Eagle Eye Application Note - AN044

Utilizing 4G and 5G Internet Connectivity with Eagle Eye Networks Bridges and CMVRs

2023-06-30   Revision 01.0

Target Audience

This Application Note is intended for Resellers of the Eagle Eye Networks Cloud VMS who wish to utilize cellular or mobile connectivity in conjunction with the VMS to deploy cloud recording or cloud managed CCTV in locations where hardwired internet connectivity is unavailable or impractical.

Introduction

There are many elements of the Eagle Eye Networks Cloud VMS architecture that make it ideal for deployment on 4G or 5G cellular networks. However, careful consideration should be given prior to deployment in these types of environments to ensure that an appropriate solution is implemented to meet the site's requirements and avoid a negative customer experience post-installation.

Background

Several elements of the Eagle Eye Networks Cloud VMS make it suitable for deployment on 4G and 5G cellular networks, including:

- **Outbound communications -** Since Eagle Eye Networks Bridge and CMVR devices require only outbound communications with their Data Centers and Cloud Services, it is possible to deploy these devices on cellular connections without the need for static public IP addresses and inbound port forwarding rules. This helps reduce the costs of the associated cellular data provider.
- **Local video buffering -** Fluctuations in available cellular bandwidth can be overcome by utilizing the local video buffering feature included with all Eagle Eye Networks Bridge and CMVR devices by buffering video locally during times of reduced available bandwidth.
- **Deployment options for lower bandwidth environments -** Utilizing Eagle Eye Networks CMVR devices, systems can be deployed that provide fully cloud-managed and remotely accessible capabilities that only utilize minimal bandwidth. This is achieved by storing high resolution video footage on-site and providing remote access "on-demand."

Pre-installation Considerations When Using 4G/5G Cellular Networks

Selecting your cellular service provider

Utilizing a True Cloud platform, such as Eagle Eye Networks Cloud VMS, to retain video surveillance data offsite can lead to high data requirements of its associated internet connection.For this reason, it's recommended that installers utilize the Eagle Eye Networks VMS Product Wizard to assess the predicted upload bandwidth and storage requirements of the proposed installation, and determine its suitability for deployment on 4G and 5G cellular connections. The Product Wizard can be found [here](#).

When selecting a cellular network provider, it is recommended to select an "unlimited" data plan, where any "fair use" or similar policies are reviewed to ensure the predicted storage requirements of the system will not exceed the data allowance or any limit imposed by a "fair use" policy. It is also imperative to ensure that the costs of exceeding the included data allowance are acceptable to those responsible for the cellular contract. Doing this will avoid unexpected costs later on and a negative customer experience.

Pre-installation bandwidth tests

Prior to installing an Eagle Eye Networks system on a cellular connection, it is recommended that extensive bandwidth tests be conducted. It is important to conduct these tests in the following reasons:
- The intended cellular network providers' speeds can vary drastically from one to the next.
- The intended cellular networking hardware (router and associated aerials) varies from one provider to the next and they will have different levels of capabilities.
- Different locations can lead to differing results so be sure to test different aerial locations for the best results.
- Speed test results can fluctuate at different times during the day for various reasons (for example: the number of concurrent system users).

If the average tested speed, calculated at multiple times during a day, exceeds the bandwidth requirement calculated by the Eagle Eye Networks VMS Product Wizard, then this is a good indication that the deployment will be possible using cellular connectivity.

Configuration of Bridges / CMVRs for Use in Cellular Environments

Eagle Eye Networks Bridges

Utilizing Eagle Eye Bridge devices, the VMS transmits both full resolution and preview recordings for storage within its cloud infrastructure. Typically, this requires a higher amount of available upload bandwidth and higher amounts of data usage by the deployment than those used by Eagle Eye CMVR devices. It is recommended that a dedicated cellular connection be provided to the Eagle Eye Bridge to avoid any negative impact from other systems sharing a single cellular connection.

It is recommended that the bandwidth scheduling function of Eagle Eye Bridge devices not be utilized, and that a fixed level of bandwidth is configured that exceeds the bandwidth available to the Bridge via its 4G or 5G connection. This way, the Bridge is able to make full use of the available bandwidth at all times.

Bandwidth settings can be configured from the "Bridge" tab of any Bridge's setup menu which is accessed from the Eagle Eye Cloud VMS Dashboard. Suggested configuration is shown below, where the fixed bandwidth value exceeds the bandwidth available to the unit.

Further information on the configuration of Eagle Eye intelligent bandwidth management features, and the calculation of expected bandwidth requirements using the Eagle Eye VMS Product Wizard can be found in the Application Notes linked below:

AN004: [Managing and Optimizing Bandwidth With Eagle Eye VMS](#)
AN038: [Understanding Impact and How To Use Bandwidth Calculations](#)

In addition to optimal bandwidth settings, it is also recommended that users taking advantage of cellular networking with Eagle Eye Bridge devices perform exercises to ensure cameras are recording full resolution video only when motion is detected, and that motion settings for each camera have been reviewed to ensure unnecessary motion recordings are minimized. Doing this ensures that bandwidth and data consumption remain as low as possible.

To ensure a camera is configured to record full resolution video only when motion is detected, the **Record When** field in the camera settings **Resolution** tab should be set to **event**, as shown below:


**Cloud Managed Video Recorders (CMVRs)**

Eagle Eye CMVR devices can be deployed in configurations where all footage is stored locally on the device, or just the preview video is recorded in the cloud, and high resolution recordings remain stored on the CMVR. In these configurations, CMVRs are expected to require significantly less bandwidth and data usage than a Bridge solution with equal camera counts, resolutions, and quality settings. For this reason they can be appropriate alternatives when 4G or 5G connectivity is unable to provide the bandwidth required for a Bridge-based solution.

In addition to the configuration steps described above for a Bridge deployment, it is important to ensure the camera's retention and transmit settings are configured appropriately.

For deployments that will not store video footage in the cloud (known as an M10 subscription), the **Cloud Retention** for each camera should be set to "None (M10)" in each camera's retention settings as shown below:
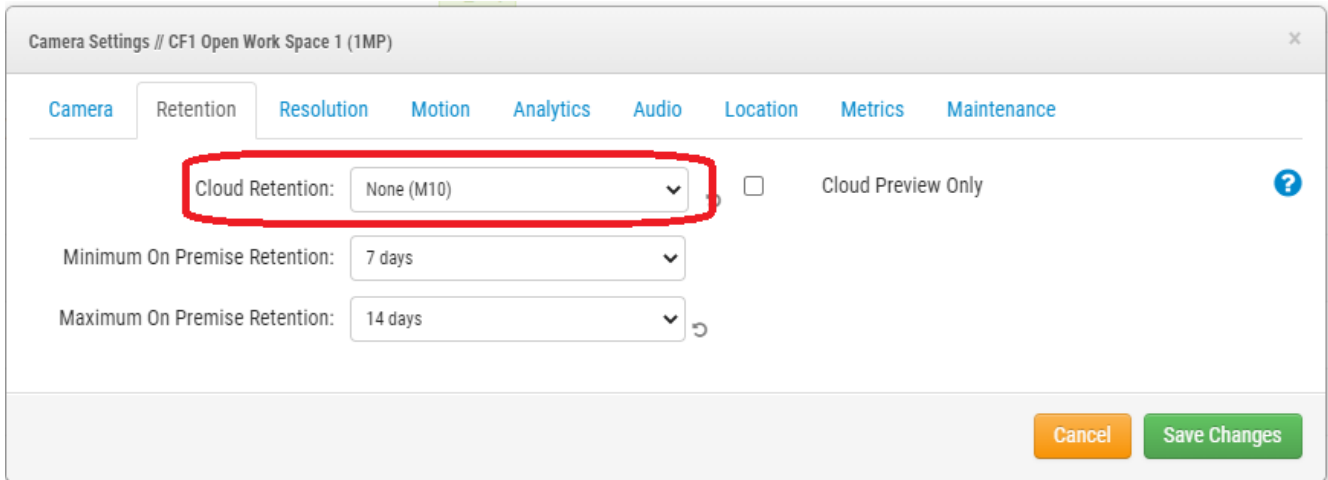

The transmit settings in the camera's Resolution tabs should both be set to on demand, as shown below:
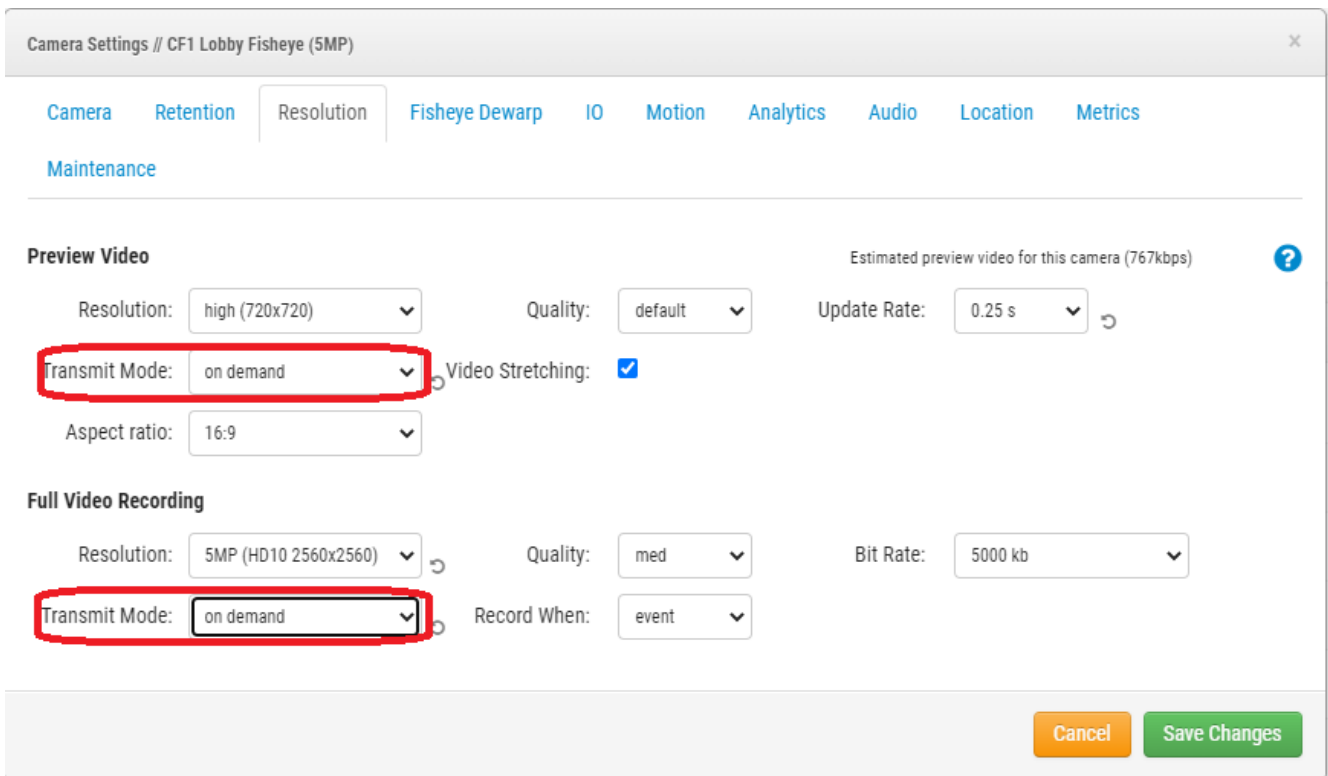
For deployments intended to record only the low resolution preview recordings in the cloud (known as "preview only" subscriptions), the **Cloud Retention** for each camera should be set to the appropriate amount of time, with the **Cloud Preview Only** tick box selected in each camera's retention settings as shown below:
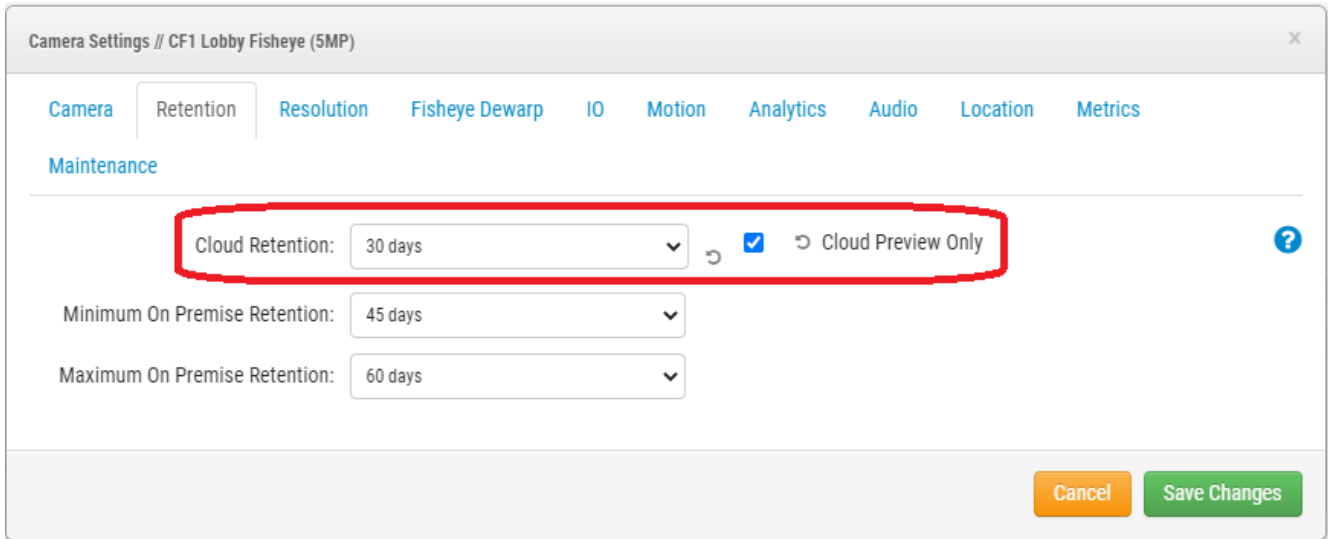
The preview **Transmit Mode** settings in the camera's resolution tabs should be set to **always**, whilst the full video recording transmit mode should be set to **on demand** as shown below:
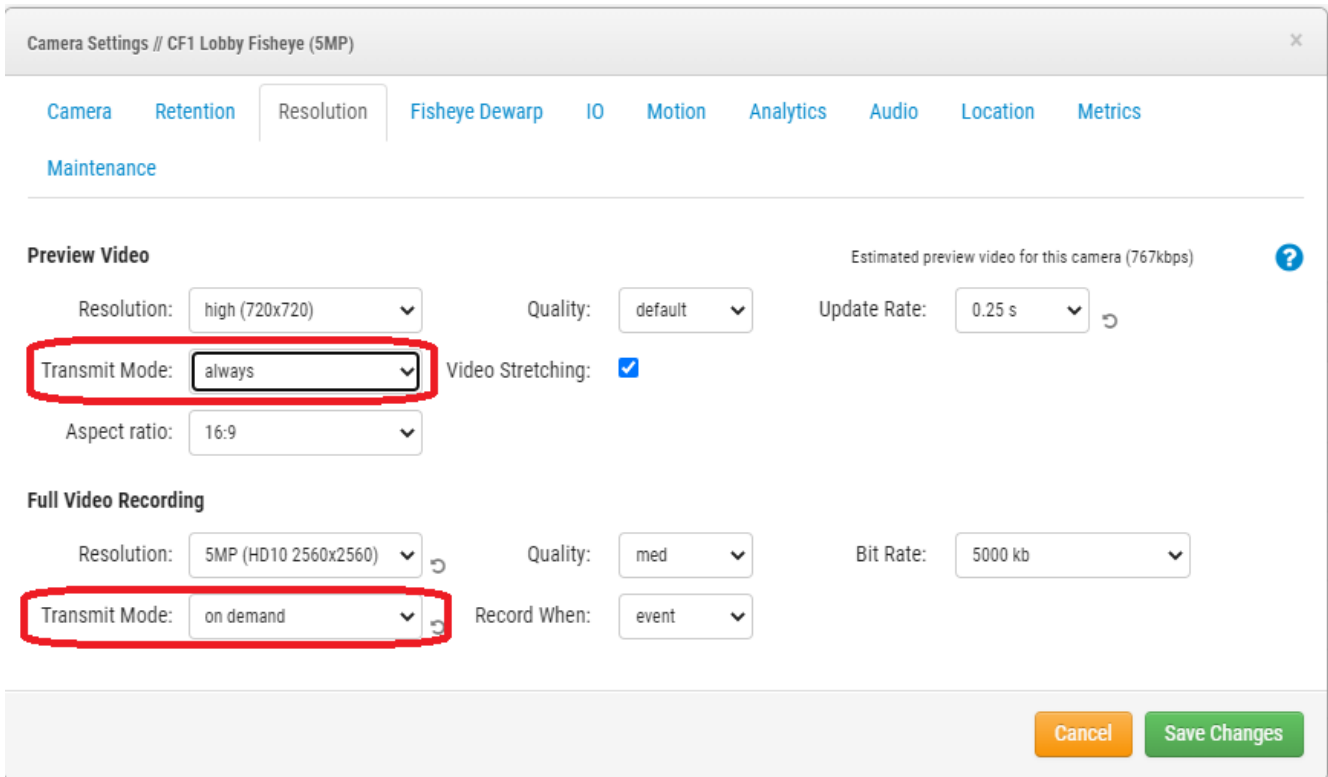
Configured in this way, the CMVR device will use the minimum bandwidth required to conduct its intended purpose.