
visionplatform.ai
your vision, our AIgorithms

Install

Welcome to visionplatform.ai.
The latest version of our installation manual can always be found here on google drive:
https://drive.google.com/drive/u/4/folders/1COyJtixsvOzFwWIXqAAahtUgoA7W_kz1

For our product to work well, it's important your camera settings are set up correctly. We see too often that settings are not well enough calibrated. Please double-check your camera settings. Therefore, please carefully check our camera FAQ further down in the manual.

Start first with setting up your license on our platform. Once this is done, set up a NVIDIA Jetson. We support Jetpack 5 on Jetson. This works with Ubuntu 20.4.
If you have a higher version of Ubuntu please reflash to 20.4.
Make sure to install CUDA when you install.

1. Connect a monitor to the Jetson. SSH is also possible but with a screen is highly preferred. If you encounter any issues with SSH enable the screen first and check the troubleshooting chapter.

Things to check before starting:
- Put the power mode on MAXN. It's in the right top and usually standard on 15W. It will require the device to restart.
- Make sure your timezone is set correctly

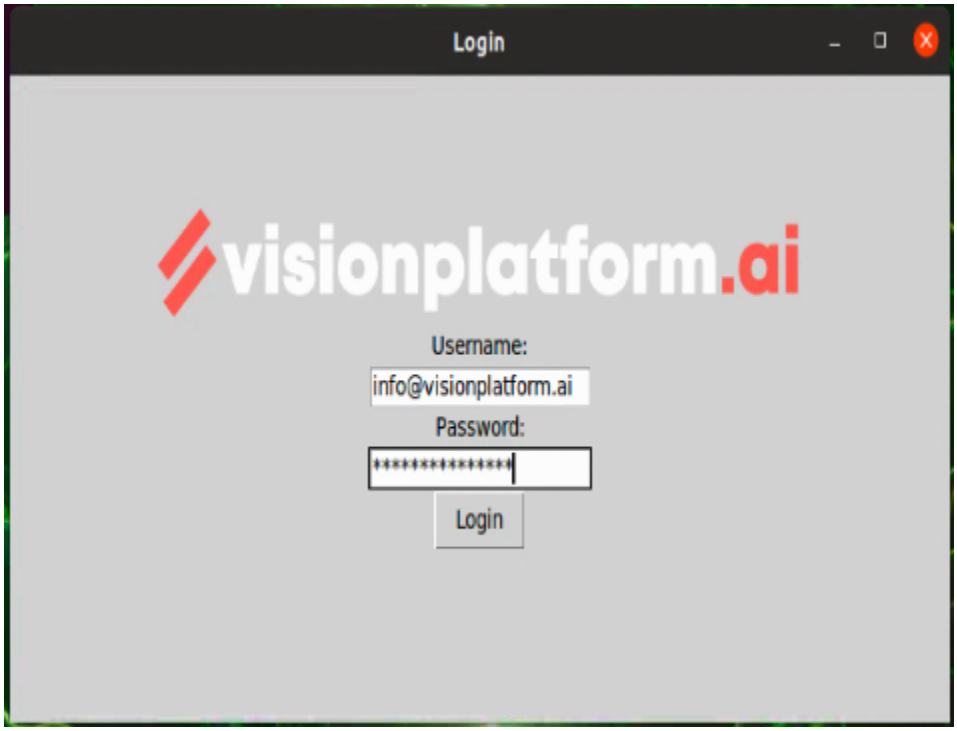
2. Open terminal (Ctrl+Alt+T)
3. You need your Jetson to be connected to the internet.
   It will communicate through HTTPS and MQTT SSL. Make sure your security allows this.
4. Run the following command in the terminal or if you have this manual open on your jetson use (Ctrl+C) to copy and (Ctrl+Shift+V) to copy it into the terminal or use the mouse to right click and cope paste:

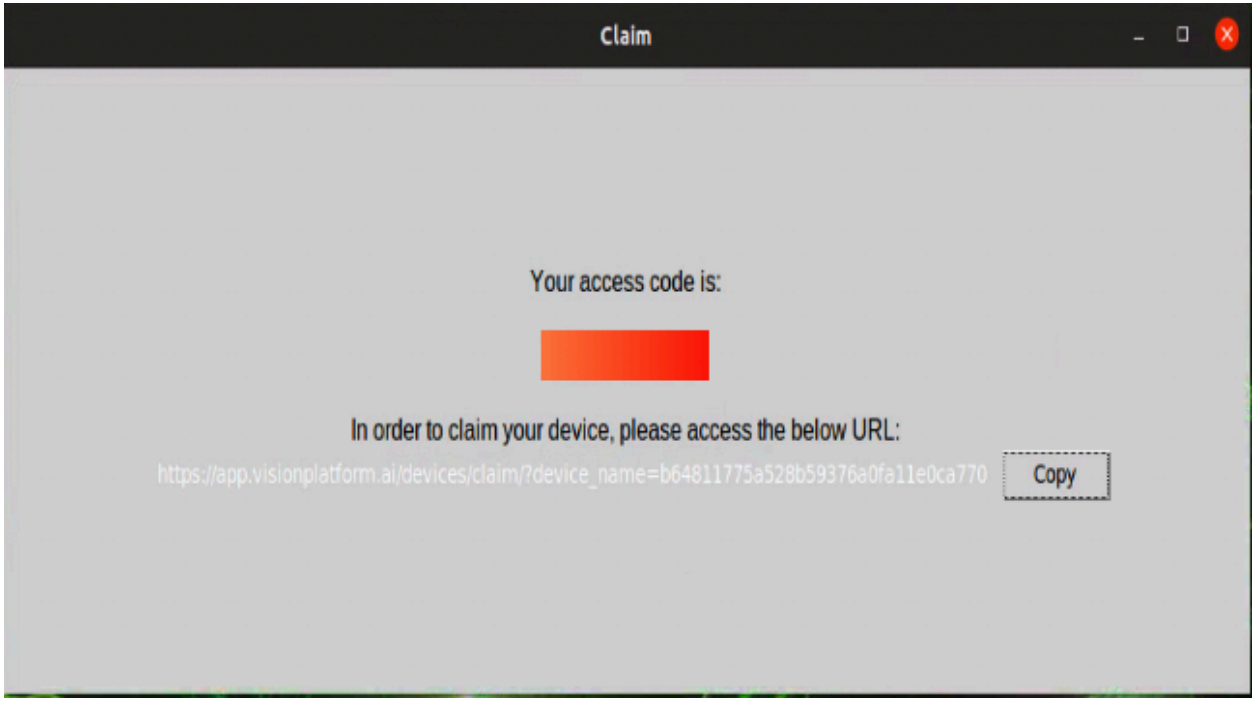
```
Python
sudo bash -c "$(wget -qO - http://bit.ly/vp-installer)"
```

5. Enter your password from your MIC-Jetson; this is mic-711, mic-713, mic-733 or mic-733ao depending on the type of Jetson you have.

Our installer will check if NVIDIA Deepstream is already installed. If this is not the case, follow the steps on the screen from the Deepstream installer.

6. Once installation is complete, you will be asked to log in to visionplatform.ai. Use your e-mail address as user name and password from app.visionplatform.ai and follow the steps on the screen.





Copy the link with the button and open it in your browser (can be on any computer).
Fill in the activation code and give your device a name.

Please note visionplatform.ai is (for now) NOT supported on firefox. Please use Chrome or Edge.

If you have any questions, suggestions, improvement or tips, please reach out to us through info@visionplatform.ai or ask our AI chatbot in the platform.

That's it! Enjoy our platform and good luck developing your Vision!

Update an existing client

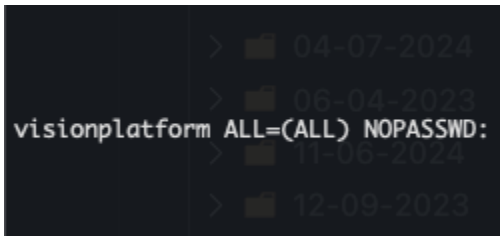
To update an existing client, you can run the same command as for the first-time installation

```
Unset
sudo bash -c "$(wget -qO - http://bit.ly/vp-installer)"
```

IMPORTANT: *if you're updating from a version before 1.3.1 then please edit your sudoers file by running:*

```
Unset
sudo visudo
```

Then find the line that starts with **visionplatform ALL=(ALL),**, *completely remove that entire line (including everything after (ALL)) and save the file!*

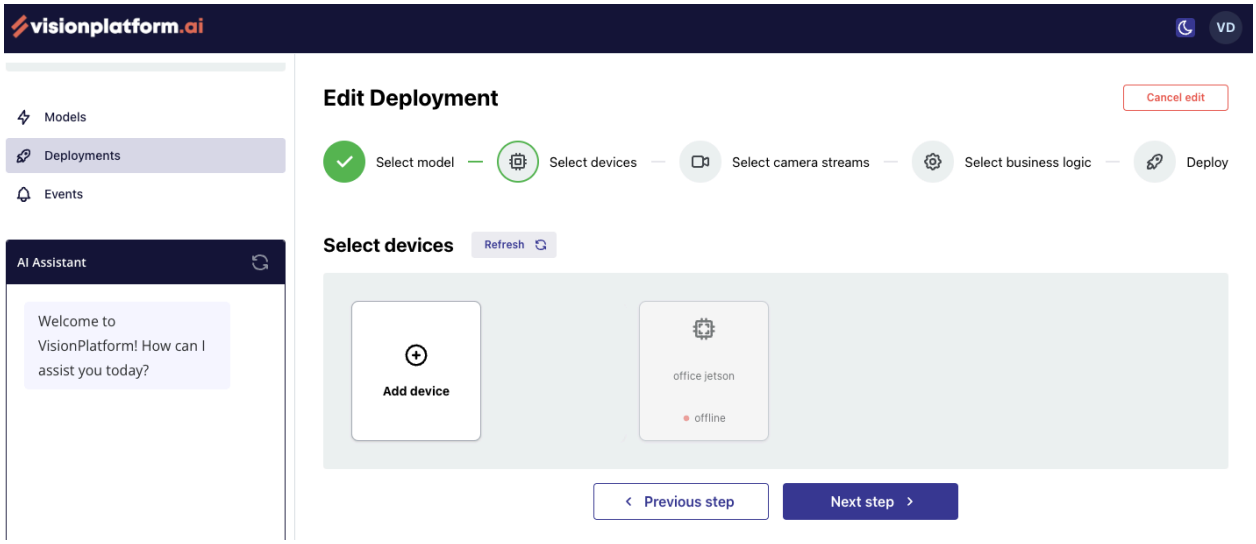


You can find out your version by running:

```
Unset
sudo /opt/visionplatform/vp-edge-client --version
```

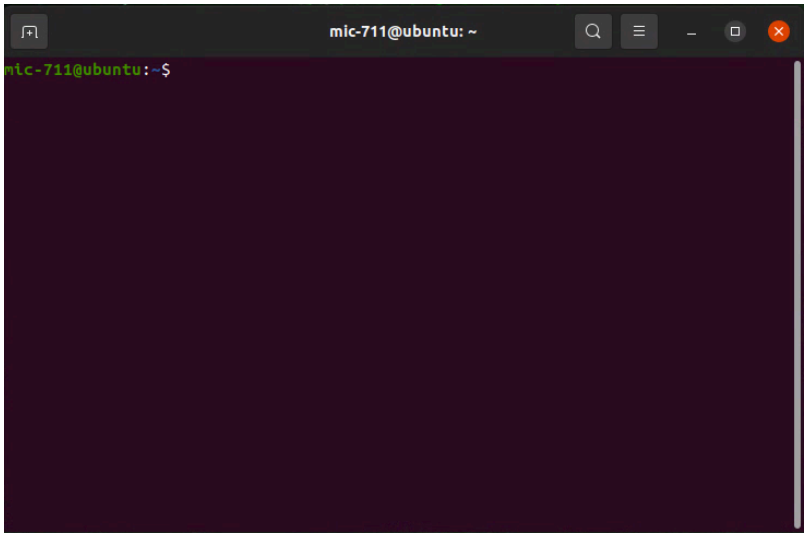
Troubleshooting

My Jetson is offline



Restart client

1. Open the terminal



2. Run the following command: ***sudo systemctl restart visionplatform.service***
3. Press the refresh button after a minute or two.

Check installer logs

If needed, view the installer.log file in the directory where you ran the installation command

I don't see live inference

To see live inference you need to have a screen attached to the Jetson. Then run the following in the terminal:

xhost +

Now you can restart the service or the container.

Uninstall
To completely remove the Edge Client from your Jetson

1. Open the terminal
2. Run the following command

```
Python
sudo bash -c "$(wget -qO - http://bit.ly/vp-installer)" ""
--uninstall
```

View system service logs

1. Open the terminal
2. Run the following command:
   journalctl -u visionplatform.service -f

View client logs

1. Open the terminal
2. Check the logs under /var/log/visionplatform/visionplatform.log

View deployment logs (to check issues with the deployment itself)

1. Find the container id with:
   sudo docker ps

   Check the logs of that container with:
   sudo docker logs -f <container id>

Stop client

1. Open the terminal

2. Run the following command
3. sudo systemctl stop visionplatform.service
4. docker container ls
5. docker kill (write container ID)

NVIDIA Jetson

MIC-711-ON - Jetson Nano Orin 8GB
Hardware manual -
https://advdownload.advantech.com/productfile/Downloadfile5/1-2DK0HD2/MIC-711_User_Manual(3-in-1)_Ed.1-D4.pdf

Specification -
https://advdownload.advantech.com/productfile/PIS/MIC-711-ON/file/MIC-711-ON_DS(081523)20230815131357.pdf?_gl=1*63gvt3*_ga*MTkzMTg2MzQ1My4xNzAwNTgzMjcz*_ga_CFPK80LF7Y*MTcwMTM0NjYzNy41LjEuMTcwMTM0NzY5Ni4yMC4wLjA.

MIC-711-OX - Jetson NX Orin 8GB or 16GB
Hardware manual -
https://advdownload.advantech.com/productfile/Downloadfile5/1-2DK0HD2/MIC-711_User_Manual(3-in-1)_Ed.1-D4.pdf

Specification -
https://advdownload.advantech.com/productfile/PIS/MIC-713-OX/file/MIC-713-OX_DS(081823)20230823124402.pdf?_gl=1*1ysb0nt*_ga*MTkzMTg2MzQ1My4xNzAwNTgzMjcz*_ga_CFPK80LF7Y*MTcwMTM0NjYzNy41LjEuMTcwMTM0Nzg3Ni43LjAuMA..

MIC-733AO - Jetson AGX Orin 32 or 64GB
Hardware manual -
https://advdownload.advantech.com/productfile/Downloadfile3/1-2DY85M1/MIC-733_User_Manual(3-in-1)_Ed.1_FINAL.pdf

Specification -
https://advdownload.advantech.com/productfile/PIS/MIC-733/file/MIC-733-AO_DS(101923)20231020125537.pdf?_gl=1*c9ezdo*_ga*MTkzMTg2MzQ1My4xNzAwNTgzMjcz*_ga_CFPK80LF7Y*MTcwMTM0NjYzNy41LjEuMTcwMTM0NzU2Ny41OC4wLjA.

Fan description and airflow

The NVIDIA Jetson needs an airflow of 0.7 m/s at 0 / +60C. Most street cabinets have ventilation, but we encountered also without. In order to make sure the Jetson has extra airflow at all circumstances, we delivered the Jetson with a USB Fan. For maximum durability and performance please screw the fan on top of the heatsink and connect the USB cable.

Networking FAQ

SETUP STATIC IP:

The static IP can be setup in two ways.

1 Setting Up Static IP on a Router:

Ideally the IP address can be set on the router itself. Contact your network administrator to set up a MAC IP binding and reserve an IP for the device.

2 Setting up Static IP on the device:

This method is not advisable and should be done when the previous method is not possible. Here we tell the device to not change its IP address when ever it connects to the network.

This method can also be used when the device is in a static subnet i.e a subnet without a DHCP. In this case also the device needs to set a static ip manually.

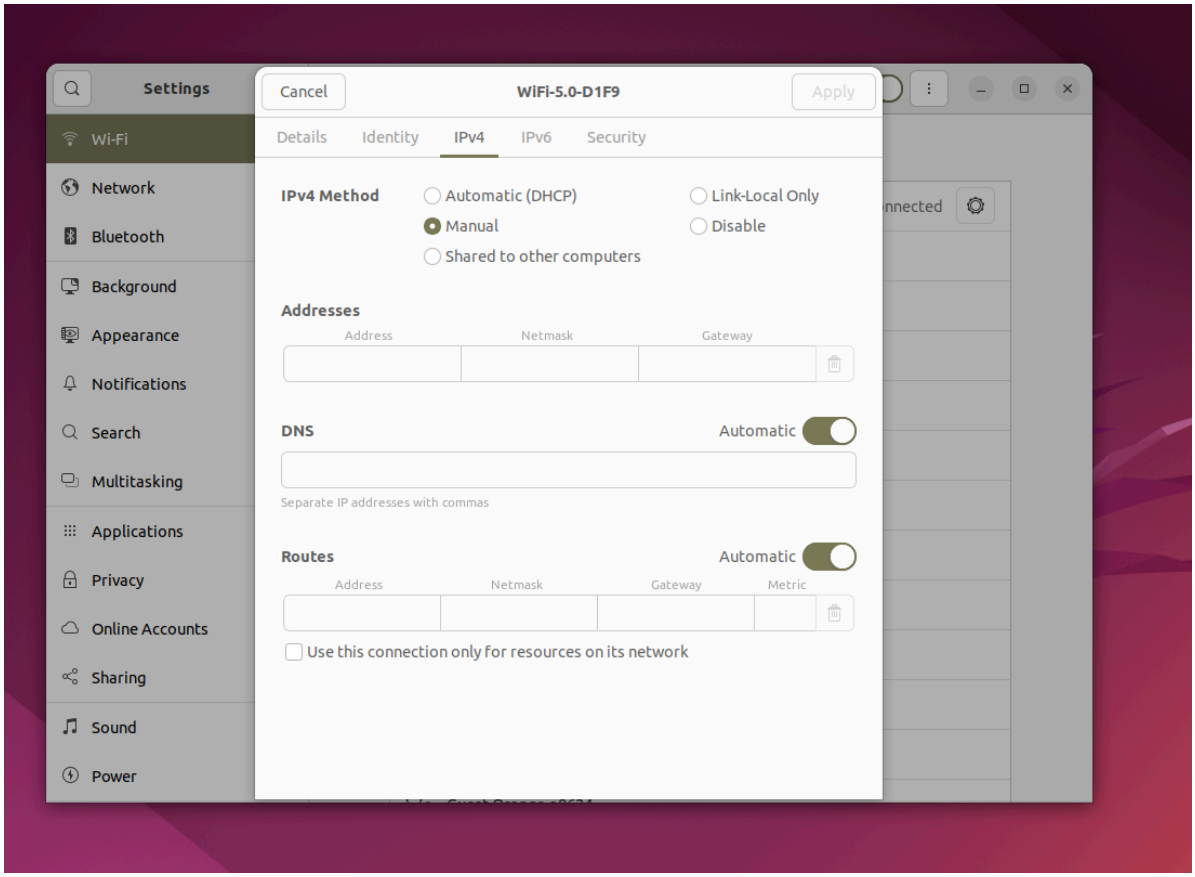
But care must be taken that no other device has the same IP as the device when its connected to the network.

Finding the ip address(note down the details, and this will be used in the next steps):

1. Open the terminal on the system (Ctrl+Alt+t)
2. Type and enter: ifconfig -a
3. From eth0/lan1 (whichever port through which internet is connected) note down the ip address (inet) and netmask (if it gives an error that ifconfig is not installed, do sudo apt install net-tools)
4. On the terminal do: ip route | grep default
5. You should be able to see for example something like this Default Gateway: xx.xx… note down this as the gateway. In the picture below it is 10.26.35.1
6. With this you have the address, netmask and gateway that will be used for setting up the static ip in next steps.

Setting Static ip address:

1. Open settings
2. Click on the tab Network to modify
3. To open the interface settings, click on the gear icon next to the interface name.
4. Select “Manual” in the IPV4 tab and enter your static IP address, Netmask and Gateway
5. Click on the Apply button.



Camera FAQ

RTSP Streams

For IP security cameras RTSP is a common protocol from which the live stream is available. In general, the RTSP stream of the camera is of the format:

```
Unset
rtsp://<username>:<password>@<ip address of camera>:<rtsp port>
```

1. If its not in the below format check the manual of the ip cameras.
2. Generally the RTSP port is 554.
3. The RTSP port should not be blocked. If it is please contact your internal IT department

Recommended Camera Settings for Optimal Performance

To ensure the best performance, we recommend configuring your camera with the following settings:

1. Fixed FPS (Frames Per Second)

Many modern cameras support Variable FPS, which adjusts frame rates dynamically based on movement. However, this is not ideal for our processing solution. Instead, it's best to set a fixed FPS.

If your use case does not involve high-speed motion, we suggest setting the FPS to **8 FPS**. This strikes the perfect balance by:

- Reducing the required bitrate.
- Maintaining smooth video playback.
- Allowing more cameras to be processed on the same hardware.

2. Encoding Strategy

Cameras provide multiple encoding options. We recommend using **H.265**, which is more efficient than **H.264**, as it reduces the bitrate and minimizes CPU load on visionplatform.ai hardware.

However, some VMS (Video Management Systems) may not support **H.265**, and many cameras are configured with **H.264** by default. Therefore, we recommend testing compatibility to ensure smooth integration.

3. Fixed Bitrate (CBR – Constant Bitrate)

Similar to FPS, we recommend avoiding **Variable Bitrate (VBR)** as it causes fluctuations that can negatively impact processing. Instead, set a fixed bitrate in line with your chosen FPS and resolution settings.

Bitrate Recommendations

The optimal bitrate depends on a combination of FPS, resolution, and encoding strategy. Setting it too low may result in pixelated images, while a bitrate that's too high can cause performance issues.

Resolution	FPS	Codec	Bitrate Low (Mbps)	Bitrate High (Mbps)	Bitrate Average (Mbps)
2MP (1920x1080)	8	H.264	1.2	2.5	1.8
2MP (1920x1080)	8	H.265	0.6	1.2	0.9
4MP (2560x1440)	8	H.264	2.1	4.4	3.2
4MP (2560x1440)	8	H.265	1.0	2.2	1.6
8MP (3840x2160)	8	H.264	4.6	10.0	7.3
8MP (3840x2160)	8	H.265	2.3	5.0	3.6

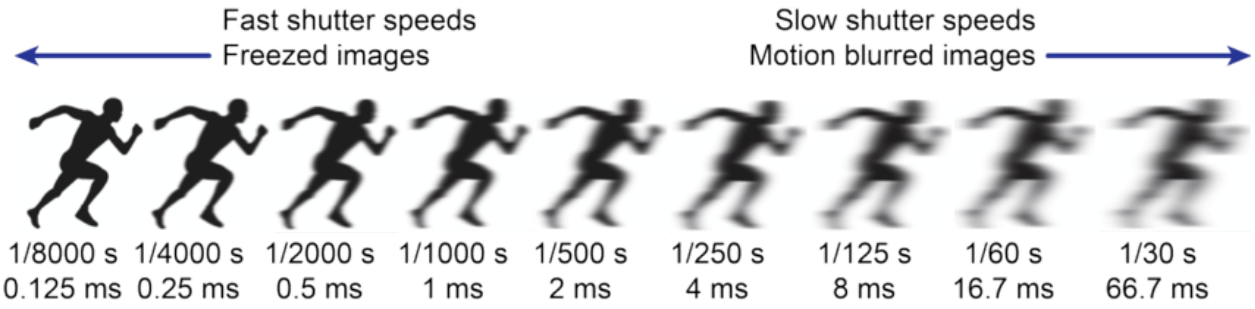
Here are the **reference** bitrates based on different configurations:We suggest to start testing with the average of our low/high.

Shutter Speed: Optimizing for AI Analysis

Shutter speed plays a crucial role in capturing clear images, especially when objects are in motion. By default, most cameras have **automatic shutter speed settings**, which can work well in static environments. However, when movement is involved, the camera prioritizes brightness over speed. This can lead to **motion blur**, making it harder for AI to accurately analyze objects.

To ensure sharper images and improve AI detection accuracy, we recommend **fixing the shutter speed** based on the camera's installation environment. For areas with moving objects, such as roads, production lines, or warehouses, we suggest setting the shutter speed to **at least 1/500 (2ms) or faster**. This minimizes motion blur while maintaining enough light intake for clear and analyzable footage.

If lighting conditions are a challenge, consider adjusting the **camera's gain and exposure settings** alongside shutter speed to maintain optimal image clarity.



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Various FAQ

Development or troubleshooting procedure:

To personally help you the developers in visionplatform.ai need to be able to connect to the device via SSH. This can be achieved via a VPN. It would be helpful if port 4000 was also not blocked and nomachine is also available but it's optional. In case it's difficult to allow SSH connections, TeamViewer can be installed on the Jetson as an alternative for remote access.

Secure Communication, Connectivity & Bandwidth

- **Protocols:** Our application is diligently served over HTTPS, incorporating advanced TLS 1.2 and 1.3 protocols. These protocols ensure that all data transmitted between your device and our servers is encrypted and secure.
- **Device to Cloud communication:** The customer device communicates with the cloud via the means of a custom service account created in GCP and a security key installed on the device itself that authenticates that service account, that key is configured according to the principles of least privilege. [1]
- **Allowed domains:** the device should be able to connect to *app.visionplatform.ai* and *tb-test.visionplatform.ai*
- **Allowed outgoing ports/protocols:** the following ports need to be open for external communication:
    - 8883
    - 443
    - ICMP
- **SSL inspection:** the communication generated by the device can undergo SSL inspection, root CA certificates are used for the secure MQTT communication
- **Bandwidth:** Can really vary, depends on how they use it and how many detections they have, it's something we can calculate individually per client. A rough estimate is minimum 0.015 Mbps and maximum 32 Mbps per camera. For more exact calculations we need to know:
    - - how many cameras
    - - what resolution are they
    - - how many detections per minute/hour/day
    - - how often they update the model

Enhanced Login Security

- **Two-Factor Authentication (2FA):** We provide an optional 2FA feature for an added layer of security. With 2FA, you'll receive a One-Time Password (OTP) via email every time you log in, ensuring that access is guarded against unauthorized users.

Cloud Infrastructure and Compliance

- **Google Cloud Platform (GCP):** The backbone of our platform is the robust and secure Google Cloud Platform. Our services on GCP adhere to the highest standards of data security and privacy which include, but are not limited to protection against denial-of-service attacks, encryption of communications in transit and data encryption at rest. [2] [3]
- **Compliance and Standards:** All GCP services we use are compliant with multiple international standards including ISO/IEC 27001, GDPR, ISO 50001:2018, ISO 22301:2019, ISO/IEC 27017, ISO/IEC 27018, ISO/IEC 27110, ISO/IEC 27701, and others, ensuring a globally recognized level of security. [4]
- **Virtual Machine:** The virtual machines hosting our web application are hosted on Google Compute Engine and the OS images used are hardened in line with the CIS Benchmarks standards, providing a secure and resilient environment. [5]

Data Management and Storage

We categorize data into customer user data (such as personal details of registered users) and customer event data (like videos, images, and annotations).

Customer User Data

- **Storage:** User data is stored in a PostgreSQL database on Google Cloud Compute Engine, in the Netherlands region
- **Privacy:** The mandatory user data stored is minimal (email, nickname) and is not being shared with any third parties.
- **Password Security:** User passwords are protected using the PBKDF2 algorithm with a SHA256 hash, ensuring robust protection against unauthorized access.

Customer Event Data

- **Storage and Encryption:** Unstructured event data such as videos, images and annotations are stored in Google Cloud Storage, encrypted at rest with a Google-owned key. We offer the option to encrypt unstructured data with customer-owned keys upon request. Structured event data such as JSON documents containing metadata and detection information resides in Google Firestore (a managed NoSQL database). [6]
- **Location and Backup:** All data is stored within the European Union, specifically in the Netherlands. We perform weekly backups of both user and structured event data, stored securely in Google Cloud infrastructure.
- **Durability and Availability:** Google Cloud Storage guarantees an impressive 11 nines (99.999999999%) durability and 99.9% availability, ensuring your data is safe and always accessible. Upon request the data can be stored in multiple regions. [7] [8]

- **Retention Policy:** Customer event data is stored for the amount of months mentioned in the features of your subscription type. https://visionplatform.ai/platform/shop/

Devices

- **Jetson updates:** The device is under client's control and the client is responsible for ensuring the Jetson OS is up to date as far as packages and security patches go
- **Camera link:** The cameras are linked to the device programmatically via the web application. They are added logically to the device entity in our device management system

TeamViewer Troubleshooting:

Download TeamViewer Host arm64-64bit for Ubuntu

```
Unset
# Either download it from the official website by just navigating to the link
below

https://download.teamviewer.com/download/linux/teamviewer-host_arm64.deb


# or with wget in the command line like below

wget https://download.teamviewer.com/download/linux/teamviewer-host_arm64.deb


# Install the package by running the following command, make sure to type the
version correctly for the one you downloaded.

cd ~/Downloads
sudo dpkg -i teamviewer-host_<insert your version here>_arm64.deb
```

References

1. https://cloud.google.com/iam/docs/service-account-overview
2. https://cloud.google.com/security/infrastructure
3. https://services.google.com/fh/files/misc/google_cloud_trust_whitepaper_dec2022.pdf
4. https://cloud.google.com/security/compliance/offerings
5. https://www.cisecurity.org/cis-benchmarks
6. https://cloud.google.com/storage/docs/gsutil/addlhelp/SecurityandPrivacyConsiderations

7. https://cloud.google.com/storage/sla
8. https://cloud.google.com/blog/products/storage-data-transfer/understanding-cloud-storage-11-9s-durability-target

We are committed to maintaining the highest standard of security in our systems, providing you with a secure and reliable experience. For any further queries or assistance, please do not hesitate to contact our support team.