

Eagle Eye Application Note - AN020

Utilizing Cloud Client Dewarp and Virtual PTZ for Fisheye Cameras

2022-07-22 Revision 1.1

Target Audience

This Application Note is intended for Eagle Eye Networks Cloud VMS administrators or any user that would be responsible for configuring cameras within the VMS. A basic working knowledge of the VMS is recommended prior to making any changes to configuration settings.

Feature Overview

With Cloud Client Dewarp, Eagle Eye Cloud VMS customers can record a full 360° video image from a fisheye camera and dewarp it in a browser or mobile app without the need for plug-ins or additional permissions.

Included with Cloud Client Dewarping is a Virtual PTZ function that provides benefits over traditional PTZ cameras that can only capture the region of interest they are viewing when the camera is actually viewing that specific region of interest. The Virtual PTZ function captures footage of an entire area of coverage, regardless of any virtual pan, tilt, or zoom that has taken place since the initial installation.

Therefore, a user can replay recorded footage of an entire scene, even if the camera was zoomed in the opposite direction from the event of interest. Cloud Client Dewarp does not require the camera to do the dewarping function. Dewarping is done in real-time or when viewing historic videos by the Eagle Eye Cloud VMS. Customers can also apply additional preset Viewports to their fisheye camera in Single, Dual 180, Quad, or 360 views. These viewports can be converted to layouts as if they were separate cameras.

Theory of Operation

For Cloud Client Dewarp and Virtual PTZ (vPTZ) to function, the fisheye camera needs to have Cloud Client Dewarp support enabled by the Eagle Eye Networks Camera Engineering team.

There are many cameras currently available, including our Eagle Eye Networks CDUF-003a, 1.83mm 12MP Fisheye Camera. Current support is also available for these popular fisheye cameras; Axis M3058, Hanwha 9010R, Avigilon 12.0-H4F-DO1-IR, Hikvision DS-2CD63C5G0-I(V)(S), Dahua NK8BR4.

Please note that you should always check the EEN.com website for the most up to date list of supported cameras at <https://www.een.com/support/camera-compatibility-digital-ip/>.

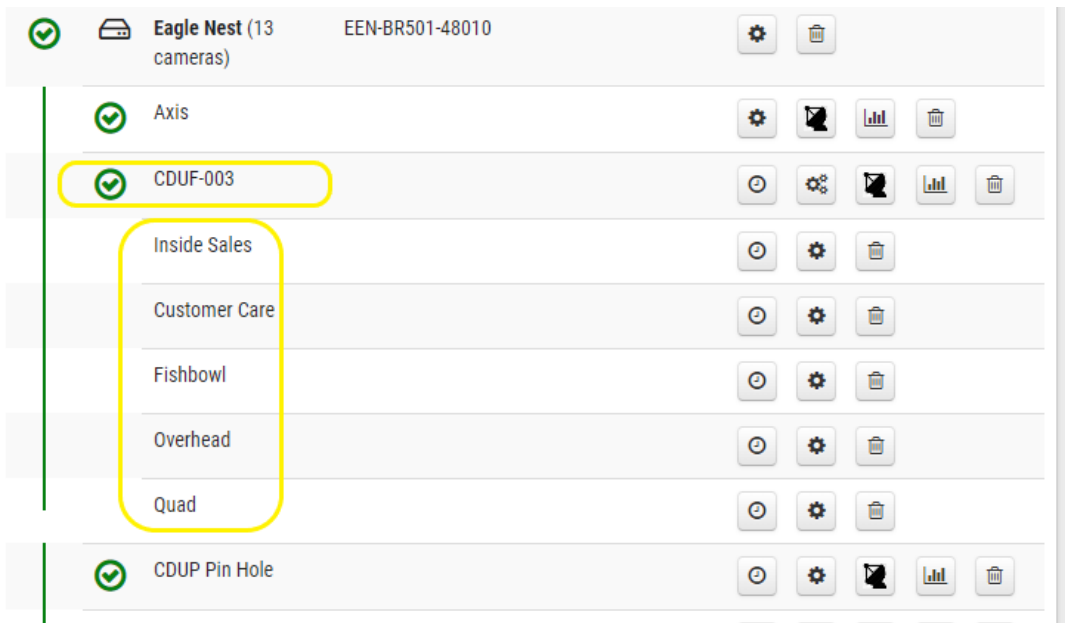
“Cloud Client” is a term with inherent meaning; Eagle Eye Cloud VMS is doing the operation of dewarping or vPTZ for the Client using the function and at any time another Client using the same device can use the Cloud to perform separate functions without affecting the original Client or what is happening on-site with the camera and its event recordings within its full 360° field of view. In addition to the Client/Client’s operation, the VMS can utilize multiple independent viewports from the same camera without any adverse effect on the local bandwidth or the Bridge/CMVR device. All the operations for the functions of Dewarp, vPTZ and viewports, happen in the Eagle Eye Data Centers.

Functionality

Viewports

A viewport is a preset, dewarped view of the full fisheye image. Multiple Viewports can be added if desired and they can be named and added to Layouts as if they were individual IP Cameras. This allows a single Fisheye camera to appear as multiple cameras for layouts while only being invoiced as a single camera subscription.

A Fisheye Camera with Viewports appears as a multi-view camera in the Dashboard. The Fisheye is shown as the parent and Viewports appear as child cameras beneath the parent as can be seen in the image below. Please note however, that only the full 360-degree Fisheye image is recorded, which is invoiced as any other IP Camera; by retention and resolution.



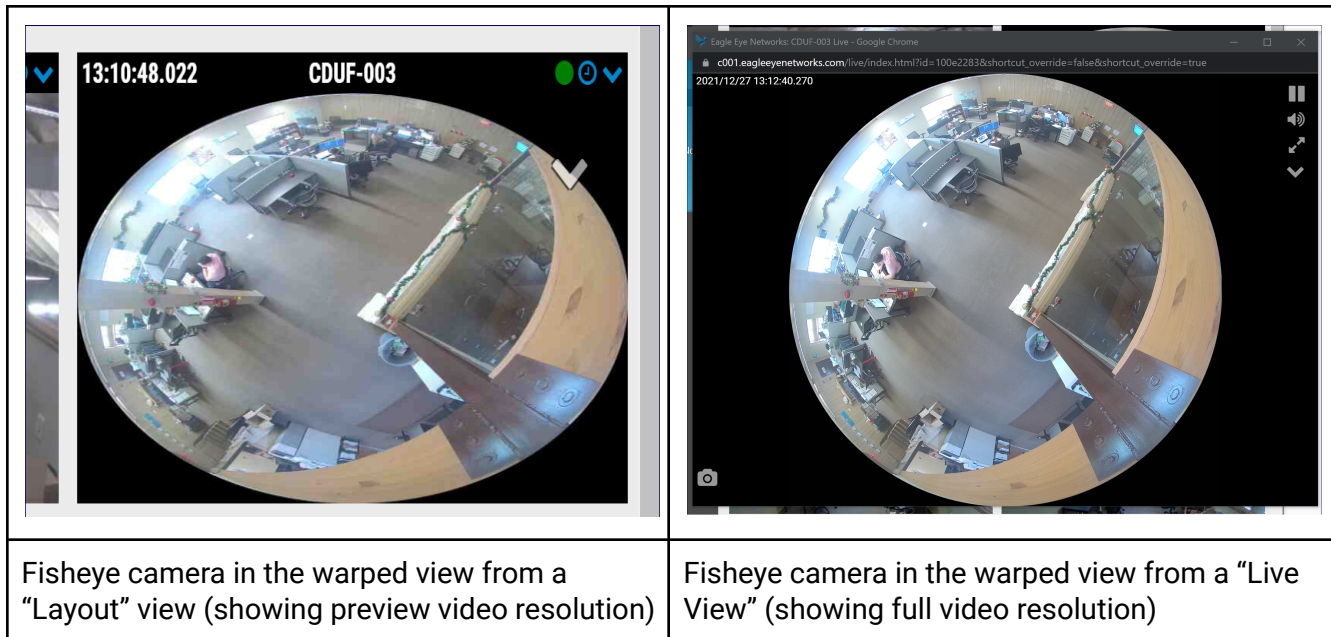
There are three types of Viewports:

- **Single:** this is a single view, sometimes called the “normal” view
- **Panorama:** two 180° panorama views are shown (one beneath the other)
- **Quad:** separate views displayed as a 2 x 2 layout

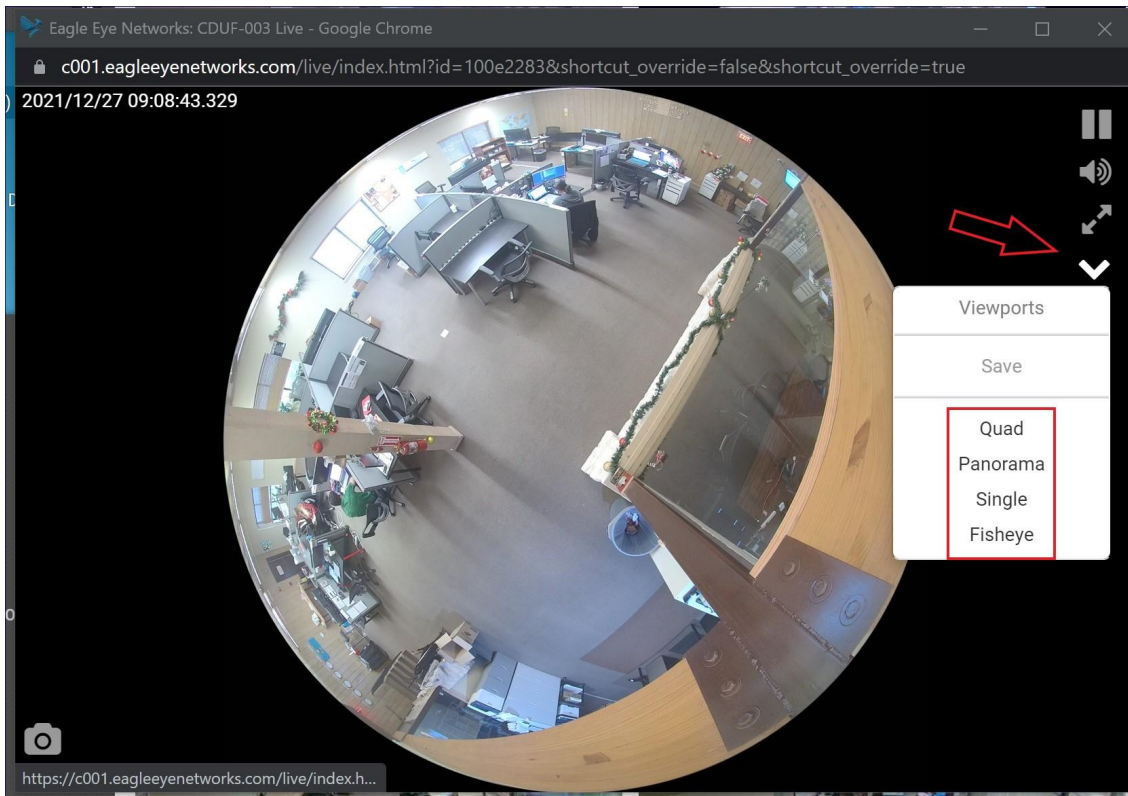
Dewarping

The Eagle Eye Networks Cloud VMS includes Cloud Client Fisheye Dewarping of the full 360-degree image. The full image can be dewarped without the need for any additional plugins. This includes both live and recorded video.

The images below show how a “warped” fisheye camera view is displayed in the Eagle Eye Cloud VMS User Interface:

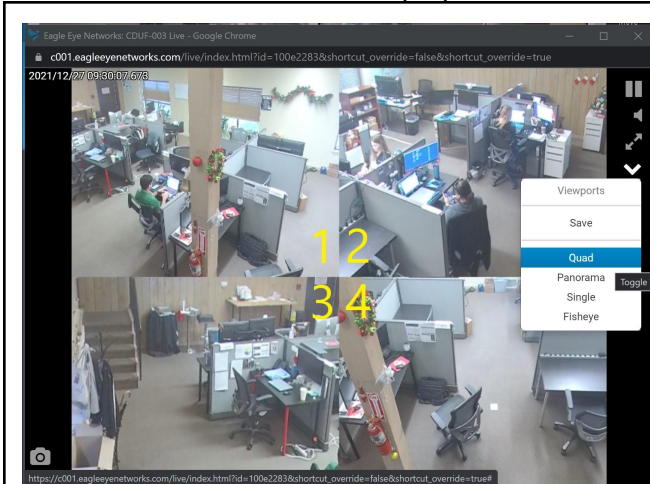


Selecting the dropdown from either the Preview image or the Live view allows the client to select one of three Dewarp options (these are the same as the Viewport options listed above); Quad, Panorama, Single. Fisheye is the default for the parent camera. See the image below to see the dropdown menu and Dewarp options:



Dewarp dropdown menu and viewing options

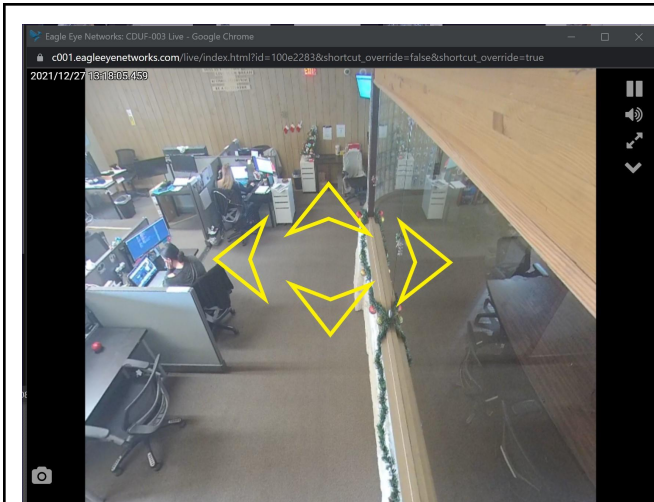
Here is a look at all four Dewarp options:



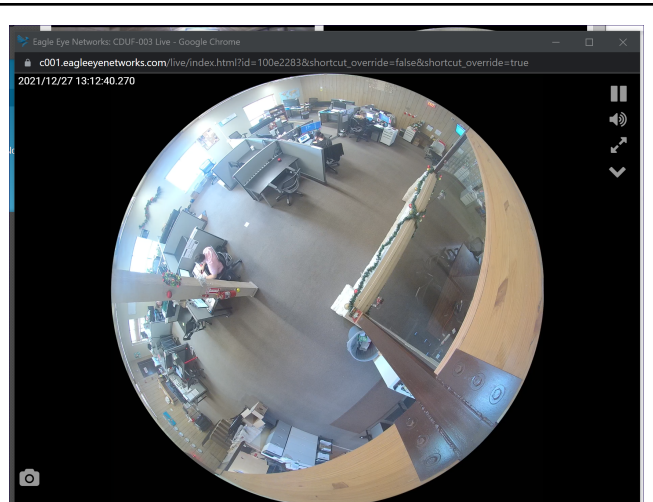
The Quad option allows for four independent dewarped “views” to be established, in a single quad (2x2) display. Each view is created by dragging and dropping an image from the quadrant to its desired placement.



The Panorama option allows for the configuration of two separate 180° views. In this mode, the view is warped but less so than the full 360°; the warping is more prevalent in objects that are closest to the camera. The orientation of the camera also affects this.



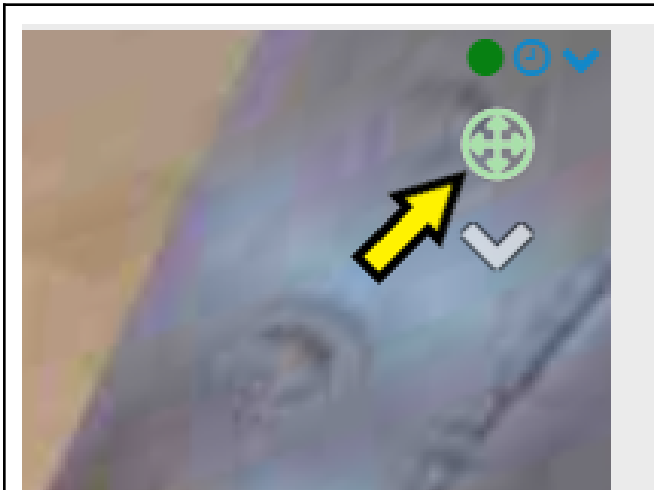
The Single option creates a single dewarped Viewport. When configuring, you can drag and drop to create the desired view.



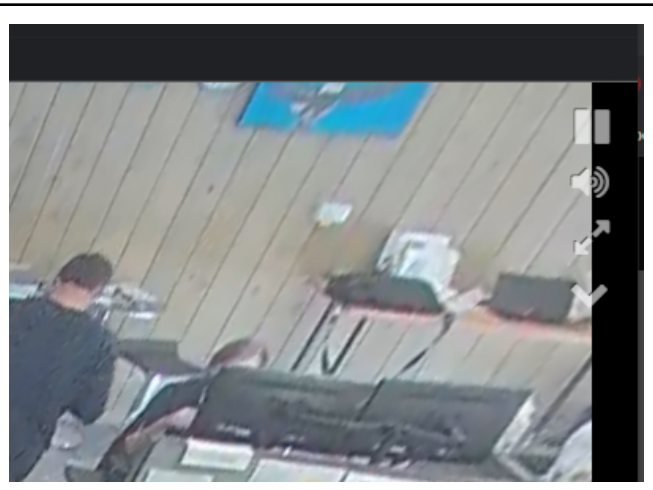
The Fisheye option is the default and does not have any additional "setup" options since it is already showing a warped view.

Virtual PTZ

Any user that has been granted permission to view video can use Virtual PTZ to virtually pan, tilt and zoom within the full 360° image of a Viewport because it does not change the recorded video of the Parent camera:



When viewing the preview video within a Layout, a Viewport will show the Virtual PTZ icon in the upper right corner of the preview image. Click on the Virtual PTZ icon to activate Virtual PTZ. The icon will turn green. Click within the preview image to pan and use the middle mouse wheel to zoom in and out.



Note: When in the Live View or History Browser of a Viewport, there is no need to select the crosshair. Repositioning the view is done by simply dragging and dropping the image. Use the middle mouse wheel to zoom in and out.

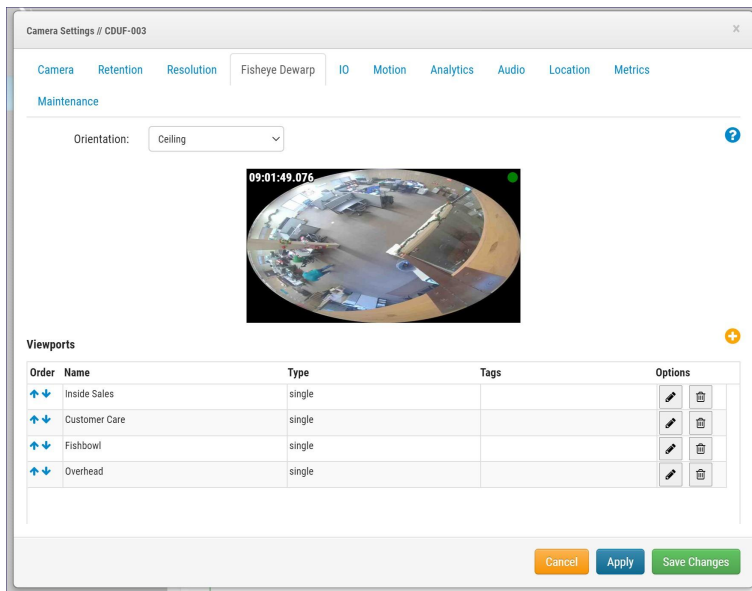
Virtual PTZ is enabled by default when adding or editing a Viewport in Camera Settings.

Application

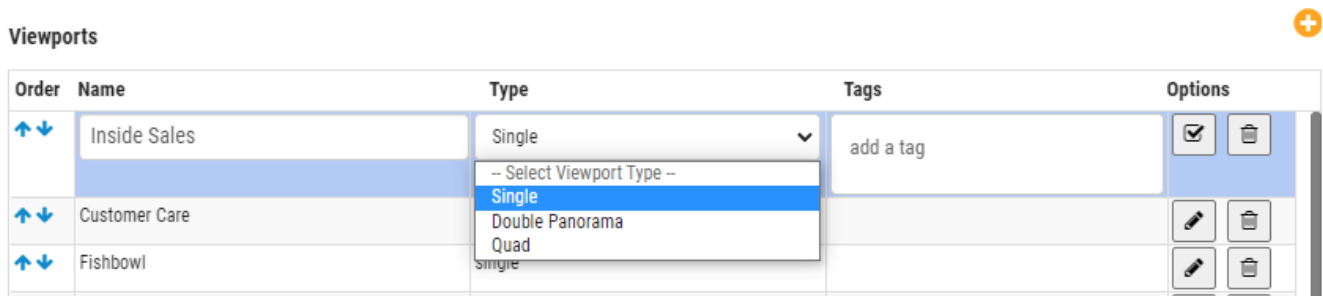
Adding a Viewport 1

- From Camera Settings:

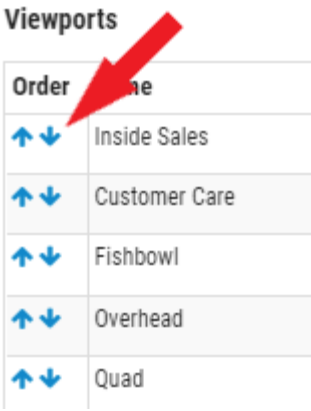
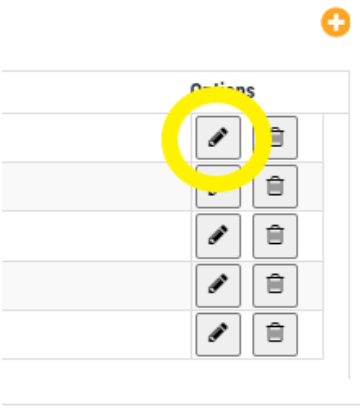
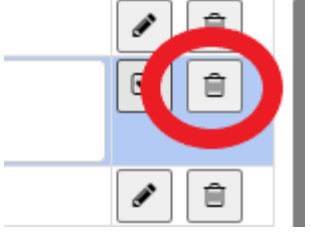

Navigate to the “Fisheye Dewarp” tab in the parent camera settings as shown below (use the Gear Icon from the Dashboard or from the dropdown menu in Preview Video on a Layout):

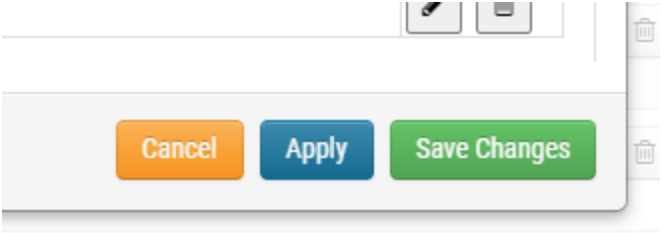


Create a Viewport by clicking the yellow “+” symbol located on the right side of the window next to the preview image. Name the Viewport. Select the Viewport Type. This is also where any Tags that need to be added are defined:



Virtual PTZ is enabled when adding or editing a Viewport. Click on the preview image to pan and tilt. Use the middle mouse to zoom in and out. Click on any Viewport to select it and see it in the preview window.

 <p>Viewports</p> <table border="1"> <thead> <tr> <th>Order</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>↑ ↓</td> <td>Inside Sales</td> </tr> <tr> <td>↑ ↓</td> <td>Customer Care</td> </tr> <tr> <td>↑ ↓</td> <td>Fishbowl</td> </tr> <tr> <td>↑ ↓</td> <td>Overhead</td> </tr> <tr> <td>↑ ↓</td> <td>Quad</td> </tr> </tbody> </table>	Order	Name	↑ ↓	Inside Sales	↑ ↓	Customer Care	↑ ↓	Fishbowl	↑ ↓	Overhead	↑ ↓	Quad	
Order	Name												
↑ ↓	Inside Sales												
↑ ↓	Customer Care												
↑ ↓	Fishbowl												
↑ ↓	Overhead												
↑ ↓	Quad												
<p>When adding multiple Viewports, you can change the order in which they are displayed on the dashboard by clicking on the up/down blue arrows to arrange the Viewports.</p>	<p>Click on the Pencil icon to edit the Viewport.</p>												
													
<p>Click on the Trash Can icon to delete a Viewport.</p>	<p>Click on Apply or Save, or the Checkbox to save any changes.</p>												



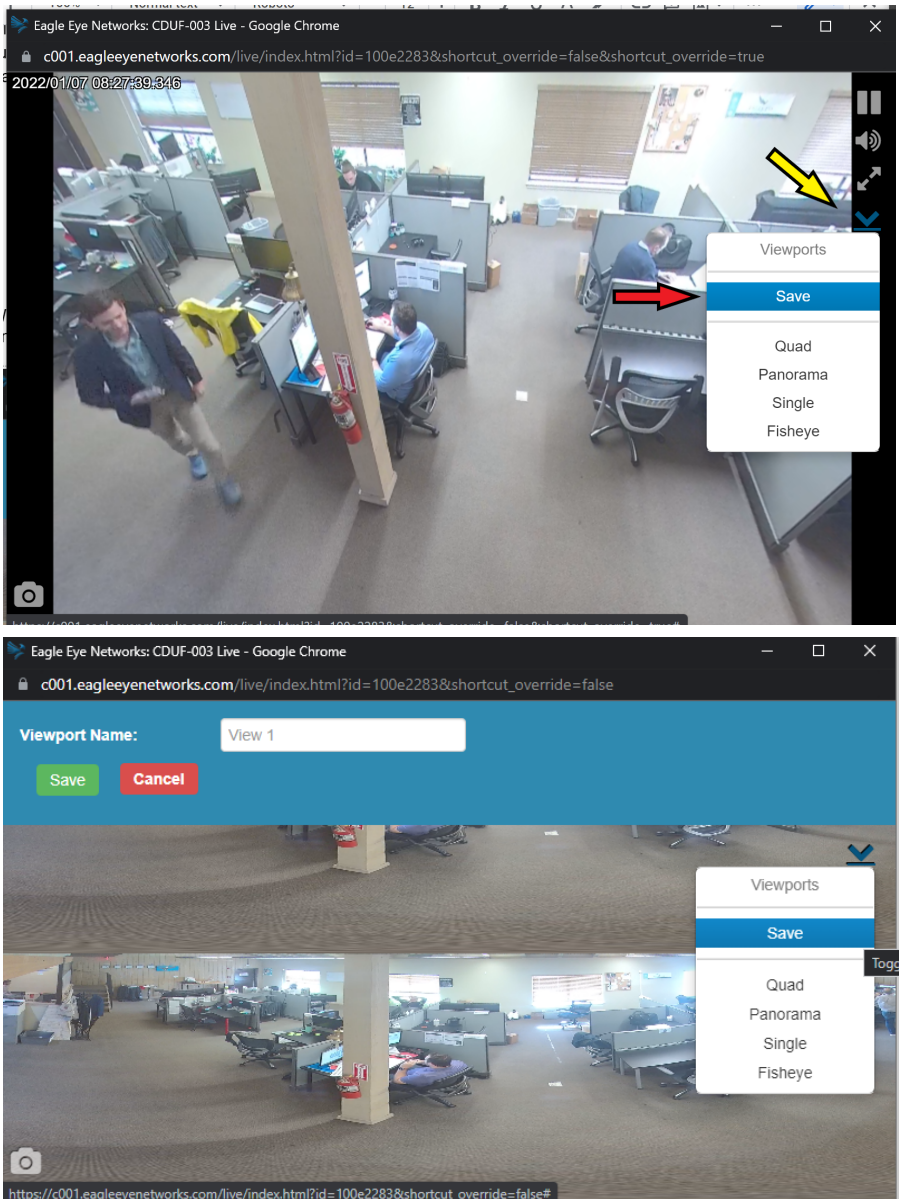
Clicking Apply will save any changes to the Viewports and keep the Camera Settings open for further editing. Save Changes will close the Camera Settings window, saving the settings that have been made.

Adding a Viewport 2

- **From Layouts or Live View:**

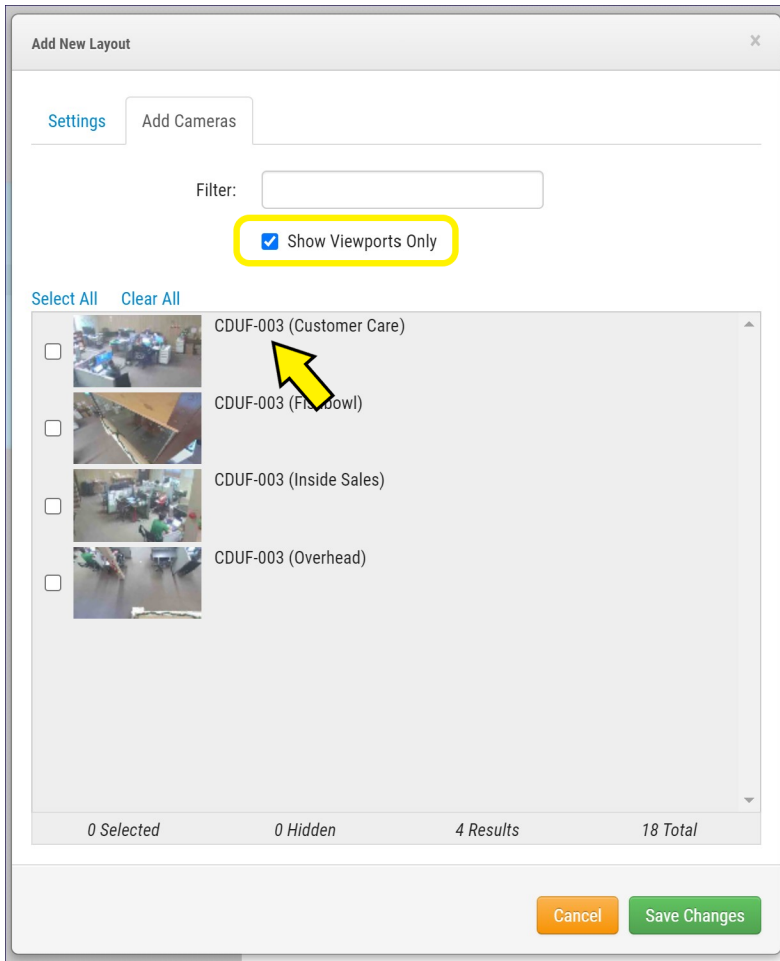
When a user is interacting with a Cloud Client Fisheye camera in the Layout or Live View, any Viewport enabled and configured can immediately be saved by selecting the dropdown icon and clicking the

Save option. This will open a dialog box that lets you name the Viewport and save it to the parent camera as a Viewport.

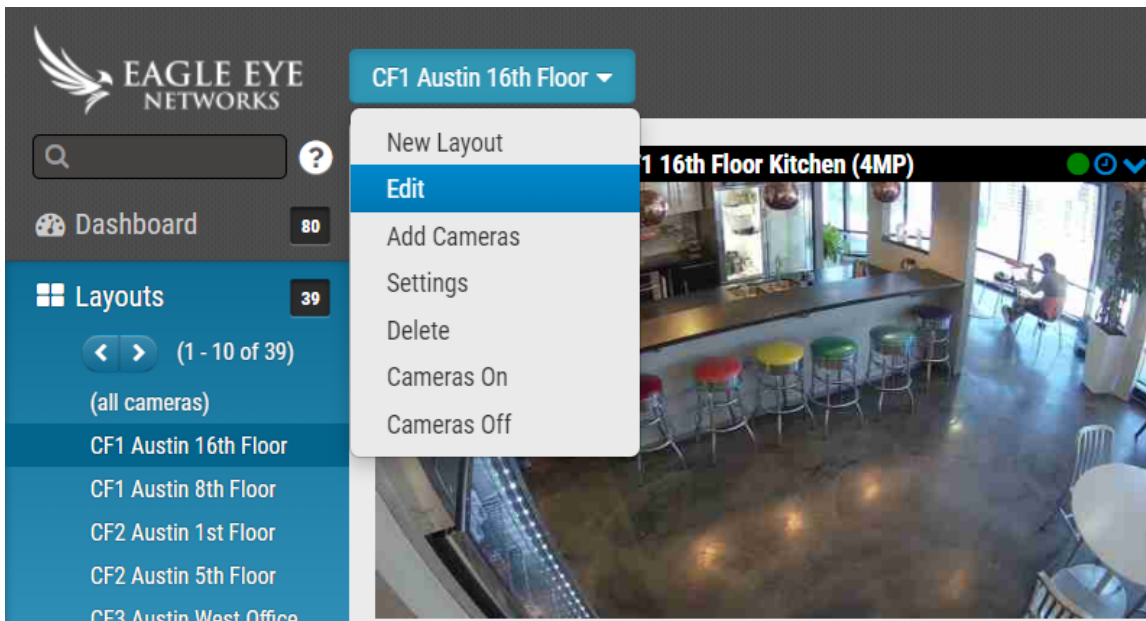


Adding Viewports to Layouts

First, select or create a Layout. From the Layout menu, select "Add Cameras". If Viewports are available, "Show Viewports Only" will appear beneath the search Filter. Check the box to see only Viewports and note that the Parent camera name will also be shown. Select the Viewports and click Save Changes to add the Viewports to the layout, or choose to make a New Layout.



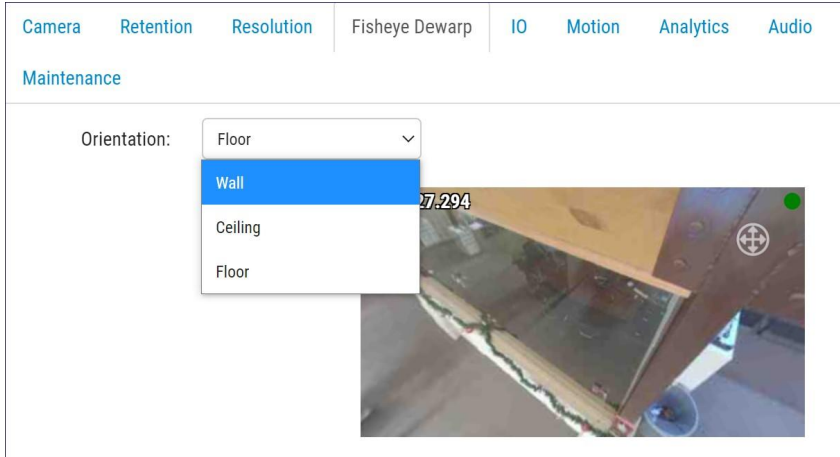
Select "Edit" from the Layout Menu to rearrange and size each camera's preview video.



Notes and Other Helpful Details

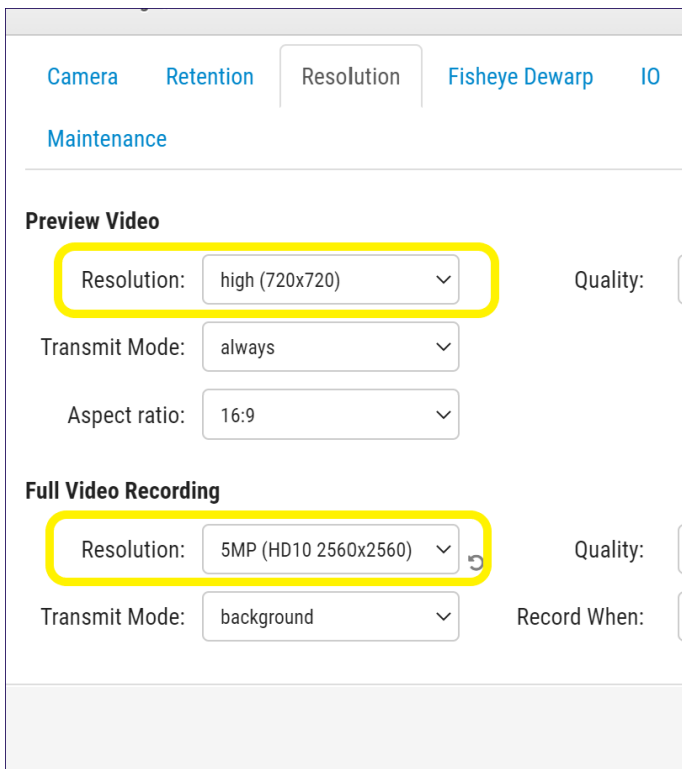
Orientation

The Orientation is a one-time setting that needs to be determined once the camera has been installed. Simply populate how the camera is mounted. Options include: Wall, Ceiling or Floor and the choice changes the dewarping for panning. Set it to the way the camera is mounted as shown below:



Resolution

Due to the complexity of a Fisheye image, it is recommended that the camera operate with a high-resolution Preview Image (720p/ HD1/ 1MP). It is also recommended to run the camera on a higher resolution for the Full Video Recording / H.264 stream as can be seen from the image below:



Note however, that higher resolution carries additional subscription costs. Make sure to explain to end users that when compared to the alternative of buying and paying a subscription on multiple cameras to perform the same functions and activity, the higher resolution Fisheye option provides better value. Benefits include but are not limited to; Cloud Client Dewarping, use of Viewports, and Virtual PTZ functionality, all from a single camera.

It is also not advised to utilize camera analytics on a Fisheye camera. This is because the Eagle Eye Networks Cloud VMS utilizes the Fisheye view for motion capture, which is a warped image and problematic for Analytics. For this reason, a Fisheye camera should be avoided when there is a need for the use of Analytics.

Quick Viewport Switching

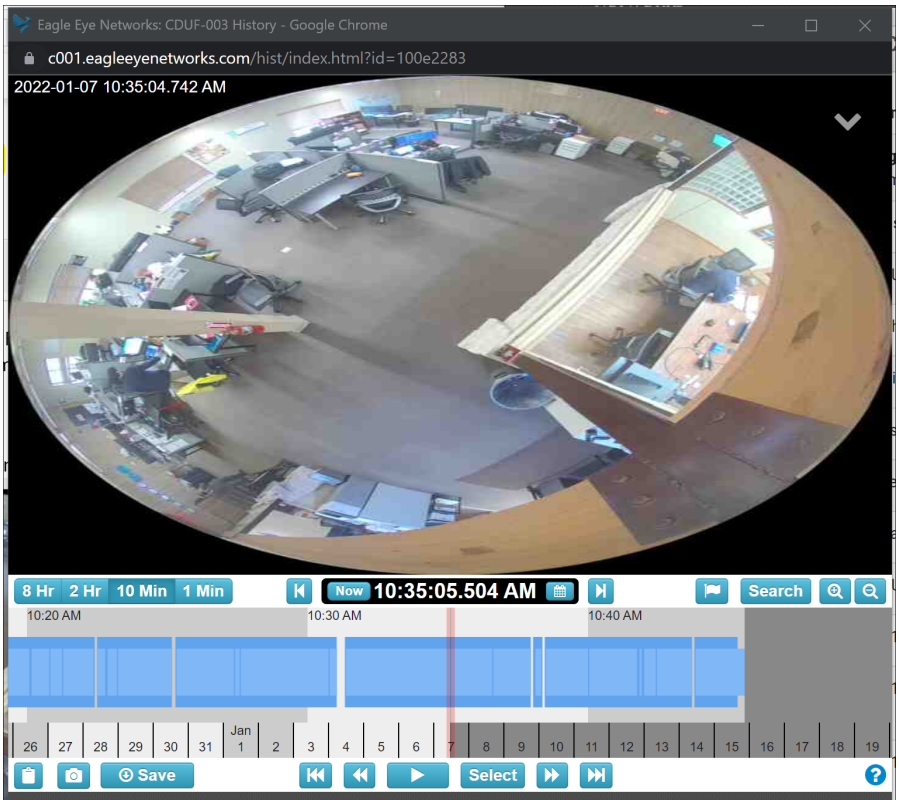
When viewing any Viewport, or the parent camera, you can quickly switch to any other Viewport by clicking the dropdown arrow and selecting the other Viewports from the list as shown below:



History Browser Playback on a Parent Camera vs. Playback from a Viewport

The only time that Cloud Client Dewarp & Virtual PTZ are able to function in the History Browser is when the video is available from the Cloud, inside the History Browser of a Viewport, and within the Retention settings of the camera.

The History Browser for the parent camera is always in the Fisheye view as can be seen below, as this is the actual Full Video File that is stored in the Cloud or on a CMVR per the Resolution and Retention settings configured. All downloaded or Archived videos will only be available in the Fisheye / Warped format.



Fisheye view (warped) that always displays the parent camera