Milestone Systems

Milestone® ONVIF Bridge

Getting started guide

milestone

Contents

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Overview

Milestone ONVIF Bridge (explained)

ONVIF is an open, global forum that is working to standardize and secure the way that IP video surveillance products communicate. The goal is to make it easy to exchange video data. For example, to enable law enforcement, surveillance centers, or similar organizations to quickly access live and recorded video streams in any IP-based surveillance system.

Milestone Systems wants to support this goal, and has developed the Milestone ONVIF Bridge toward that end. Milestone ONVIF Bridge is a part of the Milestone Open Platform, and offers an interface that supports the parts of the ONVIF standard for retrieving live and recorded video from any Milestone VMS product.

This document provides the following:

- Information about the ONVIF standard and links to reference materials

- Instructions for installing and configuring the Milestone ONVIF Bridge in your XProtect VMS product

- Examples of how to enable various types of ONVIF clients to stream live and recorded video from XProtect VMS products

Milestone ONVIF Bridge and the ONVIF standard

The ONVIF standard facilitates information exchange by defining a common protocol. The protocol contains ONVIF profiles, which are collections of specifications for interoperability between ONVIF compliant devices.

Milestone ONVIF Bridge is compliant with the parts of ONVIF Profile G and Profile S that provide access to live and recorded video, and the ability to control pan-tilt-zoom cameras:

- Profile G - Provides support for video recording, storage, search, and retrieval. For more information, see ONVIF Profile G Specification (https://www.onvif.org/profiles/profile-g/)

- Profile S - Provides support for streaming live video using the H.264 codec, audio streaming, and pan-tilt-zoom (PTZ) controls. For more information, see ONVIF Profile S Specification (https://www.onvif.org/profiles/profile-s/)

For more information about the ONVIF standard, see the ONVIF® website (https://www.onvif.org/).

ONVIF Profiles support "get" functions that retrieve data, and "set" functions that configure settings. Each function is either mandatory, conditional, or optional. For security reasons, Milestone ONVIF Bridge supports only the mandatory, conditional, and optional "get" functions that do the following:

- Request video

- Authenticate users

- Stream video

- Play recorded video

ONVIF clients (explained)

ONVIF clients are computer appliances or software programs that use ONVIF Webservices. Examples of ONVIF clients are servers, media players, IP-based surveillance systems, or bridges like the Milestone ONVIF Bridge.

The Real Time Streaming Protocol (RTSP) is used to establish and control media sessions between two or more endpoints. The Milestone ONVIF Bridge uses ONVIF Profile S and RTSP to handle requests for video from an ONVIF client, and to stream video from an XProtect installation to the ONVIF client.

By default, communication between ONVIF clients and the ONVIF Bridge server uses the following ports:

- ONVIF port 580. ONVIF clients use this port to submit requests for video streams

- RTSP port 554. Milestone ONVIF Bridge uses this port to stream video to ONVIF clients

ONVIF clients can access the RTSP port on the Milestone ONVIF Bridge directly. For example, the VLC media player or a VLC plug-in in a browser can retrieve and display video. This is described in this document in Use a media player to view a video stream on page 18.

You can use different ports to, for example, avoid a port conflict. If you change the port numbers, you must also update the RTSP stream for the ONVIF client URI.

RTSP supports only the H.264 codec. Cameras must be able to stream video in the H.264 codec.

Milestone ONVIF Bridge interoperability

The Milestone ONVIF Bridge is comprised of the following components:

- Milestone ONVIF Bridge server

- Milestone ONVIF Bridge 32-bit plug-in for Management Application

- Milestone ONVIF Bridge 64-bit plug-in for Management Client

The following illustration shows a high-level view of the interoperability between an ONVIF client, the Milestone ONVIF Bridge, and XProtect VMS.

> ✎ Milestone recommends that you install the ONVIF Bridge server in a demilitarized zone (DMZ).
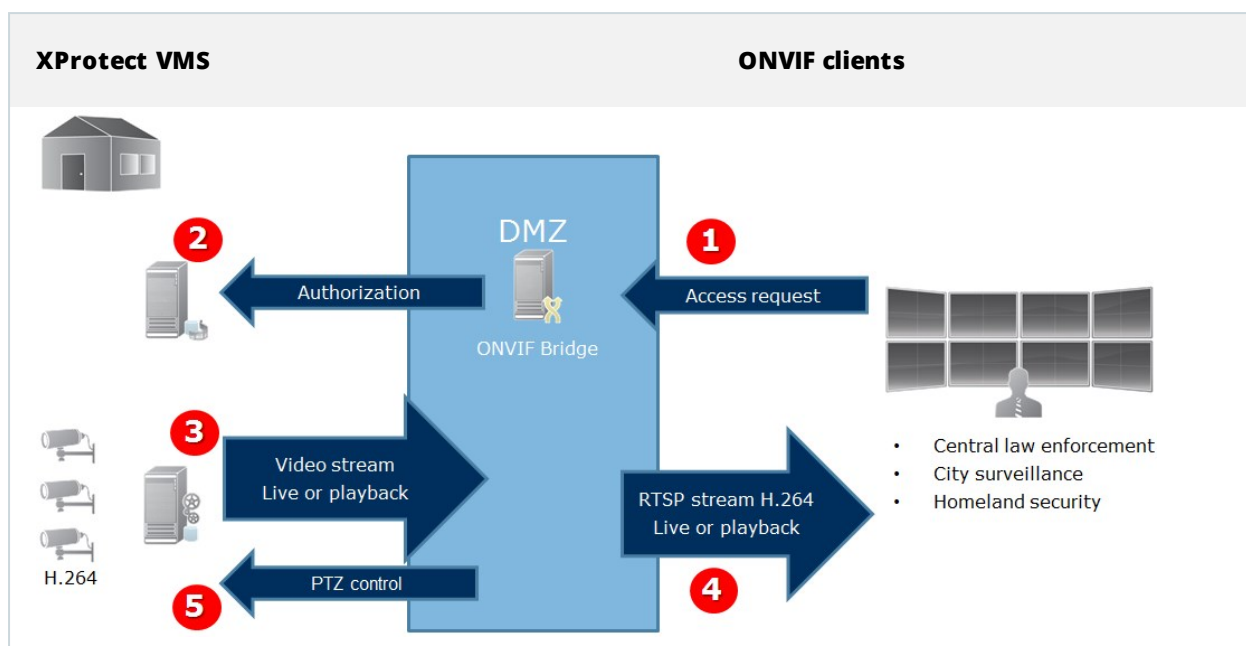
1. An ONVIF client connects to the XProtect VMS via the ONVIF Bridge server through the Internet. To do this, the ONVIF client needs the IP address or domain name (domain/host name) of the server where the Milestone ONVIF Bridge is installed, and the ONVIF port number.

2. The ONVIF Bridge server connects to the management server to authorize the ONVIF client user.

3. After authorization, the recording server starts sending H.264 video streams from the cameras to the ONVIF Bridge server.

> If a camera supports multiple streams, only the default stream is sent.

4. The ONVIF Bridge server sends the video as RTSP streams to the ONVIF client.

5. If available, the ONVIF client user can pan-tilt-zoom PTZ cameras.

Setting up Milestone ONVIF Bridge security controls

Milestone ONVIF Bridge enforces user authorization of ONVIF clients. This controls the ONVIF client's ability to access cameras, and the types of operations the ONVIF clients can perform. For example, whether ONVIF clients can use pan-tilt-zoom (PTZ) controls on cameras.

Milestone recommends that you create and add a dedicated user account for the Milestone ONVIF Bridge, and for each ONVIF client, as follows:

1. Create a basic user in the Management Client, or a Windows user.

2. In the Management Client, assign the user to a role that can access cameras, and specify permissions for the ONVIF Bridges security group on the Overall Security tab for the role.

3. Assign the user to the Milestone ONVIF Bridge during installation, and in the Management Client for each ONVIF client afterward.

Milestone ONVIF Bridge allows ONVIF clients only to request and receive video streams from cameras. ONVIF clients cannot configure settings in the XProtect VMS system or the Milestone ONVIF Bridge.

As a security precaution, Milestone recommends that you install the ONVIF Bridge server in a demilitarized zone (DMZ). If you install the bridge in a DMZ, you must also configure port forwarding for the internal and external IP addresses.

Licensing

ONVIF licensing

Milestone ONVIF Bridge does not require additional licenses. You can download and install the software for free from the Milestone Systems website (https://www.milestonesys.com/downloads/).

Requirements and considerations

System requirements

The computer where you want to install the Milestone ONVIF Bridge server component must have access to the Internet, and the following software installed:

- Microsoft® .NET Framework 3.5.

- Microsoft® .NET Framework 4.7 or higher.

- Visual C++ Redistributable Package for Visual Studio 2013 (x64).

> ⚠️ Cameras must support H.264 streaming via the Internet.

What's installed?

During installation, the following components are installed:

- Milestone ONVIF Bridge server, including the Milestone ONVIF Bridge service, the Milestone RTSP Bridge service, and the ONVIF Bridge Manager

- Milestone ONVIF Bridge plug-in. The plug-in is available in the Servers node in Management Client. This happens automatically when you use a **Typical** installation method. If you use a **Custom** installation method, you install it at a later stage of the installation

Installation also does the following:

- Registers and starts the Milestone ONVIF Bridge service and the Milestone RTSP Bridge service

- Starts the Milestone ONVIF Bridge Manager, which is available in the Windows notification area on the server where the ONVIF Bridge Server is installed

> 📝 The actions in the ONVIF Bridge Manager apply to both the Milestone ONVIF Bridge service and the Milestone RTSP Bridge service. For example, when you start or stop the ONVIF Bridge service, the Milestone RTSP Bridge service also starts or stops.

Before you install

Before you start the installation, get the following information:

- The domain name and password for the dedicated user account that was created for the Milestone ONVIF Bridge. For more information, see Setting up Milestone ONVIF Bridge security controls on page 7

- The URL or IP address, and the port number of the management server

You will need this information during installation.

Installation

Installing Milestone ONVIF Bridge

When you install Milestone ONVIF Bridge, you install a server and a plug-in for the Management Client. For example, you use these components to manage cameras, set up users, grant permissions, and so on.

You can install and add one or more Milestone ONVIF Bridges to your system. However, this increases the load on the network, and can impact performance. Typically, only one Milestone ONVIF Bridge is added to a system because multiple ONVIF clients can connect via one bridge.

Install Milestone ONVIF Bridge

Download the installation file:

1. On the computer where you want to install Milestone ONVIF Bridge, go to the Milestone website (https://www.milestonesys.com/downloads/) and locate the Milestone ONVIF Bridge product.

2. Click the Milestone ONVIF Bridge installer file.

3. Run the installer and follow the instructions.

Run the installer:

1. Select the language you want to use, and then click **Continue**.

2. Read and accept the license agreement, and then click **Continue**.

3. Select the installation type, as follows:

To install the ONVIF Bridge server and plug-in on one computer, and apply default settings, click Typical.

1. Verify that the server URL, user name and password are correct and click **Continue**.

2. Select the file location and product language, and then click **Install**.

   When the installation is complete, a list of successfully installed components displays. Click **Close**.

To install the ONVIF Bridge server and plug-ins on separate computers, click Custom. Use this method if you have a distributed system.

1. To install the server, select the **Milestone ONVIF Bridge Server** checkbox, and then click **Continue**.

2. Establish a connection to the management server by specifying the following:
   - The URL or IP address, and the port number, of the management server. The default port is 80. If you omit the port number, the system will use port 80

   - Keep the **Log in as** field set to **User account**. The domain user name and password of the Windows user or Basic user that the service will use

   - Click **Continue**

3. Select the file location and product language, and then click **Install**.

    When the installation is complete, a list of successfully installed components displays.

4. Click **Close**, and then install the ONVIF Bridge plug-in on the computer where the Management Client is installed. To install the plug-in, run the installer again on that computer, select **Custom** and select the respective plug-ins.

The following components are now installed:

- Milestone ONVIF Bridge server

- Milestone ONVIF Bridge plug-in that is visible in Management Client in the **Servers** node

- Milestone ONVIF Bridge Manager that is running and accessible from the notification area on the server with the ONVIF Bridge server installed

- Milestone ONVIF Bridge service that is registered as a service

You are ready for initial configuration (see Configuring the Milestone ONVIF Bridge on page 13).

Configuration

Configuring the Milestone ONVIF Bridge

After you install the Milestone ONVIF Bridge, the ONVIF Bridge service is running and the ONVIF Bridge Manager tray icon turns green. The next steps are to:

- Add the ONVIF Bridge plug-in to the Management Client

- Enable ONVIF clients to access your XProtect system

Add Milestone ONVIF Bridge to the Management Client:

1. Open the Management Client.

2. Expand **Servers**, right-click **ONVIF Bridge**, and select **Add New**.

3. Enter a name for Milestone ONVIF Bridge, and then click **OK**.

Configure user settings for an ONVIF client

Before you can complete these steps, you must have already created a basic user in Management Client, or a Windows user for the ONVIF client. The user must be assigned to a role that has permission to view cameras and access the Milestone ONVIF Bridge. For more information, see Setting up Milestone ONVIF Bridge security controls on page 7. For information about how to set up a basic user in Management Client, see the Help for those programs.

To provide an ONVIF client access to your XProtect VMS, follow these steps:

1. Open the Management Client.

2. Expand **Servers**, select **ONVIF Bridge**, and then select the bridge you just added.

3. On the **User settings** tab, enter the domain user name (domain/user) and the password of the dedicated user created for the ONVIF client.

4. Click the **Add user** button.

The name of the ONVIF client user appears in the list of **ONVIF user credentials**.

Managing Milestone ONVIF Bridge

After you configure the Milestone ONVIF Bridge, you can monitor the service and change configuration settings in several ways.

Optimization

Tips and tricks

The configuration created by ONVIF Bridge Manager is stored locally in a file at *ProgramData\Milestone\XProtect ONVIF Bridge*. The name of the file is serverconfiguration.xml. If this file is deleted, you must update the configuration in the ONVIF Bridge Manager.

To update a configuration, follow the steps described in Change configuration settings for a Milestone ONVIF Bridge in this document.

Milestone ONVIF Bridge properties

This section provides information about the settings for managing users and connections, and configuration settings for cameras.

Open the Management Client and select the **ONVIF Bridges** node.
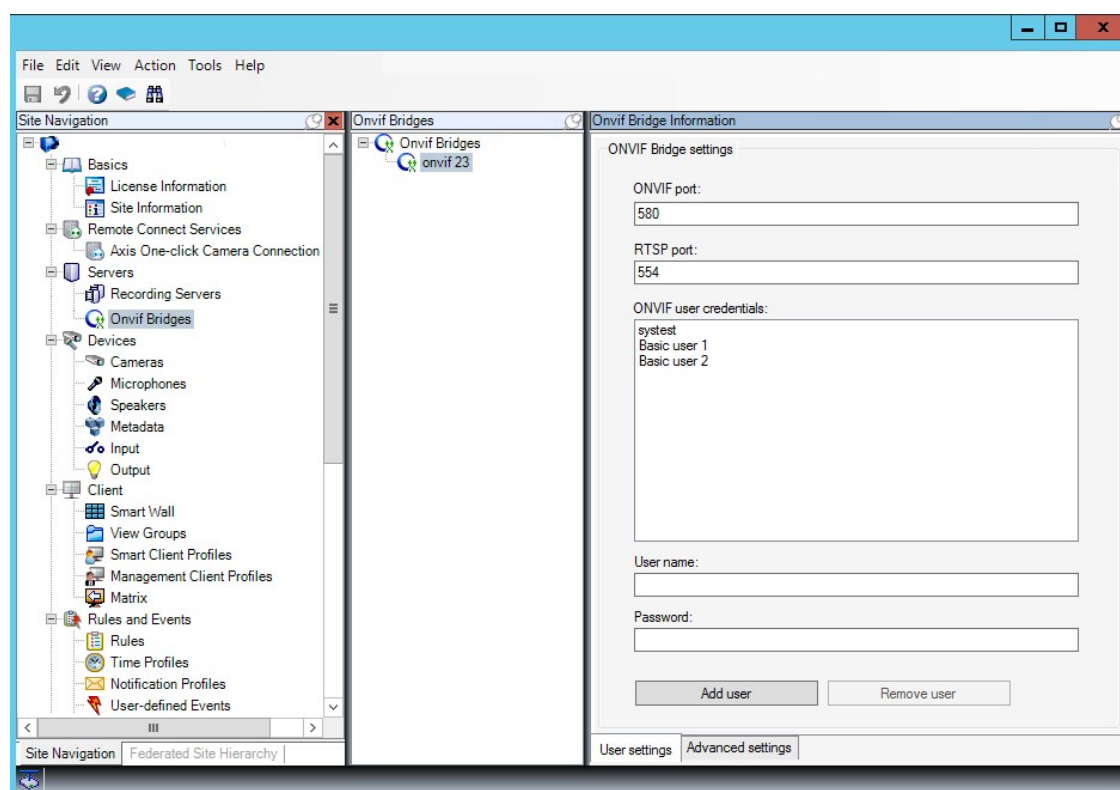
User settings tab (properties)

The following table describes the settings for the ONVIF Bridge server and ONVIF clients.

Name	Description
ONVIF port	The port number of the ONVIF port. ONVIF clients use this port to connect to the ONVIF Bridge server. The default port number is 580.
RTSP port	The port number of the RTSP port. The ONVIF Bridge server sends RTSP video streams through this port to ONVIF clients. The default port number is 554.
ONVIF user credentials	Lists the ONVIF client users that have access to the XProtect VMS system through the ONVIF Bridge server.
User name	The domain user name of the user created for an ONVIF client. Requirement: You must set up the ONVIF client users as users in Management Client with access to cameras and the Milestone ONVIF Bridge.
Password	The password for the ONVIF client user.
Add user	After you enter a domain user name and password, click the **Add user** button to add the user.
Remove user	Prevent an ONVIF client from accessing the Milestone ONVIF Bridge. Remove a selected user from the **ONVIF user credentials** list.

Advanced settings tab (properties)

The advanced settings for the ONVIF Bridge list the default settings for all cameras that the ONVIF Bridge provides to the ONVIF clients when the clients connect and request video streams.

The settings do not reflect the actual configuration of the cameras, and do not affect the video stream. The system uses the settings to speed up the exchange of video between the ONVIF Bridge and the ONVIF client. The ONVIF client will use the actual settings from the RTSP stream.

You can change the default settings that ONVIF Bridge provides to the ONVIF client, for example, if you want the values to reflect the actual configuration of the cameras.

Name	Description
Max days of retention	Default value is 30.
Frame per seconds	Default value is 5.
Width	Default value is 1920. This corresponds to full HD quality.
Height	Default value is 1080. This corresponds to full HD quality.
Bitrate Kbps	Default value is 512.
GOP size	Default value is 5.
Codec	Select one of the H.264 codec profiles. The default value is H.264 Baseline Profile.

Name	Description
Use configurations from cameras	Enable this to use the actual configuration of the cameras instead of the default average values defined above. ✏️ If you enable this setting, the response time between the XProtect system and the ONVIF clients increases.
Return sequences on command	Enable this to return information for sequences on the DESCRIBE command response.
Maximum number to return	Set the maximum number of sequences to be sent to the client. Default value is 10.
Return from start or end of recording	Select from where to start searching the sequences. from the start or from the end of the recording.
Prefer absolute time over normalized	This setting defines the RTSP server playback response, where the client's time interval for playback is not specified. Select this option if you want your RTSP server to use real time as opposed to scaled or normalized playback. However, if your client application is set to use either relative time intervals or real time intervals (in UTC), the RTSP server replies with those intervals defined in the client.

Operation

Using ONVIF clients to view video streams

ONVIF clients can be many different things, ranging from advanced custom surveillance systems to basic media players.

This section provides examples of how to connect to the Milestone ONVIF Bridge.

Use a Network Video Client to view a live stream

This example describes how to install the ONVIF Device Manager, and configure it to stream live video from an XProtect installation.

The ONVIF Device Manager is a free, open source Network Video Client from iDeviceDesign that complies with ONVIF standards. The tool is widely used to because it makes it easy to discover and view video from ONVIF compliant cameras on a network. However, you use ONVIF Device Manager to stream only live video. Additionally, you cannot capture and save the video data in the stream.

Before you start, get the following information from the person who administrates the XProtect installation:

- The login credentials for the user that was created for the Milestone ONVIF Bridge

The IP address or computer name of the computer where the Milestone ONVIF Bridge is installed To install the ONVIF Device Manager, follow these steps:

1. Go to the Sourceforge ONVIF Device Manager site (https://sourceforge.net/projects/onvifdm/) and then download and run the installer. You can install the ONVIF Device Manager on any computer.

2. When the installation completes, an icon is available on your desktop. Double-click the icon to start the ONVIF Device Manager.

3. When you start the ONVIF Device Manager, it automatically discovers ONVIF compliant devices on the network. However, it might not discover the Milestone ONVIF Bridge.
   - If it does, go to step 6
   - If it does not, add the bridge manually. Continue with step 4

4. To add a Milestone ONVIF Bridge, click **ADD**.

5. In the **Add device** dialog box, in the **URI** field, provide the name or IP address of the computer where the Milestone ONVIF Bridge is installed, and the ONVIF port number. For example, the string should look like this: *http://[IP address]:580/onvif/device_service*.

6. After you add the bridge, it is available at the bottom of the **Device** list. Select it.

7. Enter the login credentials for the basic user that was created for the ONVIF client above the list. For the user name, you must enter the domain user name.

8. Restart the ONVIF Bridge service to apply the change.

Use a media player to view a video stream

This example describes how to use the VLC media player to retrieve and view a live video feed or recorded video from a camera in an XProtect installation.

VLC media player is a free, open source multimedia player from VideoLan that supports various streaming protocols, including RTSP. For example, using VLC media player is useful when you want a very fast way to connect to a camera, or just to test the connection to a camera.

When you connect to a camera to view recorded video, the Milestone ONVIF Bridge streams the video sequences, starting with the first sequence.

Before you start, get the following information from the person who administrates the XProtect installation:

- The login credentials for the user account that is assigned to the Milestone ONVIF Bridge
- The IP address or computer name of the computer where the Milestone ONVIF Bridge is installed
- The GUID of the device that you want to stream video from

> The camera GUID is available in Management Client. To find the GUID, select the recording server where the camera has been added, and then select the camera. Click the **Info** tab, press and hold CTRL on your keyboard, and then click the camera's video preview.

This description is based on VLC 2.2.4 for Windows.

To install the VLC media player, and connect it to an XProtect system, follow these steps:

1. Go to https://www.videolan.org/vlc/, and then download the installer for the VLC media player.
2. Run the installer, and follow the instructions for each step.
3. On the toolbar, click **Media**, and select **Open Network Stream**.
4. In the **Open media** dialog box, enter the following RSTP string. Replace the variables in the square brackets [ONVIF Bridge IP Address] and [Camera GUID] with the correct information:
    - To view a live video stream, enter **rtsp://[ONVIF Bridge IP Address]:554/live/[Camera GUID]**
    - To view recorded video, enter **rtsp://[ONVIF Bridge IP Address]:554/vod/[Camera GUID]**
5. Click **Play**, and then enter the user name and password of the user account that was added to the Milestone ONVIF Bridge.

Manage video playback

Playback controls comply with RTSP standards and the ONVIF Streaming Specification (https://www.onvif.org/profiles/specifications/).

Recording summary

You can get an overview of all recorded video available on the device by using the `GetRecordingSummary` command. This is not required, but it provides useful information prior to conducting a search.

You can use `GetRecordingSummary` and/or `GetMediaAttributes` to get the timestamp of the first and the last recording, but you must first enable the **Use configurations from cameras** setting on the **Advanced settings** tab on the Milestone ONVIF Bridge plug-in in the XProtect Management Client.

Create a proxy for the `RecordingSearch` service using the service endpoint returned by `GetServices`. Create request and response objects, then call `GetRecordingSummary`.

```
SearchBindingProxy searchProxy( &soapSearch );
```

```
std::string searchEndpoint = "http://" + host + "/onvif/recording_search_service";

_tse__GetRecordingSummary tse__GetRecordingSummary;

_tse__GetRecordingSummaryResponse tse__GetRecordingSummaryResponse;

result = searchProxy.GetRecordingSummary( searchEndpoint.c_str(), NULL,

    &tse__GetRecordingSummary, &tse__GetRecordingSummaryResponse );
```

Search for recordings

The Search service method `FindRecordings` starts an asynchronous search on the camera. `FindRecordings` returns a token that references the search results. Even though there is only one recording available, a search is the proper way to obtain a reference for that recording.

Send a `FindRecordings` request with the following mandatory parameters:

- `SearchScope` > `IncludedSources` > `Token` – you must provide the camera GUID token
- `SearchScope` > `RecordingInformationFilter` – string with the following parameters:
    - `timestamp` (in UTC format)
    - `maxTimeBefore` (the time before the requested timestamp, in milliseconds)
    - `maxCountBefore` (the maximum number of tracks before requested timestamp)
    - `maxTimeAfter` (the time after the requested timestamp, in milliseconds)
    - `maxCountAfter` (the maximum number of tracks after requested timestamp)

For example:

```
boolean(//Track[TrackType = "Video"]),2016-12-06T08:07:43Z,99999999,20,99999999,20
```

You will get a response with a `SearchToken`, which is unique for the search criteria.

Pass the `SearchToken` to `GetRecordingSearchResults` and you will get a list with all the tracks corresponding to the search criteria.

Initiating playback

When viewing video playback, the default speed is 1 (normal playback in the forward direction).

Playback is initiated by means of the RTSP PLAY method. A range can be specified. If no range is specified, the stream is played from the beginning and plays to the end, or, if the stream is paused, it is resumed at the point it was paused. In this example, "Range: npt=3-20" instructs the RTSP server to start playback from the 3rd second until 20th second.

For example:

```
PLAY rtsp://basic:basic@bgws-pvv-04:554/vod/943ffaad-42be-4584-bc2c-c8238ed96373
RTSP/1.0

CSeq: 123

Session: 12345678

Require: onvif-replay

Range: npt=3-20

Rate-Control: no
```

Reverse playback

ONVIF devices MAY support reverse playback. Reverse playback is indicated using the Scale header field with a negative value. For example to play in reverse without data loss, a value of –1.0 would be used.

The Milestone ONVIF Bridge supports values [-32 : 32].

```
PLAY rtsp://basic:basic@bgws-pvv-04:554/vod/943ffaad-42be-4584-bc2c-c8238ed96373
RTSP/1.0

CSeq: 123

Session: 12345678

Require: onvif-replay

Range: clock=20090615T114900.440Z

Rate-Control: no

Scale: -1.0
```

Change speed

Speed is controlled by the RTSP Rate-Control header. If "Rate-Control=yes", then the server is in control of the playback speed. The stream is delivered in real time using standard RTP timing mechanisms. If "Rate-Control=no", then the client is in control of the playback speed. Rate-controlled replay will typically only be used by non-ONVIF specific clients because they will not specify "Rate-Control=no".

To control playback speed in a client, use the provided controllers. For example, with the VLC media player, select **Playback** > **Speed** > **Faster** or **Slower**. This increases or decreases the speed by 0.5.

Faster Fine and **Slower Fine** change the speed by 0.25.

Manage VLC media player playback with command line entries

You can manage video playback in the VLC media player by using command lines. Refer to the VLC command line help (https://wiki.videolan.org/VLC_command-line_help/) for details.

Such commands allow you to, for example, reverse playback and change the start time of the playback.

An example of a typical command line:

```
>vlc.exe --rate=-1.0 --start-time=3600 "rtsp://basic:basic@bgws-pvv-
04:554/vod/943ffaad-42be-4584-bc2c-c8238ed96373"
```

Where:

- Rate is the scale and speed parameter

- Start-time is seconds after the database start

Following are the playback controls for VLC media player:

Code	What can I achieve with the code?
input-repeat=	<integer [-2147483648 .. 2147483647]> Input repetitions Number of time the same input will be repeated
start-time=	<float> Start time The stream will start at this position (in seconds)
stop-time=	<float> Stop time The stream will stop at this position (in seconds)
run-time=	<float> Run time The stream will run this duration (in seconds)
input-fast-seek no-input-fast-seek	Fast seek (default disabled) Favor speed over precision while seeking
rate=	<float> Playback speed This defines the playback speed (nominal speed is 1.0)

Code	What can I achieve with the code?
input-list=	<string> Input list You can give a comma-separated list of inputs that will be concatenated together after the normal one
input-slave=	<string> Input slave (experimental) This allows you to play from several inputs at the same time. This feature is experimental, not all formats are supported. Use a '#' separated list of inputs
bookmarks=	<string> Bookmarks list for a stream You can manually give a list of bookmarks for a stream in the form " {name=bookmark-name,time=optional-time-offset,bytes=optional-byte-off set},{...}"

Maintenance

Check the status of the ONVIF Bridge service

To view the status of the ONVIF Bridge service, follow these steps.

1. On the computer where the ONVIF Bridge server is installed, look in the notification area. The ONVIF Bridge Manager tray icon indicates the status of the ONVIF Bridge service. If the service is running, the icon is green.
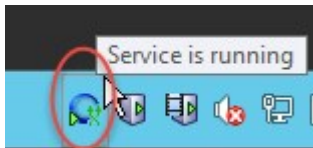
2. If it is not running, the icon is yellow or red. Right-click the icon and select **Start ONVIF Bridge service**.

View logs

The ONVIF Bridge Manager saves the log information about the ONVIF Bridge server and the RTSP streams.

1. In the notification area on the computer where the ONVIF Bridge server is installed, right-click the ONVIF Bridge Manager tray icon.
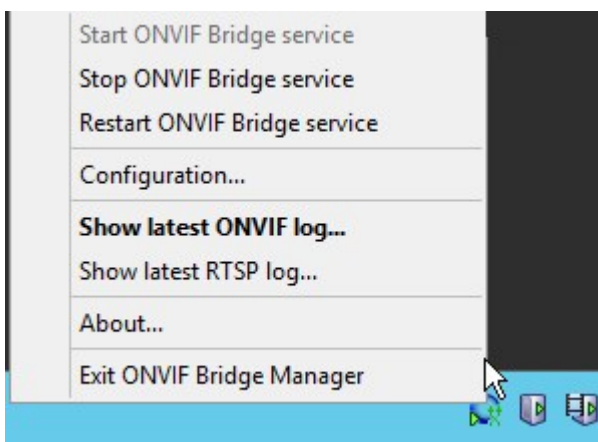
2. Select **Show latest ONVIF log** or **Show latest RTSP log**.

Change the level of information in your logs

The ONVIF Bridge Manager saves the log information about the ONVIF Bridge server and the RTSP streams.

To change the level of information, follow these steps:

1. Right-click the ONVIF Bridge Manager tray icon, and then stop the ONVIF Bridge service.

2. Right-click the ONVIF Bridge Manager tray icon again, and select **Configuration**.

3. In the **Log level for ONVIF** and **Log level for RTSP** fields, specify the type of information, and how much information you want to save in your ONVIF and RTSP logs. The default value is **Information**.

> From top to bottom in the list, the options are ordered from lowest level to highest level. Each level includes the level above it in the list. For example, the **Warning** level includes the **Error** level. Milestone recommends that you use only the **Error**, **Warning**, and **Information** levels. The **Trace** and **Message** levels capture more information and use more disk space, which can decrease performance.

4. Click **OK**.

5. Right-click the ONVIF Bridge Manager tray icon, and then start the ONVIF Bridge service.

Change configuration settings for the Milestone ONVIF Bridge

If you change the IP address or host name of the surveillance server, or if you have changed the user accounts that have access to the surveillance server service, you must update this information for Milestone ONVIF Bridge.

To change the VMS address or login credentials, follow these steps:

1. On the computer where Milestone ONVIF Bridge server is installed, right-click the ONVIF Bridge Manager tray icon, and then stop the ONVIF Bridge service.

2. Right-click the ONVIF Bridge Manager tray icon again, and select **Configuration**.

3. Specify the new information, and then click **OK**.

> ✏ You must use the fully qualified domain name or the IP address of the server where the management server is installed.

4. Right-click the ONVIF Bridge Manager tray icon, and then start the ONVIF Bridge service.

The ONVIF Bridge service is now running and the tray icon turns green.

Include sub-sites

By default, the Milestone ONVIF Bridge is configured to exclude sub-sites. This means that ONVIF client users cannot access video from cameras that are installed on sub-sites.

You can change this to include sub-sites. However, Milestone recommends that you do so only for systems where sub-sites do not contain large numbers of cameras. The Milestone ONVIF Bridge aggregates and displays all cameras, including those from sub-sites, in one list. For example, if the system and sub-sites have more than 50 cameras, the list will be difficult to use.

> ✅ If you must include sub-sites, consider installing the Milestone ONVIF Bridge on each management server. You will have more than one list of cameras, however, the cameras will be easier to identify and navigate.

To include sub-sites:

1. Right-click the ONVIF Bridge Manager tray icon, and then stop the ONVIF Bridge service.

2. Right-click the ONVIF Bridge Manager tray icon again, and click **Configuration**.

3. Select the **Include sub-sites** checkbox, and then click **OK**.

4. Right-click the ONVIF Bridge Manager tray icon, and then start the ONVIF Bridge service.

Supported functions

To use an IP-based surveillance system as an ONVIF client and connect to the Milestone ONVIF Bridge, the system must support certain functions in ONVIF Profile G and Profile S. This section lists these functions, and organizes them according to the features they support.

- For more information about Profile G, see the ONVIF Profile G Specification (https://www.onvif.org/profiles/profile-g/)

- For more information about Profile S, see the ONVIF Profile S Specification (https://www.onvif.org/profiles/profile-s/)

The Milestone ONVIF Bridge does not support functions related to configuration, jobs, user maintenance, or functions defined as Media or Event.

Supported functions for ONVIF Profile G

The following tables list the supported functions for ONVIF Profile G. The tables show whether these functions are mandatory, optional, or conditional, according to the specifications.

The Implemented column shows whether the function has been implemented in the Milestone ONVIF Bridge. The fields marked as Dummy means that server sends a valid response according to the standard, but it is not verified that data in it is correct.

ONVIF 7.2.3 Function list for Capabilities

Function	Service	Device	Implemented
GetServices	Device	Mandatory	Yes
GetServiceCapabilities	Device	Mandatory	Yes
GetWsdlUrl	Device	Mandatory	Yes
GetServiceCapabilities	Recording Control	Mandatory	Yes (Dummy)
GetServiceCapabilities	Replay	Mandatory	Yes
GetServiceCapabilities	Search	Mandatory	Yes
GetServiceCapabilities	Receiver	Conditional	No
GetServiceCapabilities	Event	Mandatory	No
GetServiceCapabilities	Media	Conditional	Yes

ONVIF 7.3.3 Function list for Recording Search

Function	Service	Device	Implemented
GetRecordingSummary	Search	Mandatory	Yes
GetRecordingInformation	Search	Mandatory	Yes
GetMediaAttributes	Search	Mandatory	Yes
FindRecordings	Search	Mandatory	Yes
GetRecordingSearchResults	Search	Mandatory	Yes
FindEvents	Search	Mandatory	No
GetEventSearchResults	Search	Mandatory	No
EndSearch	Search	Mandatory	Yes
tns1:RecordingHistory/Recording/State	Event	Mandatory	No
tns1:RecordingHistory/Track/State	Event	Mandatory	No
XPath dialect	Search	Mandatory	Yes

ONVIF 7.4.3 Function list for Reply Control

Function	Service	Device	Implemented
GetReplayUri	Replay	Mandatory	Yes
SetReplayConfiguration	Replay	Mandatory	Yes (Dummy)
GetReplayConfiguration	Replay	Mandatory	Yes (Dummy)

ONVIF 9.1.4.3 Function list for Recording Control – Using an on-board media source (if supported)

*If the device has any on-board media sources

**If the device has any on-board audio sources

Configuration	Function	Service	Device	Imple-mented
Media Profile Configuration	CreateProfile	Media	Mandatory*	No
	DeleteProfile	Media	Mandatory*	No
	GetProfiles	Media	Mandatory*	Yes
	GetProfile	Media	Mandatory*	Yes

Configuration	Function	Service	Device	Imple-mented
Video Source Configuration	GetVideoSources	Media	Mandatory*	Yes
	GetVideoSourceConfiguration	Media	Mandatory*	Yes
	GetVideoSourceConfigurations	Media	Mandatory*	Yes
	AddVideoSourceConfiguration	Media	Mandatory*	No
	RemoveVideoSourceConfiguration	Media	Mandatory*	No
	SetVideoSourceConfiguration	Media	Mandatory*	No
	GetCompatibleVideoSourcConfigurations	Media	Mandatory*	No
	GetVideoSourceConfigurationOptions	Media	Mandatory*	No
Video Encoder Configuration	GetVideoEncoderConfiguration	Media	Mandatory*	No
	GetVideoEncoderConfigurations	Media	Mandatory*	Yes
	AddVideoEncoderConfiguration	Media	Mandatory*	No
	RemoveVideoEncoderConfiguration	Media	Mandatory*	No
	SetVideoEncoderConfiguration	Media	Mandatory*	No
	GetCompatibleVideoEncoderConfigurations	Media	Mandatory*	No
	GetVideoEncoderConfigurationOptions	Media	Mandatory*	Yes (Dummy)
	GetGuaranteedNumberOfVideoEncoderInstances	Media	Mandatory*	No
Metadata Configuration	GetMetadataConfiguration	Media	Mandatory*	No
	GetMetadataConfigurations	Media	Mandatory*	No
	AddMetadataConfiguration	Media	Mandatory*	No
	RemoveMetadataConfiguration	Media	Mandatory*	No
	SetMetadataConfiguration	Media	Mandatory*	No
	GetCompatibleMetadataConfigurations	Media	Mandatory*	No
	GetMetadataConfigurationOptions	Media	Mandatory*	No

Configuration	Function	Service	Device	Imple-mented
Audio Source Configuration	GetAudioSources	Media	Mandatory**	No
	GetAudioSourceConfiguration	Media	Mandatory**	No
	GetAudioSourceConfigurations	Media	Mandatory**	No
	AddAudioSourceConfiguration	Media	Mandatory**	No
	RemoveAudioSourceConfiguration	Media	Mandatory**	No
	SetAudioSourceConfiguration	Media	Mandatory**	No
	GetCompatibleAudioSource Configurations	Media	Mandatory**	No
	GetAudioSourceConfiguration Options	Media	Mandatory**	No
Audio Encoder Configuration	GetAudioEncoderConfiguration	Media	Mandatory**	No
	GetAudioEncoderConfigurations	Media	Mandatory**	No
	AddAudioEncoderConfiguration	Media	Mandatory**	No
	RemoveAudioEncoder Configuration	Media	Mandatory**	No
	SetAudioEncoderConfiguration	Media	Mandatory**	No
	GetCompatibleAudioEncoder Configurations	Media	Mandatory**	No
	GetAudioEncoderConfiguration Options	Media	Mandatory**	No

ONVIF 9.3.3 Function list for Discovery

Function	Service	Device	Implemented
WS-Discovery	Core	Mandatory	Yes
GetDiscoveryMode	Device	Mandatory	No
SetDiscoveryMode	Device	Mandatory	No
GetScopes	Device	Mandatory	Yes
SetScopes	Device	Mandatory	No
AddScopes	Device	Mandatory	No
RemoveScopes	Device	Mandatory	No

ONVIF 9.4.3 Function list for Network Configuration

Function	Service	Device	Implemented
GetHostname	Device	Mandatory	No
SetHostname	Device	Mandatory	No
GetDNS	Device	Mandatory	Yes (Dummy)
SetDNS	Device	Mandatory	No
GetNetworkInterfaces	Device	Mandatory	Yes
SetNetworkInterfaces	Device	Mandatory	No
GetNetworkProtocols	Device	Mandatory	No
SetNetworkProtocols	Device	Mandatory	No
GetNetworkDefaultGateway	Device	Mandatory	No
SetNetworkDefaultGateway	Device	Mandatory	No

ONVIF 9.5.3 Function list for System

Function	Service	Device	Implemented
GetDeviceInformation	Device	Mandatory	Yes
GetSystemDateAndTime	Device	Mandatory	Yes
SetSystemDateAndTime	Device	Mandatory	No
SetSystemFactoryDefault	Device	Mandatory	No
Reboot	Device	Mandatory	No

ONVIF functions that Milestone ONVIF Bridge does not support:

- ONVIF 8.1.3 Function list for Recording Control – Dynamic Recording

- ONVIF 8.1.4 Function list for Recording Control – Dynamic Tracks

- ONVIF 9.1.3 Function list for Recording Control

- ONVIF 9.1.5.3 Function list for Recording Control – Using a Receiver as Source

- ONVIF 9.2.3 Function list for Recording Source Configuration

- ONVIF 9.6.3 Function list for User Handling

- ONVIF 9.7.4 Function list for Event Handling

Supported functions for ONVIF Profile S

The following tables list the supported functions for ONVIF Profile S. The tables show whether these functions are mandatory, optional, or conditional, according to the specifications.

The Implemented column shows whether the function has been implemented in the Milestone ONVIF Bridge. The fields marked as Dummy means that server sends a valid response according to the standard, but it is not verified that data in it is correct.

ONVIF 7.2.3 Capabilities Function List for Devices

Function	Service	Device	Implemented
GetCapabilities	Device	Mandatory	Yes
GetWsdlUrl	Device	Mandatory	Yes (Dummy)

ONVIF 7.3.3 Discovery Function List for Devices

Function	Service	Device	Implemented
WS-Discovery	Core	Mandatory	Yes
GetDiscoveryMode	Device	Optional	No
SetDiscoveryMode	Device	Optional	No
GetScopes	Device	Optional	Yes
SetScopes	Device	Optional	No
AddScopes	Device	Optional	No
RemoveScopes	Device	Optional	No

ONVIF 7.4.3 Network Configuration Function List for Devices

Function	Service	Device	Implemented
GetHostname	Device	Mandatory	No
SetHostname	Device	Mandatory	No
GetDNS	Device	Mandatory	Yes (Dummy)
SetDNS	Device	Mandatory	No
GetNetworkInterfaces	Device	Mandatory	Yes
SetNetworkInterfaces	Device	Mandatory	No
GetNetworkProtocols	Device	Mandatory	No
SetNetworkProtocols	Device	Mandatory	No
GetNetworkDefaultGateway	Device	Mandatory	No
SetNetworkDefaultGateway	Device	Mandatory	No

ONVIF 7.5.3 System Function List for Devices

Function	Service	Device	Implemented
GetDeviceInformation	Device	Mandatory	Yes
GetSystemDateAndTime	Device	Mandatory	Yes
SetSystemDateAndTime	Device	Mandatory	No
SetSystemFactoryDefault	Device	Mandatory	No
Reboot	Device	Mandatory	No

ONVIF 7.8.3 Video Streaming Function List for Devices

Function	Service	Device	Implemented
GetProfiles	Media	Mandatory	Yes
GetStreamUri	Media	Mandatory	Yes
Media Streaming using RTSP	Streaming	Mandatory	Yes

ONVIF 7.10.3 Video Encoder Configuration Function List for Devices

Function	Service	Device	Implemented
GetVideoEncoderConfiguration	Media	Mandatory	No
GetVideoEncoderConfigurations	Media	Mandatory	Yes
AddVideoEncoderConfiguration	Media	Mandatory	No
RemoveVideoEncoderConfiguration	Media	Mandatory	No
SetVideoEncoderConfiguration	Media	Mandatory	No
GetCompatibleVideoEncoderConfigurations	Media	Mandatory	No
GetVideoEncoderConfigurationOptions	Media	Mandatory	Yes (Dummy)
GetGuaranteedNumberOfVideoEncoderInstances	Media	Mandatory	No

ONVIF 7.11.3 Media Profile Configuration Function List for Devices

Function	Service	Device	Implemented
GetProfiles	Media	Mandatory	Yes
GetProfile	Media	Mandatory	Yes
CreateProfile	Media	Mandatory	No
DeleteProfile	Media	Mandatory	No

ONVIF 7.12.3 Video Source Configuration Function List for Devices

Function	Service	Device	Implemented
GetVideoSources	Media	Mandatory	Yes
GetVideoSourceConfiguration	Media	Mandatory	Yes
GetVideoSourceConfigurations	Media	Mandatory	Yes
AddVideoSourceConfiguration	Media	Mandatory	No
RemoveVideoSourceConfiguration	Media	Mandatory	No
SetVideoSourceConfiguration	Media	Mandatory	No
GetCompatibleVideoSourceConfigurations	Media	Mandatory	No
GetVideoSourceConfigurationOptions	Media	Mandatory	No

ONVIF 8.3.3 PTZ Function List for Devices

Function	Service	Device	Implemented
AddPTZConfiguration	Media	Mandatory	No
RemovePTZConfiguration	Media	Mandatory	No
GetNodes	PTZ	Mandatory	Yes
GetNode	PTZ	Mandatory	Yes
GetConfigurations	PTZ	Mandatory	No
GetConfiguration	PTZ	Mandatory	No
GetConfigurationOptions	PTZ	Mandatory	No
SetConfiguration	PTZ	Mandatory	No
ContinuousMove	PTZ	Mandatory	Yes
Stop	PTZ	Mandatory	Yes
GetStatus	PTZ	Mandatory	Yes

ONVIF 8.4.3 PTZ – Absolute Positioning Function List for Devices

Function	Service	Device	Implemented
AbsoluteMove	PTZ	Mandatory	Yes

ONVIF 8.5.3 PTZ – Relative Positioning Function List for Devices

Function	Service	Device	Implemented
RelativeMove	PTZ	Mandatory	Yes

ONVIF 8.6.3 PTZ – Presets Function List for Devices

Function	Service	Device	Implemented
SetPreset	PTZ	Mandatory	Yes
GetPresets	PTZ	Mandatory	Yes
GotoPreset	PTZ	Mandatory	Yes
RemovePreset	PTZ	Mandatory	No

ONVIF 8.7.3 PTZ – Home Position Function List for Devices

Function	Service	Device	Implemented
GotoHomePosition	PTZ	Mandatory	Yes
SetHomePosition	PTZ	Conditional	No

ONVIF 8.8.3 PTZ – Auxiliary Command Function List for Devices

Function	Service	Device	Implemented
SendAuxiliaryCommand	PTZ	Mandatory	Yes

ONVIF functions that Milestone ONVIF Bridge does not support:

- 7.6.3 User Handling Function List for Devices

- 7.7.3 Event Handling Function List for Devices

- 7.13.3 Metadata Configuration Function List for Devices

- 8.1.3 Video Streaming – MPEG4 Function List for Devices

- 8.2.3 Video Streaming – H264 Function List for Devices

- 8.9.3 Audio Streaming Function List for Devices

- 8.12.3 Multicast Streaming Function List for Devices

- 8.13.3 Relay Outputs Function List for Devices

- 8.14.3 NTP Function List for Devices

- 8.15.3 Dynamic DNS Function List for Devices

- 8.16.3 Zero Configuration Function List for Devices

- 8.17.3 Relay Outputs Function List for Devices

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About Milestone

Milestone Systems is a leading provider of open platform video management software; technology that helps the world see how to ensure safety, protect assets and increase business efficiency. Milestone Systems enables an open platform community that drives collaboration and innovation in the development and use of network video technology, with reliable and scalable solutions that are proven in more than 150,000 sites worldwide. Founded in 1998, Milestone Systems is a stand-alone company in the Canon Group. For more information, visit https://www.milestonesys.com/.