

# Network Configuration & Requirements

## System Requirements

### Bandwidth

Several factors such as bandwidth, quality of connection, firewalls, and the number of participants can impact audio and video quality, but generally we recommend a **minimum internet connection speed of 5 mbps download, 2 mbps upload** to support a meeting with multiple participants using audio and video.

- Online tools such as [fast.com](https://fast.com) and <https://www.speedtest.net> can be used to test your internet connection speed.
- Use of a wifi connection will typically provide better and faster internet connection vs. 4G/5G network connection.
- A VPN connection can reduce connection speed and performance – this is true for any application / internet service. Consider this as a potential factor if you experience connectivity and performance issues.
- If you experience latency using Welo, consider closing other open browser windows, tabs, and applications. Especially for older devices, freeing up memory can improve performance – this applies to any application / internet service.

### Supported Browsers & Devices

We recommend Chrome, Firefox, or Edge for the best experience.

Safari: some participants with older/legacy versions of Safari may experience screen sharing issues.

It is considered a general best practice to use the latest available version of your preferred web browser. If you experience any screen sharing or other issues, consider updating your browser to the latest version.

### Microphone, speaker and camera

To enable full participation in a Welo space, Welo needs access to your mic, speaker and camera.

Mobile Devices – [please see this guide](#).

## Network Configuration

Some company firewalls, VPN, Cloud Access Security Broker (CASB), Secure Access Service Edge (SASE) connections may have restrictions which can affect connectivity or media performance. If you are unable to access Welo, and **if any of the checks/tests below fail, please contact your organization’s IT helpdesk for assistance**. Note that Welo support personnel are unable to make necessary changes on your computing device and/or network to troubleshoot and correct these issues.

- Run a quick test at <https://app.welo.space/check-meeting-readiness> to check if there are any network or VPN issues which might impact audio and video.

To resolve issues see [Subnets & Ports](#).

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- If you’re unable to load the Welo application (this often appears as a blank white screen) you may have restricted access to our servers. Please visit <https://debug-my.web.app/> to run our connectivity test. Once the test completes, you should see results as "Succeeded" as shown below.

To resolve issues see [Whitelisting Requirements](#).

```
*****
All tests done.
1: webchannel.googleapis.com with default options: SUCCEEDED (2721ms)
2: webchannel.sandbox.google.com with default options: SUCCEEDED (2711ms)
3: webchannel.googleapis.com with detectBufferingProxy: SUCCEEDED (2631ms)
4: webchannel.googleapis.com with forceLongPolling: SUCCEEDED (2759ms)
5: Firestore listen test with default options: SUCCEEDED (247ms)
6: Firestore listen test with detectBufferingProxy: SUCCEEDED (252ms)
7: Firestore listen test with forceLongPolling: SUCCEEDED (365ms)
*****
```

## Subnets & Ports

Our audio, video, and screen sharing are provided by Amazon Chime.

A client running the Amazon Chime SDK connects to the Amazon Chime service via URIs (never direct IP addresses) that are part of the \*.chime.aws domain. The URIs resolve to IP addresses in the CHIME\_MEETINGS subnets, as published in the [AWS](#)

[ip-ranges.json](#), which is currently a single subnet: **99.77.128.0/18**

The Amazon Chime SDK will use **TCP:443** for https and websocket connectivity, and **UDP:3478** for media. If UDP:3478 is blocked, the SDK falls back to TCP, however the video experience will be poor, and audio will use a region specific subnet assigned by [Amazon Elastic Compute Cloud \(Amazon EC2\)](#).

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## Whitelisting Requirements

Some networks will require the following domains to be whitelisted to ensure consistent performance.

- <https://app.welo.space> (Our web application)
- <https://www.welo.space> (Our website)
- [https://\\*.chime.aws](https://*.chime.aws) (For media signaling, e.g. [signal.m1.ue1.app.chime.aws](https://signal.m1.ue1.app.chime.aws))
- [https://\\*.firebaseio.com](https://*.firebaseio.com) (Welo presence database)
- <https://firestore.googleapis.com> (Welo database)
- <https://www.googleapis.com> (Authentication & Identity)