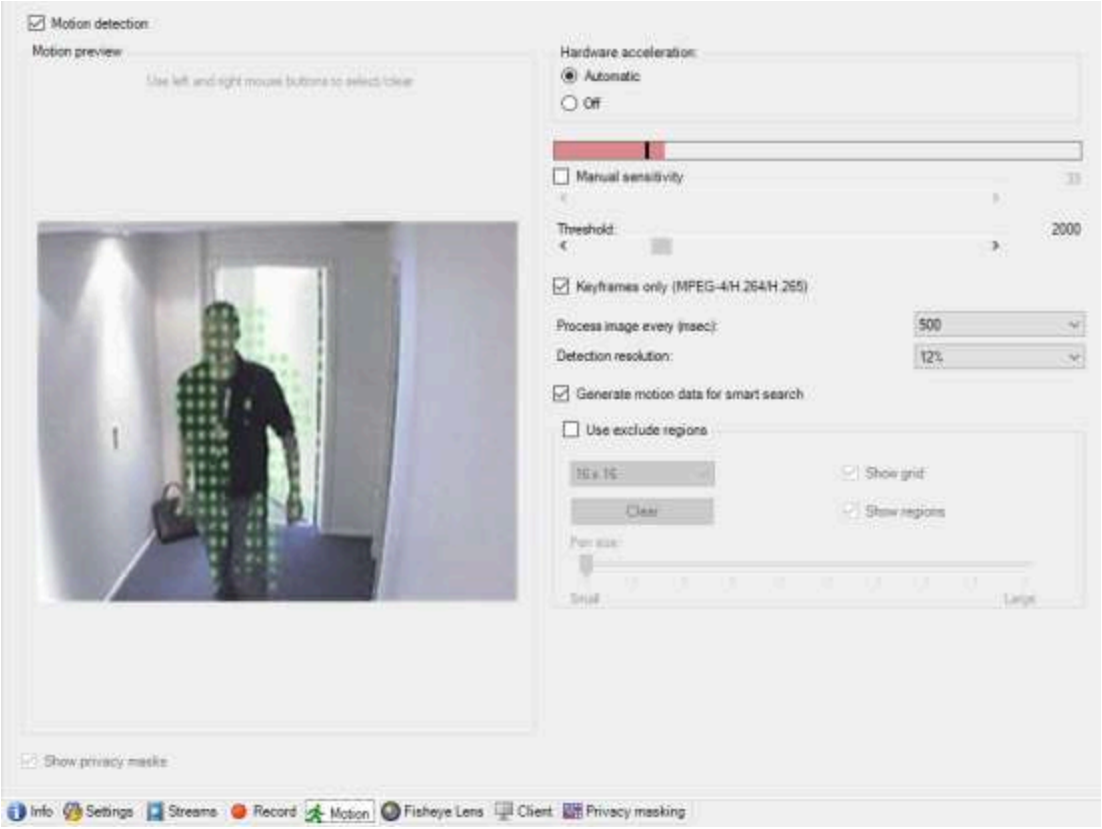
Name	Description
	Enable recording on related devices
Pre-buffer	Pre-buffering and storage of pre-buffer recordings (explained) Manage pre-buffering Manage manual recording
Recording frame rate	Specify recording frame rate Enable keyframe recording
Storage	Monitor the status of databases for devices
Select	Move devices from one storage to another
Delete All Recordings	Use this button if you have added all devices in the group to the same server: Delete recordings
Automatically retrieve remote recordings when connection is restored	Save and retrieve remote recording

Motion tab (devices)

The following devices have a **Motion** tab:

- Cameras

On the **Motion** tab, you can enable and configure motion detection for the selected camera.



Tasks on the Motion tab

Name	Description
Motion detection	Enable and disable motion detection
Hardware acceleration	Select **Automatic** to enable hardware acceleration or select **Off** to disable the setting. For more information, see Enable or disable hardware acceleration.
Privacy masks	If you have defined areas with permanent privacy masks, you can select the **Privacy masks** check box to display the privacy masks on the **Motion** tab. You define areas with privacy masks on the Privacy masking tab (devices). There is no motion detection within areas covered by permanent privacy masks.
Manual sensitivity	Determine **how much each pixel** in the image must change before it is regarded as motion: Enable manual sensitivity to define motion

Name	Description
Threshold	Determine **how many pixels** in the image must change before it is regarded as motion: Specify threshold to define motion
Keyframes only (MPEG-4/ H.264/ H.265)	Select this check box to do motion detection on keyframes only instead of on the entire video stream. Only applies to MPEG-4/H.264/H.265. Motion detection on keyframes reduces the amount of processing power used to carry out the analysis.
Process image every (msec)	Select an image processing interval in this list to determine how often the system performs the motion detection analysis. For example, every 1000 milliseconds are once every second. Default value is every 500 milliseconds. The interval is applied if the actual frame rate is higher than the interval you set here.
Detection resolution	Select a detection resolution in this list to optimize motion detection performance. Only the selected percentage of the image is analyzed, for example 25%. By analyzing 25%, only every fourth pixel in the image is analyzed instead of all pixels. Using optimized detection reduces the amount of processing power used to carry out the analysis, but also means a less accurate motion detection.
Generate motion data for smart search	With this check box enabled, the system generates motion data for the images used for motion detection. For example, if you select motion detection on keyframes only, the motion data is also produced for keyframes only. The extra motion data enables the client user, via the smart search function, to quickly search for relevant recordings based on motion in the selected area of the image. The system does not generate motion data within areas covered by permanent privacy masks, but only for areas with liftable privacy masks (see Motion detection (explained)). Motion detection threshold and exclude regions do not influence the generated motion data. • Specify the default setting of generating smart search data for cameras under **Tools** > **Options** > **General**.
Use exclude regions	Exclude motion detection from specific areas of a camera view: Specify exclude regions for motion detection

Presets tab (devices)

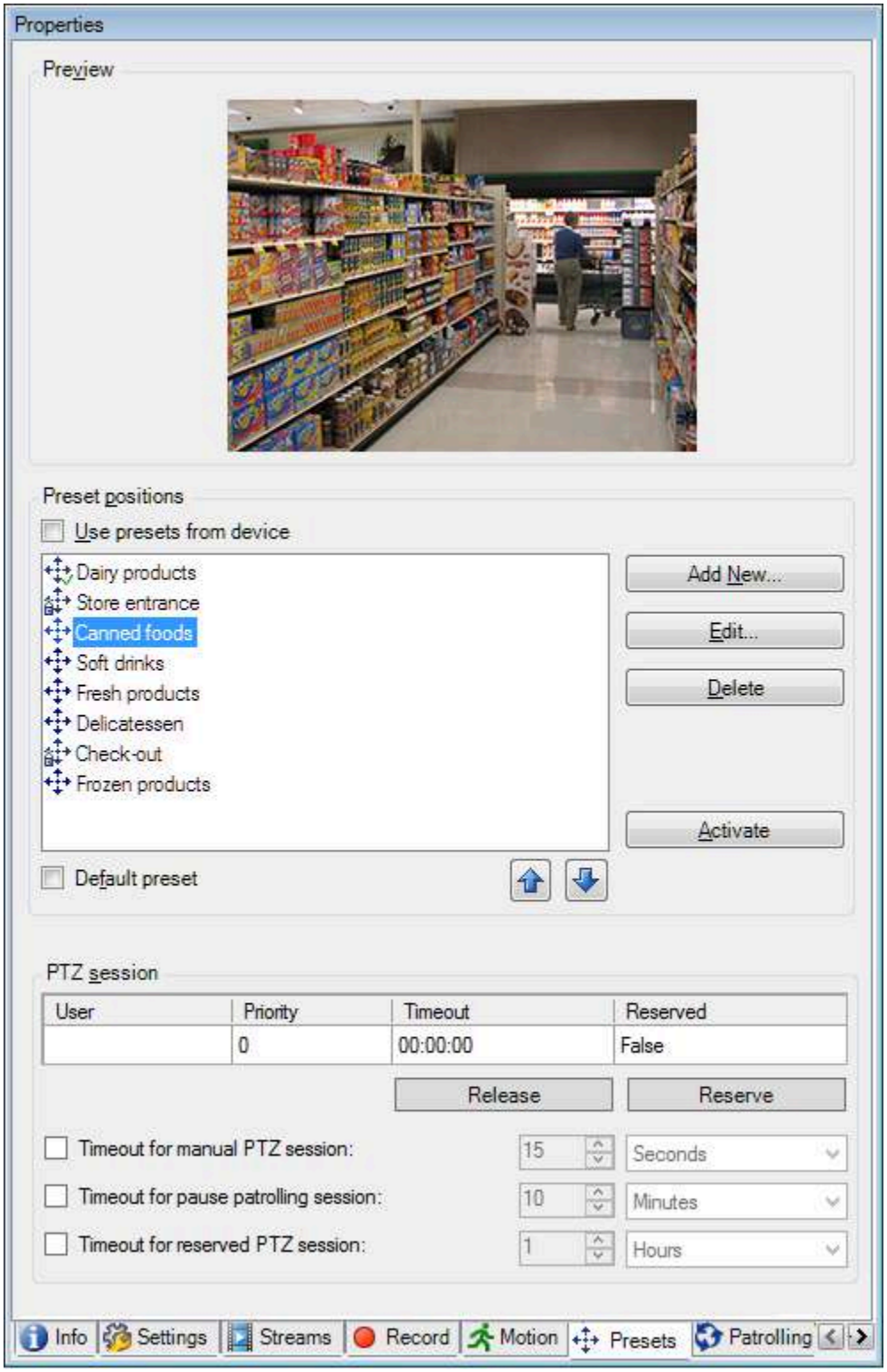
The following devices have a **Presets** tab:

- PTZ cameras that support preset positions

On the **Presets** tab, you can create or import preset positions, for example:

- In rules for making a PTZ (pan-tilt-zoom) camera move to a specific preset position when an event occurs
- In patrolling, for the automatic movement of a PTZ camera between a number of preset positions
- For manual activation by the XProtect Smart Client users

You assign PTZ permission to roles on the Overall Security tab (see Overall Security tab (roles)) or the PTZ tab (see PTZ tab (roles)).



Tasks on the Presets tab

Name	Description
New	Add a preset position for a camera in the system: Add a preset position (type 1)
Use presets from device	Add a preset position for a PTZ cameras on the camera itself: Use preset positions from the camera (type 2)
Default preset	Assign one of a PTZ camera's preset positions as the camera's default preset position: Assign a camera's default preset position as default
Edit	Edit an existing preset position defined in the system: Edit a preset position for a camera (type 1 only) Edit the name of a preset position defined in the camera: Rename a preset position for a camera (type 2 only)
Locked	Select this check box to lock a preset position. You can lock a preset position if you want to prevent users in XProtect Smart Client or users with limited security permissions from updating or deleting a preset. Locked presets are indicated with this icon  . You lock presets as part of adding (see Add a preset position (type 1)) and editing (see Edit a preset position (type 1 only)).
Activate	Click this button to test a cameras preset position: Test a preset position (type 1 only).
Reserve and **Release**	Prevent other users from taking control over the camera and release the reservation. Administrators with security permissions to run a reserved PTZ session can run the PTZ camera in this mode. This prevents other users from taking control over the camera. With sufficient permissions, you can release other users' reserved PTZ sessions: Reserve and release PTZ sessions.
PTZ session	Monitor if the system is currently patrolling or a user has taken control: PTZ session properties. View the status of PTZ cameras and manage timeouts for cameras:

Name	Description
	Specify PTZ session timeouts.

PTZ session properties

The **PTZ session** table shows the current status of the PTZ camera.

Name	Description
User	Displays the user that has pressed the **Reserved** button and currently controls the PTZ camera. If a patrolling session is activated by the system, it displays **Patrolling**.
Priority	Displays the user's PTZ priority. You can only take over PTZ sessions from users with a lower priority than you.
Timeout	Displays the remaining time of the current PTZ session.
Reserved	Indicates if the current session is a reserved PTZ session or not: • **True**: Reserved • **False**: Not reserved

The check boxes in the **PTZ session** section enable you to change the following timeouts for each PTZ camera.

Name	Description
Timeout for manual PTZ session	Specify the timeout period for manual PTZ sessions on this camera if you want the timeout to be different from the default period. You specify the default period in the **Tools** menu under **Options**.
Timeout for pause patrolling PTZ session	Specify the timeout period for pause patrolling PTZ sessions on this camera if you want the timeout to be different from the default period. You specify the default period in the **Tools** menu under **Options**.
Timeout for reserved PTZ session	Specify the timeout period for reserved PTZ sessions on this camera if you want the timeout to be different from the default period. You specify the default period in the **Tools** menu under **Options**.

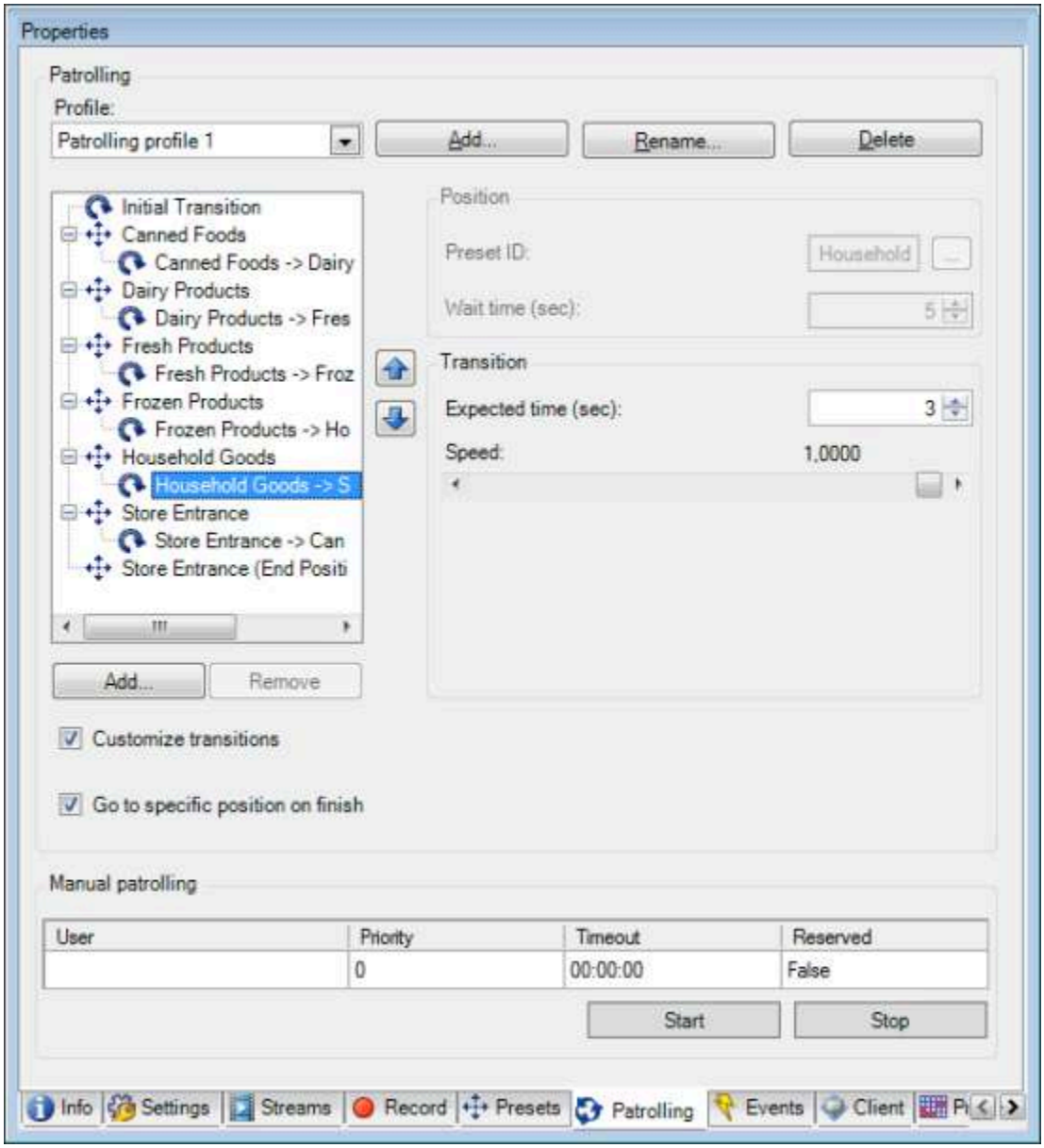
Patrolling tab (devices)

The following devices have a **Patrolling** tab:

- PTZ cameras

On the **Patrolling** tab, you can create patrolling profiles - the automatic movement of a PTZ (pan-tilt-zoom) camera between a number of preset positions.
Before you can work with patrolling, you must specify at least two preset positions for the camera in the **Presets** tab, see Add a preset position (type 1).

Patrolling tab, displaying a patrolling profile with customized transitions:



Tasks on the Patrolling tab

Name	Description
Add	Add a patrolling profile
Preset ID	Specify preset positions in a patrolling profile

Name	Description
Wait time (sec)	Specify the time at each preset position
Customize transitions	Customize transitions (PTZ)
Go to specific position on finish	Specify an end position when patrolling
Manual patrolling	Monitor if the system is currently patrolling or a user has taken control.
Start and **Stop**	Use the **Start** and **Stop** buttons to initiate and stop manual patrolling. See Specify PTZ session timeouts for information about how to specify how much time should pass before regular patrolling is resumed for all or for individual PTZ cameras.

Manual patrolling properties

The **Manual patrolling** table shows the current status of the PTZ camera.

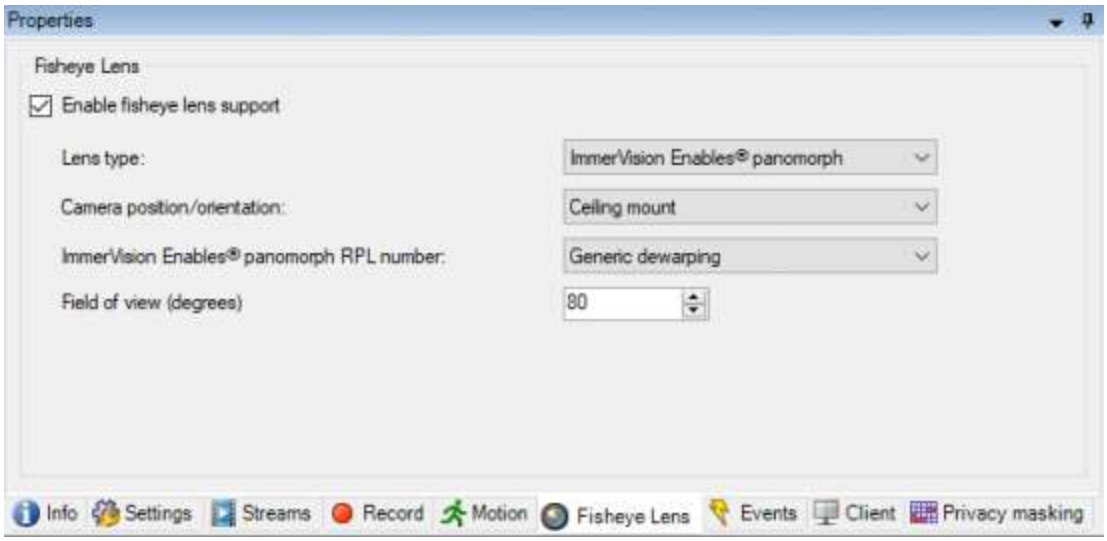
Name	Description
User	Displays the user who has either reserved the PTZ session or started a manual patrolling and currently controls the camera. If a patrolling session is activated by the system, it displays **Patrolling**.
Priority	Displays the user's PTZ priority. You can only take over PTZ sessions from users or patrolling profiles with a lower priority than yours.
Timeout	Displays the remaining time of the current reserved or manual PTZ sessions.
Reserved	Indicates if the current session is a reserved PTZ session or not. • **True**: Reserved • **False**: Not reserved

Fisheye lens tab (devices)

The following devices have a **Fisheye Lens** tab:

- Fixed cameras with a fisheye lens

On the **Fisheye Lens** tab, you can enable and configure fisheye lens support for the selected camera.



Task on the Fisheye lens tab

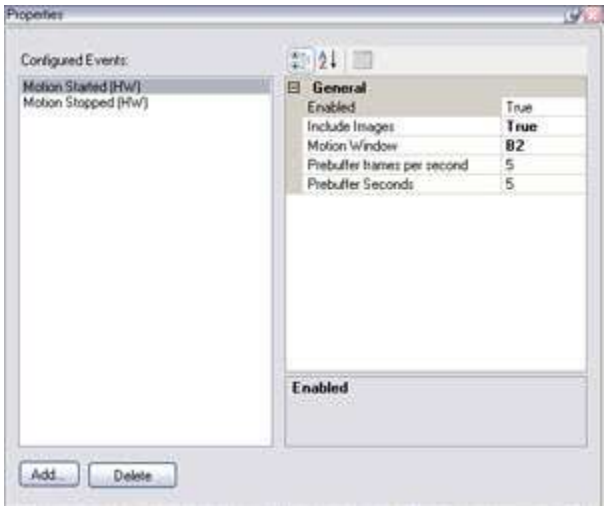
Name	Description
Enable fisheye lens support	Enable and disable fisheye lens support

Events tab (devices)

The following devices have an **Events** tab:

- Cameras
- Microphones
- Inputs

In addition to the system's event, some devices can be configured to trigger events. You can use these events when creating event-based rules in the system. Technically, they occur on the actual hardware/device rather than on the surveillance system.



Tasks on the Events tab

Name	Description
Add and **Delete**	Add an event for a device and Delete an event for a device

Event tab (properties)

Name	Description
Configured events	Which events you may select and add in the **Configured events** list is determined entirely by the device and its configuration. For some types of devices, the list is empty.
General	The list of properties depends on the device and the event. In order for the event to work as intended, you must specify some or all of the properties identically on the device as well as on this tab.

Client tab (devices)

The following devices have a **Client** tab:

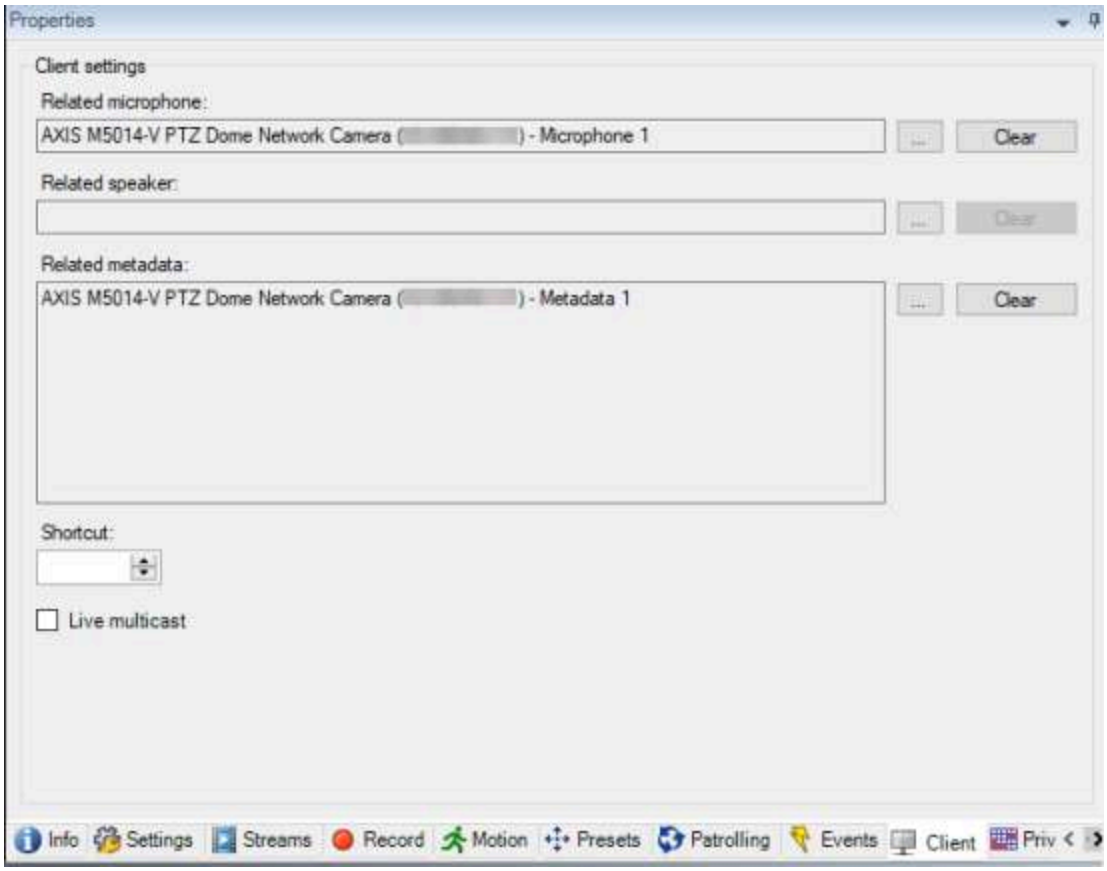
- Cameras

On the **Client** tab you can specify which other devices are viewed and heard when you use the camera in XProtect Smart Client.

The related devices also record when the camera records, see Enable recording on related devices.

You can also enable **Live multicast** on the camera. It means that the camera multicasts live streams to the clients via the recording server.

Multicast streams are not encrypted, even if the recording server uses encryption.



Client tab properties

Name	Description
Related microphone	Specify the microphone on the camera that XProtect Smart Client users by default listen to audio. The XProtect Smart Client user can manually select to listen to another microphone if needed. Specify the microphone that is related to the video push camera for streaming video with audio. The related microphones record when the camera records.
Related speaker	Specify through which speakers on the camera, that XProtect Smart Client users speak by default. The XProtect Smart Client user can manually select another speaker if needed. The related speakers record when the camera records.
Related metadata	Specify one or more metadata devices on the camera, that XProtect Smart Client users receive data from. The related metadata devices record when the camera records.
Shortcut	To ease the selection of cameras for the XProtect Smart Client users, define keyboard shortcuts to the camera.

Name	Description
	• Create each shortcut so it uniquely identifies the camera • A camera shortcut number cannot be longer than four digits
Live multicast	The system supports multicast of live streams from the recording server to XProtect Smart Client. To enable multicast of live streams from the camera, select the check box. Live multicasting only works on the stream that you have specified as the camera's default stream on the **Streams** tab. You must also configure multicasting for the recording server. See Enable multicasting for the recording server. Multicast streams are not encrypted, even if the recording server uses encryption.

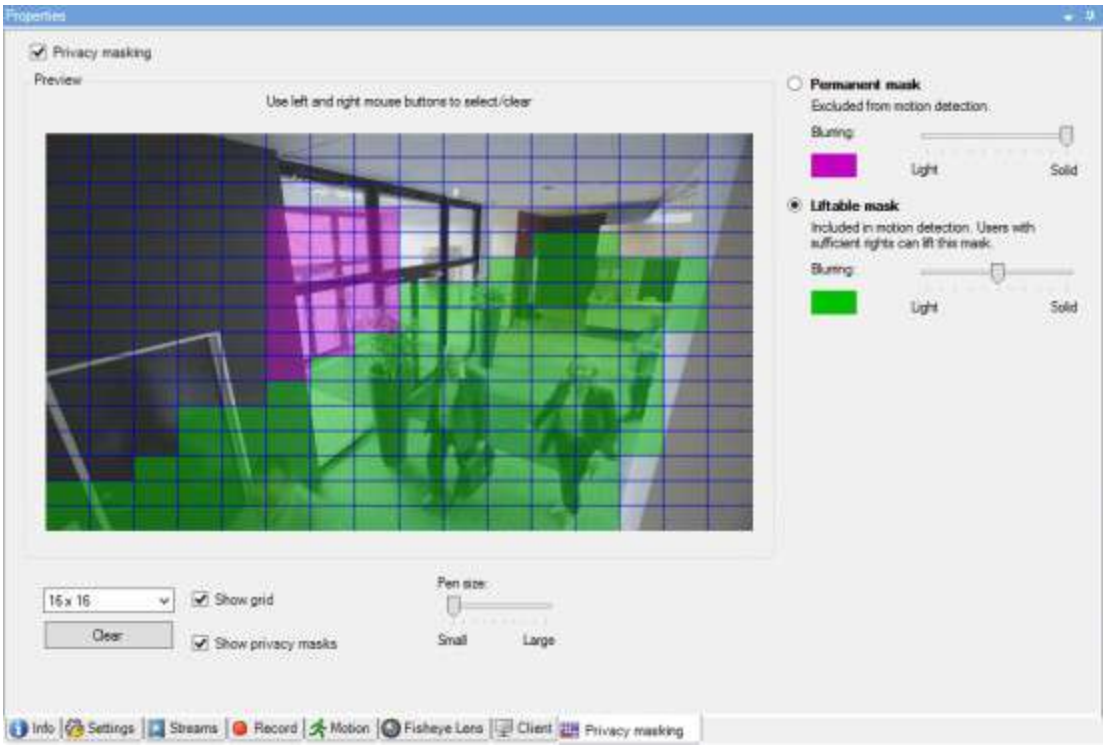
Privacy masking tab (devices)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

The following devices have a **Privacy masking** tab:

- Cameras

On the **Privacy masking** tab, you can enable and configure privacy protection for the selected camera.



Tasks on the Privacy masking tab

Name	Description
Privacy masking	Enable/disable privacy masking Privacy masking (explained)
Permanent mask and **Liftable mask**	Define, if you want a permanent or liftable privacy mask: Define privacy masks

Tasks related to Privacy masking

Task	Description
Change the timeout for lifted privacy masks for the Smart Client profile associated with the role that has the permission to lift privacy masks.	Change the timeout for lifted privacy masks
Enable or disable the permission to lift privacy masks for a role.	Give users permission to lift privacy masks

Task	Description
Create a devices report with information about your cameras' current privacy masking settings.	Create a report of your privacy masking configuration

Privacy masking tab (properties)

Name	Description
Grid size	The selected grid size determines the density of the grid, regardless whether the grid is visible in the preview or not. Select between the values 8×8, 16×16, 32×32 or 64×64.
Clear	Clears **all** privacy masks you have specified.
Show grid	Select the **Show grid** check box to make the grid visible.
Show privacy masks	When you select the **Show privacy masks** check box (default), permanent privacy masks appear in purple in the preview and liftable privacy masks in green. Milestone recommends that you keep the **Show privacy masks** box selected so that you and your colleagues can see the current privacy protection configuration.
Pen size	Use the **Pen size** slider to indicate the size of the selections you wish to make when you click and drag the grid to select regions. Default is set to small, which is equivalent to one square in the grid.
Permanent mask	Appears in purple in the preview on this tab and on the **Motion** tab. Permanent privacy masks are always visible in XProtect Smart Client and cannot be lifted. Can be used to cover areas of the video that never requires surveillance, like public areas, where surveillance is not allowed. Motion detection is excluded from permanent masks. You specify the coverage of privacy masks as either solid or some level of blurred. The coverage settings apply to both live and recorded video.
Liftable mask	Appears in green in the preview on this tab. Liftable privacy masks can be lifted in XProtect Smart Client by users with sufficient user permissions. By default, the privacy masks are lifted for 30 minutes, or until the user apply them again. Be aware that the privacy masks are lifted on video from all the cameras that the user has access to. If the XProtect Smart Client user does not have the permission to lift privacy masks, the system asks for a user with permission to authorize the lift. You specify the coverage of privacy masks as either solid or a level of blurred. The coverage settings apply to both live and recorded video.

Name	Description
Blurring	Use the slider to select the blurring level of the privacy masks in the clients or set the coverage to solid. By default, the coverage of areas with permanent privacy masks are solid (nontransparent). By default, liftable privacy masks are medium blurred. You can inform the client users about the appearance of permanent and liftable privacy masks, so they are able to distinguish.

Hardware Properties window

You have several options for adding hardware to each recording server in your system.

> ⚠ If your hardware is located behind a NAT-enabled router or a firewall, you may need to specify a different port number and configure the router/firewall so it maps the port and IP addresses that the hardware uses.

The **Add Hardware** wizard helps you detect hardware like cameras and video encoders on your network and add them to the recording servers on your system. The wizard also helps you add remote recording servers for Milestone Interconnect setups. Only add hardware to **one recording server** at a time.

Info tab (hardware)

For information about the **Info** tab for remote servers, see Info tab (remote server).

Name	Description
Name	Enter a name. The system uses the name whenever the hardware is listed in the system and in the clients. The name does not have to be unique. When you rename hardware, the name is changed globally in the Management Client.
Description	Enter a description of the hardware (optional). The description appears in a number of listings within the system. For example, when moving the mouse pointer over the hardware name in the **Overview** pane: 
Model	Identifies the hardware model.
Serial number	Hardware serial number as specified by the manufacturer. The serial number is often, but not always, identical to the MAC address.

Name	Description
Driver	Identifies the driver that handles the connection to the hardware.
IE	Opens the default home page of the hardware vendor. You can use this page for administration of the hardware.
Address	The host name or IP address of the hardware.
MAC address	Specifies the Media Access Control (MAC) address of the system hardware. A MAC address is a 12-character hexadecimal number uniquely identifying each piece of hardware on a network.
Firmware version:	The firmware version of the hardware device. To ensure that the system displays the current version, run the **Update hardware data** wizard after every firmware update.
Password last changed	The **Password last changed** field shows the time stamp of the latest password change based on the local time settings of the computer that the password was changed from.
Hardware data last updated:	Time and date of the last update of the hardware data.

Settings tab (hardware)

On the **Settings** tab, you can verify or edit settings for the hardware.

The content of the **Settings** tab is determined by the selected hardware, and varies depending on the type of hardware. For some types of hardware, the **Settings** tab displays no content at all or read-only content.

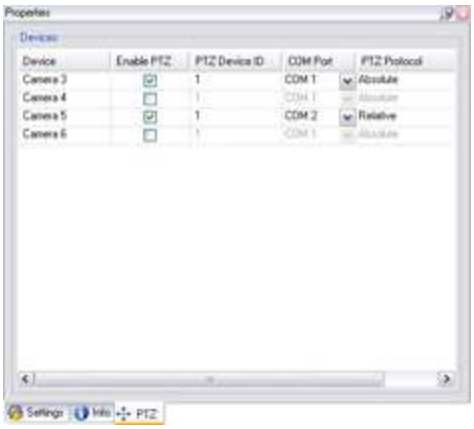
For information about the **Settings** tab for remote servers, see Settings tab (remote server).

PTZ tab (video encoders)

On the **PTZ** tab, you can enable PTZ (pan-tilt-zoom) for video encoders. The tab is available if the selected device is a video encoder or if the driver supports both non-PTZ and PTZ cameras.

You must enable the use of PTZ separately for each of the video encoder's channels on the **PTZ** tab before you can use the PTZ features of the PTZ cameras attached to the video encoder.

Not all video encoders support the use of PTZ cameras. Even video encoders that support the use of PTZ cameras may require configuration before the PTZ cameras can be used. It is typically the installation of additional drivers through a browser-based configuration interface on the device's IP address.



PTZ tab, with PTZ enabled for two channels on a video encoder.

Clients (node)

This article describes how to customize the user interface for operators in XProtect Smart Client and for system administrators in the Management Client.

Smart Wall (Client node)

Smart Wall properties

Info tab

On the **Info** tab for a Smart Wall definition, you can add and edit Smart Wall properties.

Name	Description
Name	The name of the Smart Wall definition. Displayed in XProtect Smart Client as the Smart Wall view group name.
Description	A description of the Smart Wall definition. The description is only used internally in XProtect Management Client.
Status text	Display camera and system status information in camera view items.
No title bar	Hide the title bar on all view items on the video wall.
Title bar	Show the title bar on all view items on the video wall.

Presets tab

On the **Presets** tab for a Smart Wall definition, you can add and edit Smart Wall presets.

Name	Description
Add New	Add a preset to your Smart Wall definition. Enter a name and description for the preset.
Edit	Edit the name or description of a preset.
Delete	Delete a preset.
Activate	Apply the preset on the Smart Wall monitors that are configured to use the preset. To apply a preset automatically, you must create a rule that uses the preset.

Layout tab

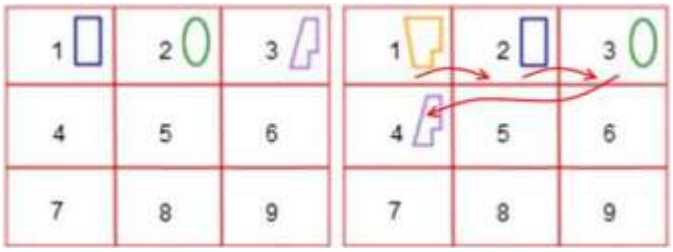
On the **Layout** tab for a Smart Wall definition, you position the monitors, so their positions resemble the mounting of the physical monitors on the video wall. The layout is also used in XProtect Smart Client.

Name	Description
Edit	Adjust the positioning of the monitors.
Movement	To move a monitor to a new position, select the monitor and drag it to the desired position, or click one of the arrow buttons to move the monitor in the selected direction.
Zoom buttons	Zoom in or out of the Smart Wall layout preview to ensure you position the monitors correctly.
Name	The name of the monitor. The name is displayed in XProtect Smart Client.
Size	The size of the physical monitor on the video wall.
Aspect ratio	The height/width relationship of the physical monitor on the video wall.

Monitor properties

Info tab

On the **Info** tab for a monitor in a Smart Wall preset, you can add monitors and edit the monitor settings.

Name	Description
Name	The name of the monitor. The name is displayed in XProtect Smart Client.
Description	A description of the monitor. The description is only used internally in the XProtect Management Client.
Size	The size of the physical monitor on the video wall.
Aspect ratio	The height/width relationship of the physical monitor on the video wall.
Empty preset	Defines what should be displayed on a monitor with an empty preset layout when a new Smart Wall preset is triggered or selected in XProtect Smart Client: • Select **Preserve** to keep the current content on the monitor. • Select **Clear** to clear all content so nothing is displayed on the monitor.
Empty preset item	Defines what should be displayed in an empty preset item when a new Smart Wall preset is triggered or selected in XProtect Smart Client: • Select **Preserve** to keep the current content in the layout item. • Select **Clear** to clear the content so nothing is displayed in the layout item.
Element insertion	Defines how cameras are inserted in the monitor layout when viewed in the XProtect Smart Client: • **Independent** - only the content of the affected layout item changes, the rest of the content in the layout remain the same. • **Linked** - the contents of the layout items are pushed from left to right. If, for example, a camera is inserted in position 1, the previous camera of position 1 is pushed to position 2, the previous camera of position 2 is pushed to position 3, and so on. Illustrated in this example: 

Presets tab

On the **Presets** tab for a monitor in a Smart Wall preset, you can edit the view layout and content of the monitor in the selected Smart Wall preset.

Name	Description
Preset	A list of Smart Wall presets for the selected Smart Wall definition.
Edit	Click **Edit** to edit the layout and the content of the selected monitor. Double-click a camera to remove it. Click **Clear** to define a new layout or to exclude the monitor in the Smart Wall preset so the monitor is available for other content not controlled by the Smart Wall preset. Click  to select the layout you want to use with your monitor, and click **OK**.

Smart Client Profiles (Client node)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the following tabs, you can specify the properties of each Smart Client profile. You can lock the settings in the Management Client if required, so the users of XProtect Smart Client cannot change them.

To create or edit Smart Client profiles, expand **Client** and select **Smart Client Profiles**.

Info tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Info	Name and description, priority of existing profiles and an overview of which roles use the profile. If a user is a member of more than one role, each with their individual Smart Client profile, the user gets the Smart Client profile with the highest priority.

General tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
General	Settings such as show/hide and mini- and maximize menu settings, login/-out, startup, timeout, info and

Tab	Description
	messaging options, and enabling or disabling of certain tabs in XProtect Smart Client. The **Camera error messages**, **Server error messages**, and **Live video error message** settings let you control if these error messages are displayed as an overlay, as a black image with overlay, or if they are hidden. The **Live video stopped message** is displayed in XProtect Smart Client when the camera live feed is stopped. For example if the camera has stopped sending images even though it's connected. ⚠ If you **Hide** the camera error messages, there is a risk that the operator overlooks that the connection to a camera has been lost. The **Cameras allowed during search** setting lets you control how many cameras operators can add to searches in XProtect Smart Client. Setting a camera limit can help you prevent overloading the system. The **Online help** setting lets you to disable the help system in XProtect Smart Client. The **Video tutorials** setting lets you disable the **Video tutorials** button in XProtect Smart Client. The button redirects operators to the video tutorials page: https://www.milestonesys.com/support/help-yourself/video-tutorials/

Advanced tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Advanced	Advanced settings such as maximum decoding threads, deinterlacing and time zone settings. **Maximum decoding threads** controls how many decoding threads are used to decode video streams. It can help improve performance on multi-core computers in live as well as playback mode. The exact performance improvement depends on the video stream. It is mainly relevant if using heavily coded high-resolution video streams like H.264/H.265, for which the performance improvement potential can be significant, and less relevant if using, for example, JPEG or MPEG-4. With **deinterlacing**, you convert video into a non-interlaced format. Interlacing determines how an image is refreshed on a screen. The image is refreshed by first scanning the odd lines in the image, then scanning the even lines. This allows a faster refresh rate because less information is processed during each scan. However, interlacing may cause flickering, or the changes in half of the image's lines may be noticeable. **Adaptive streaming** enables XProtect Smart Client to automatically select the live video streams with the best match in resolution to the streams requested by the view item. This decreases the load on the CPU and the GPU and thereby improves the decoding capability and performance of the computer. This requires multi-streaming of live video streams with different resolutions to be configured, see Manage multi-streaming. Adaptive streaming can be applied in both live and playback mode. In playback mode, adaptive streaming is referred to as adaptive playback. Adaptive playback requires that two streams are set to recording. For more information about how to add streams for adaptive streaming in live mode and for adaptive playback, see Add a stream.

Live tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Live	Availability of the live mode and other live features, camera playback, camera overlay buttons, and bounding boxes, and also live-related MIP plug-ins.

Playback tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Playback	Availability of the playback mode and other playback features, layout of print reports, independent playback, bookmarks, and bounding boxes, and also playback-related MIP plug-ins.

Setup tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Setup	Availability of general setup/panes/buttons, setup-related MIP plug-in and permissions to edit a map and to edit live video buffering.

Export tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Export	Paths, privacy masks, video and still image formats and what to include when exporting these, export formats for XProtect Smart Client – Player and much more.

Timeline tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Timeline	Whether to include audio or not, visibility of indication of time and motion, and finally how to handle playback gaps. You can also select whether to show additional data or additional markers from other sources. See Configuration options for timelines.

Access Control tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Access Control	Select if access request notifications should pop up on the XProtect Smart Client screen when triggered by events.

Alarm Manager tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Alarm Manager	Specify whether: • Desktop notifications for alarms should be displayed on the computers where XProtect Smart Client is installed. The notifications appear only if XProtect Smart Client is running - even if minimized Desktop notifications for alarms appear only when the alarms have certain priorities, for example **Medium** or **High**. To configure which alarm priorities that trigger notifications, go to **Alarms** > **Alarm Data Settings** > **Alarm Data Levels**. For each required alarm priority, select the **Enable desktop notifications** check box. See Alarms Data Settings (Alarms node). • Alarms should play sound notifications on the computers where XProtect Smart Client is installed. The sound notifications play only if XProtect Smart Client is running - even if minimized Sound notifications for alarms play only when a sound is associated with the alarm. To associate sounds with alarms, go to **Alarms** > **Alarm Data Settings** > **Alarm Data Levels**. For each required alarm priority, select the sound to be associated with the alarm. See Alarms Data Settings (Alarms node).

Smart map tab (Smart Client profiles)

This tab allows you to specify the following properties:

Tab	Description
Smart map	Specify settings for the smart map feature. You can specify whether: • Milestone Map Service is available for use as a geographic background • OpenStreetMaps is available for use as a geographic background • XProtect Smart Client will automatically create locations when a user adds a custom overlay to the smart map. You can also specify how often you want the system to delete data related to smart maps from your computer. To help XProtect Smart Client display smart map faster, the client saves map data in the cache on your computer. Over time this might slow down your computer. Caching does not apply for Google Maps. If you want to use Bing Maps or Google Maps as geographic backgrounds, enter a Bing Maps API key, or a Maps Static API key from Google.

Management Client Profiles (Client node)

This functionality is available in XProtect Corporate only.

Info tab (Management Client Profiles)

On the **Info** tab, you can set the following for Management Client profiles:

Component	Requirement
Name	Enter a name for the Management Client profile.
Priority	Use the up and down arrows to set a priority for the Management Client profile.
Description	Enter a description for the profile. This is optional.
Roles using the Management Client profile	This field shows the roles that you have associated with the Management Client

Component	Requirement
	profile. You cannot edit this.

Profile tab (Management Client Profiles)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Profile** tab, you can enable or disable the visibility of the following elements from the Management Client's user interface:

Navigation

In this section, decide if an administrator user associated with the Management Client profile is allowed to see the various features and functionality located in the **Navigation** pane.

Navigation element	Description
Basics	Allows the administrator user associated with the Management Client profile to see **License Information** and **Site Information**.
Remote Connect Services	Allows the administrator user associated with the Management Client profile to see **Axis One-click Camera Connection**.
Servers	Allows the administrator user associated with the Management Client profile to see **Recording Servers** and **Failover Servers**.
Devices	Allows the administrator user associated with the Management Client profile to see **Cameras**, **Microphones**, **Speakers**, **Metadata**, **Input** and **Output**.
Client	Allows the administrator user associated with the Management Client profile to see **Smart Wall**, **View Groups**, **Smart Client Profiles**, **Management Client Profiles** and **Matrix**.
Rules and Events	Allows the administrator user associated with the Management Client profile to see **Rules**, **Time Profiles**, **Notification Profiles**, **User-defined Events**, **Analytics Events** and **Generic Events**.
Security	Allows the administrator user associated with the Management Client profile to see **Roles** and **Basic Users**.

Navigation element	Description
System Dashboard	Allows the administrator user associated with the Management Client profile to see **System Monitor**, **System Monitor Thresholds**, **Evidence Lock**, **Current Tasks** and **Configuration Reports**.
Server Logs	Allows the administrator user associated with the Management Client profile to see system, audit, and rule-triggered logs.
Access Control	Allows the administrator user associated with the Management Client profile to see **Access Control** features, if you have added any access control system integrations or plug-ins to your system.

Details

In this section, decide if an administrator user associated with the Management Client profile is allowed to see the various tabs for a specific device channel, for example the **Settings** tab or **Record** tab for cameras.

Device channel	Description
Cameras	Allows the administrator user associated with the Management Client profile to see some or all camera-related settings and tabs.
Microphones	Allows the administrator user associated with the Management Client profile to see some or all microphone-related settings and tabs.
Speakers	Allows the administrator user associated with the Management Client profile to see some or all speaker-related settings and tabs.
Metadata	Allows the administrator user associated with the Management Client profile to see some or all metadata-related settings and tabs.
Input	Allows the administrator user associated with the Management Client profile to see some or all input-related settings and tabs.
Output	Allows the administrator user associated with the Management Client profile to see some or all output-related settings and tabs.

Tools Menu

In this section, decide if an administrator user associated with the Management Client profile is allowed to see the elements that are part of the **Tools** menu.

Tool Menu option	Description
Registered Services	Allows the administrator user associated with the Management Client profile to see **Registered Services**.
Effective Roles	Allows the administrator user associated with the Management Client profile to see **Effective Roles**.
Options	Allows the administrator user associated with the Management Client profile to see **Options**.

Federated Sites

In this section, decide if an administrator user associated with the Management Client profile is allowed to see the **Federated Site Hierarchy** pane.

Rules (Rules and Events node)

Your system includes a number of default rules that you can use for basic features without setting anything up. You can deactivate or modify the default rules as you need. If you modify or deactivate the default rules, your system may not work as desired nor guarantee that video feeds or audio feeds are automatically fed to the system.

Default rule	Description
Go to Preset when PTZ is done	Ensures that PTZ cameras go to their respective default preset positions after you have operated them manually. This rule is not enabled by default. Even when you have enabled the rule, you must have defined default preset positions for the relevant PTZ cameras in order for the rule to work. You do this on the **Presets** tab.
Play Audio on Request	Ensures that video is recorded automatically when an external request occurs. The request is always triggered by a system integrating externally with your system, and the rule is primarily used by integrators of external systems or plug-ins.
Record on Bookmark	Ensures that video is recorded automatically when an operator sets a bookmark in XProtect Smart Client. This is provided you have enabled recording for the relevant cameras. Recording is enabled by default. The default recording time for this rule is three seconds before the bookmark is set and 30 seconds after the bookmark is set. You can edit the default recording times in the rule. The pre-buffer which you set on the Record Tab must match or be longer than the pre-recording time.
Record on Motion	Ensures that as long as motion is detected in video from cameras, the video is recorded, provided recording is enabled for the relevant cameras. Recording is by default enabled. While the default rule specifies recording based on detected motion, it does not guarantee that the system

Default rule	Description
	records video, as you may have disabled individual cameras' recording for one or more cameras. Even when you have enabled recording, remember that the quality of recordings may be affected by individual camera's recording settings.
Record on Request	Ensures that video is recorded automatically when an external request occurs, provided recording is enabled for the relevant cameras. Recording is enabled by default. The request is always triggered by a system integrating externally with your system, and the rule is primarily used by integrators of external systems or plug-ins.
Start Audio Feed	Ensures that audio feeds from all connected microphones and speakers are automatically fed to the system. While the default rule enables access to connected microphones' and speakers' audio feeds immediately upon installing the system, it does not guarantee that audio is recorded, as you must specify recording settings separately.
Start Feed	Ensures that video feeds from all connected cameras are automatically fed to the system. While the default rule enables access to connected cameras' video feeds immediately upon installing the system, it does not guarantee that video is recorded, as cameras' recording settings must be specified separately.
Start Metadata Feed	Ensures that data feeds from all connected cameras are automatically fed to the system. While the default rule enables access to connected cameras' data feeds immediately upon installing the system, it does not guarantee that data is recorded, as cameras' recording settings must be specified separately.
Show Access Request Notification	Ensures that all access control events categorized as 'Access Request', will cause an access request notification to pop up in XProtect Smart Client, unless the notification function is disabled in the Smart Client profile.

Recreate default rules

If you accidentally delete any of the default rules, you can recreate them by entering the following content:

Default rule	Text to enter
Goto preset when PTZ is done	Perform an action on PTZ Manual Session Stopped from All Cameras Move immediately to default preset on the device on which event occurred

Default rule	Text to enter
Play Audio on Request	Perform an action on Request Play Audio Message from External Play audio message from metadata on the devices from metadata with priority 1
Record on Bookmark	Perform an action on Bookmark Reference Requested from All Cameras, All Microphones, All Speakers start recording three seconds before on the device on which event occurred Perform action 30 seconds after stop recording immediately
Record on Motion	Perform an action on Motion Started from All Cameras start recording three seconds before on the device on which event occurred Perform stop action on Motion Stopped from All Cameras stop recording three seconds after
Record on Request	Perform an action on Request Start Recording from External start recording immediately on the devices from metadata Perform stop action on Request Stop Recording from External stop recording immediately
Start Audio Feed	Perform an action in a time interval always start feed on All Microphones, All Speakers Perform an action when time interval ends stop feed immediately
Start Feed	Perform an action in a time interval always start feed on All Cameras Perform an action when time interval ends stop feed immediately
Start Metadata Feed	Perform an action in a time interval always start feed on All Metadata Perform an action when time interval ends stop feed immediately
Show Access Request Notification	Perform an action on Access request (Access Control Categories) from Systems [+ units] Show built-in access request notification

Notification Profiles (Rules and Events node)

Specify the following properties for notification profiles:

Component	Requirement
Name	Enter a descriptive name for the notification profile. The name appears later whenever you select the notification profile during the process of creating a rule.
Description (optional)	Enter a description of the notification profile. The description appears when you pause your mouse pointer over the notification profile in the Overview pane's **Notification Profiles** list.
Recipients	Enter the e-mail addresses to which the notification profile's e-mail notifications should be sent. To enter more than one e-mail address, separate addresses with a semicolon. Example: aa@aaaa.aa;bb@bbbb.bb;cc@cccc.cc
Subject	Enter the text you want to appear as the subject of the e-mail notification. You can insert system variables, such as **Device name**, in the subject and message text field. To insert variables, click the required variable links in the box below the field.
Message text	Enter the text you want to appear in the body of the e-mail notifications. In addition to the message text, the body of each e-mail notification automatically contains this information: • What triggered the e-mail notification • The source of any attached still images or AVI video clips
Time between e-mails	Specify required minimum time (in seconds) to pass between the sending of each e-mail notification. Examples: • If specifying a value of **120**, a minimum of 2 minutes pass between the sending of each e-mail notification, even if the notification profile is triggered again by a rule before the 2 minutes have passed • If specifying a value of **0**, e-mail notifications is sent each time the notification profile is triggered by a rule. This can potentially result in a very large number of e-mail notifications being sent. If using the value **0**, you should therefore carefully consider whether you want to use the notification profile in rules which are likely to be triggered frequently
Number of images	Specify the maximum number of still images you want to include in each of the notification profile's e-mail notifications. Default is five images.
Time between images (ms)	Specify the number of milliseconds you want between the recordings presented on the included images. Example: With the default value of 500 milliseconds, the included images show recordings with half a second between them.
Time before event (sec.)	This setting is used to specify the start of the AVI file. By default, the AVI file contains recordings from 2 seconds before the notification profile is triggered. You can change this to the number of seconds you require.
Time after event (sec.)	This setting is used to specify the end of the AVI file. By default, the AVI file ends 4 seconds after the

Component	Requirement
	notification profile is triggered. You can change this to the number of seconds you require.
Frame rate	Specify the number of frames per second you want the AVI file to contain. Default is five frames per second. The higher the frame rate, the higher the image quality and AVI file size.
Embed images in e-mail	If selected (default), images are inserted in the body of e-mail notifications. If not, images are included in e-mail notifications as attached files.

Events overview

When you add an event-based rule in the **Manage Rule** wizard, you can select between a number of different event types. In order for you to get a good overview, events you can select are listed in groups according to whether they are:

Hardware:

Some hardware can create events themselves, for example to detect motion. You can use these as events but you must configure them on the hardware before you can use them in the system. You may only be able to use the events listed on some hardware as not all types of cameras can detect tampering or temperature changes.

Hardware - Configurable events:

Configurable events from hardware are automatically imported from device drivers. This means that they vary from hardware to hardware and are not documented here. Configurable events are not triggered until you have added them to the system and configured them on the **Event** tab for hardware. Some of the configurable events also require that you configure the camera (hardware) itself.

Hardware - Predefined events:

Event	Description
Communication Error (Hardware)	Occurs when a connection to the hardware is lost.
Communication Started (Hardware)	Occurs when communication with the hardware is successfully established.
Communication Stopped (Hardware)	Occurs when communication with the hardware is successfully stopped.

Devices - Configurable events:

Configurable events from devices are automatically imported from device drivers. This means that they vary from device to device and are not documented here. Configurable events are not triggered until you have added them to the system and

configured them on the **Event** tab on a device.

Devices - Predefined events:

Event	Description
Bookmark Reference Requested	Occurs when a bookmark is made in live mode in the clients. Also, a requirement for using the Default record on bookmark rule.
Communication Error (Device)	Occurs when a connection to a device is lost, or when an attempt is made to communicate with a device, and the attempt is unsuccessful.
Communication Started (Device)	Occurs when communication with a device is successfully established.
Communication Stopped (Device)	Occurs when communication with a device is successfully stopped.
Evidence Lock Changed	Occurs when an evidence lock is changed for devices by a client user or via the MIP SDK.
Evidence Locked	Occurs when an evidence lock is created for devices by a client user or via the MIP SDK.
Evidence Unlocked	Occurs when an evidence lock is removed for devices by a client user or via the MIP SDK.
Feed Overflow Started	Feed overflow (media overflow) occurs when a recording server cannot process received data as quickly as specified in the configuration and therefore is forced to discard some recordings. If the server is healthy, feed overflow usually happens because of slow disk writes. You can resolve this either by reducing the amount of data written, or by improving the storage system's performance. Reduce the amount of written data by reducing frame rates, resolution or image quality on your cameras, but this may degrade recording quality. If you are not interested in that, instead improve your storage system's performance by installing extra drives to share the load or by installing faster disks or controllers. You can use this event to trigger actions that helps you avoid the problem, for example, to lower the recording frame rate.
Feed Overflow Stopped	Occurs when feed overflow (see Feed Overflow Started) ends.
Live Client Feed Requested	Occurs when client users request a live stream from a device. The event occurs upon the request even if the client user's request later turns out to be unsuccessful, for example because the client user does not have the permissions required for viewing the requested live feed or because the feed is for some reason stopped.

Event	Description
Live Client Feed Terminated	Occurs when client users no longer request a live stream from a device.
Manual Recording Started	Occurs when a client user starts a recording session for a camera. The event is triggered even if the device is already recording via rule actions.
Manual Recording Stopped	Occurs when a client user stops a recording session for a camera. If the rule system also has started a recording session it continues recording even after the manual recording is stopped.
Marked Data Reference Requested	Occurs when an evidence lock is made in playback mode in the clients or via the MIP SDK. An event is created that you can use in your rules.
Motion Started	Occurs when the system detects motion in video received from cameras. This type of event requires that the system's motion detection is enabled for the cameras to which the event is linked. In addition to the system's motion detection, some cameras can detect motion themselves and trigger the **Motion Started (HW)** event, but it depends on the configuration of the camera hardware and in the system. See also Hardware - Configurable events:.
Motion Stopped	Occurs when motion is no longer detected in received video. See also Motion Started. This type of event requires that the system's motion detection is enabled for the cameras to which the event is linked. In addition to the system's motion detection, some cameras can detect motion themselves and trigger the Motion Stopped (HW) event, but it depends on the configuration of the camera hardware and in the system. See also Hardware - Configurable events:.
Output Activated	Occurs when an external output port on a device is activated. This type of event requires that at least one device on your system supports output ports.
Output Changed	Occurs when the state of an external output port on a device is changed. This type of event requires that at least one device on your system supports output ports.
Output Deactivated	Occurs when an external output port on a device is deactivated. This type of event requires that at least one device on your system supports output ports.

Event	Description
PTZ Manual Session Started	Occurs when a manually operated PTZ session (as opposed to a PTZ session based on scheduled patrolling or automatically triggered by an event) is started on a camera. This type of event requires that the cameras to which the event is linked are PTZ cameras.
PTZ Manual Session Stopped	Occurs when a manually operated PTZ session (as opposed to a PTZ session based on scheduled patrolling or automatically triggered by an event) is stopped on a camera. This type of event requires that the cameras to which the event is linked are PTZ cameras.
Recording Started	Occurs whenever recording is started. There is a separate event for manual recording started.
Recording Stopped	Occurs whenever recording is stopped. There is a separate event for manual recording stopped.
Settings Changed	Occurs when settings on a device are successfully changed.
Settings Changed Error	Occurs when an attempt is made to change settings on a device, and the attempt is unsuccessful.

External events - Predefined events:

Event	Description
Request Play Audio Message	Activated when play audio messages are requested via the MIP SDK. Through the MIP SDK a third-party vendor can develop custom plug-ins (for example, integration to external access control systems or similar) for your system.
Request Start Recording	Activated when start recordings are requested via the MIP SDK. Through the MIP SDK a third-party vendor can develop custom plug-ins (for example, integration to external access control systems or similar) for your system.
Request Stop Recording	Activated when stop recordings are requested via the MIP SDK. Through the MIP SDK a third party vendor can develop custom plug-ins (for example, integration to external access control systems or similar) for your system.

External events - Generic events:

Generic events allow you to trigger actions in the system by sending simple strings via the IP network to the system. The purpose of generic events is to allow as many external sources as possible to interact with the system.

External events - User-defined events:

A number of events custom made to suit your system may also be selectable. You can use such user-defined events for:

- Making it possible for client users to manually trigger events while viewing live video in the clients
- Countless other purposes. For example, you may create user-defined events which occur if a particular type of data is received from a device

  See also User-defined events (explained).

Recording servers:

Event	Description
Archive Available	Occurs when an archive for a recording server becomes available after having been unavailable. See also Archive Unavailable.
Archive Unavailable	Occurs when an archive for a recording server becomes unavailable, for example if the connection to an archive located on a network drive is lost. In such cases, you cannot archive recordings. You can use the event to, for example, trigger an alarm or a notification profile so that an email notification is automatically sent to relevant people in your organization.
Archive Not Finished	Occurs when an archive for a recording server is not finished with the last archiving round when the next is scheduled to start.
Database Deleting Recordings Before Set Retention Size	Occurs when the retention time limit is reached before the database size limit.
Database Deleting Recordings Before Set Retention Time	Occurs when database size limit is reached before the retention time limit.
Database Disk Full - Auto Archiving	Occurs when a database disk is full. A database disk is full when there is less than 5GB of space is left on the disk: The oldest data in a database is always auto-archived (or deleted if no next archive is defined) when less than 5GB of space is free.
Database Disk Full - Deleting	Occurs when a database disk is full and less than 1GB space is free. Data is deleted even if a next archive is defined. A database always requires 250MB of free space. If this limit is reached (if data is not

Event	Description
	deleted fast enough), no more data is written to the database until enough space has been freed. The actual maximum size of your database is the number of gigabytes you specify, minus 5GB.
Database Full - Auto Archiving	Occurs when an archive for a recording server is full and needs to auto-archive to an archive in the storage.
Database Repair	Occurs if a database becomes corrupted, in which case the system automatically attempts two different database repair methods: a fast repair and a thorough repair.
Database Storage Available	Occurs when a storage for a recording server becomes available after having been unavailable. See also Database Storage Unavailable. You can, for example, use the event to start recording if it has been stopped by a **Database Storage Unavailable** event.
Database Storage Unavailable	Occurs when a storage for a recording server becomes unavailable, for example if the connection to a storage located on a network drive is lost. In such cases, you cannot archive recordings. You can use the event to, for example, stop recording, trigger an alarm or a notification profile so an e-mail notification is automatically sent to relevant people in your organization.
Failover encrypted communication error	Occurs when there is an SSL communication error between the failover server and monitored recording servers.
Failover Started	Occurs when a failover recording server takes over from a recording server. See also Failover servers (node).
Failover Stopped	Occurs when a recording server becomes available again and can take over from a failover recording server.

System monitor events

System monitor events are triggered by exceeded thresholds values configured in the **System Monitor Thresholds** node. See also View the current state of your hardware and troubleshoot if needed.

This functionality requires that the Data Collector service is running.

System Monitor - Server:

Event	Description
CPU usage critical	Occurs when the CPU usage exceeds the critical CPU threshold.
CPU usage normal	Occurs when the CPU usage falls back below the warning CPU threshold.
CPU usage warning	Occurs when the CPU usage exceeds the warning CPU threshold or falls back below the critical CPU threshold.
Memory usage critical	Occurs when the memory usage exceeds the critical memory threshold.
Memory usage normal	Occurs when the memory usage falls back below the warning memory threshold.
Memory usage warning	Occurs when the memory usage exceeds the warning memory threshold or falls back below the critical memory usage threshold.
NVIDIA decoding critical	Occurs when the NVIDIA decoding usage exceeds the critical NVIDIA decoding threshold.
NVIDIA decoding normal	Occurs when the NVIDIA decoding usage falls back below the warning NVIDIA decoding threshold.
NVIDIA decoding warning	Occurs when the NVIDIA decoding usage exceeds the warning NVIDIA decoding threshold or falls back below the critical NVIDIA decoding threshold.
NVIDIA memory critical	Occurs when the NVIDIA memory usage exceeds the critical NVIDIA memory threshold.
NVIDIA memory normal	Occurs when the NVIDIA memory usage falls back below the warning NVIDIA memory threshold.
NVIDIA memory warning	Occurs when the NVIDIA memory usage exceeds the warning NVIDIA memory threshold or falls back below the critical NVIDIA memory threshold.
NVIDIA rendering critical	Occurs when the NVIDIA rendering usage exceeds the critical NVIDIA rendering threshold.
NVIDIA rendering normal	Occurs when the NVIDIA rendering usage falls back below the warning NVIDIA rendering threshold.

Event	Description
NVIDIA rendering warning	Occurs when the NVIDIA rendering usage exceeds the warning NVIDIA rendering threshold or falls back below the critical NVIDIA rendering threshold.
Service available critical	Occurs when a server service stops running. There are no threshold values for this event.
Service available normal	Occurs when a server service status changes to running. There are no threshold values for this event.

System Monitor - Camera:

Event	Description
Live FPS critical	Occurs when the live FPS rate falls below the critical live FPS threshold.
Live FPS normal	Occurs when the live FPS rate exceeds the warning live FPS threshold.
Live FPS warning	Occurs when the live FPS rate falls below the warning live FPS threshold or exceeds the critical live FPS threshold.
Recording FPS critical	Occurs when the recording FPS rate falls below the critical recording FPS threshold.
Recording FPS normal	Occurs when the recording FPS rate exceeds the warning recording FPS threshold.
Recording FPS warning	Occurs when the recording FPS rate falls below the warning recording FPS threshold or exceeds the critical recording FPS threshold.
Used space critical	Occurs when the storage used for recordings by a specific camera exceeds the critical used space threshold.
Used space normal	Occurs when the storage used for recordings by a specific camera falls back below the warning used space threshold.
Used space warning	Occurs when the storage used for recordings by a specific camera exceeds the warning used space

Event	Description
	threshold or falls back below the critical used space threshold.

System Monitor - Disk:

Event	Description
Free space critical	Occurs when the disk space usage exceeds the critical free space threshold.
Free space normal	Occurs when the disk space usage falls below the warning free space threshold.
Free space warning	Occurs when the disk space usage exceeds the warning free space threshold or falls back below the critical free space threshold.

System Monitor - Storage:

Event	Description
Retention time critical	Occurs when the system predicts that the storage will be filled up faster than the critical retention time threshold value. For example, when data from video streams is filling up the storage faster than expected.
Retention time normal	Occurs when the system predicts that the storage will be filled up slower than the warning retention time threshold value. For example, when data from video streams is filling up the storage at the expected rate.
Retention time warning	Occurs when the system predicts that the storage will be filled up faster than the warning retention time threshold value or slower than the critical retention time threshold value. For example, when data from video streams is filling up the storage faster than expected due to more motion detected by the cameras configured to record on motion.

Other:

Event	Description
Automatic license activation failed	Occurs when online automatic license activation fails.

Event	Description
	There are no thresholds values for this event.
Scheduled password change started	Occurs when a scheduled password change starts.
Scheduled password change completed successfully	Occurs when a scheduled password change completes without errors.
Scheduled password change completed with errors	Occurs when a scheduled password change completes with errors.

Events from XProtect extensions and integrations:

Events from XProtect extensions and integrations can be used in the rule system, for example:

- Analytics events can also be used in the rule system

Events from Arcules alarm descriptions and video clips

Alarm descriptions and related video clips from Arcules can be reviewed and managed in the events queue in XProtect. However, if you want to use the Arcules alarm descriptions and video clips to create alarm rules and alarm handling actions, you need to be assigned the role of an administrator. The operator's role cannot be configured to see Arcules alarms.

Actions and stop actions

A set of actions and stop actions are available for rule creation in the **Manage Rule** wizard. You may have more actions available if your system installation uses XProtect extensions or vendor-specific plug-ins. For each type of action, stop action information is listed if relevant.

Manage Rule Wizard

Action	Description
Start recording on <devices>	Start recording and saving data in the database from the selected devices. When your select this type of action, the **Manage Rule** wizard prompts you to specify: When recording should start. This happens either immediately or a number of seconds before the triggering event/beginning of the triggering time interval and on which devices the action should take place. This type of action requires that you have enabled recording on the devices to which the action is linked. You can only save data from before an event or time interval if you have enabled pre-buffering for the relevant devices. You enable recording and specify pre-buffering settings for a device on the **Record** tab. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Stop recording**.

Action	Description
	Without this stop action, recording would potentially continue indefinitely. You also have the option of specifying further stop actions.
Start feed on <devices>	Begin data feed from devices to the system. When the feed from a device is started, data is transferred from the device to the system, in which case you may view and record, depending on the data type. When you select this type of action, the **Manage Rule** wizard prompts you to specify on which devices to start the feeds. Your system includes a default rule which ensures that feeds are always started on all cameras. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Stop feed**. You can also specify further stop actions. Using the mandatory stop action **Stop feed** to stop the feed from a device means that data is no longer transferred from the device to the system, in which case live viewing and recording of video, for example, is no longer possible. However, a device on which you have stopped the feed can still communicate with the recording server, and you can start the feed again automatically through a rule, as opposed to when you manually have disabled the device. While this type of action enables access to selected devices' data feeds, it does not guarantee that data is recorded, as you must specify recording settings separately.
Set <Smart Wall> to <preset>	Sets the XProtect Smart Wall to a selected preset. Specify the preset on the **Smart Wall Presets** tab. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Set <Smart Wall> <monitor> to show <cameras>	Sets a specific XProtect Smart Wall monitor to display live video from the selected cameras on this site or any child site configured in Milestone Federated Architecture. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Set <Smart Wall> <monitor> to show text <messages>	Sets a specific XProtect Smart Wall monitor to display a user-defined text message of up to 200 characters. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Remove <cameras> from <Smart Wall> monitor <monitor>	Stop displaying video from a specific camera. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.

Action	Description
Set live frame rate on <devices>	Sets a particular frame rate to use when the system displays live video from the selected cameras that substitutes the cameras' default frame rate. Specify this on the **Settings** tab. When you select this type of action, the **Manage Rule** wizard prompts you to specify which frame rate to set, and on which devices. Always verify that the frame rate you specify is available on the relevant cameras. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Restore default live frame rate**. Without this stop action, the default frame rate would potentially never be restored. You also have the option of specifying further stop actions.
Set recording frame rate on <devices>	Sets a particular frame rate to use when the system saves recorded video from the selected cameras in the database, instead of the cameras' default recording frame rate. When you select this type of action, the **Manage Rule** wizard prompts you to specify which recording frame rate to set, and on which cameras. You can only specify a recording frame rate for JPEG, a video codec with which each frame is separately compressed into a JPEG image. This type of action also requires that you have enabled recording on the cameras to which the action is linked. You enable recording for a camera on the **Record** tab. The maximum frame rate you can specify depends on the relevant camera types, and on their selected image resolution. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Restore default recording frame rate**. Without this stop action, the default recording frame rate would potentially never be restored. You also have the option of specifying further stop actions.
Set recording frame rate to all frames for MPEG-4/H.264/H.265 on <devices>	Sets the frame rate to record all frames when the system saves recorded video from the selected cameras in the database, instead of keyframes only. Enable the recording keyframes only function on the **Record** tab. When you select this type of action, the **Manage Rule** wizard prompts you to select which devices the action should apply for. You can only enable keyframe recording for MPEG-4/H.264/H.265. This type of action also requires that you have enabled recording on the cameras to which the action is linked. You enable recording for a camera on the **Record** tab. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Restore default recording frame rate of keyframes for MPEG-4/H.264/H.265** Without this stop action, the default setting would potentially never be restored. You also have the option of specifying further stop actions.
Start patrolling on <device> using <profile> with PTZ priority	Begins PTZ patrolling according to a particular patrolling profile for a particular PTZ camera with a particular priority. This is an exact definition of how patrolling should be carried out, including the sequence of preset positions, timing settings, and more.

Action	Description
<priority>	If you have upgraded your system from an older version of the system, the old values (**Very Low**, **Low**, **Medium**, **High** and **Very High**) have been translated as follows: • Very Low = 1000 • Low = 2000 • Medium = 3000 • High = 4000 • Very High = 5000 When you select this type of action, the **Manage Rule** wizard prompts you to select a patrolling profile. You can only select one patrolling profile on one device and you cannot select several patrolling profiles. This type of action requires that the devices to which the action is linked are PTZ devices. You must define at least one patrolling profile for the device(s). You define patrolling profiles for a PTZ camera on the **Patrolling** tab. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Stop patrolling** Without this stop action, patrolling would potentially never stop. You can also specify further stop actions.
Pause patrolling on <devices>	Pauses PTZ patrolling. When you select this type of action, the **Manage Rule** wizard prompts you to specify the devices on which to pause patrolling. This type of action requires that the devices to which the action is linked are PTZ devices. You must define at least one patrolling profile for the device(s). You define patrolling profiles for a PTZ camera on the **Patrolling** tab. **Stop action required**: This type of action requires one or more stop actions. In one of the following steps, the wizard automatically prompts you to specify the stop action: **Resume patrolling** Without this stop action, patrolling would potentially pause indefinitely. You have also the option of specifying further stop actions.
Move <device> to <preset> position with PTZ priority <priority>	Moves a particular camera to a particular preset position - however always according to priority. When selecting this type of action, the **Manage Rule** wizard prompts you to select a preset position. Only one preset position on one camera can be selected. It is not possible to select several preset positions. This type of action requires that the devices to which the action is linked are PTZ

Action	Description
	devices. This action requires that you have defined at least one preset position for those devices. You define preset positions for a PTZ camera on the **Presets** tab. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Move to default preset on <devices> with PTZ priority <priority>	Moves one or more particular cameras to their respective default preset positions - however always according to priority. When you select this type of action, the **Manage Rule** wizard prompts you to select which devices the action should apply for. This type of action requires that the devices to which the action is linked are PTZ devices. This action requires that you have defined at least one preset position for those devices. You define preset positions for a PTZ camera on the **Presets** tab. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Set device output to <state>	Sets an output on a device to a particular state (activated or deactivated). When you select this type of action, the **Manage Rule** wizard prompts you to specify which state to set, and on which devices. This type of action requires that the devices to which the action is linked each have at least one external output unit connected to an output port. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Create bookmark on <device>	Creates a bookmark on live streaming or recordings from a selected device. A bookmark makes it easy to retrace a certain event or period in time. Bookmark settings are controlled from the **Options** dialog box. When you select this type of action, the **Manage Rule** wizard prompts you to specify bookmark details and select devices. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Play audio <message> on <devices> with <priority>	Plays back an audio message on selected devices triggered by an event. Devices are mostly speakers or cameras. This type of action requires that you have uploaded the message to the system on **Tools** > **Options** > **Audio messages** tab. You can create more rules to the same event and send different messages to each device, but always according to priority. The priorities that control the sequence are those set on the rule and on the device for a role on the **Speech** tab:

Action	Description
	• If a message is played back and another message with the same priority is sent to the same speaker, the first message will complete and then the second one starts • If a message is played back and another message with a higher priority is sent to the same speaker, the first message is interrupted and the second one starts immediately
Send notification to <profile>	Sends a notification, using a particular notification profile. When you select this type of action, the **Manage Rule** wizard prompts you to select a notification profile, and which devices to include pre-alarm images from. You can only select one notification profile and you cannot select several notification profiles. A single notification profile may contain several recipients. You can also create more rules to the same event and send different notifications to each of the notification profiles. You can copy and re-use the content of rules by right-clicking a rule in the **Rules** list. This type of action requires that you have defined at least one notification profile. Pre-alarm images are only included if you have enabled the **Include images** option for the relevant notification profile. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Make new <log entry>	Generates an entry in the rule log. When selecting this type of action, the **Manage Rule** wizard prompts you to specify a text for the log entry. When you specify the log text, you can insert variables, such as **$DeviceName$**, **$EventName$**, into the log message. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Start plug-in on <devices>	Starts one or more plug-ins. When you select this type of action, the **Manage Rule** wizard prompts you to select required plug-ins, and on which devices to start the plug-ins. This type of action requires that you have at least one or more plug-ins installed on your system. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Stop plug-in on <devices>	Stops one or more plug-ins. When you select this type of action, the **Manage Rule** wizard prompts you to select required plug-ins, and on which devices to stop the plug-ins. This type of action requires that you have at least one or more plug-ins installed on your system. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Apply new settings on <devices>	Changes device settings on one or more devices. When you select this type of action, the **Manage Rule** wizard prompts you to select relevant devices, and you can define the relevant settings on the devices you have specified. If you define settings for more than one device, you can only change settings that are available for all of the specified devices.

Action	Description
	Example: You specify that the action should be linked to Device 1 and Device 2. Device 1 has the settings A, B and C, and Device 2 has the settings B, C and D. In this case, you can only change the settings that are available for both devices, namely settings B and C. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Set Matrix to view <devices>	Makes video from the selected cameras appear on a computer capable of displaying Matrix-triggered video such as a computer on which you have installed XProtect Smart Client. When you select this type of action, the **Manage Rule** wizard prompts you to select a Matrix recipient, and one or more devices from which to display video on the selected Matrix recipient. This type of action allows you to select only a single Matrix recipient at a time. If you want to make video from the selected devices appear on more than one Matrix recipient, you should create a rule for each required Matrix recipient or use the XProtect Smart Wall feature. By right-clicking a rule in the **Rules** list, you can copy and re-use the content of rules. This way, you can avoid having to create near-identical rules from scratch. As part of the configuration on the Matrix recipients themselves, users must specify the port number and password required for the Matrix communication. Make sure that the users have access to this information. The users must typically also define the IP addresses of allowed hosts from which commands regarding display of Matrix-triggered video is accepted. In that case, the users must also know the IP address of the management server, or any router or firewall used.
Send SNMP trap	Generates a small message which logs events on selected devices. The text of SNMP traps is auto-generated and cannot be customized. It can contain the source type and name of the device on which the event occurred. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Retrieve and store remote recordings from <devices>	Retrieves and stores remote recordings from selected devices (that support edge recording) in a specified period before and after the triggering event. This rule is independent of the **Automatically retrieve remote recordings when connection is restored** setting. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Retrieve and store remote recordings between <start and end time> from <devices>	Retrieves and stores remote recordings in a specified period from selected devices (that support edge recording). This rule is independent of the **Automatically retrieve remote recordings when connection is restored** setting. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional

Action	Description
	stop actions to be performed on either an event or after a period of time.
Activate archiving on <archives>	Starts archiving on one or more archives. When you select this type of action, the **Manage Rule** wizard prompts you to select relevant archives. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
On <site> trigger <user-defined event>	Relevant mostly within Milestone Federated Architecture, but you can also use this in a single site setup. Use the rule to trigger a user-defined event on a site, normally a remote site within a federated hierarchy. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Show <access request notification>	Lets you access request notifications pop up on the XProtect Smart Client screen when the criteria for the triggering events are met. Milestone recommends that you use access control events as triggering events for this action, because access request notifications typically are configured for operating on related access control commands and cameras. This type of action requires that you have at least one access control plug-in installed on your system. **No mandatory stop action**: This type of action does not require a stop action.You can specify optional stop actions to be performed on either an event or after a period of time.
Change the password on hardware devices	Changes the password of selected hardware devices to a randomly-generated password based on the password requirements for that specific hardware device. For a list of supported hardware devices, see Find hardware. This action is only available when you set up a rule using the **Perform an action on a <recurring time>** rule type. The following events are available for the action: • Scheduled password change started • Scheduled password change completed successfully • Scheduled password change completed with errors This type of action does not have a stop action. You can view the progress of this action in the **Current Tasks** node. For more information, seeView currently ongoing tasks on recording servers. To view the action results - go to the **Server Logs** node, on the **System logs** tab. For more information, see Server Logs tab (options). For more information, see System logs (tab).

Test Analytics Event (properties)

When you test the requirements of an analytics event, a window appears that checks four conditions and provides possible error descriptions and solutions.

Condition	Description	Error messages and solutions
Changes saved	If the event is new, is it saved? Or if there are changes to the event name, are these changes saved?	**Save changes before testing analytics event**. Solution/Explanation: Save changes.
Analytics Events enabled	Is the Analytics Event feature enabled?	**Analytics events have not been enabled**. Solution/Explanation: Enable the Analytics Events feature. To do this, click **Tools** > **Options** > **Analytics Events** and select the **Enabled** check box.
Address allowed	Is the IP address/host name of the machine sending the event(s) allowed (listed on the analytics events address list)?	**The local host name must be added as allowed address for the Analytics Event service**. Solution/Explanation: Add your machine to the analytics events address list of allowed IP addresses or host names. **Error resolving the local host name**. Solution/Explanation: The IP address or host name of the machine cannot be found or is invalid.
Send analytics event	Did sending a test event to the Event Server succeed?	See table below.

Each step is marked by either failed: ✗ or successful: ✓.

Error messages and solutions for the condition **Send analytics event**:

Error message	Solution
Event server not found	Unable to find the event server on the list of registered services.
Error connecting to event server	Unable to connect to the event server on the stated port. The error occurs most likely because of network problems, or the Event Server service has stopped.
Error sending analytics event	The connection to the event server is established, but the event cannot be sent. The error most likely occurs because of network problems, for example a time out.
Error receiving response from event server	The event has been sent to the event server, but no reply received. The error most likely occurs because of network problems or a port that is busy. See the event server log, typically located at `ProgramData\Milestone\XProtect`

Error message	Solution
	`Event Server\Logs\`.
Analytics event unknown by event server	The Event Server service does not know the event. The error most likely occurs because the event or changes to the event have not been saved.
Invalid analytics event received by event server	The event format is incorrect.
Sender unauthorized by event server	Most likely your machine is not on the list of allowed IP addresses or host names.
Internal error in event server	Event server error. See the event server log, typically located at `ProgramData\Milestone\XProtect Event Server\Logs\`.
Invalid response received from Event server	The response is invalid. Possibly the port is busy or there are network problems. See the event server log, typically located at `ProgramData\Milestone\XProtect Event Server\Logs\`.
Unknown response from event server	The response is valid, but not understood. The error occurs possibly because of network problems, or the port is busy. See the event server log, typically located at `ProgramData\Milestone\XProtect Event Server\Logs\`.
Unexpected error	Please contact Milestone support for help.

Generic Events and Data sources (properties)

This feature only works if you have the XProtect event server installed.

Generic event (properties)

Component	Requirement
Name	Unique name for the generic event. Name must be unique among all types of events, such as user defined events, analytics events, and so on.

Component	Requirement
Enabled	Generic events are by default enabled. Clear the check box to disable the event.
Expression	Expression that the system should look out for when analyzing data packages. You can use the following operators: • `( )`: Used to ensure that related terms are processed together as a logical unit. They can be used to force a certain processing order in the analysis **Example**: The search criteria `(User001 OR Door053) AND Sunday` first processes the two terms inside the parenthesis, then combines the result with the last part of the string. So, the system first looks for any packages containing either of the terms `User001` or `Door053`, then takes the results and run through them in order to see which packages also contain the term `Sunday`. • `AND`: With an `AND` operator, you specify that the terms on both sides of the `AND` operator must be present **Example**: The search criteria `User001 AND Door053 AND Sunday` returns a result only if the terms `User001`, `Door053` and `Sunday` are all included in your expression. It is not enough for only one or two of the terms to be present. The more terms you combine with AND, the fewer results you retrieve. • `OR`: With an `OR` operator, you specify that either one or another term must be present **Example**: The search criteria `"User001" OR "Door053" OR "Sunday"` returns any results containing either `User001`, `Door053` or `Sunday`. The more terms you combine with `OR`, the more results you retrieve.
Expression type	Indicates how particular the system should be when analyzing received data packages. The options are the following: • **Search**: In order for the event to occur, the received data package must contain the text specified in the **Expression** field, but may also have more content **Example**: If you have specified that the received package should contain the terms `User001` and `Door053`, the event is triggered if the received package contains the terms `User001` and `Door053` and `Sunday` since your two required terms are contained in the received package • **Match**: In order for the event to occur, the received data package must contain exactly the text specified in the **Expression** field, and nothing else • **Regular expression**: In order for the event to occur, the text specified in the **Expression** field must identify specific patterns in the received data packages If you switch from **Search** or **Match** to **Regular expression**, the text in the **Expression** field is automatically translated to a regular expression.
Priority	The priority must be specified as a number between 0 (highest priority) and 999999 (lowest priority). The same data package may be analyzed for different events. The ability to assign a priority to each event lets you manage which event should be triggered if a received package matches the criteria for several events. When the system receives a TCP and/or UDP package, analysis of the packet starts with analysis for the event with the highest priority. This way, when a package matches the criteria for several events, only the event with the highest priority is triggered. If a package matches the criteria for several events with an identical priority, for example two events with a priority of 999, all events with this priority is triggered.

Component	Requirement
Check if expression matches event string	An event string to be tested against the expression entered in the **Expression** field.

Webhooks (Rules and Events node)

On the **Webhooks** node, you can create, edit and delete webhook endpoints.

The following fields are available when creating and editing webhooks:

Field	Description
Name	Enter a unique name of the webhook endpoint. The webhook name cannot be empty.
Address	The URL of the web server or application you want to send event data to. If the URL of the web server is updated, you must update the webhook URL in the webhook node. Using HTTP through unsecure networks (like open internet) exposes all the events in plain text.
Token	Enter a token which is used to help secure communication with other applications by validating the source of the HTTP POST. Using a token to hep secure communication is optional but recommended.
API version	The version of the webhook plugin and API utilized for the webhook functionality.

Roles (Security node)

Info tab (roles)

User and Groups tab (roles)

External IDP (roles)

Overall Security tab (roles)

Device tab (roles)

PTZ tab (roles)

Speech tab (roles)

Info tab (roles)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Info** tab of a role, you can change the following settings:

Name	Description
Name	Enter a name for the role.
Description	Enter a description for the role.
Management Client profile	Select a Management Client profile to associate with the role. You cannot apply this to the default **Administrators** role. Requires permissions to manage security on the management server.
Smart Client profile	Select a Smart Client profile to associate with the role.

Name	Description
	Requires permissions to manage security on the management server.
Default time profile	Select a default time profile to associate with the role. You cannot apply this to the default **Administrators** role.
Evidence lock profile	Select an evidence lock profile to associate with the role.
Smart Client login within time profile	Select a time profile for which the XProtect Smart Client user associated with this role is allowed to log in. If the XProtect Smart Client user is logged in when the period expires, he or she is logged off automatically. You cannot apply this to the default **Administrators** role.
Allow Smart Client login	Select the check box to allow users associated with this role to log in to XProtect Smart Client. Access to Smart Client is not allowed by default. Clear the check box to deny access to XProtect Smart Client.
Allow XProtect Mobile client login	Select the check box to allow users associated with this role to log in to XProtect Mobile client. Access to XProtect Mobile client is not allowed by default. Clear the check box to deny access to XProtect Mobile client.
Allow XProtect Web Client login	Select the check box to allow users associated with this role to log in to XProtect Web Client. Access to XProtect Web Client is not allowed by default. Clear the check box to deny access to XProtect Web Client.
Login authorization required	Select the check box to associate login authorization with the role. It means that XProtect Smart Client or the Management Client asks for a second authorization, typically by a superuser or manager, when the user logs in. To enable administrators to authorize users, configure the management server's **Authorize Users** permission on the **Overall Security** tab. You cannot apply this to the default **Administrators** role.
Make users anonymous during PTZ sessions	Select the check box to hide the names of users associated with this role when they control PTZ sessions.

User and Groups tab (roles)

On the **User and Groups** tab, you assign users and groups to roles (see Assign/remove users and groups to/from roles). You can assign Windows users and groups or basic users (see Users (explained)).

External IDP (roles)

On the **External IDP** tab, you can view existing claims and add new claims to roles.

Name	Description
External IDP	The name of the external IDP.
Claim name	A variable that is defined in the external IDP.
Claim value	The value of the claim, such as a group name, that can be used to assign the appropriate role to the user.

Overall Security tab (roles)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

On the **Overall Security** tab, you set up overall permissions for roles. For every component available in your system, define access permissions for the roles by setting **Allow** or **Deny**. When a role is denied access to a component, that component is not visible in the **Overall Security** tab to a user in that role.

You can define more access permissions for XProtect Corporate than for the other XProtect VMS products. This is because you can only set up differentiated administrator permissions in XProtect Corporate, while you can set up overall permissions for a role that uses XProtect Smart Client, XProtect Web Client, or XProtect Mobile client in all products.

The overall security settings only apply to the current site.

If you associate a user with more than one role and select **Deny** on a security setting for one role and **Allow** for another, the **Deny** permission overrules the **Allow** permission.

In the following, the descriptions show what happens on each individual permission for the different system components if you select **Allow** for the relevant role. If you use XProtect Corporate, you can see which settings are available **only** to your system under each system component.

For every system component or functionality, the full system administrator can use the **Allow** or **Deny** check boxes to set up security permissions for the role. Any security permissions that you set up here are set up for the whole system component or functionality. If, for example, you select the **Deny** check box on **Cameras**, all cameras added to the system are unavailable for the role. In contrast, if you select the **Allow** check box, the role can see all cameras added to the system. The result of selecting **Allow** or **Deny** on your cameras is that the camera settings on the **Device** tab then inherit your selections on the **Overall Security** tab so that either all cameras are either available or unavailable to the particular role.

If you want to set security permissions for **individual** cameras or similar, you can only set these individual permissions on the tab of the relevant system component or functionality if you have **not set any overall permissions** for the system component or functionality on the **Overall Security** tab.

The descriptions below also apply to the permissions that you can configure through the MIP SDKs.

If you want to switch your base license from XProtect Corporate to one of the other products, make sure that you remove all security permissions that are available to only XProtect Corporate. If you do not remove those permissions, you cannot complete the switch.

Management Server

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Connect	Enables users to connect to the Management Server. This permission is enabled by default. You can temporarily deny connection permission on roles for maintenance purposes, and then reapply access to the system. This permission must be selected to allow access to the system.
Read	This permission is a highly privileged administrative permission that gives significant access rights to the XProtect VMS, including access to sensitive data such as credentials configured in the system. Enables the permission to access a wide range of functionality, including: • Logging in with the Management Client • List of current tasks • Server logs It also enables access to: • Remote Connect Services • Smart Client Profiles • Management Client Profiles • Matrix • Time Profiles • Registered Servers and Service Registration API This permission also reveals some sensitive information to the client: • Credentials for any configured external IDP • Credentials, IP-addresses, and other information for all cameras in the XProtect VMS • Credentials for configured mail server

Security permission	Description
	• Credentials for any configured Matrix • Credentials configured for the Milestone Interconnect feature • Credentials configured for license activation This permission does not reveal credentials for users of the XProtect VMS. This includes Basic Users, Windows users and users from external IDPs.
Edit	Enables the permission to modify data in a wide range of functionality, including: • Options • License Management It also enables users to create, delete, and edit the following: • Remote Connect Services • Device groups • Matrix • Time Profiles • Notification Profiles • Registered Servers Enables the permission to configure local IP ranges when configuring the network on the recording server.
Status API	Enables the permission to perform queries on the Status API located on the recording server. This means that the role with this permission enabled has access to read the status of the items located on the recording server.
Manage Federated site hierarchy	Enables the permission to add and detach the current site to other sites in a federated site hierarchy. If you set this permission to allowed on the child site only, the user can still detach the site from the parent site.
Backup Configuration	Enables the permission to create backups of the system configuration using the system's backup and restore functionality.
Authorize users	Enables the permission to authorize users when they are asked for a second login in XProtect Smart Client or Management Client. You define if a role requires login authorization on the **Info** tab.
Manage security	Enables the permission to manage permissions for the Management Server. It also enables users to create, delete, and edit the following features:

Security permission	Description
	• Roles • Basic users • Smart Client Profiles • Management Client Profiles

Recording Servers

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Edit	Enables the permission to edit properties on the recording servers, except for network configuration settings that require edit permission on the management server.
Delete	Enables the permission to delete recording servers. To do this, you must also give the user delete permissions on: • Hardware security group if you have added hardware to the recording server If any of the devices on the recording server contains evidence locks, you can only delete the recording server if it is offline.
Manage hardware	Enables the permission to add hardware on recording servers.
Manage storage	Enables the permission to administrate storage containers on recording server, that is, to create, delete, move, and empty storage containers.
Manage security	Enables the permission to manage security permissions for recording servers.

Failover Servers

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to see and access failover servers in the Management Client.
Edit	Enables the permission to create, update, delete, move, and enable or disable failover servers in the Management Client.
Manage security	Enables the permission to manage security permissions for the failover servers.

Mobile Servers

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to see and access mobile servers in the Management Client.
Edit	Enables the permission to edit and delete mobile servers in the Management Client.
Manage security	Enables the permission to manage security permissions for the mobile servers.

Hardware

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Edit	Enables the permission to edit properties on hardware.
Delete	Enables the permission to delete hardware. If any of the hardware devices contains evidence locks, you can only delete the hardware if the recording server is offline.
Driver commands	Enables the permission to send special commands to the drivers and thereby control features and configuration on the device itself. The **Driver commands** permission is for special developed MIP plug-ins in the clients only. It does not control standard configuration tasks.
View passwords	Enables the permission to view passwords on hardware devices in the **Edit Hardware** dialog box.
Manage security	Enables the permission to manage security permissions for the hardware.

Cameras

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.

Security permission	Description
Read	Enables the permission to view camera devices in the clients and the Management Client.
Edit	Enables the permission to edit properties for cameras in the Management Client. It also enables users to enable or disable a camera.
View live	Enables the permission to view live video from cameras in the clients and the Management Client.
View restricted live	Enables the permission to view live restricted video from cameras in the clients and the Management Client.
Playback	Enables the permission to play back recorded video from cameras in all clients.
Playback restricted recordings	Enables the permission to play back recorded restricted video from cameras in all clients.
Retrieve remote recordings	Enables the permission to retrieve recordings in the clients from cameras on remotes sites or from edge storages on cameras.
Read sequences	Enables the permission to read the sequence information related to, for example, playing back recorded video in the clients.
Smart search	Enables the permission to use the Smart search function in the clients.
Export	Enables the permission to export recordings from the clients.
Create bookmarks	Enables the permission to create bookmarks in recorded and live video in the clients.
Read bookmarks	Enables the permission to search for and read bookmark details in the clients.
Edit bookmarks	Enables the permission to edit bookmarks in the clients.
Delete bookmarks	Enables the permission to delete bookmarks in the clients.
Create and extend evidence locks	Enables the permission to create and extend evidence locks in the clients.

Security permission	Description
Read evidence locks	Enables the permission to search and read evidence locks in the clients.
Delete and reduce evidence locks	Enables the permission to delete or reduce evidence locks in the clients.
Create and extend live and playback restrictions	Enables the permission to create and extend restrictions in the clients.
Read live and playback restrictions	Enables the permission to see a list of existing restrictions in the clients.
Delete and reduce live and playback restrictions	Enables the permission to delete and reduce restrictions in the clients.
Start manual recording	Enables the permission to start manual recording of video in the clients.
Stop manual recording	Enables the permission to stop manual recording of video in the clients.
AUX commands	Enables the permission to use auxiliary (AUX) commands on the camera from the clients. **AUX commands** offer users the control of, for example, wipers on a camera connected via a video encoder. Camera-associated devices connected via auxiliary connections are controlled from the client.
Manual PTZ	Enables the permission to use PTZ functions on PTZ cameras in the clients and the Management Client.
Activate PTZ presets or patrolling profiles	Enables the permission to move PTZ cameras to preset positions, start and stop patrolling profiles, and pause a patrolling in the clients and the Management Client. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
Manage PTZ presets or patrolling profiles	Enables the permission to add, edit, and delete PTZ presets and patrolling profiles on PTZ cameras in the clients and the Management Client. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
Lock/unlock PTZ presets	Enables the permission to lock and unlock PTZ presets in the Management Client. This prevents or allows other users from changing preset positions in the clients and in the Management Client.
Reserve PTZ sessions	Enables the permission to set PTZ cameras in reserved PTZ session mode in the clients and the Management Client.

Security permission	Description
	In a reserved PTZ session, other users with higher PTZ priority are not able to take over the control. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
Release PTZ sessions	Enables the permission to release other users' PTZ sessions from the Management Client. You can always release your own PTZ sessions - without this permission.
Delete recordings	Enables the permission to delete stored video recordings from the system via the Management Client.
Lift privacy masks	Enables the permission to temporarily lift privacy masks in XProtect Smart Client. It also enables the permission to authorize other XProtect Smart Client users to lift privacy masks. Lifting privacy masks only applies to privacy masks configured as liftable privacy masks in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for the camera.

Microphones

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view microphone devices in the clients and the Management Client.
Edit	Enables the permission to edit microphone properties in the Management Client. It also allows users to enable or disable microphones.

Security permission	Description
Listen live	Enables the permission to listen to live audio from speakers in the clients and the Management Client.
Listen restricted live audio	Enables the permission to listen to live restricted audio from speakers in the clients and the Management Client.
Playback	Enables the permission to play back recorded audio from microphones in the clients.
Playback restricted recordings	Enables the permission to play back recorded restricted audio from microphones in the clients.
Retrieve remote recordings	Enables the permission to retrieve recordings in the clients from microphones on remotes sites or from edge storages on cameras.
Read sequences	Enables the permission to read the sequence information related to, for example, the **Playback** tab in the clients.
Export	Enables the permission to export recordings from the clients.
Create bookmarks	Enables the permission to create bookmarks in the clients.
Read bookmarks	Enables the permission to search for and read bookmark details in the clients.
Edit bookmarks	Enables the permission to edit bookmarks in the clients.
Delete bookmarks	Enables the permission to delete bookmarks in the clients.
Create and extend evidence locks	Enables the permission to create or extend evidence locks in the clients.
Read evidence locks	Enables the permission to search and read evidence lock details in the clients.
Delete and reduce evidence locks	Enables the permission to delete or reduce evidence locks in the clients.
Create and extend live and playback restrictions	Enables the permission to create and extend restrictions on microphones in the clients.

Security permission	Description
Read live and playback restrictions	Enables the permission to see a list of existing restrictions on microphones in the clients.
Delete and reduce live and playback restrictions	Enables the permission to delete and reduce restrictions on microphones in the clients.
Start manual recording	Enables the permission to start manual recording of audio in the clients.
Stop manual recording	Enables the permission to stop manual recording of audio in the clients.
Delete recordings	Enables the permission to delete stored recordings from the system.
Manage security	Enables the permission to manage security permissions in the Management Client for microphones.

Speakers

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view speaker devices in the clients and the Management Client.
Edit	Enables the permission to edit properties for speakers in the Management Client. It also allows users to enable or disable speakers.
Listen live	Enables the permission to listen to live audio from speakers in the clients and the Management Client.
Listen restricted live audio	Enables the permission to listen to live restricted audio from speakers in the clients and the Management Client.

Security permission	Description
Speak	Enables the permission to speak through the speakers in the clients.
Playback	Enables the permission to play back recorded audio from speakers in the clients.
Playback restricted recordings	Enables the permission to play back recorded audio from speakers in the clients.
Retrieve remote recordings	Enables the permission to retrieve recordings in the clients from speakers on remotes sites or from edge storages on cameras.
Read sequences	Enables the permission to use the Sequences feature while browsing recorded audio from speakers in the clients.
Export	Enables the permission to export recorded audio from speakers in the clients.
Create bookmarks	Enables the permission to create bookmarks in the clients.
Read bookmarks	Enables the permission to search for and read bookmark details in the clients.
Edit bookmarks	Enables the permission to edit bookmarks in the clients.
Delete bookmarks	Enables the permission to delete bookmarks in the clients.
Create and extend evidence locks	Enables the permission to create or extend evidence locks to protect recorded audio in the clients.
Read evidence locks	Enables the permission to view recorded audio protected by evidence locks in the clients.
Delete and reduce evidence locks	Enables the permission to delete or reduce evidence locks on protected audio in the clients.
Create and extend live and playback restrictions	Enables the permission to create and extend restrictions on speakers in the clients.
Read live and playback restrictions	Enables the permission to see a list of existing restrictions on speakers in the clients.

Security permission	Description
Delete and reduce live and playback restrictions	Enables the permission to delete and reduce restrictions on speakers in the clients.
Start manual recording	Enables the permission to start manual recording of audio in the clients.
Stop manual recording	Enables the permission to stop manual recording of audio in the clients.
Delete recordings	Enables the permission to delete stored recordings from the system.
Manage security	Enables the permission to manage security permissions in the Management Client for speakers.

Metadata

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to receive metadata in the clients.
Edit	Enables the permission to edit metadata properties in the Management Client. It also allows users to enable or disable metadata devices.
Live	Enables the permission to receive live metadata from metadata devices in the clients.
View restricted live	Enables the permission to receive live restricted metadata from metadata devices in the clients.
Playback	Enables the permission to play back recorded data from metadata devices in the clients.
Playback restricted recordings	Enables the permission to play back restricted recorded data from metadata devices in the clients.

Security permission	Description
Retrieve remote recordings	Enables the permission to retrieve recordings in the clients from metadata devices on remotes sites or from edge storages on cameras.
Read sequences	Enables the permission to read the sequence information related to, for example, the **Playback** tab in the clients.
Export	Enables the permission to export recordings in the clients.
Create and extend evidence locks	Enables the permission to create evidence locks in the clients.
Read evidence locks	Enables the permission to view evidence locks in the clients.
Delete and reduce evidence locks	Enables the permission to delete or reduce evidence locks in the clients.
Create and extend live and playback restrictions	Enables the permission to create and extend restrictions on metadata in the clients.
Read live and playback restrictions	Enables the permission to see a list of existing restrictions on metadata in the clients.
Delete and reduce live and playback restrictions	Enables the permission to delete and reduce restrictions on metadata in the clients.
Start manual recording	Enables the permission to start manual recording of metadata in the clients.
Stop manual recording	Enables the permission to stop manual recording of metadata in the clients.
Delete recordings	Enables the permission to delete stored recordings from the system.
Manage security	Enables the permission to manage security permissions in the Management Client for metadata.

Input

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view input devices in the clients and the Management Client.
Edit	Enables the permission to edit properties for input devices in the Management Client. It also enables users to enable or disable an input device.
Manage security	Enables the permission to manage security permissions in the Management Client for input devices.

Output

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view output devices in the clients.
Edit	Enables the permission to edit properties for output devices in the Management Client. It also enables users to enable or disable an output device.
Activate	Enables the permission to activate outputs in the clients.
Manage security	Enables the permission to manage security permissions in the Management Client for output devices.

Smart Wall

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security permissions in XProtect Management Client.
Read	Enables the permission to view a video wall in XProtect Smart Client.
Edit	Enables the permission to edit properties for the Smart Wall definition in XProtect Management Client.
Delete	Enables the permission to delete existing Smart Wall definitions in XProtect Management Client.
Operate	Enables the permission to activate and modify Smart Wall definitions, for example to change and activate presets or apply cameras on views in XProtect Smart Client and in XProtect Management Client. You can associate **Operate** with time profiles that define when the user permission applies.
Create Smart Wall	Enables the permission to create new Smart Wall definitions in XProtect Management Client.
Manage security	Enables the permission to manage security permissions in XProtect Management Client for the Smart Wall definition.
Playback	Enables the permission to play back recorded data from a video wall in XProtect Smart Client. You can associate **Playback** with time profiles that define when the user permission applies.

View Groups

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view View Groups in the clients and in the Management Client. View groups are created in the Management Client.
Edit	Enables the permission to edit properties on the View Groups in the Management Client.
Delete	Enables the permission to delete View Groups in the Management Client.
Operate	Enables the permission to use View Groups in XProtect Smart Client, that is, to create and delete subgroups and views.
Create view group	Enables the permission to create View Groups in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for View Groups.

User-defined Events

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view user-defined events in the clients.
Edit	Enables the permission to edit properties on user-defined events in the Management Client.
Delete	Enables the permission to delete user-defined events in the Management Client.

Security permission	Description
Trigger	Enables the permission to trigger user-defined events in the clients.
Manage security	Enables the permission to manage security permissions in the Management Client for user-defined events.
Create user-defined event	Enables the permission to create new user-defined events in the Management Client.

Analytics Events

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view analytics events in the Management Client.
Edit	Enables the permission to edit properties on analytics events in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for analytics events.

Generic Events

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view generic events in the clients and the Management Client.

Security permission	Description
Edit	Enables the permission to edit properties on generic events in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for generic events.

Matrix

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to select and send video to the Matrix recipient from the clients.
Edit	Enables the permission to edit properties for a Matrix in the Management Client.
Delete	Enables the permission to delete a Matrix in the Management Client.
Create Matrix	Enables the permission to create a new Matrix in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for all Matrix's.

Rules

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view existing rules in the Management Client.
Edit	Enables the permission to edit properties for rules and to define rule behavior in the Management Client. It also requires that the user has read permissions on all the devices that are impacted by the rule.
Delete	Enables the permission to delete rules from the Management Client. It also requires that the user has read permissions on all devices that are impacted by the rule.
Create rule	Enables the permission to create new rules in the Management Client. It also requires that the user has read permissions on all devices that are impacted by the rule.
Manage security	Enables the permission to manage security permissions in the Management Client for all rules.

Sites

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view other sites in the Management Client. Connected sites are connected via Milestone Federated Architecture. To edit properties, you need Edit permissions on the Management Server on each site.
Manage security	Enables the permission to manage security permissions on all sites.

System monitor

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view system monitors in XProtect Smart Client.
Edit	Enables the permission to edit properties for system monitors in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for all system monitors.

Alarms

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Manage	Enables the permission to manage alarms in the Smart Client. For example, changing priorities of alarms, re-assigning alarms to other users, acknowledging alarms, changing the alarm state of multiple alarms (for example from **New** to **Assigned**). To edit alarm settings, you also need the **Edit alarm settings** permission. Only when you set this to allowed does the **Alarms and Events** tab in the **Options** dialog appear.
View	Enables the permission to view the **Alarm Manager** tab in XProtect Smart Client and retrieve alarms and alarm settings through the API.

Security permission	Description
	To view alarms in XProtect Smart Client, you must enable the **View** permission for at least one alarm definition. You view alarms from third-party solutions by default.
Disable alarms	Enables the permission to disable alarms.
Receive notifications	Enables the permission to receive notifications about alarms in XProtect Mobile clients and XProtect Web Client.
Manage security	Enables the permission to manage security permissions for alarms.
Edit alarm settings	Enables the permission to edit alarm definitions, alarm states, alarm categories, alarm sounds, alarm retention, and event retention. To edit alarm settings, you also need the **Manage** permission.

Alarm Definitions

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
View	Enables the permission to view alarm definitions, alarm states, alarm categories, alarm sounds, alarm retention, and event retention.
Write	Enables the **View** permission.
Manage security	Enables the permission to manage security permissions for alarm definitions.

Metadata search

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.

Security permission	Description
Read	Enables the permission to view the **Metadata Use** functionality in Management Client and its related settings, but does not enable the permission to change the settings.
Edit the metadata search configuration	Enables the permission to enable or disable metadata search categories, for example metadata for people or vehicles, in the Management Client.
Manage security	Enables the permission to manage security permissions for metadata searches.

Search

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Read public searches	Enables the permission to view and open saved public searches in XProtect Smart Client.
Create public searches	Enables the permission to save newly configured searches as public searches in XProtect Smart Client.
Edit public searches	Enables the permission to edit the details or the configuration of saved public searches in XProtect Smart Client, for example the name, description, cameras, and search categories.
Delete public searches	Enables the permission to delete saved public searches.
Manage security	Enables the permission to manage security permissions in the Management Client for search.

Server Logs

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read system log entries	Enables the permission to see system log entries.
Read audit log entries	Enables the permission to see audit log entries.
Read rule-triggered log entries	Enables the permission to see rule-triggered log entries.
Read log configuration	Enables the permission to read log settings in **Tools** > **Options** > **Server Logs**.
Update log configuration	Enables the permission to change log settings in **Tools** > **Options** > **Server Logs**.
Manage security	Enables the permission to manage security permissions for alarms.

Transaction sources

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view properties for the Transaction sources in the Management Client.
Edit	Enables the permission to edit properties for the Transaction sources in the Management Client.
Manage security	Enables the permission to manage security permissions in the Management Client for all Transaction sources.

Transaction definition

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Read	Enables the permission to view properties for the Transaction definitions in the Management Client.
Edit	Enables the permission to edit properties for the Transaction definitions in the Management Client.

Security permission	Description
Manage security	Enables the permission to manage security permissions in the Management Client for all Transaction definitions.

Access Control

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Edit	Enables the permission to edit properties for the Access Control systems in the Management Client.
Use access control	Allows the user to use any access control-related features in the clients.
View cardholders list	Allows the user to view the cardholders list on the **Access Control** tab in the clients.
Receive notifications	Allows the user to receive notifications about access requests in the clients.
Manage security	Enables the permission to manage security permissions for all Access Control systems.

Privacy Blur

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Manage	Currently not in use.

Security permission	Description
View	Allows the user to use the Privacy Blur feature in XProtect Smart Client.
Manage security	Currently not in use.

Sticky Notes

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Manage	Enables the user to create, edit, delete sticky notes in XProtect Smart Client.
View	Enables the user to see the sticky notes in XProtect Smart Client.
Manage security	Currently not in use.

Multiroom Audio

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Manage	Currently not in use.
View	Enables the user to use Multiroom Audio in XProtect Smart Client.
Manage security	Currently not in use.

LPR

If your system runs with XProtect LPR, specify the following permissions for the user:

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
View the LPR tab in client applications	Enables the permission to use XProtect LPR features in XProtect Smart Client.
Manage LPR	Enables the permission to: • add, import, modify, export, and delete match lists in the Management Client. • add and remove license plates from match lists in XProtect Smart Client. • remove, disable, and configure existing LPR cameras.
View the LPR node in Management Client	Enables the permission to: • add, remove, and configure match lists. • add, remove, and configure LPR camera. • add, remove, and configure LPR servers. • add, remove, and configure license plate aliases.
Manage security	Enables the permission to manage security permissions in the Management Client for LPR.

Webhooks

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

Security permission	Description
Full control	Enables the permission to manage all security entries on this part of the system.
Edit	Enables the permission to edit properties for webhooks in the Management Client.
Read	Enables the permission to view properties for webhooks in the Management Client.

Security permission	Description
Manage security	Enables the permission to manage security permissions in the Management Client for all webhooks.

MIP plug-ins

Through the MIP SDK, a third-party vendor can develop custom plug-ins for your system, for example, integration to external access control systems or similar functionality.

Device tab (roles)

Available functionality depends on the system you are using. See the complete feature list, which is available on the product overview page on the Milestone website (https://www.milestonesys.com/products/software/xprotect-comparison/).

The **Device** tab lets you specify which features users/groups with the selected role can use for each device (for example, a camera) or device group in XProtect Smart Client.

Remember to repeat for each device. You can also select a device group, and specify role permissions for all the devices in the group in one go.

You can still select or clear such square-filled check boxes, but note that your choice in that case applies for **all** devices within the device group. Alternatively, select the individual devices in the device group to verify exactly which devices the relevant permission applies for.

Camera-related permissions

Specify the following permissions for camera devices:

Name	Description
Read	The selected camera(s) will be visible in the clients.
View live	Allows live viewing of video from the selected camera(s) in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.
View restricted live	Allows live viewing of restricted video from the selected camera(s) in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.

Name	Description
Playback > Within time profile	Allows playback of recorded video from the selected camera(s) in the clients. Specify the time profile or leave the default value.
Playback > Limit playback to	Allows playback of recorded video from the selected camera(s) in the clients. Specify a playback limit or apply no restrictions.
Playback restricted recordings	Allows playback of recorded restricted video from the selected camera(s) in the clients. Specify the time profile or leave the default value.
Read sequences	Allows reading the sequence information related to, for example, the Sequence explorer in the clients.
Smart search	Allows the user to use the Smart search function in the clients.
Export	Allows the user to export recordings from the clients.
Start manual recording	Allows starting manual recording of video from the selected camera(s) in the clients.
Stop manual recording	Allows stopping manual recording of video from the selected camera(s) in the clients.
Read bookmarks	Allows search for and read bookmark details in the clients.
Edit bookmarks	Allows editing bookmarks in the clients.
Create bookmarks	Allows adding bookmarks in the clients.
Delete bookmarks	Allows deleting bookmarks in the clients.
AUX commands	Allows the use of auxiliary commands from the clients.
Create and extend evidence locks	Allows the client user to: • Add the camera to new or existing evidence locks • Extend the expiry time for existing evidence locks • Extend the protected interval for existing evidence locks

Name	Description
	Requires user permissions to all devices included in the evidence lock.
Delete and reduce evidence locks	Allows the client user to: • Remove the camera from existing evidence locks • Delete existing evidence locks • Shorten the expiry time for existing evidence locks • Shorten the protected interval for existing evidence locks Requires user permissions to all devices included in the evidence lock.
Read evidence locks	Allows the client user to search for and read evidence lock details.
Create and extend live and playback restrictions	Allows the client user to: • Create a live restriction on the camera • Create a playback restriction on the camera recordings • Add a new camera to a live or playback restriction • Extend the restriction period of the camera recordings Requires user permissions to all devices included in the restriction.
Read live and playback restrictions	Allows the client user to: • See a list of existing live and playback restrictions on the camera • Filter and search the list of live and playback restrictions on the camera
Delete and reduce live and playback restrictions	Allows the client user to: • Remove a live restriction on the camera • Remove a playback restriction on the camera recordings • Reduce the restriction period of the camera recordings • Change the settings of the live or playback restriction Requires user permissions to all devices included in the restriction.

Microphone-related permissions

Specify the following permissions for microphone devices:

Name	Description
Read	The selected microphone(s) will be visible in the clients.
Listen live	Allows listening to live audio from the selected microphones in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.
Listen restricted live audio	Allows listening to live restricted video from the selected microphone(s) in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.
Playback > Within time profile	Allows playback of recorded audio from the selected microphone(s) in the clients. Specify the time profile or leave the default value.
Playback > Limit playback to	Allows playback of recorded audio from the selected microphone(s) in the clients. Specify a playback limit or apply no restrictions.
Playback restricted recordings	Allows playback of recorded restricted audio from the selected microphone(s) in the clients. Specify the time profile or leave the default value.
Read sequences	Allows reading the sequence information related to, for example, the Sequence explorer in the clients.
Export	Allows the user to export recordings from the clients.
Start manual recording	Allows starting manual recording of audio from the selected microphone(s) in the clients.
Stop manual recording	Allows stopping manual recording of audio from the selected microphone(s) in the clients.
Read bookmarks	Allows search for and read bookmark details in the clients.
Edit bookmarks	Allows editing bookmarks in the clients.
Create bookmarks	Allows adding bookmarks in the clients.

Name	Description
Delete bookmarks	Allows deleting bookmarks in the clients.
Create and extend evidence locks	Allows the client user to: • Add the microphone to new or existing evidence locks • Extend the expiry time for existing evidence locks • Extend the protected interval for existing evidence locks  Requires user permissions to all devices included in the evidence lock.
Delete and reduce evidence locks	Allows the client user to: • Remove the microphone from existing evidence locks • Delete existing evidence locks • Shorten the expiry time for existing evidence locks • Shorten the protected interval for existing evidence locks  Requires user permissions to all devices included in the evidence lock.
Read evidence locks	Allows the client user to search for and read evidence lock details.
Create and extend live and playback restrictions	Allows the client user to: • Create a live restriction on the microphone • Create a playback restriction on the audio recordings • Add a new microphone to a live or playback restriction • Extend the restriction period of the audio recordings  Requires user permissions to all devices included in the restriction.
Read live and playback restrictions	Allows the client user to: • See a list of existing live and playback restrictions on the microphone • Filter and search the list of live and playback restrictions on the microphone
Delete and reduce live and playback restrictions	Allows the client user to: • Remove a live restriction on the microphone • Remove a playback restriction on the audio recordings • Reduce the restriction period of the audio recordings • Change the settings of the live or playback restriction

Name	Description
	Requires user permissions to all devices included in the restriction.

Speaker-related permissions

Specify the following permissions for speaker devices:

Name	Description
Read	The selected speaker(s) is visible in the clients.
Listen live	Allows listening to live audio from the selected speaker(s) in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.
Listen restricted live audio	Allows listening to live restricted video from the selected speaker(s) in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions. Specify the time profile or leave the default value.
Playback > Within time profile	Allows playback of recorded audio from the selected speaker(s) in the clients. Specify the time profile or leave the default value.
Playback > Limit playback to	Allows playback of recorded audio from the selected speaker(s) in the clients. Specify a playback limit or apply no restrictions.
Playback restricted recordings	Allows playback of recorded restricted audio from the selected speaker(s) in the clients. Specify the time profile or leave the default value.
Read sequences	Allows reading the sequence information related to, for example, the Sequence explorer in the clients.
Export	Allows the user to export recordings from the clients.
Start manual recording	Allows starting manual recording of audio from the selected speaker(s) in the clients.

Name	Description
Stop manual recording	Allows stopping manual recording of audio from the selected speaker(s) in the clients.
Read bookmarks	Allows search for and read bookmark details in the clients.
Edit bookmarks	Allows editing bookmarks in the clients.
Create bookmarks	Allows adding bookmarks in the clients.
Delete bookmarks	Allows deleting bookmarks in the clients.
Create and extend evidence locks	Allows the client user to: • Add the speaker to new or existing evidence locks • Extend the expiry time for existing evidence locks • Extend the protected interval for existing evidence locks  Requires user permissions to all devices included in the evidence lock.
Delete and reduce evidence locks	Allows the client user to: • Remove the speaker from existing evidence locks • Delete existing evidence locks • Shorten the expiry time for existing evidence locks • Shorten the protected interval for existing evidence locks  Requires user permissions to all devices included in the evidence lock.
Read evidence locks	Allows the client user to search for and read evidence lock details.
Create and extend live and playback restrictions	Allows the client user to: • Create a live restriction on the speakers • Create a playback restriction on the audio recordings • Add a new microphone to a live or playback restriction • Extend the restriction period of the audio recordings  Requires user permissions to all devices included in the restriction.

Name	Description
Read live and playback restrictions	Allows the client user to: • See a list of existing live and playback restrictions on the speakers • Filter and search the list of live and playback restrictions on the speakers
Delete and reduce live and playback restrictions	Allows the client user to: • Remove a live restriction on the speakers • Remove a playback restriction on the audio recordings • Reduce the restriction period of the audio recordings • Change the settings of the live or playback restriction Requires user permissions to all devices included in the restriction.

Metadata-related permissions

Specify the following permissions for metadata devices:

Name	Description
Read	Enables the permission to see metadata devices and retrieve data from them in the clients.
Edit	Enables the permission to edit metadata properties. It also allows users to enable or disable metadata devices in the Management Client and via the MIP SDK.
View Live	Enables the permission to view live metadata from cameras in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions.
View live restriction	Enables the permission to view live restricted metadata from cameras in the clients. For XProtect Smart Client, it requires that the role has been granted the permission to view the clients' **Live** tab. This permission is granted as part of the application permissions.
Playback	Enables the permission to play back recorded data from metadata devices in the clients.
Playback restricted recordings	Enables the permission to play back recorded data from restricted metadata devices in the clients.
Read sequences	Enables the permission to use the Sequences feature while browsing recorded data from

Name	Description
	metadata devices in the clients.
Export	Enables the permission to export recorded audio from metadata devices in the clients.
Create and extend evidence locks	Enables the permission to create and extend the evidence locks on metadata in the clients.
Read evidence locks	Enables the permission to view evidence locks on metadata in the clients.
Delete and reduce evidence locks	Enables the permission to delete or reduce evidence locks on metadata in the clients.
Start manual recording	Enables the permission to start manual recording of metadata in the clients.
Stop manual recording	Enables the permission to stop manual recording of metadata in the clients.
Create and extend live and playback restrictions	Allows the client user to: • Create a live restriction on the metadata device • Create a playback restriction on the metadata device • Add new metadata to a live or playback restriction • Extend the restriction period of the metadata device Requires user permissions to all devices included in the restriction.
Read live and playback restrictions	Allows the client user to: • See a list of existing live and playback restrictions on the metadata device • Filter and search the list of live and playback restrictions on the metadata device
Delete and reduce live and playback restrictions	Allows the client user to: • Remove a live restriction on the metadata device • Remove a playback restriction on the metadata device • Reduce the restriction period of the metadata device • Change the settings of the live or playback restriction Requires user permissions to all devices included in the restriction.

Input-related permissions

Specify the following permissions for input devices:

Name	Description
Read	The selected input(s) will be visible in the clients.

Output-related permissions

Specify the following permissions for output devices:

Name	Description
Read	The selected output(s) will be visible in the clients. If visible, the output will be selectable on a list in the clients.
Activate	The selected output(s) can be activated from the Management Client and the clients. Specify the time profile or leave the default value.

PTZ tab (roles)

You set up permissions for pan-tilt-zoom (PTZ) cameras on the **PTZ** tab. You can specify the features users/groups can use in the clients. You can select individual PTZ cameras or device groups containing PTZ cameras.

Specify the following permissions for PTZ:

Name	Description
Manual PTZ	Determines if the selected role can use PTZ functions and pause a patrolling on the selected camera. Specify a time profile, select **Always**, or leave the default value that follows the default time profile defined on the **Info** tab for that role.
Activate PTZ presets or patrolling profiles	Determines if the selected role can move the selected camera to preset positions, start and stop patrolling profiles, and pause a patrolling. Specify a time profile, select **Always**, or leave the default value that follows the default time profile defined on the **Info** tab for that role. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
PTZ Priority	Determines the priority of PTZ cameras. When several users on a surveillance system want to control the same PTZ camera at the same time, conflicts may occur.

Name	Description
	You can avoid such a situation by specifying a priority for use of the selected PTZ camera(s) by users/groups with the selected role. Specify a priority from 1 to 32,000, where 1 is the lowest priority. The default priority is 3,000. The role with the highest priority number is the one who can control the PTZ camera(s).
Manage PTZ presets or patrolling profiles	Determines the permission to add, edit and delete PTZ presets and patrolling profiles on the selected camera in both the Management Client and XProtect Smart Client. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
Lock/unlock PTZ presets	Determines if the role can lock and unlock preset positions for the selected camera.
Reserve PTZ sessions	Determines the permission to set the selected camera in reserved PTZ session mode. In a reserved PTZ session other users or patrolling sessions with higher PTZ priority are not able to take over the control. To allow this role to use other PTZ functions on the camera, enable the **Manual PTZ** permission.
Release PTZ sessions	Determines if the selected role can release other users' PTZ sessions from the Management Client. You can always release your own PTZ sessions - without this permission.

Speech tab (roles)

Relevant only if you use speakers on your system. Specify the following permissions for speakers:

Name	Description
Speak	Determine if users should be allowed to talk through the selected speaker(s). Specify the time profile or leave the default value.
Speak priority	When several client users want to talk through the same speaker at the same time, conflicts may occur. Solve the problem by specifying a priority for use of the selected speaker(s) by users/groups with the selected role. Specify a priority from **Very low** to **Very high**. The role with the highest priority is allowed use the speaker before other roles. Should two users with the same role want to speak at the same time, the first come, first served-principle applies.

Remote Recordings tab (roles)

Specify the following permissions for remote recordings:

Name	Description
Retrieve remote recordings	Enables the permission to retrieve recordings in the clients from cameras, microphones, speakers, and metadata devices on remotes sites or from edge storages on cameras.

Smart Wall tab (roles)

Through roles, you can grant your client users Smart Wall-related user permissions:

Name	Description
Read	Allows users to view the selected Smart Wall in XProtect Smart Client.
Edit	Allows users to edit the selected Smart Wall in the Management Client.
Delete	Allows users to delete the selected Smart Wall in the Management Client.
Operate	Allows users to apply layouts on the selected Smart Wall in XProtect Smart Client and to activate presets.
Playback	Allows users to play back recorded data from the selected Smart Wall in XProtect Smart Client.

External Event tab (roles)

Specify the following external event permissions:

Name	Description
Read	Allows users to search for and view the selected external system event in the clients and the Management Client.
Edit	Allows users to edit the selected external system event in the Management Client.
Delete	Allows users to delete the selected external system event in the Management Client.
Trigger	Allows users to trigger the selected external system event in the clients.

View Group tab (roles)

On the **View Group** tab, you specify which view groups the users and user groups with the selected role can use in the clients.

Specify the following permissions for view groups:

Name	Description
Read	Enables the permission to view the View Groups in the clients and in the Management Client. View groups are created in the Management Client.
Edit	Enables the permission to edit properties on View Groups in the Management Client.
Delete	Enables the permission to delete View Groups in the Management Client.
Operate	Enables the permission to use View Groups in XProtect Smart Client, that is to create and delete subgroups and views.

Servers tab (roles)

Specifying role permissions on the **Servers** tab is only relevant if your system works in a Milestone Federated Architecture setup.

Name	Description
Sites	Enables the permission to view the selected site in the Management Client. Connected sites are connected via Milestone Federated Architecture. To edit properties, you need Edit permissions on the Management Server on each site.

See Configuring Milestone Federated Architecture for more information.

Matrix tab (roles)

If you have configured Matrix recipients on your system, you may configure Matrix role permissions. From a client, you can send video to selected Matrix recipients. Select the users who can receive this on the Matrix tab.

The following permissions are available:

Name	Description
Read	Determine if users and groups with the selected role can select and send video to the Matrix recipient from the

Name	Description
	clients.

Alarms tab (roles)

If you use alarms in your system setup to provide central overview and control of your installation (including any other XProtect servers), you can use the **Alarms** tab to specify the alarm permissions for users and groups with the selected role they should have, for example, how to handle alarms in the clients.

In **Alarms**, you specify the permissions for alarms:

Security permission	Description
Manage	Enables the permission to manage alarms in the Smart Client. For example, changing priorities of alarms, re-assigning alarms to other users, acknowledging alarms, changing the alarm state of multiple alarms (for example from **New** to **Assigned**). To edit alarm settings, you also need the **Edit alarm settings** permission. Only when you set this to allowed does the **Alarms and Events** tab in the **Options** dialog appear.
View	Enables the permission to view the **Alarm Manager** tab in XProtect Smart Client and retrieve alarms and alarm settings through the API. To view alarms in XProtect Smart Client, you must enable the **View** permission for at least one alarm definition. You view alarms from third-party solutions by default.
Disable alarms	Enables the permission to disable alarms.
Receive notifications	Enables the permission to receive notifications about alarms in XProtect Mobile clients and XProtect Web Client.
Edit alarm settings	Enables the permission to edit alarm definitions, alarm states, alarm categories, alarm sounds, alarm retention, and event retention. To edit alarm settings, you also need the **Manage** permission.

In **Alarm Definitions**, you specify the permissions for a specific alarm definition:

Name	Description
View	Enables the permission to view alarm definitions, alarm states, alarm categories, alarm sounds, alarm retention, and event retention.

Name	Description
Write	Enables the **View** permission.

Access Control tab (roles)

When you add or edit basic users, Windows users or groups, specify access control settings:

Name	Description
Use access control	Allows the user to use any access control-related features in the clients.

LPR tab (roles)

If your system runs with XProtect LPR, specify the following permissions for the users:

Name	Description
View the LPR tab in client applications	Enables the permission to use XProtect LPR features in XProtect Smart Client.
Manage LPR	Enables the permission to: • add, import, modify, export, and delete match lists in the Management Client. • add and remove license plates from match lists in XProtect Smart Client. • remove, disable, and configure existing LPR cameras.
View the LPR node in Management Client	Enables the permission to: • add, remove, and configure match lists • add, remove, and configure LPR camera • add, remove, and configure LPR servers • add, remove, and configure license plate aliases.

Incidents tab (roles)

If you have XProtect Incident Manager, you can specify the following permissions for your roles.

To give a Management Client administrator role the permissions to manage or view incident properties, select the **Incident properties** node.

To give an operator of XProtect Smart Client permission to view your defined incident properties, select **Incident properties** and give **View** permission. To give general permissions to manage or view incident projects, select the **Incident project** node. Expand the **Incident project** node and select one or more sub-nodes to give permissions for these additional specific features or capabilities.

Name	Description
Manage	Permission to manage (view, create, edit, and delete) settings and properties related to a feature or view a user interface element represented by the selected node in either Management Client or XProtect Smart Client.
View	Permission to view (but not create, edit, and delete) the settings and properties related to a feature, view defined incident properties, or view a user interface element represented by the selected node in either Management Client or XProtect Smart Client.

Healthcare tab (roles)

If your system runs with XProtect Hospital Assist, specify the following permissions for the users:

Privacy Blur-related permissions

Name	Description
Manage	Currently not in use.
View	Enables the Privacy Blur feature in XProtect Smart Client.

Sticky Notes-related permissions

Name	Description
Manage	Enables the permission to create, edit, and delete sticky notes in XProtect Smart Client.
View	Enables the Sticky Notes feature in XProtect Smart Client.

Multiroom Audio-related permissions

Name	Description
Manage	Currently not in use.
View	Enables the role to use the listen and speak functionality for the Multiroom Audio feature in XProtect Smart Client.

Webhooks tab (roles)

If your system runs with webhooks, specify the following permissions for the users:

Name	Description
Edit	Enables the permission to edit properties for webhooks in the Management Client.
Read	Enables the permission to view properties for webhooks in the Management Client.

Transact tab (roles)

If your system runs with XProtect Transact, specify the following permissions for the users:

Transaction sources

Name	Description
Edit	Enables the permission to edit properties for transaction sources in the Management Client.
Read	Enables the permission to view properties for transaction sources in the Management Client.

Transaction definitions

Name	Description
Edit	Enables the permission to edit properties for transaction definitions in the Management Client.
Read	Enables the permission to view properties for transaction definitions in the Management Client.

MIP tab (roles)

Through the MIP SDK, a third-party vendor can develop custom plug-ins for your system, for example, integration to external access control systems or similar functionality. The third-party plug-ins will have their own settings on individual tabs.

The settings you change depend on the actual plug-in. Find the custom settings for the plug-ins on the **MIP** tab.

Basic user (Security node)

There are two user account types in Milestone XProtect VMS: Basic users and Windows users.

Basic users are user accounts that you create in Milestone XProtect VMS. It is a dedicated system user account with a basic user name and password authentication for the individual user.

Windows users are user accounts that you add through Microsoft's Active Directory.

There are some differences between basic users and Windows users:

- Basic users are authenticated by a user name and password combination and are specific to one system/site.

Note that even if a basic user created at one federated site has the same name and password as a basic user on another federate site, the basic user only has access to the site it has been created on.

- Windows users are authenticated based on their Windows login and are specific to a machine.

System Dashboard node

Under the **System Dashboard** node, you find different functionality to monitor your system and its various system components.

Name	Description
Current Task	Get an overview of ongoing tasks on a selected recording server.
System Monitor	Monitor the status of your servers and cameras by parameters you define.
System Monitor Thresholds	Set threshold values for monitored parameters on server and monitor tiles used in System Monitor.
Evidence Lock	Get an overview of all protected data in the system.
Configuration Reports	Print a report with your system configuration. You can decide what to include in the report.

Current Tasks (System Dashboard node)

The **Current Tasks** window shows an overview of ongoing tasks under a selected recording server. If you have initiated a task that takes a long time and runs in the background, you can open the **Current Tasks** window to see how the task progresses. A few examples of lengthy user-initiated tasks are firmware updates and movement of hardware. You can see information about the task's start-time, estimated end-time, and progress.

The information shown in the **Current Tasks** window is not dynamically updated but is a snapshot of the current tasks from the moment you opened the window. If you have had the window open for some time, refresh the information by selecting the **Refresh** button in the lower right corner of the window.

System Monitor (System Dashboard node)

The **System Monitor** functionality provides you with a quick, visual overview of the current well-being of your system's servers and cameras.

System monitor dashboard window

Tiles

The upper part of the **System monitor dashboard** window shows colored tiles that represent the state of your system's server hardware and camera hardware.

The tiles change their state and thereby color based on threshold values set under **System Monitor Thresholds** node. For

more information, see System Monitor Thresholds (System Dashboard node). Define the thresholds, so tile colors mean the following:

Tile color	Description
Green	**Normal** state. Everything is running normally.
Yellow	**Warning** state. One or more monitoring parameters is above the threshold value for the **Normal** state.
Red	**Critical** state. One or more monitoring parameters is above the threshold value for the **Normal** and **Warning** state.

Hardware list with monitoring parameters

If you click a tile, you can see the state of each selected monitoring parameter for each hardware represented by the tile in the bottom part of the **System monitor dashboard** window.

Example: A camera's LIVE FPS monitoring parameters have reached the Warning state.

Customize dashboard window

Select **Customize** in the upper right corner of the window to open the **Customize dashboard** window.

In the **Customize dashboard** window, you can select which tile to create, edit or delete. When creating or editing tiles, you can select which hardware and which monitoring parameters you want to monitor on the tile.

Details window

If you select a tile and then from the hardware list with monitoring parameters, select the **Details** button to the right of a camera or server, you can -depending on the selected hardware - view system information and create reports regarding:

Hardware	Information
Management server	Shows data about: • CPU Usage • Memory available Select **History** to see the historical states of your hardware and create a report on the above data.
Recording server(s)	Shows data about:

Hardware	Information
	• CPU usage • Memory available • Disks • Storage • Network • Cameras Select **History** to see the historical states of your hardware and create a report on the above data.
Failover recording servers	Shows data about: • CPU usage • Memory available • Monitored recording servers Select **History** to see the historical states of your hardware and create a report on the above data.
Log servers, events servers, and more	Shows data about • CPU usage • Memory available Select **History** to see the historical states of your hardware and create a report on the above data.
Cameras	Shows data about: • Storage • Used Space • Live FPS (Default) • Recording FPS • Live Video Format • Recording Video Format • Media Data Received (Kbit/s) • Memory available Select the camera name to see its historical states and create a report on: • Data received from camera • Camera disk usage

If you access the system monitor's details from a server operating system, you may experience a message regarding **Internet Explorer Enhanced Security Configuration**. Follow the instructions to add the **System Monitor** page to the **Trusted sites zone** before proceeding.

System Monitor Thresholds (System Dashboard node)

System monitor thresholds allow you to define and adjust the thresholds when tiles on the **System monitor dashboard**

should visually indicate that your system hardware changes state. For example, when the CPU usage of a server changes from a normal state (green) state to a warning state (yellow) or from a warning state (yellow) to a critical state (red).

Example of thresholds between the three states

You can change thresholds for servers, cameras, disks, and storage, and all thresholds have some common buttons and settings.

Common user interface elements

Buttons & settings	Description	Unit
Calculation interval	Often there are short outages in the connection to your different hardware. If you specify a calculation interval of 0 seconds, all these short outages will trigger alerts about changes in hardware state. Therefore, define a calculation interval of some length. If you define a one (1) minute calculation internal, it means that you only get alerts if the average value for the whole minute exceeds the threshold. With the correct calculation interval setting, you will not receive false-positive alerts but only alerts about sustained issues with, for example, CPU usage or memory consumption. To change the values of calculation intervals, see Edit thresholds for when hardware states should change.	sec
Advanced	If you select the **Advanced** button, you can define thresholds and calculation intervals for individual servers, cameras, disks, and storage. For more information, see below.	-
Create rule	You can combine events from **System Monitor** and rules to trigger actions, for example, when a server's CPU usage is critical, or a disk is running out of free space. For more information, see Rules and events (explained) and Add rules.	-

Server thresholds

Threshold	Description	Unit
CPU usage	Thresholds for the CPU usage on the servers you monitor.	%
Memory available	Thresholds for RAM in use on the servers you monitor.	MB
NVIDIA decoding	Thresholds for the NVIDIA decoding usage on the servers you monitor.	%
NVIDIA memory	Thresholds for NVIDIA RAM in use on the servers you monitor.	%
NVIDIA rendering	Thresholds for the NVIDIA rendering usage on the servers you monitor.	%

Camera thresholds

Threshold	Description	Unit
Live FPS	Thresholds for cameras' FPS in use when live video is shown on cameras you monitor.	%
Recording FPS	Thresholds for cameras' FPS in use when the system is recording video on cameras, you monitor.	%
Used space	Thresholds for the space used by cameras you monitor.	GB

Disk thresholds

Threshold	Description	Unit
Free space	Thresholds for available space on disks you monitor.	GB

Storage thresholds

Threshold	Description	Unit
Retention time	Threshold showing a prediction for when you run out of space on your storage. The state shown is based on your system setup and is updated twice a day.	Days

Evidence Lock (System Dashboard node)

Evidence Lock under the **System Dashboard** node shows an overview of all protected data on the current surveillance system.

The following metadata is available for all evidence locks:

- Start and end date for the protected data
- The user who locked the evidence
- When the evidence is no longer locked
- Where the data is stored
- The size of each evidence lock

All information shown in the **Evidence Lock** window is snapshots. Press F5 to refresh.

Configuration Reports (System Dashboard node)

You make many choices when you install and configure your VMS system, and you may need to document these. Over time it is also hard to remember all the settings you have changed since the installation and initial configuration - or just during the last couple of months. That is why it is possible to print a report with all your configuration choices.

The following settings are available when creating and printing configuration reports:

Name	Description
Reports	A list of elements that is possible to include in a configuration report.
Select All	Adds all elements in the **Reports** list to the configuration report.
Clear All	Removes all elements in the **Reports** list from the configuration report.
Front Page	Customize the front page of the report.
Formatting	Format the report.
Exclude sensitive data	Removes personal data like user names, e-mail addresses, and other types of sensitive data from the configuration report and makes it GDPR compliant. Information about the license owner is always exclude from the report.
Export	Select a save location for the report and create it as a PDF.

Server Logs node

System logs (tab)

Each row in a log represents a log entry. A log entry contains a number of information fields:

Name	Description
Log level	Info, warning, or error.
Local time	Timestamped in the local time of your system's server.
Message text	The identification number for the logged incident.
Category	The type of logged incident.
Source type	The type of equipment on which the logged incident occurred, for example, server or device.
Source name	The name of the equipment on which the logged incident occurred.
Event type	The type of event represented by the logged incident.

Audit logs (tab)

Each row in a log represents a log entry. A log entry contains a number of information fields:

Name	Description
Local time	Timestamped in the local time of your system's server.
Message text	Shows a description of the logged incident.
Permission	The information about whether the remote user action was allowed (granted) or not.
Category	The type of logged incident.
Source type	The type of equipment on which the logged incident occurred, for example, server or device.
Source name	The name of the equipment on which the logged incident occurred.
User	The user name of the remote user causing the logged incident.
User location	The IP address or host name of the computer from which the remote user caused the logged incident.

Rule-triggered logs (tab)

Each row in a log represents a log entry. A log entry contains a number of information fields:

Name	Description
Local time	Timestamped in the local time of your system's server.
Message text	Shows a description of the logged incident.
Category	The type of logged incident.
Source type	The type of equipment on which the logged incident occurred, for example, server or device.
Source name	The name of the equipment on which the logged incident occurred.
Event type	The type of event represented by the logged incident.
Rule name	The name of the rule triggering the log entry.
Service name	The name of the service on which the logged incident occurred.

Metadata and metadata search

To manage and configure metadata devices, see Show or hide metadata search categories and search filters.

What is metadata?

Metadata is data about data, for example, data that describes the video image, the content or objects in the image, or the location of where the image was recorded.

Metadata can be generated by:

- The device itself delivering the data, for example a camera that is delivering video
- A third-party system or integration via a generic metadata driver

Metadata search

Metadata search is any search for video recordings in XProtect Smart Client that uses search categories and search filters related to metadata.

The default Milestone metadata search categories are:

- Location: Users can define geo coordinates and a search radius from these coordinates.
- People: Users can search for gender and approximate height and age as well as select to show results with faces.
- Vehicles: Users can search for vehicle color, speed, and type, as well as search for a specific license plate.

Metadata search requirements

To get search results, you need one of the following:

- At least one device in your video surveillance system that can perform video analytics and is configured correctly
- A video processing service in your video surveillance system that generates metadata

In either case, metadata must be in the required metadata format.

For more information, see the documentation for integration of Metadata Search.

Systems (Access Control node)

General Settings tab

Doors and Associated Cameras tab

GPS coordinates tab

Access Control Events tab

Access Request Notification tab

Cardholders tab

General Settings tab

Name	Description
Enable	Enable or disable the integrated access control system. If you disable this setting, your XProtect system will no longer receive access control events. Integrated access control systems are enabled and visible in XProtect Smart Client by default for users with sufficient permissions. Sometimes, you might need to disable access control events, such as during maintenance, to avoid generating unnecessary alarms.
Name	Add or edit the name of the access control system integration shown in the Management Client and other clients.
Description	Add a description of the access control integration (optional).
Integration plug-in	Displays the type of access control system selected during the initial integration.
Last configuration refresh	Displays the date and time when the configuration was last imported from the access control system.
Refresh configuration	Click this button when you have made configuration changes in the integrated access control system and want to reflect them in XProtect, such as adding or deleting a door. After you click the button, a summary of the configuration changes from the access control system is displayed. Review the list to ensure your access control system is correctly reflected before applying the new configuration.
Operator login required	If the access control system supports differentiated user permissions, enable an additional login for the client users. If you enable this setting, the access control system will not be available in XProtect Mobile client. This setting is only displayed if the integration plug-in supports differentiated user permissions.

Potential settings

The following examples of settings might be displayed, depending on the access control system plug-in you're integrating with. The names of the settings and their content are imported from the plug-in.

Name	Description
Address	Enter the address of the server that hosts the integrated access control system.

Name	Description
Port	Specify the port number on the server the access control system is connected to.
User name	Enter the name of the user from the access control system who should be the administrator of the integrated access control system in XProtect.
Password	By default, the password field is hidden. Click the button to enter the administrator's password for the access control system to save. When you save, the password is verified.

Doors and Associated Cameras tab

Use this tab to link door access points with cameras, microphones, and speakers.

- You must assign cameras to door access points during the integration setup, but you can change them later.
- Microphones and speakers are automatically linked through their associated cameras.

Name	Description
Doors	Lists the available door access points defined in the access control system, grouped by door. For an easier navigation to the relevant doors, you can filter on the doors in your access control system with the dropdown list box at the top. **Enabled**: Licensed doors are enabled by default. You can disable a door to free up a license. **License**: Shows if a door is licensed or if the license has expired. The field is empty when the door is disabled. **Remove**: Click **Remove** to remove a camera from an access point. If you remove all cameras, the check box for associated cameras is automatically cleared.
Cameras	Lists the cameras configured in the XProtect system. Select a camera from the list and drag and drop it at the relevant access point to associate the access point with the camera.

GPS coordinates tab

When you add the GPS coordinates for an access control unit, the unit automatically appears on the smart maps in XProtect Smart Client.

Name	Description
Access control	Select the access control unit you want to add GPS coordinates for.

Name	Description
units	
GPS coordinates	Enter the GPS coordinates of the access control unit in the format latitude, longitude. The value you enter determines the position of the access control unit icon on the smart map in XProtect Smart Client.

Access Control Events tab

Event categories organize events and influence access control behavior. For example, you can set one alarm to trigger for multiple event types.

Name	Description
Access Control Event	Lists the access control events imported from the access control system. The integration plug-in controls default enabling and disabling of events. You can disable or enable events at any time after the integration. When an event is enabled, it is stored in the event database, and users can filter for it in the XProtect Smart Client.
Source Type	Shows the access control unit that can trigger the access control event.
Event Category	Assign event categories to the access control events. You can add multiple categories. The XProtect system automatically maps relevant event categories to the events during integration and creates a default setup. You can change the mapping at any time. Built-in event categories are: • Access denied • Access granted • Access request • Alarm • Error • Warning. The integration plug-in's own events and event categories might be displayed, and you can also define your own event categories. If you change the event categories in XProtect Corporate, ensure that the existing access control rules still work.
User-defined Categories	Allows you to create, modify, or delete user-defined event categories. You might want to create event categories when the built-in categories do not meet your requirements, such as when you define triggering events for access control actions.

Name	Description
	The categories apply to all integration systems added to the XProtect system. They enable you to set up cross-system handling, such as on alarm definitions. If you delete a user-defined event category, you will receive a warning if it is in use with any of your integrations. If you still delete it, all configurations made with this category, such as access control actions, will no longer work.

Access Request Notification tab

You can customize how your access request notifications are displayed in XProtect Smart Client when a given event is triggered.

Name	Description
Name	Enter a name for the access request notification.
Add Access Request Notification	Click to add and define access request notifications. To delete a notification, click **X** on the right-hand side. If you log into the parent site using XProtect Smart Client in a Milestone Federated Architecture, you also see access request notifications from the child sites.
Access request notification details	Specify the cameras, microphones, or speakers that are displayed in the access request notifications when a given event occurs. You can also specify the sound you want to use to alert the user when the notification is displayed.
Add command	Select the commands to display as buttons in access request notification windows in XProtect Smart Client. • Related access request commands: enables all commands related to access request operations available on the source unit. For example **Open door**. • All related commands: enables all commands on the source unit. • Access control command: enables a selected access control command. • System command: Enables a command predefined in the XProtect system To delete a command, click **X** on the right-hand side.

Cardholders tab

Use the **Cardholders** tab to review available information about cardholders in the access control system.

Name	Description
Search cardholder	Type a cardholder's name. If the name exists in the system, it will appear in the list.
Name	Lists the names of the cardholders retrieved from the access control system.
Type	Lists the type of cardholder, for example: • Employee • Guard • Guest.

If your access control system integration allows adding and deleting image files in XProtect, you can upload images to cardholder profiles. This functionality is useful if the access control system integration does not store any existing cardholder images already.

Not all access control systems support adding cardholder pictures through XProtect.

Name	Description
Select picture	Specify a path to a file with an image of the cardholder. This button is hidden if the integrated access control system manages the images and does not allow image changes in XProtect. • You can use files in the .bmp, .png, and .jpg formats. • Images are resized to maximize the view. • Milestone recommends that you use a square image.
Delete picture	Click to delete the picture. If the cardholder also had a picture the integrated access control system, this picture will be shown instead.

Access control unit groups

With access control groups, you can manage all your access control units more granularly. You can use roles to assign permissions to specific groups and units, ensuring that users have access only to the access control units they need.

You can add an access control group from the **Access Control** node, and manage the group permissions from the **Security** node in XProtect Management Client.

Related topics:

- Add an access control unit group
- Add access control units to a group

- Manage group permissions

Incident properties (Incidents node)

The following information describes settings that are related to XProtect Incident Manager.

You define all incident properties for your XProtect Smart Client operators on these tabs:

- Types
- Statuses
- Categories
- Category 1-5

All the incident properties have the following settings:

Name	Description
Name	Incident property names do not have to be unique, but it is an advantage to use unique and descriptive incident property names in many situations.
Description	An additional explanation of the defined incident property. For example, if you have created a category named Location, its description could be Where did the incident happen?

Transaction Sources (Transact node)

The following table describes the properties for transaction sources.

For more information about adding a source, see Add transaction source (wizard).

Transaction sources (properties)

Name	Description
Enable	If you want to disable the transaction source, clear this check box. The stream of transaction data stops, but the data already imported remains on the event server. You can still view transactions from a disabled transaction source in XProtect Smart Client during its retention period.  Even a disabled transaction source requires a transaction source license.
Name	If you want to change the name, enter a new name here.
Connector	You cannot change the connector you selected when you created the transaction source. To select a different connector, you need to create a new transaction source, and during the wizard, select the connector you

Name	Description
	want.
Transaction definition	You can select a different transaction definition that defines how to transform the transaction data received into transactions and transaction lines. This includes defining: • When a transaction begins and ends • How transactions are displayed in XProtect Smart Client
Retention period	Specify, in days, for how long transaction data is maintained on the event server. The default retention period is 30 days. When the retention period expires, automatically the data is deleted. This is to avoid the situation, where the storage capacity of the database is exceeded. The minimum value is 1 day, whereas the maximum value is 1000 days.
TCP client connector	If you selected **TCP client connector**, specify these settings: • **Host name**: enter the host name of the TCP server associated with the transaction source • **Port**: enter the port name on the TCP server associated with the transaction source
Serial port connector	If you selected **Serial port connector**, specify these settings and make sure that they match the settings on the transaction source: • **Serial port**: select the COM port • **Baud rate**: specify the number of bits transmitted per second • **Parity**: specify the method for detecting errors in the transmissions. By default, **None** is selected • **Data bits**: specify the number of bits used to represent one character of data • **Stop bits**: specify the number of bits to indicate when a byte has been transmitted. Most devices need 1 bit • **Handshake**: specify the handshaking method determining the communication protocol between the transaction source and event server

Transaction Definitions (Transact node)

The following table describes the properties for definitions to be used for the transaction sources.

For more information about creating and adding transaction definitions, see Create and add transaction definitions.

Transaction definitions (properties)

Name	Description
Name	Enter a name.

Name	Description
Encoding	Select the character set used by the transaction source, for example the cash register. This helps XProtect Transact convert the transaction data to understandable text that you can work with when configuring the definition. If you select the wrong encoding, the data may appear as non-sense text.
Start collecting data	Collect transaction data from the connected transaction source. You can use the data to configure a transaction definition. Wait for at least one, but preferably more, transactions to complete.
Stop collecting data	When you have collected sufficient data to configure the definition, click this button.
Load from file	If you want to import data from an already existing file, click this button. Typically this is a file that you have created previously in the file format .capture. It can be other file formats. What is important here is that the encoding of the import file matches the encoding selected for the current definition.
Save to file	If you want to save the collected raw data to a file, click this button. You can reuse it later.
Match type	Select the match type to use to search for the start pattern and the stop pattern in the collected raw data: • Use exact match: The search identifies strings that contain exactly what you have entered in the **Start pattern** and **Stop pattern** fields • Use wildcards: The search identifies strings that contain what you have entered in the **Start pattern** and **Stop pattern** fields in combination with a wild card symbol (*, #, ?) * matches any number of characters. For example, if you have entered "Start tra*tion", the search identifies strings that contain "Start transaction". # matches exactly 1 digit. For example, if you have entered "# watermelon", the search identifies strings that contain, for example, "1 watermelon". ? matches exactly 1 character. For example, you may use the search expression "Start trans?ction" to identify strings that contain "Start transaction" • Use regular expression: Use this match type to identify strings that contain specific notation methods or conventions, for example a date format or credit card number. For more information, see the Microsoft website (https://docs.microsoft.com/dotnet/standard/base-types/regular-expression-language-quick-reference/)
Raw data	Transaction data strings from the connected transaction source are displayed in this section.
Start pattern	Specify a start pattern to indicate where a transaction begins. Horizontal lines are inserted in the **Preview** field to visualize where the transaction starts and ends, and will help to keep individual transactions separated.
Stop pattern	Specify a stop pattern to indicate where a transaction ends. A stop pattern is not mandatory, but is useful if the received data contains irrelevant information, such as information about opening hours or

Name	Description
	special offers, between actual transactions. If you do not specify a stop pattern, the end of the receipt is defined in terms of where the next receipt starts. The start is determined by what is entered in the **Start pattern** field.
Add filter	Use the **Add filters** button to point out the characters that you want to be omitted in XProtect Smart Client or replaced by other characters or a line break. Replacing characters is useful when the transaction source string contains control characters for non-printing purposes. Adding line breaks is necessary to make receipts in XProtect Smart Client resemble the original receipts.
Filter text	Displays the characters currently selected in the **Raw data** section. If you are aware of characters that you want to be omitted or replaced, but they do not occur in the collected raw data string, you can enter the characters manually in the **Character** field. If the character is a control character, you need to enter its hexadecimal byte value. Use this format for the byte value: {XX} and {XX, XX,...} if a characters consists of more bytes.
Action	For each filter you add, you should specify how the characters you have selected are handled: • Omit: the characters you select are filtered out • Substitute: the characters you select are replaced with the characters you specify • Add line break: the characters you select are replaced by a line break
Substitution	Enter the text to replace the characters selected. Only relevant if you have selected the action **Substitute**.
Remove control characters that are not defined as filter text	Remove non-printing characters that were not already removed after adding filters. In the **Raw data** pane and the **Preview** section, see how the transaction data strings change when you enable or disable this setting.
Preview	Use the **Preview** section to verify that you have identified and filtered out unwanted characters. The output you see here resembles what the real-life receipt looks like in XProtect Smart Client.

Alarm Definitions (Alarms node)

When your system registers an event on your system, you can configure the system to generate an alarm in XProtect Smart Client. You must define alarms before you can use them, and alarms are defined based on events registered in your system servers. You can also use user-defined events for triggering alarms and use the same event to trigger several different alarms.

Alarm definition settings:

Name	Description
Enable	By default, the alarm definition is enabled. To disable it, clear the check box.
Name	Alarm names do not have to be unique, but using unique and descriptive alarm names are advantageous in many situations.
Instructions	Enter a descriptive text about the alarm and how to resolve the issue that caused the alarm. The text appears in XProtect Smart Client when the user handles the alarm.
Triggering event	Select the event message to use when the alarm is triggered. Choose from two dropdowns: • The first drop-down: Select the type of event, for example analytics event and system events • The second drop-down: Select the specific event message to use. The messages available are determined by the event type you selected in the first drop-down menu
Sources	Specify the sources that the events originate from. Aside from cameras or other devices, sources may also be plug-in defined sources, for example VCA and MIP. The options depend on the type of event you have selected.

Alarm trigger:

Name	Description
Time profile	Select the **Time profile** radio button to specify the time interval during which the alarm definition is active. Only the time profile you have defined under the **Rules and Events** node are displayed in the list. If none are defined, only the **Always** option is available.
Event based	If you want the alarm to be based on an event, select this radio button. Once selected, specify the start and stop event. You can select hardware events defined on cameras, video servers and input. See also Events overview. Also, global/manual event definitions can be used. See also User-defined events (explained).

Operator action required:

Name	Description
Time limit	Select a time limit for when operator action is required. The default value is 1 minute. The time limit is not active before you have attached an event in the **Events triggered** drop-down menu.
Events triggered	Select which event to trigger when the time limit has passed.

Maps:

Name	Description
Alarm Manager view	Assign either a smart map or a map to the alarm when the alarm is listed in XProtect Smart Client > **Alarm Manager**. Smart map displays alarms if they are triggered by a device and if the device is added to the smart map.

Other:

Name	Description
Related cameras	Select up to 15 cameras to include in the alarm definition, even if these cameras themselves do not trigger the alarm. This can be relevant, for example, if you have selected an external event message (such as a door being opened) as the source of your alarm. By defining one or more cameras near the door, you can attach the cameras' recordings of the incident to the alarm.
Initial alarm owner	Select a default user responsible for the alarm.
Initial alarm priority	Select a priority for the alarm. Use these priorities in XProtect Smart Client to determine the importance of an alarm.
Alarm category	Select an alarm category for the alarm, for example **False alarm** or **Need investigation**.
Events triggered by alarm	Define an event that the alarm can trigger in XProtect Smart Client.

Name	Description
Auto-close alarm	If you want a particular event to automatically stop the alarm, select this check box. Not all events can trigger alarms. Clear the check box to disable the new alarm from the beginning.
Alarm assignable to Administrators	Select the check box to include users with an administrator role in the **Assigned to** list. The **Assigned to** list is in the alarm details on the **Alarm Manager** tab in XProtect Smart Client. Clear the check box to filter out users with an administrator role from the **Assigned to** list to shorten the list.

Alarm Data Settings (Alarms node)

When you configure alarm data settings, specify the following:

Alarm Data Levels tab

Priorities

Name	Description
Level	Add new priorities with level numbers of your choosing or use/edit the default priority levels (numbers 1, 2 or 3). These priority levels are used to configure the **Initial alarm priority** setting.
Name	Enter a name for the entity. You can create as many as you like.
Sound	Select the sound to be associated with the alarm. Use one of the default sounds or add more in **Sound Settings**.
Repeat sound	Decide whether the sound should play only once or repeatedly until in XProtect Smart Client, the operator clicks the alarm in the alarm list.
Enable desktop notifications	For each alarm priority, you can enable or disable desktop notifications. If you are using an XProtect VMS that supports Smart Client profiles, you must also enable notifications on the required Smart Client profiles. See Alarm Manager tab (Smart Client profiles).

States

Name	Description
Level	In addition to the default state levels (numbers **1**, **4**, **9** and **11**, which cannot be edited or reused), add new states with level numbers of your choosing. These state levels are only visible in the XProtect Smart Client's *Alarm List*.

Categories

Name	Description
Level	Add new categories with level numbers of your choosing. These category levels are used to configure the **Initial alarm category** setting. Level 99 is reserved for the Emergency Alert alarm in XProtect Mobile client.
Name	Enter a name for the entity. You can create as many as you like.

Alarm List Configuration tab

Name	Description
Available columns	Use > to select which columns should be available in the XProtect Smart Client's *Alarm List*. Use < to clear selection. When done, **Selected columns** should contain the items to be included.

Reasons for Closing tab

Name	Description
Enable	Select to enable that all alarms must be assigned a reason for closing before they can be closed.
Reason	Add reasons for closing that the user can choose between when closing alarms. Examples could be *Solved-Trespasser* or *False Alarm*. You can create as many as you like.

Sound Settings (Alarms node)

When you configure sound settings, specify the following:

Name	Description
Sounds	Select the sound to be associated with the alarm. The list of sounds contains a number of default Windows sounds. You can also add new sounds (.wav or .mp3).
Add	Add sounds. Browse the sound file and upload one or several .wav or .mp3 files.
Remove	Remove a selected sound from the list of manually added sounds. Default sounds cannot be removed.
Test	Test the sound. In the list, select the sound. The sound plays once.

Federated site properties

This section describes the **General** tab and the **Parent Site** tab.

General tab

You can change some of the information related to the site that you are currently logged in to.

Name	Description
Name	Enter the name of the site.
Description	Enter a site description.
URLs	Use the list to add and remove URL(s) for this site and indicate if they are external or not. External addresses can be reached from outside the local network.
Version	The version number of the site's management server.
Service account	The service account under which the management server is running.
Time for last synchronization	Time and date of the last synchronization of the hierarchy.
Status for last synchronization	The status of the last synchronization of the hierarchy. It can be either **Successful** or **Failed**.

Parent Site tab

This tab shows information about the parent site of the site that you are currently logged in to. The tab is not visible if your site has no parent site.

Name	Description
Name	Shows the name of the parent site.
Description	Shows a description of the parent site (optional).
URLs	Lists URL(s) for the parent site and indicates if they are external or not. External addresses can be reached from outside the local network.
Version	The version number of the site's management server.
Service account	The service account under which the management server is running.
Time for last synchronization	Time and date of the last synchronization of the hierarchy.
Status for last synchronization	The status of the last synchronization of the hierarchy. It can be either **Successful** or **Failed**.

Husky IVO System Health (Node)

The node displays system health data from all Husky IVO units that have successfully connected to XProtect Management Client, listing their machine names and the overall status of each unit.

Select a unit name in the node to display key system health statistics for that unit in a new page.

Only system health data from Husky IVO units can be displayed in the node.

The Husky IVO System Health node is only accessible after the Husky IVO System Health plug-in has been installed on the XProtect Management Client machine.

Husky IVO System Health is currently released as a beta version. The appearance and function of the final version may differ from the beta version.

System health status indicators

The general status indicators displayed on the node are:

- **All is fine**: No discovered issues to report.
- **Needs Attention**: One or more issues have been detected that require your attention.
- **Missing Data**: The status cannot be reported due to insufficient data.

Refreshing the system health data

The system health data will automatically be updated at fixed 5-minute intervals and cannot be manually refreshed.

For more information, see Husky IVO System Health

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/.