Video Streamer

Installation and Upgrade Guide

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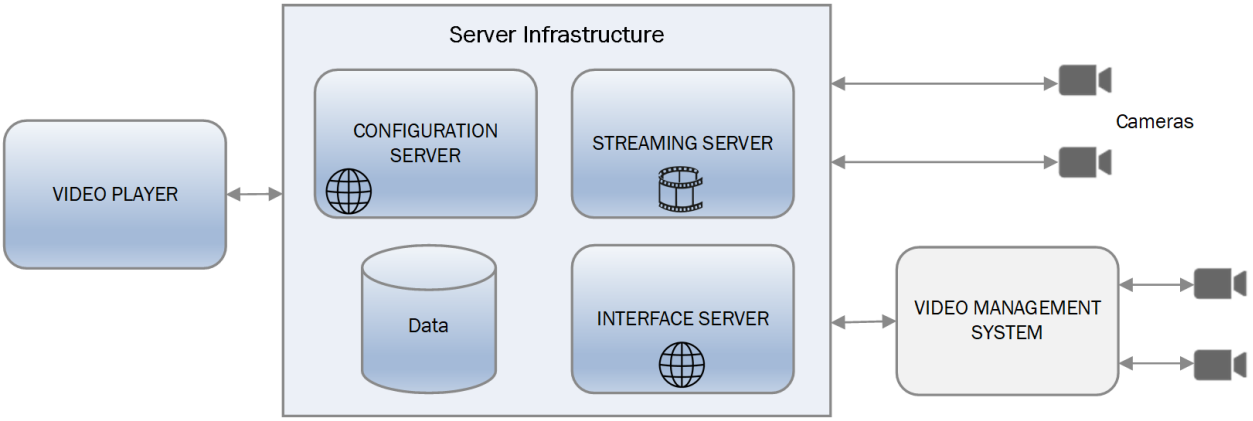
Contents

Overview/System Architecture

Video Streamer from Hexagon's Safety, Infrastructure & Geospatial division enables other products to play video originating from cameras or Video Management Systems (VMS) in a web browser. Video Streamer is based on a series of server components and works in conjunction with other software pieces as shown in the diagram below:



Configuration Server

The Configuration server manages the configuration of the system. It provides load-balancing functionality across one or more connected Streaming servers. The Configuration server also hosts a Web-based administration user-interface that allows an administrator to perform the following tasks:

- Manage the administrator account profile
- Configure product licensing
- Set up video sources
- View Interface servers
- Configure Streaming servers

Interface Server

The Interface server provides the technical interface to each video source with the following functions:

- Lifecycle management (startup, shutdown, and so forth) of each component associated with a video source
- Metadata transformation from each individual source

- Interface interoperability (PTZ, discovery, and so forth) for each source

Streaming Server

As part of the Video Streamer network, one or more Streaming servers can be configured to stream video from two different video source types: Video Management Systems (VMS) or cameras.

Streaming server connections to a video source must use H.264/RTSP. A video player hosted in a consuming application (such as HxGN OnCall Dispatch | Video Responder) or in the Video Streamer Administrator consumes H.264/WebRTC.

Data

Data for the Video Streamer is stored in a PostgreSQL database. This database can be hosted on the same computer as the Configuration server or on a separate computer.

Video Sources

You can configure two types of sources for playing video: Video Management Systems and Generic Camera.

- **Video Management System** (VMS) - You can configure a Video Management System (VMS) interface to host cameras to play video. For each instance of a VMS interface, a video interface component (plugin DLL) must be installed on the Configuration server. This component can either be provided by Hexagon or can be created by using the SDK for Video Streamer. The Configuration server communicates with the VMS through the video interface component.
- **Generic Camera** - If no VMS is being used for video, you can use the delivered Generic Camera video source or create a different video source.

Video Player

The product used to play video (such as HxGN Connect Live Share or HxGN OnCall® Dispatch | Video Responder) will embed a video player provided with the SDK for Video Streamer.

Before You Install

Verify that you have the following software and other requirements installed on the computers that will host the configuration server, interface server, and streaming servers **before you begin** the installation process for Video Streamer.

Configuration Server

- If you are installing Video Streamer on Windows Server, version 2022 is required. Previous versions of Windows Server are no longer supported.
- .Net 6.0.32 installed on the computer that will host the Configuration Server.
- Full version of PostgreSQL 15.2.1 or later. If PostgreSQL is not already installed, version 16.4.1 is included with the Video Streamer 2409 installation media. You should be familiar with the installation process and database creation process for PostgreSQL.
- A license file created by Hexagon that allows the configuration of interfaces to video sources.
- An SSL certificate to provide secure connections on the computer that hosts the Configuration server. You can obtain a certificate from any certificate authority you choose. The Configuration server uses the PFX file version of the certificate. The password for the PFX file certificate is required.

   Hexagon recommends that you obtain a wildcard certificate to cover the security for all server components. However, the certificate must be in different formats. See the topic *Convert SSL Certificate Files into Other Formats* (on page 77) for more information.

Interface Server

- .NET Framework 4.8.1 is required for the Interface Server and all VMS Interfaces listed below.
- Install the Interface server on the same computer as the Configuration server.

For each instance of a Video Management System (VMS) that will be used with Video Streamer, an external VMS interface (plug-in DLL) must be installed on the same computer that hosts the Configuration and Interface servers. The Interface server communicates with the VMS through the external VMS interface. Hexagon provides the following VMS interfaces that you can install:

- Avigilon VMS Interface - See the *Avigilon VMS Installation Guide*.

- Genetec VMS Interface - See the *Genetec VMS Installation Guide*.
- Milestone VMS Interface - See the *Milestone VMS Installation Guide*.
- Qognify VMS Interface - See the *Qognify VMS Installation Guide*.

You can also create your own external VMS interface by using the SDK for Video Streamer. Contact *Hexagon Support https://hexagon.com/support-success/safety-infrastructure-geospatial* to obtain a copy of the SDK for Video Streamer.

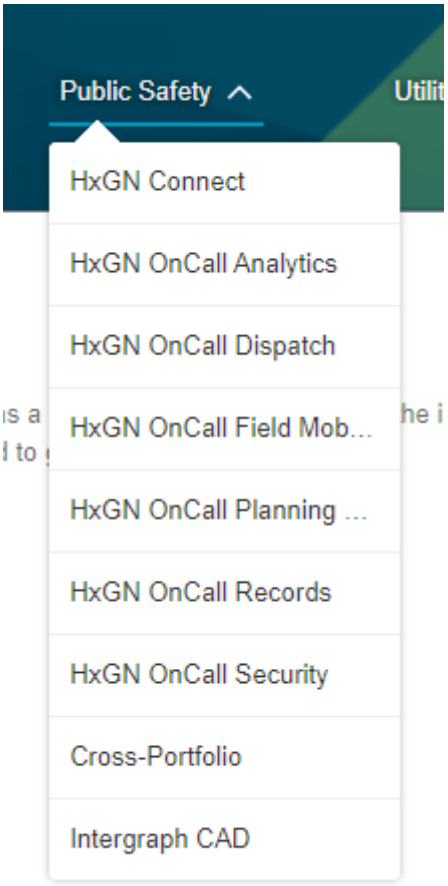
Streaming Server

- Command-line tools for PostgreSQL 15.2.1 or later must be installed on the computer where the Streaming server will be hosted (unless there is already a PostgreSQL installation on that computer).
- An SSL certificate to provide secure connections on the computer that hosts the Streaming server. The Streaming server uses a PEM file version of the certificate. The password for the PEM file certificate is required. See the topic *Convert SSL Certificate Files into Other Formats* (on page 77) for more information.

What's New

To read about new features, updated features, and system requirements, use the **Support** page. For online and phone support, see *Technical Support* (on page 92).

1. Go to the *Support page https://hexagon.com/support-success/safety-infrastructure-geospatial*.
2. Click **Log in**.
3. Type your username and password, and click **Log in**.
4. From the **Products** list, select your product portfolio.



The list of products for the selected portfolio displays.

5. Click a product link to open its support page.

6. When the product page opens, click the appropriate links to view product announcements or technical documentation.
   - Click **Release Notes** to review new or enhanced product features.
   - Click **Issues Resolved** to review defects that have been fixed.
   - Click **Supported Environments** to review system requirements.
   - Click **Open-Source Software Notices** in the **Product Information** box, if available, to review information on open-source software in the product.

   Some minor releases might not provide Release Notes or Issues Resolved.

Document Set

The following documents are provided with the product.

Document	Description
Video Streamer Supported Environments	A PDF file that lists the supported software configurations (required and optional) for the product.
Video Streamer Release Notes	A PDF file that lists the enhancements for the current release.
Video Streamer Open Source Software Notices	A PDF file that lists open-source software and licenses included with the product.  Products that do not contain open-source software do not deliver this document.
Video Streamer Installation and Upgrade Guide	A PDF file that contains instructions for installing and upgrading the product.
Video Streamer Database Replication and Failover Guide	A PDF file that contains instructions for setting up database replication and failover for the product.
Video Streamer Administrator Help	HTML files that contain information about the Administrator application included with a product suite that provides a user interface to configure and customize HxGN products.

These documents install with the product or are available on the delivery media location.

The current versions of the Supported Environments, Release Notes, Issues Resolved, and Open Source Software Notices are available on the Hexagon *Support website https://hexagon.com/support-success/safety-infrastructure-geospatial*.

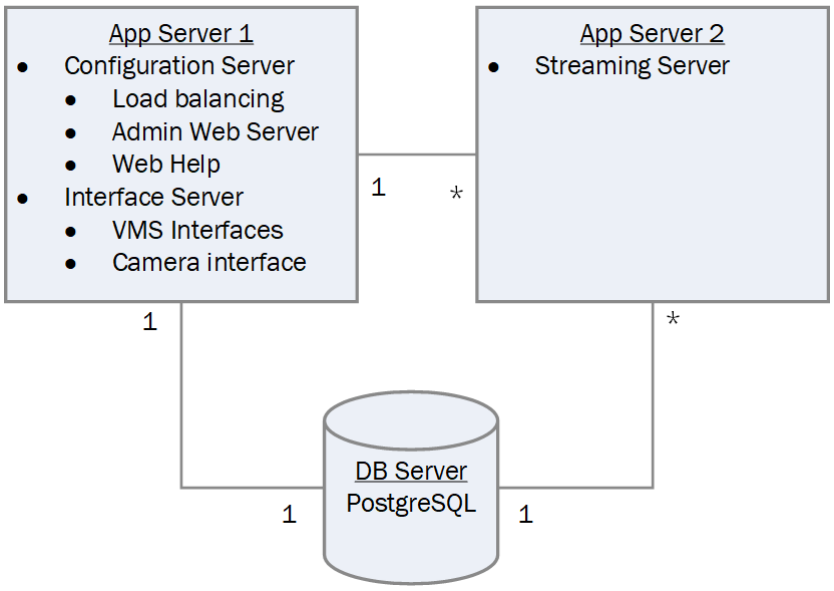
Physical System Overview

For a Video Streamer production environment, Hexagon recommends you have at least the following:

- One Windows computer for the Configuration server, Interface server, and the PostgreSQL Database.
- One Windows computer for each Streaming server.

All the Video Streamer components can be installed on the same computer. In fact, for most installations, the Configuration server, Interface server, and database will be installed on the same computer. However, if a Streaming server is installed on the same computer as the Configuration and Interface servers, the **Streaming server must use a secure port** that is different from those associated with the other two servers. For example, the Configuration server might be listening on port 446, the Interface server on port 447, and the Streaming server on 443.

The following diagram illustrates a possible configuration for a Video Streamer production environment where the system is maximally scaled horizontally, meaning the each component is hosted on a separate computer.



For information about configuring Video Streamer for failover, see the *Video Streamer Failover Guide*.

Install and Configure a New Video Streamer System

This section provides steps and information to install a NEW Video Streamer system. If you need to upgrade a Video Streamer system to the latest version, skip to the *Upgrade* (see "*Upgrade a Video Streamer System*" on page 45) section of this document.

To create a new Video Streamer system, perform the following tasks in this order:

Configuration and Interface Servers

1. *Install PostgreSQL on the Configuration server* (on page 16).
2. *Install the Configuration server software* (on page 17).
3. *Install the Interface Server Software* (on page 20).
4. *Install or Create VMS Interfaces* (on page 21)
5. *Start Video Streamer Administrator and change the password* (on page 21).
6. *Review Server Information and Change Log Settings* (on page 23)
7. *Set up licenses* (see "*Set Up the License*" on page 25).
8. *Add a VMS Video Source* (on page 28)
9. Add Application Connections.

Streaming Server

1. *Install PostgreSQL command-line tools on the Streaming server* (see "*Install PostgreSQL Command-line Tools on the Streaming Server Host*" on page 36).
2. *Create a Streaming server definition* (on page 38).
3. *Install the Streaming server software* (on page 41).

Install the Configuration and Interface Servers

The Configuration server manages the configuration of the system. It provides load-balancing functionality across one or more connected Streaming servers. The Interface server provides the technical interface to each video source.

Use the topics in this section of the document to install the Configuration and Interface servers for Video Streamer.

To upgrade the Configuration server to the latest version, see *Upgrade a Video Streamer System* (on page 45).

To use self-signed certificates with Video Streamer, see the *Use Self-Signed Certificates with Video Streamer* (on page 81) topic before you begin the product installation.

Install PostgreSQL on the Configuration Server

Before you install the Configuration server software, you must install PostgreSQL (full version) or identify an existing installation of PostgreSQL that can be used.

PostgreSQL version 15.2.1 or later is supported. If a supported version of PostgreSQL is not already installed, version 16.4.1 is included with the Video Streamer 2409 installation media.

See the *documentation* (*https://www.postgresql.org/docs/*) provided with PostgreSQL for detailed instructions. You should be familiar with the installation process and database creation process for PostgreSQL.

To install PostgreSQL:

1. *Disable IPv6* (on page 59).
2. If PostgreSQL 15.2.1 or later is not already installed, navigate to the location of the Video Streamer 2409 installation media and open the *\ThirdParty* folder.

   PostgreSQL can be installed on the same computer as the Configuration and Interface servers or on a separate computer.
3. Double click the *postgresql-16.4-1-windows-x64.exe* file to begin the installation of the PostgreSQL software.
4. On the **Welcome** page, click **Next**.
5. On the **Installation Directory** page, click **Next** to accept the default location.

6. On the **Select Components** page, uncheck the **Stack Builder** option and click **Next**.
7. On the **Data Directory** page, click **Next** to accept the default location.
8. On the **Password** page, enter the password for the postgres superuser. Click **Next**.
9. Click **Next** on the **Advanced Options** page to accept the **Default locale**.
10. Click **Next** on the **Pre-Installation Summary** page.
11. Click **Next** on the **Ready to Install** page, The installation process begins.
12. When prompted that the PostgreSQL installation is complete, click **Finish**.
13. Identify the IP address of the computer that will host the Configuration server. You will need this address for the next step.
14. Configure client access to PostgreSQL for the Configuration server by performing the following steps:
    a. Locate the *pg_hba.conf* file **on the computer where PostgreSQL is installed**. This file is usually located in the *\data* folder (for example, *c:\Program Files\PostgreSQL\16\data*).
    b. Open the *pg_hba.conf* file with a text editor, such as Notepad.
    c. Scroll to the end of the file. Add a line under the **IPv4 local connections** section for the computer that hosts the Configuration server. Use the IP address you recorded in a previous step. The line has the following format (replace the IP address below with your IP address):

```
# IPv4 local connections:
host    all             all             127.0.0.1/32            scram-sha-256
host    all             all             129.135.11.22/32        scram-sha-256
```

    This line allows any user from the host with this IP address to connect to any database when the user's password is entered correctly.
    d. Save and close the file.

Install the Configuration Server Software

Use these steps to install the Configuration server software for the Video Streamer.

To upgrade the Configuration server from a previous version, see *Upgrade to the Latest Version* (see "*Upgrade to the Latest Version of Video Streamer*" on page 45).

To use self-signed certificates with Video Streamer, see the *Use Self-Signed Certificates with Video Streamer* (on page 81) topic before you begin the product installation.

.Net 6.0.32 is required for version 2409 of the Configuration Server.

To install the Configuration server:

1. Open an Administrative command prompt.
2. Navigate to the location of the Video Streamer installation media.
3. From the command prompt, run the *install_hvs_configuration.bat* file with the following options. Any option that contains spaces should be enclosed in double quotation marks.
   - **DomainName**: The fully qualified domain name of the computer that will host the Configuration server (for example, `mycomputer.mydomain.com`).
   - **Port**: The port number where the Configuration server will accept connections. You can use any port number that has not already been used.
   - **PfxFile**: The SSL certificate file (must include full path to the *.pfx* file).
   - **PfxPw**: The password for the certificate file. If the certificate password contains any character that is not a letter or a number (special characters such as @ # $ % & * ( ) + = < > ? | , ;), the special characters must be escaped with a caret (^) character. An escape character invokes an alternative interpretation of the character so that it can be used correctly within the software. Also, for this script, make sure the password is enclosed in **double** quotes, as shown in this example:

     ```
     "ke^*mn3^)fs"
     ```
   - **PostgresHost**: The name of the host computer where the PostgreSQL database is running.
   - **PostgresPort**: The port on the host computer where the PostgreSQL database is running.
   - **PostgresUser**: The PostgreSQL username for the Configuration server. The default username for PostgreSQL is **postgres**.
   - **PostgresPw**: The PostgreSQL user password for the Configuration server.

     Example Command Line: The following shows an example command line for installing the Configuration server. Your command line will be different.

```
install_hvs_configuration.bat server1.acme.com 446
C:\Certificates\Server1.pfx "ke^*mn3^)fs" server1.acme.com
5432 postgres dEs3#99N
```

Running this command performs the following tasks:

- Verifies the installation script is running in 64-bit mode.
- Verifies the certificate file is present (*.pfx* file).
- Verifies that the PostgreSQL installation, database user, and password are valid.
- Installs Chocolatey if needed.
- Checks for the supported .Net 6 version and if not found, displays this error message: "The minimally supported version of .Net 6 is not installed on the host. Please refer to the installation guide to install the supported version." Exit the Configuration server installation, navigate to the location of the Video Streamer installation media and open the *\ThirdParty* folder. Double-click the *dotnet-hosting-6.0.32-win.exe* file to begin the installation. Once the installation of .Net 6.0.32 is finished, return to Step 3 above to install the Configuration server.
- Uses Chocolatey to perform the following tasks:
  - Checks for previous versions of the Configuration server product (hvsconfigurationserver). If a previous version is found, it is uninstalled and the newer version is installed.
  - Installs the Configuration server files to the default Windows *\Program Files* folder.

    Example: *C:\Program Files\Hexagon\Video Streamer\Configuration Server*
  - Creates a PostgreSQL database named **hvsdb** if the PostgreSQL user has appropriate permissions. If the database is not created, you can use the PostgreSQL **pgAdmin 4** administration tool to create the database after installation is complete.

    When Video Streamer components are *uninstalled* (see "*Uninstall Video Streamer*" on page 90), existing PostgreSQL data is not altered or deleted.
  - Creates the required PostgreSQL schema in the *hvsdb* database.
  - Loads delivered data into the PostgreSQL schema.
  - Creates and starts a new Windows service for the Configuration server.

4. When the installation process is complete, leave the Administrative command-prompt window open.

If you get the message, "The software was installed but additional steps are required to complete the installation," go to the *Modified Video Streamer Installation Procedure* (on page 51) and follow the instructions in that topic.

Install the Interface Server Software

Use these steps to install the Interface server software for the Video Streamer on the same computer as the Configuration server is installed.

.Net Framework 4.8.1 or later is required for version 2409 of the Interface Server.

To install the Interface server:

1. Open an Administrative command prompt if one is not already open.
2. Navigate to the location of the Video Streamer 2409 installation media.
3. At the command prompt, run the *install_hvs_interface.bat* file and include the following options:
   - **Port**: The port number where the Interface server will accept connections. You can use any port number that has not already been used.

     ```
     install_hvs_interface.bat <port>
     ```

     For example:

     ```
     install_hvs_interface.bat 447
     ```

   Running this command performs the following tasks:
   - Installs .NET Framework 4.8.1 if needed.
   - Uses Chocolatey to perform the following tasks:
     - Checks for previous versions of the Interface server product (hvsinterfaceserver). If a previous version is found, it is uninstalled and the newer version installed.
     - Installs the Interface server files to the default Windows *\Program Files* folder.

       Example: *C:\Program Files\Hexagon\Video Streamer\Interface Server*
     - Creates and starts a new Windows service for the Interface server.
4. When the installation process is complete, close the command prompt window.

5. If .NET Framework 4.8.1 was installed, restarting your computer is recommended.

Install or Create VMS Interfaces

For each instance of a Video Management System (VMS) that will be used with Video Streamer, an external VMS interface (plug-in DLL) must be installed on the computer that hosts the Interface server. The Interface server communicates with the VMS through the external VMS interface. You can do the following:

- Install one or more of the VMS interfaces provided by Hexagon:
  - Avigilon VMS Interface - See the *Avigilon VMS Installation Guide*.
  - Genetec VMS Interface - See the *Genetec VMS Installation Guide*.
  - Milestone VMS Interface - See the *Milestone VMS Installation Guide*.
  - Qognify VMS Interface - See the *Qognify VMS Installation Guide*.

  OR
- Create a custom VMS interface by using the Video Streamer SDK. Contact *Hexagon Support* *https://hexagon.com/support-success/safety-infrastructure-geospatial* to obtain a copy of the Video Streamer SDK.

 If a VMS is not being used, you can use the delivered *Generic Camera video source* (see "*Configure the Generic Camera Video Source*" on page 33) to view cameras.

Start Video Streamer Administrator and Change the Password

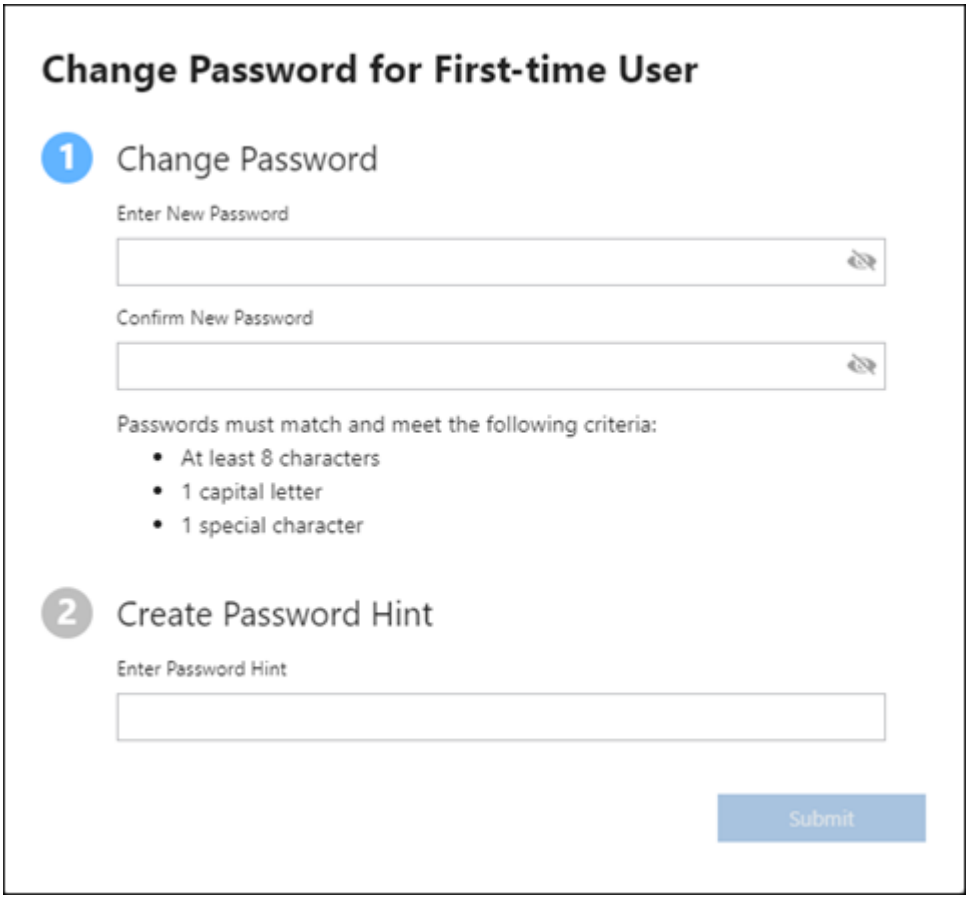
Video Streamer allows only one user named *admin*. The first time you sign into Video Streamer, type `admin` as the username and `admin` as the password. Then you are prompted to change the password and provide a hint in case you forget the password.

You can change the password and hint whenever needed. However, if you forget the password and the hint does not help you remember it, contact *Hexagon Support* (see "*Technical Support*" on page 92).

To sign into Video Streamer the first time:

1. Type the URL for Video Streamer (for example, `<domain_name>:<port>`) into a chromium-based Web browser (such as Google Chrome). A sign-in page is displayed.

2. Type `admin` as the username.
3. Type `admin` as the password. You will be prompted to change the password once you are signed in.
4. Click **Sign In**.
5. A **Welcome** form is displayed. Click **Proceed** to open the **Change Password for First-time User** dialog box.



6. Using the criteria noted on the form, type your new password in the **Enter New Password** field. To display the password, click the **Show Password** icon.
7. Type the same password in the **Confirm New Password** field. To display the password, click the **Show Password** icon.
8. Type a password hint to remind you in case you forget the password.
9. Click **Submit**. The Video Streamer opens to the **Overview** page.

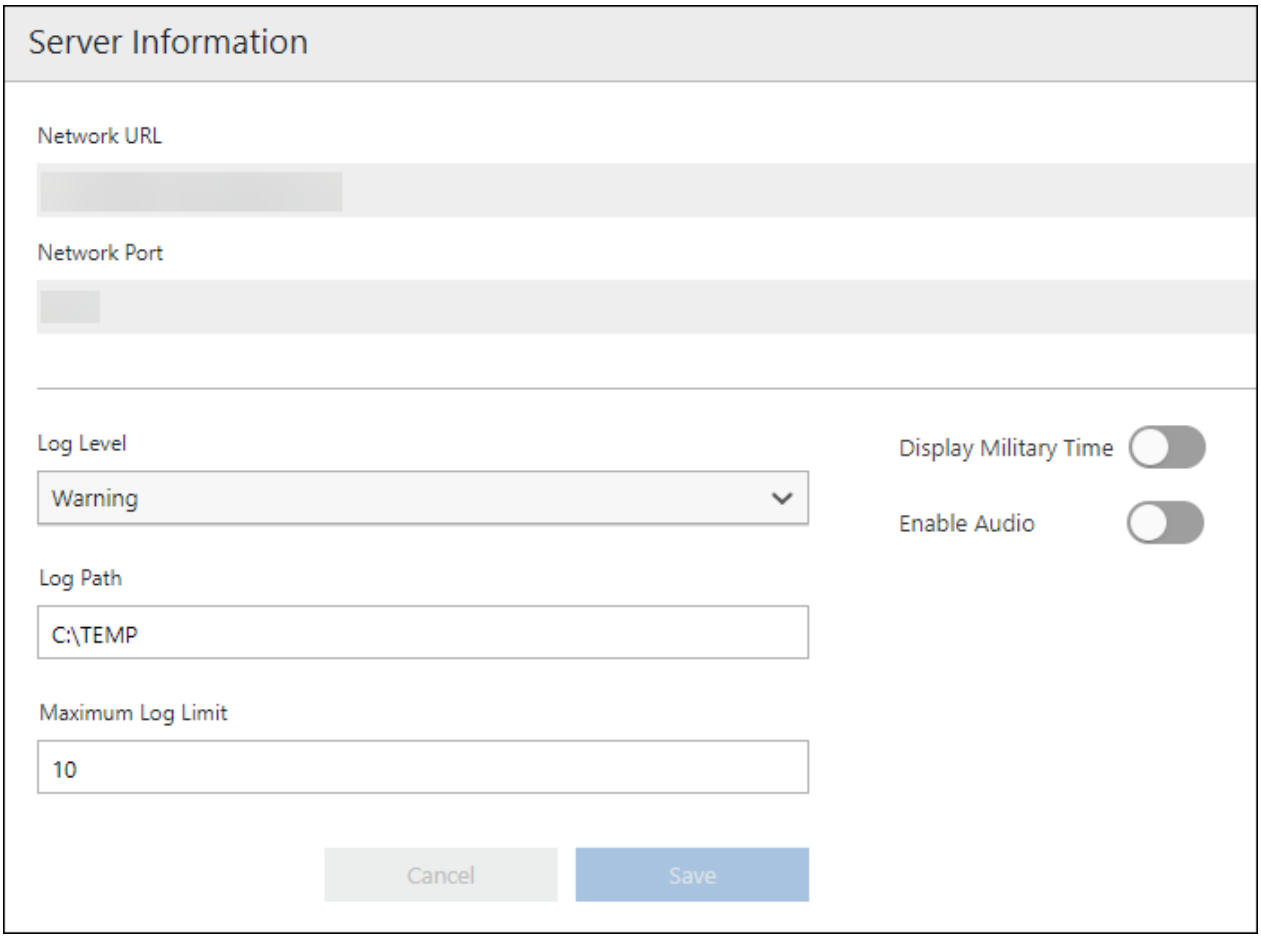
Review Server Information and Change Log Settings

The Configuration and Interface servers log information about system processes to help investigate any errors or issues that occur. Use these steps to configure the log settings for the Configuration and Interface servers.

You can also turn on the display of Military time from this form.

To review the server information:

1. From the **Video Streamer** menu, select **Settings**. The page displays the **Server Information** for the Configuration server. The **Network URL** and **Network Port** information is displayed but cannot be edited.

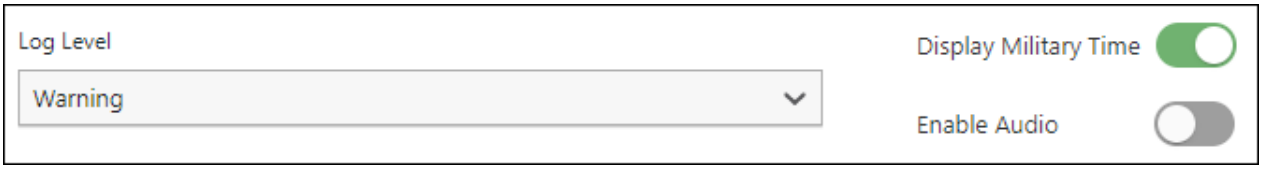


2. Select the logging level from the **Log Level** drop-down list. **Warning** is the default setting.

Log Level	Description	When to Set
Warning	Default log level. Records when a service is degraded, endangered, or behaving outside of its expected parameters. A **Warning** log level includes errors, warnings, and some performance issues.	During installation and configuration of Video Streamer.
Error	Records when functionality is unavailable or when expectations are not met. An **Error** log level records errors only.	When Video Streamer is in production.
Info	Records actions happening in the system that correspond to its responsibilities and functions. Generally, these are the observable actions the system can perform. An **Info** log level includes errors, warnings, performance information, and normal processing information.	When you want high-level system information but not full details.
Verbose	Records internal system events that are not necessarily observable from the outside but might be useful when determining how something happened. A **Verbose** log level includes extensive information: errors, warnings, performance information, normal processing information, and detailed processing information.	Only when advised by Hexagon Support.

3. Specify the **Log Path** where the log files will be saved. The default location is *c:\temp*.
4. Specify the **Maximum Log Limit**, which is the maximum number of log files that are maintained. When the log limit is reached, the oldest log file is deleted. The default is 10 log files.

5. *Optional*: Turn on **Display Military Time**. Changes to this setting do not require saving.



6. *Optional*: Turn on **Enable Audio** to turn on audio when playing a camera that supports audio. Changes to this setting do not require saving.
7. Click **Save**.

Set Up the License

Hexagon uses software-enforced licenses for its products. When these products are purchased, a license (LIC) file is made available containing the license code for the products your site purchased. This license code is used to activate the product licenses. You must have a license for each instance of a Video Management System (VMS) and/or one license that will be used for all cameras not associated with a VMS. Hexagon recommends that each configuration server have its own unique set of licenses. All these licenses are included in one LIC file.

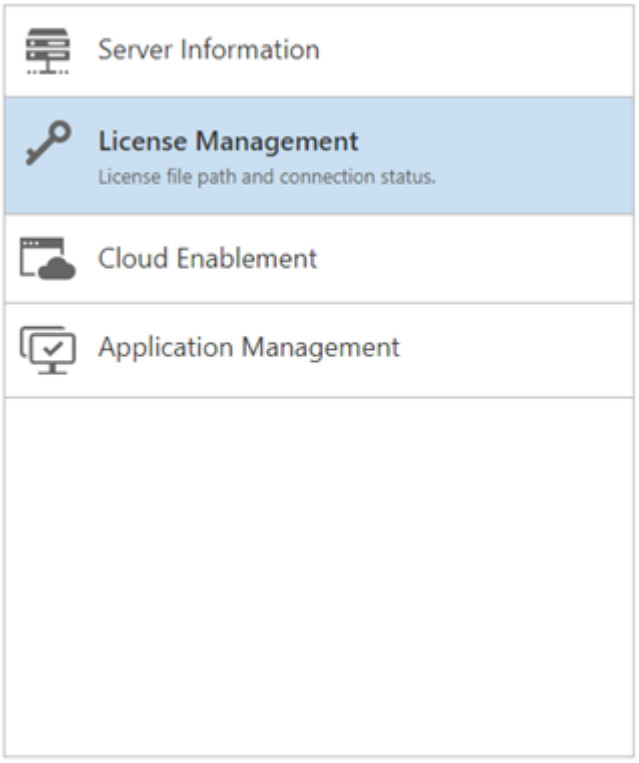
The licenses are concurrent/floating, which means they are not tied to any particular computer. For Video Streamer, licenses are issued based on the number of a Video Management Systems (VMS) being used with Video Streamer.

For more information on licensing, see the *Hexagon Licensing web page* (*https://support.hexagonsafetyinfrastructure.com/infocenter/index?page=licensing_resources*). For licensing support, contact Hexagon Safety & Infrastructure Support at 877.822.8921.

To manage licenses:

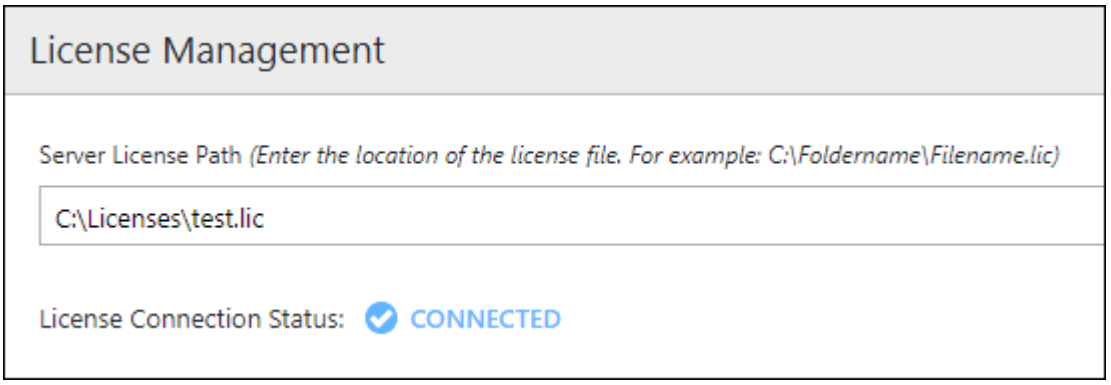
1. Locate the license letter that was emailed to you at the time of your product purchase or upgrade. This license letter contains the unique LIC file for your site with the codes for your products. Save this file locally.
2. Sign into Video Streamer.
3. From the **Video Streamer** menu, select **Settings**.

4. From the left panel, select **License Management**.



Hexagon recommends that each configuration server have its own unique set of licenses; however, this is not required.

5. Enter the full path to the LIC file, including the filename.



6. Click **Save**.

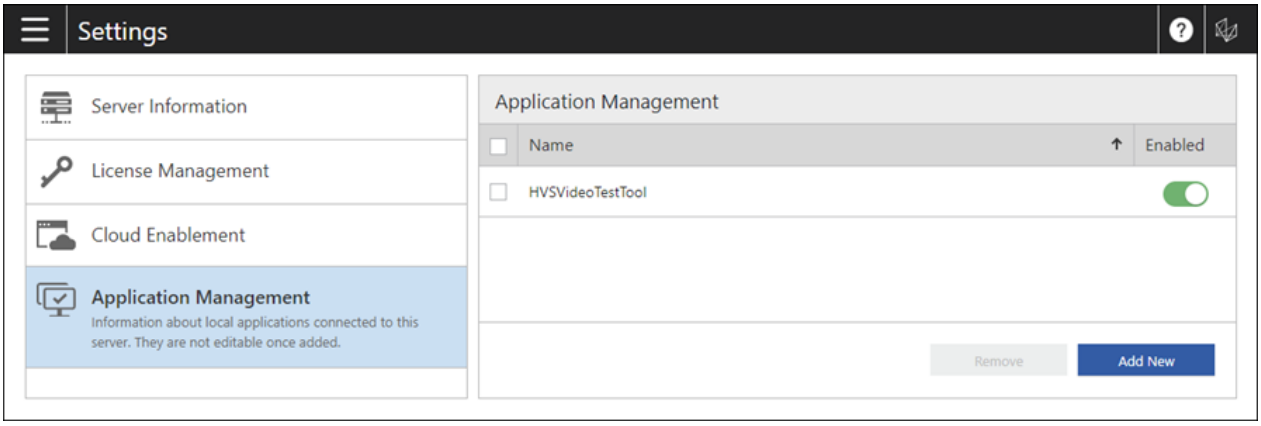
After you have configured Video Sources, their license usage status is displayed in the **License Features** section. The status shows zero usage when no licenses are in use or when the license server is disconnected or attempting to reconnect.

Add Application Connections

To use another software application to work with Video Streamer to play video, complete the following steps.

To add a connection to an application:

1. From the **Video Streamer** menu, select **Settings**.
2. From the left panel, select **Application Management**.



3. Click **Add New** to open the **Add Application Connection** dialog box.
4. Enter the name of the application you want to add.
5. Click **Generate** to have the software create an application key for you.

   OR

   Type your own key.
6. Click **Copy to Clipboard**. Save the key to a file because the generated key will not be displayed again. You will use this key when setting up video for another product.
7. Click **Submit**.

Add Video Sources

A *Video Source* represents a management interface that allows access to external camera sources. It provides the ability to discover camera data, view live and archive

video streams, and control the movement and position of a camera lens. It is the main interface for interacting with cameras.

Video Streamer provide two types of video sources:

- VMS - Represents an interface to an external Video Management System (such as Milestone, Genetec, Avigilon, or Qognify).
- Camera - Represents an interface to a grouping of stand-alone Internet Protocol (IP) cameras (cameras that are not associated with a VMS).

Every camera must be associated with a video source.

Using Video Streamer, you can create video sources for the following types of cameras:

- **Cameras associated with a COTS VMS** (see "**Add a VMS Video Source**" on page 28). Video Streamer supports the following VMS systems as commercial-off-the-shelf (COTS) products.
  - Avigilon
  - Genetec
  - Milestone
  - Qognify
- **Cameras for a VMS not currently supported as a COTS product**. Using the Video Streamer SDK, you can create a custom VMS interface for your system to handle cameras from a VMS that is not currently supported as a COTS product. Once the custom VMS interface is ready, use the steps in *Add a VMS Video Source* (on page 28) to add the interface (plugin) to the system.
- **Cameras that are not associated with a VMS**. Video Streamer provides a **Generic Camera** video source for cameras that are not associated with a VMS. It comes installed and partially configured as a part of the Configuration Server component. The Video Streamer SDK can also be used to create a custom Camera interface. Once the custom Camera interface is ready, use the steps in the *Add a Camera Video Source* (on page 34) topic to add the interface (plugin) to the system.

Add a VMS Video Source

Use these steps to add a video source for cameras associated with a VMS.

To add a VMS video source:

Before adding a video source for a VMS, *install the external VMS interface* (see "*Install or Create VMS Interfaces*" on page 21) (plug-in DLL) on the computer that hosts the Configuration server.

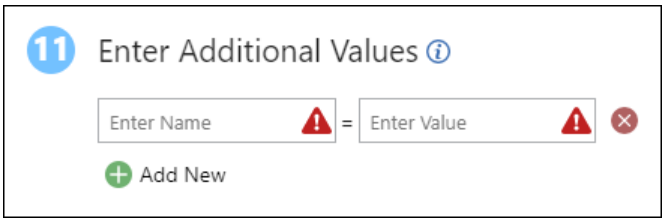
1. From the **Video Streamer** menu, select **Video Sources**.
2. On the **Video Sources** page, click **Add New Source**.
3. On the **Add Video Source** dialog box, select **Video Management System** as the type of source to add.
4. Select an existing source name from the drop-down list. (These names come from each VMS plug-in DLL.)

   OR

   Type a new source name in the box. Use the same name as the one in the *PluginVendor*.dll* file. For example, for the *PluginVendorMilestone.dll* file, you would type `Milestone` as the source name. This new name is added to the existing list of sources after you click **Submit**.
5. Enter a unique name to be displayed for this video source.
6. Type the fully qualified domain name (IP address or **Hostname**) for the computer that hosts the external VMS.
7. Type the **Port** number of the computer where the external VMS will accept connections.
8. Select the **Transport Protocol** for the video data from the drop-down list. Valid options are UDP, TCP, HTTP, and Multicast.
9. Select the **Recording Type** to specify how the VMS handles the recording of video streams:
   - **Motion** - The camera records video based on motion detected within the viewing area of the video stream.
   - **Continuous** - The camera records video continuously.
10. Select the **Archive Time Source** from the drop-down list. Valid options are listed below:
    - **ONVIF** - Archive frame time is stored as defined in the ONVIF protocol.
    - **RTPPresentation** - Archive frame time is stored in the RTP Presentation time field.

- **GetParameter** - Archive frame time is obtained using the GetParameter RTSP command.

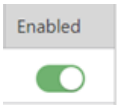
11. Click **Additional Options** to enter additional information required by your VMS.
    a. *Optional:* Enter the username and password used for connecting to the external VMS.
    b. *Optional:* If necessary, type a unique key for connecting to the external VMS. This key can be a license or subscription key required for connecting to the external VMS.
    c. *Optional*: If your VMS requires additional information, click **Add New** to enter a name/value pair. These fields cannot be left empty. If you add an additional value but do not need it, click to remove it.



12. Click **Submit** to save the information. The VMS video source is added to the list on the **Video Sources** page; however, its **Status** is **Disconnected**.

For more information on status messages, see Video Source Status Messages.

13. Turn on the **Enabled** setting (green is on; gray is off) to activate the new video source.



14. Repeat these steps for each video source you need to add.

Define Cameras for the Generic Camera Video Source

The Generic Camera video source provides a way to discover and view cameras that are not associated with a VMS. To view these cameras, information (metadata) about them must be stored in some format so that Video Streamer can discover the camera data into the system. As a part of the Interface server component installation process, a Common-separated values (CSV) file template is delivered to allow for such storage.

Use these steps to define stand-alone Internet Protocol (IP) cameras for the Generic Camera video source that is delivered with Video Streamer.

If you have your own Camera vendor-type plugin, set up the associated CSV file for that vendor before the vendor can be enabled.

To add camera data to the CSV file:

1. Navigate to the *\Program Files\Hexagon\Video Streamer\Interface Server* folder and open the *GenericCameraDataTemplate.csv* file with Microsoft Excel or a text editor, such as Notepad.
2. Select **File > Save as** and save the file by typing `GenericCameraData.csv` as the name.
3. Add the camera information to the spreadsheet. The spreadsheet contains specific column headers for the necessary camera data as shown in the table below.

Column Name	Required	Comments
MANUFACTURER	No	The name of the manufacturer of the camera.
CAMERA_TYPE	No	The type of camera such as dome, bullet, traffic, fixed, and bodycam. Other custom values can also be used.
EXTERNAL_CAMERA_ID	Yes	The unique identifier for the camera. It can be the same as CAMERA_NAME if all values are unique in this column. It provides a way to identify this camera in the external environment.
CAMERA_NAME	Yes	The name to be displayed for this camera.
ONLINE	No	A value of 1 indicates the camera is online. A value of zero (0) and any other value (including blank) indicates the camera is offline. Video from offline cameras cannot be viewed. The online status cannot be changed in the administration tool.
LATITUDE	No	The distance of the camera north or south of the earth's equator in decimal degrees.
LONGITUDE	No	The distance of the camera east or west of the meridian at Greenwich, England, in decimal degrees.
ALTITUDE	No	The height of the camera above ground level in meters.
USERNAME	No	Username for the account used to authenticate the camera.

Column Name	Required	Comments
PASSWORD	No	Password for the account used to authenticate the camera.
MEDIA_TYPE	Yes	The format of the video. Currently, Video Streamer only supports H264.
VIDEO_WIDTH	Yes	The width in pixels of the live video feed. Currently, Video Streamer does not use this value, but it is still required for future use.
VIDEO_HEIGHT	Yes	The height in pixels of the live video feed. Currently, Video Streamer does not use this value, but it is still required for future use.
LIVE_FEED_URL	Yes	The URL of the live video feed. Currently, Video Streamer supports HTTPS protocol for Avigilon cameras and RTSP protocol for all other video feeds. Example: rtsp://machine1.acme.com554/live
PTZ_ENABLED	No	A value of 1 indicates the camera is capable of pan, tilt and zoom functions. A value of zero (0) and any other value (including blank) indicates the camera is not PTZ enabled. The default configuration of Video Streamer does not provide PTZ interfaces to the IP cameras.
PAN_TILT_SPEED	No	The percentage value controlling the speed of the pan and tilt operations. Valid values are from 0.0 to 1.0. A blank value defaults to 1.0.
GROUP_NAME	No*	The display name of the group this camera belongs. Video Streamer does not display this information but does provide it to external applications which request this data.
GROUP_DESCRIPTION	No	The description of the group this camera belongs. Video Streamer does not display this information but does provide it to external applications which request this data.
EXTERNAL_GROUP_ID	No*	The unique identifier of the group this camera belongs. It provides a way to identify this group in an external system.
EXTERNAL_PARENT_ GROUP_ID	No*	The unique identifier of the parent for the group to which this camera belongs. It provides a way to identify the parent of the group in an external system.
TRANSPORT	Yes	The IP transport protocol of the video data. Valid options are UDP TCP, HTTP, and Multicast.

Column Name	Required	Comments
AUDIO_ENABLED	No	A value of 1 indicates the camera is capable of streaming audio. A value of zero (0) and any other value (including blank) indicates the camera is not Audio enabled.
AUDIO_CODEC	No	The format of the audio. Currently, Video Streamer only supports OPUS, G711 and G722.
AUDIO_LIVE_FEED_URL	No	The URL of the live audio feed. Example: rtsp://machine1.acme.com554/live. In a majority of cases, the audio live-feed URL will be the same as the video live-feed URL.

* If the EXTERNAL_GROUP_ID is blank, all group information is ignored for that camera. If a camera has an EXTERNAL_GROUP_ID, it must also have a GROUP_NAME. Additionally, the EXTERNAL_GROUP_ID must correspond one-to-one with the same GROUP_NAME and vice versa in all rows. Example: EXTERNAL_GROUP_ID of 123 cannot have a GROUP_NAME of Group 1 in one row and a GROUP_NAME of Group 2 in another row. EXTERNAL_PARENT_GROUP_ID is not required but is used to identify group hierarchy. EXTERNAL_PARENT_GROUP_ID must correspond one-to-one with the same EXTERNAL_GROUP_ID and vice versa in all rows.

4. When you are finished editing the CSV file, save it to the *\Program Files\Hexagon\Video Streamer\Interface Server* folder. Be sure to **close the file** so that discovery works properly. When you discover cameras using the **Generic Camera** video source, the information in the CSV file is used as the input source for the IP cameras.

Configure the Generic Camera Video Source

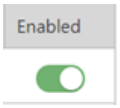
Video Streamer provides a Generic Camera video source for cameras that are not associated with a VMS. This video source provides the ability to a camera's live video stream. Other features, such as viewing archives and controlling cameras, are not provided with a Camera video source. The Generic Camera video source comes installed and partially configured as a part of the *Interface server component* (see "*Install the Interface Server Software*" on page 20). However, to use the Generic Camera video source, it must be fully configured and enabled in the system.

Use these steps to finish configuring the Generic Camera video source.

Instead of using the delivered Generic Camera interface, the Video Streamer SDK can be used to create a custom Camera interface (plugin) to handle cameras that are not associated with a VMS. Once your custom Camera interface is ready, follow the steps in the *Add a Camera Video Source* (on page 34) topic to add the interface (plugin) in the system.

To finish configuring the Generic Camera video source:

1. Use the steps in the *Define Cameras for the Generic Camera Video Source* (on page 30) topic to define cameras for the system. The CSV file must be defined before the Camera video source can be enabled.
2. From the **Video Streamer** menu, select **Video Sources**.
3. From the list of **Video Sources**, select **Generic Camera**.
4. Turn on the **Enabled** setting (green is on; gray is off) to activate the Generic Camera video source.



Add a Camera Video Source

Instead of using the delivered *Generic Camera* (see "*Define Cameras for the Generic Camera Video Source*" on page 30) interface, the Video Streamer SDK can be used to create a custom Camera interface (plugin) to handle cameras that are not associated with a VMS. Once your custom Camera interface is ready, use these steps to add and configure your custom Camera video source in the system.

Contact *Hexagon Support* *https://hexagon.com/support-success/safety-infrastructure-geospatial* to obtain a copy of the Video Streamer SDK.

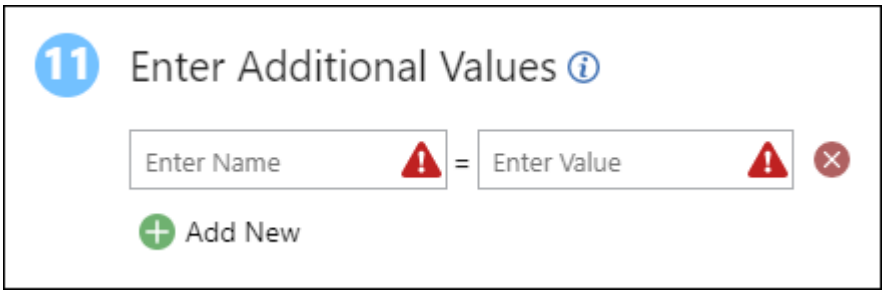
To add and configure a Camera video source:

1. From the **Video Streamer** menu, select **Video Sources**.
2. On the **Video Sources** page, click **Add New Source**.
3. On the **Add Video Source** dialog box, select **Camera** as the type of source to add.
4. Select an existing source name from the drop-down list.

   OR

Type a new source name in the box. Use the same name as the one in the *PluginVendor*.dll* file. For example, for the *PluginVendorCustomCamera.dll* file, you would type `CustomCamera` as the source name. This new name is added to the existing list of sources after you click **Submit**.

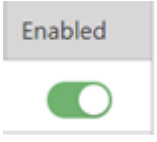
5. Enter a unique name to be displayed for this Camera video source. (You cannot use GenericCamera as the source name because this is the Camera video source provided by Video Streamer.)
6. Select the **Transport Protocol** for the video data from the drop-down list. Valid options are UDP, TCP, HTTP, and Multicast.
7. *Optional*: If your Camera video source requires additional information, click **Add New** to enter the name/value pairs.



8. Click **Submit** to save the information. The Camera video source is added to the list on the **Video Sources** page; however, its **Status** is **Disconnected**.

For more information on status messages, see Video Source Status Messages.

9. Follow the steps in the *Define Cameras for the Generic Camera Video Source* (on page 30) topic to define cameras for the video source. Substitute your custom Camera interface name for the GenericCamera interface name. The custom Camera CSV file must be defined before the custom Camera video source can be enabled.
10. Turn on the **Enabled** setting (green is on; gray is off) to activate the new video source.



Install the Streaming Server

As part of the Video Streamer network, one or more Streaming servers can be configured to stream video from two different types of video sources:

- Video Management Systems
- Cameras

Streaming server connections to a video source must use H.264/RTSP. A video player hosted in a consuming application (such as HxGN OnCall Dispatch | Video Responder) or in the Video Streamer Administrator consumes H.264/WebRTC.

To upgrade the Streaming server to the latest version, see *Upgrade a Video Streamer System* (on page 45).

Install PostgreSQL Command-line Tools on the Streaming Server Host

If there is already a PostgreSQL installation on the Streaming server host computer, skip to the next section *Create a Streaming Server Definition* (on page 38).

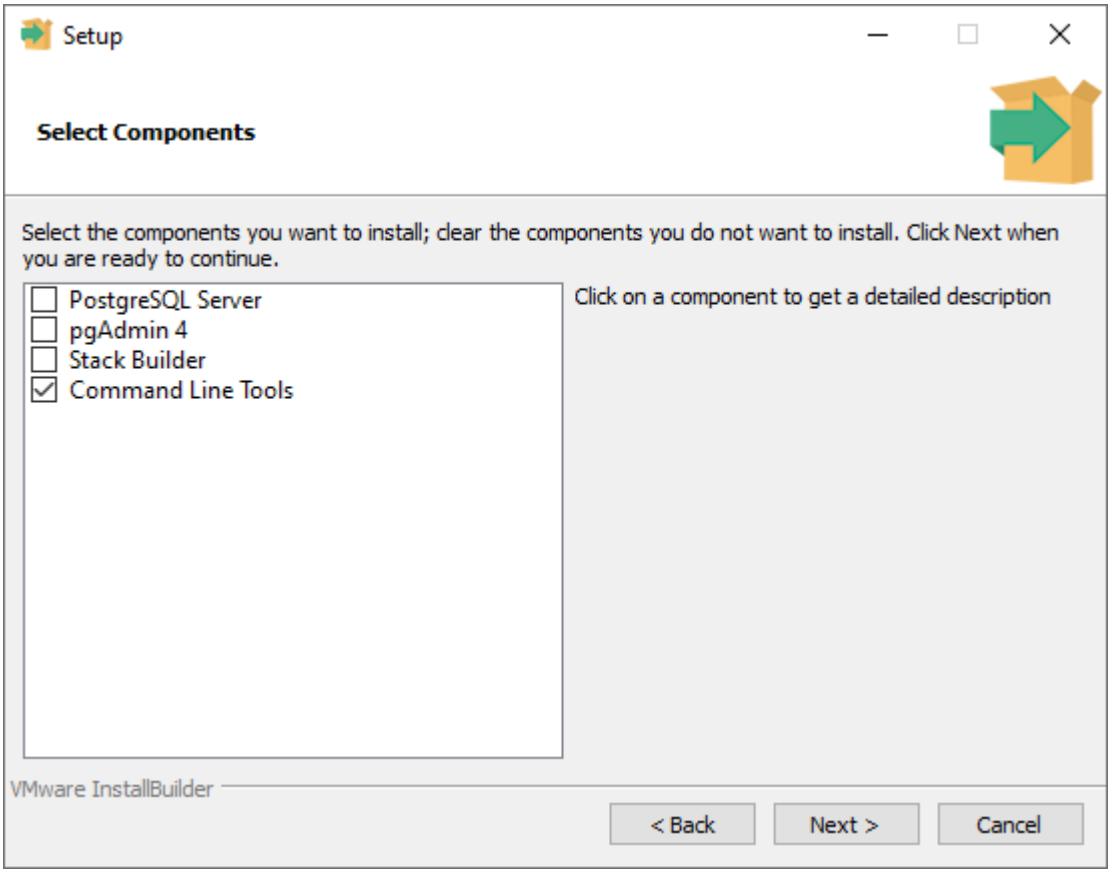
Before you install the Streaming server software, you must install the PostgreSQL 16.4.1 Command-line Tools on the computer where the Streaming server will be hosted **unless there is already a 16.4.1 installation on that computer**.

See the *documentation* (*https://www.postgresql.org/docs/*) provided with PostgreSQL for detailed instructions. You should be familiar with the installation process and database creation process for PostgreSQL.

To install PostgreSQL Command-line tools:

1. *Disable IPv6* (on page 59).
2. If the 16.4.1 Command-line Tools are not already installed on the computer where the Streaming server is hosted, navigate to the location of the Video Streamer installation media and open the *\ThirdParty* folder.
3. Double click the EXE file to begin the installation of the PostgreSQL software.
4. On the **Welcome** page, click **Next**.
5. On the **Installation Directory** page, click **Next** to accept the default location.

6. On the **Select Components** page, uncheck all but **Command Line Tools**.



7. Click **Next**.
8. Click **Next** on the **Pre-Installation Summary** page.
9. Click **Next** on the **Ready to Install** page, The installation process begins.
10. When prompted that the PostgreSQL installation is complete, click **Finish**.
11. Identify the IP address of the computer that will host the Streaming server. You will need this address for the next step.
12. Configure client access to PostgreSQL for the Streaming server by performing the following steps:
    a. Locate the *pg_hba.conf* file on the **computer where the PostgreSQL database server is installed**. This file is usually located in the data folder for the database cluster.

b. Add a record to *pg_hba.conf* for the computer that will host the Streaming server, using the IP address you recorded in Step 2. The record has the following format (replace the IP address below with your IP address):

```
host    all   all   192.135.42.95/32     scram-sha-256
```

This record allows any user from the host with this IP address to connect to any database when the user's password is correctly supplied.

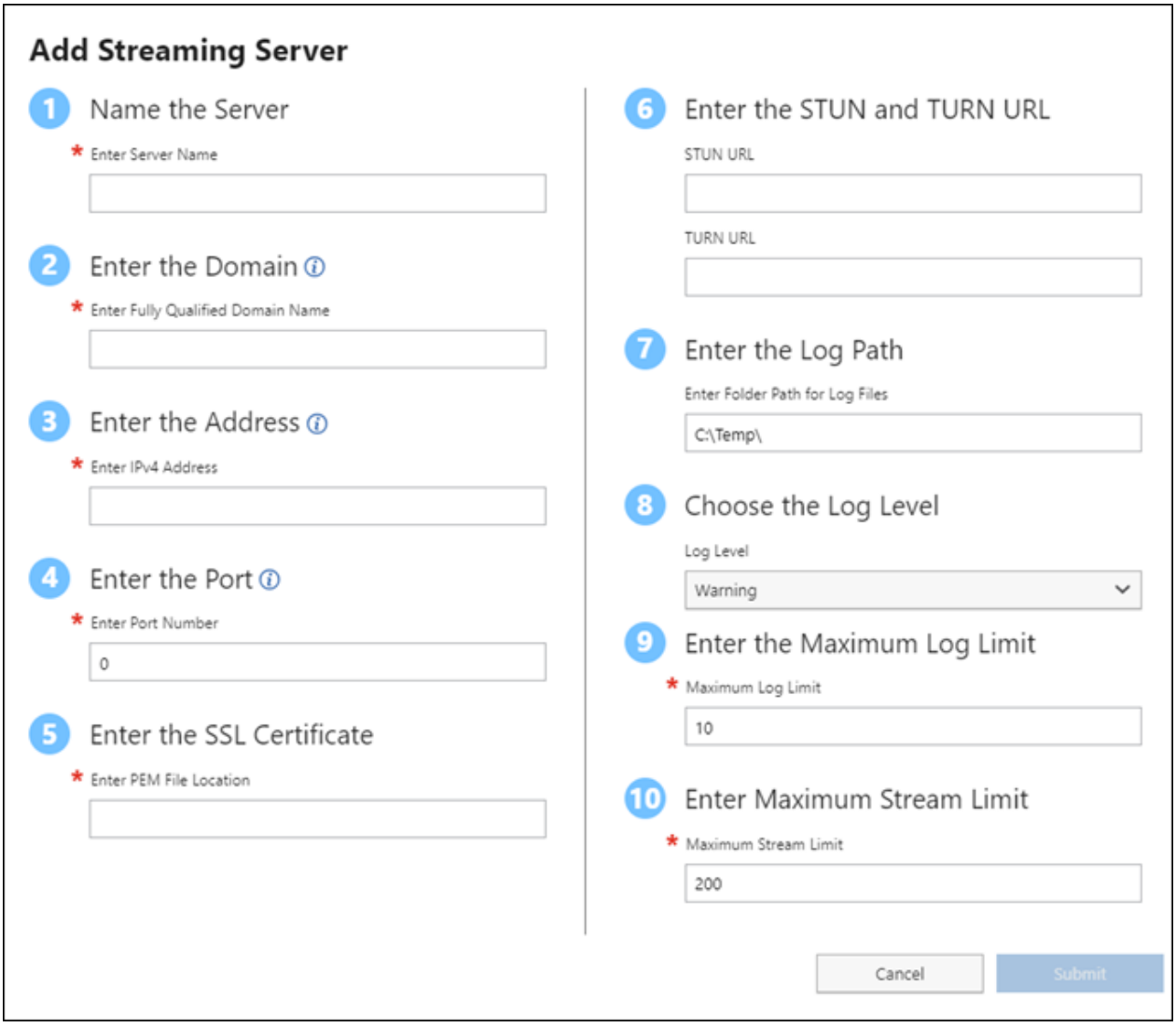
Create a Streaming Server Definition

Use the Video Streamer Administrator on the Configuration server to create a streaming server definition. You will need to perform these steps for each Streaming server in your Video Streamer system.

To create a Streaming server definition:

1. From the **Video Streamer** menu, select **Streaming Servers**.

2. On the **Streaming Servers** page, click **Add New Server** to open the dialog box.



3. On the **Add Streaming Server** dialog box, supply the following information:
   a. Enter name you want to use for this Streaming Server.
   b. Enter the fully qualified domain name of the computer that will host this streaming server.
   c. Enter the IPv4 address of the computer that hosts this streaming server.

d. Enter the port number where this streaming server will accept connections. This should be a port number that is different from the ones used for the Configuration server and the Interface server.

e. Enter the location of the valid PEM file, including the filename. For more information about PEM files, see *Convert SSL Certificate Files into Other Formats* (on page 77).

f. *As needed*: Enter the URL for the STUN server and the URL for the TURN server. For more information, see *STUN and TURN* (on page 87).

g. Type the **Log Path** where the log files will be saved. The default location is *c:\temp*.

h. Select the logging level from the **Log Level** drop-down list. **Warning** is the default setting.

Log Level	Description	When to Set
Warning	Default log level. Records when a service is degraded, endangered, or behaving outside of its expected parameters. A **Warning** log level includes errors, warnings, and some performance issues.	During installation and configuration of Video Streamer.
Error	Records when functionality is unavailable or when expectations are not met. An **Error** log level records errors only.	When Video Streamer is in production.
Info	Records actions happening in the system that correspond to its responsibilities and functions. Generally, these are the observable actions the system can perform. An **Info** log level includes errors, warnings, performance information, and normal processing information.	When you want high-level system information but not full details.

Log Level	Description	When to Set
Verbose	Records internal system events that are not necessarily observable from the outside but might be useful when determining how something happened. A **Verbose** log level includes extensive information: errors, warnings, performance information, normal processing information, and detailed processing information.	Only when advised by Hexagon Support.

i. Specify the **Maximum Log Limit**, which is the maximum number of log files that are maintained. When the log limit is reached, the oldest log file is deleted. The default is 10 log files.

j. Specify the **Maximum Stream Limit**, which is the maximum number of inbound streams allowed. The default is 200 streams. See the "Load Balancing" topic in the *Video Streamer Administrator Help* for more information.

4. Click **Submit.**
5. Review the steps on the **Server Added Successfully** dialog box. You will use these to install the Streaming server software.
6. Click **Copy to Clipboard** to copy the command-line statement to your clipboard. Paste it into a file, such as a TXT, and save it. Click **Finish**.

   The command-line statement will not be shown again once the dialog box is dismissed; thus, copying the command-line statement to a file prevents losing the information associated with the Streaming server. If the Video Streamer Administrator user interface is not being accessed from the computer where the Streaming server will be installed, the file can be used to transport the information to that computer.
7. Continue with the next topic, *Install the Streaming Server Software* (on page 41).

Install the Streaming Server Software

Use these steps to install the Streaming server software. You will need to repeat this process for each Streaming server in your Video Streamer system. One or more Streaming servers can be configured to stream video from different video sources (Video Management Systems or cameras).

To upgrade the Streaming server from a previous version, see *Upgrade to a New Version of Video Streamer* (see "*Upgrade to the Latest Version of Video Streamer*" on page 45).

To install the Streaming server software:

1. On the computer where the Streaming server will be hosted, open an Administrative command prompt.
2. From the command prompt, navigate to the folder that contains the Video Streamer installation media.
3. Paste the command-line statement *that you saved* (see "*Create a Streaming Server Definition*" on page 38) into the command prompt and press ENTER.

   Do not edit this command-line statement.

   The following is an example of the command-line statement. Yours will be different:

   ```
   install_hvs_streamer.bat HvsStreamer1 server1.acme.com 446
   scfwv+Je
   ```

   Running this command performs the following tasks. You may be prompted to enter information.

   - Verifies the installation script is running in 64-bit mode.
   - Installs Chocolatey if needed.
   - Uses Chocolatey to perform the following tasks:
     - Checks for previous versions of the Streaming server product (hvsstreamingserver). If a previous version is found, the installation process stops. Uninstall the previous version, and then install the new version.
     - Installs Streaming server files to the default Windows *\Program Files* folder.

       Example: *C:\Program Files\Hexagon\Video Streamer\Streaming Server*
     - Registers the *HvsUtility.dll* .NET assembly.
     - Copies required PostgreSQL DLL files into the installation folder.

       When Video Streamer components are uninstalled, existing PostgreSQL data is not altered or deleted.
     - Creates and starts a new Windows service for the Streaming server.

     When Video Streamer components are *uninstalled* (see "*Uninstall Video Streamer*" on page 90), existing PostgreSQL data is not altered or deleted.
   - Installs OpenSSL 1.1.1 if not already installed.

If any other version of OpenSSL is already installed, the installer will stop. You must uninstall the previous version of OpenSSL and start the installation process again to install the required version of OpenSSL for the Streaming server.

- Installs .NET Framework 4.8.1 if needed.
- If you receive the message "The default PostgreSQL bin directory does not exist," type the correct location for the \bin folder and press ENTER. The default location is C:\Program Files\PostgreSQL\<Version Number>\bin.

4. When processing completes, the Streaming Server is installed.

Discover Cameras

After video sources (VMS or Camera) are created, camera information (metadata) associated with the video source can be discovered into the system. Use either of the following processes to discover cameras into the system.

Discover Cameras for All Video Sources

Use these steps to discover cameras for all the video sources at one time.

To discover cameras for all Video Sources:

1. From the **Video Streamer** menu, select **Video Sources**.
2. On the **Video Sources** page, click **Discover All** to open the **Discover Video Source** dialog box.
3. Click **Start**. Process messages are displayed in the **Discover Status** section.

   When camera discovery is completed successfully, blue check marks are displayed for each video source listed.
4. Click **Close**.

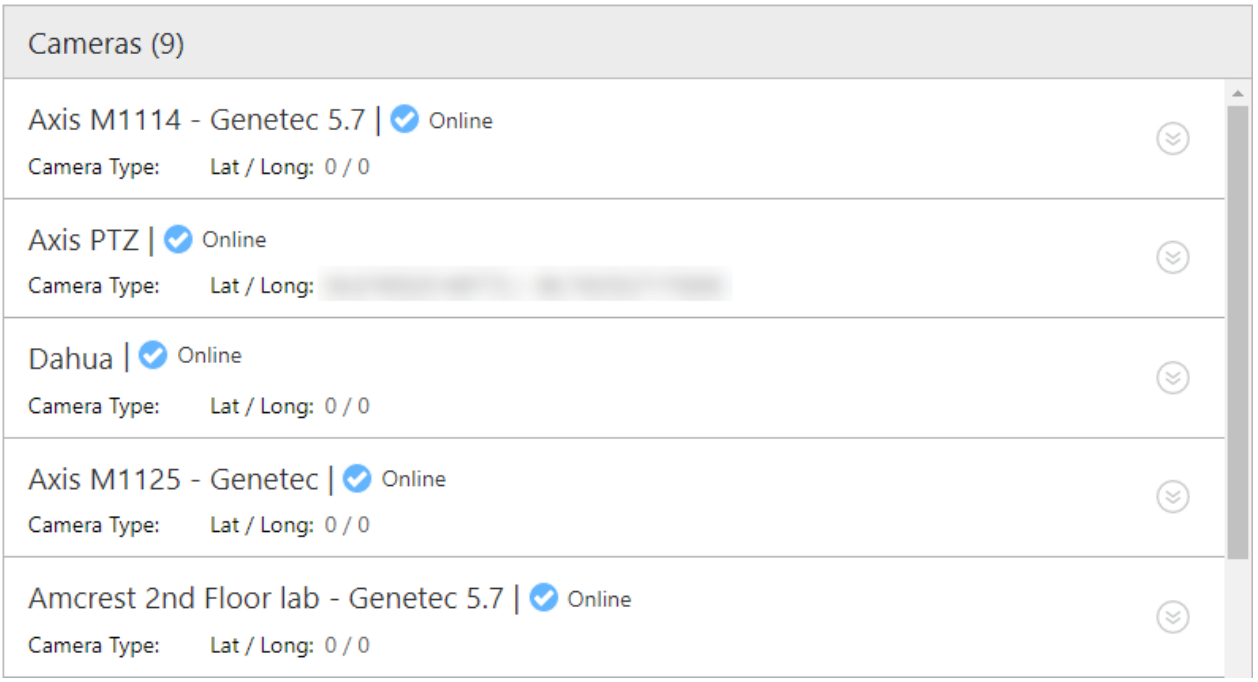
Discover Cameras for a Single Video Source

Use these steps to discover cameras for individual video sources.

To discover cameras for a single video source:

1. From the **Video Streamer** menu, select **Video Sources**.
2. On the **Video Sources** page, select the video source for which you want to discover cameras. Information for the video source is displayed in the upper-right panel.

3. Make sure the **Video Source** is enabled.
4. Click **Discover** to open the **Discover Video Source** dialog box.
5. Click **Start**. Process messages are displayed in the **Discover Status** section. When camera discovery is completed successfully, a blue check mark is displayed.
6. Click **Close**. The discovered cameras are displayed in the **Cameras** list.



Upgrade a Video Streamer System

This section provides steps and information to upgrade your system to the latest version of Video Streamer.

Upgrades for Video Streamer are incremental. For example, you cannot upgrade from version 2303 to version 2409. You must upgrade from 2303 to 2309 and then upgrade to 2409.

Upgrade to the Latest Version of Video Streamer

Failover Configuration

If the Video Streamer environment is set up **for failover**, do the following:

1. Stop the failover cluster role.
2. Upgrade the primary node: Run the upgrade batch files as described in the steps below.
3. Restart the failover cluster role.
4. Upgrade each standby node: Run the upgrade batch files as described in the steps below.

No Failover Configuration

If the Video Streamer environment is **not set up for failover**, run the upgrade batch files as described in the steps below.

To upgrade to the latest version of Video Streamer, you must run three BAT files:

- *upgrade_hvs_configuration.bat*
- *upgrade_hvs_interface.bat*
- *upgrade_hvs_streamer.bat* (except for version 2409. See the steps below to upgrade to 2409.)

You can run the upgrade BAT files on the same version of Video Streamer in a situation where the software is not working properly. In that case, the upgrade overwrites the Video Streamer software but does not overwrite the database.

To upgrade the Configuration server:

Use the *upgrade_hvs_configuration.bat* file to upgrade to the latest version. It does not take any arguments, but it will prompt you for a PostgreSQL password.

1. On the computer where the Configuration server is hosted, open an Administrative command prompt.
2. Navigate to the location of the Video Streamer 2409 installation media.
3. From the command prompt, run the *upgrade_hvs_configuration.bat* file.
4. When the upgrade is complete, close the command prompt window.

To upgrade the Interface server:

Use the *upgrade_hvs_interface.bat* file to upgrade to the latest version.

1. On the computer where the Configuration server is hosted, open an Administrative command prompt.
2. Navigate to the location of the Video Streamer 2409 installation media.
3. From the command prompt, run the *upgrade_hvs_interface.bat* file.
4. When prompted, type `y` to stop the Windows Service for the Configuration Server.
5. When the upgrade is complete, close the command prompt window.

To upgrade the Streaming server for version 2409 only:

To upgrade from 2309 to the 2409 version of Video Streamer, you must uninstall the 2309 version of the Streaming server component and then install the 2409 Streaming server component. Structural changes in the data files used by the Streaming server require the uninstall and reinstall.

1. Sign in to Video Streamer.
2. From the **Video Streamer** menu, select **Streaming Servers**.
3. On the **Streaming Servers** page, select the server to be removed.
4. Disable the selected streaming server by turning off its **Enabled** toggle.

5. Click **Remove Server**.

6. When you are prompted to confirm the remove action, click **Confirm**.
7. Sign out of Video Streamer.
8. On the computer where the Streaming server is hosted, open an Administrative command prompt.
9. Navigate to the location of the Video Streamer 2409 installation media.
10. From the command prompt, run the *uninstall_hvs_streamer.bat* file.
11. When the uninstall is completed, sign in to Video Streamer again.
12. From the **Video Streamer** menu, select **Streaming Servers**.
13. On the **Streaming Servers** page, click **Add New Server**.
14. On the **Add Streaming Server** dialog box, supply the following information:
    a. Enter name you want to use for this Streaming server.
    b. Enter the fully qualified domain name of the computer that will host this streaming server.
    c. Enter the IPv4 address of the computer that hosts this streaming server.
    d. Enter the port number where this streaming server will accept connections. This should be a port number that is different from the ones used for the Configuration server and the Interface server.
    e. Enter the location of the valid PEM file, including the filename. For more information about PEM files, see *Convert SSL Certificate Files into Other Formats* (on page 77).
    f. *As needed*: Enter the URL for the STUN server and the URL for the TURN server. For more information, see *STUN and TURN* (on page 87).
    g. Type the **Log Path** where the log files will be saved. The default location is *c:\temp*.
    h. Select the logging level from the **Log Level** drop-down list. **Warning** is the default setting.
    i. Specify the **Maximum Log Limit**, which is the maximum number of log files that are maintained. When the log limit is reached, the oldest log file is deleted. The default is 10 log files.
    j. Specify the **Maximum Stream Limit**, which is the maximum number of inbound streams allowed. The default is 200 streams. See the "Load Balancing" topic for more information.

15. Click **Submit.**
16. Review the steps on the **Server Added Successfully** dialog box. You will use these to install the Streaming server software.
17. Click **Copy to Clipboard** to copy the command-line statement to your clipboard. Paste it into a file, such as a TXT, and save it. Click **Finish**.

    The command-line statement will not be shown again once the dialog box is dismissed; thus, copying the command-line statement to a file prevents losing the information associated with the Streaming server.
18. Sign out of Video Streamer.
19. On the computer where the Streaming server is hosted, open an Administrative command prompt.
20. Navigate to the location of the Video Streamer 2409 installation media.
21. Paste the command-line statement *that you saved* (see "*Create a Streaming Server Definition*" on page 38) into the command prompt and press ENTER.

    Do not edit this command-line statement.

    The following is an example of the command-line statement. Yours will be different:

    ```
    install_hvs_streamer.bat HvsStreamer1 server1.acme.com 446
    scfwv+Je
    ```
22. When processing completes, the Streaming server is installed.

To upgrade VMS Interfaces provided by Hexagon:

To upgrade the VMS interfaces provided by Hexagon, see the associated vendor documentation for the upgrade steps:

- **Milestone VMS Interface** - See the *Milestone VMS Installation Guide*.
- **Genetec VMS Interface** - See the *Genetec VMS Installation Guide*.
- **Avigilon VMS Interface** - See the *Avigilon VMS Installation Guide*.
- **Qognify VMS Interface** - See the *Qognify VMS Installation Guide*.

Add New Audio Columns to Generic Camera CSV File

If the Video Streamer environment has an existing Generic Camera CSV file with discoverable cameras, new columns need to be added to the file to support discovery for audio functionality. To add the new columns, do the following:

1. Navigate to the *\Program Files\Hexagon\Video Streamer\Interface Server* folder and open the existing *GenericCameraData.csv* file with Microsoft Excel or a text editor, such as Notepad.
2. Add the following new columns and camera information to the spreadsheet.

Column Name	Required	Comments
AUDIO_ENABLED	No	A value of 1 indicates the camera is capable of streaming audio. A value of zero (0) and any other value (including blank) indicates the camera is not Audio enabled.
AUDIO_CODEC	No	The format of the audio. Currently, Video Streamer only supports OPUS, G711 and G722.
AUDIO_LIVE_FEED_URL	No	The URL of the live audio feed. Currently, Video Streamer supports HTTPS protocol for Avigilon cameras and RTSP protocol for all other video feeds. Example: rtsp://machine1.acme.com554/live. In most cases, the audio live feed URL will be the same as the live feed URL.

3. When you are finished editing the CSV file, save it to the *\Program Files\Hexagon\Video Streamer\Interface Server* folder. Be sure to close the file so that discovery works properly. When you discover cameras using the Generic Camera video source, the information in the CSV file is used as the input source for the IP cameras.

Appendix

Topics

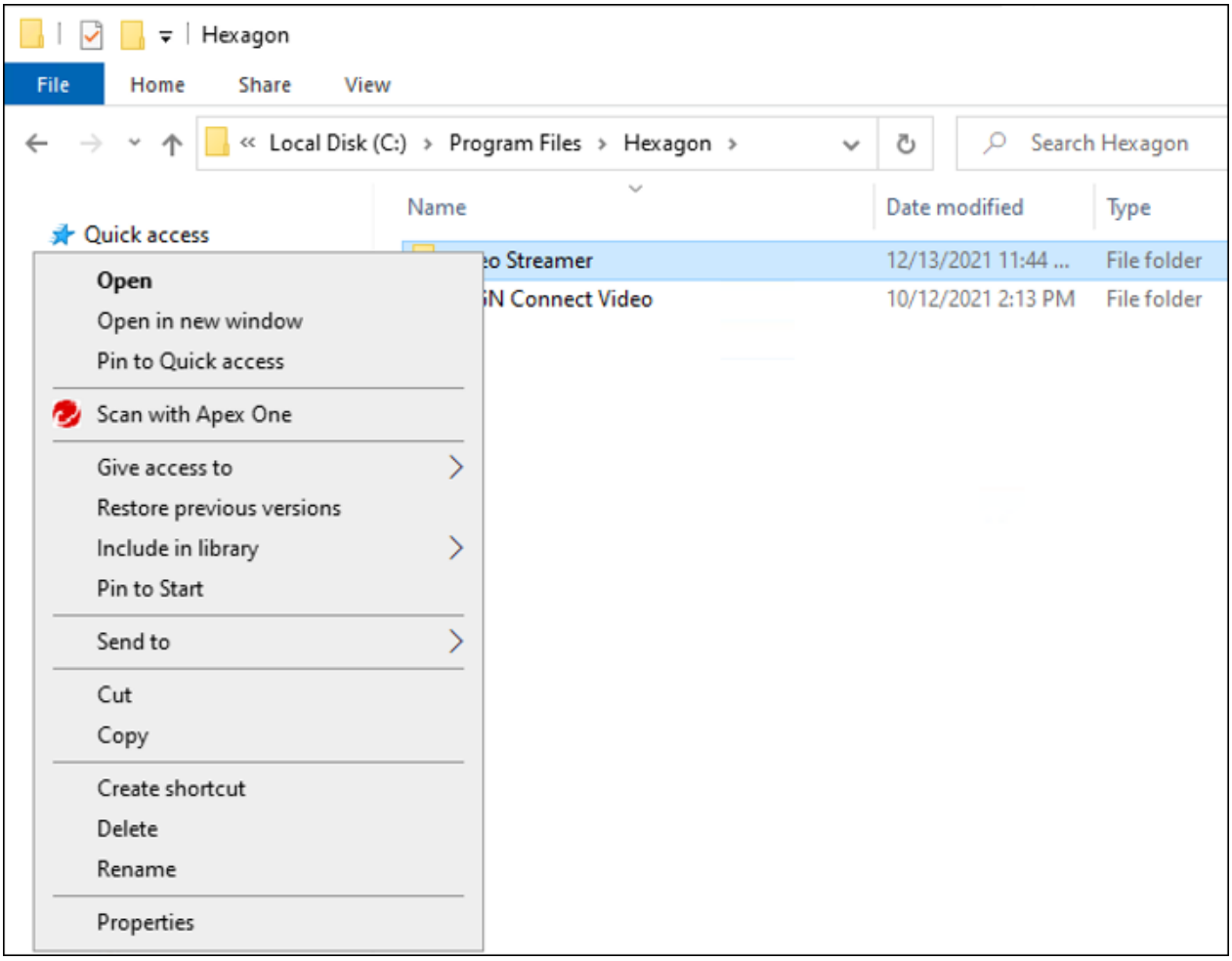
APPENDIX A

Modified Video Streamer Installation Procedure

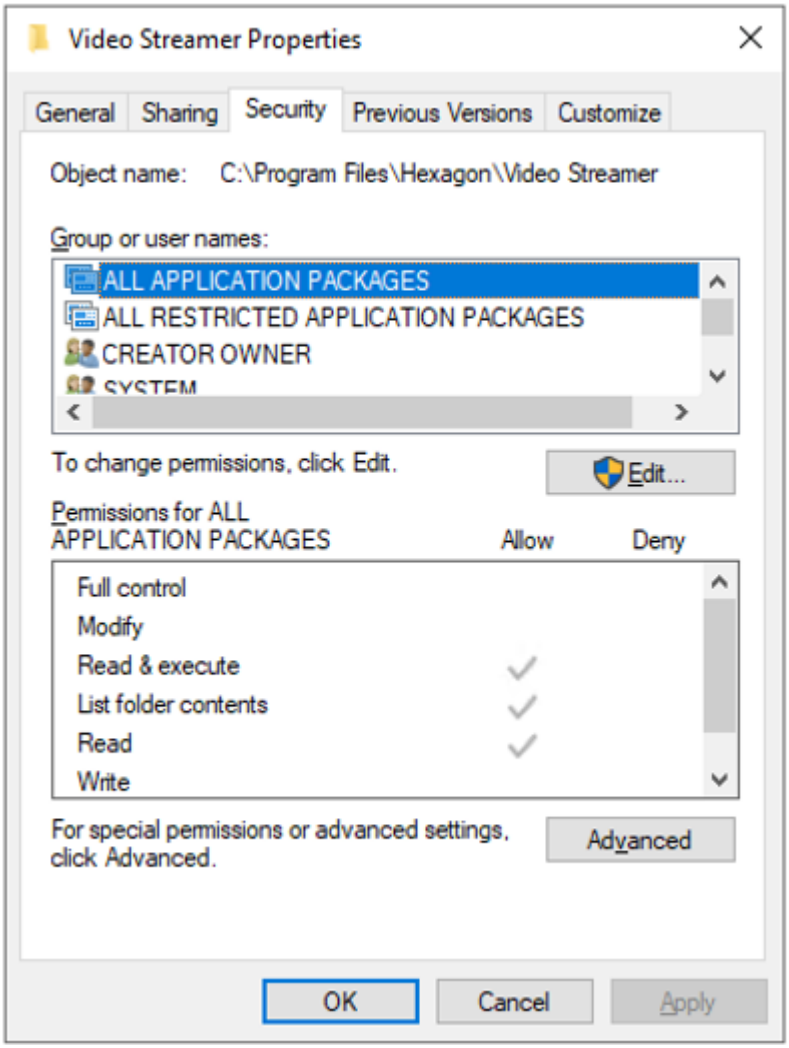
Video Streamer uses Microsoft Cryptography API: Next Generation (CNG) to perform encryption activities. If a security certificate in a customer environment is generated with private keys in plain text, the installation of the Video Streamer product will fail. If you encounter such a failure, use these steps to correct the problem.

To perform a modified Video Streamer installation:

1. Navigate to the product installation folder (default is *C:\Program Files\Hexagon\Video Streamer).*
2. Right click the folder and select **Properties**.



3. On the **Video Streamer Properties** dialog box, select the **Security** tab.

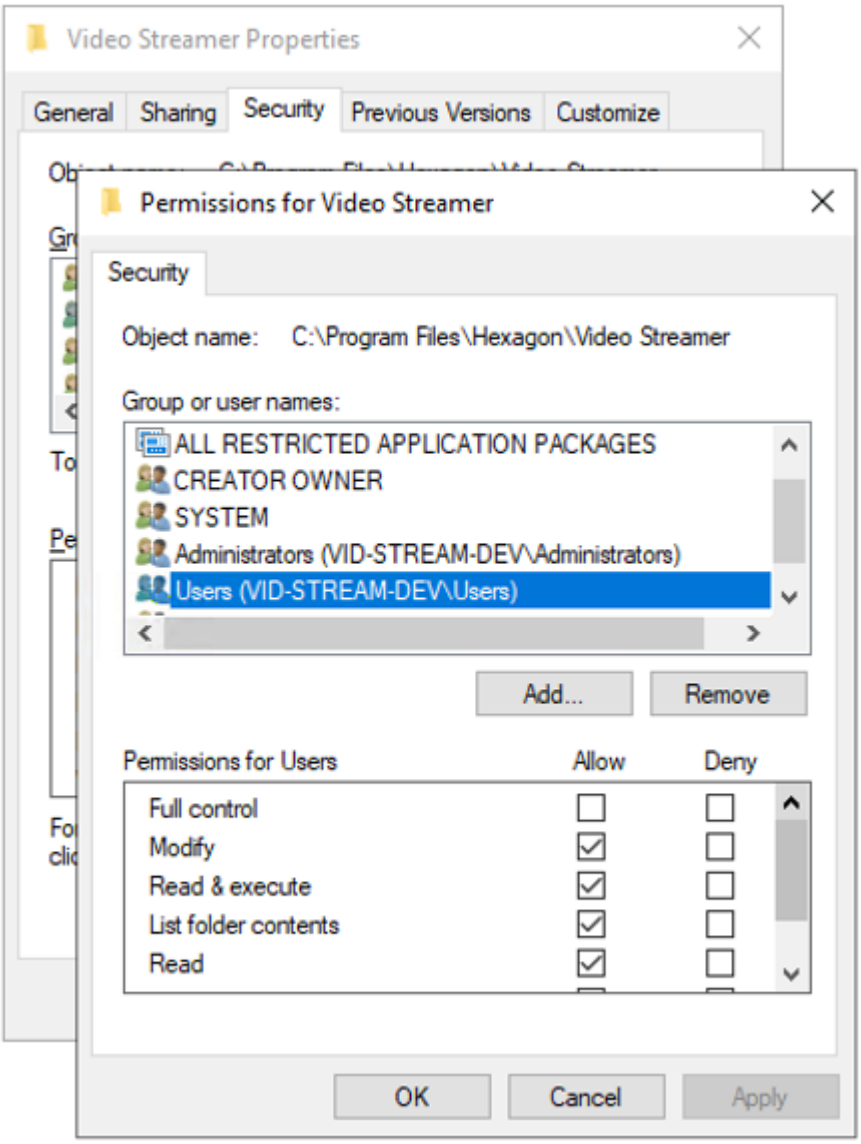


a. Click **Edit**

b. On the **Permissions for Video Streamer** dialog box, select the currently signed-in user under **Group or user names**.

   If the currently signed-in user is not listed, click the **Add** button to add the user to the list.

c. Update the **Permissions** for the signed-in user. Make sure to select the **Modify** and **Write** permissions.



d. Click **Apply** and then click **OK** to dismiss the dialog box.

4. Open a non-administrative command prompt, and navigate to the installation media *\Tools* folder.
5. Run the *CreateHvsData.bat* file with the following command line options:

- **DomainName**: The fully qualified domain name of the computer that will host the Configuration server (for example, `mycomputer.mydomain.com`).
- **Port**: The port number where the Configuration server will accept connections.
- **PfxFile**: The SSL certificate file (must include full path to the *.pfx* file).
- **PfxPw**: The password for the certificate file. If the certificate password contains any character that is not a letter or a number (special characters such as @ # $ % & * ( ) + = < > ? | , ;), the special characters must be escaped with a caret (^) character. An escape character invokes an alternative interpretation of the character so that it can be used correctly within the software. Also, for this script, make sure the password is enclosed in **double** quotes, as shown in this example:

  ```
  "ke^*mn3^)fs"
  ```

- **PostgresHost**: The name of the host computer where the PostgreSQL database is running.
- **PostgresPort**: The port on the host computer where the PostgreSQL database is running.
- **PostgresUser**: The PostgreSQL username for the Configuration server. The default username for PostgreSQL is **postgres**.
- **PostgresPw**: The PostgreSQL user password for the Configuration server.

  Example:

  ```
  CreateHvsData.bat server1.acme.com 446
  C:\Certificates\Server1.pfx "ke^*mn3^)fs" server1.acme.com
  5432 postgres dEs3#99N
  ```

6. When the process is complete, close the command prompt window.
7. Open the Windows Services application and start the Video Streamer Configuration server.
8. Return to the topic *Start Video Streamer Administrator and Change the Password* (on page 21) to complete the installation and set up of the system.

APPENDIX B

Update Video Streamer Application Settings

Video Streamer stores important application settings in a secure file. Occasionally, there may be a need to update one or more of the settings. Conditions where an update must be made are listed below:

- The domain name, IP address, and/or port changed for the Configuration server host machine.
- The port changed for the Interface server host machine.
- The security certificate expired, and the new certificate has a different file name.
- The password for the security certificate changed, or there is a new password for a new certificate file.
- The username or password changed for the PostgreSQL database.

To change these settings, use the *UpdateHvsSettings.bat* file that is delivered in the Tools folder for the installation media.

The following settings can be changed:

- **Domain**: The domain name (or IP) of the Configuration server host machine
- **Configuration Server Port**: The port number used by the Configuration server process
- **CertFile**: The signed certificate used by Video Streamer for the administrator user interface and communications between the Configuration server and Streaming servers.
- **CertKey**: The password for the CertFile defined above.
- **DbHost**: The host name or IP of the PostgreSQL database server host machine.
- **DbPort**: The port of the PostgreSQL database server host machine.
- **DbUser**: The PostgresSQL username that can access the Video Streamer data.
- **DbKey**: The password for the DbUser defined above.
- **DbBin**: The bin folder (such as "C:\Program Files\PostgreSQL\16\bin") of the PostgresSQL product.
- **DbData**: The data folder (such as "C:\Program Files\PostgreSQL\16\data") of the PostgresSQL product.

- **PlayerAppName**: The name of the video player used by Configuration server. The default name is "HVSVideoPlayer" and should not have to be changed.
- **PlayerAppKey**: The password for the PlayerAppName defined above.
- **Features**: The features of the Video Streamer system. A feature is a named functionality that can be enabled.
- **ISFKey**: The password for the Interface server.
- **Interface Server Port**: The port number used by the Interface server process.

To edit the settings for the Configuration Server:

1. Stop the Windows service for the Video Streamer Configuration server before making these changes.
2. Run the *UpdateHvsSettings.bat* file as administrator. The following menu will be displayed:

```
================ Update HVS Configuration Server Settings
================

a. Domain

b. Configuration Server Port

c. CertFile

d. CertKey

e. DbHost

f. DbPort

g. DbUser

h. DbKey

i. DbBin

j. DbData

k. PlayerAppName

l. PlayerAppKey

m. Features

n. ISFKey

o. Interface Server Port

x. EXIT
```

```
Please make a selection:
```

3. Each selection will prompt for more data, such as a domain name, filename, or password. All passwords will be encrypted in the data file. A confirmation message is displayed when the new information is successfully updated and saved in the data file. In case of an error, details will be displayed to help identify the issue.

   When you are prompted for the certificate filename, be sure to enter the certificate path and filename.

4. Once all the setting changes have been completed, enter the letter `x` to exit the batch file.
5. Restart the Windows service for the Video Streamer Configuration server.

Update Domain name or Port

If the IP or port of the Configuration server host machine has changed, use selection "a" and "b" to update the settings.

Update SSL Certificate

If the SSL certificate used by the Configuration server needs to be updated (perhaps the current certificate has expired), use selection "c" and "d" to update the certificate information. The Configuration server SSL certificate can only use a PFX-formatted file. Use the *ConvertCertificate* (see "*Convert SSL Certificate Files into Other Formats*" on page 77) tool to generate a PFX file if needed. Also, the corresponding Streaming server certificate (PEM files) will need to be placed on the same machine of each Streaming server, and the SSL Certificate name must be updated using the Streaming servers page of the Configuration server administration tool. Use the ConvertCertificate tools to generate a PEM file if needed.

Starting with version 1.3.2109, the Video Streamer software uses a new encryption model based on the certificate file. After the certificate file has been updated, the system needs to be updated to support it. Use the *UpgradeCertificate* (see "*Upgrade SSL Certificate*" on page 79) tool to upgrade the Video Streamer software to use the new certificate file.

Update PostgreSQL Connection

If the PostgreSQL connection information has changed, use selection "e", "f," and "g," "h," "i," and "j" to update the connection information.

Update Features

Features are options provided to certain installations. Each feature has a name that is enabled or disabled. All existing features are replaced by the new feature names entered during this step. Valid feature names for each installation are provided by Hexagon. Normally, updates to features are not necessary.

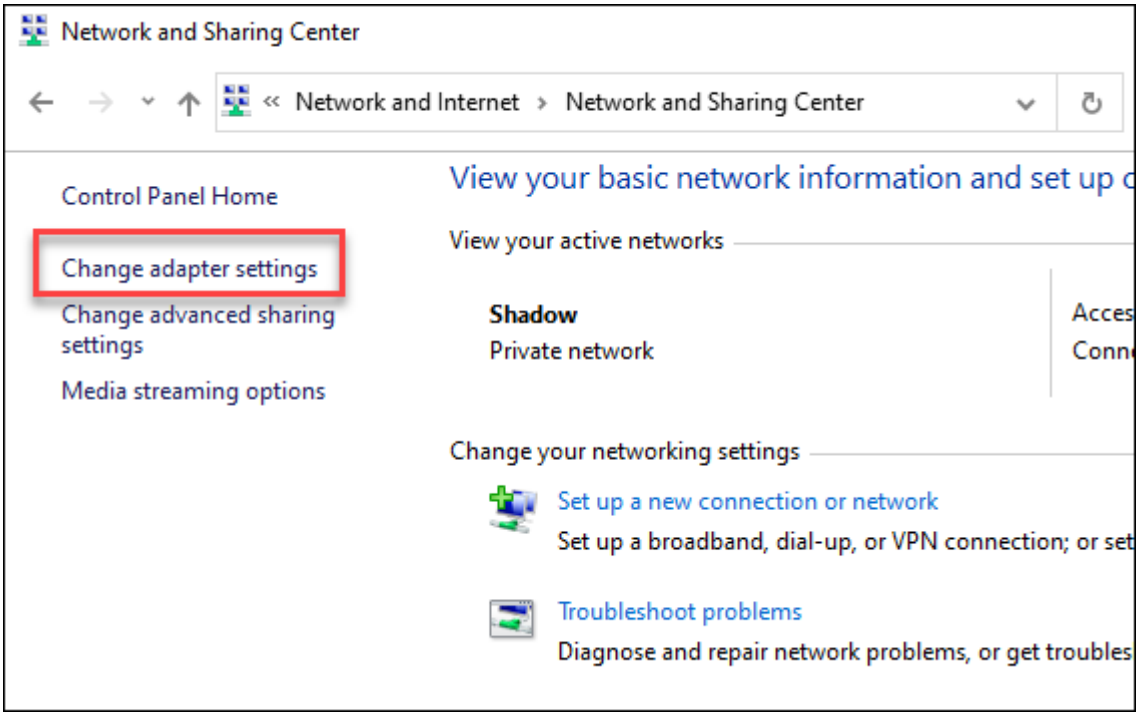
APPENDIX C

Disable IPv6

Before you install or upgrade PostgreSQL, you need to disable IPv6.

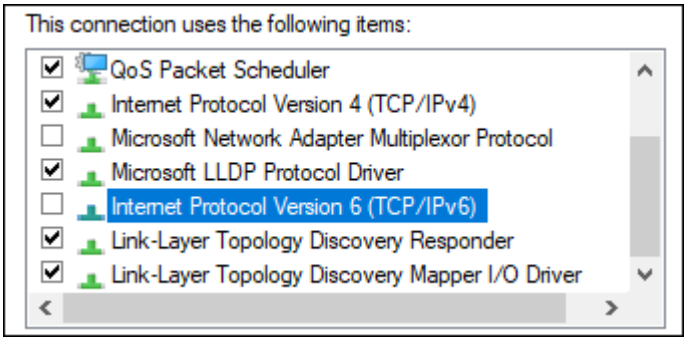
To disable IPv6:

1. Open **Control Panel**.
2. Select **Network and Internet**.
3. Select **Network and Sharing Center**.
4. Click **Change Adapter Settings**.



5. Right-click your **Ethernet** connection and select **Properties**.

6. On the **Ethernet Properties** dialog box, uncheck the box for **Internet Protocol Version 6 (TCP/IPv6)**.



7. Click **OK** to save the changes.

APPENDIX D

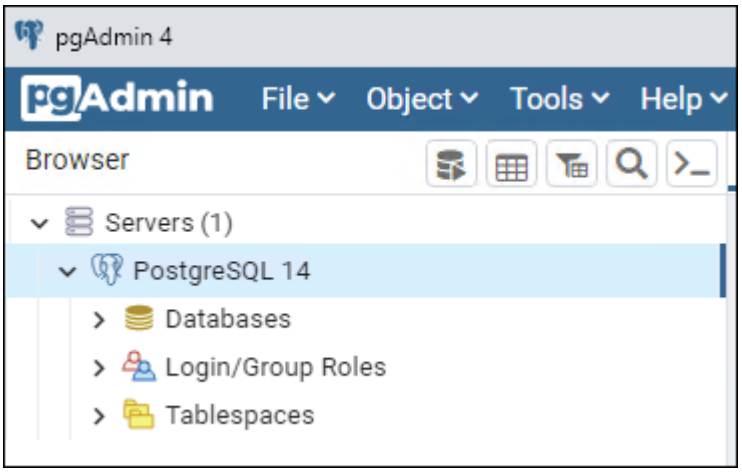
Migrate the PostgreSQL Database

If you are loading a new, major version of PostgreSQL (for example, 16.4) on the same computer as the existing version (for example, 15.2), perform the following steps.

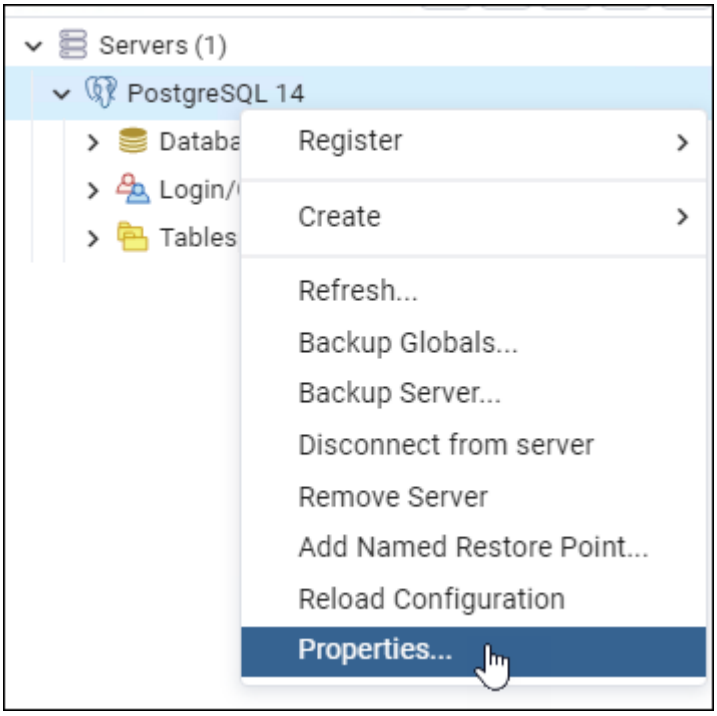
A major version is 15.x or 16.x.

To locate the port number of the existing PostgreSQL database:

1. From the Windows Start menu, navigate to and expand the **PostgreSQL** node. Select **pgAdmin 4**.
2. Enter the **Master Password** and click **OK**.
3. Expand the **Servers** menu.
4. Enter the password used to connect to the PostgreSQL server. The **Servers** menu expands.

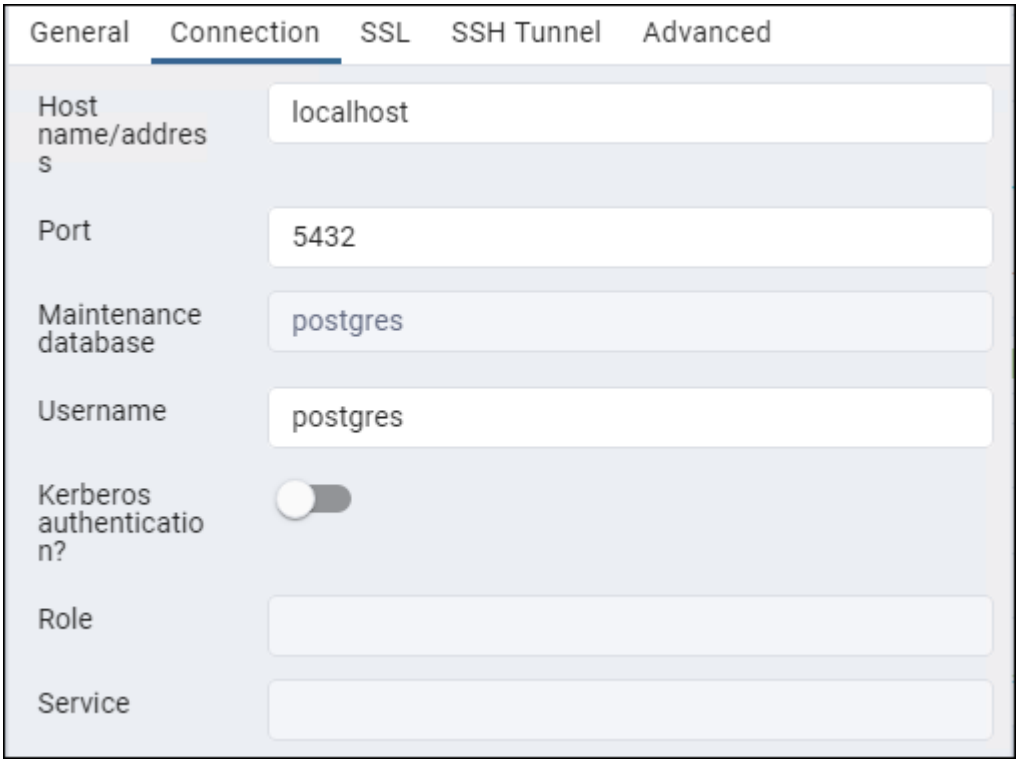


5. Right-click the existing PostgreSQL database version, and then select **Properties**.



6. Click the **Connection** tab and verify the port of the current database.

Record the port number to be used later.



7. Click **Close** to close the dialog box.
8. Close **pgAdmin 4**.

To install the New PostgreSQL database version on the Configuration server:

1. *Disable IPv6* (on page 59).
2. If the *new* PostgreSQL database version is not already installed, navigate to the location of the Video Streamer 2409 installation media and open the *\ThirdParty* folder.
3. Double click the EXE file to begin the installation of the new PostgreSQL software.
4. On the **Welcome** page, click **Next**.
5. On the **Installation Directory** page, click **Next** to accept the default location.
6. On the **Select Components** page, uncheck the **Stack Builder** option and click **Next**.
7. On the **Data Directory** page, click **Next** to accept the default location.

8. On the **Password** page, enter the password for the postgres superuser. Click **Next**.
9. On the **Port** page, note the *database port number* to be used by the new version.
10. Click **Next** on the **Advanced Options** page to accept the **Default locale**.
11. Click **Next** on the **Pre-Installation Summary** page.
12. Click **Next** on the **Ready to Install** page, The installation process begins.
13. When prompted that the PostgreSQL installation is complete, click **Finish**.
14. Identify the *IP address* of the computer hosting the Configuration server.

    Record this address for the next step.
15. Complete the following steps to configure client access to PostgreSQL for the Configuration server:
    a. Locate the *pg_hba.conf* file on the computer where the *new* PostgreSQL is installed. This file is usually located in the *\data* folder (such as *C:\Program Files\PostgreSQL\16\data*) for the database.
    b. Open the *pg_hba.conf* file with a text editor, such as Notepad.
    c. Scroll to the end of the file. Add a line under the **IPv4 local connections** section for the computer that hosts the Configuration server. Use the IP address you recorded in a previous step. The line has the following format (replace the IP address below with your IP address):
    d.

```
# IPv4 local connections:
host    all             all             127.0.0.1/32            scram-sha-256
host    all             all             129.135.11.22/32        scram-sha-256
```

    This line lets any user from the host with this IP address connect to any database when the user's password is entered correctly.
    e. Save and close the file.

Stop the Windows Services for Video Streamer

When migrating the database, stop all services that access the database to prevent data loss. If failover is supported and configured for Video Streamer, you should migrate the Standby servers first since the Window services are not running for those servers. However, if you choose to migrate the Primary server first, stop the Failover Cluster Role before migrating the database. This ensures that all the services on the Primary and Standby servers are not running before migrating the database.

To stop the Window Services:

1. Open the **Services** tool on the Configuration server computer.
2. Stop the Windows service for the Configuration server, if is it running.

   Stopping the Configuration server automatically stops the Interface server.
3. Stop the Windows service for the Streaming server, if it is running.

Export the Existing PostgreSQL Database

Complete the following steps to export the existing PostgreSQL database to an SQL script file.

Use the PostgreSQL utilities from the latest version to benefit from any recent updates.

To export the existing PostgreSQL database:

1. Use **File Explorer** to create a folder for the database export, such as *C:\backup*, if such a folder does not already exist.
2. Run **Command Prompt** using the **Run as administrator** option.
3. Navigate to the *new* PostgreSQL database version *\bin* folder (for example, *C:\Program Files\PostgreSQL\16\bin*).
4. Run the following command using the PostgreSQL super-user account. Use the existing PostgreSQL database port that you noted when completing the steps for locating the port number of the existing PostgreSQL database.

   ```
   pg_dump -h <host> -p <existing database port> -U <username> -d <databasename> -f <path\filename>.sql
   ```

   Example:

   ```
   pg_dump -h server1 -p 5432 -U postgres -d hvsdb -f "c:\backup\hvsdbdump.sql"
   ```
5. When prompted, enter the password for the database user. You do not see the password as you type it to maintain security.
6. Verify that the SQL file you specified was created in the specified path.

Create the Video Streamer Database

Before the exported PostgreSQL database can be imported into the new PostgreSQL version, the Video Streamer database needs to be created.

To create the Video Streamer database:

1. Run **Command Prompt** using the **Run as administrator** option.
2. Navigate to the new PostgreSQL database version *\bin* folder (for example, *C:\Program Files\PostgreSQL\16\bin*).
3. Run the following command using the PostgreSQL super-user account. Use the new PostgreSQL database port you noted when completing the steps for installing the new PostgreSQL database version on the Configuration server.

   ```
   psql -h <host> -p <new database port> -t -c "CREATE DATABASE hvsdb" -d <default database name> -U <username>
   ```

   Example:

   ```
   psql -h server1 -p 5433 -t -c "CREATE DATABASE hvsdb" -d postgres -U postgres
   ```

4. When prompted, enter the password for the database user. You do not see the password as you type it to maintain security.
5. Verify that the Video Streamer database exists.
   a. From the Windows Start menu, navigate to and expand the *new* **PostgreSQL** version.
   b. Select **pgAdmin 4**.
   c. Enter the **Master Password** and click **OK**.
   d. Expand the **Servers** menu.
   e. Expand the *new* PostgreSQL database version node.
   f. Enter the password used to connect to the PostgreSQL server.
   g. Expand the **Databases** menu.
   h. Verify the *hvsdb* database exists.
   i. If you do not see the *hvsdb* database, right-click the **Databases** option, and then select **Refresh**. Expand the **Databases** menu again.

Import the Existing PostgreSQL Database into the New Database

To import the existing PostgreSQL database into the new database version, complete the following steps.

Use the PostgreSQL utilities from the latest version to benefit from any recent updates.

To import the existing PostgreSQL database:

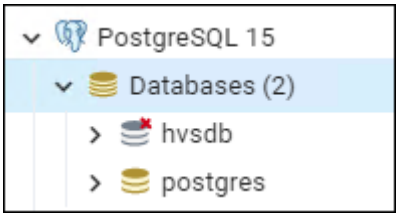
1. Run **Command Prompt** using the **Run as administrator** option.
2. Navigate to the **new** PostgreSQL database version *\bin* folder (for example, *C:\Program Files\PostgreSQL\16\bin*).
3. Run the following command using the PostgreSQL super-user account. Use the **new** PostgreSQL database port you noted when completing the steps for installing the new PostgreSQL database version on the Configuration server.

   ```
   psql -h <host> -p <new database port> -U <username> -d <database name> -f <filename>.sql
   ```

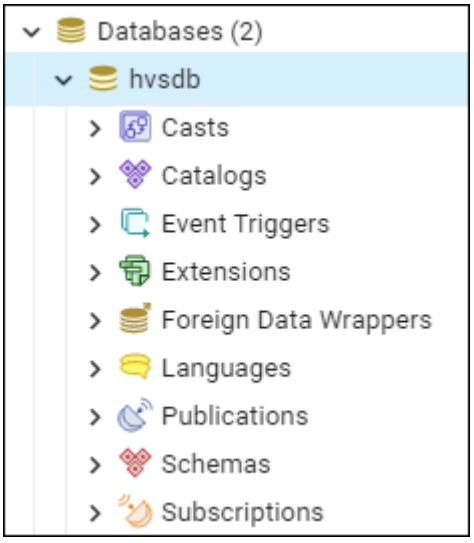
   Example:

   ```
   psql -h server1 -p 5433 -U postgres -d hvsdb -f "c:\backup\hvsdbdump.sql"
   ```

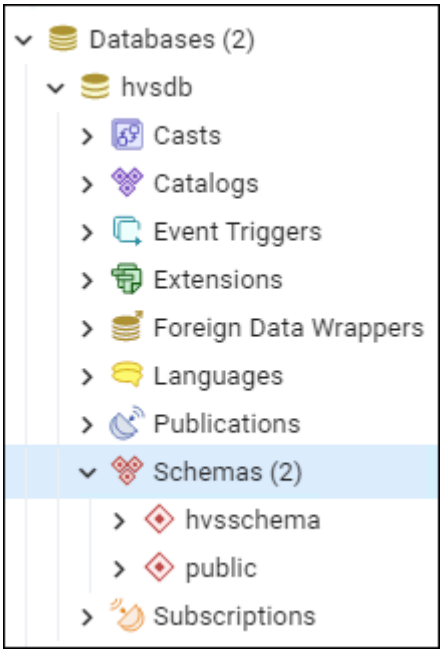
4. When prompted, enter the password for the database user. You do not see the password as you type it to maintain security.
5. Verify the existing data was imported into the new database
   a. Open new version of the **pgAdmin4** tool from the Windows Start menu.
   b. Log in with the PostgreSQL super-user account.
   c. Expand the **Servers** menu.
   d. Expand the new PostgreSQL database version.
   e. Expand the **Databases** menu.



f. Expand the *hvsdb* database.

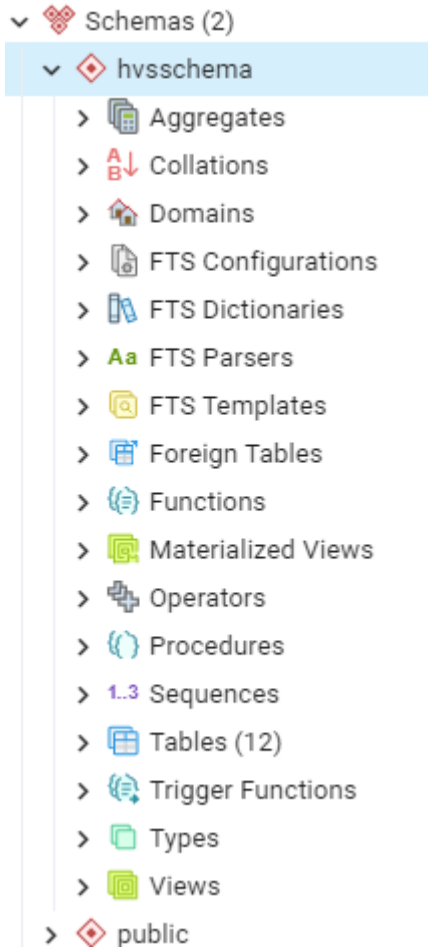


g. Expand the **Schemas** menu.



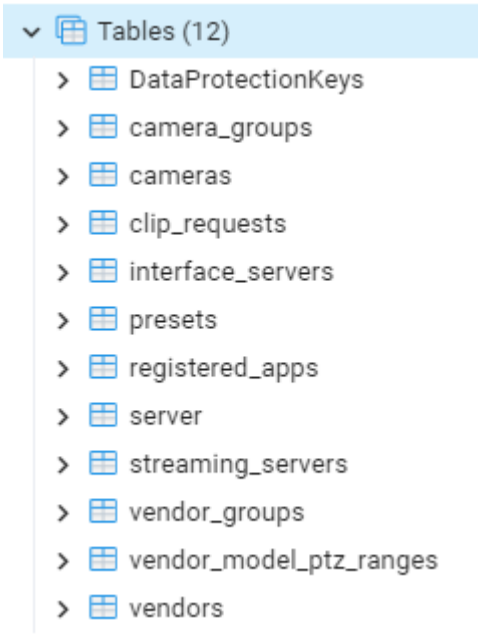
h. Verify the *hvsschema* exists.

i. Expand the *hvsschema* menu.



j. Expand the **Tables** menu.

k. Verify the Video Streamer tables exist.



l. Right-click the **server** table and select **View/Edit Data > All Rows**.

m. Verify data exists in the table.

6. Next, you must define the port for the *new* database. You can use one of the following methods:
   - *Use Existing PostgreSQL Port for New Database* (on page 70) (Recommended)
   - *Use New PostgreSQL Port Defined for New Database* (on page 74).
7. After you define the port for the new database, continue with *Final Migration Steps* (on page 76).

Use Existing PostgreSQL Port for New Database

To continue using the port that was defined for the existing database, edit the port value in the *postgresql.conf* file for the new database. This is the **recommended** workflow.

However, you can use the port defined for the new database. To use the new port, skip to *Use New PostgreSQL Port Defined for New Database* (on page 74) for more information.

Stop the PostgreSQL Services

1. Close **pgAdmin4** if it is open.
2. Open the **Services** tool.
3. Scroll to the *postgresql-x64-< version >* services. There should be a service for the existing version and a service for the new version.
4. Stop each PostgreSQL service.
5. Set the *existing* database service to **Manual**. This prevents the database from automatically starting, which could cause port conflicts between the databases.

Verify that the PostgreSQL Databases are Not Running

1. Open an Administrative command prompt.
2. Navigate to the new PostgreSQL database version bin folder (for example, c:\Program Files\PostgreSQL\16\bin).
3. Run the following command using the PostgreSQL superuser account.

   ```
   psql -h <host> -p <existing database port> -U <username>
   ```

   Example:

   ```
   psql -h server1 -p 5432 -U postgres
   ```

4. Verify that the command displays an error message. This indicates that the existing database is no longer running.
5. Run the same command using the new database port:

   ```
   psql -h <host> -p <new database port> -U <username>
   ```

   Example:

   ```
   psql -h server1 -p 5433 -U postgres
   ```

6. Verify that the command displays an error message. This indicates that the new database is no long running.

Change the PostgreSQL Port Value

1. Edit the *postgresql.conf* file for the **new** database in the associated PostgreSQL data folder (for example, *c:\Program Files\PostgreSQL\16\data*).
2. Search for the port setting (for example, `port = 5433`).
3. Change the port value to the value that was used by the existing database.
4. Save and close the *postgresql.conf* file.

Start the New PostgreSQL Service

1. Open the **Services** tool again.
2. Scroll down to the *postgresql-x64-<new version>* service.
3. Start the new PostgreSQL service.

Verify that the New PostgreSQL Database is Running

1. Open an Administrative command prompt.
2. Navigate to the *\bin* folder for the new PostgreSQL database (for example, *c:\Program Files\PostgreSQL\16\bin*).
3. Run the following command using the PostgreSQL superuser account.

   ```
   psql -h <host> -p <database port> -U <username>
   ```

   The *new* database port value will now be the value that was saved to the new PostgreSQL *postgresql.conf* file.

   Example:

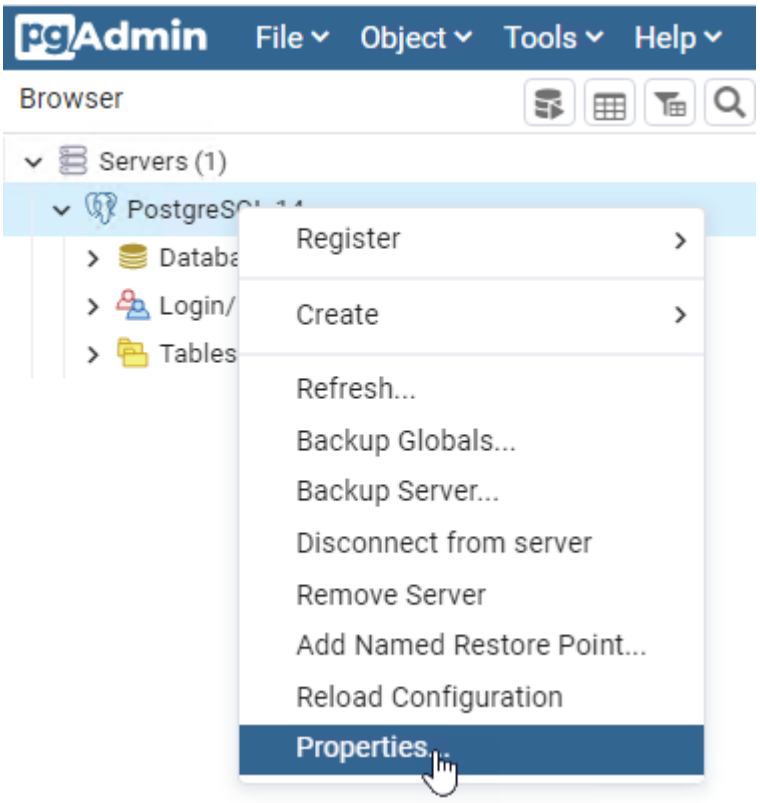
   ```
   psql -h server1 -p 5432 -U postgres
   ```

4. You are prompted to enter the password for the database user. You will not see the password as you type to maintain security.
5. Verify that the command established a database connection, which is indicated by the message `postgres=#`. This indicates that the new database is listening on the existing database port.

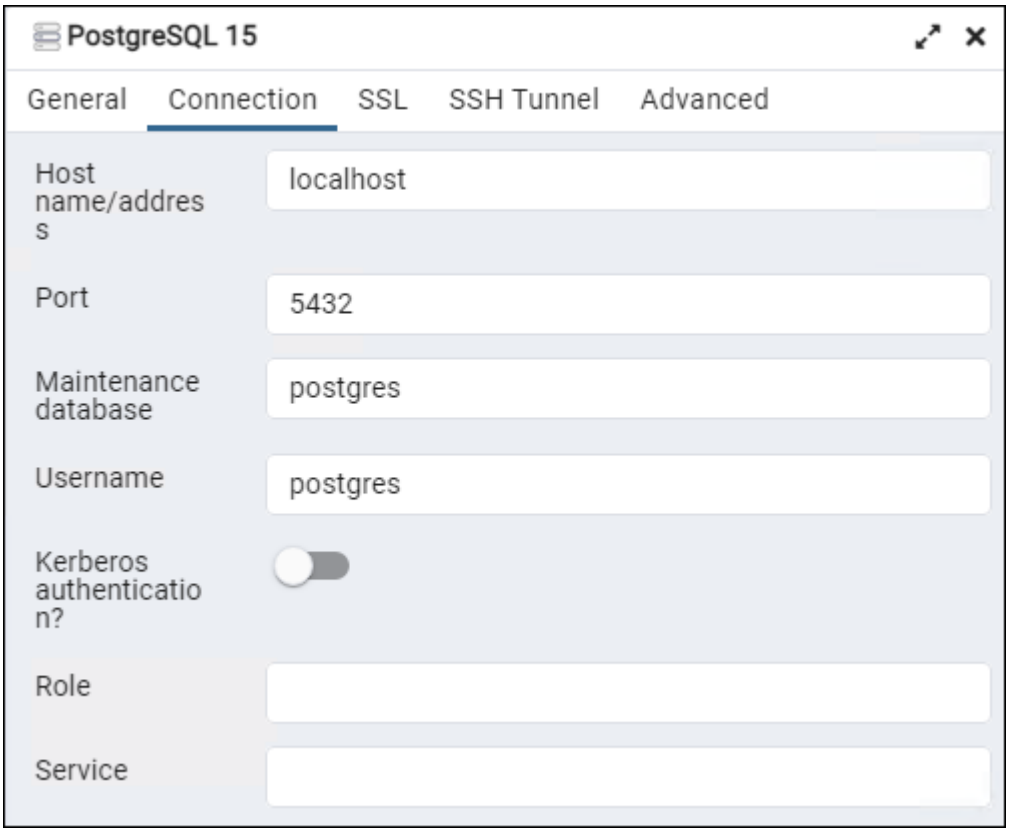
Clear the PostgreSQL pgAdmin Cache

1. If pgAdmin is running, close it.
2. Using File Explorer, browse to the *AppData\Roaming* folder for logged-in users (for example, *c:\users\hvsuser\AppData\Roaming*).
3. Remove the *pgAdmin* folder if it exists.
4. From the Windows Start menu, navigate to and expand the *new* **PostgreSQL** version node.
5. Select **pgAdmin 4**.
6. Enter the **Master Password** and click **OK**.
7. Expand the **Servers** node.

8. Right-click the *new* PostgreSQL database version and select **Properties**.



9. Click the **Connection** tab and verify the port of the new database. If the port value is still set to the new port value, change it to the value that was used by the existing database.



10. Click **Save** to save the changes.
11. Continue with *Final Migration Steps* (on page 76).

Use New PostgreSQL Port Defined for New Database

Complete the steps in this topic ONLY if you chose NOT to perform the steps in the *Use Existing PostgreSQL Port for New Database* (on page 70) topic.

As an alternative to using the previous database port, you can use the port defined for the *new* database. To use the new port that was defined for the new PostgreSQL database, complete the steps below to update the Video Streamer settings.

Update the Video Streamer Settings

1. Open an Administrative command prompt.

2. Navigate to the *\Tools* folder of the new installation media for Video Streamer.
3. From the command prompt, run the *UpdateHvsSettings.bat* file to update the **Dbport** application settings:
   - **DbPort** – The port of the PostgreSQL database server host computer.

   You are prompted to make a selection.
4. Enter the letter `f` to update the **DbPort** setting.
5. Enter the new database port value.
6. Enter the letter `x` to exit the utility

Start the New PostgreSQL Service

1. Open the **Services** tool again.
2. Scroll down to the *postgresql-x64-<new version>* service.
3. Start the new PostgreSQL service.

Verify that the New PostgreSQL Database is Running

1. Open an Administrative command prompt.
2. Navigate to the **new** PostgreSQL database version bin folder (for example, *c:\Program Files\PostgreSQL\16\bin*).
3. Run the following command using the PostgreSQL super-user account.

   ```
   psql -h <host> -p <database port> -U <username>
   ```

   The **new** database port value will now be the value that was saved to the **new** PostgreSQL *postgresql.conf* file.

   Example:

   ```
   psql -h server1 -p 5433 -U postgres
   ```
4. You are prompted to enter the password for the database user. You will not see the password as you type to maintain security.
5. Verify that the command established a database connection, which is indicated by the message `postgres=#`. This indicates that the new database is listening on the new database port.
6. Continue with *Final Migration Steps* (on page 76).

Final Migration Steps

Start the Video Streamer Window Services

1. Open the **Services** tool on the Configuration server computer.
2. Start the Windows service for the Configuration server if it is not already started.

   The service for the Interface server starts automatically. However, you may need to refresh **Services** to see the updated status.
3. Start the Windows service for the Streaming server if it is not already started.

Verify Video Streamer Runs on the New Database

1. Type the URL for Video Streamer (such as `<domain_name>:<port>`) into a chromium-based Web browser (such as Google Chrome). A sign-in page is displayed.
2. Type `admin` as the username.
3. Type the password.
4. Click **Sign In**.
5. Verify that the Admin user interface contains the previous database data.

Remove Previous Database Version

Once you are satisfied with the database migration, you can remove the previous PostgreSQL database version from the system.

1. From the **Search** bar, search for "Add or remove programs."
2. From the **Settings** dialog, scroll the **App & features** list to find the *previous* PostgreSQL database version.
3. Select the version and click **Uninstall**.

APPENDIX E

Convert SSL Certificate Files into Other Formats

Video Streamer requires the following types of certificates for its servers:

- **Streaming server**: A Privacy Enhanced Mail (PEM) formatted certificate. The PEM file is a Base64 encoded DER certificate.
- **Configuration server**: A Personal Exchange Format (PFX) formatted certificate. A PFX file contains the public key file (SSL certificate file) and the associated private key file.

Use the *ConvertCertificate.bat* file (a Microsoft Windows batch file) that is included in the *\Tools* folder on the installation media to convert the various SSL certificate files into the appropriate formats using OpenSSL. Install OpenSSL before you run this batch file. This batch file can convert certificate files (a private key file is required) into the following formats:

- A PEM file and PFX file
- A PEM file into a PFX file
- A PFX file into a PEM file

Syntax

```
ConvertCertificate.bat -Convert <String> -CerFile <String> -KeyFile <String> -PemFile <String> -PfxFile <String> -Password <String>
```

```
ConvertCertificate.bat -Convert <String> -PemFile <String> -PfxFile <String> -Password <String>
```

Parameters

Parameter	Description
`-Convert <String>`	The type of conversion to perform: • `CerToPemAndPfx` • `PemToPfx` • `PfxToPem`
`-CerFile <String>`	The name of the certificate file to read.

Parameter	Description
`-KeyFile <String>`	The name of the private key file associated with the certificate file to read.
`-PemFile <String>`	The name of the PEM file to read or create.
`-PfxFile <String>`	The name of the PFX file to read or create.
`-Password <String>`	The password to create a new PFX or to read an existing PFX file. If the PFX password contains any character that is not a letter or a number (special characters such as @ # $ % & * ( ) + = < > ? | , ;), the special characters must be escaped with a caret (^) character. An escape character invokes an alternative interpretation of the character so that it can be used correctly within the software. Also, for this script, make sure the password is enclosed in **single** quotes, as shown in this example: `'394f^&xet8'`

The *ConvertCertificate.bat* file can be run from a Microsoft Windows command prompt. Thus, the certificate password argument should have single quotes (not double quotes) around it in case the password contains any Windows batch-file special characters. This means the password itself should not contain any single quotes. See the examples below.

Examples

- `ConvertCertificate.bat -Convert CerToPemAndPfx -CerFile "c:\temp\mycert.cer" -KeyFile "c:\temp\mycert.key" -PemFile "c:\temp\mycert.pem" -PfxFile "c:\temp\mycert.pfx" -Password '394f^&xet8'`
- `ConvertCertificate.bat -Convert PemToPfx -PemFile "c:\temp\mycert.pem" -PfxFile "c:\temp\mycert.pfx" -Password '394f^&xet8'`
- `ConvertCertificate.bat -Convert PfxToPem -PfxFile "c:\temp\mycert.pfx" -Password '394f^&xet8' -PemFile "c:\temp\mycert.pem"`

APPENDIX F

Upgrade SSL Certificate

Video Streamer requires an SSL Certificate, and these certificates have expiration dates. Whenever a new certificate is issued, use the *UpgradeCertificate.bat* file that is included in the *\Tools* folder on the installation media to upgrade the Video Streamer software to use the new certificate file.

To upgrade the new certificate file for the Video Streamer:

1. Convert the new SSL certificate file *(PFX) into a PEM file* (see "*Convert SSL Certificate Files into Other Formats*" on page 77).
2. Copy both the new certificate (PFX) file and the converted PEM file to the *C:\Certificates* folder on the Configuration server.
3. Stop the Windows service for the Video Streamer Configuration server.
4. Open an Administrative command prompt.
5. Navigate to the *\Tools* folder for the most recent version of the installation media.
6. From the command prompt, run the *UpgradeCertificate.bat* file with the following options.

   Any option that contains spaces should be enclosed in double quotation marks.

   - **PfxFile**: The SSL certificate file (must include the full path to the *.pfx* file).
   - **PfxPw**: The password for the certificate file. If the certificate password contains any character that is not a letter or a number (special characters such as @ # $ % & * ( ) + = < > ? | , ;), the special characters must be escaped with a caret (^) character. An escape character invokes an alternative interpretation of the character so that it can be used correctly within the software. Also, for this script, make sure the password is enclosed in double quotes, as shown in the example below:

     ```
     "ke^*mn3^)fs"
     ```

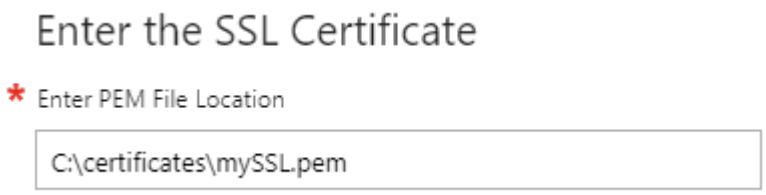
     Example: `UpgradeCertificate.bat C:\Certificates\Server1.pfx "ke^*mn3^)fs"`

     Running this command performs the following tasks:

     - Generates a new *VideoConfiguration.data* file.
     - Re-encrypts the existing settings.

- Re-encrypts the existing database.

7. Start the Windows service for the Video Streamer Configuration server.
8. Sign into Video Streamer Administrator on the Configuration server.
9. From the **Video Streamer** menu, select **Streaming Servers**.
10. On the **Streaming Servers** page, select the streaming server that needs to be updated with the new PEM file.
11. Disable the selected streaming server.
12. Click **Manage**.
13. In the **Enter the SSL Certificate** box, update the PEM file name to the new name.



14. Click **Submit**.
15. Enable the streaming server you just updated.
16. Click **Restart** to restart the streaming server.

APPENDIX G

Use Self-Signed Certificates with Video Streamer

A customer environment is typically configured as follows:

- Configuration Server and Interface Server components installed on the same computer (computer1).
- Streaming Server components installed on one or more computers (computer2 and computer3).
- Each computer has a Fully Qualified Domain Name (FQDN):
  - computer1.acme.com
  - computer2.acme.com
  - computer3.acme.com

A customer usually purchases a certificate that matches the pattern for the FQDNs used in the Video Streamer environment from a third-party certificate authority. To secure the hosts without purchasing multiple certificates, a wildcard certificate can be purchased (such as *.acme.com).

Instead of purchasing a certificate, you can create a self-signed certificate for Video Streamer using the utilities that come with the computer's operating system (such as Windows). Typically, you use a PowerShell command to create the self-signed certificate. This is useful for setting up development, test, or demonstration environments. In many cases, all the components mentioned above are installed on the same host computer (such as computer1.acme.com).

Video Streamer must have its own self-signed certificate. Do NOT use the same self-signed certificate that is being used in the HxGN OnCall environment. This does not work because of the way the HxGN OnCall certificate is generated.

To create a Self-signed Certificate for Video Streamer:

1. Use PowerShell to create the certificate:

   New-SelfSignedCertificate -Type Custom -KeySpec Signature -Subject "CN=<machine name>,O=<machine name>" -DnsName "<machine name>"-KeyExportPolicy Exportable -HashAlgorithm sha256 -KeyLength 2048 -CertStoreLocation "Cert:\LocalMachine\My"

2. Use the Microsoft Management Console (MMC) snap-in for Certificates to copy the certificate to different trusted roots for the host computer. To make sure the

certificate is used properly by the Video Streamer, place it in the following **Certification Authorities**:

- **Trusted Root**
- **Intermediate**
- **Third-Party**

3. Most of the time, this will work using the **Current User** (such as **My user account**), but depending upon the configuration, it is possible the certificate may have to be stored in the **Computer account**.
4. Use the MMC or some other means (OpenSSL, etc.) to export the certificate to a .PFX file.
5. Run the Video Streamer ConvertCertificate utility to produce a .PEM file that corresponds to the .PFX file. See "*Convert SSL Certificate Files into Other Formats* (on page 77)" for complete steps.
6. Use these files to install Video Streamer:
   - **Clean Installation** - Use the files generated in the previous steps and follow the instructions in this guide to install the Video Streamer product.
   - **Existing Installation** - To repair an existing installation of Video Streamer, use the files generated in the previous steps and follow the instructions in "*Upgrade SSL Certificate* (on page 79)" to update the Video Streamer product.

APPENDIX H

Network Port Reference

Depending on your network configuration, it may be necessary to open network ports to view video successfully. The following table provides a list of default ports used by the Video Streamer. The Video Streamer installation also provides firewall rules to ensure the flow of network traffic for the computers hosting the Video Streamer server components. See *Inbound Firewall Rules* (on page 85) for more information.

Port Range	Protocols	Computer	Notes
5432	TCP	Database host	The default port used to communicate with the PostgreSQL database. This port can be changed during PostgreSQL installation. If a port other than 5432 is used, an update must be made to the firewall rules created during installation.
*Specified during Configuration server installation	TCP	Configuration server host and any client connecting to the Configuration server	The port used to communicate with the Configuration server component. This port is specified during Configuration server installation. The Video Streamer installation script automatically adds inbound firewall rules for the Configuration server host. Any computers attempting to connect to the Configuration server must also open this port.
*Specified during Interface server installation	TCP	Interface server host and any client connecting to the Interface server	The port used to communicate with the Interface server component. This port is specified during Interface server installation. The Video Streamer installation script automatically adds inbound firewall rules for the Interface server host. Any computers attempting to connect to the Interface server must also open this port.
*Specified during Streaming server configuration	TCP, UDP	Streaming server host and any client connecting to the Streaming server	The port used to communicate with the Streaming server component. This port is specified during Streaming server configuration using Video Streamer Administrator. The Video Streamer installation script automatically adds inbound firewall rules for the Streaming server host. Any computers attempting to connect to the Streaming server must also open this port.

Port Range	Protocols	Computer	Notes
49000 - 65535	UDP	Streaming server host and any client connecting to the Streaming server	Port range used for video transmission originating from the Streaming server component. The ports in use will vary within this range.
3478	TCP, UDP	Any client connecting to the Streaming server	Port used to establish the peer-to-peer connection that is necessary for streaming video from the server to the client.

APPENDIX I

Inbound Firewall Rules

The following Microsoft Windows firewall rules are automatically installed on the local computer when HxGN Video Streamer is installed. These rules are inbound rules. There are no outbound rules installed, because outbound traffic is rarely restricted for local computers.

Inbound Firewall Rules for Configuration Server

The Configuration server requires various ports for communication with streaming servers and Google Chrome web browsers for control data and video data. To support communication between these ports, the following rule is installed:

Rule name: HVS - Allow TCP inbound for *HvsConfigurationServer.exe*

- Rule group name: HVS Configuration Server
- Protocol: TCP
- Local Port: Any
- Program: *HvsConfigurationServer.exe*

The configuration server uses a PostgreSQL database. The default PostgreSQL port is 5432. If the port is changed in the PostgreSQL configuration, the following rule must also be changed to match the new port number:

- Rule name: HVS - Allow TCP inbound for PostgreSQL
- Rule group name: HVS Configuration Server
- Protocol: TCP
- Port: 5432

Inbound Firewall Rules for Interface Server

The Interface server requires various ports for communicating with Google Chrome web browsers for control data and video data. To support communication between these ports, the following rule is installed:

- Rule name: HVS – Allow TCP inbound for *HvsInterfaceServer.exe*
- Rule group name: HVS Interface Server
- Protocol: TCP

- Local Port: Any
- Program: *HvsInterfaceServer.exe*

Inbound Firewall Rules for Streaming Server

The Streaming servers require various ports for communication with a Configuration server for control data and video data. To support communication between these ports, the following rule is installed:

Rule name: HVS - Allow any inbound for *HvsStreamingServer.exe*

- Rule group name: HVS Streaming Server
- Protocol: Any (TCP and UDP)
- Local Port: Any
- Program: *HvsStreamingServer.exe*

The Streaming server uses a PostgreSQL database. The default PostgreSQL port is 5432. If the port is changed in the PostgreSQL configuration, the following rule must also be changed to match the new port number.

- Rule name: HVS - Allow TCP inbound for PostgreSQL
- Rule group name: HVS Streaming Server
- Protocol: TCP
- Port: 5432

APPENDIX J

STUN and TURN

Session Traversal Utilities for NAT (STUN) and Traversal Using Relay around NAT (TURN) are a set of Internet Engineering Task Force (IETF) standard protocols to negotiate traversing the Network Address Translations (NATs) when establishing peer-to-peer communication sessions.

A server host for Video Streamer uses a STUN server to discover its public IP address when it is located behind a NAT/Firewall. If the NAT/Firewall still does not allow a client host to connect directly to the server host for Video Streamer, the two hosts can make a connection to a server that implements TURN, which will relay media between the two hosts.

 Contact *Hexagon Support* (see "*Technical Support*" on page 92) for more information about the set up and configuration of a STUN-TURN environment.

APPENDIX K

Whitelist Domains for Video Streamer External APIs

Cross-origin resource sharing (CORS) is a browser security mechanism which enables controlled access to resources located outside of a given domain or Origin (domain, scheme, or port). CORS is a relaxation of the same-origin policy implemented in modern browsers. Under the same-origin policy, a web browser allows scripts in one web page to access data from another web page, but only if both pages have the same origin. However, the CORS relaxation of this policy has the potential for cross-domain based attacks if the CORS policy is for a website is poorly configured and implemented.

Therefore, the Video Streamer product has implemented a CORS policy that restricts access to all unknown domains. However, a domain Whitelist (or allowed list) configuration setting is provided to allow unknown domains access to Video Streamer data. Only domains that are absolutely needed for cross-origin communication should be whitelisted. This whitelist provides access to the Video Streamer external APIs (for example, ExtractVideoClip, GoToPrset, and so forth).

To add domains to the whitelist:

1. Browse to the Video Streamer product installation folder.
2. Browse to the Interface server installation folder.
3. Use a text editor to open the *appsettings.json* file.
4. Locate the DomainWhiteList section. The DomainWhiteList section is delivered with an empty list ("DomainWhiteList": [])
5. Add allowed domains to the list as a comma separated list of strings using the following format:

   "<scheme>://<domain>:<port>"

   - **Scheme** - The protocol used by the domain. For example, http (without SSL) or https (with SSL).
   - **Domain** - The Web server that will be allowed to access the system.
   - **Port** - The port (or technical "gate") used to access the domain. The port number must be specified if it is not a standard port (80 for http and 443 for https).

   See the following examples:

   Adding 1 domain

"DomainWhiteList": ["https://www.servera.com:449"]

Adding multiple domains

"DomainWhiteList": ["https://www.servera.com:449",
"https://serverb.domain1.com:446"]

6. When finished, save the *appsettings.json* file.
7. Restart the Windows service for the Configuration server to allow these changes to take effect.

APPENDIX L

Uninstall Video Streamer

You might need to uninstall Video Streamer software when upgrading to a new version or to solve a problem with an existing installation. The Video Streamer software that you installed with batch files on the Configuration server, Interface server, and the Streaming server does not appear in the **Programs and Features** dialog box in Windows. You can uninstall the Video Streamer components using the uninstall batch files located on your installation media.

 When Video Streamer components are *uninstalled* (see "*Uninstall Video Streamer*" on page 90), existing PostgreSQL data is not altered or deleted.

To uninstall Configuration Server on a Video Streamer host:

1. Use administrator privileges to sign on to the computer that hosts the Configuration server.
2. Open an Administrative command prompt.
3. Navigate to the location of the Video Streamer installation media.
4. Run the *uninstall_hvs_configuration.bat* file.

   The script displays output in the command prompt window.

To uninstall Interface Server on a Video Streamer host:

1. Use administrator privileges to sign on to the computer that hosts the Interface server.
2. Open an Administrative command prompt.
3. Navigate to the location of the Video Streamer installation media.
4. Run the *uninstall_hvs_interface.bat* file.

   The script displays output in the command prompt window.

To uninstall Streaming Server on a Video Streamer host:

1. Use administrator privileges to sign on to the computer that hosts the Streaming server.
2. Open an Administrative command prompt.

3. Navigate to the location of the Video Streamer installation media.
4. Run the *uninstall_hvs_streamer.bat* file.

   The script displays output in the command prompt window.

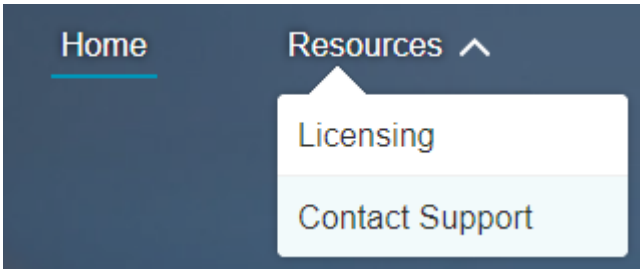
Technical Support

Hexagon's Safety, Infrastructure & Geospatial division provides several ways to contact Support, including online case submission and phone support. For general Hexagon information, call 800-345-4856 (US). For phone support, see the *Contact Support page https://supportsi.hexagon.com/help/s/contactsupport?language=en_US*.

Submit a Case Online

Hexagon provides an online method of requesting support 24/7.

1. Go to the *Support page https://hexagon.com/support-success/safety-infrastructure-geospatial*.
2. Click **Log in**.
3. Type your username and password, and click **Log in**.
4. From the **Resources** list, select **Contact Support**.



   The **Contact Support** page displays.
5. Click **Online case submission**.

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