ORBNET
SYSTEMS

Streaming Engine
Milestone XProtect

Installation, Setup, and User guide

Table of Contents

Prerequisites

Software and Licensing

Microsoft System Requirements

- Microsoft® Windows® 10 Pro (64 bit)
- Microsoft® Windows® 10 Enterprise (64 bit)
- Microsoft® Windows® 10 Enterprise LTSB 2016 (version 1607 or later)
- Microsoft® Windows® 10 IoT Enterprise, version 1803 or later (64 bit), IoT Core

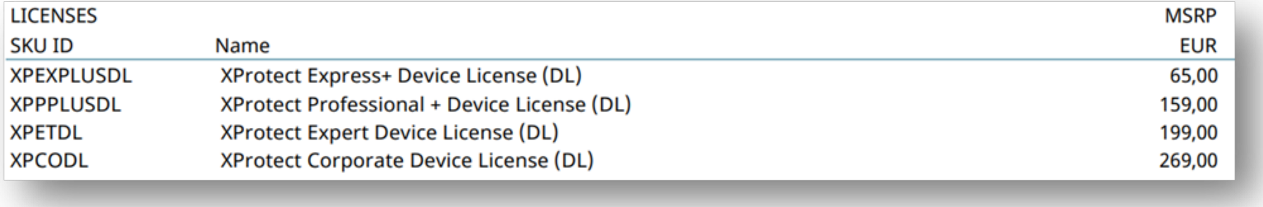
- Microsoft® Windows® Server 2016 (64 bit): Essentials, Standard and Datacenter
- Microsoft® Windows® Server 2019 (64 bit): Essentials, Standard and Datacenter

Milestone XProtect System Requirements

- XProtect Essential+, Express+, Professional+, Expert, Corporate 2021 R1 (21.1a) or above

- Milestone Event Server
    - The Event Server is included as part of you Milestone installation. ***Note*** ***If this component has not been installed with your version follow the steps found in troubleshooting at the end of this document.***

- Milestone Device Licenses applied to your XProtect base license.
    - Each video device attached to Milestone will require a device license to provide access to the Streaming Engine.
    - The Streaming Engine only connects to devices added to Milestone.



LICENSES		MSRP
SKU ID	Name	EUR
XPEXPLUSDL	XProtect Express+ Device License (DL)	65,00
XPPPLUSDL	XProtect Professional + Device License (DL)	159,00
XPETDL	XProtect Expert Device License (DL)	199,00
XPCODL	XProtect Corporate Device License (DL)	269,00

ORBNET Systems

- License –
  - When you first install the Stream Engine you will get a 30-day trial license, following this you will need to update to a paid license.
  - From the website ORBNET Systems - ORBNET Streaming Engine select “ORDER NOW!”

- Installer – ‘`ORBNET Streaming Engine Service Setup.msi`’

  Available to download from https://orbnetsys.com/ Register once registered and signed into the website ORBNET Systems - ORBNET Streaming Engine

- Installer – ‘`ORBNET Streaming Engine Plugins Setup.msi`’

  Available to download from https://orbnetsys.com/ Register once registered and signed into the website ORBNET Systems - ORBNET Streaming Engine

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Microsoft and Windows are registered trademarks of Microsoft Corporation.

This document contains other trademarks which belong to their respective owners.

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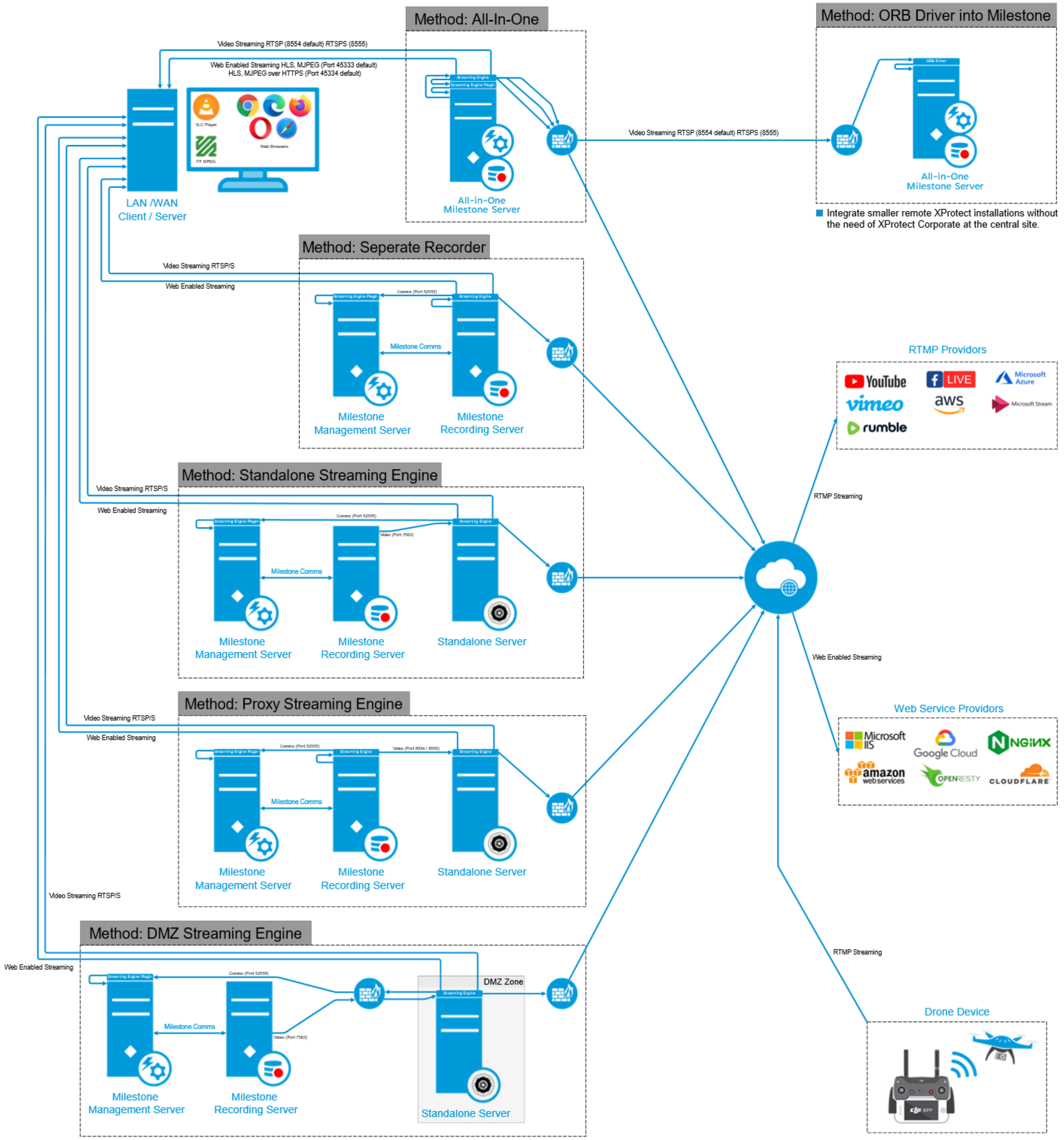
Information provided herein does not constitute any kind of warranty, and any risk resulting from its use rests with the recipient.

Adjustments may be made without prior notification by ORBNET Systems.

In this text, all names and organizations referenced in examples are fictitious.

Software Schematic with Installation Methods



- Integrate smaller remote XProtect installations without the need of XProtect Corporate at the central site.

Installation Methods Guide

Method: All-In-One

Where the Milestone XProtect Management, Recording and Event services reside on the same server.

Both installers are to be installed on this one server.

- 'ORBNET Streaming Engine Plugins Setup.msi'
- 'ORBNET Streaming Engine Service Setup.msi'

External connections to the Streaming Engine are made to the all-in-one Milestone server address.

If connecting from a XProtect Management Client elsewhere on the LAN the 'ORBNET Streaming Engine Plugins Setup.msi' will be needed to access the Streaming Engine settings.

Method: Separate Recorder

Where the XProtect Management and Event service are on one server and the XProtect Recording service is on a sperate server.

Server with XProtect Management and Event service, install.

- 'ORBNET Streaming Engine Plugins Setup.msi'

Server with XProtect Recording service, install.

- 'ORBNET Streaming Engine Service Setup.msi'

External connections to the Streaming Engine are made to the Milestone Recording server address.

If connecting from a XProtect Management Client elsewhere on the LAN the 'ORBNET Streaming Engine Plugins Setup.msi' will be needed to access the Streaming Engine settings.

Method: Standalone Streaming Engine

Where the XProtect Management and Event service are on one server and or XProtect Recording service is on a sperate server. Where the Streaming Engine is to be run from a dedicated separate machine.

Server with XProtect Management and Event service, install.

- 'ORBNET Streaming Engine Plugins Setup.msi'

Server dedicated to Streaming Engine, install.

- 'ORBNET Streaming Engine Service Setup.msi'

External connections to the Streaming Engine are made to the Streaming Engine server address.

If connecting from a XProtect Management Client elsewhere on the LAN the 'ORBNET Streaming Engine Plugins Setup.msi' will be needed to access the Streaming Engine settings.

Method: Proxy Streaming Engine

Where the XProtect Management and Event service are on one server and or XProtect Recording service is on a sperate server and connections are to be hidden. Where the Streaming Engine is to be run from a dedicated separate machine and used to hide where the video originates from. Used to publish content on another subnet or online.

Server with XProtect Management and Event service, install.

- 'ORBNET Streaming Engine Plugins Setup.msi'

Server with XProtect Recording service, install.

- 'ORBNET Streaming Engine Service Setup.msi'

Server dedicated to Streaming Engine, install.

- 'ORBNET Streaming Engine Service Setup.msi'

External connections to the Streaming Engine are made to the dedicated Streaming Engine server address. These connections pass through the first Streaming Engine, located on the Recording server and hide the video source. This can be done through multiple Streaming Engines.

If connecting from a XProtect Management Client elsewhere on the LAN the 'ORBNET Streaming Engine Plugins Setup.msi' will be needed to access the Streaming Engine settings.

Method: DMZ Streaming Engine

Where the XProtect Management and Event service are on one server and or XProtect Recording service is on a separate server. Where the Streaming Engine is to be run from a dedicated separate machine that resides in the demilitarized zone (DMZ). Mostly used for publishing content to a website or to the internet.

Server with XProtect Management and Event service, install.

- 'ORBNET Streaming Engine Plugins Setup.msi'

Server dedicated to Streaming Engine in the DMZ, install.

- 'ORBNET Streaming Engine Service Setup.msi'

External connections to the Streaming Engine are made to the Streaming Engine server address or public IP address.

If connecting from a XProtect Management Client elsewhere on the LAN the 'ORBNET Streaming Engine Plugins Setup.msi' will be needed to access the Streaming Engine settings.

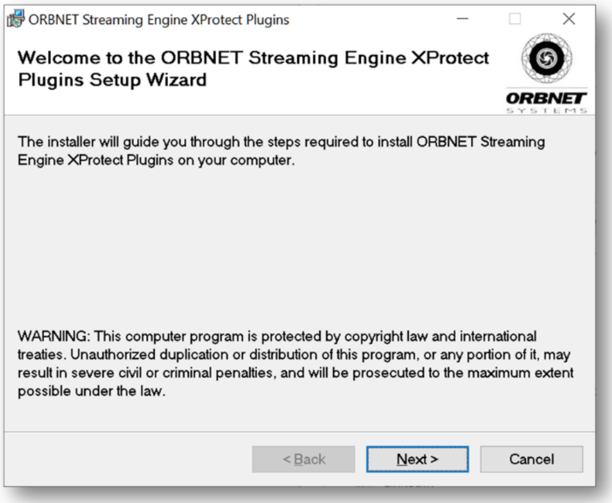
Method: Other Methods

These are not the only methods of installing the Streaming Engine application. If you wish to discuss further your project or intended solution, please email (support@orbnetsys.com). We can propose a design method to best work with Milestone XProtect and your intended solution.

Installation of Streaming Engine for Milestone XProtect

Begin with the server/machine running the Milestone XProtect Management, Event services and any machines with a Management Client that will need access to Streaming Engine settings.

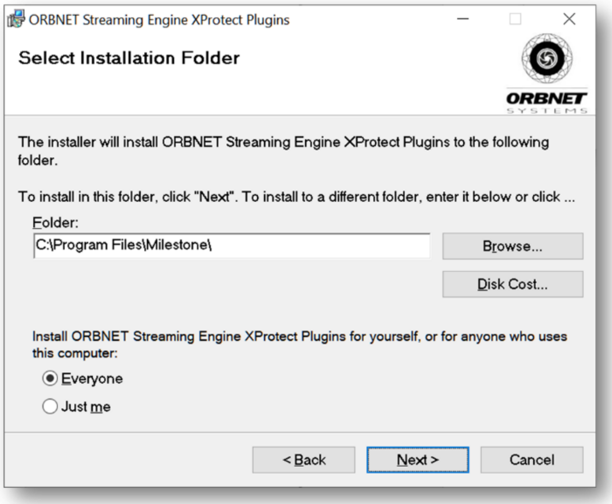
Run the ‘`ORBNET Streaming Engine Plugins Setup.msi`’



Welcome to the ORBNET Streaming Engine XProtect Plugins Setup Wizard

The installer will guide you through the steps required to install ORBNET Streaming Engine XProtect Plugins on your computer.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.



Select Installation Folder

The installer will install ORBNET Streaming Engine XProtect Plugins to the following folder.

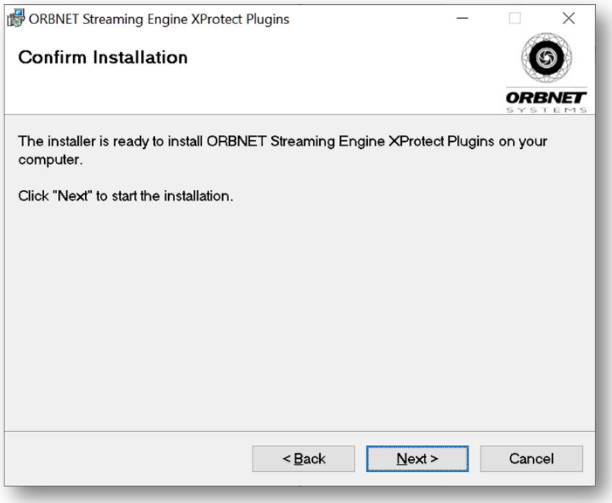
To install in this folder, click "Next". To install to a different folder, enter it below or click ...

Folder: C:\Program Files\Milestone\

Install ORBNET Streaming Engine XProtect Plugins for yourself, or for anyone who uses this computer:

● Everyone

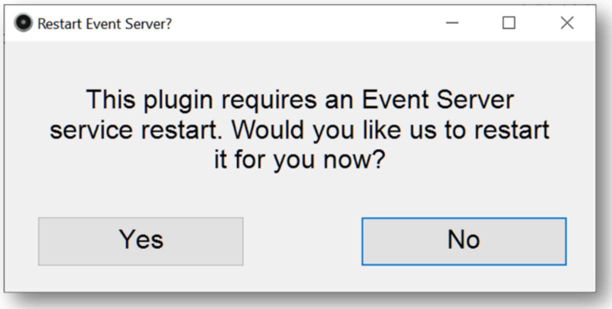
○ Just me



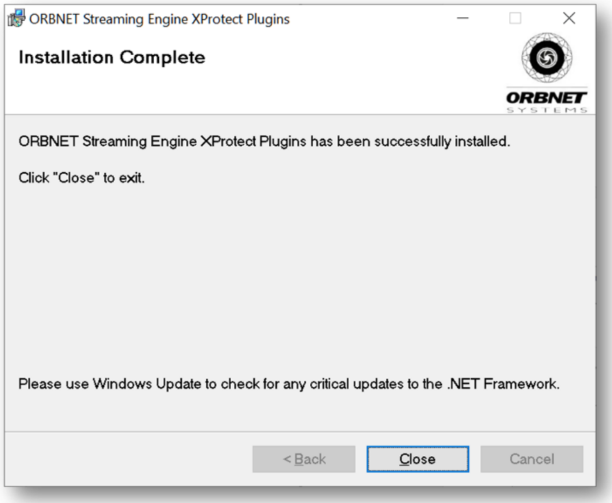
Confirm Installation

The installer is ready to install ORBNET Streaming Engine XProtect Plugins on your computer.

Click "Next" to start the installation.



This plugin requires an Event Server service restart. Would you like us to restart it for you now?



Installation Complete

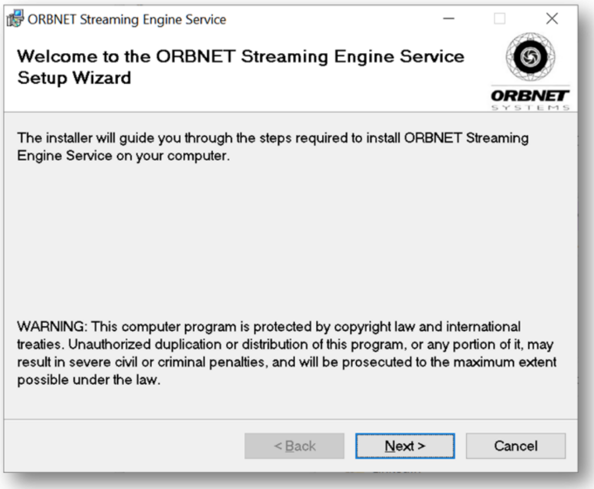
ORBNET Streaming Engine XProtect Plugins has been successfully installed.

Click "Close" to exit.

Please use Windows Update to check for any critical updates to the .NET Framework.

Follow with the server/machine selected to be used for the Streaming Engine service.

Run the ‘`ORBNET Streaming Engine Service Setup.msi`’

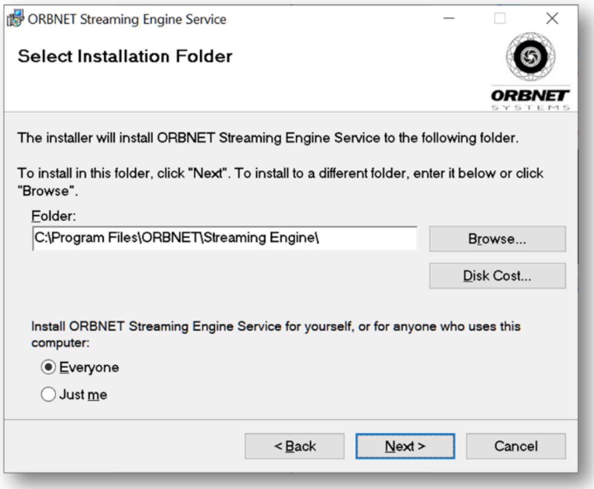


ORBNET Streaming Engine Service

Welcome to the ORBNET Streaming Engine Service Setup Wizard

The installer will guide you through the steps required to install ORBNET Streaming Engine Service on your computer.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.



ORBNET Streaming Engine Service

Select Installation Folder

The installer will install ORBNET Streaming Engine Service to the following folder.

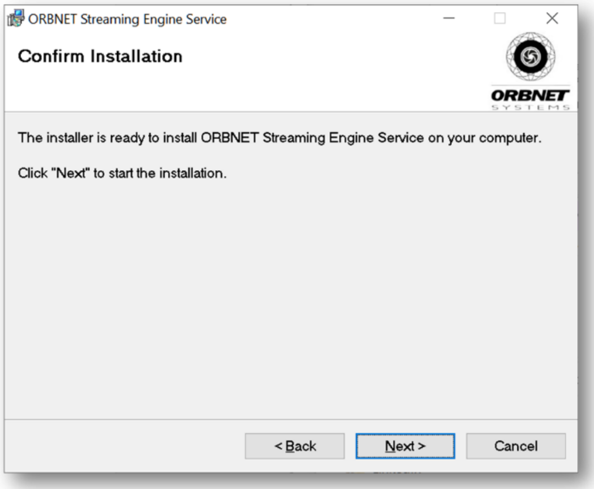
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".

Folder: C:\Program Files\ORBNET\Streaming Engine\

Install ORBNET Streaming Engine Service for yourself, or for anyone who uses this computer:

● Everyone

○ Just me

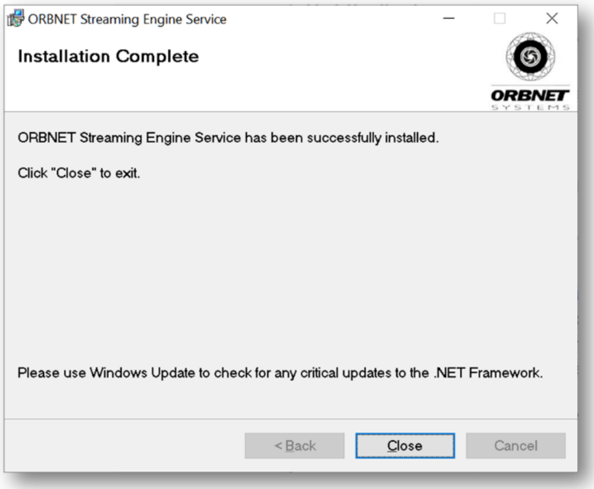


ORBNET Streaming Engine Service

Confirm Installation

The installer is ready to install ORBNET Streaming Engine Service on your computer.

Click "Next" to start the installation.



ORBNET Streaming Engine Service

Installation Complete

ORBNET Streaming Engine Service has been successfully installed.

Click "Close" to exit.

Please use Windows Update to check for any critical updates to the .NET Framework.

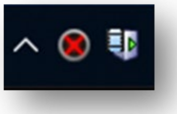
Initial connection to Milestone

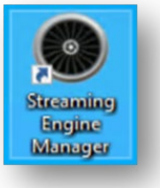
Ensure you have either have a Milestone Basic account created or a Windows service account ready and assigned to a Security role in Milestone to be used for the Streaming engine service.

See **Basic User Setup** or **Changing a service account**

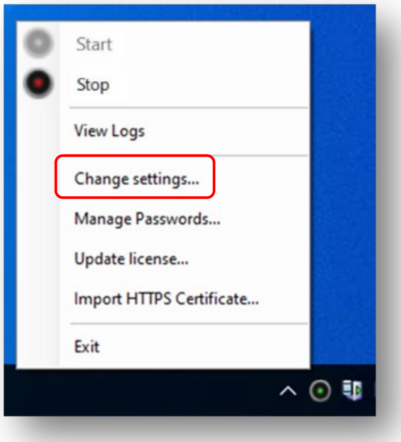
After installation the Streaming Engine service will not be connected to the Milestone XProtect system.

The Streaming Engine Manager will show in the taskbar with a red cross to indicate a problem. If the task icon is not showing, check that it is not hidden in the system tray or run from the desktop shortcut.

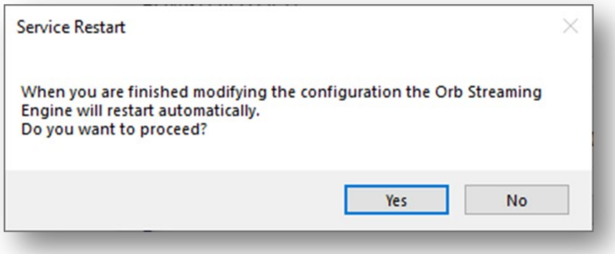




Right click the tray icon and select `Change settings…`



Service Restart confirmation, Click `Yes`



Service Restart

When you are finished modifying the configuration the Orb Streaming Engine will restart automatically.
Do you want to proceed?

From Streaming Engine Settings two Milestone user options are available.

1. Log in with service account credentials (See **Changing a service account** in this document)

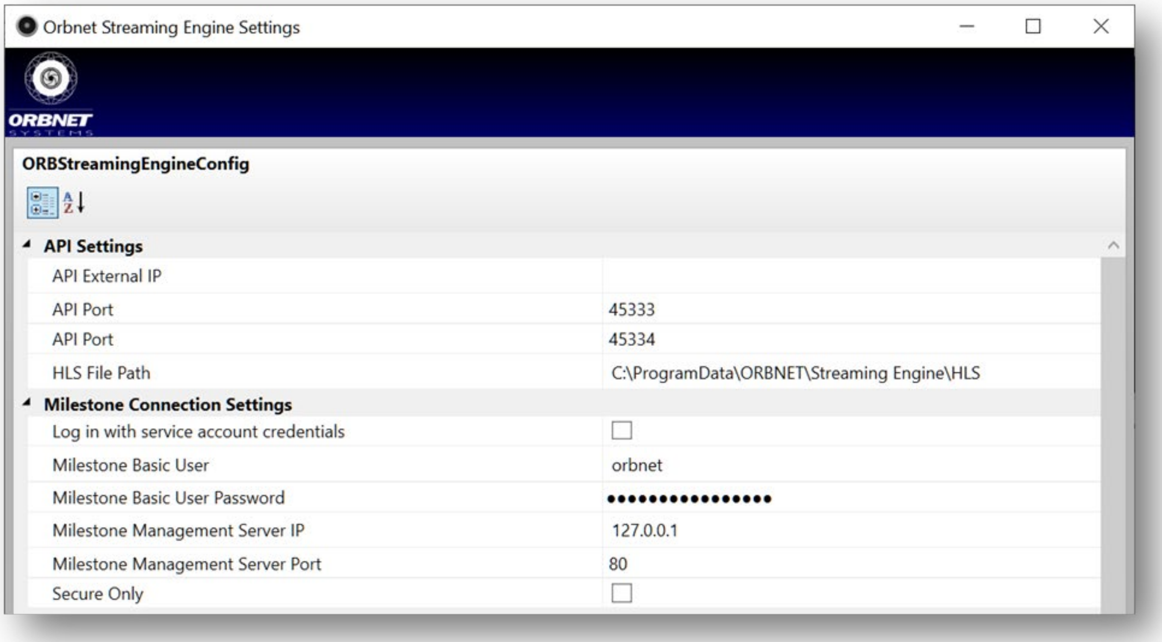
[Uses the windows account that is running the "ORBNET Streaming Engine" service to login to Milestone. If set to true, you must change the service user from "Network Service" to a domain service account of your choosing and add the service account to Milestone security roles.]

2. Milestone Basic User (See **Basic user setup** in this document)

[This is a uses a Milestone created basic user account, the account needs to be added to a relevant Milestone security role. Only works if "Log in with service account" is set to false.]

- Fill out the correct Milestone Management Server IP address and port.

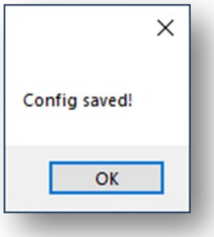
- Tick Secure Only if you have installed Milestone using a Management Server certificate.



ORBStreamingEngineConfig

API Settings	
API External IP	
API Port	45333
API Port	45334
HLS File Path	C:\ProgramData\ORBNET\Streaming Engine\HLS
Milestone Connection Settings	
Log in with service account credentials	□
Milestone Basic User	orbnet
Milestone Basic User Password	●●●●●●●●●●●●●●●●
Milestone Management Server IP	127.0.0.1
Milestone Management Server Port	80
Secure Only	□

Finish your configuration changes then exit with the close-window cross at the top right of this window. You will get a message "`Config saved!`"

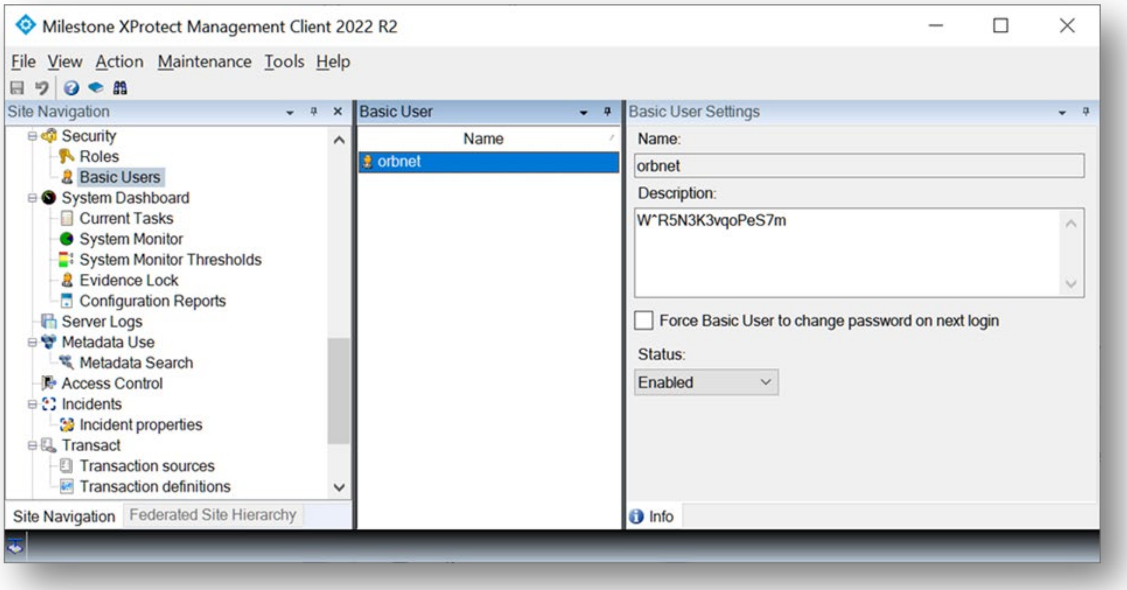


Config saved!

Basic User setup

Basic user: a dedicated VMS user account authenticated by a combination of username and password using a password policy. Basic users connect to the VMS using a secure socket layer (SSL) with current Transport Layer (TLS) security protocol session for login, encrypting the traffic contents and username and password.

Setup of a Basic user account is completed in the Milestone XProtect Management Application, under **`Security`** group then **`Basic Users.`** You can add a new user by right clicking **`Basic Users`** or the white space in the middle tile.



Name
orbnet

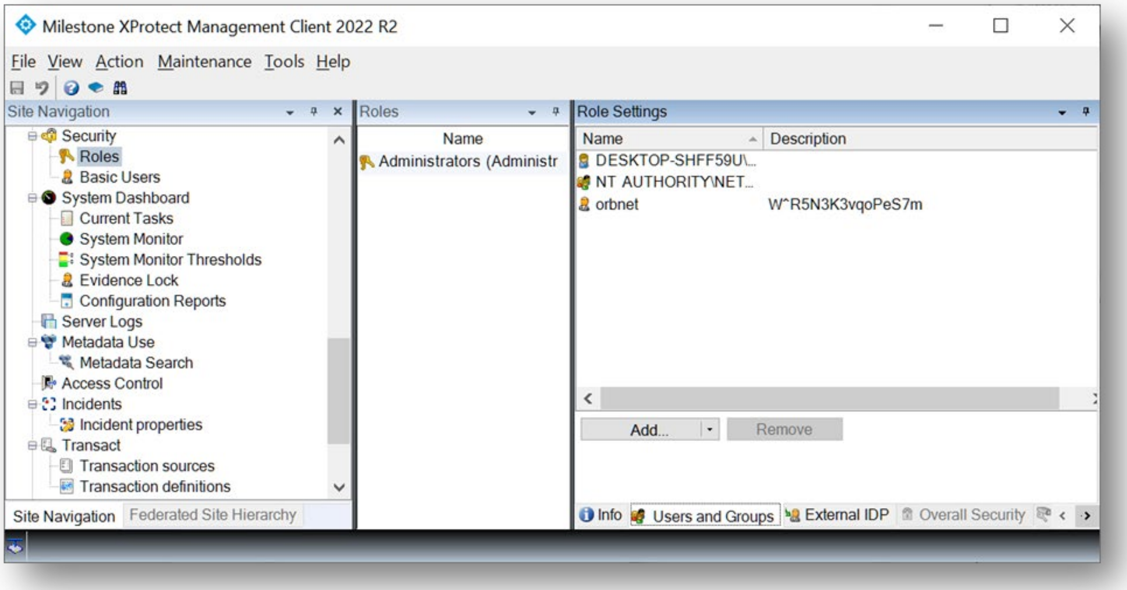
Name: orbnet

Description: W^R5N3K3vqoPeS7m

□ Force Basic User to change password on next login

Status: Enabled

Ensure this account is associated with a Role relevant to the access required for the Streaming Engine service *(i.e. Live access to any cameras that will be re-streamed)*



Name
Administrators (Administr

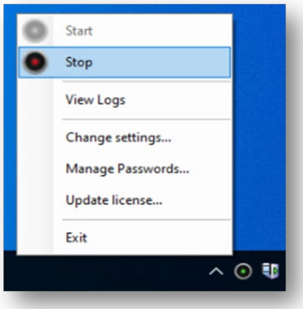
Name	Description
DESKTOP-SHFF59U\...	
NT AUTHORITY\NET...	
orbnet	W^R5N3K3vqoPeS7m

Changing to a service account

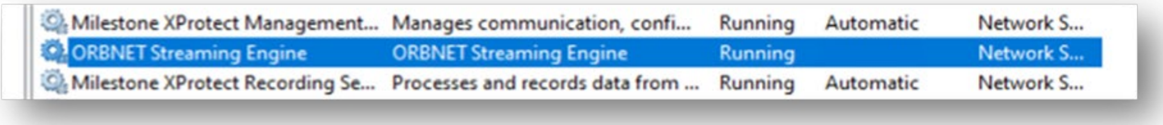
For installations that require the use of a local Windows service account or domain service account authentication, please update the Service Log On account used via Windows Services.

⚠ Please ensure the Milestone Management and Recording Service are already changed to a service account and this account has Administrator rights via the Milestone roles. It is also best to do this while in trial mode as the ORBNET license may need to have to be re-issued once changed. If the account is new for this machine, please ensure that the user has been logged into Windows.

Stop the Streaming Engine service first.

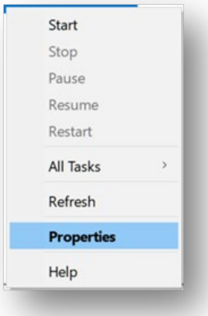


Navigate to Windows Services and locate ORBNET Streaming Engine.

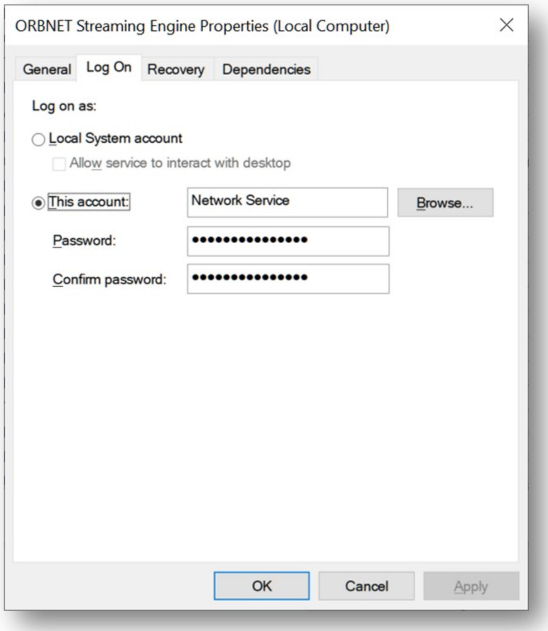


Milestone XProtect Management...	Manages communication, confi...	Running	Automatic	Network S...
ORBNET Streaming Engine	ORBNET Streaming Engine	Running		Network S...
Milestone XProtect Recording Se...	Processes and records data from ...	Running	Automatic	Network S...

Right click the service and select `Properties`, then navigate to the `Log On` tab. From here you will be able to update the account used by the service.



Click **Browse** and locate the relevant service account to be used for the Streaming Engine. In most cases this should be the same service account used for the Milestone services.



ORBNET Streaming Engine Properties (Local Computer)

Log on as:

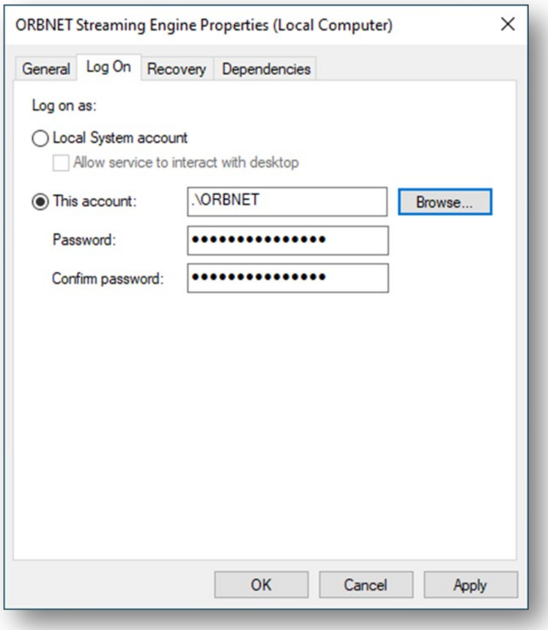
○ Local System account

□ Allow service to interact with desktop

● This account: Network Service

Password: •••••••••••••••

Confirm password: •••••••••••••••



ORBNET Streaming Engine Properties (Local Computer)

Log on as:

○ Local System account

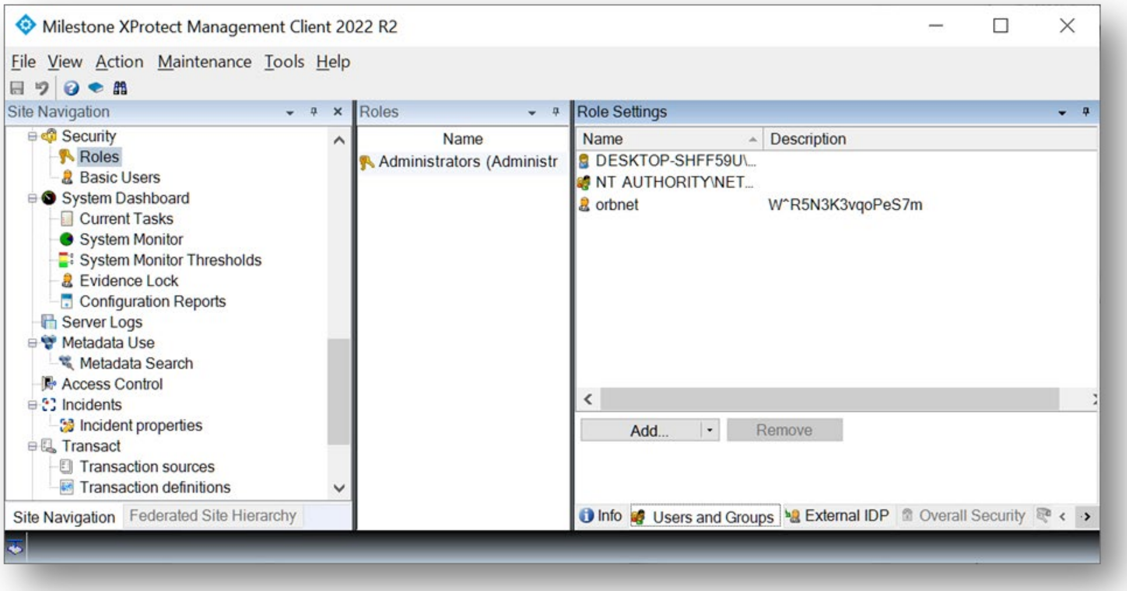
□ Allow service to interact with desktop

● This account: .\ORBNET

Password: •••••••••••••••

Confirm password: •••••••••••••••

Ensure this account is associated with a Role relevant to the access required for the Streaming Engine service *(i.e. Live access to any cameras that will be re-streamed)*.

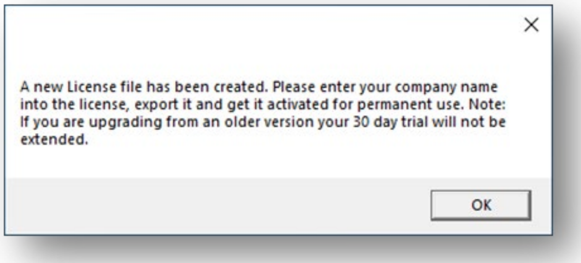


Milestone XProtect Management Client 2022 R2

Name	Description
DESKTOP-SHFF59U\...	
NT AUTHORITY\NET...	
orbnet	W^R5N3K3vqoPeS7m

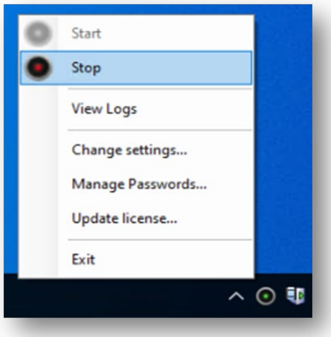
License activation

When you first install the Stream Engine you will get a 30-day trial license, following this you will need to update to a paid license. Product version revisions will require a new updated license, access to version is restricted via a valid ORB Up related to the license purchase.

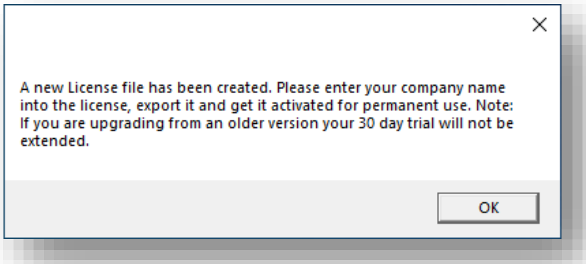


A new License file has been created. Please enter your company name into the license, export it and get it activated for permanent use. Note: If you are upgrading from an older version your 30 day trial will not be extended.

The ORBNET Streaming Engine License information can be accessed from the Streaming Engine Tray controller. `Stop` the Streaming Engine service first.

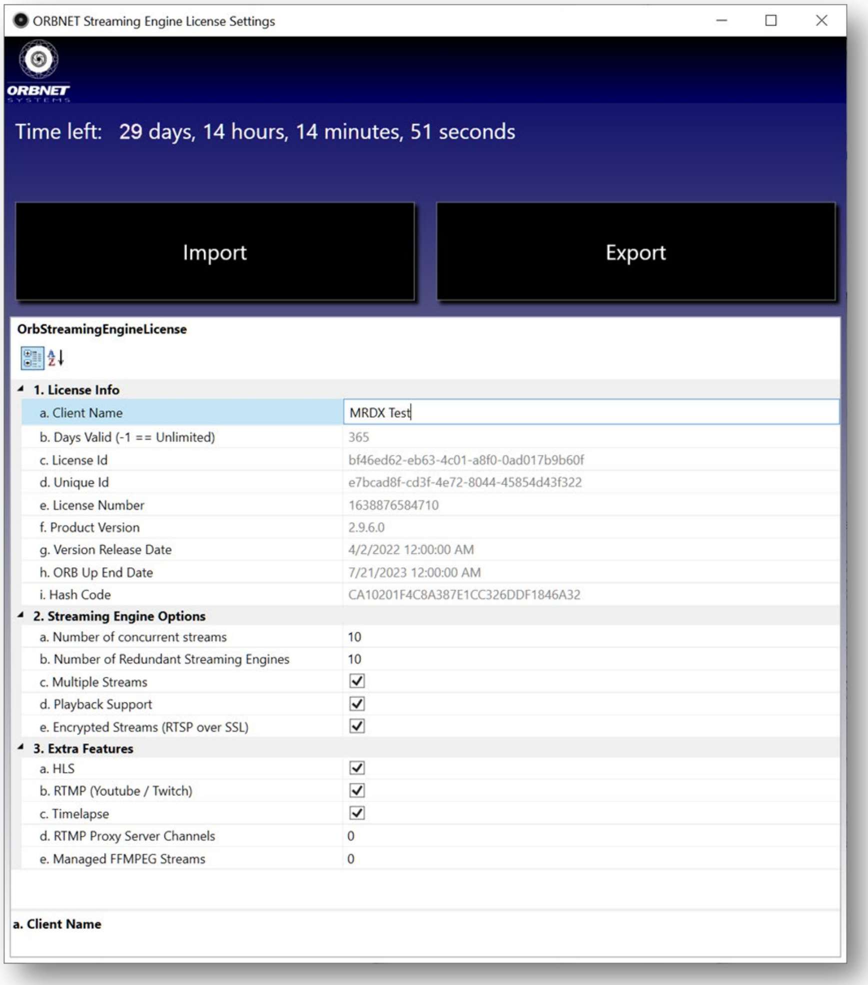


Then right click again and you can then select `Update license…`



A new License file has been created. Please enter your company name into the license, export it and get it activated for permanent use. Note: If you are upgrading from an older version your 30 day trial will not be extended.

This page will initially show the default license values with just the trial license countdown at the top.


ORBNET Streaming Engine License Settings
ORBNET
Import
Export
OrbStreamingEngineLicense

Time left: 29 days, 14 hours, 14 minutes, 51 seconds

1. License Info	
a. Client Name	MRDX Test
b. Days Valid (-1 == Unlimited)	365
c. License Id	bf46ed62-eb63-4c01-a8f0-0ad017b9b60f
d. Unique Id	e7bcad8f-cd3f-4e72-8044-45854d43f322
e. License Number	1638876584710
f. Product Version	2.9.6.0
g. Version Release Date	4/2/2022 12:00:00 AM
h. ORB Up End Date	7/21/2023 12:00:00 AM
i. Hash Code	CA10201F4C8A387E1CC326DDF1846A32
2. Streaming Engine Options	
a. Number of concurrent streams	10
b. Number of Redundant Streaming Engines	10
c. Multiple Streams	☑
d. Playback Support	☑
e. Encrypted Streams (RTSP over SSL)	☑
3. Extra Features	
a. HLS	☑
b. RTMP (Youtube / Twitch)	☑
c. Timelapse	☑
d. RTMP Proxy Server Channels	0
e. Managed FFMPEG Streams	0

a. Client Name

`Import` and `Export` buttons for license requests and software activation.

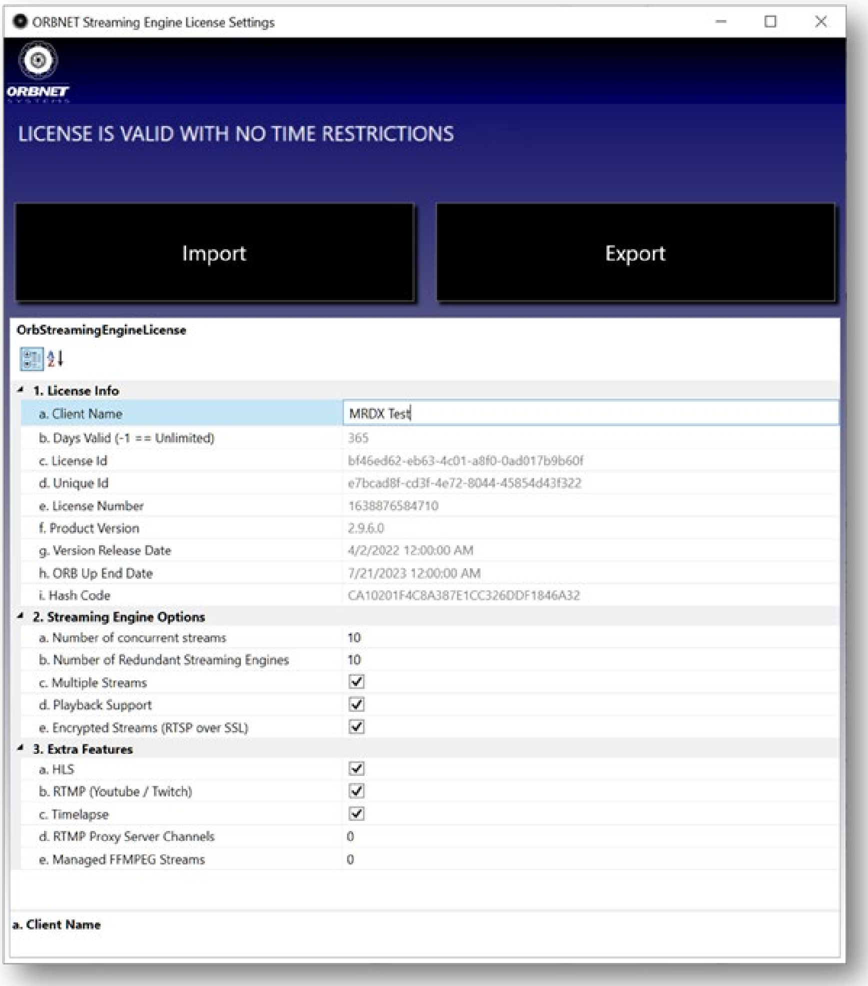
When making a license request, please complete the fields in bold.

- 1. License Info
  - Enter the site name
- 2. Streaming Engine Options
  - Increment the values of the options and enable the required checkboxes
- 3. Extra Features
  - Increment the values of the options and enable the required checkboxes

Use the `Export` license request button to generate a license request file. This will be required to be included in an email to ORBNET Systems (purchase@orbnetsys.com) when requesting your activated product license.

On completion of an order alongside a license request file a valid license will be sent back. This can be imported by using the `Import` valid license button.

This will now show an unlimited (Days Valid = -1) time frame associated to the Streaming Engine at the top.



LICENSE IS VALID WITH NO TIME RESTRICTIONS

OrbStreamingEngineLicense

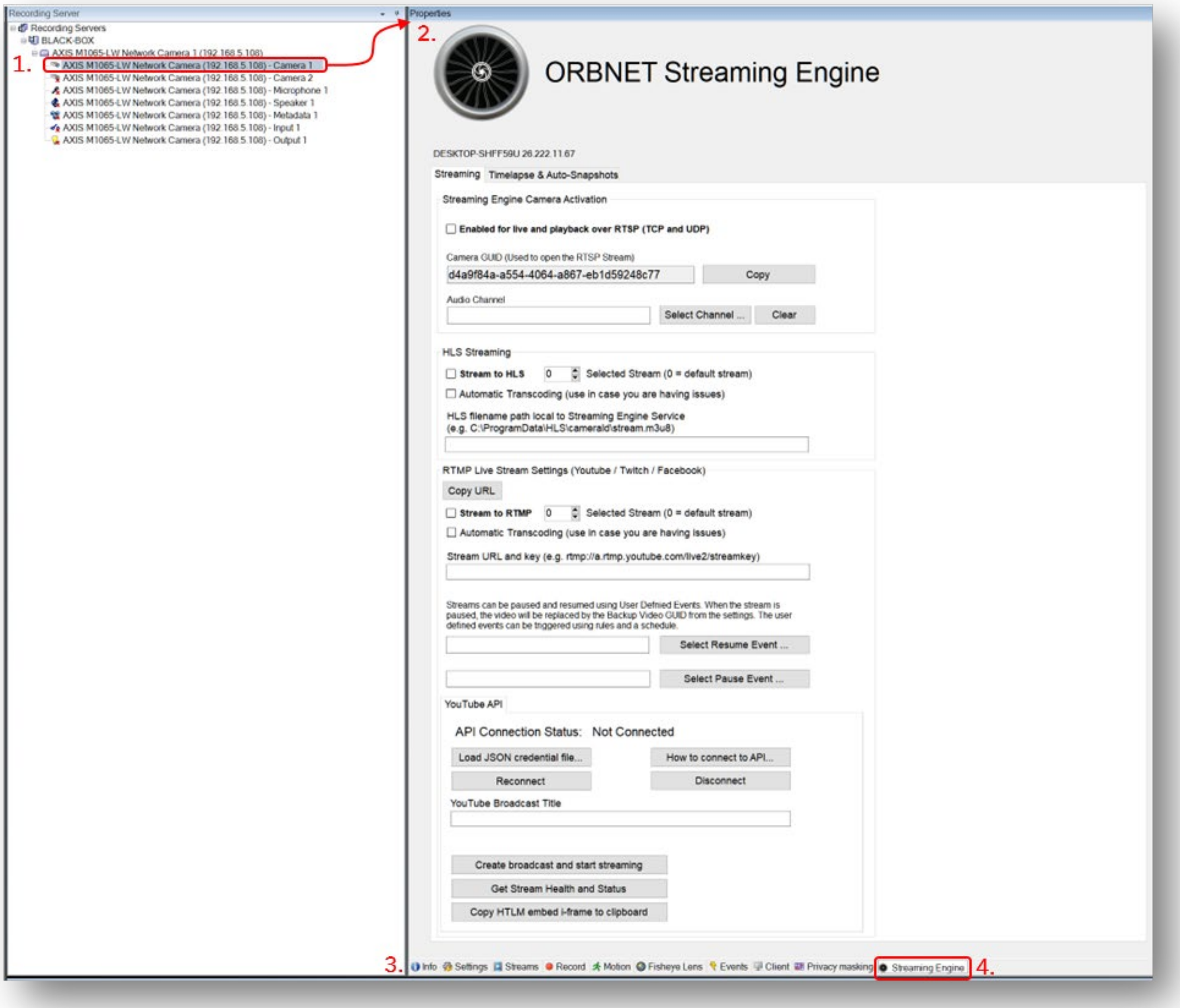
1. License Info	
a. Client Name	MRDX Test
b. Days Valid (-1 == Unlimited)	365
c. License Id	bf46ed62-eb63-4c01-a8f0-0ad017b9b60f
d. Unique Id	e7bcad8f-cd3f-4e72-8044-45854d43f322
e. License Number	1638876584710
f. Product Version	2.9.6.0
g. Version Release Date	4/2/2022 12:00:00 AM
h. ORB Up End Date	7/21/2023 12:00:00 AM
i. Hash Code	CA10201F4C8A387E1CC326DDF1846A32
2. Streaming Engine Options	
a. Number of concurrent streams	10
b. Number of Redundant Streaming Engines	10
c. Multiple Streams	☑
d. Playback Support	☑
e. Encrypted Streams (RTSP over SSL)	☑
3. Extra Features	
a. HLS	☑
b. RTMP (Youtube / Twitch)	☑
c. Timelapse	☑
d. RTMP Proxy Server Channels	0
e. Managed FFMPEG Streams	0

a. Client Name

Streaming Engine Tab in Management Application

The Streaming Engine settings are made available within a hardware device video channel. Select the video channel (**1.**) you wish to work with then in the Properties pane (2.) locate the tabbed settings groups (3.). Streaming Engine is located at the furthest right (4.).

If your display window is not large enough some tabs may be hidden and you will have to use the arrow keys to move over to the right. ‹ ›



Recording Servers
BLACK-BOX
AXIS M1065-LW Network Camera 1 (192.168.5.108)
AXIS M1065-LW Network Camera (192.168.5.108) - Camera 1
AXIS M1065-LW Network Camera (192.168.5.108) - Camera 2
AXIS M1065-LW Network Camera (192.168.5.108) - Microphone 1
AXIS M1065-LW Network Camera (192.168.5.108) - Speaker 1
AXIS M1065-LW Network Camera (192.168.5.108) - Metadata 1
AXIS M1065-LW Network Camera (192.168.5.108) - Input 1
AXIS M1065-LW Network Camera (192.168.5.108) - Output 1

ORBNET Streaming Engine

DESKTOP-SHFF59U 26.222.11.67

Streaming Engine Camera Activation

☐ **Enabled for live and playback over RTSP (TCP and UDP)**

Camera GUID (Used to open the RTSP Stream): d4a9f84a-a554-4064-a867-eb1d59248c77

Audio Channel

HLS Streaming

☐ **Stream to HLS** 0 Selected Stream (0 = default stream)

☐ Automatic Transcoding (use in case you are having issues)

HLS filename path local to Streaming Engine Service
(e.g. C:\ProgramData\HLS\cameraId\stream.m3u8)

RTMP Live Stream Settings (Youtube / Twitch / Facebook)

☐ **Stream to RTMP** 0 Selected Stream (0 = default stream)

☐ Automatic Transcoding (use in case you are having issues)

Stream URL and key (e.g. rtmp://a.rtmp.youtube.com/live2/streamkey)

Streams can be paused and resumed using User Defnied Events. When the stream is paused, the video will be replaced by the Backup Video GUID from the settings. The user defined events can be triggered using rules and a schedule.

YouTube API

API Connection Status: Not Connected

YouTube Broadcast Title

Streaming – RTSP

Real Time Streaming Protocol (RTSP) is used to transport video streams with or without audio. The transport method can be in UDP or TCP with or without SSL.

RTSP is for applications that supports receiving video streams. This could be a video player like VLC or a video management system like Milestone (When used with the correct driver; ORB Driver).

RTSP is not for web browser streaming, the RTSP URL is not supported for direct streaming

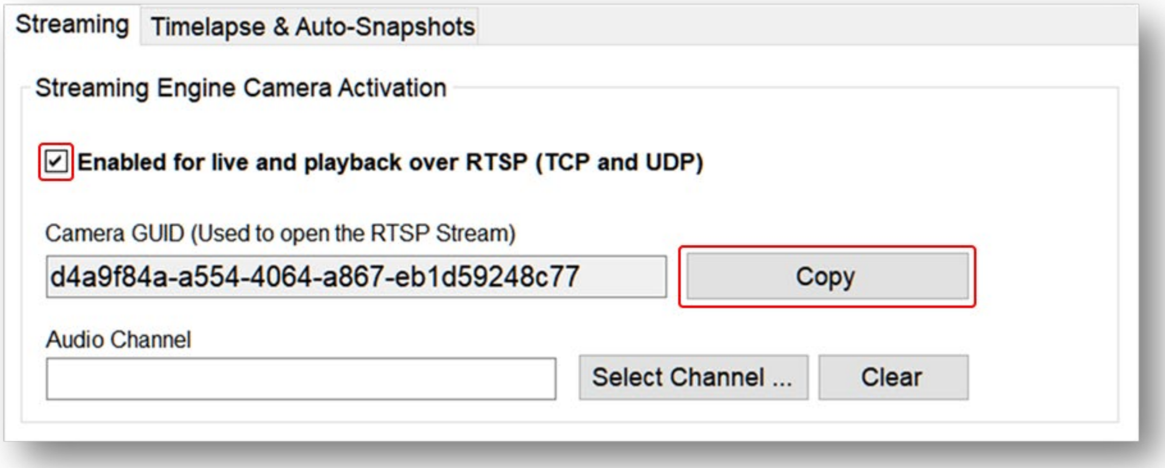
Enabled for live and playback over RTSP `Tick` to enable a RTSP video feed for streaming.

Unlike other settings in Milestone the save button does not apply the setting, these are enabled as soon as the option is selected.

Camera GUID references the video channel identifier used by the Streaming Engine to create unique RTSP URL for each video channel. Use `Copy` to copy and paste the GUID to another application like VLC.

Audio Channel if you wish to use an audio channel alongside the video channel use `Select Channel` to find an audio channel that already exists in Milestone. To remove the audio channel, select `Clear`.

No Audio will stream if the Audio Channel is not selected manually.



Streaming Engine Camera Activation

☑ Enabled for live and playback over RTSP (TCP and UDP)

Camera GUID (Used to open the RTSP Stream): d4a9f84a-a554-4064-a867-eb1d59248c77

Audio Channel:

Live RTSP Stream URL Formation

URL = [`rtsp://<streaming-engine-ip>:<port>/<camera-guid>`]

<streaming-engine-ip> = The IP address of the server with the Streaming Engine installed.

<port> = As default the port used is 8554, 8555 if using RTSP over SSL (RTSPS).

<camera-guid> = The unique camera channel identifier copied from the Streaming Engine tab.

rtsp://192.168.0.100:8554/d4a9f84a-a554-4064-a867-eb1d59248c77

This is the URL in its most basic form.

rtsp://91.37.144.121:8554/77b2067c-1387-4480-aa28-c6f83e452af4

In this URL an external IP address has been used, this requires a port forward on a firewall to be setup for (port 8554).

Live RTSP Additional URL parameters

After the <camera-guid> the Streaming Engine will support the additional parameters below.

[.../`stream=<id>`]

<id> = Lookup of Stream name value (No spaces allowed).

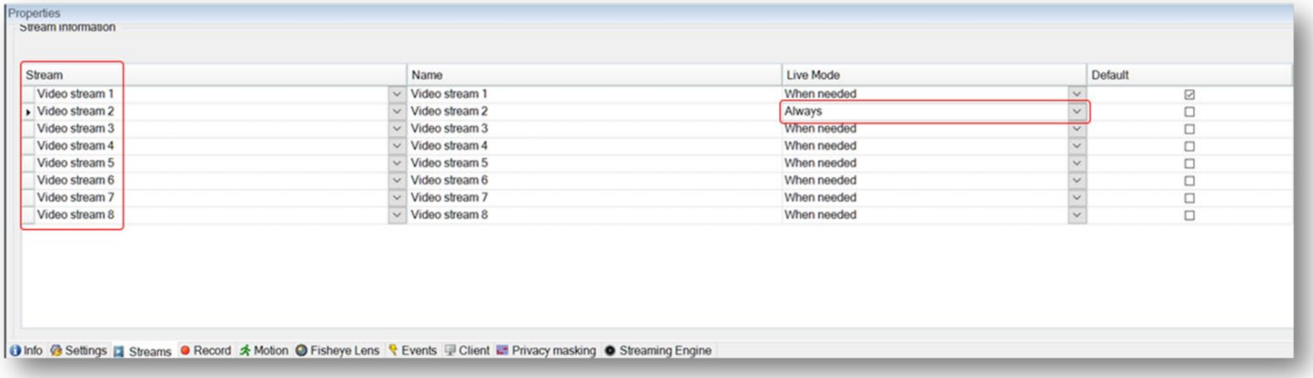
In the below example we have an Axis IP camera, this has eight streaming channels. The <id> of the stream is determined by the Stream name in Milestone, shown on the left in the below example. We need to take something unique from this name [**Video stream 2**] and cannot use spaces.

[.../`stream=2`]

For other devices the naming can differ, instead of default name of [**Video stream 1**] this might be [**JPEG**] in this case this would be what is used.

[.../`stream=JPEG`]

When using sub-video streams ensure the video stream to be used is included in the `Streams` tab as a secondary stream. Update `Live Mode` for this video stream to `Always`, without this enabled the video stream is not made available as live to the Streaming Engine from Milestone.



Properties

Stream information

Stream	Name	Live Mode	Default
Video stream 1	Video stream 1	When needed	☑
Video stream 2	Video stream 2	Always	□
Video stream 3	Video stream 3	When needed	□
Video stream 4	Video stream 4	When needed	□
Video stream 5	Video stream 5	When needed	□
Video stream 6	Video stream 6	When needed	□
Video stream 7	Video stream 7	When needed	□
Video stream 8	Video stream 8	When needed	□

rtsp://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/stream=2

rtsp://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/stream=JPEG

This would be the full URL with the stream parameter.

If the name used for the stream parameter is not unique or mistyped the Streaming Engine will resolve the Default Milestone stream

Playback RTSP Stream URL Formation

URL = [`rtsp://<streaming-engine-ip>:<port>/<camera-guid>/unix=<start-timestamp>/unixend=<end-timestamp>`]

To retrieve recordings from the Streaming Engine, a mandatory start timestamp must be specified, and an optional end timestamp can be specified.

[…`/unix=<start-timestamp>`]

<start-timestamp> = The Unix timestamp of the start of the video recording.

[…`/unixend=<end-timestamp>`]

<end-timestamp> = The Unix timestamp of the end of the video recording (optional).

rtsp://192.168.0.100:8554/d4a9f84a-a554-4064-a867-eb1d59248c77/unix= 1664204763

This is the URL with a start Unix timestamp and no end Unix timestamp.

rtsp://192.168.0.100:8554/d4a9f84a-a554-4064-a867-eb1d59248c77/unix=
1664204763/unixend=1664211963

This is the URL with a start Unix timestamp and an end Unix timestamp.

- If there are no recordings available at the selected timestamp, the Streaming Engine will automatically skip to the next available clip of recorded video.
- When playing back recorded video, the Streaming Engine will automatically skip if there are gaps in the recorded video.
- When specifying the optional end timestamp, the Streaming Engine will terminate the stream as soon as the timestamp of the video is greater or equal to specified end timestamp.

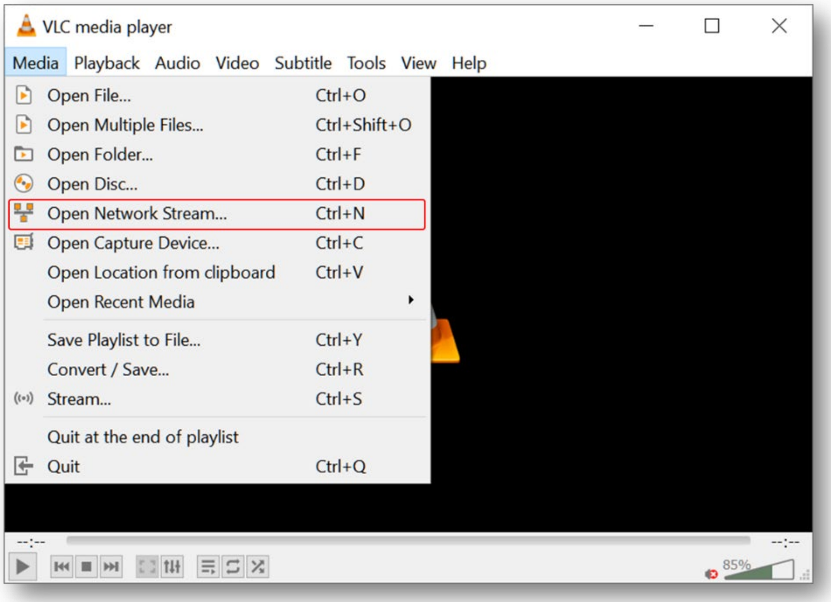
Unix time is a system for representing a point in time. It is the number of seconds that have elapsed since January 1st, 1970 00:00:00 UTC. Use an online tool to convert to the required time and date. Unix Timestamp - Epoch Converter - TimeStamp Converter

RTSP Stream Testing

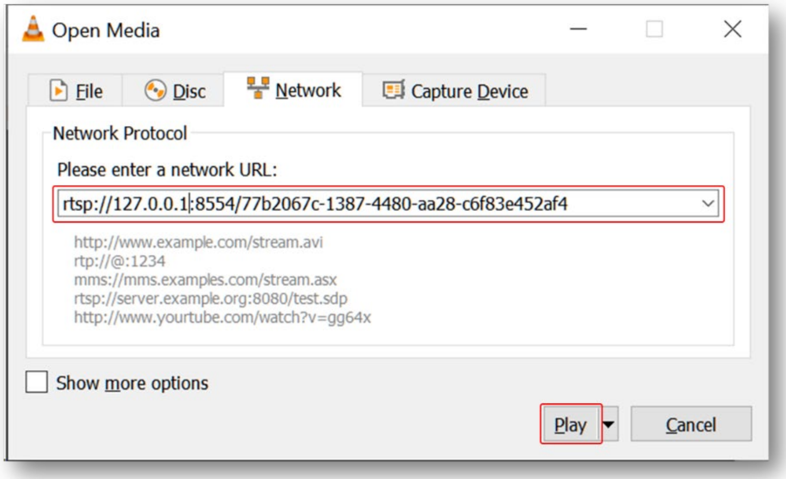
When testing RTSP streams from the Streaming Engine we would highly recommend using VLC Player for Windows. This is a free video player application with support for many video formats including RTMP.

https://www.videolan.org/vlc/

After installation, open `VLC` and select `Media`, then `Open Network Stream…`



Create the URL for the video channel you intend to use and enter this in the network URL text box. Use `127.0.0.1` or `localhost` when connecting locally from the Streaming Engine server. Click `Play`.

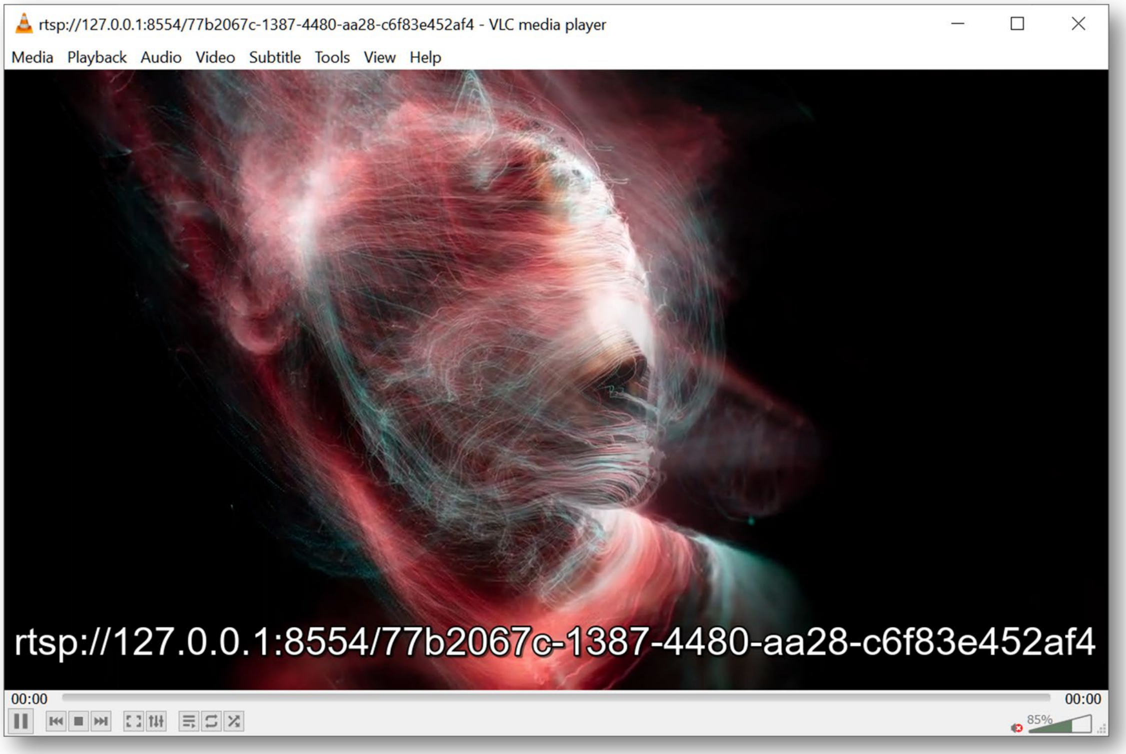


Please enter a network URL:

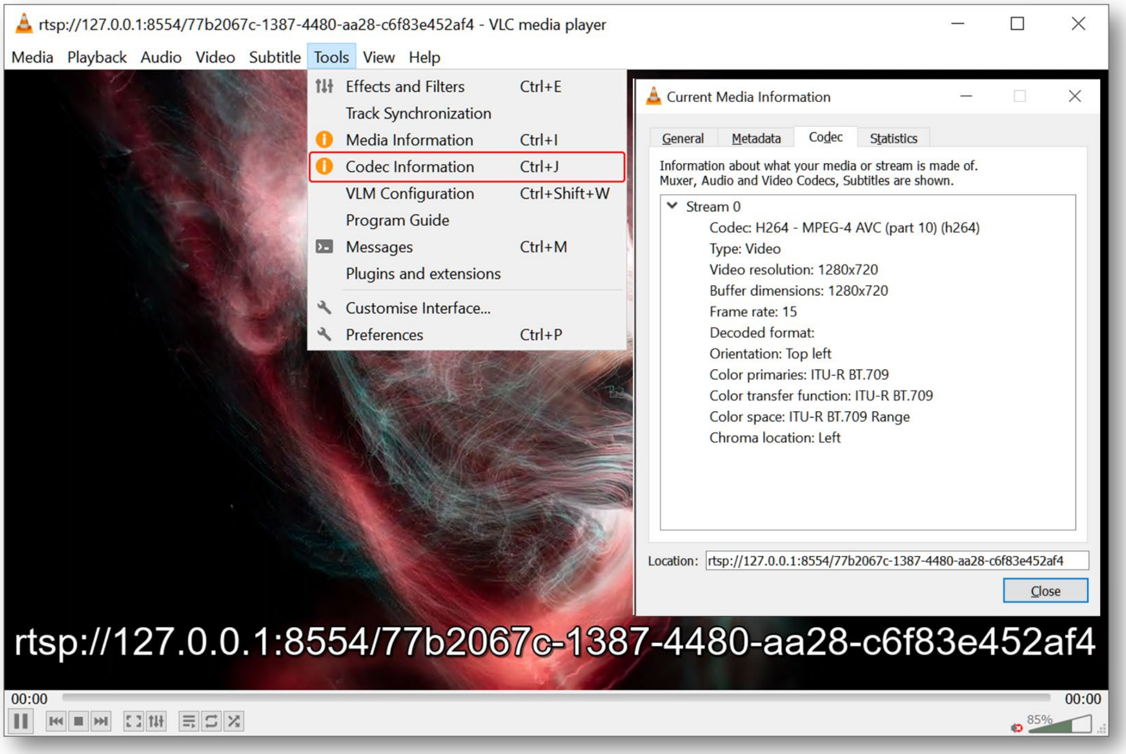
rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4

http://www.example.com/stream.avi
rtp://@:1234
mms://mms.examples.com/stream.asx
rtsp://server.example.org:8080/test.sdp
http://www.yourtube.com/watch?v=gg64x

The video feed should now display in the VLC window.


rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4
00:00
00:00
85%

To verify stream parameters, use `Tools > Codec Information`.


rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
Effects and Filters Ctrl+E
Track Synchronization
Media Information Ctrl+I
Codec Information Ctrl+J
VLM Configuration Ctrl+Shift+W
Program Guide
Messages Ctrl+M
Plugins and extensions
Customise Interface...
Preferences Ctrl+P
Current Media Information
General
Metadata
Codec
Statistics
Close
rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4
00:00
00:00
85%

Information about what your media or stream is made of.
Muxer, Audio and Video Codecs, Subtitles are shown.

Stream 0

Codec: H264 - MPEG-4 AVC (part 10) (h264)
Type: Video
Video resolution: 1280x720
Buffer dimensions: 1280x720
Frame rate: 15
Decoded format:
Orientation: Top left
Color primaries: ITU-R BT.709
Color transfer function: ITU-R BT.709
Color space: ITU-R BT.709 Range
Chroma location: Left

Location: rtsp://127.0.0.1:8554/77b2067c-1387-4480-aa28-c6f83e452af4

Streaming – HLS

HTTP Live Streaming (also known as HLS) is an HTTP-based adaptive bitrate streaming communications protocol developed by Apple Inc. and released in 2009.

Support for the protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. As of 2019, an annual video industry survey has consistently found it to be the most popular streaming format. (REF: Wiki)

HLS streaming best performs with H.264 or MJPEG streams. Ensure to select a Milestone stream that uses this codec type. Transcoding will occur if the wrong codec is selected and use additional system resources, mostly CPU.

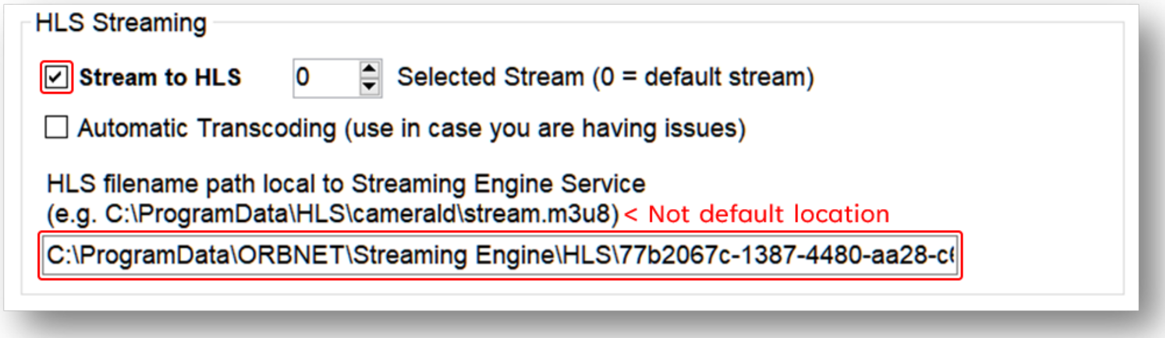
Stream to HLS first set the HLS file path local then, `Tick` to enable HLS Streaming.

Selected Stream The default stream for Milestone is 0, this is what would show live as default in the Smart Client.

Automatic Transcoding use only if the video used is not stable when using for HLS. Try an alternative stream first.

HLS filename path local this location will need to be created and set before you can enable HLS streaming. Go to C:\ProgramData\ORBNET\Streaming Engine\ and create a new folder called \HLS\ inside this folder you need to create a new folder, copy the camera channel GUID for the name. Set the filename path including the stream.m3u8. This file will be generated when HLS is enabled.

Example: [`C:\ProgramData\ORBNET\Streaming Engine\HLS\77b2067c-1387-4480-aa28-c6f83e452af4\stream.m3u8`] (This is the default HLS file path, it must match the location listed in the Streaming Engine settings, via the tray icon)



HLS Streaming

☑ Stream to HLS 0 Selected Stream (0 = default stream)

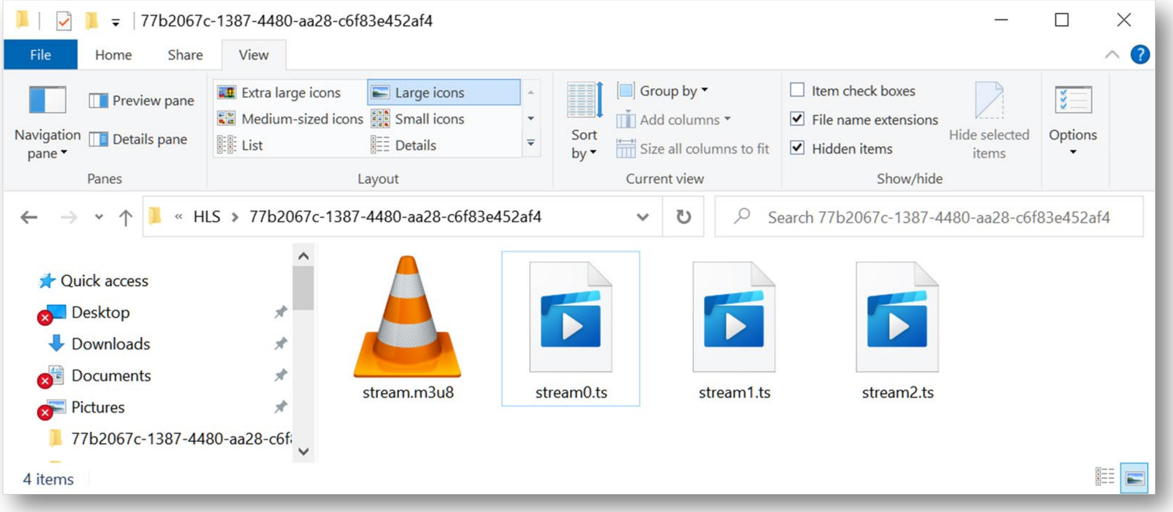
☐ Automatic Transcoding (use in case you are having issues)

HLS filename path local to Streaming Engine Service
(e.g. C:\ProgramData\HLS\cameraId\stream.m3u8) < Not default location

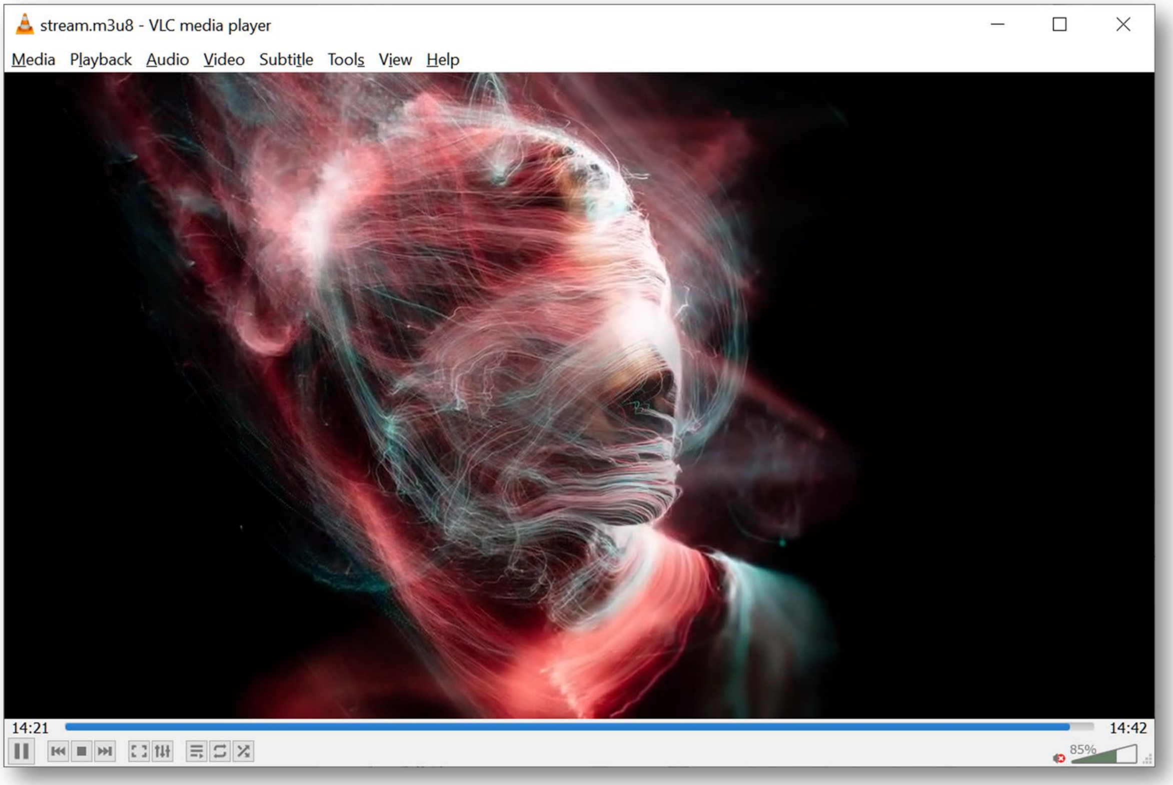
C:\ProgramData\ORBNET\Streaming Engine\HLS\77b2067c-1387-4480-aa28-c

After enabling HLS in the Streaming Engine settings restart the Streaming Engine service via the tray icon. This will reinitialize the channel and generate the HLS files required.

You will see now inside the newly created folder the `stream.m3u8` and three `stream*.ts` files have been created.



Double click the `stream.m3u8` file, this will be opened in VLC player and display the HLS video stream to confirm this is working correctly.



HLS Stream URL Formation

URL = [`http://<streaming-engine-ip>:<port>/API/HLS/Live /<camera-guid>/`]

http = HLS being a web-based video streaming solution this uses HTTP or HTTPS over SSL.

<streaming-engine-ip> = The IP address of the server with the Streaming Engine installed.

<port> = As default the port used is 45333, 45334 if using HLS over SSL.

/api/hls/ = This is delivered by the Streaming Engine API with HLS used as our streaming parameter.

/Live = This is used to specify the stream requirement for display.

<camera-guid> = The unique camera channel identifier copied from the Streaming Engine tab.

`http://192.168.0.100:45333/API/HLS/Live/d4a9f84a-a554-4064-a867-eb1d59248c77/`

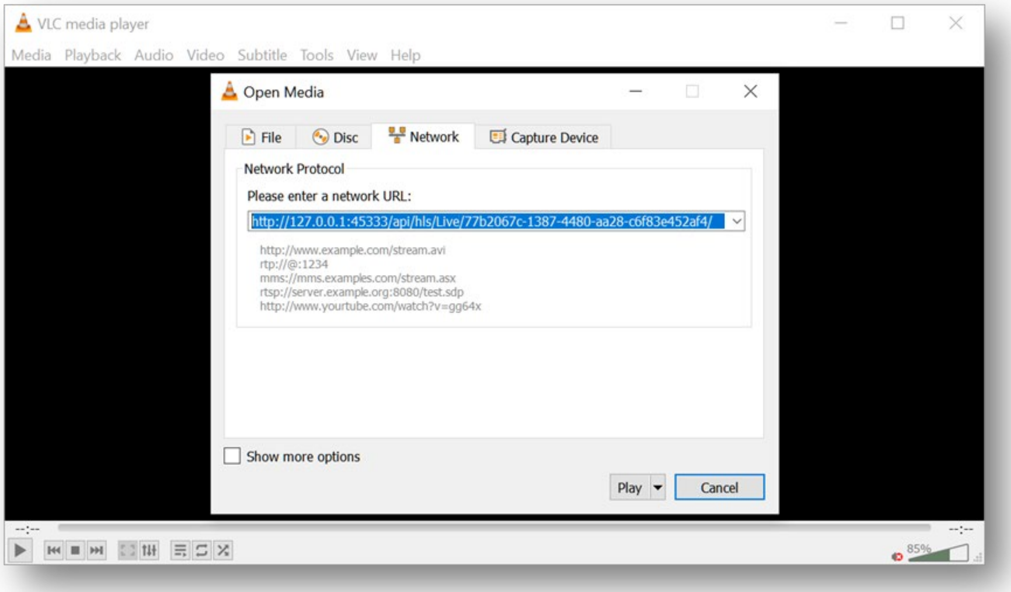
This is the URL in its most basic form.

`https://91.37.144.121:45334/API/HLS/Live/d4a9f84a-a554-4064-a867-eb1d59248c77/`

In this URL an external IP address has been used, this requires a port forward on a firewall to be setup for (port 45334).

HLS URL Test

Open **VLC Player** and select **Media**, then **Open Network Stream…**
Create the URL for the video channel you intend to use and enter this in the network URL text box.
Use `127.0.0.1` or `localhost` when connecting locally from the Streaming Engine server. Click **Play**.



Open Media

Network Protocol

Please enter a network URL:

`http://127.0.0.1:45333/api/hls/Live/77b2067c-1387-4480-aa28-c6f83e452af4/`

http://www.example.com/stream.avi
rtp://@:1234
mms://mms.examples.com/stream.asx
rtsp://server.example.org:8080/test.sdp
http://www.yourtube.com/watch?v=gg64x

□ Show more options

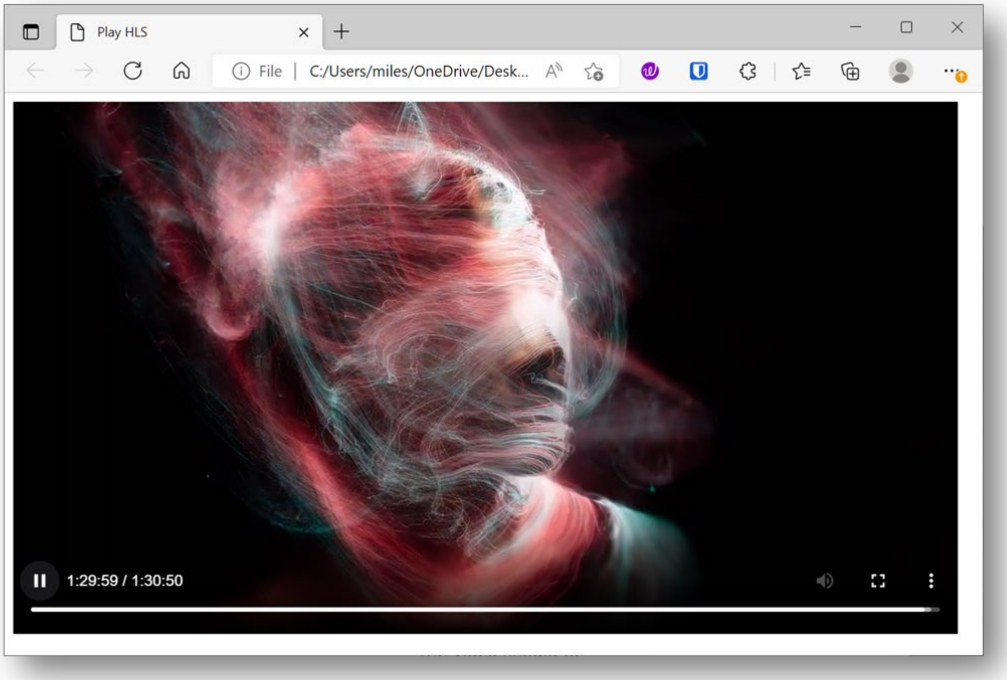
HLS Webpage Example

Once we have established that video stream works with the `stream.m3u8` file and HTTP stream request, we are able to take this video stream to a web page.

Below is a HTML code example that will display the HTTP or HTTPS source in a webpage.

This example uses a java script from https://www.jsdelivr.com/
HLS.js is released under Apache 2.0 License

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta charset="utf-8" />
 <meta name="viewport" content="width=device-width, initial-scale=1">
<title>Play HLS</title>
</head>
<body>
    <script src="https://cdn.jsdelivr.net/npm/hls.js@1"></script>
    <video id="video" controls preload="auto"></video>

<script>
  var video = document.getElementById('video');
  var videoSrc = 'http://127.0.0.1:45333/api/hls/Live/77b2067c-1387-4480-aa28-
c6f83e452af4/';
  if (Hls.isSupported()) {
    var hls = new Hls();
    hls.loadSource(videoSrc);
    hls.attachMedia(video);
  }
  else if (video.canPlayType('application/vnd.apple.mpegurl')) {
    video.src = videoSrc;
  }
</script>

</body>
</html>
```



Streaming – RTMP

RTMP stands for real-time messaging protocol. It provides for high-performance transmission of audio, video, and data from an encoder to a server, which distributes the signal across the Internet. Many streaming providers and encoder developers support RTMP streaming, including Livestream. (REF: LiveStream)

RTMP streaming best performs with H.264 or H.265 streams. Ensure to select a Milestone stream that uses this codec type. Transcoding will occur if the wrong codec is selected and use additional system resources, mostly CPU.

Stream to RTMP first set the Stream URL and key then, Tick to enable RTMP Streaming.

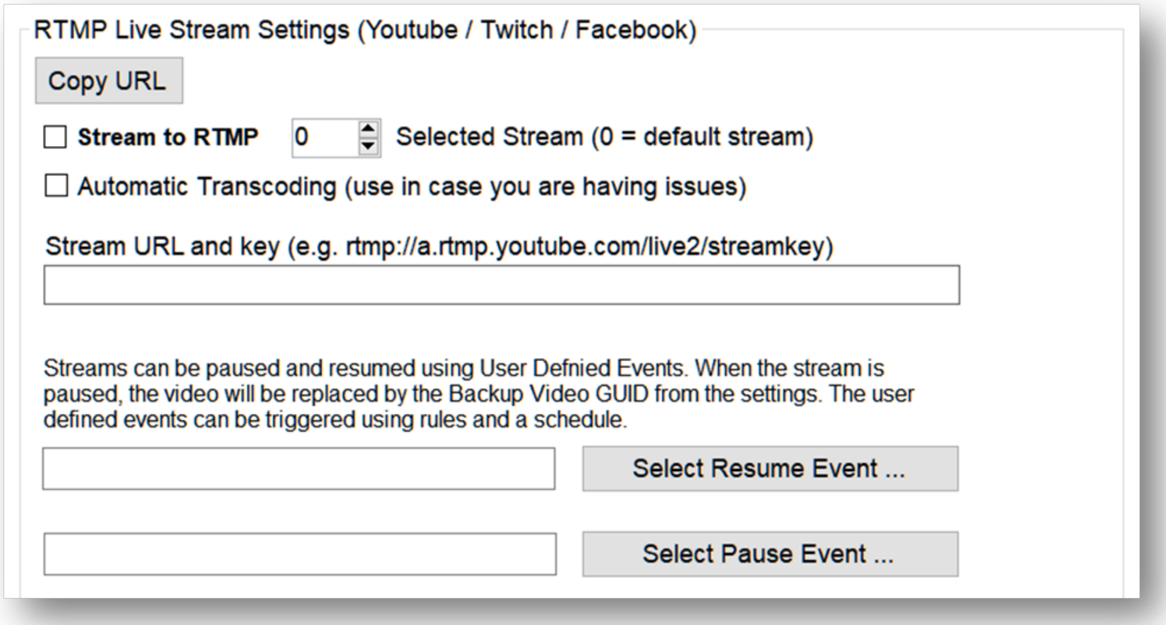
Selected Stream the default stream for Milestone is 0, this is what would show live as default in the Smart Client.

Automatic Transcoding use only if the video used is not stable when using for HLS. Try an alternative stream first.

Stream URL and Key this URL and key is gathered from the video sharing platform (i.e. YouTube). This is what is used to send the video stream to the internet.

Select Resume Event … this allows the use of a Milestone user defined event to control the sending state of the video stream to the video sharing platform.

Select Pause Event … as above



RTMP Live Stream Settings (Youtube / Twitch / Facebook)

□ Stream to RTMP 0 Selected Stream (0 = default stream)

□ Automatic Transcoding (use in case you are having issues)

Stream URL and key (e.g. rtmp://a.rtmp.youtube.com/live2/streamkey)

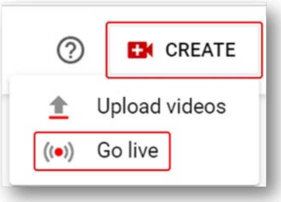
Streams can be paused and resumed using User Defnied Events. When the stream is paused, the video will be replaced by the Backup Video GUID from the settings. The user defined events can be triggered using rules and a schedule.

RTMP Stream Testing

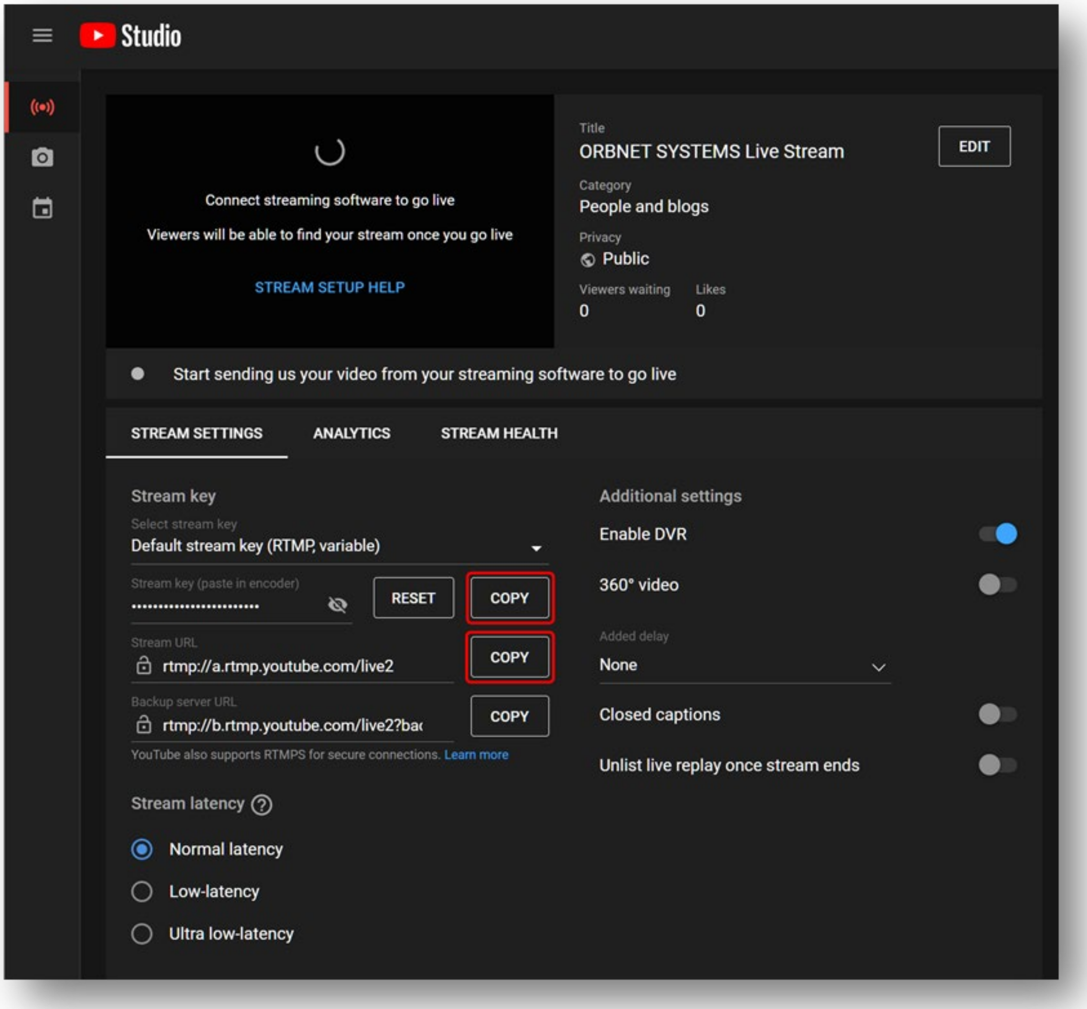
Video Sharing Platforms that support RTMP come in all sorts of shapes and sizes. Methods of testing may differ from one platform to another. In this example we will use YouTube Studio, the steps are similar to many other streaming platforms.

YouTube as a 24-hour verification process to access Live Streaming. Before you can run this as a test this verification process will need to be completed first.

Go to https://studio.youtube.com/ and select `Create` then `Go Live`



The page that follows allows connection of a video stream to start video streaming online. Copy the Stream URL into settings, add / to the end of the URL. Copy the Stream key and add to the end.



Connect streaming software to go live

Viewers will be able to find your stream once you go live

Title
ORBNET SYSTEMS Live Stream

Category
People and blogs

Privacy
Public

Viewers waiting 0
Likes 0

Start sending us your video from your streaming software to go live

Stream key

Select stream key
Default stream key (RTMP, variable)

Stream key (paste in encoder)
••••••••••••••••••••••••

Stream URL
rtmp://a.rtmp.youtube.com/live2

Backup server URL
rtmp://b.rtmp.youtube.com/live2?bac

YouTube also supports RTMPS for secure connections. Learn more

Stream latency

● Normal latency
○ Low-latency
○ Ultra low-latency

Additional settings

Enable DVR — on

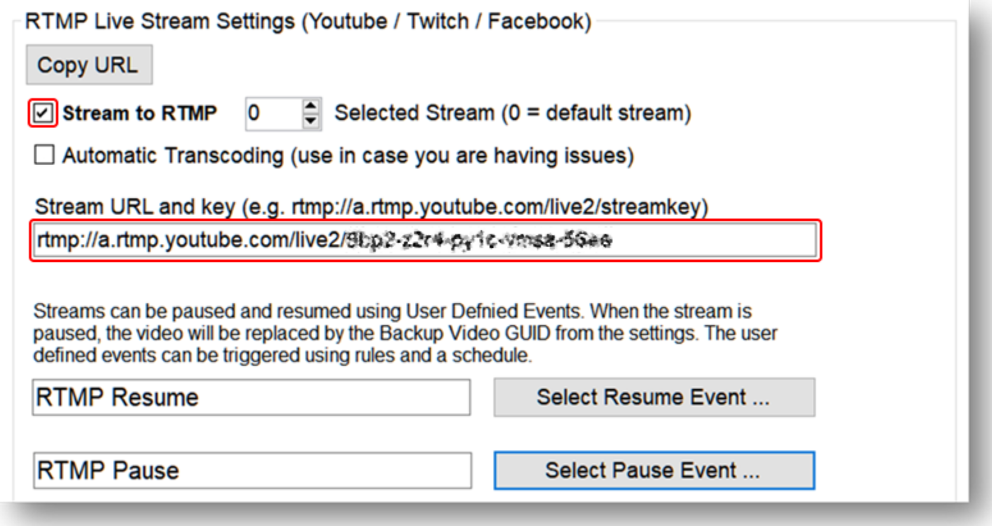
360° video — off

Added delay
None

Closed captions — off

Unlist live replay once stream ends — off

Under Streaming engine settings add the Stream URL followed by a forward slash ("/") and the Stream key. Tick Stream to RTMP to enable the stream to be sent to the video sharing platform.



RTMP Live Stream Settings (Youtube / Twitch / Facebook)

Copy URL

☑ Stream to RTMP 0 Selected Stream (0 = default stream)

☐ Automatic Transcoding (use in case you are having issues)

Stream URL and key (e.g. rtmp://a.rtmp.youtube.com/live2/streamkey)

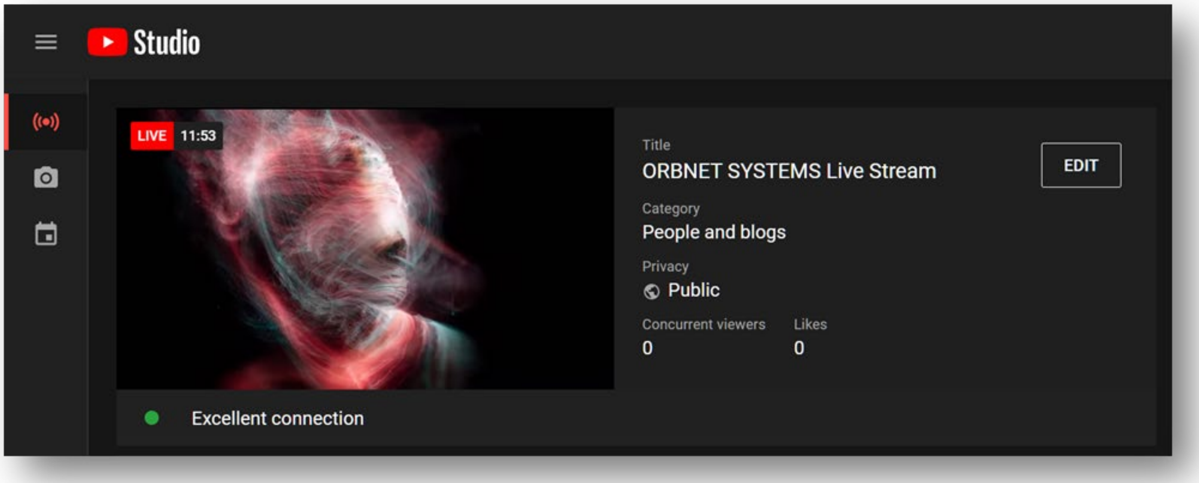
rtmp://a.rtmp.youtube.com/live2/[redacted]

Streams can be paused and resumed using User Defnied Events. When the stream is paused, the video will be replaced by the Backup Video GUID from the settings. The user defined events can be triggered using rules and a schedule.

RTMP Resume | Select Resume Event ...

RTMP Pause | Select Pause Event ...

Now enabled the connection will be established and YouTube will show the video as Live.



Title
ORBNET SYSTEMS Live Stream

Category
People and blogs

Privacy
Public

Concurrent viewers: 0
Likes: 0

Excellent connection

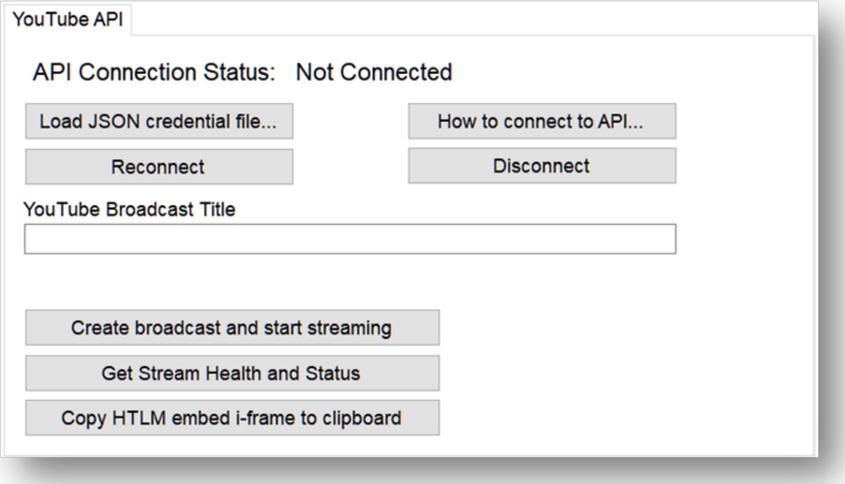
The Streaming Engine supports many video sharing platforms that support RTMP. Other systems will be covered in either a dedicated how-to guide or a website knowledge base item.

We are always expanding our support for other system, please contact support@orbnetsys.com if you need further information or assistance with your application / solution.

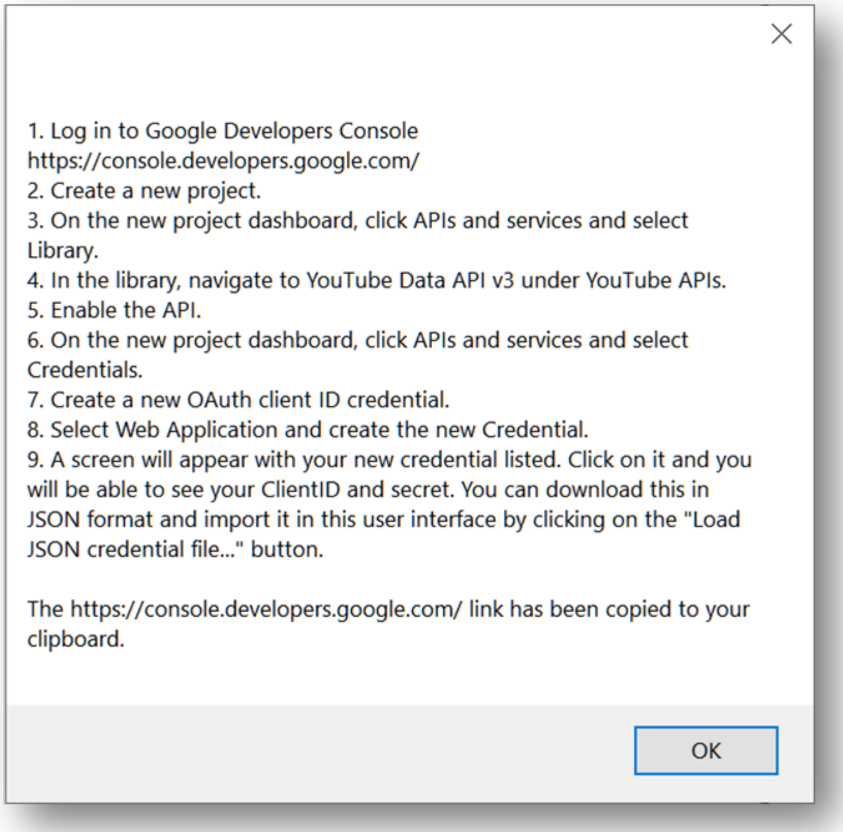
RTMP YouTube API

Support of the YouTube API has been built into the Streaming Engine. Once enabled this provides an easy-to-use method to manage multiple streams. This takes away the process of manually entering the Stream URL and managing multiple Stream Keys. Live Streaming to YouTube can be completed with the click of a button once connected.

All the YouTube API setup steps will be covered in detail in a dedicated how-to guide. Please look out for this here. https://orbnetsys.com/streamingengine


YouTube API
Load JSON credential file...
How to connect to API...
Reconnect
Disconnect
YouTube Broadcast Title
Create broadcast and start streaming
Get Stream Health and Status
Copy HTLM embed i-frame to clipboard

API Connection Status: Not Connected

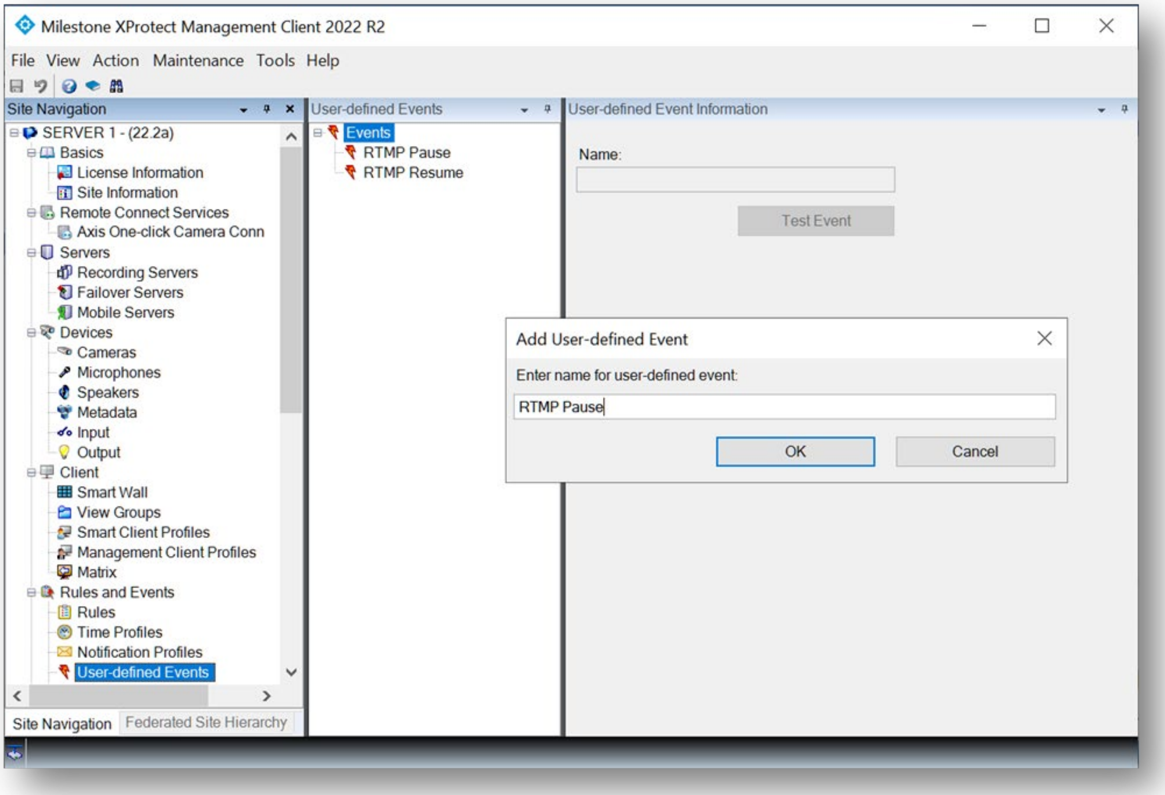


1. Log in to Google Developers Console
https://console.developers.google.com/
2. Create a new project.
3. On the new project dashboard, click APIs and services and select Library.
4. In the library, navigate to YouTube Data API v3 under YouTube APIs.
5. Enable the API.
6. On the new project dashboard, click APIs and services and select Credentials.
7. Create a new OAuth client ID credential.
8. Select Web Application and create the new Credential.
9. A screen will appear with your new credential listed. Click on it and you will be able to see your ClientID and secret. You can download this in JSON format and import it in this user interface by clicking on the "Load JSON credential file..." button.

The https://console.developers.google.com/ link has been copied to your clipboard.

RTMP Pause and Resume Events

Under Rules and Events, select User-defined Events. **Add** a new Event for **Pause** and **Resume**. These are defined for each device in the Streaming Engine settings, so if you need to control each device independently create a User-defined event for each camera with RTMP enabled. As an example, you could use **RTMP Pause - <camera-name>** , **RTMP Resume - <camera-name>** .

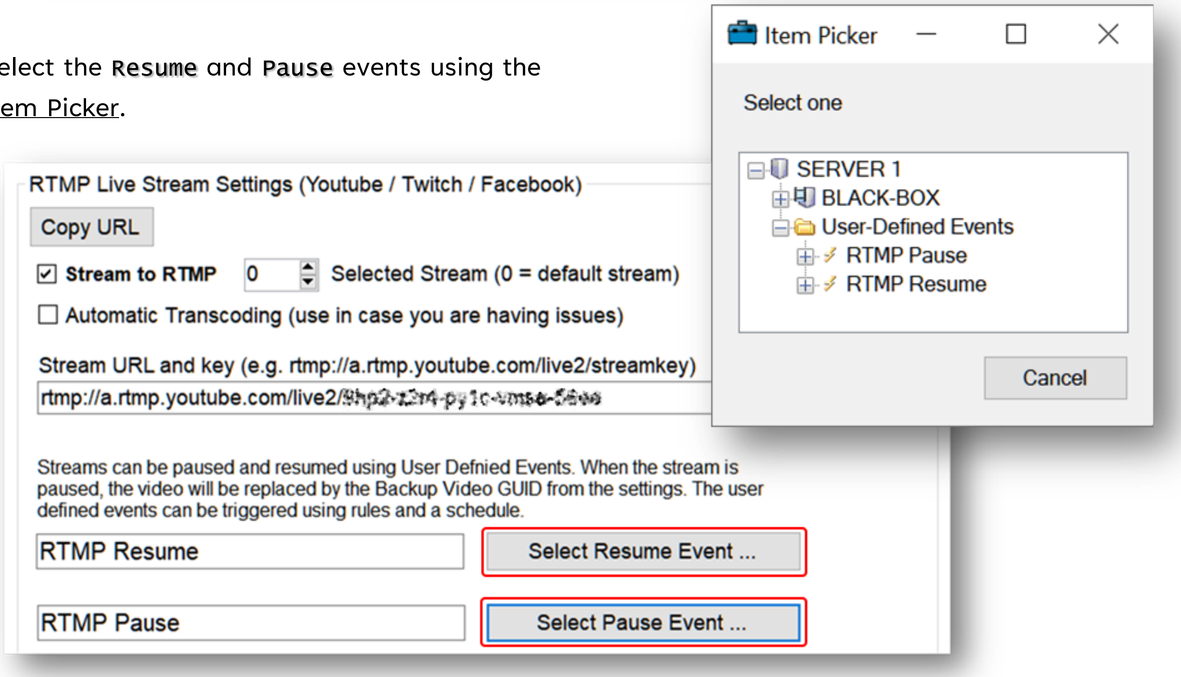


Add User-defined Event

Enter name for user-defined event:

RTMP Pause

Select the **Resume** and **Pause** events using the Item Picker.



☑ Stream to RTMP 0 Selected Stream (0 = default stream)

□ Automatic Transcoding (use in case you are having issues)

Stream URL and key (e.g. rtmp://a.rtmp.youtube.com/live2/streamkey)

rtmp://a.rtmp.youtube.com/live2/[redacted]

Streams can be paused and resumed using User Defnied Events. When the stream is paused, the video will be replaced by the Backup Video GUID from the settings. The user defined events can be triggered using rules and a schedule.

RTMP Resume — Select Resume Event ...

RTMP Pause — Select Pause Event ...

Streaming – MJPEG

Motion JPEG or MJPEG (MJPG) is a video format in which video frames are compressed individually as JPEG images. The format is widely used by digital cameras, webcams, and other video recorders and is supported by most web browsers. (REF: movavi)

MJPEG streaming best performs with MJPEG streams. Ensure to select a Milestone stream that uses this codec type. Transcoding will occur if the wrong codec is selected and use additional system resources, mostly CPU.

MJPEG streaming is a new implementation in the Streaming Engine via the API. There are currently no settings available in the Streaming Engine settings tab. The stream is built upon the URL requested.

MJPEG Stream URL Formation

URL = [`http://<streaming-engine-ip>:<port>/API/MJPEG/<camera-guid>/Live`]

http = MJPEG over HTTP being a web-based video streaming solution this uses HTTP or HTTPS over SSL.

<streaming-engine-ip> = The IP address of the server with the Streaming Engine installed.

<port> = As default the port used is 45333, 45334 if using MJPEG over SSL.

/api/mjpeg/ = This is delivered by the Streaming Engine API with MJPEG used as our streaming parameter.

<camera-guid> = The unique camera channel identifier copied from the Streaming Engine tab.

/Live = This is used to specify the stream requirement for display.

As default the requested stream is `640x480 (or per aspect ratio) at 2FPS`.

MJPEG Additional URL parameters

When using these additional URL parameters all parts of the URL that follow need to be completed with the /live to complete the URL.

After the <camera-guid> the Streaming Engine will support the additional parameters below.

[…`/<stream>/<fps>/<resolution>/live`]

[.../`<stream>`]

<stream> = Lookup of Stream name value (spaces allowed, by using ‘ `%20`’ in place of the spaces).

In the below example we have an Axis IP camera, this has eight streaming channels. The <stream> is determined by the Stream name in Milestone, shown on the left in the below example. We need to take something unique from this name [**Video stream 2**] or use the full name with ‘ `%20`’ in place of the spaces.

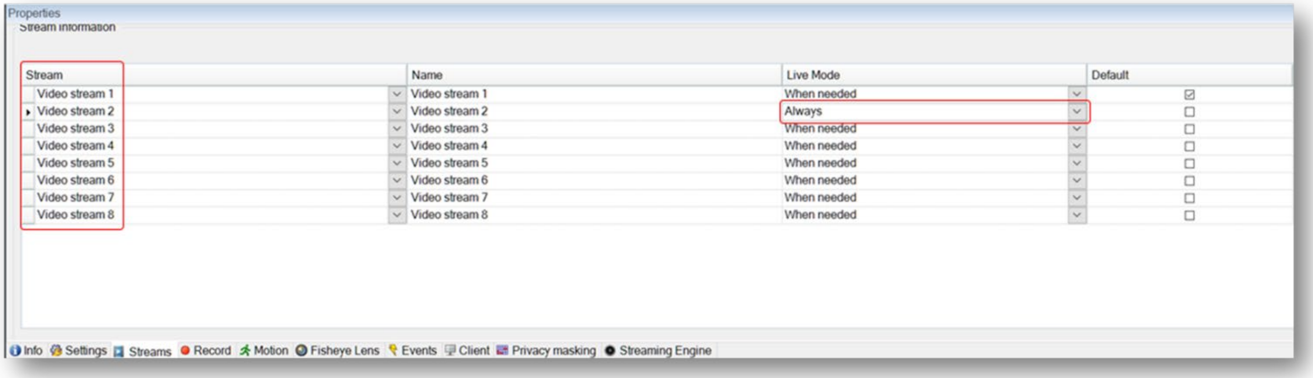
[.../`2`]

[.../`video%20stream%202`]

For other devices the naming can differ, instead of default name of [**Video stream 1**] this might be [**JPEG**] in this case this would be what is used.

[.../`JPEG`]

When using sub-video streams ensure the video stream to be used is included in the `Streams` tab as a secondary stream. Update `Live Mode` for this video stream to `Always`, without this enabled the video stream is not made available as live to the Streaming Engine from Milestone.



Properties

Stream information

Stream	Name	Live Mode	Default
Video stream 1	Video stream 1	When needed	☑
Video stream 2	Video stream 2	Always	□
Video stream 3	Video stream 3	When needed	□
Video stream 4	Video stream 4	When needed	□
Video stream 5	Video stream 5	When needed	□
Video stream 6	Video stream 6	When needed	□
Video stream 7	Video stream 7	When needed	□
Video stream 8	Video stream 8	When needed	□

http://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/2

http://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/JPEG

http://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/video%20stream%202

This would be the full URL with the stream parameter.

[.../`<stream>/<fps>`]

<fps> = This indicates the frames per second used for the MJPEG stream.

For the best performance match the frames per second used by the stream in Milestone. Check the camera channel settings, for some cameras this is set in the web interface.

http://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/2/15

This is an example with 15FPS set for the MJPEG stream.

[.../`<stream>/<fps>/<resolution>`]

<resolution> = This indicates the resolution used for the MJPEG stream. Use `<width>x<height>` to set this parameter.

For the best performance match the resolution used by the stream in Milestone. Check the camera channel settings, for some cameras this is set in the web interface. The performance will be less affected by a change to the resolution but ensure the aspect ratio matches the stream used so the stream displays best. (Aspect Ratio Calculator (ARC) (hedges.name))

http://192.168.0.100:8554/63c02a95-4d86-4d63-95ac-b3b755784c7d/2/15/1280x720

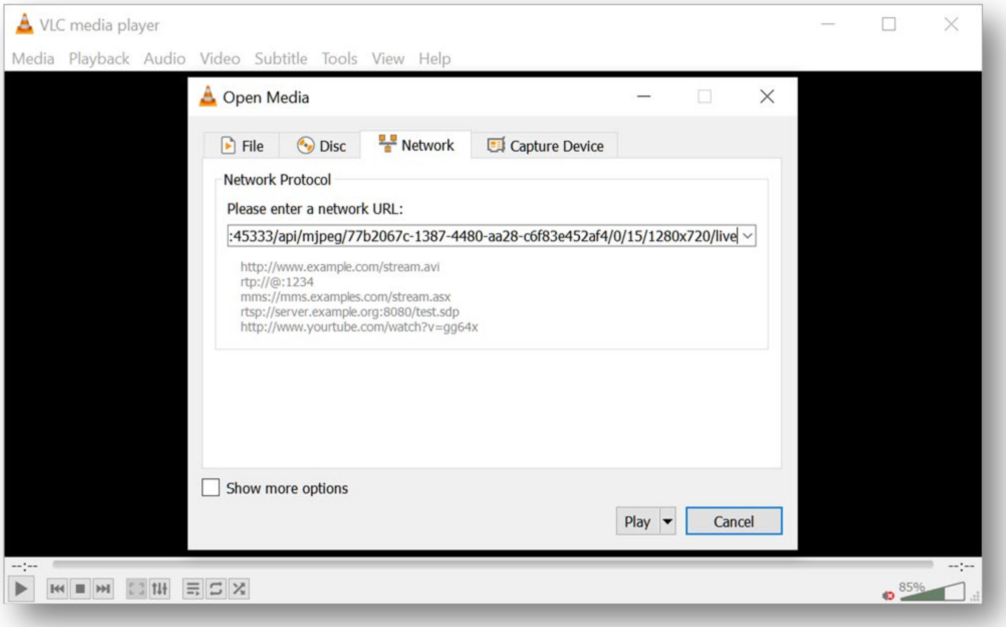
This is an example with the resolution set to a width of 1280 and a height of 720 (16:9 aspect ratio).

[.../`<stream>/<fps>/<resolution>/live`]

/live = This completes the URL and will allow the stream to connect.

MJPEG URL Test

Open `VLC Player` and select `Media`, then `Open Network Stream`...
Create the URL for the video channel you intend to use and enter this in the network URL text box.
Use `127.0.0.1` or `localhost` when connecting locally from the Streaming Engine server. Click `Play`.



Network Protocol

Please enter a network URL:

:45333/api/mjpeg/77b2067c-1387-4480-aa28-c6f83e452af4/0/15/1280x720/live

http://www.example.com/stream.avi
rtp://@:1234
mms://mms.examples.com/stream.asx
rtsp://server.example.org:8080/test.sdp
http://www.yourtube.com/watch?v=gg64x

□ Show more options

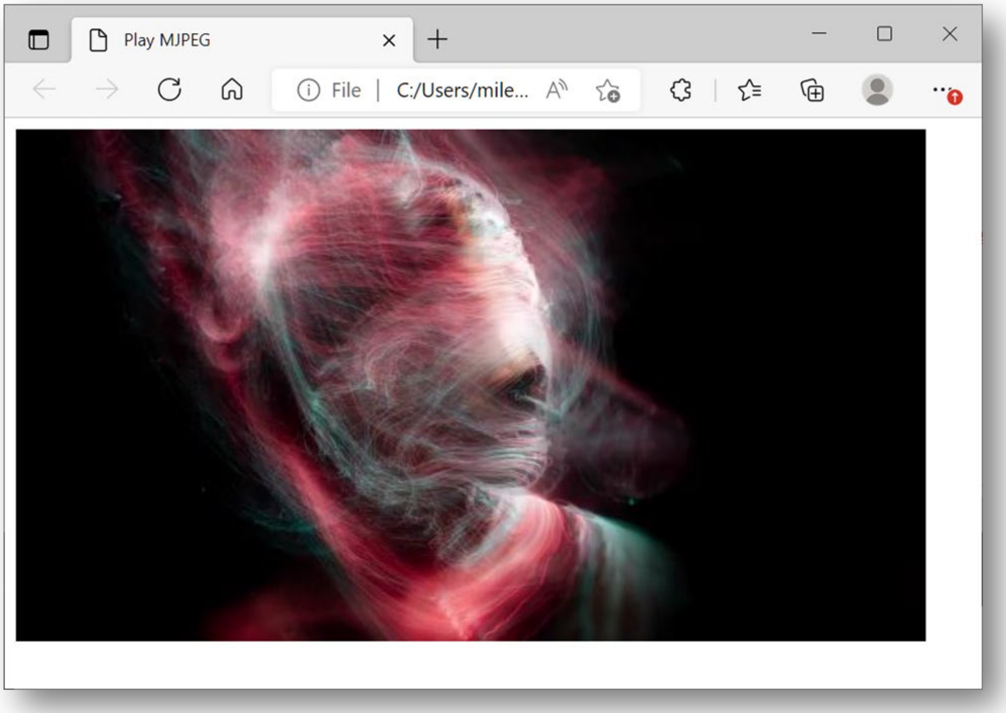
MJPEG Webpage Example

Once we have established that video stream works via a HTTP stream request, we are able to take this video stream to a web page.

MJPEG has great browser support, the HTML code used is very simple. Displaying a MJPEG video is the same code used to display an image on a web page.

Below is a very basic HTML code example that will display the HTTP or HTTPS source in a webpage.

```
<!DOCTYPE html>
<html lang="en">
 <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>Play MJPEG</title>
 </head>
 <body>
    <img src="http://192.168.0.13:45333/api/MJPEG/77b2067c-1387-4480-aa28-c6f83e452af4/Live">
 </body>
</html>
```



This below example is our advance HTML code example. This creates a full screen 4-way tile layout. This best suite an installation with the Milestone Management Server and Streaming Engine on the same machine as this utilizes the already installed Microsoft IIS web service.

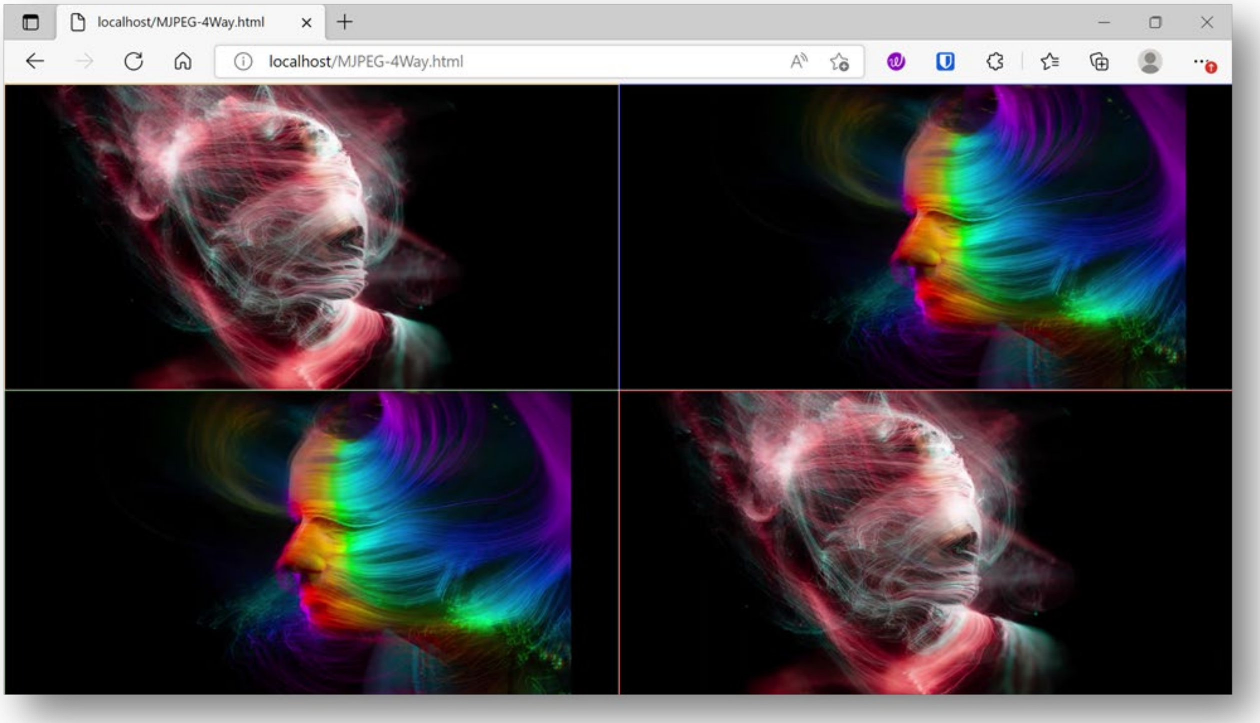
Create a HTML file with the code below and make changes to only the sections highlighted in red. Once updated move the file to `C:\inetpub\wwwroot\` on the Milestone Management Server.

Note down the full file name of your HTML file then in a browser enter http://localhost/<file-name> or https://localhost/<file-name> . This page will be accessible across the network in the same way http://<server-ip>/installation is available for installation of the Client applications.

Files in `\wwwroot\` are protected from editing, to change the HTML file, copy the file to a local directory edit then drop the file back and replace. Refresh the page to show the changes.

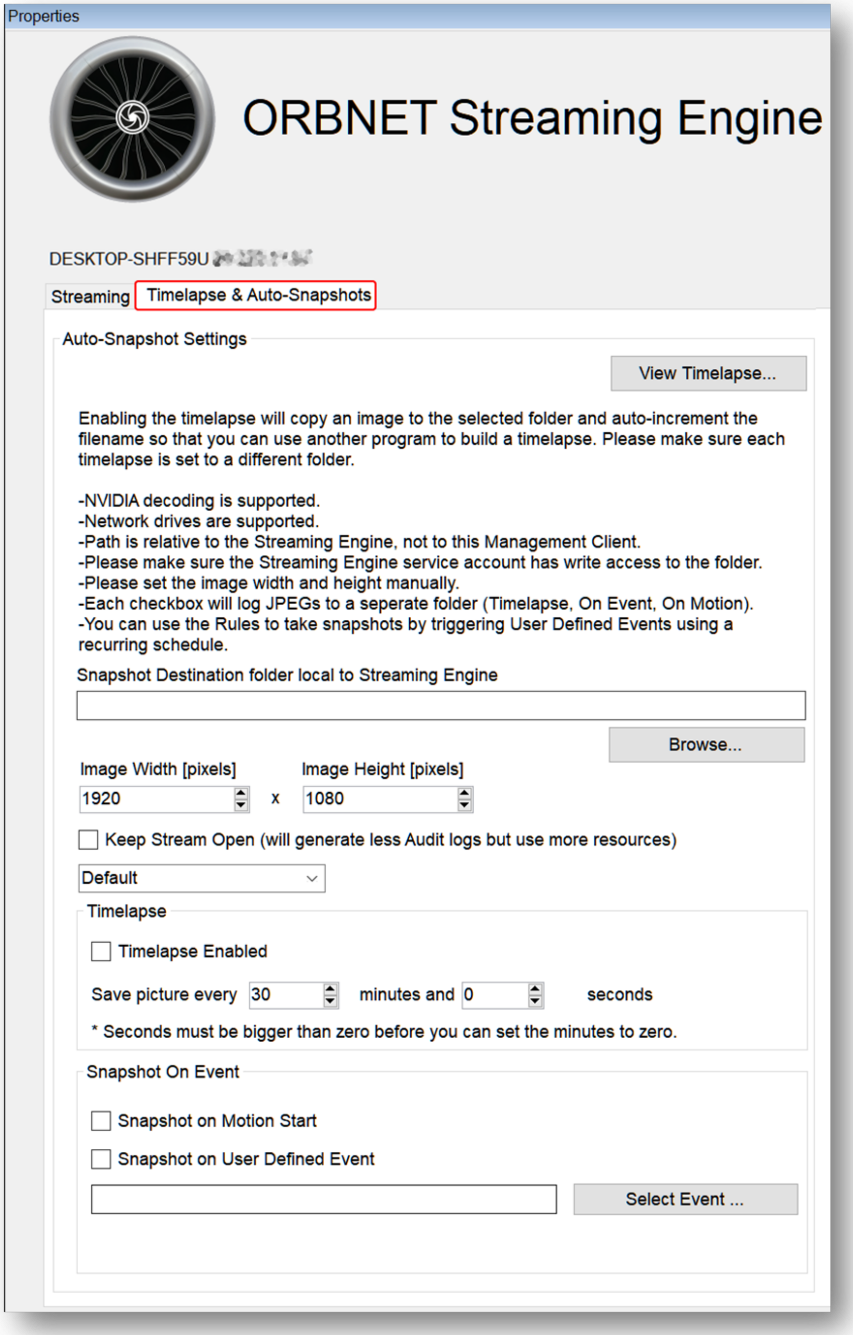
This example uses a java script from http://www.stacksnippet.com/
This is a debug element for java and shows errors in the code.

```
<!DOCTYPE html>
<html lang="en">
 <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <style>
    body {height: 100%; overflow: hidden; padding: 0; margin: 0;}
    img {height: 100%; width: 100%}
    div {position: fixed; width: 50%; height: 50%; border: 1px solid #fff;}
      #NW {top: 0; left: 0; background: orange;}
      #NE {top: 0; left: 50%; background: blue;}
      #SW {top: 50%; left: 0; background: green;}
      #SE {top: 50%; left: 50%; background: red;}
   </style>
  <script src="https://stacksnippets.net/scripts/snippet-javascript-console.min.js?v=1"></script>
 </head>

<body>
    <div id="NW"><img class="stream01live" /></div>
    <div id="NE"><img class="stream02live" /></div>
    <div id="SW"><img class="stream03live" /></div>
    <div id="SE"><img class="stream04live" /></div>

   <script type="text/javascript">

        // Stream Details
        const videostream = "0";
        const videofps     = "15";
        const videoresolutionlink = "1280x720";
        // Stream Details End

        // Stream GUID
        const stream01 = "77b2067c-1387-4480-aa28-c6f83e452af4";
        const stream02 = "63c02a95-4d86-4d63-95ac-b3b755784c7d";
        const stream03 = "c22daebe-a584-492a-913a-e1d9575fcbcd";
        const stream04 = "9b6fcead-6392-4564-a7c8-21674d598887";
        // Stream GUID End

        let host = location.protocol;
        let apiport;
          if (host == "http:") {
             apiport = "45333";
          } else if (host == "https:") {
             apiport = "45334";
          } else {
             apiport = "ERROR!";
          }
        const serveripport = location.protocol + "//" + location.host + ":" + apiport;
        const apicodec = "/api/MJPEG/";
        const videostreampull = "/" + videostream + "/" + videofps + "/" + videoresolutionlink +
"/Live";

        const stream01live = serveripport + apicodec + stream01 + videostreampull;
        const stream02live = serveripport + apicodec + stream02 + videostreampull;
        const stream03live = serveripport + apicodec + stream03 + videostreampull;
        const stream04live = serveripport + apicodec + stream04 + videostreampull;

        function update(className, property, value) {
        Array.from(document.getElementsByClassName(className)).forEach(elem => (elem[property] =
        value))
          }

        update("stream01live", "src", stream01live)
        update("stream02live", "src", stream02live)
        update("stream03live", "src", stream03live)
        update("stream04live", "src", stream04live)

     </script>

 </body>
</html>
```



Timelapse & Auto-Snapshots

Under the Streaming Engine settings tab in the Management Application select the sub-tab within the settings page for `Timelapse & Auto-Snapshots` to access the additional settings.



DESKTOP-SHFF59U [redacted]

Enabling the timelapse will copy an image to the selected folder and auto-increment the filename so that you can use another program to build a timelapse. Please make sure each timelapse is set to a different folder.

-NVIDIA decoding is supported.
-Network drives are supported.
-Path is relative to the Streaming Engine, not to this Management Client.
-Please make sure the Streaming Engine service account has write access to the folder.
-Please set the image width and height manually.
-Each checkbox will log JPEGs to a seperate folder (Timelapse, On Event, On Motion).
-You can use the Rules to take snapshots by triggering User Defined Events using a recurring schedule.

Snapshot Destination folder local to Streaming Engine

Image Width [pixels] 1920 x Image Height [pixels] 1080

□ Keep Stream Open (will generate less Audit logs but use more resources)

Default

Timelapse

□ Timelapse Enabled

Save picture every 30 minutes and 0 seconds

* Seconds must be bigger than zero before you can set the minutes to zero.

Snapshot On Event

□ Snapshot on Motion Start

□ Snapshot on User Defined Event

Timelapse & Auto-Snapshots Guidance

Enabling this timelapse feature will copy an image to the selected folder and auto-increment the filename so that you can use another program to build a timelapse video. Please make sure each camera channel timelapse is set to a different folder.

- NVIDIA decoding is supported.
- Network drives are supported.
  - Be sure to check write speeds of network locations, this can cause high CPU if not able to replace files before a file is written to a location.
- Path is relative to the Streaming Engine, not to this Management client.
- Please make sure the Streaming Engine service account has read/write access to the selected folder.
  - Ensure you check the files are being written to disk.
- Please set the image width and height manually.
  - Check the image size in Milestone, if using a different size check the aspect ratio matches the stream used so the image displays best. (Aspect Ratio Calculator (ARC) (hedges.name))
- Each checkbox will log JPEGs to a separate folder (Timelapse, On Event, On Motion).
- You can use the Rules to take snapshots by triggering User-defined Events using a recurring schedule.

Timelapse & Auto-Snapshots Settings

First set the Snapshot Destination folder local to Streaming Engine by selecting Browse...
A separate folder will be created for each selected feature (Timelapse, On Event, On Motion).

Set the image resolution by changing Image Width and Image Height (default: 1920x1080).

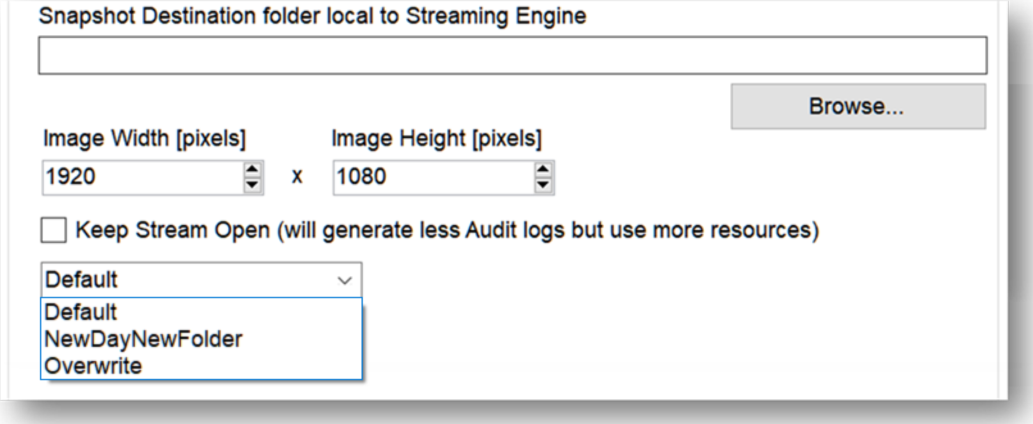
Examples:
(16:9) 320x180, 640x360, 720x567, 1280x720, 1920x1080, 3840x2160
(4:3) 320x240, 640x480, 768x576, 1280x960, 1920x1440, 3840x2880

Keep Stream Open (will generate less Audit logs but use more resources)
This keeps the video stream open in the Steaming Engine service. This is best used when snapshots are set to be taken multiple times a minute.

Save Method (Dropdown menu)

- Default – New file created for each snapshot event
- NewDayNewFolder – New file created in separated day folders

- Overwrite – A single image file is overwritten with the latest saved file each time the timer elapses.



Snapshot Destination folder local to Streaming Engine

Image Width [pixels]: 1920 x Image Height [pixels]: 1080

□ Keep Stream Open (will generate less Audit logs but use more resources)

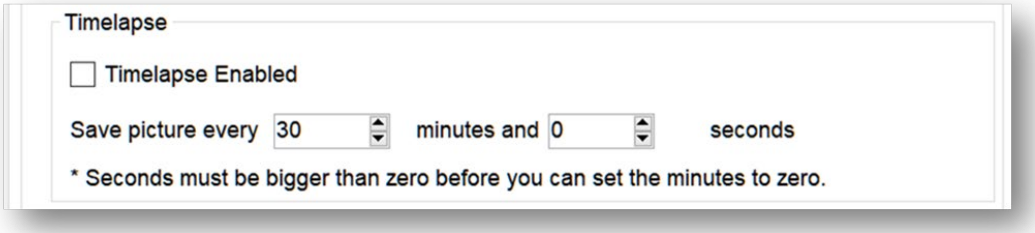
Default

Timelapse Settings

Timelapse Enabled (Tick option) – `Tick` to enable Timelapse to the relevant folder selected

Save picture every `<min>` minutes and `<sec>` seconds – Set the time between images

* Seconds must be bigger than zero before you can set the minutes to zero.



Timelapse

□ Timelapse Enabled

Save picture every 30 minutes and 0 seconds

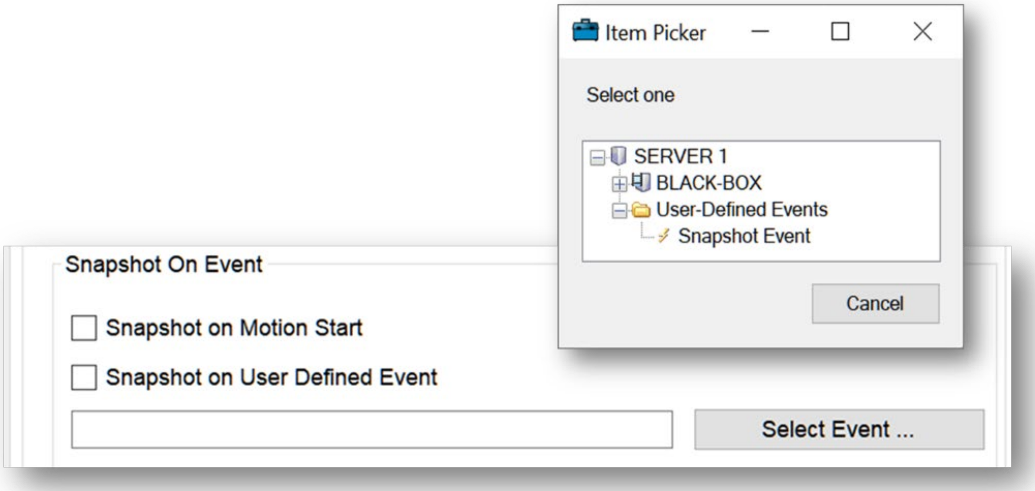
* Seconds must be bigger than zero before you can set the minutes to zero.

Snapshot on Event Settings

Snapshot on Motion Start (Tick option) – `Tick` to enable, this camera must have default Milestone motion detection setup

Snapshot on User Defined Event (Tick option) – `Tick` to enable, select a relevant event to use as the trigger for this option

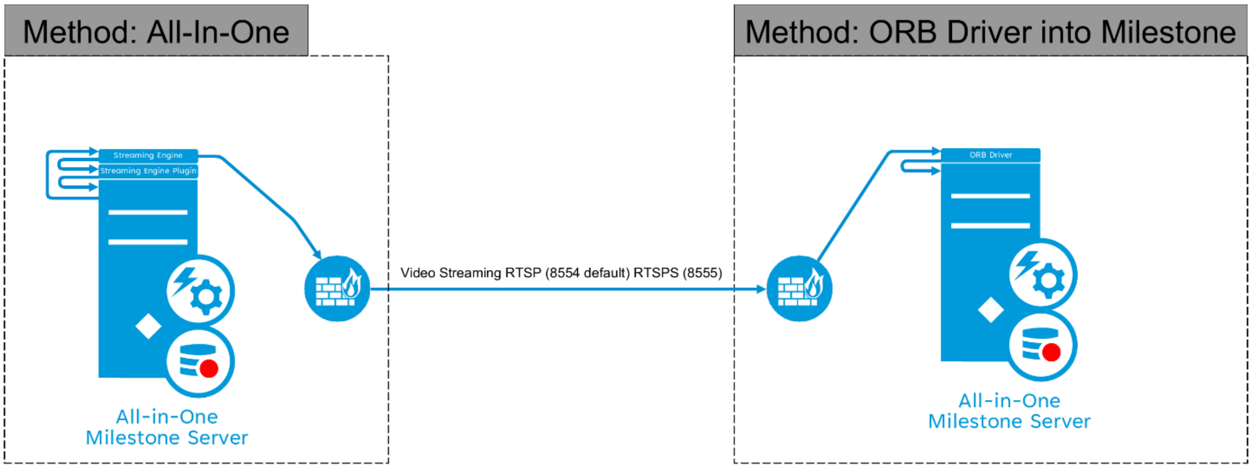
User Defined Event selection - Press `Select Event ...` to add the event assigned to the Snapshot on User Defined Event option



Stream Ingest – RTSP into Milestone

This section outlines the method of sharing a video feed from one Milestone system to another. As shown in Method: ORB Driver to Milestone. This is where the Streaming Engine is used to generate a RTSP video stream at a second Milestone installation uses the ORB Driver (provided by ORBNET Systems) to connect to this video stream.

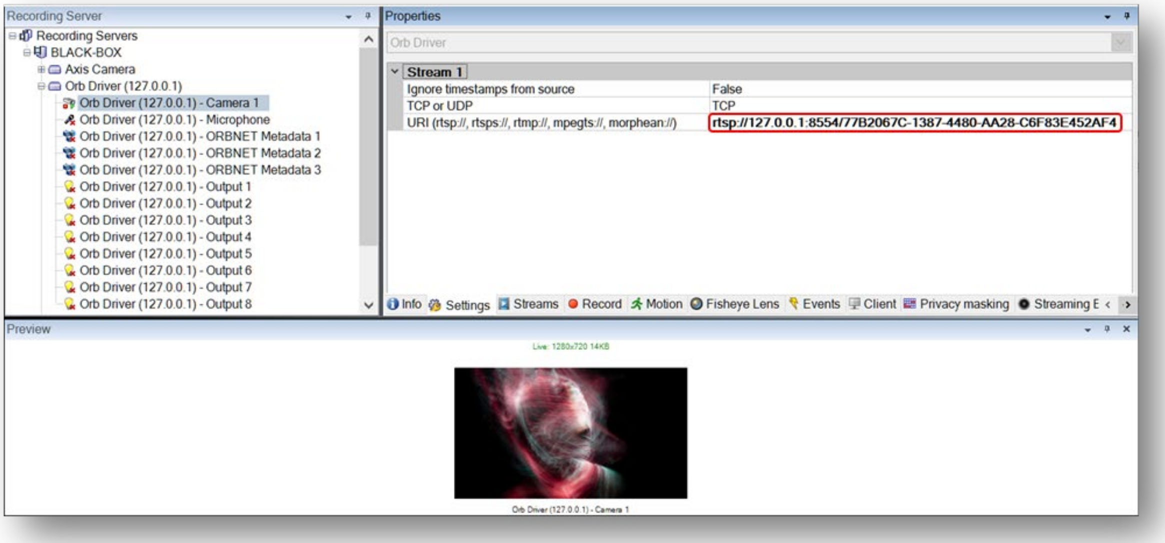
This allows a video source from any paid for Milestone XProtect version to be setup into another Milestone instance, much like Milestone Interconnect™ without the need for a Corporate head end.



🟦 Integrate smaller remote XProtect installations without the need of XProtect Corporate at the central site.

Following the guidance for RTSP Stream setup from this document and the stream will be ready to connect to the second Milestone instance. Add the stream URL in the channel settings (ORB Driver).

Please follow the ORB Driver Installation and User Guide for further detailed information on how to add and setup a video source in Milestone.



Recording Server

- Recording Servers
  - BLACK-BOX
    - Axis Camera
    - Orb Driver (127.0.0.1)
      - Orb Driver (127.0.0.1) - Camera 1
      - Orb Driver (127.0.0.1) - Microphone
      - Orb Driver (127.0.0.1) - ORBNET Metadata 1
      - Orb Driver (127.0.0.1) - ORBNET Metadata 2
      - Orb Driver (127.0.0.1) - ORBNET Metadata 3
      - Orb Driver (127.0.0.1) - Output 1
      - Orb Driver (127.0.0.1) - Output 2
      - Orb Driver (127.0.0.1) - Output 3
      - Orb Driver (127.0.0.1) - Output 4
      - Orb Driver (127.0.0.1) - Output 5
      - Orb Driver (127.0.0.1) - Output 6
      - Orb Driver (127.0.0.1) - Output 7
      - Orb Driver (127.0.0.1) - Output 8

Properties

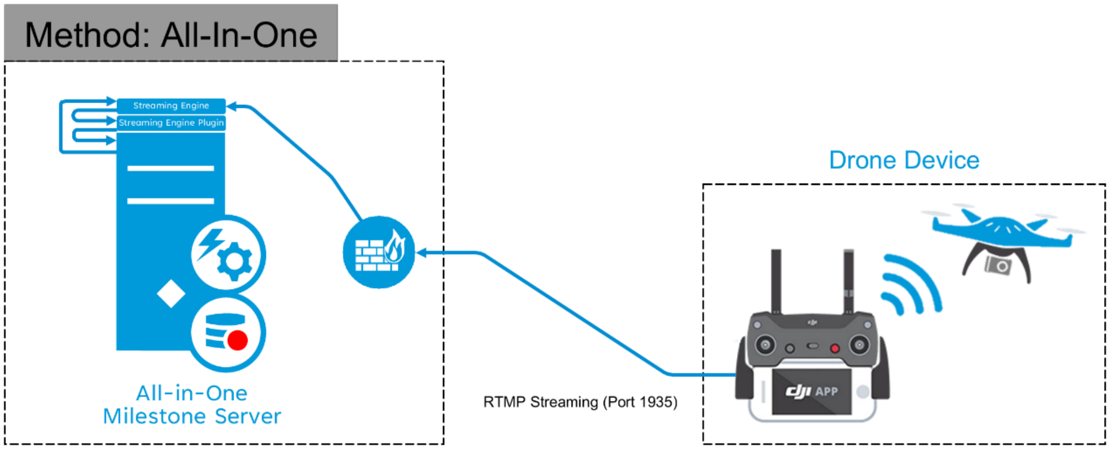
Orb Driver

Stream 1

Ignore timestamps from source	False
TCP or UDP	TCP
URI (rtsp://, rtsps://, rtmp://, mpegts://, morphean://)	rtsp://127.0.0.1:8554/77B2067C-1387-4480-AA28-C6F83E452AF4

Stream Ingest – RTMP into Milestone

This section outlines the method of ingesting RTMP from other external systems / devices. This could be from Drones, mobile phones, screen sharing software, anything that supports RTMP live streaming. This is where the Streaming Engine is used as a RTMP Proxy to receive an RTMP video stream. Then using the ORB Driver (provided by ORBNET Systems) you will be able to connect to this video stream.

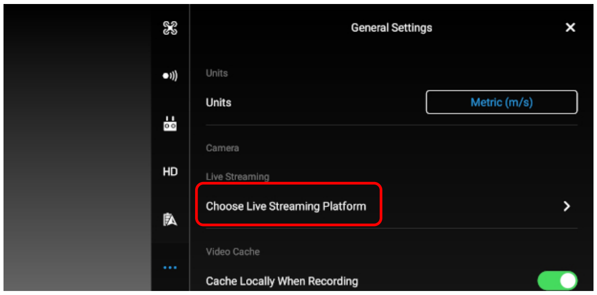


The RTMP URL is the external IP address of the Streaming Engine plus the default RTMP port (**1935**). Use a custom stream key of your choosing (example “hd3a25w3tzf2”). Use a password generator, removing Uppercase and Symbols.

URL = [`rtmp://<streaming-engine-ip>/live/<stream-key>`]

For this example, we will use the DJI Go 4 app.

From General Settings select `Choose Live Streaming Platform`, select `RTMP Custom`, Enter the RTMP URL with the custom Stream Key, click `Next` then `Start` to begin live streaming.



General Settings

Units

Units: Metric (m/s)

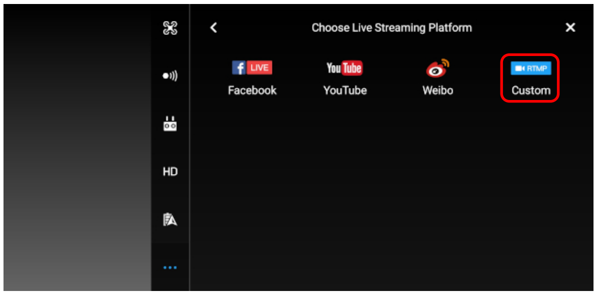
Camera

Live Streaming

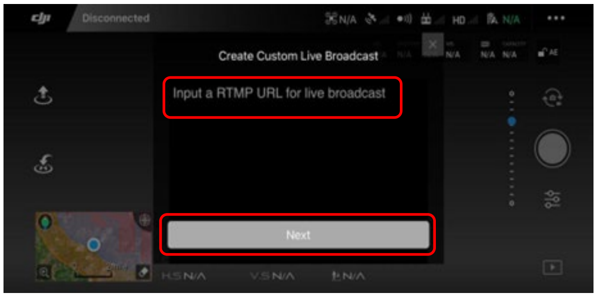
Choose Live Streaming Platform

Video Cache

Cache Locally When Recording

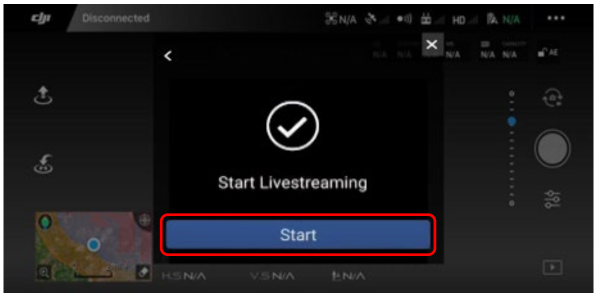


Choose Live Streaming Platform



Create Custom Live Broadcast

Input a RTMP URL for live broadcast



Start Livestreaming

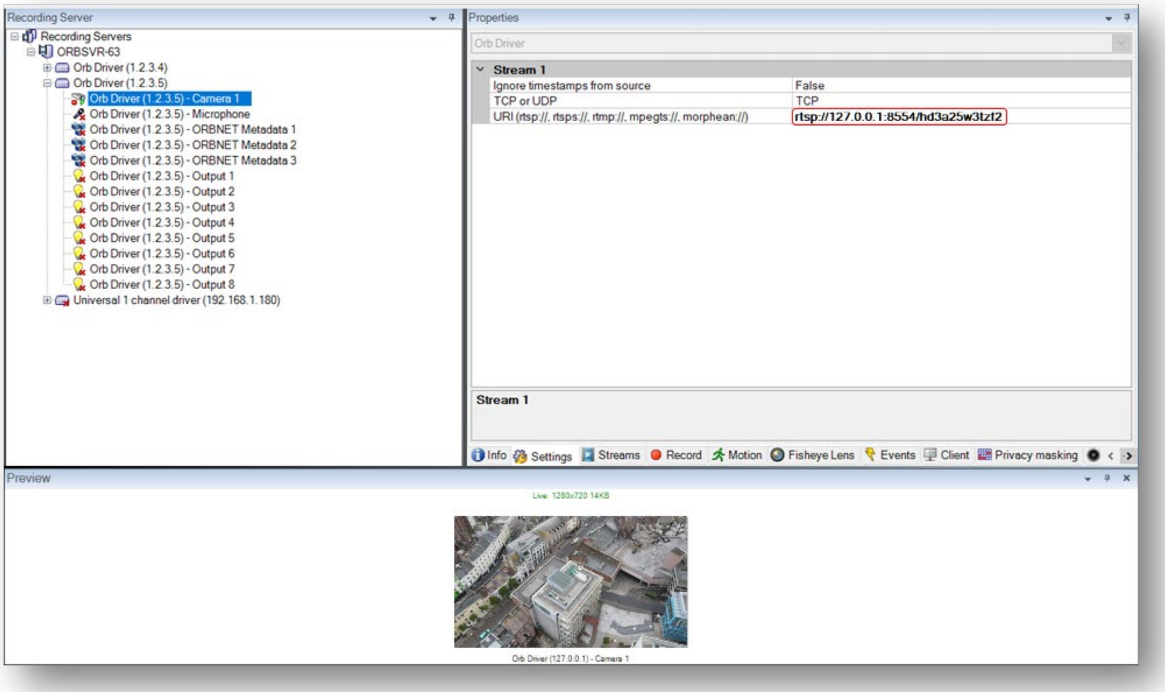
Once the RTMP stream is received by the Streaming Engine the video channel is restreamed as a RTSP channel. The URL for this channel is the IP of the local Streaming Engine instance, plus the stream key used in the previous step.

URL = [`rtsp://<streaming-engine-ip>:8554/<stream-key>`]

From the ORB Driver device, select the `video channel`, then the `Settings` tab, Add the **`stream URL`** in the channel settings.

Please note that there is a '`/live`' parameter necessary in the RTMP URL but that must **not** be included in the RTSP URL.

Please follow the ORB Driver Installation and User Guide for further detailed information on how to add and setup a video source in Milestone.



Recording Server

- Recording Servers
  - ORBSVR-63
    - Orb Driver (1.2.3.4)
    - Orb Driver (1.2.3.5)
      - Orb Driver (1.2.3.5) - Camera 1
      - Orb Driver (1.2.3.5) - Microphone
      - Orb Driver (1.2.3.5) - ORBNET Metadata 1
      - Orb Driver (1.2.3.5) - ORBNET Metadata 2
      - Orb Driver (1.2.3.5) - ORBNET Metadata 3
      - Orb Driver (1.2.3.5) - Output 1
      - Orb Driver (1.2.3.5) - Output 2
      - Orb Driver (1.2.3.5) - Output 3
      - Orb Driver (1.2.3.5) - Output 4
      - Orb Driver (1.2.3.5) - Output 5
      - Orb Driver (1.2.3.5) - Output 6
      - Orb Driver (1.2.3.5) - Output 7
      - Orb Driver (1.2.3.5) - Output 8
    - Universal 1 channel driver (192.168.1.180)

Properties

Orb Driver

Stream 1	
Ignore timestamps from source	False
TCP or UDP	TCP
URI (rtsp://, rtsps://, rtmp://, mpegts://, morphean://)	rtsp://127.0.0.1:8554/hd3a25w3tzf2

Stream 1

Stream Ingest – MP4 to Web

This section outlines a method of using the streaming engine to stream an MP4 video file over HTTP.

Any MP4 video file can be streamed in a browser if it is placed in this hardcoded location: `C:\ProgramData\ORBNET\Streaming Engine\MP4\` (The MP4 folder must be created)

MP4 Stream URL Formation

URL = [`http://<streaming-engine-ip>:<port>/API/MP4/<video-filename>`]

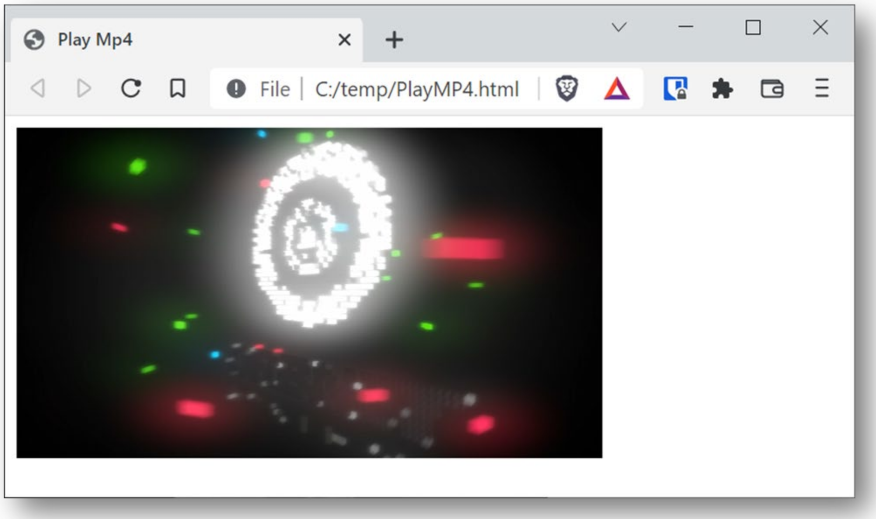
Example: `http://127.0.0.1:45333/api/MP4/pixelated-3d-logo-video.mp4`

Navigate to the URL in a browser or use the example HTML page below.

MP4 Webpage Example

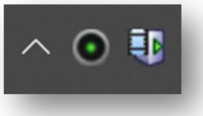
This is a basic webpage example for showing the MP4 file in a web browser.

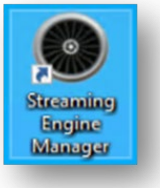
```html
<!DOCTYPE html>
<html>
 <head>
    <meta charset=utf-8 />
    <meta name="viewport" content="width=device-width, initial-scale=1">
   <title>Play Mp4</title>
 </head>
<body>

 <video autoplay controls muted loop>
  <source src="http://127.0.0.1:45333/api/MP4/pixelated-3d-logo-video.mp4" type="video/mp4" />
 </video>

</body>
</html>
```



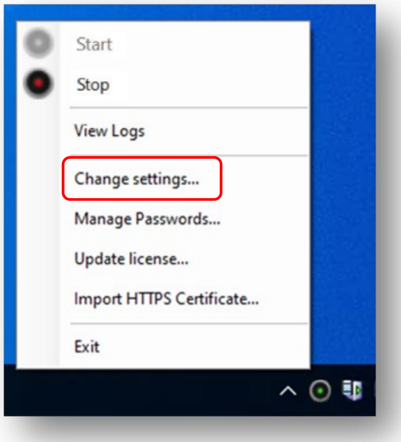
Advance Streaming Engine Settings

Find the Streaming Engine Manager in the taskbar. If the task icon is not showing, check that it is not hidden in the system tray or run from the desktop shortcut to open.

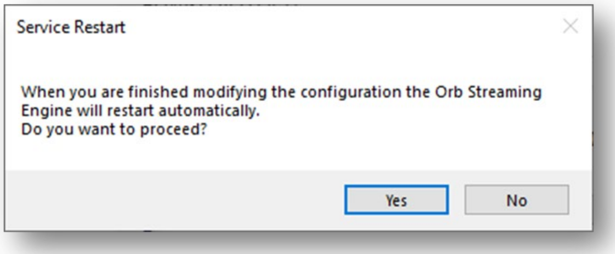




Right click the tray icon and select `Change settings…`



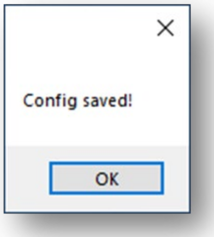
Service Restart confirmation, Click `Yes`



Service Restart

When you are finished modifying the configuration the Orb Streaming Engine will restart automatically.
Do you want to proceed?

Finish your configuration changes then exit with the cross at the top right of this window. You will get a message “`Config saved!`”



Config saved!

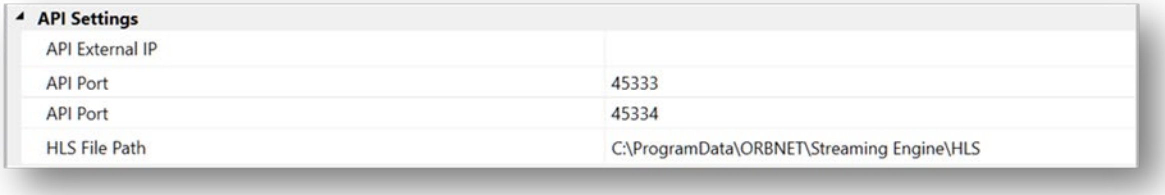
API Settings

This is a service built into the Streaming Engine that provides channel information via API calls. This would best suit a third-part application that is able to receive custom commands. The API service also handles MJPEG and HLS Streams.

API External IP Certain API requests will respond with a stream URL. Use this field to determine which IP address (local or public IP) will appear in the responses when requesting streams via the API.

API Port default port of 45333, used for API connections to the Streaming Engine

API Port (Secure) default port of 45334, used for API connections to the Streaming Engine



API Settings	
API External IP	
API Port	45333
API Port	45334
HLS File Path	C:\ProgramData\ORBNET\Streaming Engine\HLS

Milestone Connection Settings

These settings relate to the local instance of Milestone the Streaming Engine will be connected to.

Log in with service account credentials (See **Changing a service account** in this document)

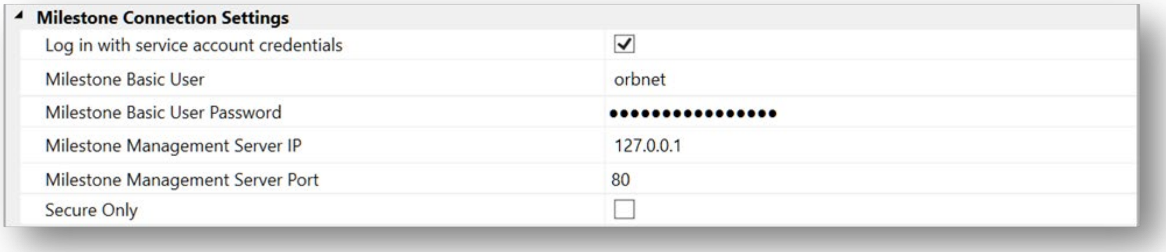
[Uses the windows account that is running the "ORBNET Streaming Engine" service to login to Milestone. If set to true, you must change the service user from "Network Service" to a domain service account of your choosing and add the service account to Milestone security roles.]

Milestone Basic User (See **Basic user setup** in this document)

[This is a uses a Milestone created basic user account, the account needs to be added to a relevant Milestone security role. Only works if "Log in with service account" is set to false.]

Fill out the correct Milestone Management Server IP address and port.

Tick Secure Only if you have installed Milestone using a Management Server certificate.



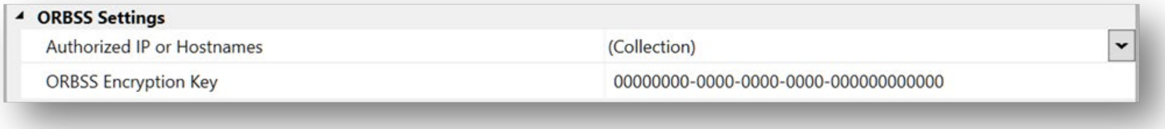
Milestone Connection Settings	
Log in with service account credentials	☑
Milestone Basic User	orbnet
Milestone Basic User Password	●●●●●●●●●●●●●●●●
Milestone Management Server IP	127.0.0.1
Milestone Management Server Port	80
Secure Only	☐

ORBSS Settings

ORBSS is an internal system of the Streaming engine that offers an additional layer of security for proxying streams through more than one Streaming Engines. This feature can be used to re-stream unsecure cameras securely through a chain of Streaming Engines.

Authorized IP or Hostnames when an IP or hostname is entered (one per line) the streaming engine will only allow Streaming Engines with these IP addresses to pull streams through it.

ORBSS Encryption Key this is used to encrypt video data between two instances of the Streaming Engine. This is where the second instance of the Streaming Engine is used as a proxy for the transmitting Streaming Engine instance. The encryption key must be the same on both sides for the ORBSS stream encryption to be active.



ORBSS Settings

Authorized IP or Hostnames	(Collection)
ORBSS Encryption Key	00000000-0000-0000-0000-000000000000

RTSP Server Settings

These options allow for a fine level of RTSP advance setting changes.

Brutal Socket Termination this will terminate any clients trying to connect to prohibited cameras.

Close Broken Streams the stream does not teardown if Milestone loses the connection to the cameras stream. Only use this if your streaming client does not shutdown or re-initialize when a camera feed is lost and comes back online.

FFMPEG Export path the Streaming Engine will store video clips here when they are export from the Streaming Engine Smart Client Plugin

Keep Alive Timeout in seconds (0 = no timeout) Number of seconds before the Streaming Engine will teardown a requested feed if no RTSP keep alive (GET_PARAMETER / SET_PARAMETER) is received. Set this value to 120 seconds if working exclusively with UDP.##

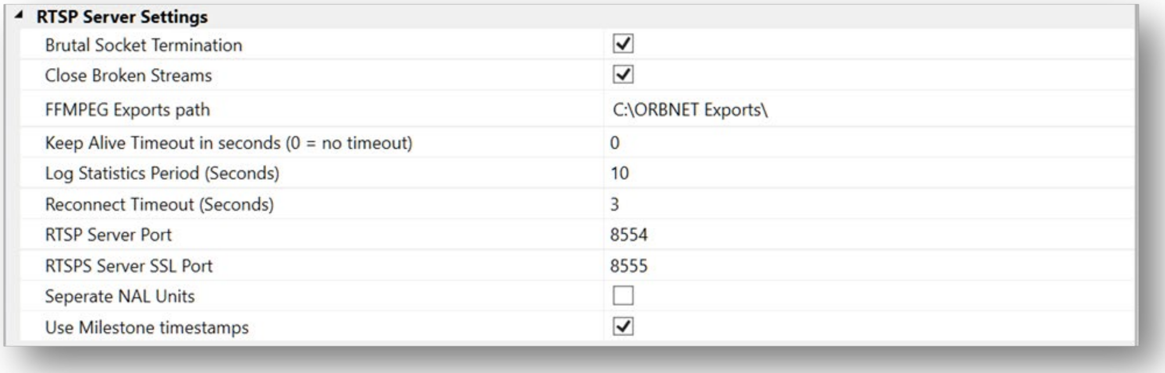
Log Statistics Period (Seconds) number of seconds between logging of statistics on each active stream.

RTSP Server Port default port of 8554, this is used when establishing RTSP connections

RTSP Server SSL Port default port of 8555, this is used when establishing secure RTSP connections

Separate NAL Units video streams over RTSP send packets over the internet in groups of frames or NAL units. Setting this parameter will send all video frames over the network frame by frame. Set this parameter to true if your streaming client has issues or artifacts while decoding frames from certain cameras.

Use Milestone timestamps use this parameter to let the Streaming Engine generate the RTSP timestamps instead of re-using the timestamps stored in Milestone. Set this parameter to true if you are experiencing late frame decoding errors due to faulty Milestone drivers.



RTSP Server Settings

Brutal Socket Termination	☑
Close Broken Streams	☑
FFMPEG Exports path	C:\ORBNET Exports\
Keep Alive Timeout in seconds (0 = no timeout)	0
Log Statistics Period (Seconds)	10
Reconnect Timeout (Seconds)	3
RTSP Server Port	8554
RTSPS Server SSL Port	8555
Seperate NAL Units	☐
Use Milestone timestamps	☑

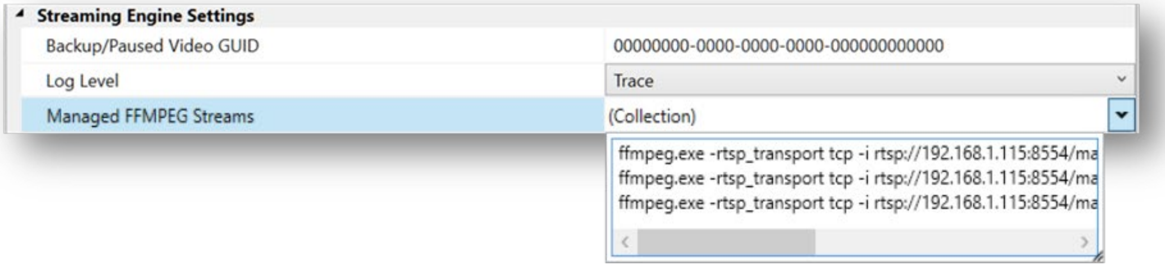
Streaming Engine Settings

These options allow for additional Streaming Engine service advance setting changes.

Backup/Paused Video GUID when video connection issues occur, or the video channel is paused in Milestone this is the GUID ID of the camera device that will be used. This helps the Streaming Engine process the video feed correctly and close a relevant open socket port till the video is re-established.

Log Level three options Normal, Debug and Trace. Normal provides all general information required for audit purposes. Debug can be used to help with troubleshooting of a video channel or service connections. Trace is best for short bursts as it will create a large sized log file in a short time. This should be used only when requested by ORBNET support for assistance with advance streaming.

Managed FFMPEG Streams This feature allows you to use your own command line arguments to create instances of FFMPEG. FFMPEG can be used to convert video files but also to transcode live streams. Any FFMPEG command that you test in a command prompt should work the same here. The Streaming Engine will create the FFMPEG process in the backend and keep it alive for you. If the FFMPEG process stops or stops converting, the Streaming Engine will attempt to restart it automatically.



Streaming Engine Settings

Backup/Paused Video GUID	00000000-0000-0000-0000-000000000000
Log Level	Trace
Managed FFMPEG Streams	(Collection)

```
ffmpeg.exe -rtsp_transport tcp -i rtsp://192.168.1.115:8554/ma
ffmpeg.exe -rtsp_transport tcp -i rtsp://192.168.1.115:8554/ma
ffmpeg.exe -rtsp_transport tcp -i rtsp://192.168.1.115:8554/ma
```

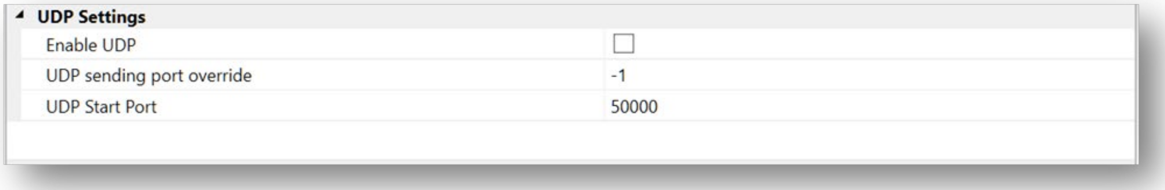
UDP Settings

As default the Streaming Engine will send streams as TCP, this setting section allows the Streaming Engine to also utilize UDP.

Enable UDP tick to enable UDP for all streams

UDP sending port override (default -1) use this parameter to force the Streaming Engines local UDP port for sending video streams. This parameter is only useful for sending UDP Streams through routers.

UDP Start Port (default 50000) the Streaming Engine will use a range of UDP ports from <UDP Start Port> to 65535 to send out video streams. RTSP over UDP utilizes a pair of ports per connection.



UDP Settings	
Enable UDP	□
UDP sending port override	-1
UDP Start Port	50000

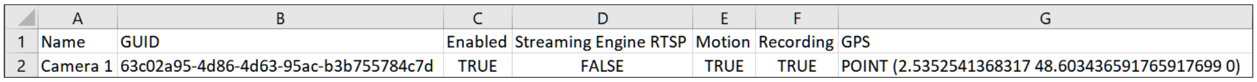
Streaming Engine API Data

CSV Export – Cameras Information

Go http://<streaming-engine-IP>:45333/API/CSV/cameras/

A CSV file will be downloaded immediately, following the below format.

```
Name,GUID,Enabled,Streaming Engine RTSP,Motion,Recording,GPS
Camera 1,63c02a95-4d86-4d63-95ac-b3b755784c7d,True,False,True,True,POINT
(2.5352541368317 48.603436591765917699 0)
```



	A	B	C	D	E	F	G
1	Name	GUID	Enabled	Streaming Engine RTSP	Motion	Recording	GPS
2	Camera 1	63c02a95-4d86-4d63-95ac-b3b755784c7d	TRUE	FALSE	TRUE	TRUE	POINT (2.5352541368317 48.603436591765917699 0)

Name camera name taken from Milestone.

GUID unique camera reference ID taken from Milestone.

Enabled (TRUE / FALSE) shows TRUE when video stream is enabled in Milestone.

Streaming Engine RTSP (TRUE / FALSE) shows TRUE when RTSP streaming is ticked in Streaming Engine tab for video channel.

Motion (TRUE / FALSE) shows TRUE when motion recording is enabled in Milestone.

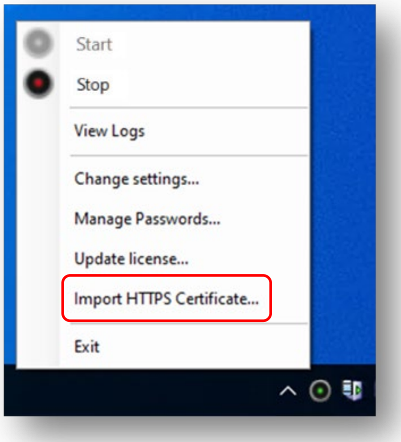
Recording (TRUE / FALSE) shows TRUE when recording is enabled in Milestone.

GPS (POINT EMPTY / POINT (GPS Position) this is taken from the video channel settings in Milestone.

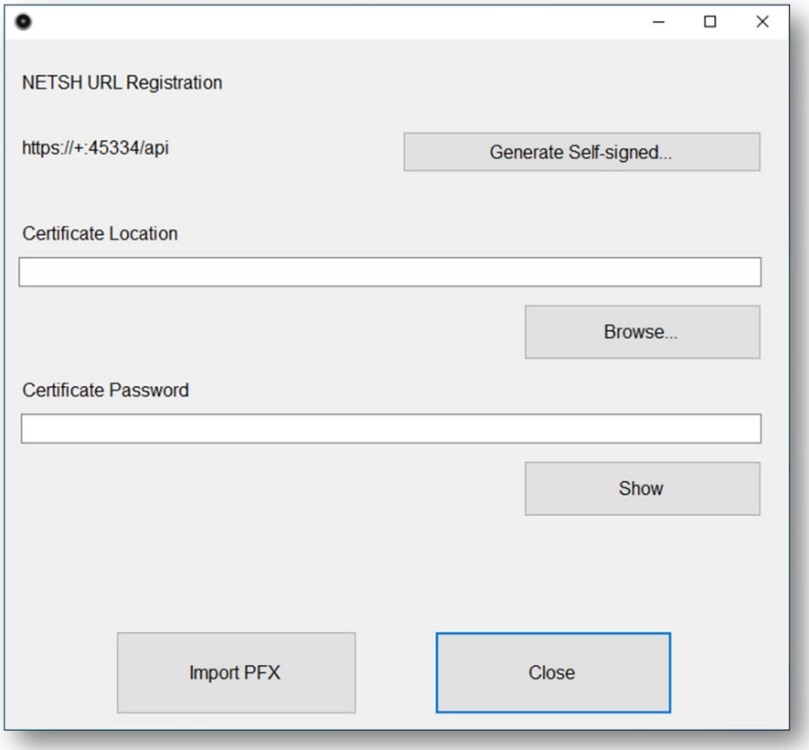
Import HTTPS Certificate

Find the Streaming Engine Manager in the taskbar. If the task icon is not showing, check that it is not hidden in the system tray or run from the desktop shortcut to open.

Right click the tray icon and select **`Change settings`**…

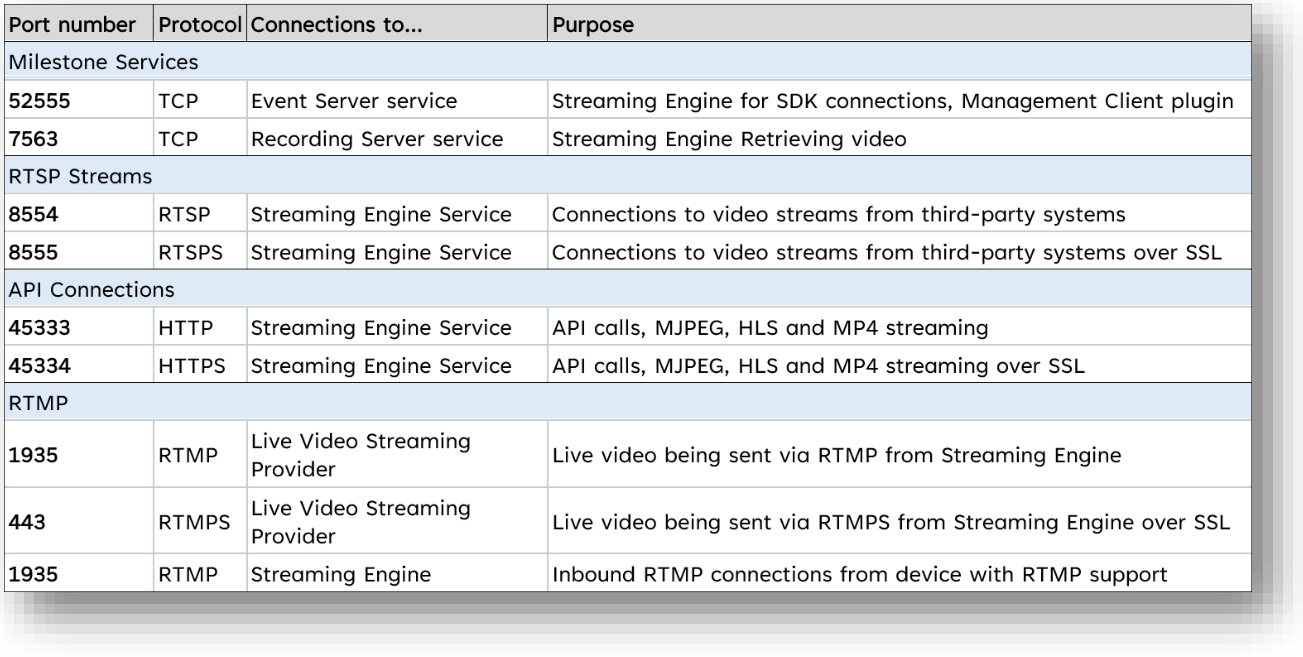


The Streaming Engine Certificate Importer window will follow. This allows you **`Generate Self-signed`** certificate, **`Import`** a Certificate authority signed certificate via **`Browse`** and specify the **`Certificate Password`** via the input field. When complete run Import PFX to complete the HTTPS setup.



System TCP/IP Ports Used

Below lists the default ports used by the Streaming Engine and Milestone to use the relevant services.



Port number	Protocol	Connections to...	Purpose
Milestone Services			
52555	TCP	Event Server service	Streaming Engine for SDK connections, Management Client plugin
7563	TCP	Recording Server service	Streaming Engine Retrieving video
RTSP Streams			
8554	RTSP	Streaming Engine Service	Connections to video streams from third-party systems
8555	RTSPS	Streaming Engine Service	Connections to video streams from third-party systems over SSL
API Connections			
45333	HTTP	Streaming Engine Service	API calls, MJPEG, HLS and MP4 streaming
45334	HTTPS	Streaming Engine Service	API calls, MJPEG, HLS and MP4 streaming over SSL
RTMP			
1935	RTMP	Live Video Streaming Provider	Live video being sent via RTMP from Streaming Engine
443	RTMPS	Live Video Streaming Provider	Live video being sent via RTMPS from Streaming Engine over SSL
1935	RTMP	Streaming Engine	Inbound RTMP connections from device with RTMP support

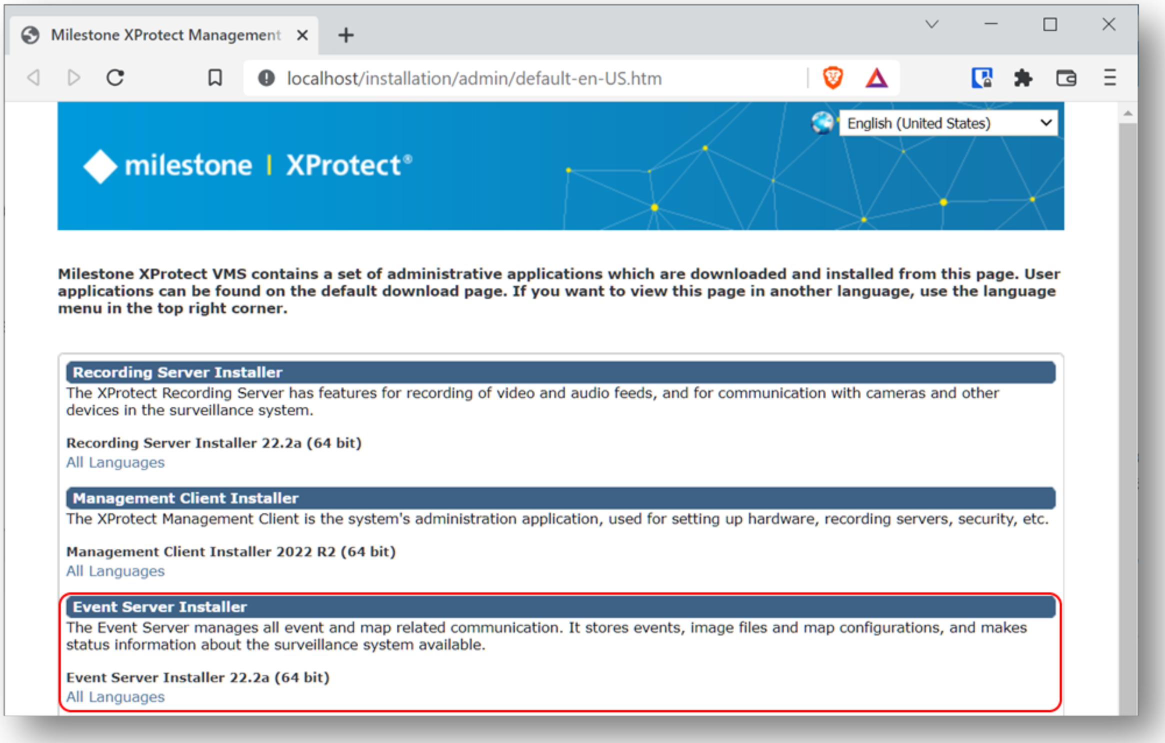
Troubleshooting

Event Server Installation

If Milestone was installed via a custom installation, the Event service may not have been included as it is not always required.

From the server/machine with the Milestone Management service follow to http://localhost/installation/admin/ (Some installations will require a port following the server's name or IP address)

This will provide a Milestone installation page where you will be about to run the installer for the Event Server. This must be installed so the ORBNET plugin can communicate with Milestone.


Milestone XProtect Management
localhost/installation/admin/default-en-US.htm
English (United States)
milestone | XProtect®

Milestone XProtect VMS contains a set of administrative applications which are downloaded and installed from this page. User applications can be found on the default download page. If you want to view this page in another language, use the language menu in the top right corner.

Recording Server Installer

The XProtect Recording Server has features for recording of video and audio feeds, and for communication with cameras and other devices in the surveillance system.

Recording Server Installer 22.2a (64 bit)

All Languages

Management Client Installer

The XProtect Management Client is the system's administration application, used for setting up hardware, recording servers, security, etc.

Management Client Installer 2022 R2 (64 bit)

All Languages

Event Server Installer

The Event Server manages all event and map related communication. It stores events, image files and map configurations, and makes status information about the surveillance system available.

Event Server Installer 22.2a (64 bit)

All Languages