Analytics Service for Milestone XProtect VMS

Bosch Video IP

BOSCH

en Quick Installation Guide

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1 Installation

1.1 Overview

The Bosch Analytics Service for Milestone XProtect acts as a software bridge between the Bosch Analytics Events, generated on a Bosch camera and Milestone XProtect. Generally, the Bosch events are transformed into Milestone Analytics Events that are available in the Milestone rule or alarm engine.

The software creates Milestone Analytics Events as described in the Milestone MIP SDK Documentation, based on a configuration that is managed through the Milestone Management Client.

More detailed information on the data layout and the software architecture is given in the course of the document.

1.2 Prerequisites

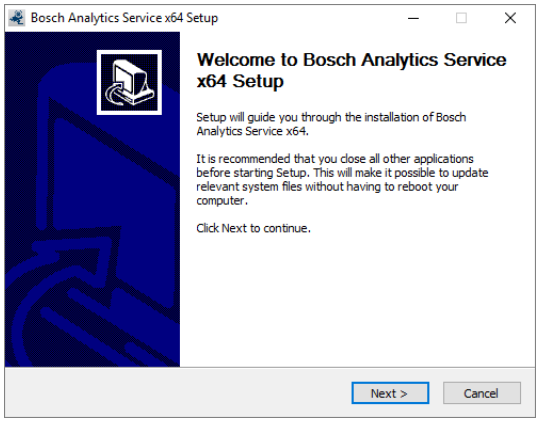
- Operating system: Windows 7, Windows 8, Windows 8.1, or Windows 10
- Milestone VMS: XProtect 2017R1 or above with metadata support
- A Bosch analytics camera (with firmware version 6.32 or above) connected to the Milestone XProtect VMS Product

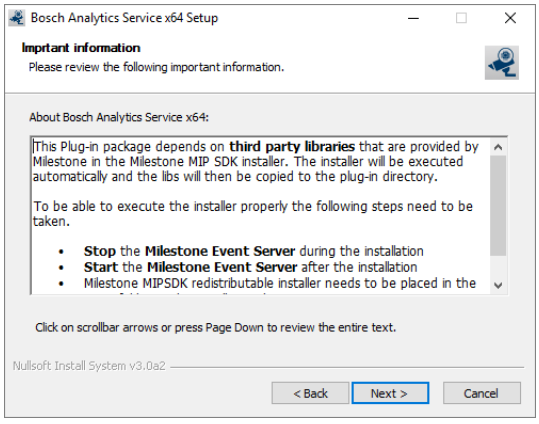
1.3 Installation procedure

The current version of the installer can be downloaded from the website **https://ipp.boschsecurity.com/**.

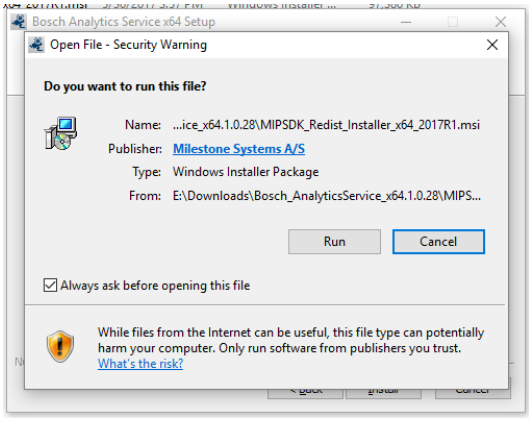
A Milestone installer that provides the necessary framework libraries, is placed in the download package, along with the Bosch installer exe.

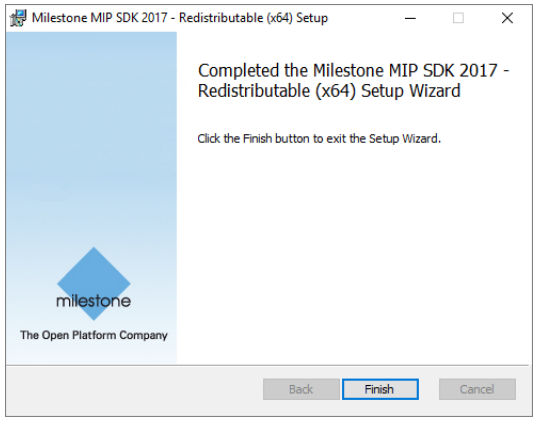
1. After extracting the download package double-click on the **Bosch_AnalyticService_x64_1.0.exe** file to start the installation.
2. Follow the instructions of the setup wizard.



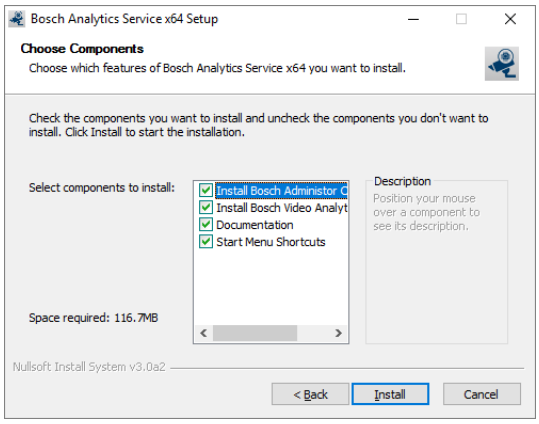


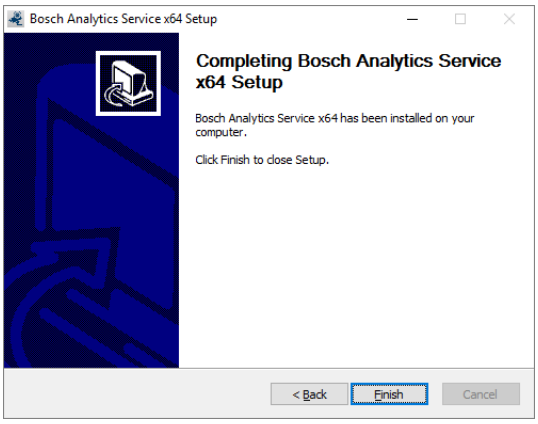
During the installation, the Milestone installer will be executed.





After installing the Milestone components, the Bosch installer is finishing the installation.





When the installation is complete, the plug-in files are installed in the default plug-in directory

– for the 64-bit XProtect Smart Client:
  C:\Program Files\VideoOS\MIPPlugins\BoschAnalyticsService(x64)

The plug-in will now be available in the Milestone XProtect Administration Client. The **User Guide** and the **EULA** can be accessed via the start menu, in case this option was selected during the installation process.

2 Software components

Several software components act together to form the Bosch Analytics Service plug-in. The involved software components are:

- Bosch plug-in for the Milestone XProtect Administration client
- Bosch plug-in for the Milestone XProtect Event server
- BoschVideoAnalyticsService
  (background process that is controlled by the Event server plug-in)

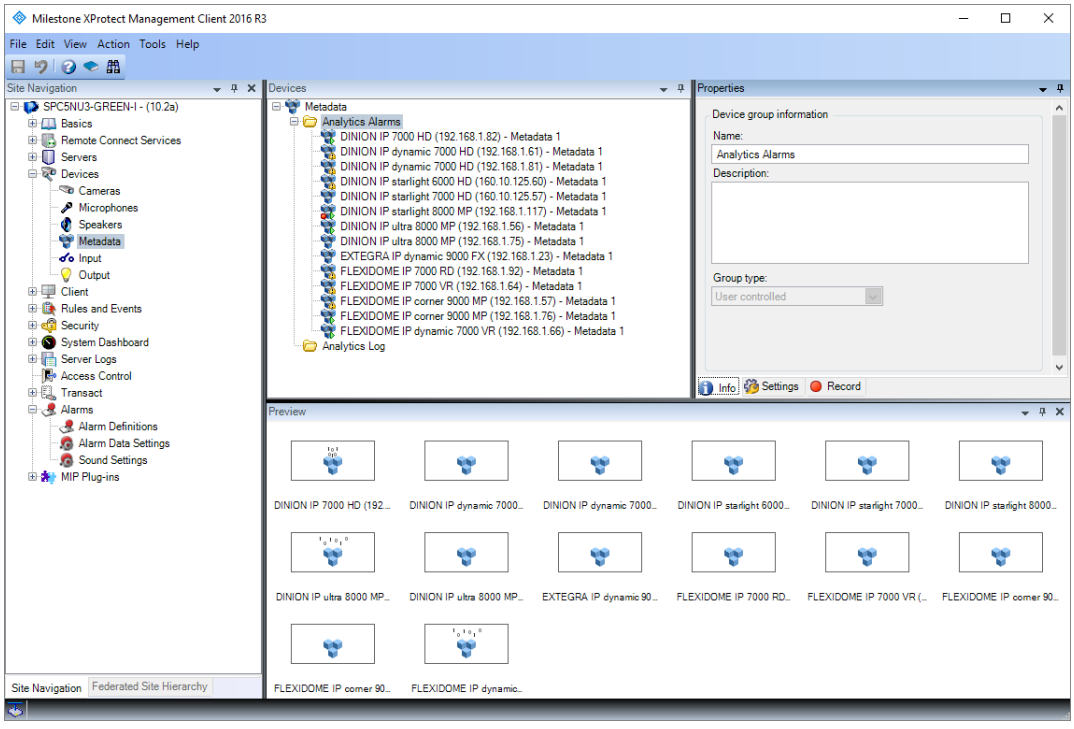
A detailed description of the software context is given in the next chapter.

2.1 Administration client

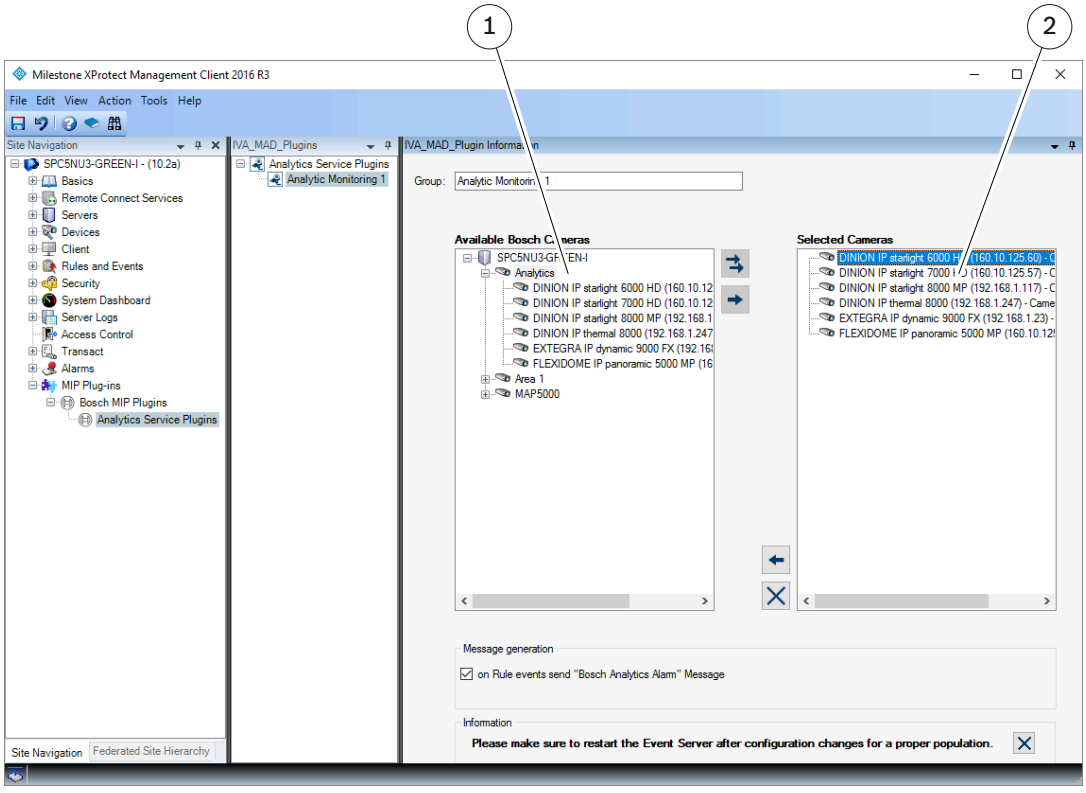
The service is configured via the administrator plug-in, which is located in the **MIP Plug-ins** node in the Administration client, however a basic Milestone XProtect setup needs to be done a priori, and the metadata channel that is offered by the Milestone driver needs to be activated for the cameras that are supposed to be monitored by the plug-in.

Note:

The camera needs to run in either **Essential Video Analytics** mode or in **Intelligent Video Analytics** mode.



After the general metadata availability, the plug-in needs to be configured.



It is possible to create more than one Analytic Service plug-in instance to be able to group cameras that are processed functionality-wise.

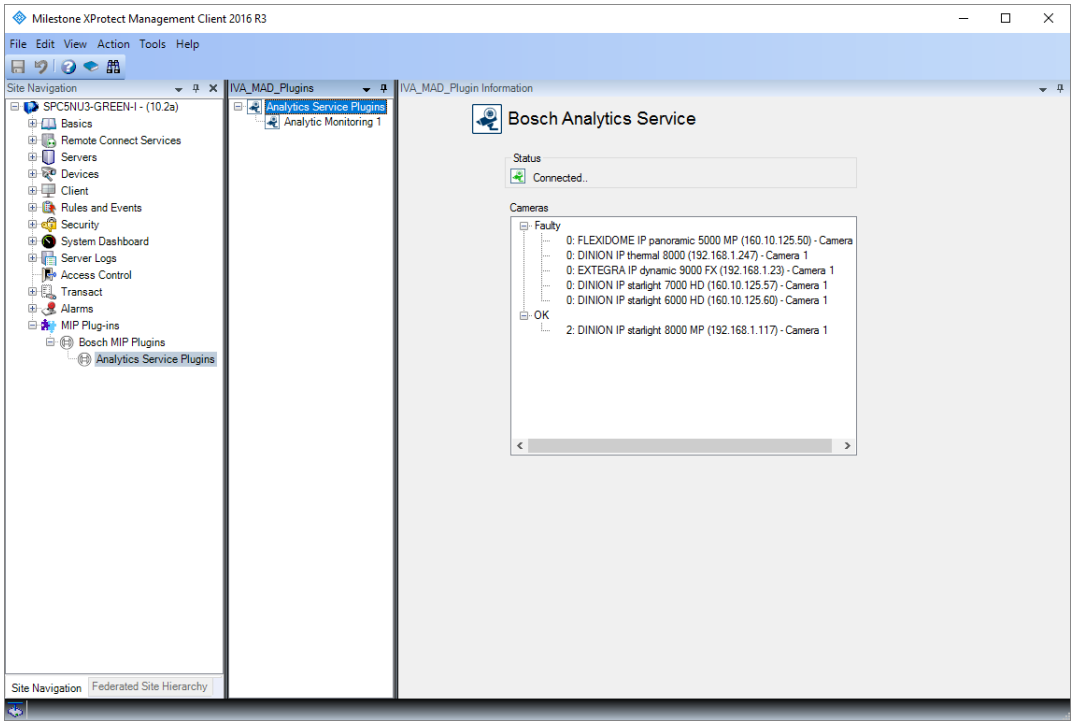
The available Bosch cameras are accessible via the left tree-view (1) and the monitored cameras are displayed in the tree-view on the right side (2).

Note:

After a configuration change the settings need to be saved in Milestone and the Milestone Event server needs to be restarted manually.

2.2 Analytics Service

The Bosch Analytics Service is executed as a background application that consumes the Bosch metadata stream and creates the actual Milestone analytic events. It is started and stopped with the Milestone Event server process. Its status can be monitored in the Milestone XProtect Administration client as shown below.



The monitoring page shows cameras with an error in the **Faulty** section and cameras that are working properly in the **OK** section. The camera name is preceded by the number of generated events, as depicted above.

The status entry gives feedback on the availability of the Analytics Service background process.

Note:

The service uses the current windows user and its credentials to log in to the Milestone XProtect Management server, which means that the windows user needs to be allowed to do so.

2.3 Event generation

The plug-in exposes a couple of events that can be consumed and utilized in the Milestone infrastructure. Milestone Analytics events are used in the core functionality of the plug-in.

2.3.1 Analytics event

A detailed description of the generated analytics events can be found in the next chapter. This information can be used for further 3rd party integrations. The event names are:

– **Bosch Analytics Alarm**
generated in case a Bosch analytic event is detected in the metadata stream, if configured in the XProtect Management Client as previously described.

2.3.2 General events

The general Milestone events are:

– **No metadata available**
generated in case a camera did not receive metadata.

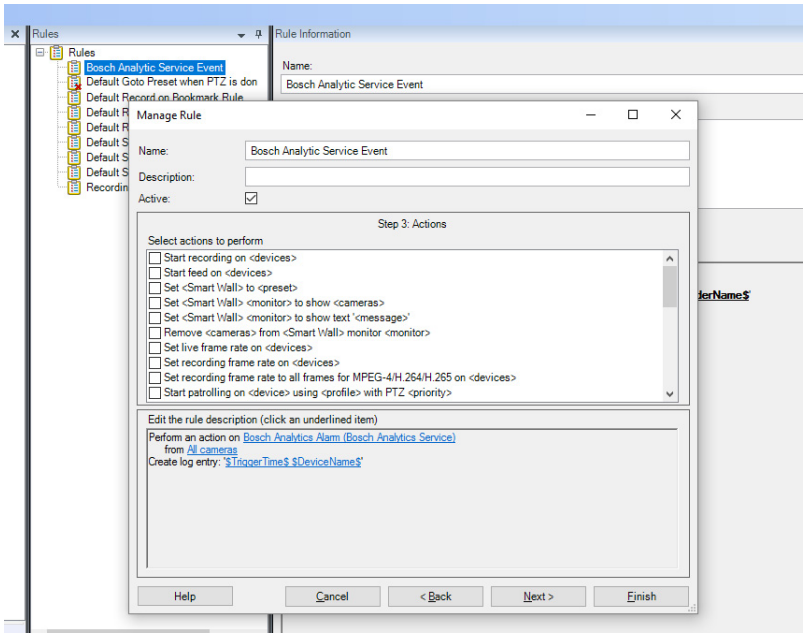
– **Camera malfunction**
generated in case a camera is not reachable.

2.4 Event handling in Milestone XProtect

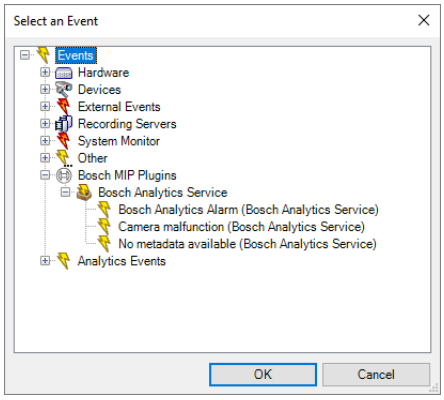
The plug-in events are available in the Milestone Event system and hence are usable in the Rule engine as well as in the Alarm engine. The following sections will briefly show the mode of operation.

2.4.1 Rule engine

Milestone rules can be created based on the Bosch Analytic Service messages. A typical rule setup is shown below.



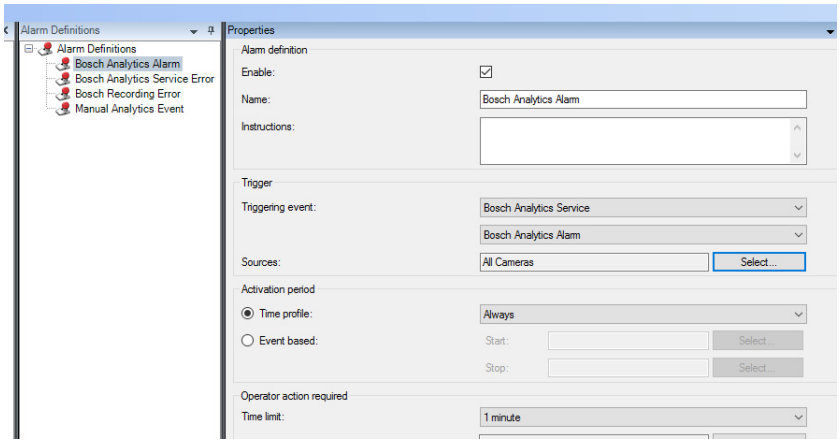
The exposed events can be accessed through the trigger **Event** wizard and are to be found under **Bosch MIP Plugins** / **Bosch Analytics Service**.



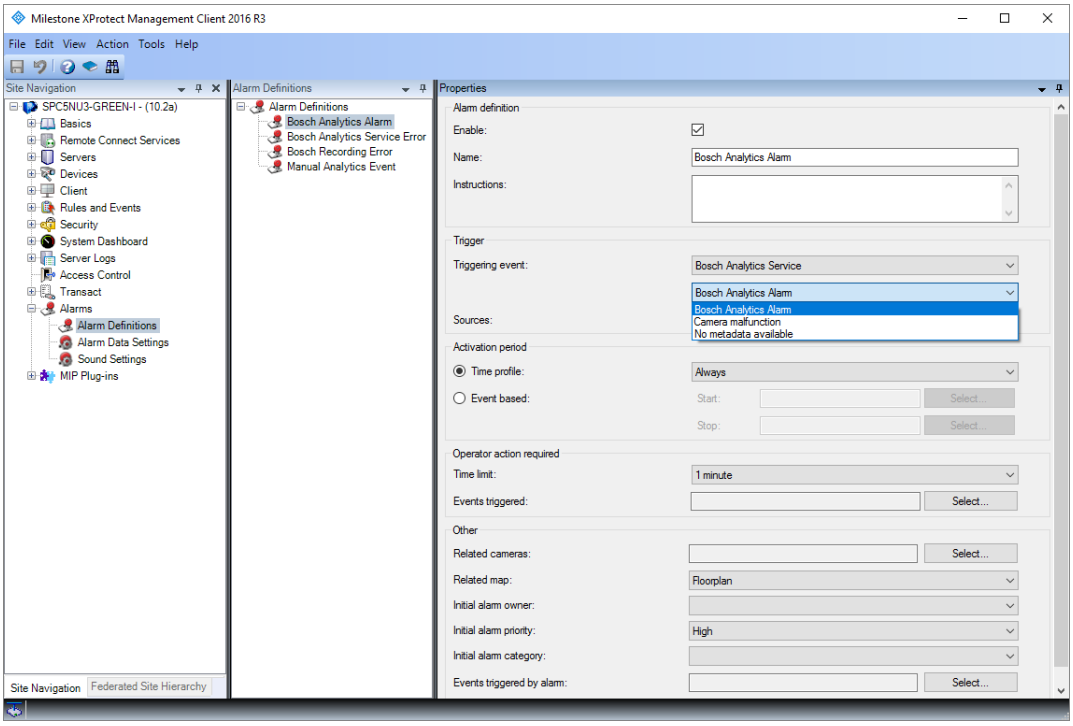
2.4.2 Alarm definition

It is also possible to define specific alarms based on Bosch Video Analytic events, that are generated by the plug-in.

A new alarm definition needs to be created as shown below.

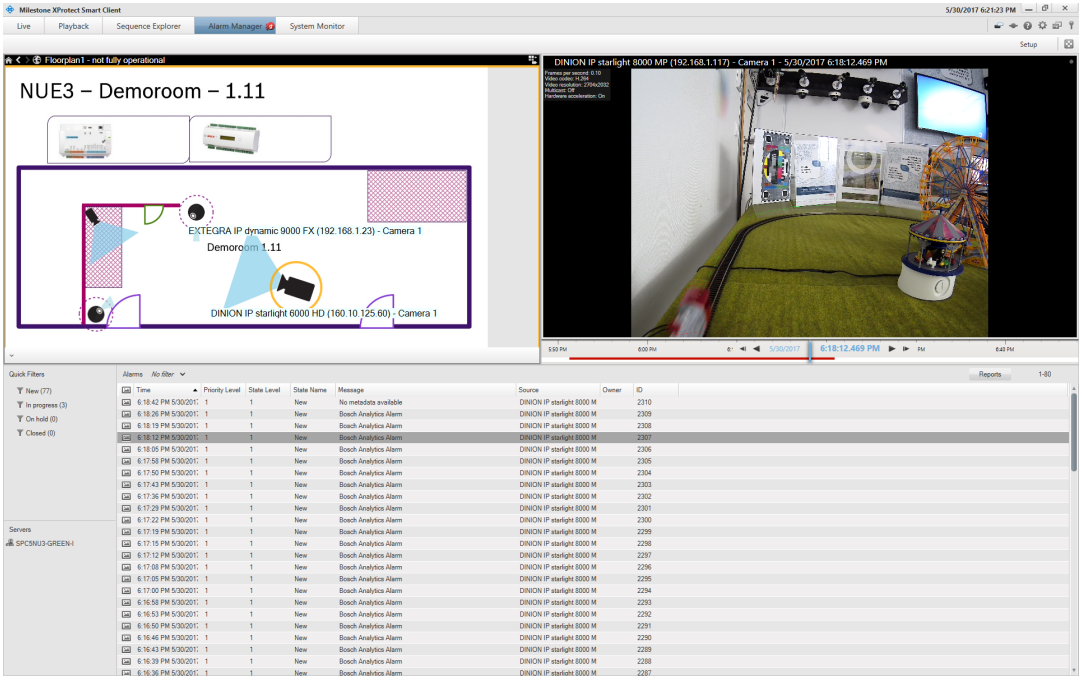


The triggering events are found in the **Bosch Analytics Service** / **Triggering event** entry.



2.4.3 Alarm Manager

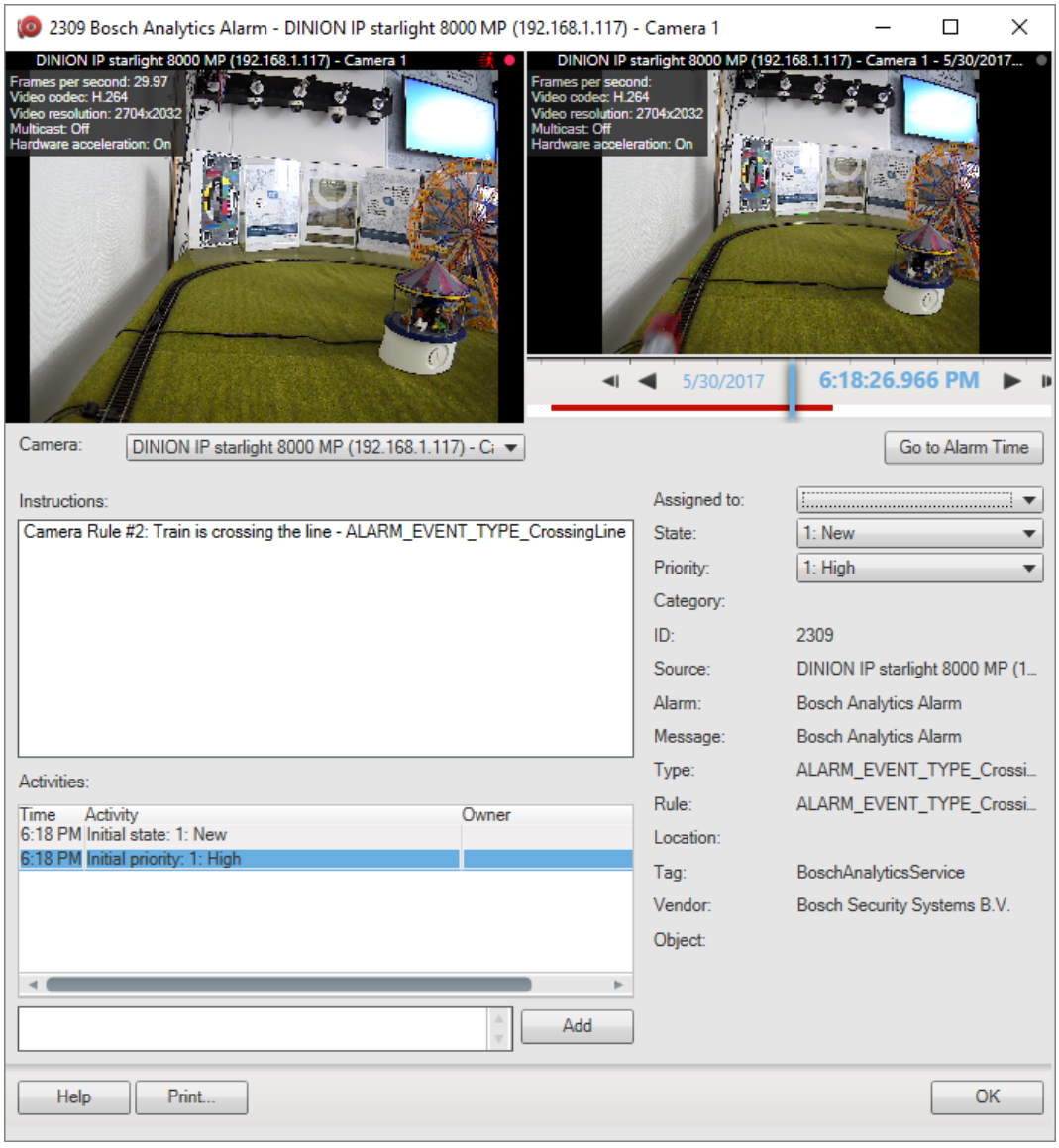
Milestone XProtect alarms are visualized in the Smart Client's **Alarm Manager** tab.



The Bosch Analytics Service generates Milestone Analytics events which provides the possibility to add additional metadata associated with the triggering event.

Double clicking on the alarm entry opens the detailed alarm view as shown below.

The Bosch rule name and the rule type are encoded in the event data, as well as the triggered rule number on the Bosch camera.

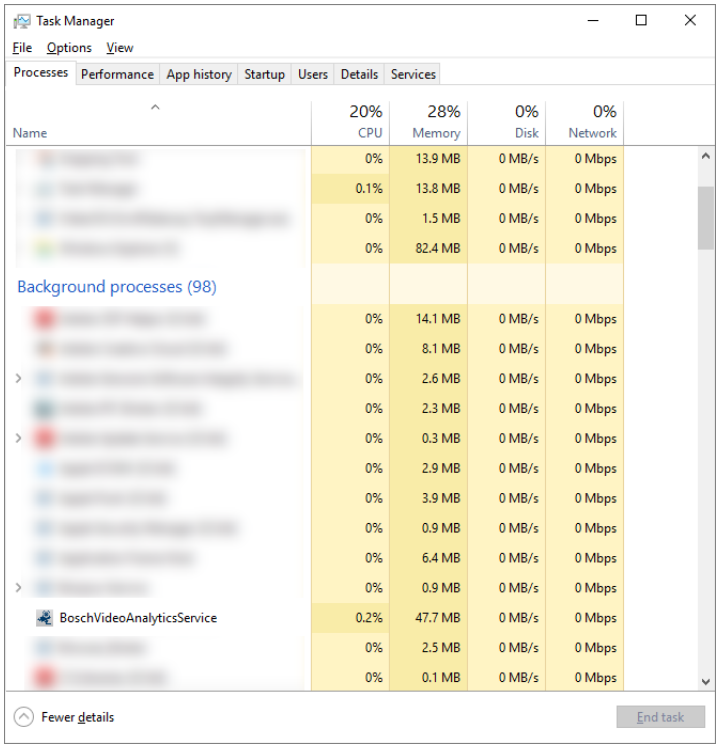


The alarm recording contains the overlayed object shape (solid red) and trajectory (solid green) as shown below.

2.5 Troubleshooting

2.5.1 Background application

Basic parameters of the background application can be monitored via Windows standard tools like the task manager or the performance monitor.



2.5.2 Logging

In addition to the Milestone MIP logging, which is available through the Milestone Event Server Management Application, further logs for troubleshooting can be enabled by creating the following Windows folder:

C:\DebugBoschAnalyticService

Logging is automatically activated if this folder exists, and turned off in case the folder is no longer available.

It is not recommended to use this folder for regular operation.

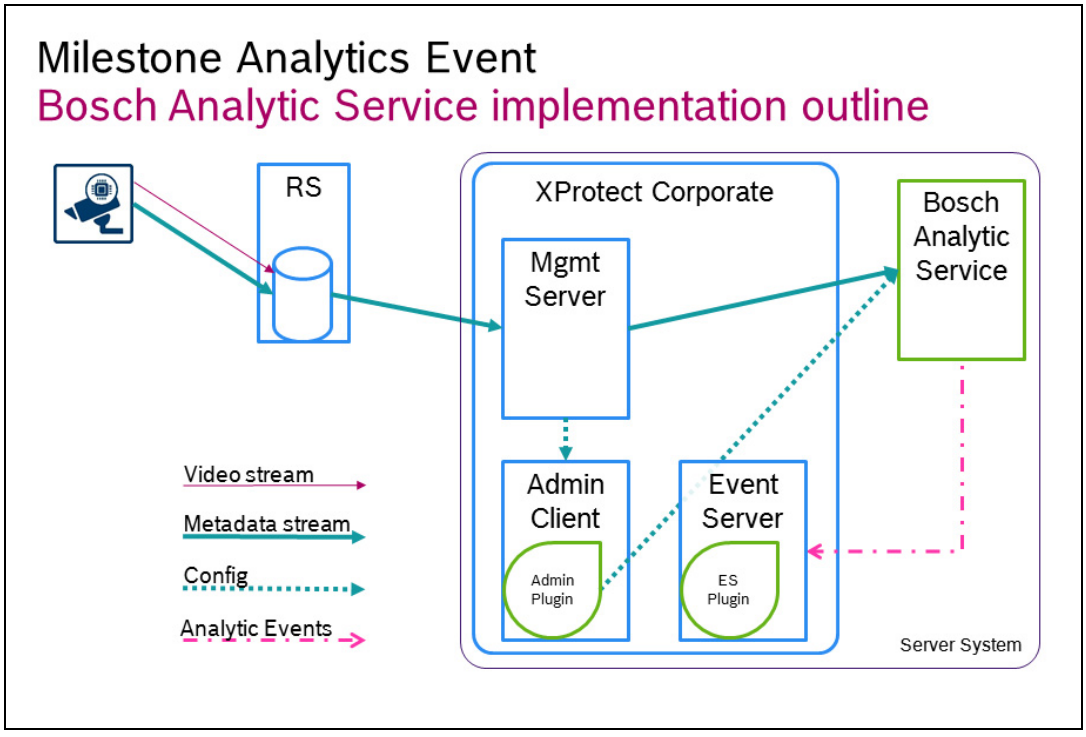
3 Integration Architecture

3.1 Software context

The Bosch Analytic Service consist 3 software components:

- **XProtect Administration Client plug-in**
  User control to setup the monitoring service, which allows to select the cameras that are supposed to generate the Analytics Events and it also allows to setup the service's behavior when detecting a Bosch event.
- **XProtect Event Server plug-in**
  Provides a list of available messages from the service into the Milestone rule-and alarm-engine in the Administrator client.
- **Bosch Analytics Service**
  Controls the metadata stream reception and parses the Bosch metadata stream to finally create the Milestone Analytic Event, which is then sent to the Event Server.

The image below depicts the above mentioned context.



3.2 Integration data structure

The generated Analytics Events implement the properties as defined below. A definition of the data structure can be found in the MIP documentation.

3.2.1 Data.AnalyticsEvent

Type	Property	Bosch Analytics Service
string	Description	`"Camera Rule #" + ruleNumber + ": " + ruleName + " - " + ruleType *`
AnalyticsObjectList	ObjectList	Used if a triggering object is available; see *AnalyticsObject* properties below
RuleList	RuleList	List of the configured Rule; see *Rule* class
Vendor	Vendor	**Name** is `"Bosch Security Systems B.V."`

* as configured on the camera

3.2.2 Data.EventHeader

Type	Property	Bosch Analytics Service
string	Class	`"Analytics"`
string	CustomTag	`"BoschAnalyticsService"`
System.DateTime	ExpireTimestamp	DateTime.MinValue
System.Guid	ID	Generated during runtime.
string	Message	`"Bosch Analytics Alarm"`
System.Guid	MessageId	Unique GUID generated during plug-in creation
string	Name	Rule name, as configured on the camera
EventSource	Source	**FQID** of the triggering camera and **Name** of the triggering camera
System.DateTime	Timestamp	Alarm event generation Timestamp
string	Type	`"Line crossing", "Object in field", "Loitering"` … see definition in the following section
string	Version	`"1.0"`

3.2.3 Data.Rule

Type	Property	Bosch Analytics Service
System.Guid	ID	Generated at runtime
string	Name	Rule name, as configured on the camera
string	Type	Same as the type in *Data.Event.Header*

3.2.4 Data.AnalyticsObject

Type	Property	Bosch Analytics Service
bool	AlarmTrigger	`"Yes"` as currently only triggering objects are transmitted
Data.ObjectMotion	Motion	**Speed** and **SpeedUnit** is used in case the camera is calibrated and provides ‘speed’ information. **Path** is used for the object’s trajectory
Data.TPolygon	Polygon	Object shape

3.3 Available strings

3.3.1 Data.AnalyticsEvent.Description

```
"Camera Rule #" + ruleNumber + ": " + ruleName + " - " +  ruleType
```

3.3.2 Data.EventHeader.Message

```
"Bosch Analytics Alarm"

"Camera malfunction"

"No metadata available"
```

3.3.3 Data.EventHeader.Type || Date.Rule.Type

```
"unknown";

"ALARM_EVENT_TYPE_VCA";

"ALARM_EVENT_TYPE_GlobalChange";

"ALARM_EVENT_TYPE_SignalTooBright";

"ALARM_EVENT_TYPE_SignalTooDark";

"ALARM_EVENT_TYPE_SignalTooNoisy";

"ALARM_EVENT_TYPE_SignalTooBlurry";

"ALARM_EVENT_TYPE_SignalLoss";

"ALARM_EVENT_TYPE_ReferenceImageCheckFailed";

"ALARM_EVENT_TYPE_InvalidConfiguration";

"ALARM_EVENT_TYPE_ObjectInField";

"ALARM_EVENT_TYPE_CrossingLine";

"ALARM_EVENT_TYPE_Loitering";

"ALARM_EVENT_TYPE_ConditionChange";

"ALARM_EVENT_TYPE_FollowingRoute";

"ALARM_EVENT_TYPE_Tampering";

"ALARM_EVENT_TYPE_RemovedObject";
```

```
"ALARM_EVENT_TYPE_IdleObject";

"ALARM_EVENT_TYPE_EnteringField";

"ALARM_EVENT_TYPE_LeavingField";

"ALARM_EVENT_TYPE_SimilaritySearch";

"ALARM_EVENT_TYPE_CrowdDetection";

"ALARM_EVENT_TYPE_FlowInField";

"ALARM_EVENT_TYPE_CounterFlowInField";

"ALARM_EVENT_TYPE_MotionInField";
```

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