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Introduction

ConvergenceTP (C2P) is the market leader in bringing text and alert information from virtually any TCP/IP enabled appliance or sensor into Wisenet WAVE Video Management System (VMS). Video surveillance is a powerful tool for security professionals, but the true benefits of video surveillance can only be realized when Users have access to and have the ability to aggregate all the data from every TCP/IP enabled device in the customer enterprise.

The value for the user when their IP appliance and sensor data is captured, stored, and time synchronized with the video is that they now have a way to match IP appliance and sensor events to video in their surveillance system. With the C2P Hypermedia Search Engine (HSE), users can search on text received from a Point of Sale terminal, License Plate Reader, Access control reader, Barcode reader, RFID sensor, etc. and then watch video of that specific event as it happened. Having the data time synchronized with the surveillance video means users can then bring up a view from any camera in their video surveillance enterprise and follow the person or object of interest as it moves out of view of one camera and into view of another.

Users can also setup the C2P real-time Rules Engine which allows them to flag specific events for immediate viewing, or push user defined procedures for that specific event to the VMS operator’s screen. The Rules engine also allows the user to push generic events to the VMS system to synchronize, annotate and bookmark the detected event within the VMS event database.

Overview of the C2P Software Integration

C2P software provides an avenue to connect many third-party IP devices to Wisenet WAVE VMS via a common setup routine.

This User Manual is intended to be used as a reference for installing C2P middleware and configuring it for use with Hanwha’s Wisenet WAVE Video Management System (VMS).

While License Plate Recognition (LPR) is used as the example third-party IP Device in this manual, this same manual can be used for the setup of many other devices.
Critical Features

- IP Device text captured by C2P is time synchronized with any and all video cameras attached to Wisenet WAVE VMS.
- IP Device text can be viewed in real-time on any Wisenet WAVE VMS Client.
- All IP Device text received is stored and available for future forensic searches.
- The Hypermedia Search Engine (HSE) can be used in researching specific events.
- Search results provide the full text of the events that are linked to the actual Wisenet WAVE VMS stored video of the event.
- C2P provides many real-time analytic tools that users can setup to trigger on specific events of interest.
Installing C2P Software

For new C2P installations, you will need both the C2P driver installer for the specific IP appliance you will be using as well as the Hanwha C2P System installer.

Figure 1

Note: For demo/evaluation applications all of the components listed above can be installed on the same system for ease of configuration.
System Requirements

C2P System Minimum Requirements:

- Processor: Intel Core i5-7500, 3.4 GHz
- RAM: 8GB

Pre-installation Checklist

- Ensure that the system(s) used to host the C2P ESE and HSE are time synchronized with Wisenet WAVE VMS media server.
- During the install, temporarily disable any antivirus software and turn off the local firewalls.
- Verify that Wisenet WAVE VMS Client is installed on the system hosting the C2P software.
- One (1) Wisenet WAVE Professional license is needed to record each virtual camera.
- Temporarily set Windows User Account Control (UAC) to off while doing the install.
- Valid Wisenet WAVE VMS administrator login credentials.
- Windows Administrator account is required for use when installing C2P software.
- Confirm the system is NOT running any other MySQL applications.
The C2P Hanwha System Software Installer

The ConvergenceTP Hanwha System Installer software installs all of the components needed for the C2P Base system. These components will be installed automatically by checking the box labeled “Install HSE Database Server”, which includes:

- The C2P Event Streaming Engine (ESE)
- The C2P Hypermedia Search Engine (HSE)
- The C2P Hypermedia Search Engine Proxy (HSE Proxy)

The C2P Installer must be installed on any system running the Wisenet WAVE Media Server. Once the C2P base installer is run you can then select which component(s) you want to install on that machine.

1. Right click on the C2P Base installation package and select “Run as administrator”.

2. Follow the default selections during the C2P Base install.
   a. The default selections will be the following:
      i. Install HSE Database Server
      ii. Install HSE License Server

*Note: Installing C2P Base for the first time may require a restart of the machine after the install completes.*
Licensing C2P Software

Before your C2P integration can be used, the integration must be activated via license through Wisenet WAVE VMS.

Perform the following steps to produce a valid license for your C2P integration with Wisenet WAVE VMS:

1. Using the CTP License Server Control Panel, click “Generate Seed Key”.
2. The seed key will be produced in the CTP Machine Code Generator. (Only systems running Wisenet WAVE Media Server require a seed key to be generated.)
3. Send the resulting key to insidesales@hanwha.com.
4. You will receive an email containing your valid license file.
5. Using the CTP License Server Control Panel, click “Register”.
6. Navigate to the folder containing your C2P license key file and click “Open”.
7. The C2P License Server Control Panel will indicate that the license is valid.
The C2P Database (DB) Server Settings contain the configuration needed for the C2P LPR Proxy to send LPR data to the C2P Hypermedia Search Engine (HSE). In most cases, the user never needs to open the DB Server Settings as all of the defaults work as installed as long as the Hypermedia Search Engine (HSE) Proxy is installed on the same machine as the HSE.

To launch the HSE DB Server settings, navigate to the the ConvergenceTP folder in the Windows Start Menu and select the CTP HSE Service which will launch the DB Server Settings window.

A few reasons to use launch the DB Server Settings:

1) Changing the default password used by the HSE.

2) Changing the HSE database retention time from the default of 30 days.
   
   Note: If “Hours to Clear Database is “0” then the database is never cleared. Otherwise if a non-zero number is used (shown is 24) then that number represents how often the database is truncated to the selected number of days specified in “Database Retention Days”.

3) Verifying that data is actually being sent to the HSE database as a troubleshooting tool. The Log Panel can be accessed by clicking on “View Log”.
The ESE Control Panel provides real-time feedback as to what data transactions the C2P Proxy is sending to Wisenet WAVE VMS. The below data transactions include LPR text images to be displayed in the Wisenet WAVE Desktop Application as well as any associated Procedures.

The “Config” button on the bottom of the ESE control panel brings up the configuration settings for the ESE. The two settings that will likely need to change are identified below on the following page.
Under the VMS, the two sections that will likely be modified are “Camera Settings” & “Generic Events”. For “Camera Settings”, choose the “push” option in the drop menu under “Type”. For “Generic Events”, the IP Address should point to the Wisenet WAVE VMS Media Server’s IP. If Generic events are being used, be sure to tick the checkbox for “Enabled”.

![Configure Event Streaming Engine](image-url)

**Camera Settings**
- **Type**: push
- **Port**: 89

**Generic Events**
- **Enabled**: checkbox
- **IP Address**: 127.0.0.1
- **Port**: 1234

**Procedure Manager**
- **HSE IP Addr**: 127.0.0.1
- **Port**: 8889

**Alert Virtual Camera**
- **Enabled**: checkbox
- **Alert Image**: 5
- **Alert Procedure**: 4

**Virtual Camera Image Defaults**
- **Default Images**

**Screen Overlay Canvas Settings**
- **Screen Overlay**: checkbox
- **Camera Elapsed Time Allowance**: 5
- **Template Attributes**
  - **Text Color**: Default
  - **Include LPR Images**
The C2P Device Proxy Interface

Using the C2P LPR integration with Wisenet WAVE VMS for our demonstration in this manual:

If the C2P LPR Proxy and the C2P Base are installed on the same system then no additional configuration is needed to run the C2P LPR to Wisenet WAVE VMS integration.

Above is a typical C2P LPR Proxy Graphical Users Interface (GUI) configuration table.

- **A** = LPR Service Stop and Start controls
- **B** = View Log
- **C** = C2P LPR Simulator
- **D** = Help button
- **E** = Device Event Directives
- **F** = Directives Setting Control
- **G** = Wisenet WAVE Desktop Application User Credentials
- **H** = Advanced Settings.
Advanced Settings

I = Event Streaming Engine (ESE).
J = Hypermedia Search Engine (HSE).
K = License Server.
L = Rule Definition.
M = Edit Procedure.
C2P Virtual Camera Setup in Wisenet WAVE VMS

C2P uses “virtual cameras” as a practical means of displaying and annotating exceptions or special events transmitted to Wisenet WAVE VMS by third-party devices.

Below is the process for creating Virtual Cameras from within Wisenet WAVE VMS.

1. Open the Wisenet WAVE Desktop Application
2. Right Click the Server > Select “Add Device”

In this example, our demonstration will use the local host address, so we will add the Device Address as shown: http://127.0.0.1:89/pushport1

Note: The “Login” and “Password” fields should be left blank.
3. Select “Scan”.
4. Once the virtual camera is discovered, click “Add Selected”. The Device Address will show up in the left column under the selected Server.
5. Rename the camera by right clicking the name, then select “Rename” and type “CTP Overview1”.
6. Repeat the process by selecting New SCAN and then create two more virtual cameras:
   - http://127.0.0.1:89/pushport2 renaming it to CTP Camera2
   - http://127.0.0.1:89/pushport3 renaming it to Procedure.
7. Next create a Web Page by right clicking “Web Pages” and selecting “Add New Webpage”
8. Enter a name – here shown as C2P HSE79 and the HSE URL: http://127.0.0.1:8989, Check Advanced box and then select OK.

   **Note:** The URL entry creates a web portal to the HSE data base which shows up in the 1+3 client view.
9. Once the cameras have been created, right click the camera names and select camera settings for each camera. Select Recording tab and turn ON the “Recording” button and have the recording schedule setup for Record Always.
Configuring the C2P Rules Engine

The C2P Rules engine allows users to create their own rules based on the Live text received from the LPR system. These rules are evaluated for each LPR read sent from the LPR system to the C2P integration with each IP Device having its own unique Rules Definition window. Using the C2P Rules Engine makes it easy to add, delete or edit a rule. These rules can be a single expression or several expressions added together. In this case, rules are sent to Wisenet WAVE VMS via TCP/IP Generic Event text.

The rules engine must be configured independently for each proxy server being used. By default, on a new installation, no rules will be created. To create a new rule:

1. Navigate to the Advanced Settings window within the proxy. In this case, we are looking at the LPR proxy.
2. Once there, select “Add” and you will see the “Expression to Alert” window.
3. In the “Expression to Alert” window, you can set the “Evaluate Expression” which is your rule, and then associate up to 3 generic events and 3 procedures to a single rule.
4. Click “Save” and “Exit”.

![Advanced Settings Window](image)

![Expression To Alert Window](image)
To create a procedure to be applied in the rules engine you will need to navigate to the CTP Procedure Manager

1. Navigate to the “Advanced Settings” tab of your selected driver, in this case, the Vigilant LPR driver.

2. Once at the “Advanced Settings” window, select the “Edit Procedures” button.

3. Here you can set the Procedure Name, assign a virtual camera #, create a Title, upload an image and provide a description.

4. Once your Procedure is created, you can then assign that Procedure to a rule following the previous instructions.
Proxy Configuration Setup

Below is an example of the LPR configuration GUI.

1. To begin the setup, select “Refresh Cameras” under the VMS Cameras section. This causes an update of the camera names from Wave VMS.

2. To add the Device ID, use the “Add” button under Directive Settings Control. This opens up the table allowing you to enter Live mode and Playback mode selection of cameras.

3. For Live mode, enter the LPR Device ID name (Lane1 shown as example) along with its virtual camera name shown as 2. Virtual camera #2 is what receives the metadata text from the LPR proxy.

4. The example shows all 3 LPR cameras for Lanes 1 - 3 sending metadata to Virtual Camera #2. This is the only place the metadata text source to virtual camera assignment is made.

5. To associate a playback camera to a Device ID, just select the appropriate camera from the “Playback Cameras (Browse Mode)” drop down. This feature is what syncs the cameras to the IP Device and this is what is shown when the “Show Cameras” button is clicked in the Hypermedia Search Engine. Select “Save” when finished and then “Stop” and “Start” the Service from the GUI.

Example: Below LPR Device ID for Lane1 will bring up the following camera views: CTP Overview1, CTP Camera2 and Procedure on the client where the metadata and the camera views will be time synchronized with each other. Repeat these steps for each LPR Device ID that you add.
Advanced Settings for IP Devices

Each IP Device has a unique listening port assignment. The Advanced setting page is used to define where you have installed the C2P software components: ESE, HSE and License Server. The page is used to enable the logging feature used with View Log on the previous GUI page. The Advanced setting page is where you create Rule Definitions to be used with that specific IP Device.

The Advanced Settings page gives you access to the Procedure Manager if you want to have a procedure show up on the client based on a rule being satisfied. The Procedure Manager (described earlier in this manual) is used to define generic events for use with the VMS. Generic events, once defined, must be enabled using the ESE configuration Control panel, see section labeled Generic Events.

The Advanced Settings page allows you to control what events show up in the client (if you created a Procedure view) by using the show all events check box. When left unchecked only the satisfied Rules will show up show up in the client. Note many applications leave the box unchecked to have only critical events pushed to the client. As an example, when there are hundreds of cars coming through the detection point, the security personnel are primarily interested in the exceptions (Rule Definitions) such as unregistered vehicle, vehicle of interest or terminated employee, etc. All license plates are captured and stored in the data base and can be recalled and time synchronized with the recorded video during playback. The Rule definition events are pushed to the client when the rule is satisfied.

Access Control Devices

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License Plate Recognition

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### Point of Sale

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### Biometrics

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### Banking

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### Asset Tracking

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Live viewing

C2P uses a common 1+3 view within Wisenet WAVE VMS for all C2P integrations.

This configuration includes:

1. The Hypermedia Search Engine (HSE), viewed as a web page
   1. CTP Overview1 - Displays video synced to the event
   2. CTP Camera2 – Displays relevant event information
   3. CTP Procedure – Displays preprogrammed information regarding the event

Note: The default HSE login password is “Password1”

To bring up the 1+3 view with the HSE window on the left and the three virtual cameras on the right, drag the C2P web page into the Wave VMS layout, log in to the HSE using the default password and then select your desired driver, click “Spreadsheet” and then select “View”. This brings up the HSE and a Table of events below the HSE window.
To view the camera for the event listed, select the “Show Cameras” button. The CTP cameras will automatically populate on the right hand side.
The Hypermedia Search Engine (HSE)

The ability to be able to search any text data that is sent by the IP appliance integrated with the Wisenet WAVE VMS is the true measure of the value of the integration. In this case, the IP Appliance is the LPR System but the C2P Hypermedia Search Engine (HSE) works exactly the same way for any IP Appliance. This means that users can jump between searches from one IP Appliance to another within the C2P HSE and the look, feel and function is exactly the same.

In the example below the user has done a search and selected “Show Cameras” for a specific license plate event of interest. The user can now play the video forward or backwards from that point and use any of the many other powerful tools within the Wisenet WAVE Desktop Application. For example, the user could zoom in on anything of interest, take a snapshot of a still, export evidence using the Wisenet WAVE export tools, etc. The user can also add, change or replace cameras while keeping the view time synchronized with the original LPR event search result.
The bubble diagram below illustrates the intuitive ease and simplicity of using the Hypermedia Search Engine in an LPR application.

- Selectable search parameters via dropdown tabs.
- Use full or partial keywords when performing a search.
- Filter your search with qualifiers such as contains, equal to, etc.
- Add additional keyword filters to the same search.
- Modify your spreadsheet columns based on need by deleting or adding columns.
- Once the search parameters are set, select "View" to show results in the Hypermedia Search window.
Troubleshooting C2P IP Device Integration

1) C2P ESE is not running.
   See C2P Event Streaming Engine (ESE) GUI

2) Improperly configured virtual camera.
   See C2P Virtual Camera Setup in the Wisenet WAVE Recording server

3) C2P or Wisenet WAVE license issue.
   For C2P go to the machine hosting the C2P license server and check license server Log file.

4) No permissions given to the user to view the Virtual Camera.
   See Wisenet WAVE user permissions settings allow for the usage of C2P virtual cameras.
Contact Information

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