

# Reflector 2

Reflector 2 is a program that runs on the teacher laptop. Reflector 2 allows the teacher laptop to act as a receiver for wireless devices on the same network to connect and mirror to the teacher laptop.

Reflector 2 is a Big Fix offer and is now available to install on every teacher laptop. Use **Big Fix** in your system tray to install Reflector 2 on your laptop. For help with installation, [click here](#).

In this document, you will learn about accessing Reflector 2, setting your preferences, troubleshooting, and common uses for Reflector 2.

**IMPORTANT:** Review the Quick Start Guide on page 3 of this document. Steps 1 – 15 are critical to ensure the security of this application.

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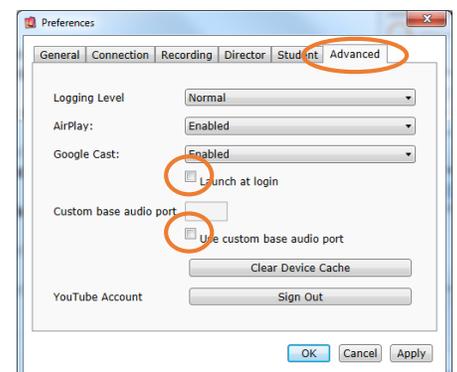
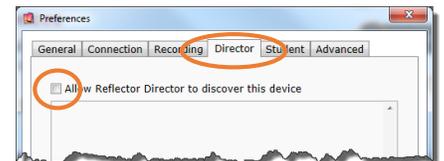
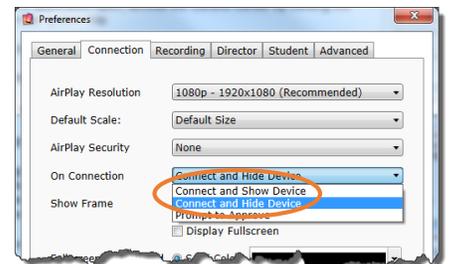
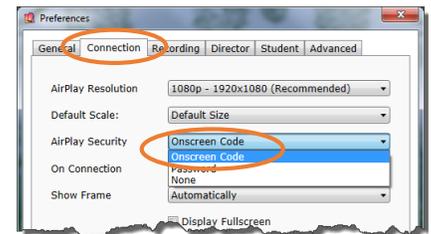
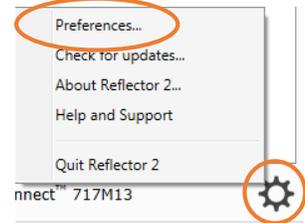
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## Quick Start Guide

Update the following preferences to get started with Reflector 2. Each option will be explained in greater detail later in this document.

1. Open **Reflector 2**.
2. Click the **Reflector 2 icon** in the system tray to access the Control Center.
3. Click the **gear**.
4. Click **Preferences**.
5. Click the **Connection tab**.
6. Change **Airplay Security** to **Onscreen Code**.
  - This is an important security setting that prompts devices that attempt to connect to enter a unique password. This code will appear on the teacher's screen, so only those in the classroom can see it.
7. Change **On Connection** to **Connect and Hide Device**.
  - This allows any client to connect to your device without notification, but you will be able to choose whether a device is displayed or not.
8. Click the **Director tab**.
9. Uncheck **Allow Reflector Director to discover this device**.
10. Click the **Student tab**.
11. Uncheck **Allow Reflector Student to discover and connect to this device**.
12. Click the **Advanced tab**.
13. Uncheck **Launch at Login**.
14. Uncheck **Use custom base audio port**.
15. Click **OK**.



## Section 1 - Accessing Reflector 2 and the Control Center

Mobile devices connect via AirPlay or Google Cast to the teacher's laptop with Reflector 2 installed.

Connect the laptop to a projector or monitor with an HDMI cable to share content with your class.



## Starting the Program

If Reflector 2 is running on your teacher laptop, you will see this icon in your system tray (to the left of the time, bottom right corner of your screen).



If you do not see the icon in your system tray, you will need to start Reflector 2. Locate the program on your Desktop, in your Start menu or search for “Reflector” from Windows search.

### Note:

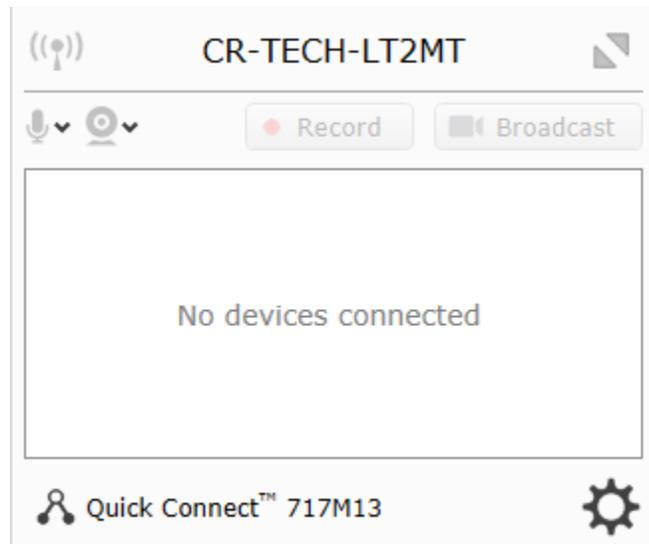
- Reflector 2 is available for teacher laptops ONLY. It cannot be installed on any student laptops or desktops.
- Reflector 2 must be installed to mirror mobile devices.

## The Control Center

Once Reflector 2 is running, click the icon in your system tray to access the **Control Center** (it may pop up when you start the program). Here you will see the name of your laptop, connected devices, the link to your preferences, your Quick Connect code, and options for enabling audio, webcam, recording, broadcasting, and full screen.



Return to the Control Center to see connected devices, change settings, record, and toggle the display of any connected devices. You can always access the Control Center when Reflector 2 is running by clicking the icon in the system tray.

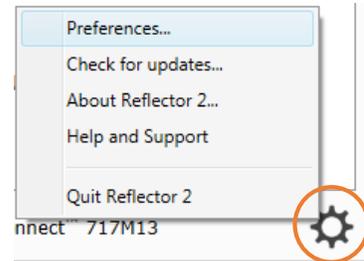


## Section 2 - Preferences

This section describes the preferences for Reflector 2.

Once the **Preferences** are set, the settings will be retained for future use.

Click the gear in the Reflector 2 Control Center and select **Preferences**.



### Note:

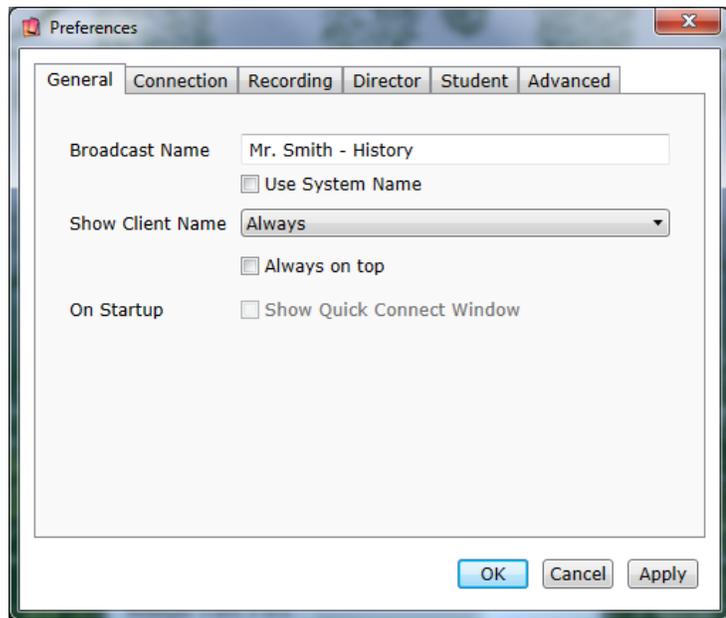
- The teacher laptop is known as the **host**.
- Any device (iPad, smartphone, etc.) that connects to the teacher laptop is the **client**.

## General

**Broadcast Name** lets your laptop be easily identified by anyone trying to connect to the host. By default, your Broadcast Name is the name of your laptop.

**Use System Name** allows you to change your Broadcast Name. Uncheck this and you are able to type in any name in the field above. Keep in mind that anyone who attempts to connect will see this name displayed.

**Show Client Name** enables you to see the name of any device that attempts to connect to the host. Most client names are the name of the device (iPad 2, iPad 3, etc.). Some client names may show up as “Cast device” or something you don’t immediately recognize.



If you have a set of classroom devices, you can check the client name in settings on the device. If other devices are connecting, you may have to determine which devices are which by trial and error.

- Recommended: Always

**Always on top** keeps the connected device in front of any other window (optional).

**On Startup - Show Quick Connect Window** allows devices with Reflector Student to connect (not used).

## Connection

**AirPlay Resolution** sets the resolution of iOS devices.

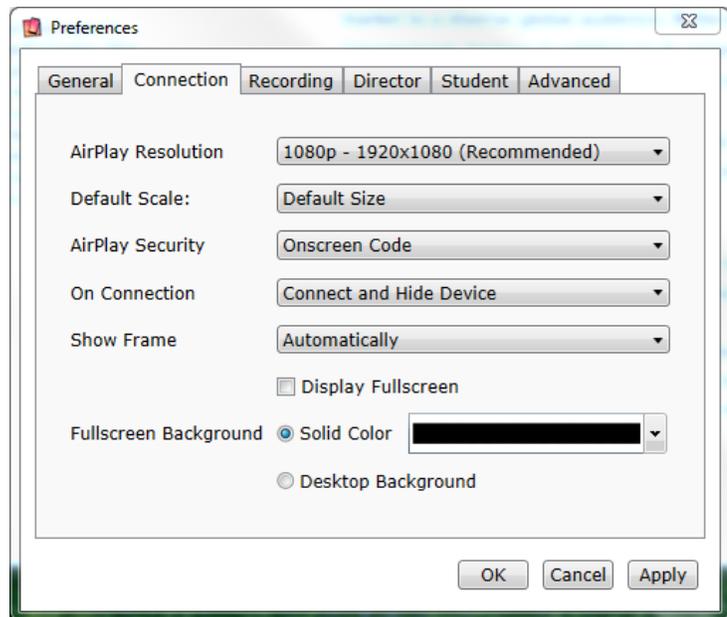
- Recommended: 1080p – 1920x1080

**Default Scale** adjusts the size the client appears on your screen.

- Recommended: Default Size. This will typically adjust the client to fit your screen.

**AirPlay Security** is a layer of security that will prompt iOS client devices with a code or password when connecting.

- Recommended: Onscreen code. This will populate a unique code that is required for other devices to connect to it.



**On Connection** allows you to control if/when a device is displayed. This setting balances security and can prevent disruption during class.

- Recommended: Connect and Hide Device. This will allow any client to connect to your device without notification, but you will be able to choose whether a device is displayed or not.

**Show Frame** allows you to show or hide a frame around the client window (meant to represent the device).

- No recommendation. Use personal preference.

**Fullscreen Background** lets you choose a solid color or your desktop as the background.

- Recommended: Solid color. This may help to reduce distraction and emphasize a single client.

## Recording

**IMPORTANT:** When recording, be mindful of privacy issues.

Reflector 2 allows you to record any client connected to the host.

**Recording Mode** allows you to choose whether to record all connected devices (including your webcam) or a single device.

- Recommended: All Connected Devices.

**Recording Background** will fill the empty area when recording multiple devices.

- No recommendation. Use personal preference.

### Recording Resolution

- Recommended: 1080p

### Recording FPS

- Recommended: 30

### Recording Quality

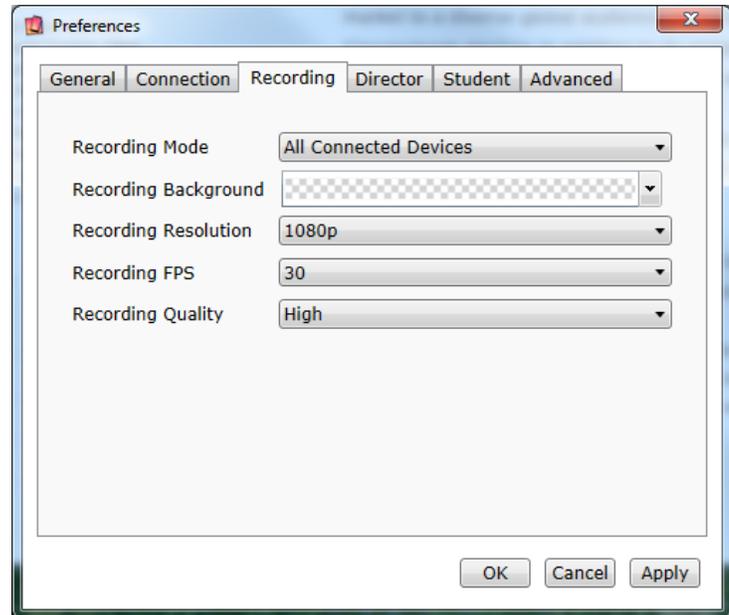
- Recommended: High

### Recording best practices:

- Experiment with this feature before using it in a class setting.
- Record short clips instead of entire classes whenever possible.
- Allow for processing time after you record.
- Check your microphone settings if you wish to include audio with your recording.
- Check your webcam settings if you wish to include a video from your webcam with your recording.
- If you enable your microphone in the Control Center, your laptop's microphone will include any sound that it picks up. You can find your laptop's microphone settings in your Control Panel on your laptop. After you stop a recording, it could take a few minutes for your laptop to process the recording and prompt you to save it.

### Note:

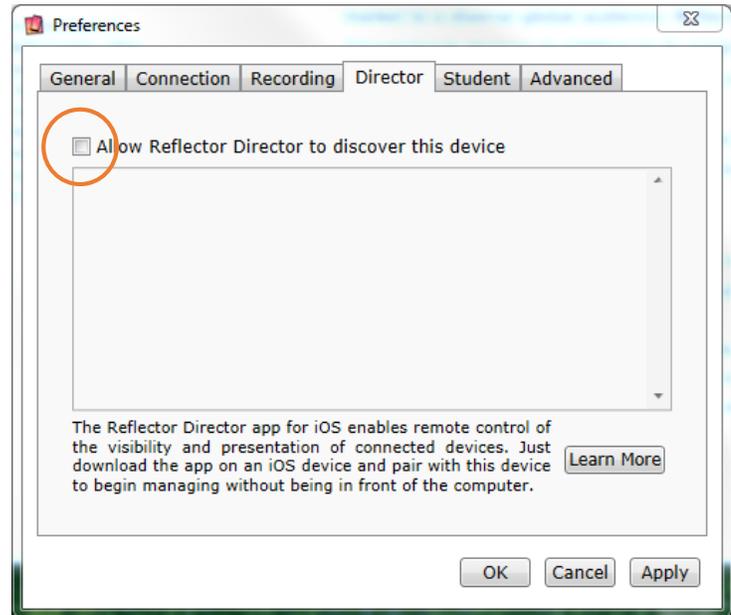
- These settings will impact the quality of your final recording. Experiment with these settings until you find an appropriate balance.
- If you experience problems with your laptop when recording (such as lag, freezing, etc.), adjust these settings.



## Director

**Reflector Director** is an app that runs on the client that allows for two-way communication. This is not recommended and may incur additional expenses to operate.

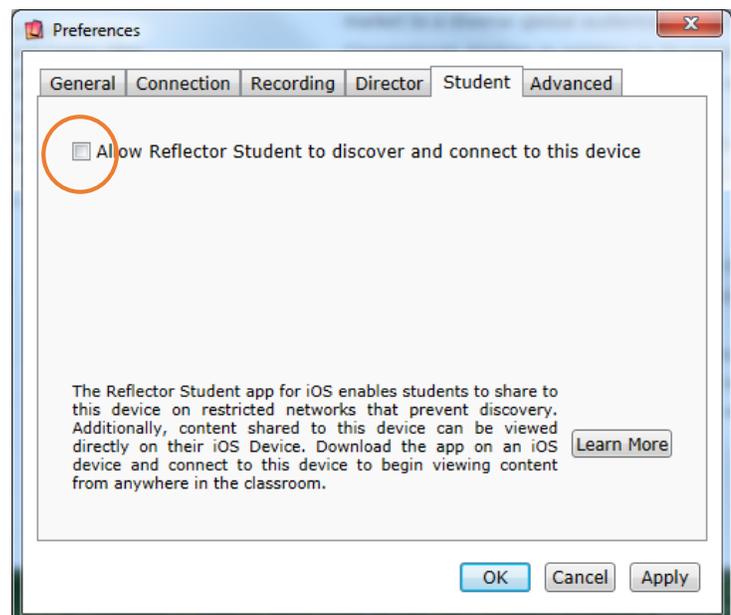
- Uncheck Allow Reflector Director to discover this device.



## Student

**Reflector Student** is a free app (for iOS only) that students may download. It will not cause any problem to use the app, but it isn't necessary to mirror to reflector.

- Uncheck Allow Reflector Student to discover and connect to this device.



## Advanced

### Logging Level

- Recommended: Normal

**AirPlay** are the protocols that allow iOS clients to connect to your laptop.

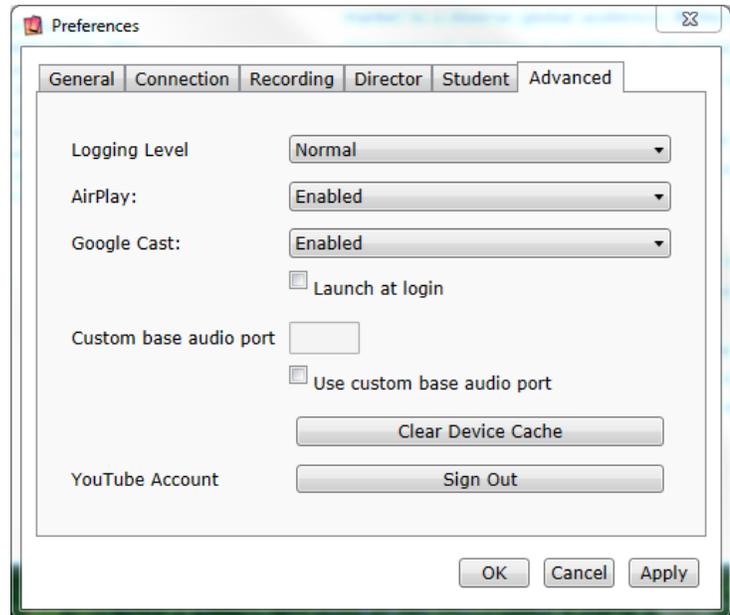
- Recommended: Enabled

**Google Cast** are the protocols that allow Android clients to connect to your laptop.

- Recommended: Enabled

### Note:

- If you find that you do not need one of these enabled, you may disable one or the other. Only disable these settings if you are sure that iOS or Android devices will not connect to your laptop.



**Launch at Login** will open Reflect 2 when you start your laptop.

- Recommended: Uncheck
- Disable this feature and run the program when you intend to use it to avoid requests to connect to your laptop from student devices.

### Custom Base Audio Port

- Recommended: Uncheck

**Clear Device Cache** will remove any settings associated with clients that have previously connected to your laptop. If you have chosen to remember settings for specific clients, these will be lost when you clear the cache. This may be beneficial in some cases.

### YouTube Account

If you have signed in with your WCPSS Google Apps credentials, you can sign out here.

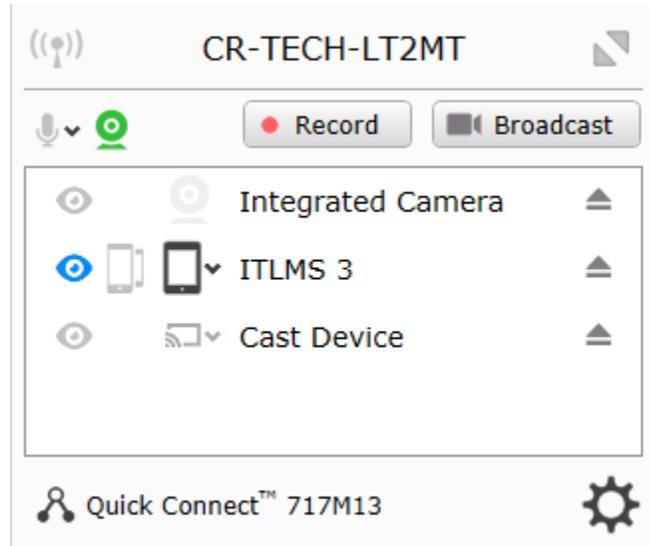
### Note:

- If you only have iPads in your classroom and do not intend to ever connect an Android device, disable Google Cast.
- If you plan to use Reflect 2 daily, enable Launch at Login, but if you plan to only use it periodically, uncheck that box.
- Any settings that aren't addressed here should be left as the default.

## Section 3 - The Control Center

To access the Control Center, click the Reflector 2 icon in your system tray. If you do not see the Reflector 2 icon in your system tray, locate the program shortcut on your desktop or in your Start menu. Reflector 2 runs in the background until you close it. It may be beneficial for you to close it when not in use to avoid unwanted connections.

This image shows a Reflector 2 Control Center with three devices connected: the laptop's webcam, an iPad, and an Android phone. Note that the Android phone shows up as "Cast Device." The iPad has a small image of an iPad next to it.



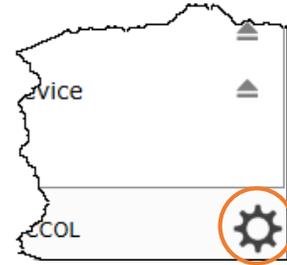
## Icons

There are several icons in the Control Center that allow you to quickly toggle common settings.

### Gear icon

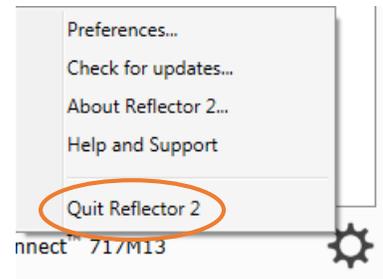
Allows access to:

- Preferences
- Check for updates
- About Reflector 2
- Help and Support
- Quit Reflector 2



### Note:

- It is recommended that you quit Reflector 2 when not in use to avoid unwanted connections.



## Unused & Not Recommended Features

### Wireless tower icon

Allows you to control Reflector Director and Reflector Student settings. These apps are installed on the client device and are typically not used.



### Fullscreen mode

When activated, this will override settings and automatically connect a client in fullscreen mode. This is not recommended.



### Quick Connect

This is a feature that is used with Reflector Student. To use Reflector Student to connect an iPad, use this feature to display a unique alphanumeric code or QR code.



## Optional & Advanced Features

**IMPORTANT:** When recording or broadcasting, be mindful of privacy issues.

### Microphone icon

Click this to enable voiceover. The host microphone is used to capture audio during recording. Use this feature if the microphone on your laptop is able to pick up your voice while mirroring or if you have an external microphone available. Typically, your laptop's microphone will not pick up your voice from around the room.



### Webcam icon

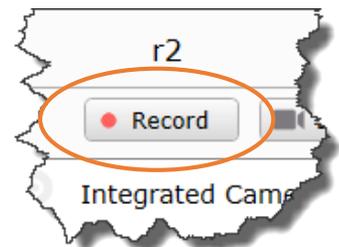
This connects your webcam as a client. You may use this feature alongside other connected clients or as a method for recording a video from your webcam. Be sure to enable the voiceover feature as well.

In the accompanying image, the webcam is activated and has become a client, but the microphone is muted.



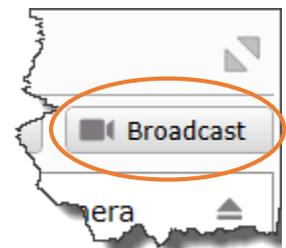
### Record button

This button becomes active when any client is connected. Clicking the Record button activates a timer on the client window. When you are finished recording, click Stop. Reflect 2 will immediately begin processing your recording. Once your recording finishes processing (could take several minutes), you will be prompted to save the recording. Keep in mind it may take several minutes to process and prompt to save.



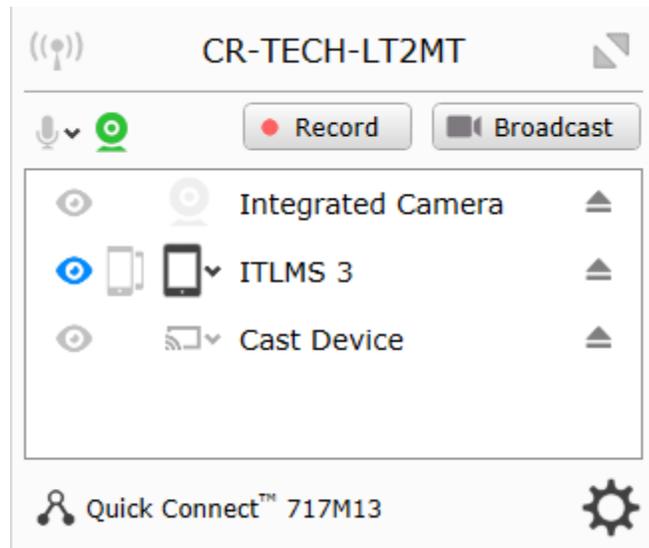
### Broadcast button

This button becomes active when any client is connected. Clicking the Broadcast button will prompt you to enable permissions in your Google Apps account associated with Reflect 2. It typically takes several minutes to initiate.



## Section 4 - Working with Connected Devices (Clients)

In this section, you will learn how to work with clients connected to the host.



## Device List

When clients connect to your laptop (Host), they will be displayed in the main window of the Control Center. If you have Connect and Hide Device selected in Preferences, any device in range will be able to connect but will remain hidden until you choose to display it.

All connected clients are shown by device name.

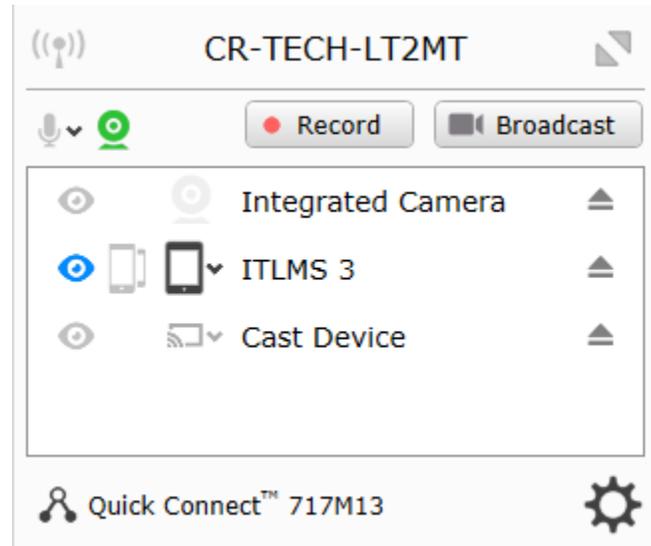
### iOS devices

To find the device name on the iPad, go to:  
Settings → General → About

### Android devices using Chromecast

The device name is typically “**Cast Device**.”  
If you have multiple Android devices connecting at once, it may be difficult to determine which is which without viewing the device.

In the image, there are three clients connected.  
Devices are labeled by system name and cannot be altered.



1. Integrated Camera – The teacher laptop’s webcam.
2. ITLMS 3 – An iPad.
3. Cast Device – An Android phone.

In this example, Integrated Camera and Cast Device are connected but not displayed; ITLMS 3 is connected and its screen is showing on the teacher's laptop (host).

## Device List Icons

### Eye icon

Click the eye icon to the left of the client name to show content from the client. Click the eye again to stop showing content. When the eye is blue, that client is being displayed. If you don't see it, look for the window on your laptop's taskbar. When the eye is gray, the client is connected but no image is being displayed.



### Multiple device icon

Click the multiple device icon to emphasize the device. This makes the window of the selected device larger and brings it to the front of other devices that are connected and displaying simultaneously. Click the multiple device icon again to stop emphasizing the device.



### Frame icon

Clicking the frame icon will allow you to choose to display a frame around the device using the frame icon. This icon will change depending on whether the device is displayed and/or has a frame chosen.



### Eject icon

Click the eject icon to the right of the client name to disconnect the device from your laptop.



### Note:

- There are other places to alter or close connected clients.
- Changing settings on each device will not alter your preferences for other clients that connect.

## The Client Context Window

When a client is being displayed, there are a few options available without opening the Control Center window.



## The Context Menu

Right-click on the top frame of the client window to access the context menu. Here, you may change settings that only affect the current client window.

**Show Frame** allows you to show or hide a frame around the client window (meant to represent the device).

**Frame Skin** allows you to choose which frame to show.

**Scale** lets you to change the size of the current client window.

**Orientation** gives you the options to lock the orientation of the device or allow it to rotate.

**Always on top** keeps the current client window on top of other windows on your laptop.

**Display Fullscreen** will display only the current client window and fills the remainder of your screen with the color you chose in Preferences.

**Close Connection** will close the current client window.

### Note:

- It may be helpful to remember to use Alt+W to close the current client window. In cases where you want to quickly remove a client, some people find this more efficient than right clicking to get to the context menu or opening the Control Center to toggle the display off.
- Any settings you change in the context menu will only affect the current client.



## Section 5 - Advanced Features

In this section, you will learn about advanced features for Reflector 2.

## Recording

**IMPORTANT:** When recording, be mindful of privacy issues.

You may record a single client window or multiple client windows at once. Check Preferences for recording settings. Experiment with these settings to find the best solution for your needs.

1. Connect a device and click the record button to begin and end recording.
2. Wait for your laptop to process and prompt you to save your recording.

**Note:**

- Recording can use a lot of system resources. Be sure to wait for your recording to process and prompt you to save.
- Save recordings locally or in Google Drive.
- Organize your recordings. Name them by subject and date for ease of locating.
- If you record multiple clips, use WeVideo or another video editing software to combine them.
- Record multiple clients, such as your iPad and webcam, to create tutorials for your students.
- Connect a lavalier or boundary microphone to your laptop to record audio.
- Limit the number of clients recorded simultaneously. Too many clients at once will reduce the size of each client in your final video and make it difficult to view on most screens.

## Using your Webcam

**IMPORTANT:** When recording, be mindful of privacy issues.

You can use Reflector 2 to record from your webcam. Check preferences for recording settings. Experiment with these settings to find the best solution for your needs.

1. Enable your webcam and microphone using the buttons in the Control Center.
2. Display your webcam and click the record button to begin and end recording.
3. Wait for your laptop to process and prompt you to save your recording.

**Note:**

- Check your surroundings when using your webcam to avoid distractions in your video.
- Make sure you have adequate lighting and avoid backlighting your video.
- Test your camera and microphone settings in a short clip. Make adjustments to your microphone in your laptop's control panel if needed.
- Use your recording as a message to students or parents, a welcome message for your web page, a description of a project posted in Canvas, or a reflection to send to students.
- Delete old recordings from your laptop or Google Drive to conserve space.
- Use WeVideo or another video editing program to edit your recordings.
- Record alongside your connected iPad to introduce a concept, demonstrate an activity, or analyze an image or pdf.

## Broadcasting

**IMPORTANT:** When broadcasting, be mindful of privacy issues.

Broadcasting allows you to connect Reflector 2 to a live feed via YouTube. Broadcasting is not covered in detail in this document. More information can be found at <http://help.airsquirls.com>.

**Note:**

- Before you choose to broadcast, become familiar with Reflector 2.
- Practice to ensure success before attempting to broadcast for the public.
- Use your WCPSS Google Apps account to connect to YouTube.

## Section 6 - FAQs and Troubleshooting

**1. Can I use Reflector 2 to display to my projector or monitor without my teacher laptop?**

No, you must connect your mobile device to Reflector 2 through your teacher laptop. Without your teacher laptop, there is no receiver for your mobile device. To use Reflector 2, you must connect your teacher laptop to your projector or monitor and then reflect from your iPad or mobile device to your laptop.

**2. Can I use Reflector 2 to display a student laptop to my projector or monitor?**

No, this feature is currently unavailable. If you wish to display a student's screen on your projector or monitor, use the HDMI cable to connect the student's device directly.

**3. What do I do if I don't see my teacher laptop on my iPad in the AirPlay menu?**

Be sure to scroll up or down in the AirPlay menu - devices may not be in any particular order. Double check that Reflector 2 is running on your laptop. Quit and restart Reflector 2 on your laptop and/or reboot your iPad.

**4. I can't hear my audio on my projector or monitor.**

Check all audio and video connections. Check the volume level on your mobile device, laptop, and speakers. Check your audio settings on your laptop. Disconnect and reconnect if nothing else works.

**5. I made a recording, but I was never prompted to save it.**

Recording takes a lot of processing power. If your laptop was unable to process the video, it may be lost. Remember to record short clips when possible, and keep other programs closed while recording to conserve processing power.

**6. Do students need to install Reflector Student in the app store to mirror?**

No. Reflector Student is a free app that is intended to make the process of connecting easier, but it is not necessary on the WCPSS network. It is also not easier to connect with Reflector Student than to use AirPlay. There is no Android app for Reflector Student.

**7. I found Reflector Director in the appstore, but it costs money. Will the district buy it for me?**

No, WCPSS does not support Reflector Director.

8. **Why do I get disconnected when I try to play a video from my iPad?**

Reflector 2 uses AirPlay, which treats fullscreen videos differently than mirroring. When switching between mirroring and fullscreen video, the connection is sometimes lost. You should be able to reconnect.

9. **Will allowing multiple students to connect to my laptop cause a problem?**

There is no limit to the number of clients that can connect, and unless they are displaying, you should not see any ill effects from having multiple clients. Unless you intend to display multiple clients, it is a good idea to quit Reflector 2 to prevent unwanted connections from running in the background.

10. **How can I connect BYOD devices?**

Currently, only devices on the WCPSS wireless network (Lunenburg) can connect to your teacher laptop through Reflector 2.

11. **Can I get Reflector 2 installed on a different laptop?**

Reflector 2 is only available for WCPSS owned staff PCs. It will not be installed on student laptops or personally owned laptops. If you have a teacher-assigned laptop and Reflector 2 is not installed, follow your normal support procedure for technology related issues.

12. **How can I prevent students from mirroring to my laptop from outside my classroom?**

Reflector 2 will only show for students who are within range of your laptop, which may include the hallway or classroom nearby. To prevent unwanted access, quit Reflector 2 when not in use.

Select **Connect and Hide Device** (page 8) to choose whether or not to display a device. Additionally, enable Onscreen code for **AirPlay Security** (page 8). This will prompt clients to enter a unique code when trying to connect.

13. **I only want the iPads in my classroom to be able to mirror to Reflector 2. How can I set this up?**

If you are concerned that unintended Android devices can connect and you are certain that only iPads will be used in your classroom, you can disable **Google Cast** in Preferences (page 11) and enable Onscreen code for **AirPlay Security** (page 8). Each iPad that connects will require this unique password.

**14. My school purchased several AppleTVs for mirroring iPads. Why shouldn't I use that instead?**

AppleTVs are designed for home use and include many features that we don't use in school. Mirroring is only one feature of the AppleTV and does not work well on our network. Reflector 2 connects iPads more easily and reliably. Reflector 2 also allows for screen recording and connecting Android devices, and AppleTVs do not.

**15. How do I connect an Android device?**

Android devices use Google Cast (or Chromecast) to connect. On your Android device, download the Google Cast app, click the menu button, then select Cast screen/Audio and then choose the appropriate device. Some Android devices may have additional ways to connect.

**16. Where can I go to get help with Reflector 2?**

Check out the Reflector 2 info page at <http://www.air squirrels.com/reflector/>. Your tech contact can also put in a ticket to pose questions, or you can reach out to colleagues to collaborate on best practices.