FREEDOM
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MP-CCTV   SERVER

Freedom VMS ONVIF™

Adding an ONVIF IP camera to a Freedom Server

Contents

This guide is a supplement to the Adding a device in Freedom VMS document. It explains some additional settings that may be required when adding certain brands or models (firmware) ONVIF IP cameras to the Freedom VMS Server software. If you have Omega, Maxima, Hikvision or Dahua IP cameras, refer to the previously mentioned '*adding a device in Freedom'* document, because those cameras can be added normally.

Some ONVIF cameras may require additional configuration settings than that which are outlined in this document due to different manufacturer implementations of stream selection and authentication.

Prerequisites

- A spare camera licence is available for the camera.
- Your Internet Explorer browser has been configured as per 'ActiveX Installation Guide'
- The camera has the latest firmware installed.
- The camera has the correct IP address and is within the Recorders IP address range. (subnet)
- The camera has been pre-configured with a minimum of encoding settings, overlay name and User accounts.
- An NTP time server is operating within the LAN and the camera is configured to get its time from that NTP server.
- The Freedom Server is configured to use the same NTP server, unless the Freedom Server itself is the NTP time server.

Related material

- [Adding a device in Freedom VMS](#)
- [ActiveX Installation Guide](#)   (Guide to configure IE web browser for device configuration)
- [General Freedom VMS video tutorials](#)

Steps involved in adding an ONVIF IP camera to Freedom Server

1. Ensure an NTP server is on-site and operating.

2. Pre-configure the camera via its webpage.

3. From 'Device Setup' section in Freedom Server, add the new camera using the ONVIF device type.

4. If your version of Freedom Server software is prior to V3.4, you have to manually turn on recording for the camera.

5. Add permissions to appropriate User account/s, if you want them to, view, playback or download.

6. Add the new camera to a camera 'group' if applicable. (i.e. the 'ALL CAMERAS' group)

7. If there are existing eMaps on site, & you've been given updated 'base' image/s, you need to create a hyperlink for the new camera/s.

Time synchronization

When using the ONVIF protocol, time synchronization is critical. You must configure the ONVIF camera via its web page to time sync via an NTP server and both the camera and the recorder must be in sync BEFORE attempting to add the ONVIF camera to the Freedom VMS software. There are a number of NTP time server products available, a popular one is '[NetTime](#)', but there are many more.

With some ONVIF IP cameras like [Samsung](#), we have to configured 2 'custom video stream profiles' from the cameras web page, 1 for the 'main' stream and the other for the 'sub-stream', we have to tell (configure) the Freedom VMS software to use these custom stream profiles you just created in the camera.

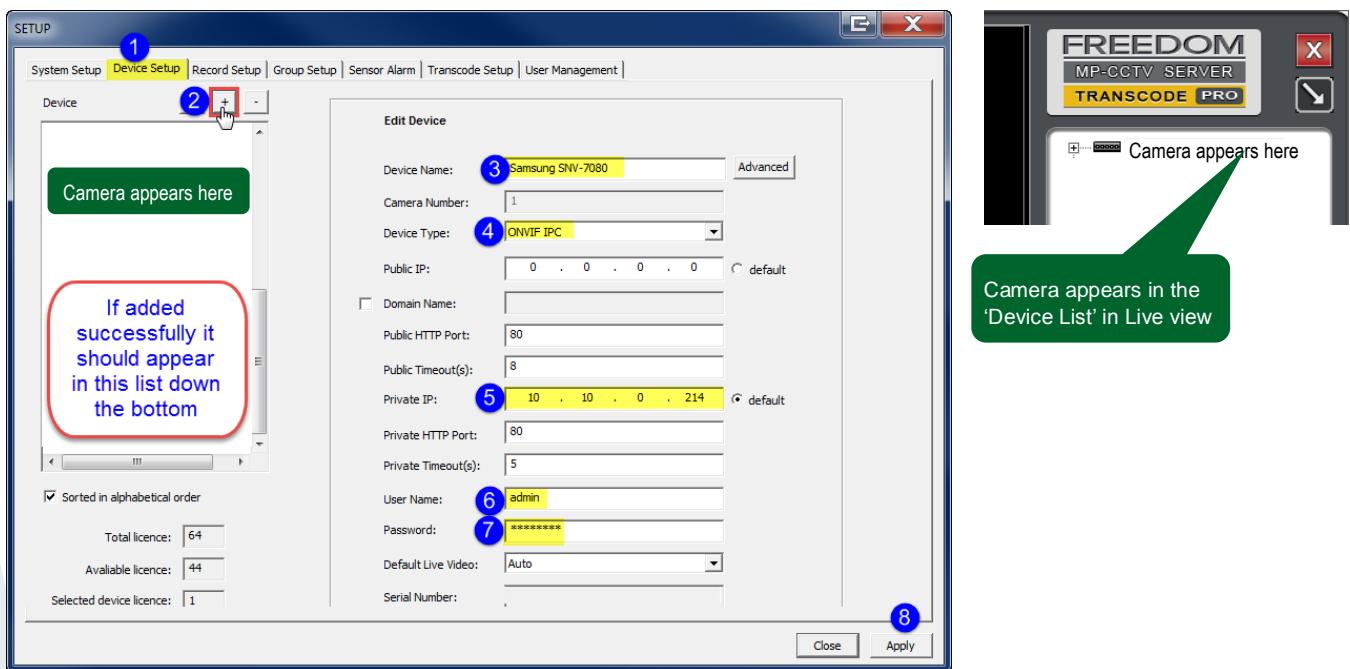## Understanding ONVIF profile selection

Manufacturers of ONVIF cameras make available a number of 'video profiles'. These video profiles equate to different types of video codecs, and are usually represented by a sequence number starting at 1. Some manufacturers might have *video profile 1* as MJPEG and *video profile 2* as H.264 (baseline) and *video profile 3* as H.264 (High) etc… while others may equate *video profile 1* to the same as what we would call 'main stream' (h.264) and *video profile 2* to what we would call 'sub stream' (h.264). Some manufacturers also allow you to create your own *video profiles,* while others can have 12 or more fixed video profiles. By default Freedom VMS will set *video profile 1* as the 'main stream' and *video profile 2* as the sub stream. Sometimes the 'video profile 1' , as set in the ONVIF camera, is not the optimal stream to use for the 'main' recording stream, if so, then you need to change, in the Freedom VMS software, to a 'customized' profile, see '[Video profile Selection](#)'.

Adding an ONVIF IP camera

(▶) Video tutorial at www.freedomvms.com/adding

There are 2 methods of adding a device in Freedom VMS. (1) Using the 'Freedom Auto Discovery', (2) manually adding the device. The video tutorial listed above outlines the auto discovery and other methods. This guide will cover the 'manual add' method of adding a device to the Freedom VMS recorder.

1. Make sure the camera and recorder are time synced with an internal NTP server.
2. With the Freedom VMS software open in Live view.
3. Click on the 'Setup' ⚙ icon on the bottom right of the GUI.
4. Click on 'device setup' tab. (1)
5. Click the 'Add' device icon [+] and enter a name for the camera i.e. C12 FRONT ENTRY
6. Under device type select 'ONVIF IPC'
7. In private IP address enter the IP address of the ONVIF camera
8. Enter the Username and password in the appropriate fields
9. Click 'Apply' to save, if successful the camera should appear at the bottom of the list on the left.

Video not appearing after camera has been added

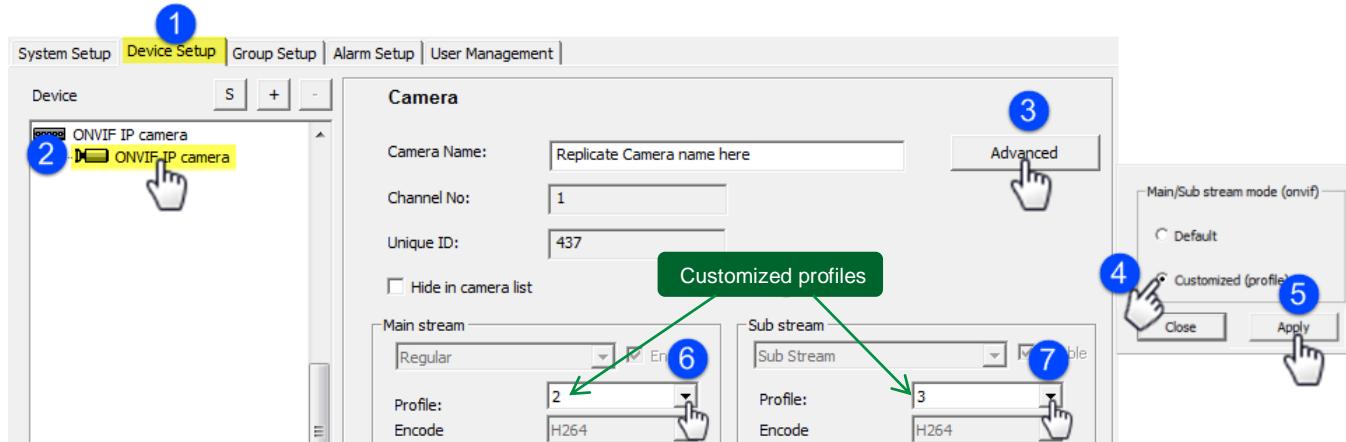If after you have added the camera, the video does not appear, there can be a few causes.

1. The time on the camera is not the same as the time on the Freedom Server PC
2. The video 'profile' is incorrect, you need to configure a 'Customized Profile'. (see below)
3. The network is too unstable and you need to set 'TCP' as the default RTSP stream protocol. (see below)
4. The IP camera has not been configured correctly. (Maybe stream profiles, or ONVIF authentication issue)
5. The camera is not fully 'Profile S' compliant, make sure you have the latest firmware installed.

Changing the Video Profile Selection

By default, Freedom selects stream-1 as 'main stream' and stream-2 as 'sub stream'. Not all IP camera manufacturers follow this implementation of ONVIF. Navigating to the camera webpage and examining video stream or ONVIF streams, may give you an idea of the video streams available and the stream currently 'enabled' on the camera.
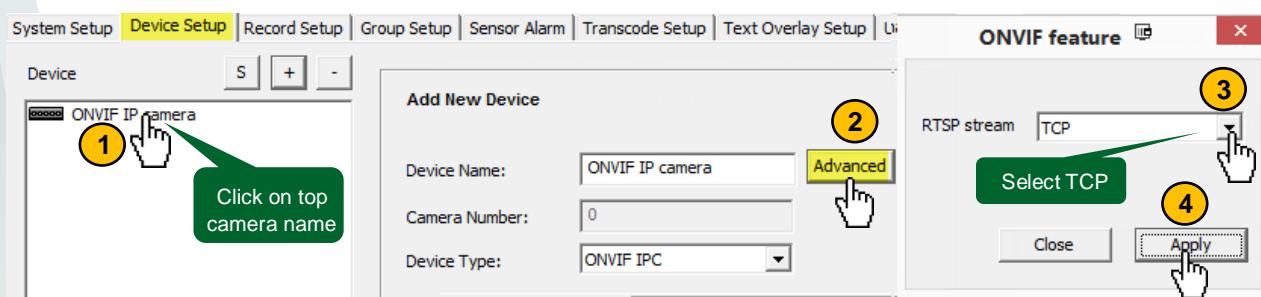
To change to a 'customized' stream in Freedom, click the camera icon (**2**) under the device name, then click the '**Advanced'** button (**3**) and change to a '*customized profile'*, click apply then close.

Then From the 'Main Stream', sub Stream section choose the 'video profile' number that corresponds to the streams within the camera 'Main stream'(**6**) and 'Sub stream'(**7**). You must have pre-configured the streams on the camera prior to doing this. In the example below, the main stream is using a 'Customized' profile which is set to '2' and the sub stream is using custom video profile '3' of the camera.

Selecting TCP as the ONVIF RTSP protocol (optional)

With some ONVIF camera manufacturers, the default RTSP stream may break up on poor quality networks or networks with high latency, if you are experiencing stream break up, like tearing and have eliminated network bandwidth and camera miss-configuration as being the problem, it's recommended you change the RTSP stream type to TCP, follow the steps illustrated below to do so.

Samsung IP Camera (additional steps, via web service page)

As previously mentioned, with some ONVIF IP cameras like Samsung, we have to create and configured 2 'custom video stream profile' from the cameras web page, one for the 'main' stream and the other for the 'sub-stream', we have to tell (configure) the Freedom VMS software to use these custom streams profiles you just created in the camera, to do this on a Samsung IP camera;

1. Navigate to the camera web page.
2. Click the 'Setup' tab and select the first stream named 'H.264'
3. Under 'Profile type' make sure 'Default profile is ticked and also tick 'Record profile'
4. Configure encoding specifications for first H.264 (main) stream as per your preference or your documentation.
5. Create an additional H.264 stream to be used as the 'sub stream' and configure as per your preference or documentation.
6. Click 'Apply' to save the settings.

Now with the Freedom VMS software open add the camera as per 'Adding an ONVIF IP camera' section

7. **Note**: If you previously added the camera and failed to get a stream you must delete the camera from the device list and add it again.

Axis Camera (additional steps)

Open the cameras web page, navigate to **System Options → Advanced → Plain Config** from the dropdown select 'WebServer' right at the bottom of the list and click 'Select Group', then untick '**Enable replay attack protection'**.

Navigate to **System Options → ONVIF** and add a new ONVIF 'administrator' user level.

Navigate to **Video → Video Stream** and enter camera overlay name (see images below)
Navigate to **System Options → Date & Time**, then in 'specify date format, select '**Own'** and enter **%d/%m/%G**

Other settings

Some manufactures require either an additional 'ONVIF' User account to be created or enabled on the camera. Some older implementations of ONVIF require the 'authentication' method on the camera to be changed, all of these settings are configured via the cameras web page.

Adding a Sony IP camera

With Sony IP cameras you have 2 options when adding a camera, the first is to use the native '*SONY IPC*' protocol and the 2nd is to use the ONVIF protocol. If you select Sony native protocol (SONY IPC) there are limitations on how many cameras you can record and display simultaneously, refer to Freedom Server manual (Advanced System setup) for more information.
Adding is the same as adding any other device to Freedom, the only difference is you have 2 options for 'Device Type' 'Sony IPC' or 'ONVIF'
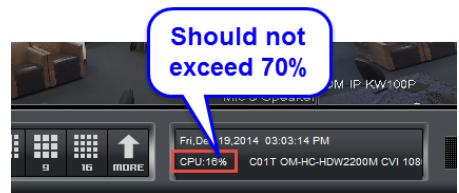
Understanding HD camera viewing limitations

Unlike traditional SD Analogue camera systems, HD systems require a lot more CPU power to decode & display multiple HD video streams as well as requiring higher network bandwidth. The amount of HD cameras that can be displayed at the same time or in a 'camera Group' is limited.

When displaying HD video careful consideration should be given to how many HD cameras can be displayed without exceeding the limitation of the Recorder, Viewing Client or network link. A general rule of thumb is the CPU usage percentage should not exceed 70% consistently. The CPU usage can be viewed in the lower status window on the Freedom 'Liveview' GUI. (pictured right)

If the CPU limit or network bandwidth is being exceeded there are a few options available.

1. Reduce the amount of HD cameras being displayed at any one time (Groups).
2. Reduce the resolution, bitrate or framerate of the cameras
3. Change 'Default Live Video:' option to use the lower quality 'Sub Stream' (pictured right)
4. Upgrade the hardware (i.e. larger CPU, faster network)