

Considerations for Connecting Cameras Using RTSP

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RTSP Stream Overview

The Eagle Eye Cloud VMS can be connected to almost any ONVIF-conformant IP camera via the industry-standard ONVIF protocol, but, in certain cases, it's necessary to connect the camera using Real Time Streaming Protocol (RTSP). This can be a single or dual stream. It is very important to understand and consider all technical limitations related to the connection type.

RTSP is a network protocol designed for use in entertainment and communications systems to control streaming media. The protocol was designed to create an easy way to access or manipulate a media stream. In CCTV and security camera systems, the media is a video stream that may or may not include audio. The protocol packs complex transcoding and programming together behind the scenes to transfer video over a network or to the Internet with an easy-to-use link.

Background

The main purpose of RTSP when it comes to security cameras is to expand device compatibility. While RTSP can only send video and audio, it helps by providing another type of stream to use with non-ONVIF devices. This occurs most often when someone attempts to use an IP camera with a third-party recorder. Most professional NVR or DVR systems provide alternate means to add third-party cameras, and one of those means is to access the camera's RTSP stream.

For Eagle Eye Networks Bridges and CMVRs, when a supported camera is added using ONVIF, it will utilize a Main Stream (H.264) for "Full Video" (the stream recorded and sent to the cloud for High-Resolution capture) and a Substream (MJPEG) for "Preview Video" (the low-bandwidth stream used for example in the "Layout" view in Cloud VMS).

There are two options when adding RTSP URLs as a source for the camera: "Single Stream" and "Dual Stream." Dual Stream mode requires that both an H.264 RTSP URL and a MJPEG RTSP URL are entered into the camera settings. Single Stream requires only an H.264 RTSP URL.

The processing power required to connect Single Stream RTSP is almost four times higher than ONVIF because the Bridge/CMVR has to transcode the stream for high resolution and preview (H.264 and MJPEG). For example, a 304+ Bridge can connect 20 cameras at 2MP via ONVIF, but the same bridge with the same quality settings should only connect up to 5 cameras using Single Stream H.264 RTSP.

Cameras can be connected via ONVIF and RTSP on the same bridge/CMVR, but care needs to be taken to make sure the bridge can handle it. The best way to make certain of this is by using the Eagle Eye Networks Product Wizard (product.wizard.eagle-eye-networks.com) to perform the calculations and propose the proper devices to keep everything working correctly.

One important thing to take into account when using RTSP streams, is that if it is possible to pull an H.264 stream from the camera or other device for the high-resolution recording, *and* a MJPEG for preview; the processing power is not affected as there is no transcoding of any stream.

Functionality

The screenshot shows a dialog box titled "Add RTSP Camera". It contains the following fields and options:

- Connect to Bridge:** A dropdown menu currently showing "Building 1 - Northeast Corner".
- Camera Name:** A text input field.
- Login (optional):** Two text input fields for "Username" and "Password".
- RTSP:** A text input field for "IP Address", a checked checkbox for "Dual Stream", a text input field for "Video Resource URL (H264)", and a text input field for "Preview Resource URL (MJPEG)".
- Examples:** Two examples of RTSP URLs are provided below the input fields:
 - Example 1: "snl/live/1/1/Ux/", "live.sdp", "h264"
 - Example 2: "snl/live/1/2/Ux/", "live2.sdp", "jpeg"
- Buttons:** "Cancel" and "Add Camera" buttons are located at the bottom right.

Image 1: Add RTSP cameras and details, and then select Add Camera to start the connection.

The RTSP URL must be known for the camera to be connected. Because each manufacturer is unique, please refer to the camera manufacturer's documentation for instructions on locating the RTSP URL of the camera.

Next, populate the following fields as follows:

- Name of the camera
- Login and password
 - In some cameras, an ONVIF user must be created

- RTSP
 - Fill in the IP address of the camera
 - It is highly recommended to utilize the Static IP schema for the system if RTSP needs to be utilized, as the stream URL is dependent on the IP address of the camera, which would become inaccessible should the IP of the camera change, for example in a DHCP network.
 - The second stream must be MJPEG (CIF-2CIF-HD at 8 frames per second (fps) preset in the camera)
 - In the field "Video Resource URL," enter the appropriate RTSP URL element (usually the one after the IP address and port number 554).
 - Example: For Dahua cameras, the RTSP URL of the main stream is "rtsp://user:pwd@<camIP>:554/cam/realmonitor?channel=1&subtype=0"; In our field, only add "cam/realmonitor?channel=1&subtype=0"
 - For other manufacturers, a similar method will apply, but the URL will be formatted differently.
 - Select "Dual Stream" as appropriate; not selecting this option creates a single-stream camera. This depends on the camera being used and its capabilities.
 - The first stream has to be H.264.
 - Typically, camera resolution will be between 1MP and 8MP for VMS customers, and typically at either 10, 12, or 15 fps. Although 30 fps is also supported, it typically requires more storage and bandwidth. To protect bandwidth, the camera bitrate should also be relatively close to the resolution of the camera. For example a 2MP camera stream with 2000kbps bitrate would consume bandwidth at an expected, appropriate rate.

Next, click on "Add Camera" to start the connection; which should then appear under the Bridge/CMVR where it's configured as an ONVIF camera.

When adding a camera via RTSP, there is no ability to configure the stream resolution in the configuration menu. This needs to be done inside the camera web interface itself.

RTSP cameras may take longer to appear as "Online" in the Eagle Eye Cloud VMS. If the camera fails to register as online within 5 minutes, restart the Bridge/CMVR by navigating to Bridge Settings, and selecting the "Restart" option in the Bridge Information section. This option should appear for Eagle Eye Cloud VMS reseller users, but if you are an account user with Bridge Settings permissions, simply press the "r" key when looking at the Bridge Settings menu.

Application

By default, the RTSP stream connection is not activated and has to be manually enabled to be able to connect cameras. To do so, you have to go to account configuration and click on “Account Settings”.

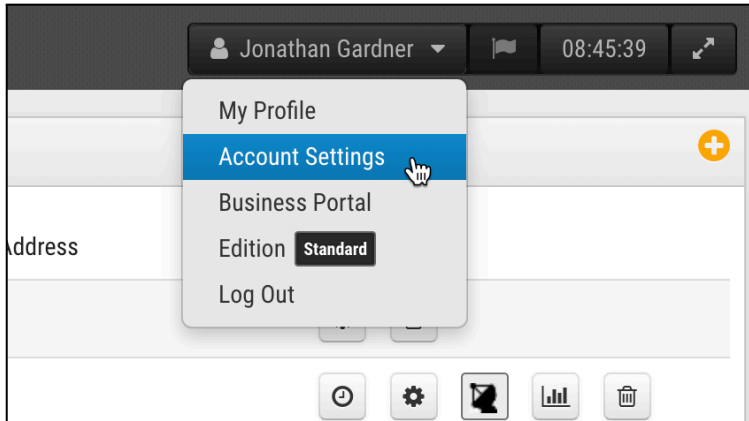


Image 2: Start with Account Settings, then select the Camera tab to enable RTSP cameras.

From Account Settings, choose “Camera” and click the option “Enable RTSP cameras.”

Optional: Add standard credentials. These standard credentials can be applied to all new cameras. Alternatively, camera credentials can be added manually for each camera as it is added to the VMS.

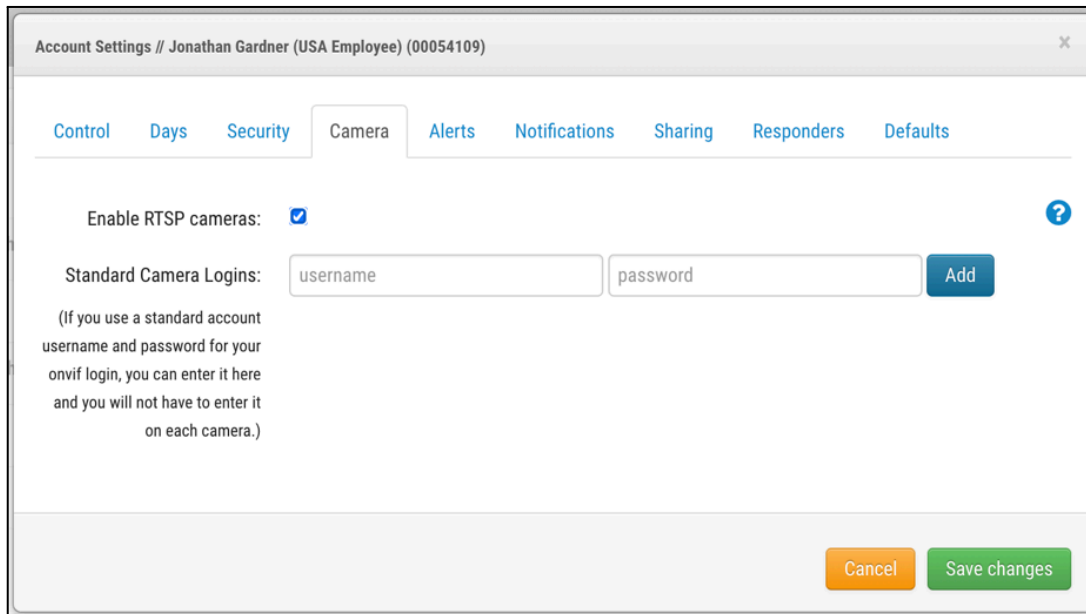


Image 3: From within the Camera tab, enable RTSP cameras.

After enabling this parameter, cameras can be enabled manually from the Dashboard as shown below:



Image 4: Manually add cameras using the "+" icon.

Now that the setup is complete, manually add cameras with the "+" icon as shown in the picture above.

VMS

Once a camera has been successfully added, it will populate under the Dashboard and Layouts tabs within the VMS like any other camera.

