Eagle Eye Application Note - AN070



Deploying Eagle Eye Systems Over Starlink Internet

2024-10-23 Revision 1.0

Target Audience

This Application Note is intended for Eagle Eye Networks Cloud VMS installers or end users who are in need of or considering deploying an Eagle Eye Security Camera System in connection with a Starlink satellite internet connection.

Introduction

Satellite internet is often the go-to solution for providing connectivity in remote areas such as off-the-grid rural locations or emerging city developments where traditional internet lines aren't yet available. It's also essential for industrial sites like offshore oil rigs and remote agricultural operations, where there's no existing infrastructure for standard internet service. While satellite internet can be a viable option in these scenarios, many providers still struggle to offer the high connection speeds needed for smooth video streaming or the bandwidth required to transfer large files to cloud-based services. This can be a challenge for businesses that rely on data-heavy operations.

Background

The Eagle Eye Networks Cloud VMS relies on a stable internet connection for optimal performance, and with high-resolution video storage through cloud subscriptions, it can demand significant bandwidth. As a result, many traditional satellite internet providers aren't ideal for Eagle Eye Cloud VMS deployment due to their slower speeds, greater latency, and higher cost.

However the Starlink satellite internet service from SpaceX offers high-speed internet with low latency and acceptable upload speeds. Internal testing has shown it to be reliable and mostly compatible with our cloud-based video management system. That said, there are important limitations to consider before proceeding with a Starlink-based installation:

- **Cloud Storage Restrictions:** A Starlink connection is appropriate only if your Eagle Eye Cloud VMS site does not need to send high-resolution video to the cloud for off-site storage. High-resolution footage should remain on-premise.
- **Bandwidth and Data Caps:** Be aware of upload speed thresholds and data caps that could pose issues for sites with heavy internet traffic (more details below).
- **Recommended Setup:** We advise using a Cloud Managed Video Recorder (CMVR) for local video recording, and subscribing to either the M10 or PR1 plans when using Starlink. These plans offer cloud management and remote access without requiring high-resolution video backup to the cloud, making them ideal for satellite-based setups.

This approach ensures a balance between reliable service and avoiding bandwidth overload while using satellite internet as your primary connection.

Starlink Internet Service Plans and Cloud Video Uploads

As of the release of this App Note, Starlink offers two primary service plans:

- **Standard Plan:** Provides unlimited high-speed internet with download speeds ranging from 25-100 Mbps and upload speeds between 5-10 Mbps.
- **Priority Plan:** Includes everything in the Standard plan, plus the option to add up to 2TB of Priority data. This data tier offers faster speeds and prioritizes your network traffic over standard users. Priority speeds range from 40-220 Mbps for downloads and 8-25 Mbps for uploads.

Starlink's high-speed connection offers a maximum upload speed of 25 Mbps with their Priority Plan and 10 Mbps on the Standard plan. Additionally, the Priority Plan has a data usage cap, and exceeding it can lead to steep price hikes.

To give a real-world example: an Eagle Eye Bridge setup with 10 cameras streaming video to the cloud at 1080p resolution can easily consume over 500GB of data per week. This setup also requires a consistent upload speed of at least 8 Mbps to avoid delays in video offloading. Achieving this level of performance with Starlink could cost upwards of \$500 per month, assuming the satellite receiver is in an ideal location. However, it's important to note that upload speeds on Starlink can fluctuate significantly throughout the day due to network congestion or satellite positioning, making consistent performance unpredictable. If upload speeds drop or you hit your data cap, video offloads may slow down or stall, potentially leading to video purging (when footage is deleted from the bridge before reaching the cloud).

While it might be possible to use Starlink for cloud-stored video with a limited number of cameras, there are too many variables to consider for this to be a straightforward recommendation. For more tailored guidance and help with deployment planning for satellite installations, please contact your

regional Eagle Eye Networks Sales Engineer. They can help determine whether Starlink will meet your specific needs.

Recommended Settings

For cloud-stored video with a Starlink connection, we recommend the Cloud Stored Video Preview plan, also known as the "PR1" plan. This plan is included at no extra cost with the base "M10" subscription (which doesn't offer cloud-stored high-resolution video), and available exclusively for our Cloud Managed Video Recorder (CMVR) products (<u>https://www.een.com/hardware/cmvrs/</u>) which include high capacity local storage. The PR1 plan allows you to back up 30 days of low-resolution preview footage in the cloud, with options to extend storage beyond 30 days if needed.

With this setup, you can locally record high-resolution video on an Eagle Eye CMVR while ensuring 24/7 cloud backup of the location's video history if the CMVR is stolen, damaged, or fails. The key advantage of this approach is that the preview stream typically uses only 1/10th of the bandwidth required for full-resolution video, making it more reliable over Starlink, even for smaller installations.

Alternatively, using the M10 plan with a CMVR for local storage should also perform well, allowing you to access your site through our web applications without any issues.

We also offer an additional App Note focused on cellular connections (<u>utilizing 4G and 5G internet</u>) with Eagle Eye Networks Bridges and CMVRs. It provides detailed guidance on optimizing settings for internet bandwidth at locations relying on non-traditional connections. Additionally, there's an App Note to help you assess how camera settings impact bandwidth usage, titled <u>Understanding Impact and How to Use Bandwidth Calculations</u>.

For more information on Starlink, their website (starlink.com) has extensive documentation and videos explaining installation guidelines for satellite kits. Their mobile app is also useful for scanning the sky to ensure proper placement and angling for optimal connectivity.

Appendix

Related documentation:

- AN038 Understanding Impact and How To Use Bandwidth Calculations
- AN044 Utilizing 4G and 5G Internet Connectivity with Eagle Eye Networks Bridges and CMVRs
- AN045 Eagle Eye Cloud VMS Subscriptions Explained