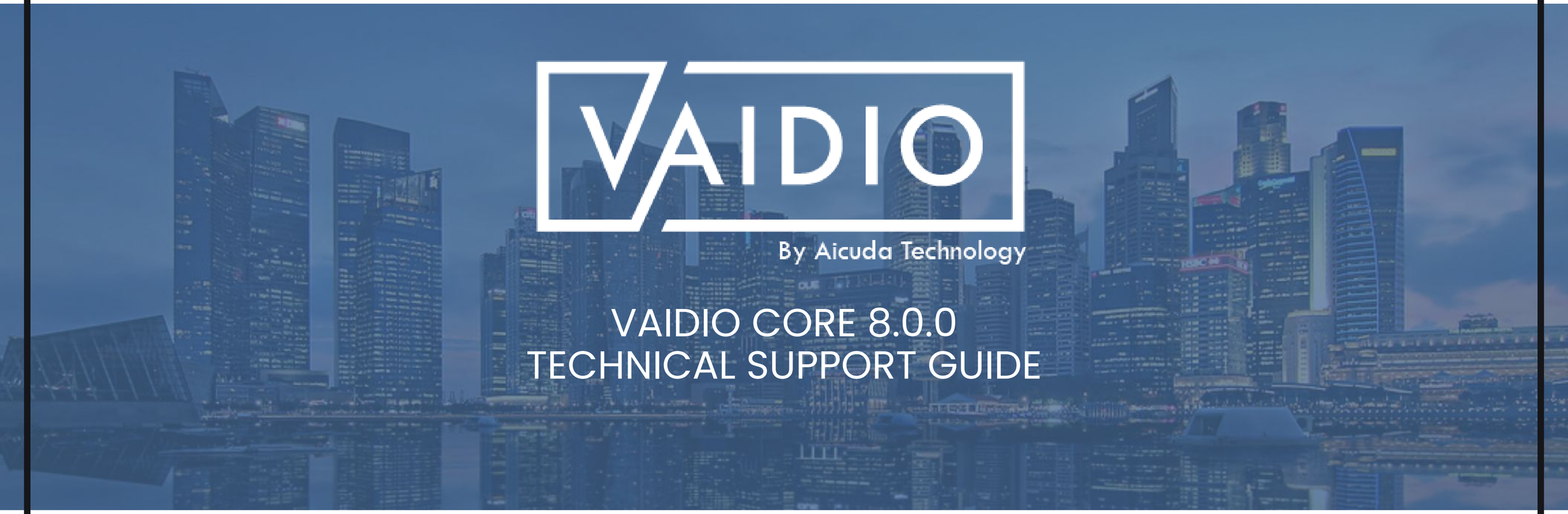


VAIDIO CORE 8.0.0
TECHNICAL SUPPORT GUIDE

TABLE OF CONTENTS

ADJUST VAIDIO CORE IP ADDRESS

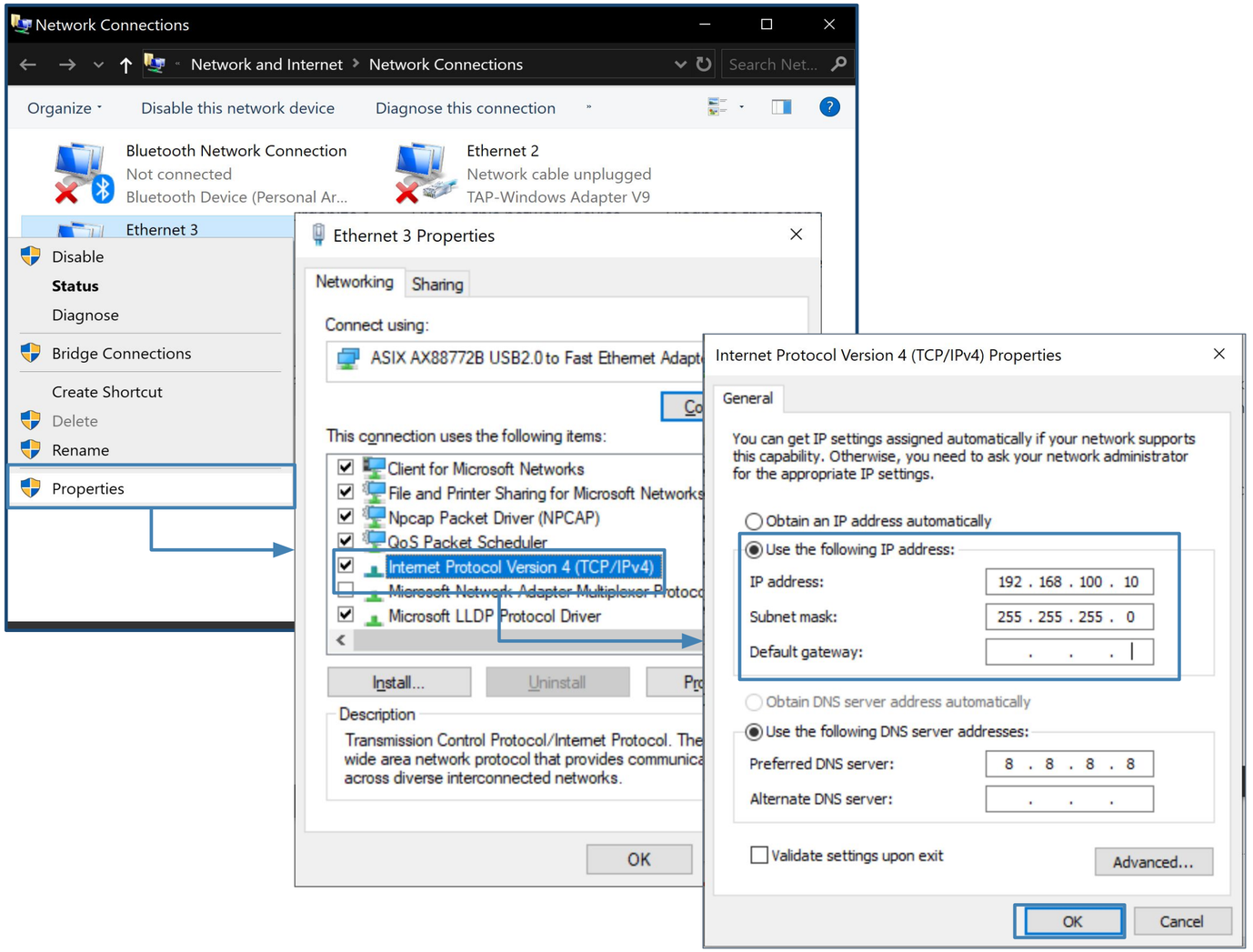
- Change Network
- Change IP Address of Vaidio

Back to Table of Contents

STEP 1: CHANGE NETWORK

If the Vaidio server was shipped from Aicuda Technology, follow these steps to put the user's PC on the same network as the Vaidio Server's default IP address: 192.168.100.100.

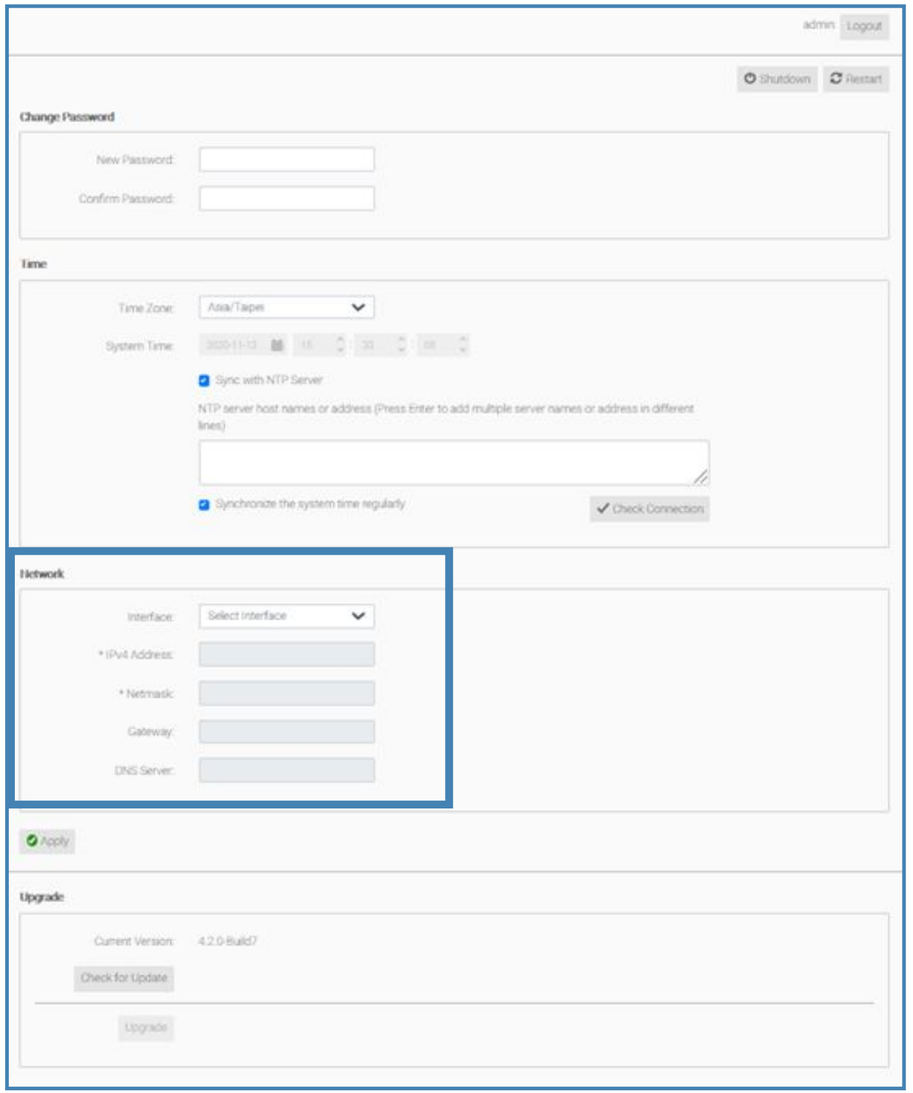
- For a Windows PC, go to Network Connections
- Right-click on the Ethernet to which Vaidio is connected and go to Properties
- Click Internet Protocol Version 4
  - Click "Use following IP address"
  - Fill in an IP address that is on the same subnet as Vaidio's default IP
    - E.g., 192.168.100.90
- Click "OK" when done



Return to Adjust Vaidio IP Address

STEP 2: CHANGE IP ADDRESS OF VAIDIO

- Vaidio Core 4.2.0 and onwards:
  - Log into the Admin Portal at http://192.168.100.100:8000
  - Network > fill out new IP address and Netmask
- Vaidio 4.1.0: Contact the Aicuda Technology Support Portal for assistance.
- Vaidio 4.0.0 and prior:
  - System > Network
  - Click on "eth1"
  - Input the desired IP address for Vaidio



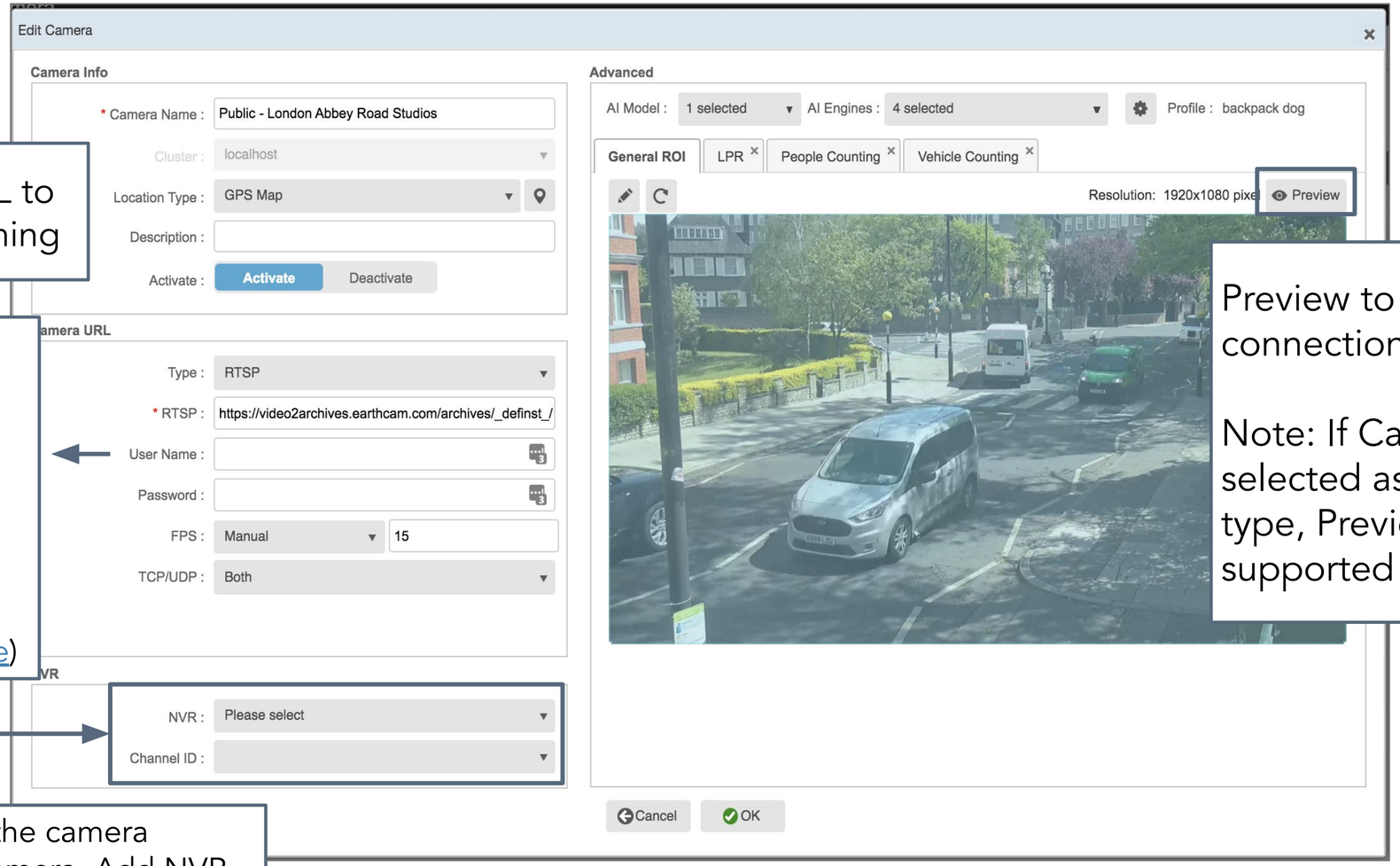
Return to Adjust Vaidio IP Address

ADD CAMERAS TO VAIDIO

- Add Camera
- IP Address/Domain Name
- RTSP
- Common Camera RTSP URLs
- Camera Auto Discovery

Back to Table of Contents

ADD CAMERA



Input camera info and URL to receive camera live streaming

Support 5 types of camera source inputs:

1. Camera IP Address
2. RTSP
3. Camera APP
4. External
5. Video File

(For types 3-5, refer to the Vaidio Core Setup User Guide)

To enable video playback of the camera stream, link the NVR to the camera. Add NVR to Vaidio first for it to be available in the dropdown list; refer to the Vaidio Core Setup Guide for more information).

Preview to check the connection

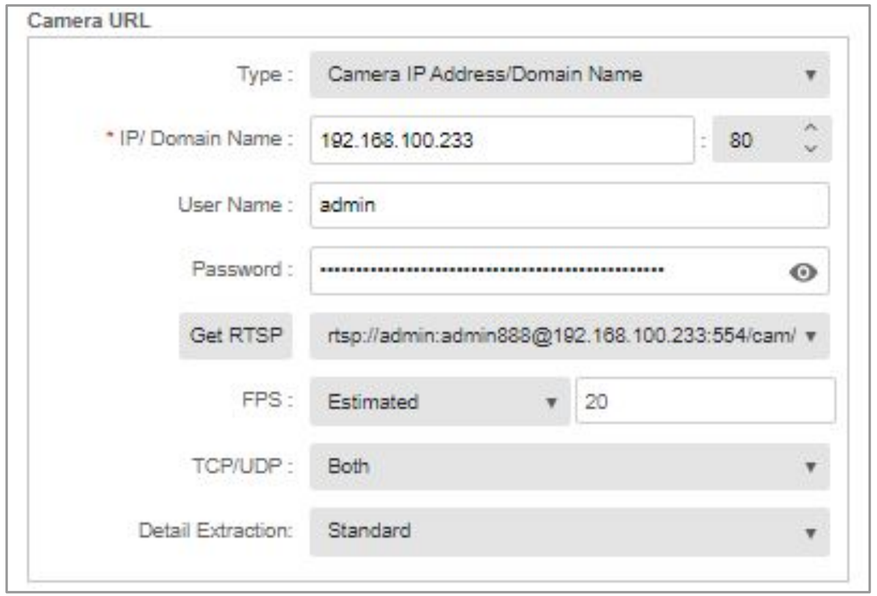
Note: If Camera APP is selected as the camera type, Preview is not supported

Return to Add Camera

ADD CAMERA (CONT.)

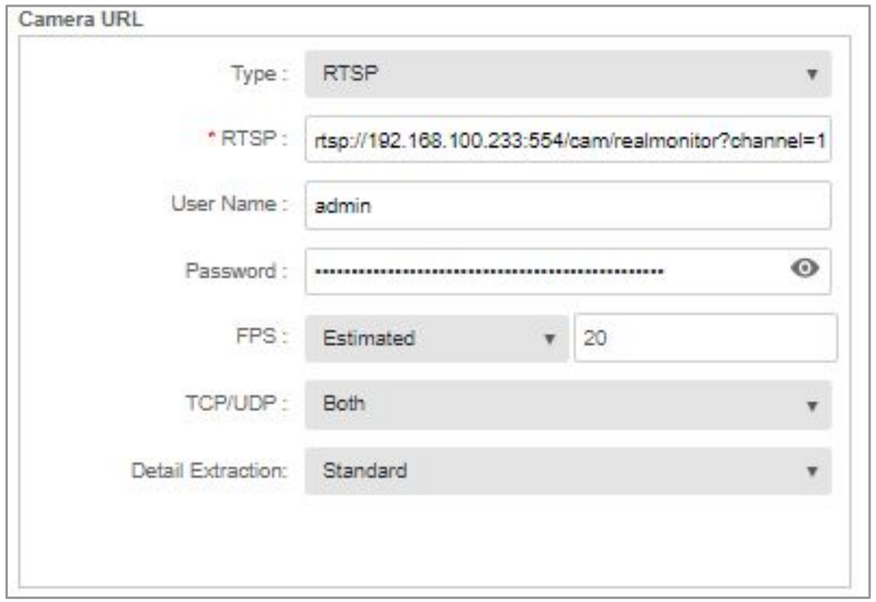
- IP Address/Domain Name: If the camera being added has ONVIF enabled, then connect to the camera using its IP address, port number (default usually 80), username, and password. Click Get RTSP after filling in the camera's credentials to select the stream. Click Preview.

Note: Not all cameras are ONVIF enabled by default. For more info, refer to the Next Slide.



- RTSP: If the camera is not ONVIF compatible or the user does not want to enable ONVIF, then it is possible to add the camera through RTSP stream. Click Preview to check camera connectivity when done.

Note: Refer to the RTSP slide for help on getting RTSP streams.



Return to Add Camera

ADD CAMERA USING IP ADDRESS/DOMAIN NAME

To connect a camera to Vaidio using IP Address/Domain name, the camera must have ONVIF enabled. Most cameras already have this enabled, but a few brands such as Axis and Hikvision do not have ONVIF setup by default.

Axis Cameras must create ONVIF users to connect to Vaidio using IP Address/Domain name as the camera type:

- ❏ Log in to the Axis camera and create an ONVIF user. The username & password can be the same as the regular camera user.

If the camera is still unable to connect after creating an user, try the next two steps.

- ❏ Disable “Replay Attack Protection” on the camera by going to System > Plain config > Web Service and uncheck the box. Users can do this temporarily to check whether the time is an issue.
- ❏ Update the camera’s firmware to the latest version.

Hikvision Cameras must have ONVIF enabled:

- ❏ Log in to the Hikvision camera and go to Configuration > Advanced Settings > Integration Protocol > Check on the 'Enable ONVIF' or 'Enable Open Network Video Interface' box > Add User

If the user does not want to set up ONVIF, connect using the camera’s RTSP stream.

Return to Add Camera

ADD CAMERA USING RTSP

- When encountering issues adding a camera using its IP address, we recommend directly adding the camera RTSP
- Refer to the chart on the next slide for common RTSP streams. If the user's camera brand is not listed or if the stream listed does not work:
  - Google "rtsp stream for [insert camera brand]" to find the format of the RTSP URL
    - Example: Toshiba IP camera: https://www.ispyconnect.com/camera/toshiba
    - Locate the camera model from the list of RTSP URLs for that brand and follow the format to add the URL to Vaidio

Return to Add Camera

COMMON CAMERA RTSP URLS

Camera/NVR Brand	RTSP Stream
Axis	rtsp://<cameraip>:<port>/axis-media/media.amp
Cisco	rtsp://<cameraip>/StreamingSetting?version=1.0&action=getRTSPStream&ChannelID=1&ChannelName=Channel1
Dahua NVR	rtsp:/<nvr_ip>:<port>/cam/realmonitor?channel=camerach&subtype=stream
Digital Watchdog, Network Optix, Hanwha Wave VMS	rtsp:/<nvr_ip>:7001/{camera_id}?stream=0
Hanwha	rtsp://<cameraip>:<port>/profile1/media.smp
Hikvision Camera (ONVIF disabled by default)	rtsp://<cameraip>:<port>/Streaming/Channels/101
Hikvision NVR	rtsp://<nvr_ip>:<port>/Streaming/Channels/{channel_id}1
Panasonic	rtsp://<cameraip>/MediaInput/h264
Samsung	rtsp://<cameraip>/profile<#>/media.smp

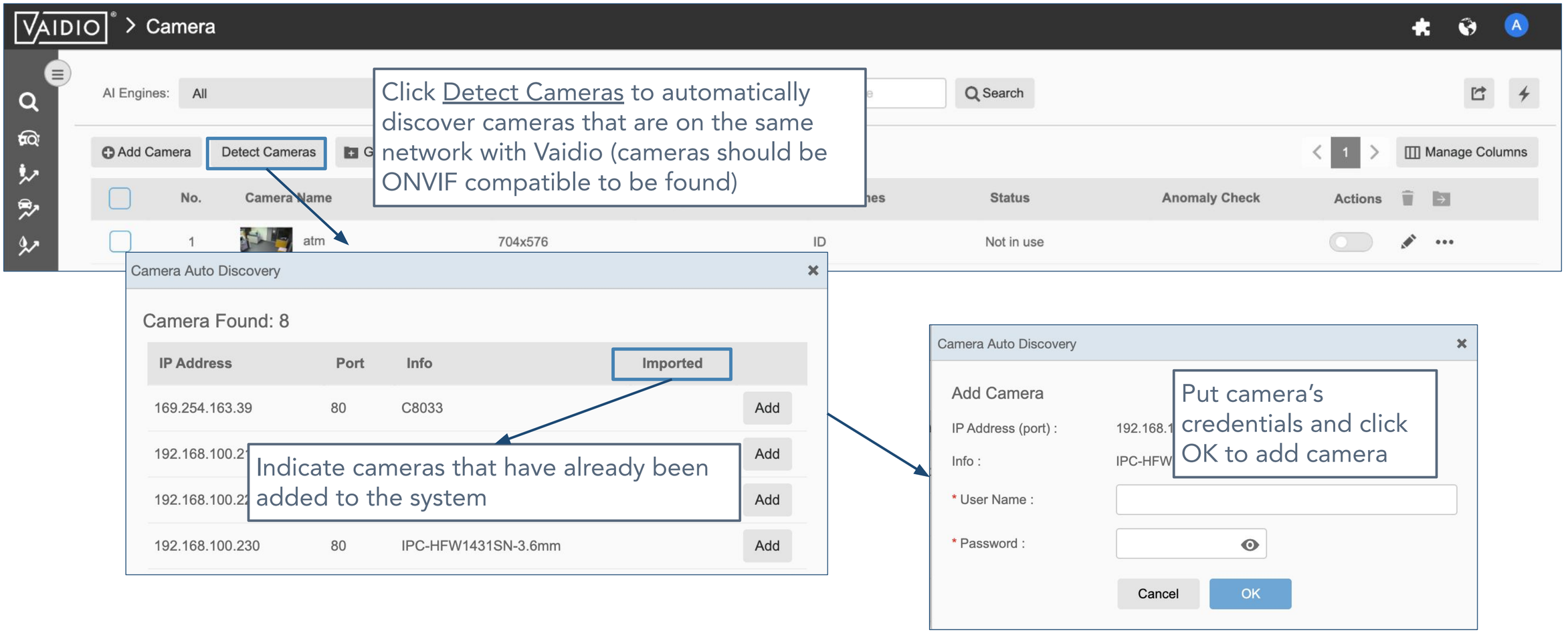
Copy the RTSP stream into Vaidio; replace the text in red with the correct IP and port for the camera/NVR.

- Default RTSP port for most cameras is 554.

If user's camera/VMS is not listed, it can be easily found with a Google search.

Return to Add Camera

CAMERA AUTO DISCOVERY



Return to Add Camera

CALCULATE CAMERA PARAMETERS

- Calculate Camera Parameters
- JVSG Calculator
- IPVM Calculator
- Resolution & Focal Length

Back to Table of Contents

CALCULATE CAMERA PARAMETERS

- Purpose: find the necessary focal length, pixel density, and viewing angle for a camera to estimate the suitable equipment for an application and vice versa
- Example: find the detection range of a camera for access control using Face Recognition

Tools:

- IPVM camera calculator: https://calculator.ipvm.com/
- JVSG camera calculator: https://www.jvsg.com/calculators/cctv-lens-calculator/

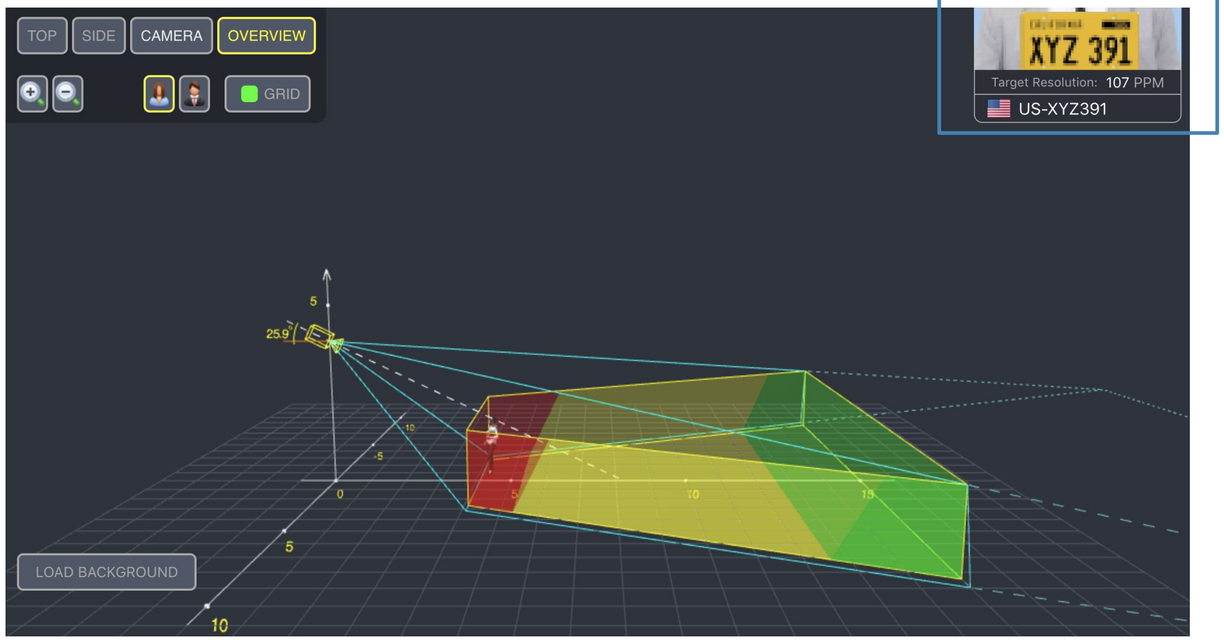
Return to Calculate Camera Parameters

JVSG CALCULATOR

- Select the camera parameters: resolution, lens focal length, and installation height
- Adjust the FOV (distance, target height, horizontal angle) to view whether the target fits into the required zone for detection
- Tutorial materials: https://www.jvsg.com/

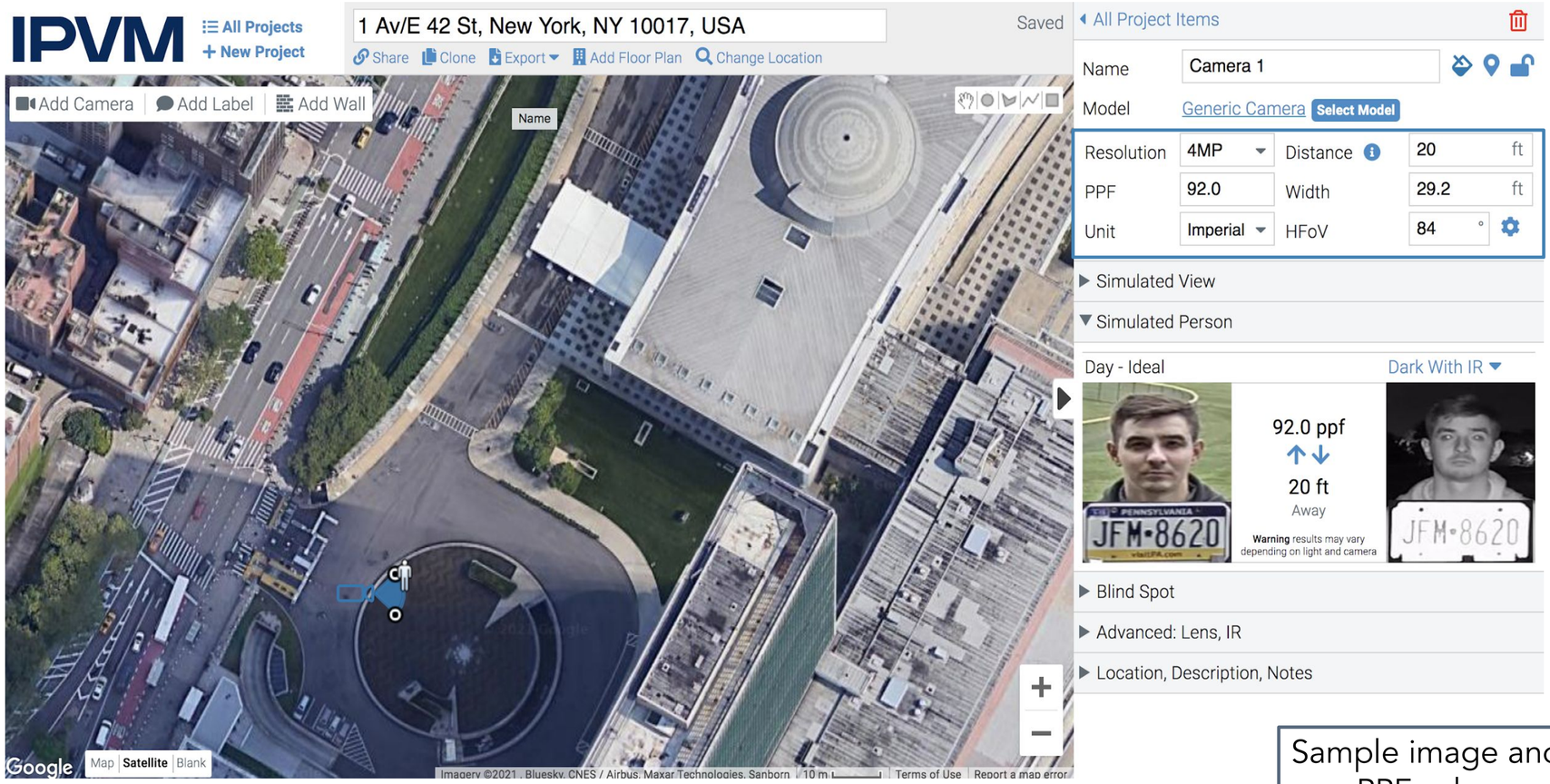
- Note: for Vaidio, the minimum pixels for FR is ~160 ppf and LPR is ~40 ppf
  - Smaller horizontal angles are better for AI recognition, even if the targets are in the identification (red) zone with high pixel density, since heavy distortion of the features will cause more mismatches

Sample image and pixel per unit length (ppf / ppm) value



Return to Calculate Camera Parameters

IPVM CALCULATOR

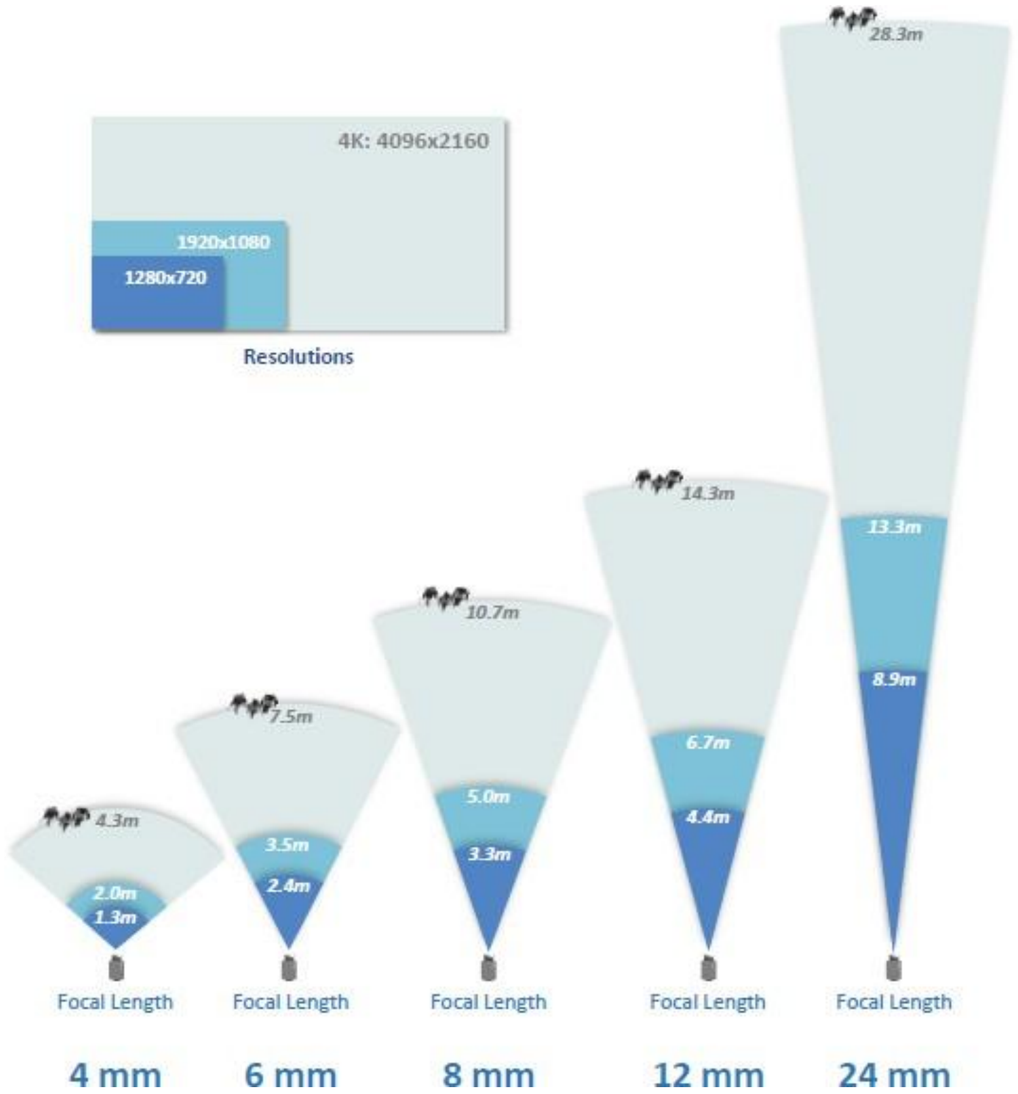


Sample image and PPF value

Adjust the parameters to display the changes in PPF value, or input required PPF to view at which distances a target can be detected

Return to Calculate Camera Parameters

RESOLUTION & FOCAL LENGTH

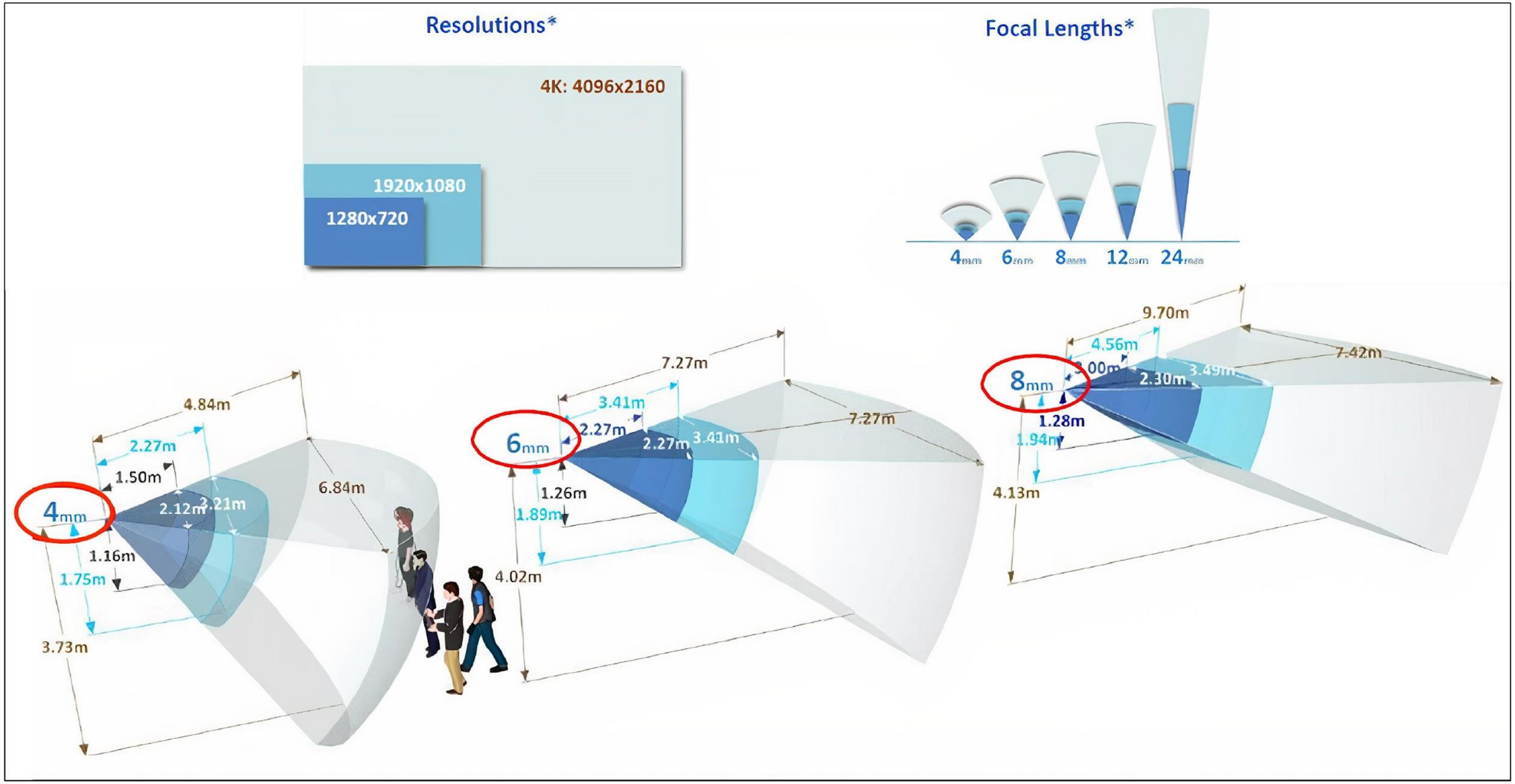


Adjustable parameters in the IPVM calculator (https://calculator.ipvm.com/)

- ❑ Resolution
- ❑ Distance
- ❑ Pixel per meter (ppm) / Pixel per foot (ppf) – Note: Vaidio requires at least 10 px on target for detection (e.g., 14 ppf for person)
- ❑ Width of field of view
- ❑ Horizontal angle of view (HAoV)
- ❑ Imager
- ❑ Focal length

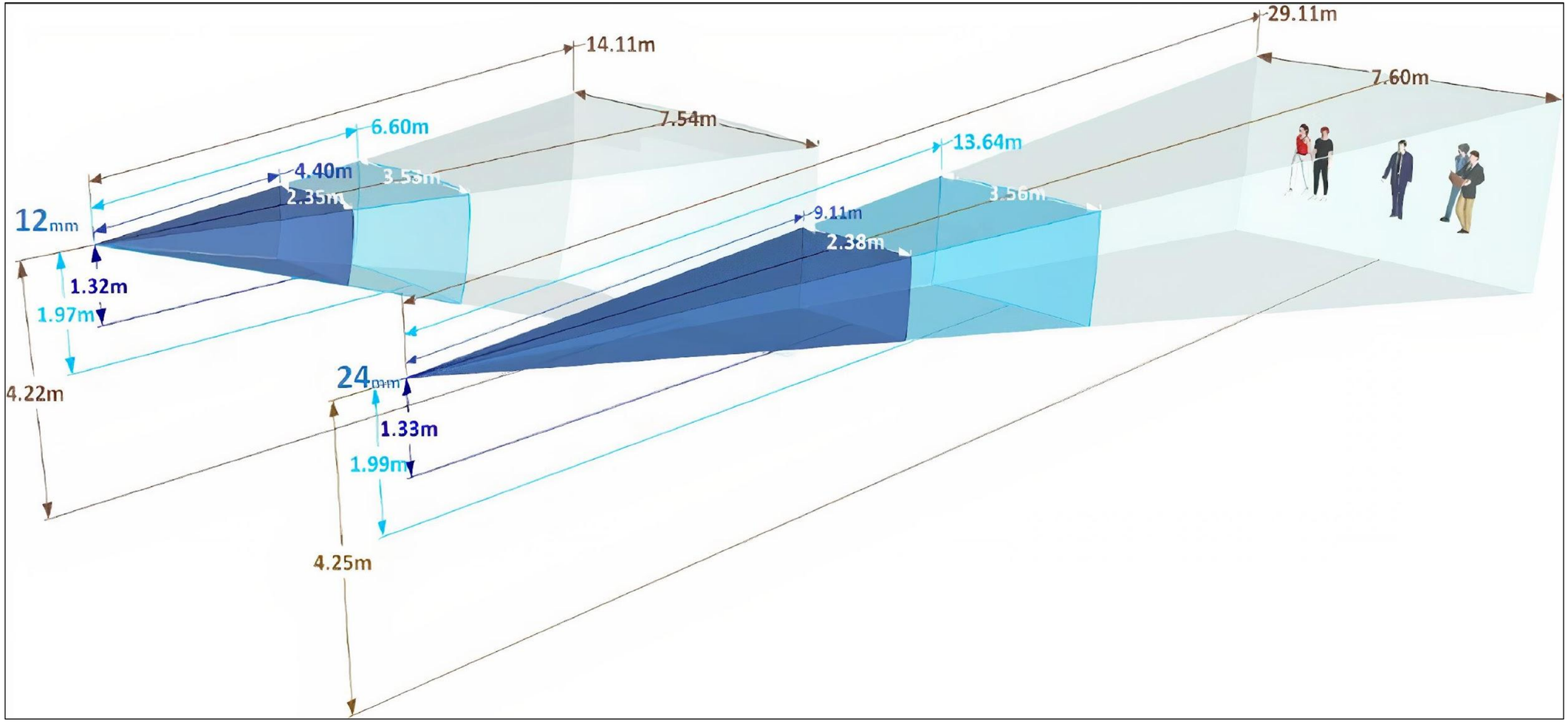
Return to Calculate Camera Parameters

RESOLUTION & FOCAL LENGTH (CONT.)



Return to Calculate Camera Parameters

RESOLUTION & FOCAL LENGTH (CONT.)



Return to Calculate Camera Parameters

REDUCE NETWORK BANDWIDTH

- Reduce Network Bandwidth
- Architectures
- Network Bandwidth & Storage Calculator

Return to Table of Contents

REDUCE NETWORK BANDWIDTH WHEN APPLYING VAIDIO

- Resolution
  - Vaidio only requires 20 pixels on target, so 1080p is sufficient for most use cases
  - Input the 2nd stream (lower resolution) from the camera
  - Pros: does not affect the main stream recorded in the VMS
  - Cons: increase the total bandwidth (albeit by a small amount) due to adding a second stream into the transmission load
- Frame rate
  - Vaidio only requires 8 frames per second or fewer, depending on the analytics
  - Change the camera setting to output fewer frames
  - Pros: maintain the same or even reduce the total bandwidth + analytics to extract useful, high-accuracy alert events and metadata
  - Cons: reduce the number of frames recorded in the VMS

Return to Reduce Bandwidth

REDUCE NETWORK BANDWIDTH WHEN APPLYING VAIDIO (CONT.)

- Bandwidth calculator: https://www.cctvcalculator.net/en/calculations/bandwidth-calculator/
- Example: for each 3MP stream with H.264 medium-quality compression and 15 fps
  - First stream to the VMS takes 3.2 Mb/s; Add the stream to Vaidio for analytics processing with no change: + 3.2 Mb/s total bandwidth consumption = 6.4 Mb/s
  - Reducing the resolution from 3MP to 1080p decreases the bandwidth consumption for Vaidio by 34%; total bandwidth consumption = 5.3 Mb/s; i.e., 17% decrease
  - Changing the camera output from 15 fps to 4 fps: transmission to the VMS = 0.8 Mb/s; transmission to Vaidio = 0.8 Mb/s; total bandwidth consumption = 1.6 Mb/s; i.e., 75% decrease
  - Reducing resolution and reducing the frame rate together: decrease the total bandwidth consumption from 6.4 Mb/s to 1.4 Mb/s; i.e., 78% decrease. In fact, the total bandwidth consumption is now 2x less than that required by just the VMS originally

Return to Reduce Bandwidth

ARCHITECTURES

Ready-to-use

ONVIF IP cameras

RTSP stream

Router/ POE switch

RTSP stream

VMS

RTSP stream

Processed metadata

VAIDIO APPLIANCE (tower, IPC or rackmount)

Record video; Display alerts

Apply analytics

Custom integration;
Low, image-only transmission to Vaidio

ONVIF IP cameras

RTSP stream

Router/ POE switch

RTSP stream

VMS

Image after motion detection

Processed metadata

VAIDIO APPLIANCE (tower, IPC or rackmount)

Record video; Detect motion; Display alerts

Apply analytics

Custom integration;
Negligible, metadata-only transmission to Vaidio

AI cameras (w/ GPU)
Install Vaidio on cam

RTSP stream

Router/ POE switch

RTSP stream

VMS

Processed metadata

VAIDIO Cloud

Apply preliminary analytics

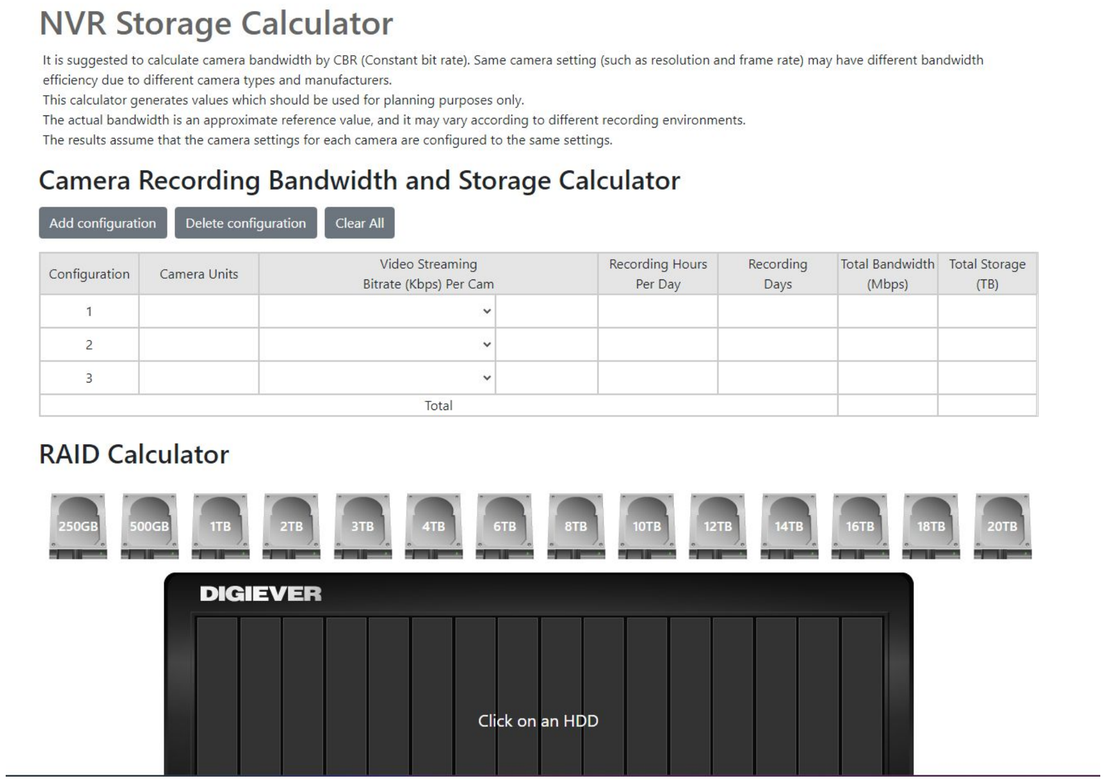
Record video; Display alerts

Apply advanced analytics

Metadata

Return to Reduce Bandwidth

NETWORK BANDWIDTH & STORAGE CALCULATOR



- Bandwidth calculator: https://www.digiever.com/support/calculator.php
- To calculate the approximate bandwidth and storage necessary, input the following for each Vaidio server:
  - Number of streams connected to that Vaidio server
  - Streaming bitrate
  - Desired recording hours per day
  - Recording days
- Example: For 20 1080p camera streams on a VSB-550: input 20 for camera units, 1920 x 1080 for the video streaming bitrate. If these cameras record 24 hrs/day for 30 days, the total estimated storage is 18.10 TB.

Return to Reduce Bandwidth

SIMULATE FILE AS RTSP STREAM USING HAPPYTIME RTSP SERVER

- Happytime RTSP Server

Back to Table of Contents

HAPPYTIME RTSP SERVER

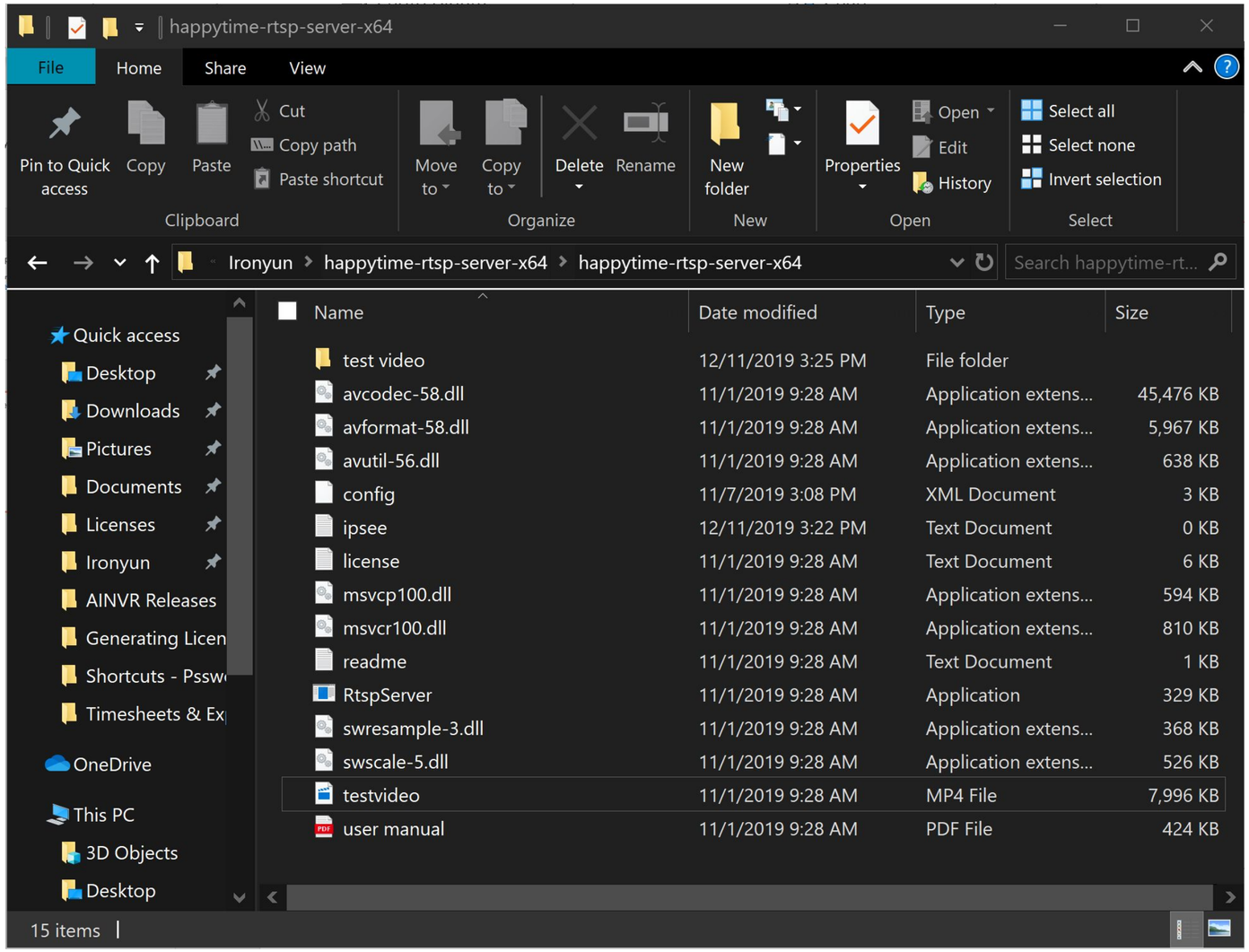
- Purpose: simulate large video file(s) as RTSP stream(s) for analytics processing in Vaidio
  - The user can upload a video (< 1 GB) and select Camera > Add Camera > Camera URL > Type > Video File to simulate the uploaded video as a stream
- Download from this link: http://www.happytimesoft.com/downloads/happytime-rtsp-server-x64.zip
- Extract Folder
- Note: Complete list of download options: http://www.happytimesoft.com/products/rtsp-server/index.html

Return to Simulate File

HAPPYTIME RTSP SERVER (CONT.)

Place video in the

“happytime-rtsp-server” Folder

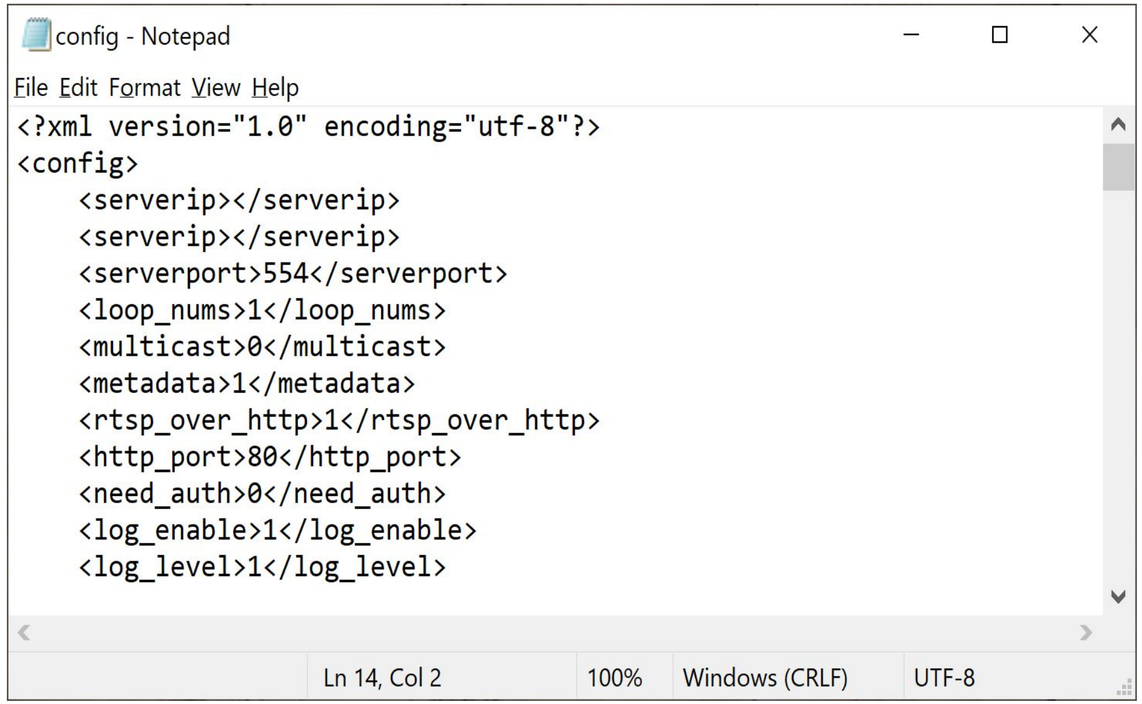


Return to Simulate File

HAPPYTIME RTSP SERVER (CONT.)

To run the video ONLY once (Note: video is looped by default):

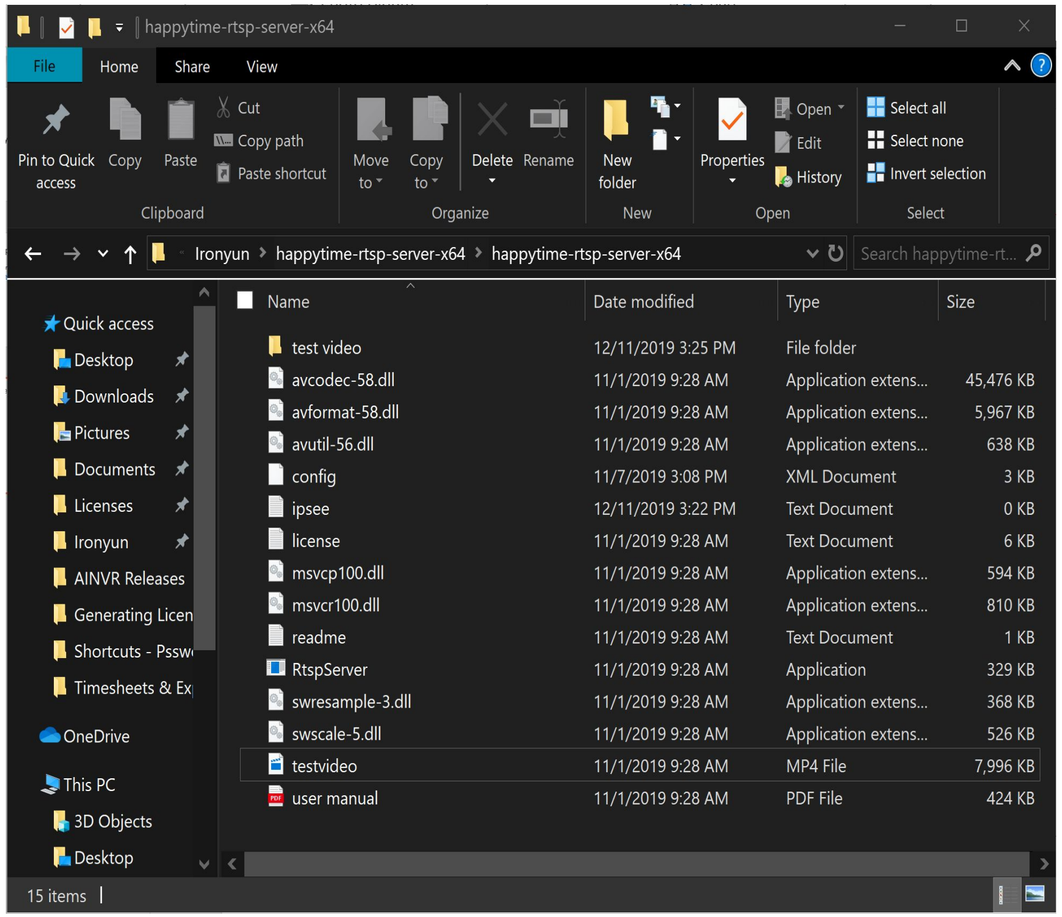
- Go to the "config" file in the Happytime folder
- Change "loop_nums" to 1
- Save



Return to Simulate File

HAPPYTIME RTSP SERVER (CONT.)

Run the RTSP server



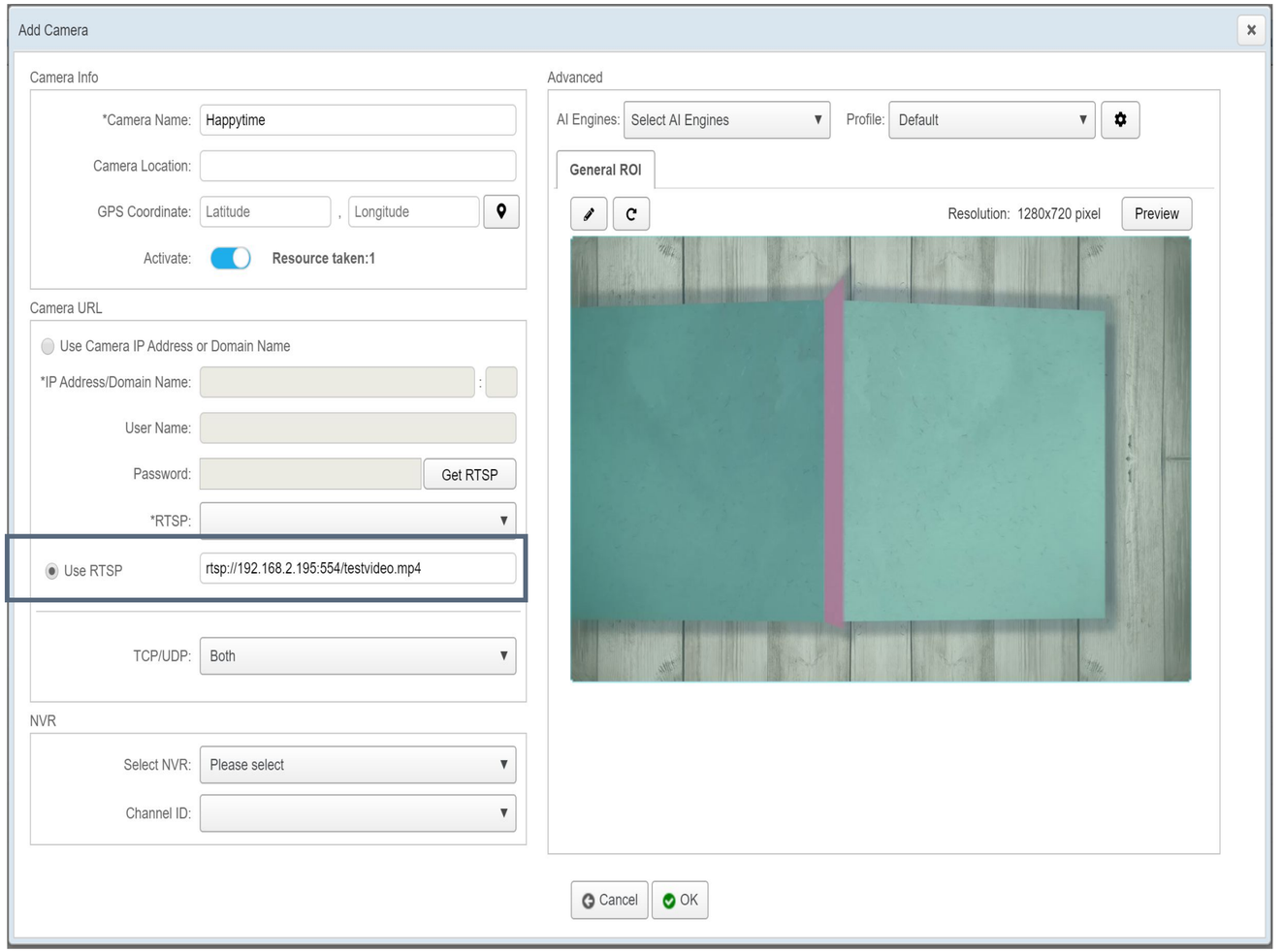
Get the corresponding RTSP stream

```
C:\Users\14apr\Documents\Ironyun\happytime-rtsp-server-x64\happytime-rtsp-server-x64\RtspServer.exe
Happytime rtsp server V4.2
Play streams from this server using the URL:
        rtsp://192.168.2.195/<filename>
where <filename> is a file present in the current directory.
        rtsp://192.168.2.195/screenlive
stream from live screen.
        rtsp://192.168.2.195/videodevice
stream from camera device.
        rtsp://192.168.2.195/audiodevice
stream from audio device.
        rtsp://192.168.2.195/screenlive+audiodevice
stream from live screen and audio device
        rtsp://192.168.2.195/videodevice+audiodevice
stream from camera device and audio device.

play pusher streams from this server using the URL:
        rtsp://192.168.2.195/pusher

(We use port 80 for optional RTSP-over-HTTP tunneling, or for HTTP live streaming)

See the log file ipsee.txt for additional information.
```

Return to Simulate File

HAPPYTIME RTSP SERVER (CONT.)

- Add RTSP stream as Camera to Vaidio
- RTSP stream:
  rtsp://ipaddress:554/videoname



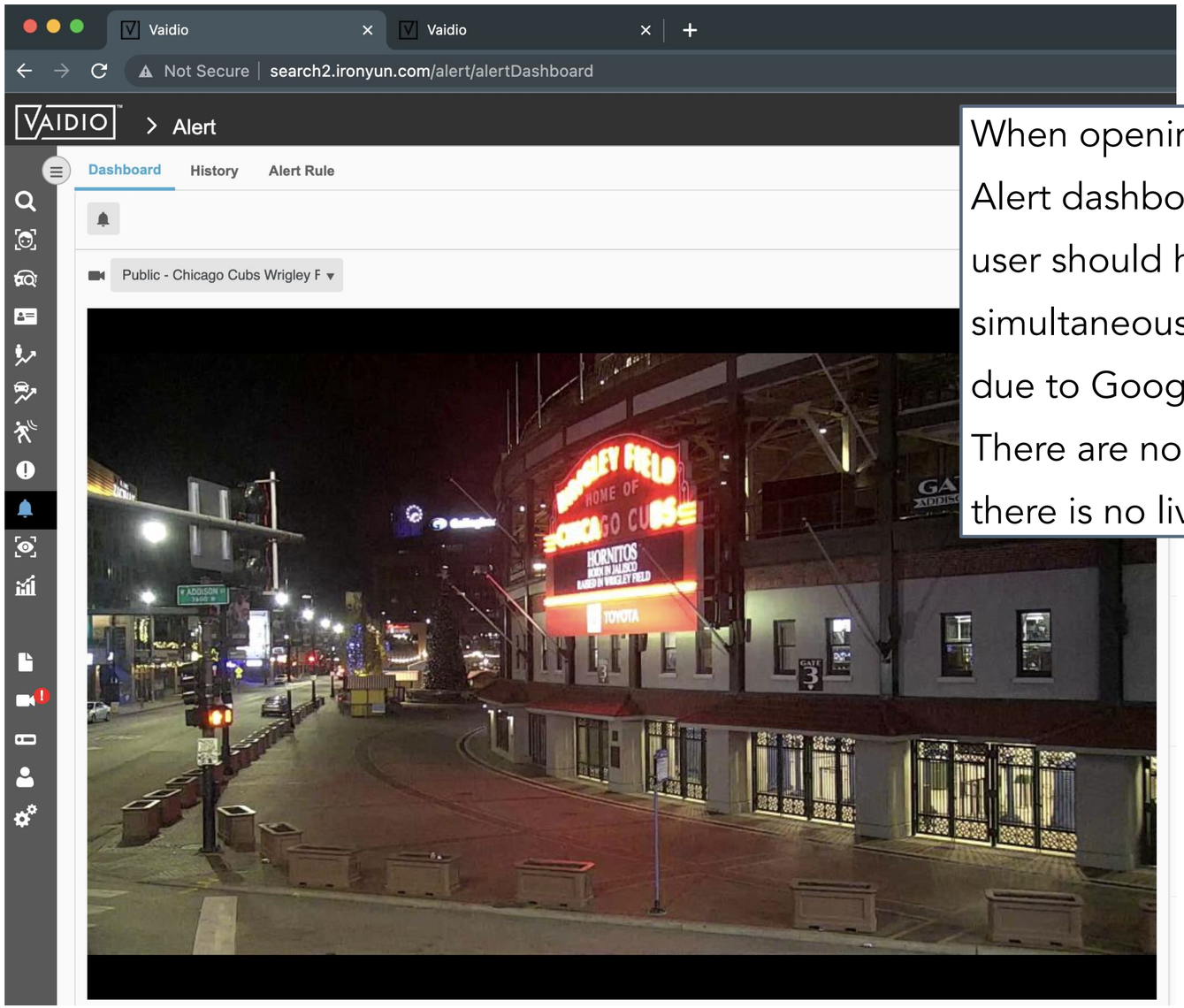
Return to Simulate File

OTHER TECHNICAL ISSUES

- Live View Limitation
- Whoops Error
- Sync Date & Time
- Invalid Parameter for ROI
- Crowd Detection Use Case

Back to Table of Contents

LIVE VIEW LIMITATION



When opening the camera live view (e.g., in the Alert dashboard, instead of the usual map view) the user should have <u>at most 2 Vaidio tabs</u> opened simultaneously; otherwise, the UI may have issues due to Google Chrome's limitation.

There are no limits to the number of tabs opened if there is no live view.

Return to Other Technical Issues

WHOOPS ERROR

- Situation: device responds to ping normally, but login via web UI takes the user to the page <[ip address]/system/license> and shows the following error message:
  - “Whoops, looks like something went wrong”

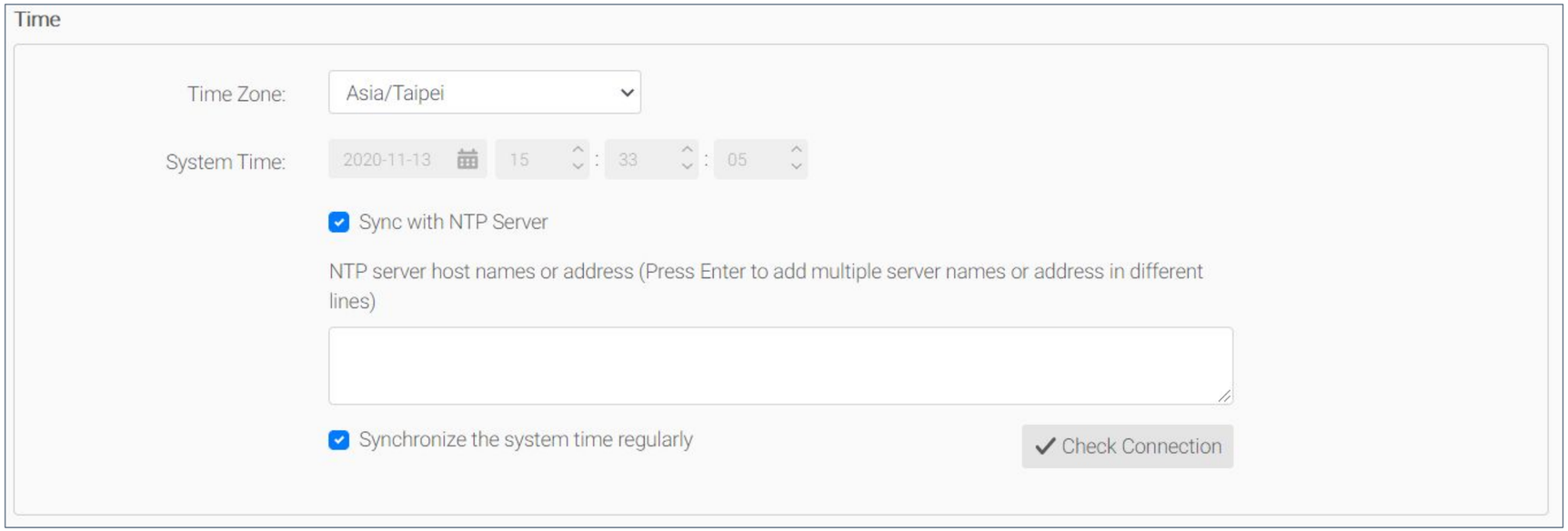
- Typical Cause: GPU problem (i.e., loose, unplugged, or broken)

- How to fix:
  - Shutdown the device through the Admin Portal and unplug the server. If comfortable, remove the server lid and check if the GPU card or cables are loose.
  - Clear the cookies for the site

Return to Other Technical Issues

SYNC DATE & TIME

- Situation: Camera is not synced within 5 seconds of the server
- How to fix:
  - Make sure both server and cameras are synced with a Network Time Protocol (NTP) server; OR,
  - Instead of connecting to the camera via ONVIF, use the RTSP stream directly, which does not require time sync



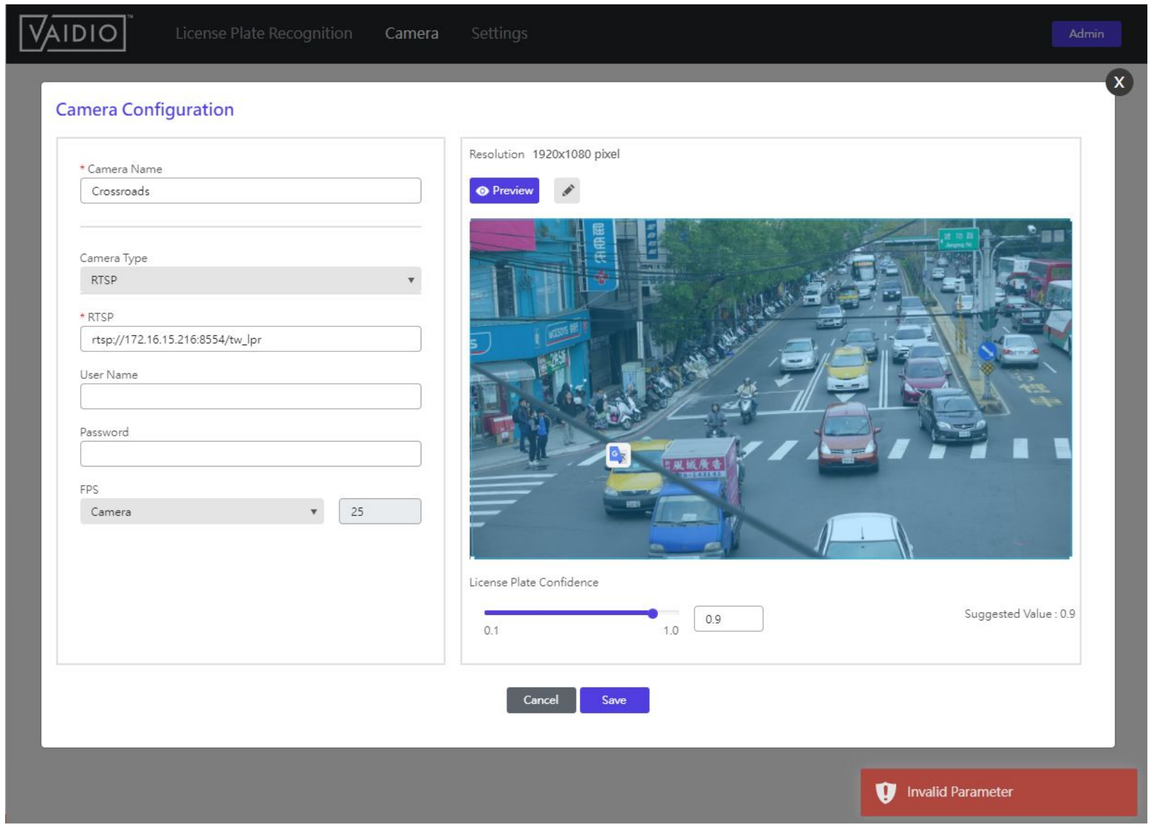
Note: This is also useful for cameras that are streaming data from other time zones

Return to Other Technical Issues

INVALID PARAMETER FOR ROI

- Situation: This error will occur if an ROI is dragged outside of the acceptable camera window (refer to screenshot)
- The “Invalid Parameter” error message will pop up if the ROI is dragged so far over the edge that it is treated as a negative value

- How to fix:
  - Pull the ROI back in the camera bounds and make sure that all points are visible



Return to Other Technical Issues

FACTORY RESET SERVER

To factory reset the Vaidio server, log into the Admin Portal at port 8000 (e.g., http://192.168.100.100:8000) and click the Factory Reset button at the bottom of the page.

Back to Table of Contents

CROWD DETECTION USE CASE

Crowd Detection for a stadium crowd levels with a 4k or 8k camera from far distance.

Special note for this kind of use case:

- We recommend setting the camera device's bitrate to the highest level to ensure the video's quality after transmission to Vaidio for analytics. A high bitrate will help maintain the video's original quality from the camera.
- Below example is the use case with ultra mode from different bitrate, :

3840x2150, 1:1 view, bitrate: average 2mbps	3840x2150, 1:1 view, bitrate: average 9mbps
	

Back to Table of Contents

SUPPORT

For technical support, please go to the Support Portal to fill out a ticket.

For additional guides and training, please visit the Aicuda Technology Download Center.

Request access at info@Aicuda.world to register for an account.

THANK YOU

For more information, visit Aicuda Technology Support Page on the Partner Portal