



## Technical Considerations for using Connectivity's Educational Services Platform (ESP) Service.

Connectivity's Educational Services Platform (ESP) platform operates on a wide variety of consumer and business computing platforms using any internet connection.

You can access ESP from both Windows-based and Macintosh-based computing platforms. ESP is also available on your Android™ and iOS™ based tablets and smartphones.

## Internet Connection

Regardless of what type of device you use, you will require an Internet connection. ESP connections using Connectivity will automatically adapt to low bandwidth conditions, but a stable internet connection will provide the best experience.

- Minimum Required Bandwidth: 512 Kb/s
- Recommended Bandwidth: 1 Mb/s or greater

Cellular 3G meets the minimum requirement. 4G broadband connections provide better quality. (Subject to signal strength, environmental conditions, and carrier charges.)

Use of a WiFi or wired connection through your business or residential internet service is preferred.

## Computer or Laptop System Requirements.

Minimum Hardware Configuration for Windows-Based or Macintosh PCs

- Core 2 Duo 2GHz
- 2 GB RAM
- 40 MB free disk space

Tested Operating Environments

- Windows: 10, 8.1, 8, 7, using Google Chrome, Internet Explorer, or Firefox
- Mac: OS X 10.6 or higher using Google Chrome, Safari or Firefox
- Linux: Debian 7.0; Fedora Core 18, 19; openSUSE 12.2, 12.3; Red Hat 6.1, 6.3; Scientific Linux (SL) 6.1, 6.3; Ubuntu 12.04, 12.10, 13.04, 13.10
- Google Chrome and Mozilla Firefox are the preferred browsers. No software download to use these browsers with Connectivity. You will be asked for permission to use the camera and microphone.
- In-Browser operation is not supported by Microsoft's Edge Browser (Windows 10). Please select another browser to use the in-browser version of our software. Edge users can utilize a fully-installed software client if required.

Devices and Accessories

- Monitor Wired Monitor, Projector, or Smartboard. Prefer resolution of 720p30 or better.
- Webcams Any integrated or USB webcam. Prefer models supporting 720p30 or better, including Logitech Webcam c9000, c920, or c930e.
- Mic/Speakers Integrated Speakers and Microphone, or webcam microphone. See the notes on *Sound Quality Considerations* later in this document for more information.

## IOS™ Tablets and Smartphones

This means your Apple iPhone, iPod, or iPad. Your device must have a front-facing camera in order to support ESP. This includes the

- iPod Touch (4<sup>th</sup> Generation and newer)
- iPhone 4 and newer
- iPad (3rd Generation or newer, iPad Air, iPad Air2, iPad Mini2, iPad Mini3)

Your device must be running iOS 7.1 or newer.

## Android™ Tablets and Smartphones

Recommended Device Hardware

- 1Ghz single core ARMv7 processor or higher
- 512 MB RAM or higher
- Front-facing camera

Your device must be running Android 3.0 or newer.

## Testing your Specific Device and Configuration

Visit our automated test and installation website at <https://getconnectivity.com/test>.

This page will walk you through the initial software installation steps and provide an automated VRU-style test connection that can be used to validate your camera, speakers, and microphone.

## Sound Quality Considerations

When operating in noisy environments you may experience a higher-quality audio connection by using a set of earbuds or headphones, especially a set that includes a noise cancelling microphone.

When operating in a smaller conference room some people have had poor experiences relying on the built-in microphones in laptop computers. They generally do not pick-up sounds farther away from the laptop. One possible solution here is to use the microphone of an external USB webcam, like the Logitech cameras mentioned above. You may also find that a tablet does a better job in these situations than the built-in microphone of a laptop.

When operating in an even larger conference room you may mind if necessary to use a USB speakerphone device for both your speaker and microphone. Most of these have built-in, hardware based echo cancellation. Examples of these units are the Phoenix Quattro Q3 or the Logitech CC3000e (which also includes a camera).

## Corporate Firewall and Proxy Considerations

This information is primarily for your IT department, if required.

Connectivity uses web-based communications on the standard network ports to establish communications (TCP ports 80 and 443).

The video connection will attempt to negotiate random higher-order ports for the video and audio streams. If it is not possible to negotiate a random port through the firewall all communication will be routed across ports 80 and 443 in a proprietary format.

In some situations, it has been necessary to have a handful of Connectivity servers bypassed in your proxy server.

All web-based traffic is secured with certificate-based TLS.

Each audio and video stream is separately secured using a 256-bit AES encryption algorithm based on a 2048-bit certificate.

Refer to our *Technical Note: Security Considerations for Educational Services Platform* for all of the specific details.