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Overview of the ARH Integration Components

The ARH – ANPR VideoXpert Integration enables the ARH FreewayCAM ANPR Camera and its ANPR capabilities to be utilized in the Pelco VideoXpert Video Management System. Live video feeds from ARH FreewayCAM (via the Pelco UDI5000-CAM) and license plate data can be viewed and monitored from the Pelco VideoXpert Ops Center.

This guide shows how to deploy and configure the server-side components of the integration.

Scope

The following diagram illustrates the two sides of the ARH / VideoXpert installation. The VideoXpert installation, specifically event injection, is discussed in this document. The Client installation is discussed in the document Pelco Ops Center Client / ARH Plug-in Guide.

Components of the Integration

- ARH FreewayCAM (discussed in this document)
- Pelco UDI5000-CAM (discussed in this document)
- Pelco Event Injector Tool (discussed in this document)
- Pelco ARH Event Agent (discussed in this document)
- Pelco ARH Ops Center Plug-in

The Pelco Event Injector Tool and ARH Event Agent are installed and run on the same machine (the Integration Server.) The ARH Ops Center Plug-in is installed on the VideoXpert Ops Center machine.

The Pelco VideoXpert Event Injector requires that Windows Message Queuing be installed on the machine running the event injector. See Appendix: VideoXpert Event Injection for details.
Installing the ARH Integration Components

Installation

This section describes the installation and setup of the following components:

- Pelco Event Injector
- ARH Event Agent
- ARH FreewayCAM Camera
- Pelco UD5000-CAM
- ARH Hardware License Key
- ARH ANPR Engine(s)

Installing the Pelco Event Injector

The Pelco Event Injector needs to be installed prior to installing the ARH Event Agent. This is included as part of VideoXpert.

The Pelco Event Injector runs in the background as a Windows service on the Integration Server.

If the Pelco Event Injector tool is running properly, there should also be two Windows processes running: VxEventInjectorSvc.exe and Pelco.VxInt.AgentProcess.exe. Open Windows Task Manager to confirm the processes are running.
Installing the ARH Event Agent

Follow these steps in install the ARH Event Agent:

1. Download the ARH Event Agent installer to a temporary folder.
2. Create a folder named \ARH\ at the following folder location: C:\Program Files\Pelco\VxEventInjector\Agents\Pelco\.
3. Unzip the downloaded file to the newly created \ARH\ folder.

The next section discusses how to configure the Pelco Event Injector and ARH Event Agent. After the ARH Event Agent is installed and configured, the Integration Server immediately starts listening for ANPR data coming from ARH cameras.

ARH FreewayCAM Camera

Please refer to the ARH FreewayCAM Installation Guide for initial installation and configuration of the camera. Configuring the image quality on the camera should be performed in accordance to recommendations made in the manufacturer’s installation guide. Failure to do so will result in poor quality images and reduces the overall effectiveness of the integration capabilities.

In addition to general installation and setup, there is additional configuration on the camera that needs to be performed in order to have a working VideoXpert integration. If needed, refer to the camera’s user’s manual for additional details.

Also reference the ARH Brief Guide for Input Images to obtaining the best possible image for ANPR processing.
Motion Detection Setup

The ARH Camera needs to be able to detect motion as vehicles pass its view of sight. When motion is detected, the camera takes a snapshot of the current image frame and bundles it with ANPR information to be passed onto the ARH Event Agent.

Event Manager Setup

The Event Manager must be setup to command the ARH camera to send ANPR events to the Integration Server (where the ARH Event Agent resides) every time motion is detected. The specific steps for this setup are:

1. Connect to the ARH camera’s web interface from an internet browser.
2. Login with the administrator credentials if asked.
3. From the menu tree, choose Advanced Setup->Event Manager.
4. Click the Register button corresponding to the Hardware Motion Detection trigger source.
5. Click the **Set Upload Target** button.

6. Select **HTTP** for **Upload Protocol**.
7. Select the **Image** and **Event** data checkboxes for **Content**.
8. Enter the Host Ip Address and Port. These values refer to the Integration Server where the ARH Event Agent resides. Note: The Port number specified here will be needed when setting up the ARH Event Agent.
9. Cut and paste the following string of text to the **Filename template field**: `VXTS-D$s0M$dY$yH$hM$mS$s-$l-VXPN$a`
10. Click the **Save** button.
11. Click **Back to Event Manager**.
12. Click the **Start** button.

**Event Manager Setup**

The UDI5000-CAM is a VideoXpert device that allows third party camera video streams to be injected into the VideoXpert VMS. The video stream is recorded and can be viewed in live or plackback mode. Follow the following steps to add the ARH FreewayCAM camera to the UDI5000-CAM.

1. Connect to the UDI5000-CAM web-based user interface from a qualified internet browser.
2. Login using the set password or the default password of **admin**.
3. Click the `+` button to add new video channel.
4. Select the following values for the Camera Information fields:
   - **Manufacturer**: ONVIF
   - **Model #**: ONVIF
   - **Channel #**: Channel 1
5. Select the following values for the Camera Credentials fields:
   - IP Address: <IP address of the ARH Camera>
   - User Name: user set or default of admin
   - Password: user set or default of admin
6. Click the Apply button and the ARH Camera will appear as a channel in the Channels list.

ARH Hardware License Key

The ARH Integration requires that a valid ARH hardware license key be present on the Integration Server before ANPR data can be received. The Hardware Key is a USB device that can be plugged into any USB port on the Integration Server. The key can be purchased through ARH.

ARH ANPR Engine(s)

ARH distributes region specific ANPR Engines for the recognition of the various kinds of license plates. Therefore, the appropriate engine is required based on regions deployed. In order to install the Engines, the ARH Freeflow software package needs to be installed. ARH Freeflow software and Engines are to be installed on the Integration Server.

Downloaded and unzip all the ARH Engine files to a local folder for later use.

Next, unzip the ARH Freeflow software package and run setup to install the software and then following the following steps to install the ARH Engines:

1. Run the ARH Engine Manager from the Windows Desktop: **Start > All Programs > CARMEN GX > 32 bit version > Engine Manager (32 bit)**
2. Click the Browse button next to the Engine(s) package text box to locate the folder location where the Engine files were unzipped. Choose the file with a .gxz extension and which has _w32 in its name.
3. Click and highlight the engine listed under Found engines.

4. Click the Install engines button. The result will be an entry with that same name in the Installed engines text box.
5. Repeat the same for the other region’s ARH engines.
6. Close the Engine Manager.

Selecting a Default ANPR Engine

The integration needs to know which ANPR Engine to use in detecting license plates native to the target region. In the Installed Engines list, click and highlight the appropriate engine. Click the Change button and the highlighted ANPR Engine becomes the default ANPR Engine that the integration will use.
Installing the ARH Integration Components

Engine Manager for 32-bit engines

Engine(s) directory:

Engine(s) package:

Browse

Found engines:

Installed engines:

- cmanpr-7.2.7.108 : general
- cmanpr-7.2.8.35 : usa
- cmanpr-7.2.8.39 : arab
- cmanpr-7.2.8.39 : latin

Engine type

- ANPR
- ACCR
- UIC

Default engine:

cmanpr-7.2.8.39 : arab

Change

Install engines

Uninstall engines

Log:
Configuring the ARH Integration Components

Configuration

After installing the ARH Event Agent, the remaining task is to configure the ARH Event Agent via the Pelco Event Injector’s Agent Configurator on the Integration Server. The Agent Configurator tool was installed as part of the Pelco Event Injector installation process.

The ARH Event Agent provides a user interface for configuring:

- ARH Event Configuration
- Device Association
- Black and White List
- Initialization of VideoXpert situations types specific to ARH ANPR events

Running the Pelco Event Injector Agent Configurator

Run the Pelco Event Injector Configurator from the Windows Desktop: Start > All Programs > Pelco > VideoXpert Event Injector > Agent Configurator

Follow these steps to configure the ARH Event Agent:

1. Log into VideoXpert using the VideoXpert Core IP Address, username and password. The default port of 443 should be left unchanged.
2. The ARH ANPR Event Agent will appear as an item in the list of available agents.
3. Check the ARH ANPR Event Agent checkbox, then click the Next button to bring up the ARH Event Agent configuration screen.
4. Set these fields in the ARH Event Configuration screen:
   - Event Listener Port: Enter the port number that was entered in the ARH Event Manager Setup.
   - Confidence Level: 0-100 (percentage scale). This value represents the minimum degree of certainty the engine must have for a detected license plate number. Adjust this value to reduce the number of duplicate plate number readings injected into VideoXpert.
   - ANPR Engine: Use this selection box to select the active ANPR Engine. Only one engine can be active at one time.
   - Click the Save All button to save the configuration. Changing any fields here requires restarting the Pelco Event Injector service.

Device Association

Although video streams and ANPR data originate from the same source (ARH camera), they take different routes to VideoXpert. Video is transmitted via the UDI5000-CAM, and ANPR data via the Pelco Event Injector tool. Since there can be many ARH cameras streaming video and injecting ANPR data into VideoXpert, there needs to be a way to correlate ANPR data with video streams. The Device Association interface makes this correlation possible.

1. Log into VideoXpert using the VideoXpert Core IP Address, username and password. The default port of 443 should be left unchanged.
2. Once logged in successfully, the ARH Event Agent queries VideoXpert for all devices that are UDI5000-CAM devices. The result of this query is listed in the Device Association tab.
3. From this list, identify all ARH cameras. For each ARH camera on the list, enter the device’s actual IP Address (Not the UDI5000-CAM IP Address) in the Camera IP Address column. Making this correlation is crucial; not performing this correlation will cause the Pelco Event Injector tool to inject ANPR data into VideoXpert incorrectly.
4. Click the Save All button to save the configuration. Changing any fields here requires restarting the Pelco Event Injector service.
Black and White List

The Black and White List adds advanced filtering capability. Every license plate detected by the ARH camera is cross-checked against license plates in these two lists. Using black and white lists, operators can get real-time alerts on unknown vehicles or previous offenders.

1. Enter license plate numbers on each row in each of the lists. When cross-checking, the ARH ANPR Engine looks for exact matches.
2. If a match occurs, the license plate is flagged in VideoXpert as either a Black List Situation or White List Situation. The VideoXpert situation types are discussed in the next section.
Initializing VideoXpert Situation Types

The final step in configuring the ARH Event Agent is to initialize the ARH specific situation types in VideoXpert.

1. Check the Use existing configuration checkbox only when situation types have already been initialized.
2. Click the Next button to proceed.
3. On the next screen, click the Start button.

4. When prompted with the Proceeding will delete the existing configuration and use this one instead, proceed? dialog, click the Yes button. Note that it is okay to perform this step multiple times as it will not affect situations already defined.

5. The result will be the creation and initialization of the following three situation types in VideoXpert:
   - External/ARH/plate_detected
   - External/ARH/plate_detected_blacklist
   - External/ARH/plate_detected_whitelist

6. At this point, the ARH integration is running and injection of ANPR data to VideoXpert has commenced.
Appendix: VideoXpert Event Injection

Enabling Windows Message Queuing

The Pelco VideoXpert Event Injector requires that Windows Message Queuing be installed on the machine running the event injector. If Windows Message Queuing is not installed, the service will not start. Instructions are provided in this MSDN article.