INTRODUCTION TO OBS – PART TWO

OBS and Bitrates

The success of your OBS output is directly influenced by the settings, and this is where the OBS bitrate comes in. If you get it wrong, you will experience increased buffering or a very low-quality stream.

According to TechTerms,
> "Bitrate, as the name implies, describes the rate at which bits are transferred from one location to another. In other words, it measures how much data is transmitted in a given amount of time."

Your stream's bitrate will depend on your Internet upload speed.

TESTING INTERNET CONNECTION SPEED

While it does depend on whether you are live streaming, recording or simply using virtual camera, internet speed is very important. Many resources recommend upload speeds of 5Mbps (5000kbps) which is good to stream at desired resolutions, including 720p at 30 fps and 1080p at 60fps. The minimum upload speed for smooth streaming with good quality is 3Mbps (3000kbps).

NOTE:

Mbps means megabits per second. Mb is used in reference to download and upload speeds. It takes 8 bits of data to equal 1 byte.

MBps stands for megabytes per second. MB is used in reference to file size, or the amount of data transferred.

Test your upload speed here:

testmy.net/upload - If you're looking for a test that offers more data than the average speed test

SpeedOf.Me- an HTML5-based speed test that's lightweight and designed to replicate real-world browsing and downloading conditions

Speedtest.net - picks a nearby server (out of a list of more than 1,000), runs a full test, and returns information on upload and download speed, latency, and packet loss

OBS Video Bitrate

The best OBS video bitrate settings (for you) depend on upload speed. By default, the bitrate in OBS is set to 2500 which falls somewhere near the middle of the scale. Choosing a video bitrate depends on what you want to achieve. Is it a pixel-perfect video production? Try to push the video bitrate to the maximum. Below is a table that will help you decide on a good video bitrate for OBS based equipment and internet upload speed.
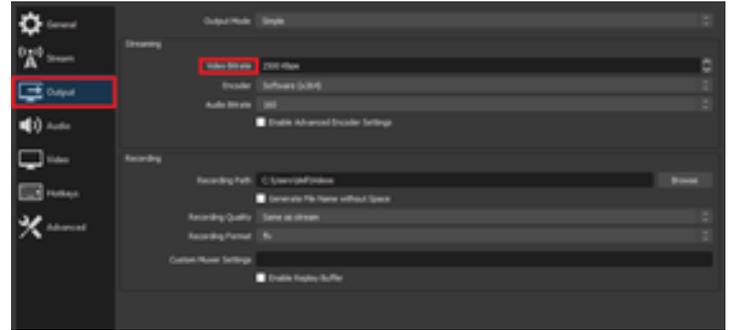
OBS Video Bitrates

| Quality	Resolution	Recommended Video Bitrate (kbps)
Low	270	400
Medium	360	800
High	480	1200
High Definition	720	1500
High Definition	1080	4000
Ultra-High Definition	4K	8000

OBS Audio Bitrate

As a rule of thumb, the lower the bitrate, the more compressed the sound will be. Just like with streaming video, the higher the streaming audio bitrate, the clearer the sound will be. The ideal audio bitrate for you depends on various factors such as internet connection and microphone.

NOTE: If sound quality is not a top priority, the audio bitrate is not as important as the video bitrate.

OBS Audio Bitrates

| Quality	Recommended Audio Bitrate (kbps)
Very Poor	64
Low	96
Medium	128
High	192
High Quality	256
High Definition (Highest MP3 quality)	320
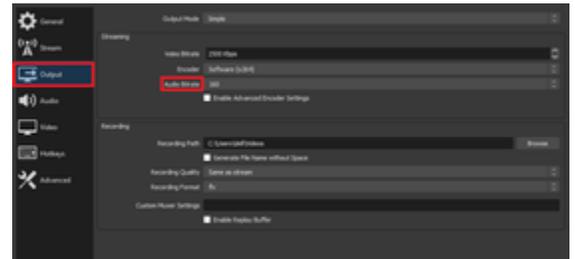
Keep in mind that audio bitrate in OBS is affected by the frames per second, the bandwidth and the processing power of your system and while these tables do depict realistic figures, bitrates may vary.
For instance, an HD broadcast operating at 720p may require a total bitrate as high as 4000 kbps.

Likewise, the OBS bitrate for a 1080p 60fps stream can go as high as 14,000 kbps. In short, there is no definite formula to find the best OBS stream settings, but the higher the quality, the higher the bitrate. The easiest way to figure out the right settings is to experiment and conduct several tests to wherever the OBS output will be hosted.

OBS Bitrate Calculator

Getting OBS stream settings right is as much an art as it is a science; there are so many variables that affect the quality of streaming media. Because of this, a member of the OBS community created an OBS plug-in called **OBS Bitrate Settings Calculator, 1.1.0**, allowing you to calculate the best resolution or frame rate for a predefined bitrate. if you're confused about the stream configuration, you can use this calculator to figure out the ballpark settings for you.
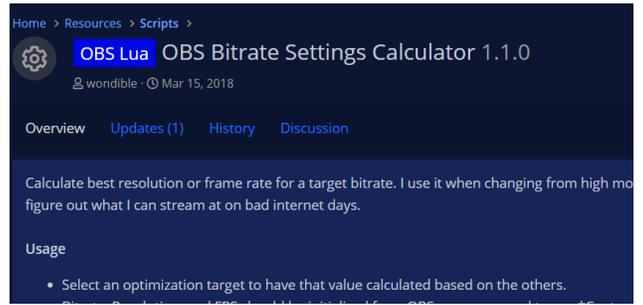
Note: This plugin **does not** change your OBS settings, but only suggests suitable audio and video bitrates for you. See "Installing Plugins" section for more information on Plugins.

When you're comfortable with the OBS bitrates, explore advanced options to tweak and fine-tune streaming experience even further.
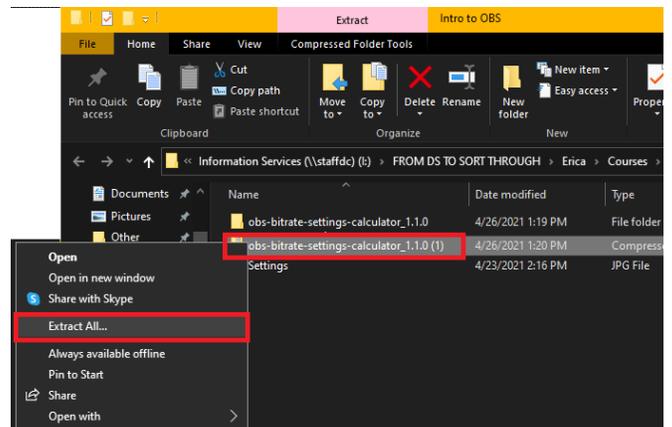
Installing OBS Scripts

While sometimes called a plugin, some additions to OBS are, actually, scripts like OBS Bitrate Settings Calculator. These additions are installed a bit different than other plugins (see below)

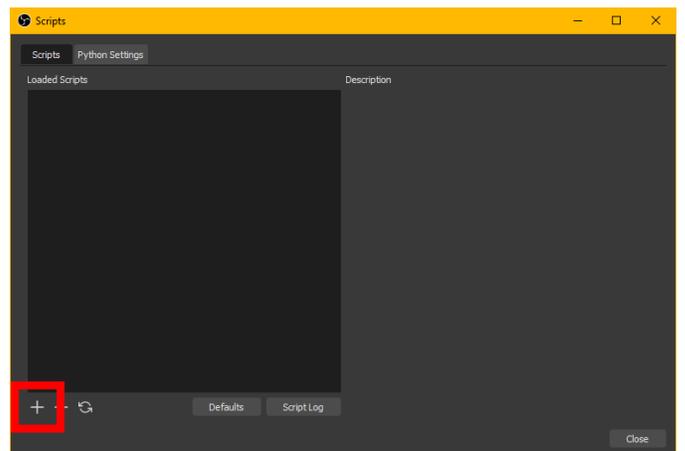Click Download on the script page to anywhere on your computer

Extract the Zip file (right click, extract), open the unzipped file
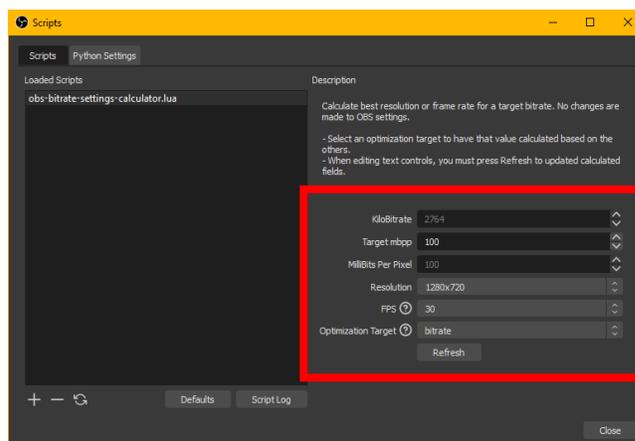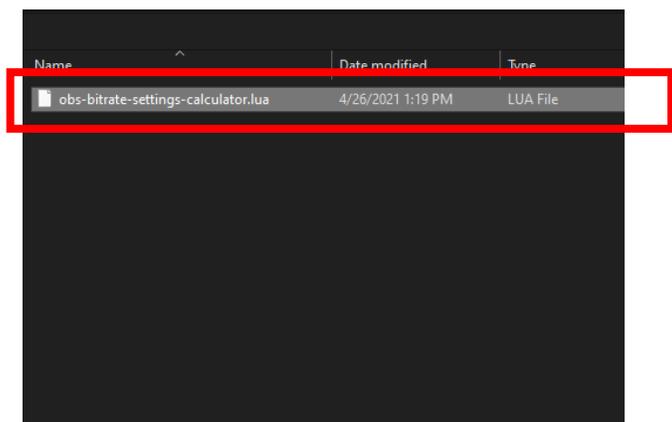
Open OBS, under Tools, click Scripts

In the Scripts Window, click the "**+**" icon

Return to the extracted script folder, find and select the **.lua** file

The script will be added to OBS. By using Bitrate as optimization target, 30fps and 720, this script recommends a bitrate of 2764

Bitratecalc.com

Don't feel like downloading scripts just yet? Bitrate Calc is an online resource that will also give you a ballpark bitrate range. Use any of the upload measurement websites listed above, find your upload speed, plug that number under "Your upload speed", allocate how much upload speed should be allocated for the stream (usually 50% of the total upload amount) 50% in Percept of Upload for Stream, under Output Stream Resolution Width (I'm going for 720p resolution) insert 1280 (the width of 720p resolution), in Output Stream Resolution Height, insert 720 and under

Output Frames per Second (fps) insert 30. These bits of information will yield a recommended bitrate, from low to high.
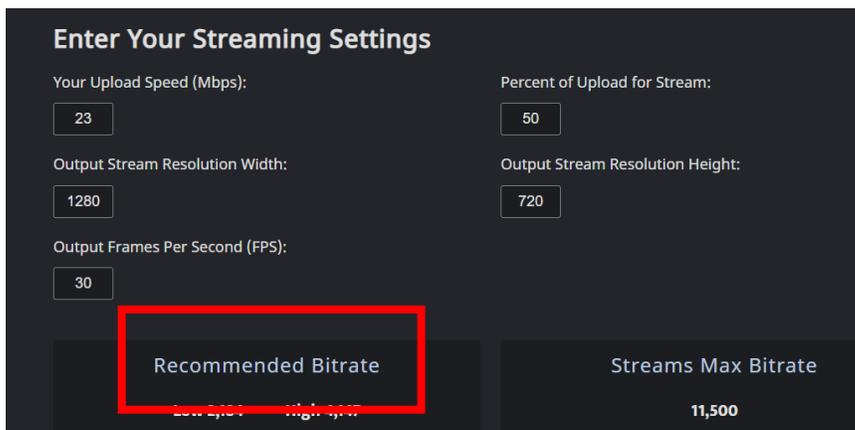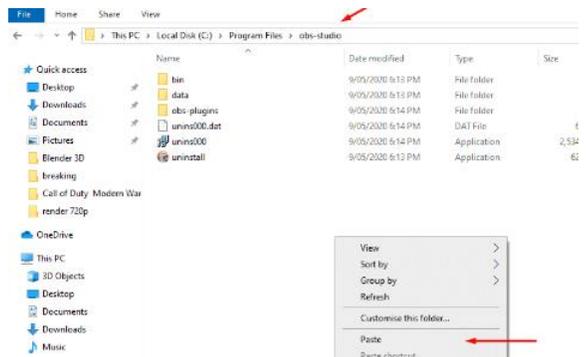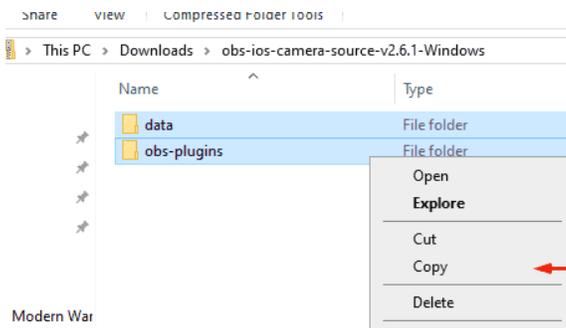
MANUALLY INSTALLING OBS PLUGINS (Windows)

NOTE: Make sure to close OBS Studio first

If the plugin has a .exe option, install it as you would any other program.
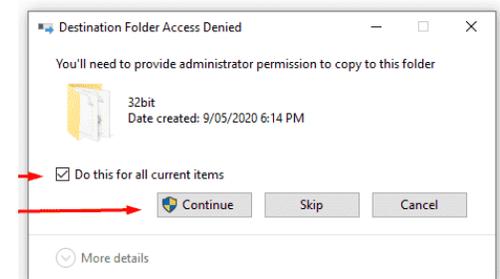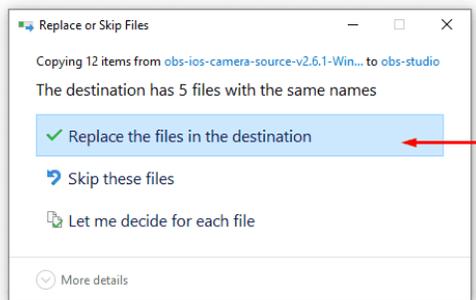
Download the zipped version of the desired plugin.
Double click the zip file
Select both folder and Copy them

Open your OBS installation folder, either
C:\Program Files\obs-studio\
or
C:\Program Files (x86)\obs-studio\
then paste.

If prompted to replace, choose to replace

if prompted for permission, grant permission (also helps to check the Do this for all current items

Open OBS Studio, click on "Tools" and see if the plugin downloaded

WHAT TO DO?

It's been our experience with OBS that, once its set up, it's incredible, but it can be a bit….. temperamental… getting to that point. Some combinations of settings are likely to cause stability issues, while others were solid and while the end goal is to have the video output look good, settings should create a balance between video image quality and file size (if recording).
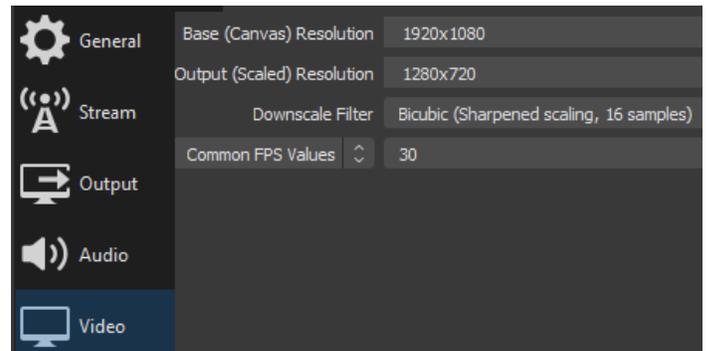
The video and output settings below are for stable, good-quality, low-file-size video; Feel free to adjust them to your tastes.

VIDEO

In OBS open the settings panel by clicking the **Settings** button at the bottom right of the interface:
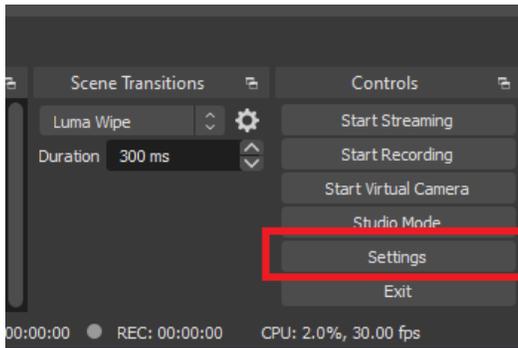
Click on **Video,** on the left side of the screen

The **Base (Canvas) Resolution** setting determines the area, in pixels, you wish to capture from your screen. It can either be the full size of the screen, or a smaller portion of it. Note that if you don't see the dimensions you want in the dropdown list, they can be manually type in with the format <width>x<height>, e.g. 1280x720.

The **Output (Scaled) Resolution** setting determines the resolution of the out video. It can either be the same as the base resolution setting, or smaller. If you set it to be smaller OBS will downscale your capture on the fly, allowing you to capture a "full HD" 1080p (1920 pixels by 1080 pixels) screen and output it to 720p (1280x720), for example.

If you do choose to downscale you'll need to be careful of which downscale filter you use. For recorded video production it's best to choose **Lanzos,** as this will give you the best quality. The other options are more suited to live streaming.

Finally, you'll need to set your **FPS**, or frames-per-second. Make sure it fits the framerate you want to edit and output your final video at, typically use **30fps** (30 frames per second is usually enough for most needs).

OUTPUT

Simple Output Mode
The output settings determine what kind of video file you'll end up with. By default, the output settings will be in **Simple** mode and look like this:

Advanced Output Mode
For advanced options, there are a few options in the 'Output' section. By using Advanced in the Output Mode, a three-tabbed interface with more options to choose from will appear
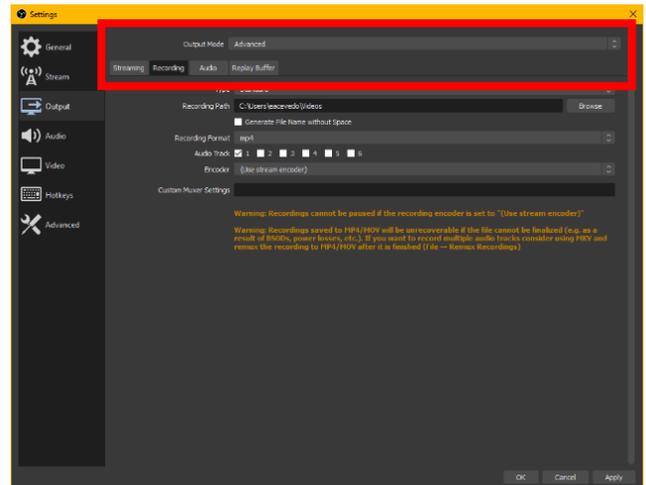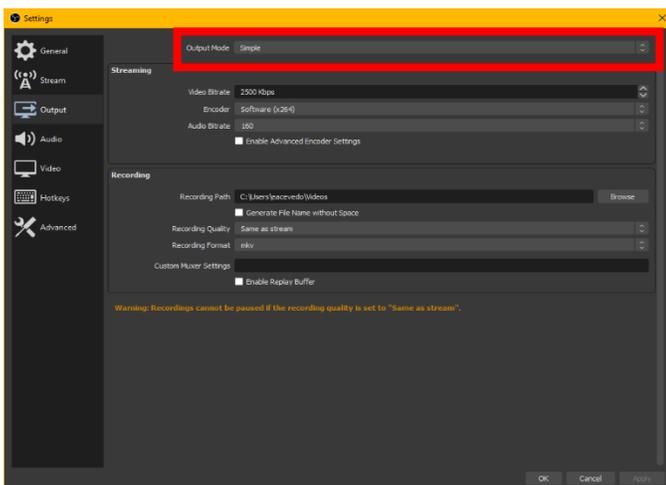
RECORDING

In the **Recording** tab, find the field labeled **Recording Path**, browse to the location the video should save to (if recording).

Change the **Recording Format** from **FLV** to **MP4**. Ensure **Encoder** is set to **(Use stream encoder)**, leave all other options on their default settings.

NOTE: When using MP4 as the recording format you may see a warning about recordings being unrecoverable in the event of power loss or other interruptions. MP4 is used by most but you'll need to decide if this is a potential issue, if so, use another video format, like MOV or MKV.

NOTE: although it's possible to switch the **Recording Format** to **Custom** (Under "**Type**") and set all your video properties in the **Recording** tab, this process tends to be prone to errors. Instead, even though we're not live streaming, we set **Encoder** to **(Use stream encoder)** and set our video output properties in the **Streaming** tab.

STREAMING

Switch into the **Streaming** tab; here is where the video bitrate information from earlier will be needed. There are several guides on YouTube that go into great detail on the subject of bitrates; we'll go over the basics.

Bitrate

Total audio + video bitrate number should be **smaller** than the upload speed. For example, if you choose a video bitrate of 2500 kbps and an audio bitrate of 256 kbps, your upload speed will need to be at least 2756 kbps or 2.7 Mbps.

If the upload speed is 3000 kbps (3 Mbps), you can stream with these settings.

Change the **Bitrate** to the recommended amount from any of the resources discussed earlier, as an example 2500 Kbps is set.

Keyframe Interval

The keyframes in a streaming video are complete images unlike the rest of the frames. Regular frames only contain data about what has changed since the last keyframe was captured. So, if you're streaming 30 fps, you've got 30 frames in total per second but not all of them are keyframes.

When it comes to live streams, the keyframe interval basically means the time a viewer will require to catch up to the ongoing broadcast. For example, if the keyframe interval is 2 seconds, then a viewer who just joined in will have to wait for 2 seconds before the feed is displayed. Leave at "0" for auto.

CPU Usage Preset

The encoder preset allows you to dictate how much CPU computing power you want to dedicate to video encoding. The relationship between the preset and time spent encoding is inversely proportional, so the lower the preset, the more time the CPU will spend encoding.

Also, keep in mind that the time spent encoding is directly proportional to the video quality. So, you need a lower preset time to achieve greater stream quality, e.g. 'veryfast' will yield the highest streaming video quality.

Change the **CPU** usage Preset to **either Veryfast, Superfast**, or UltraFast (experiment to see which of these encoder settings works best for you) and make sure the **x264** encoder is selected (if it is not already). Everything else can be left at default; this setup gives a good quality of recording along with stability.
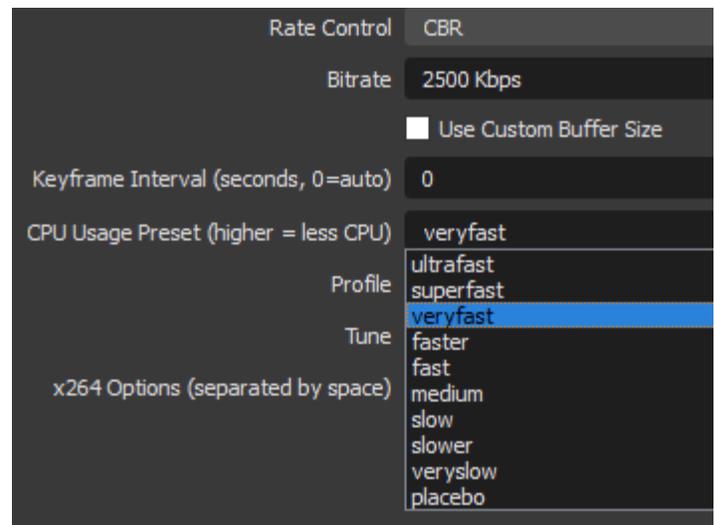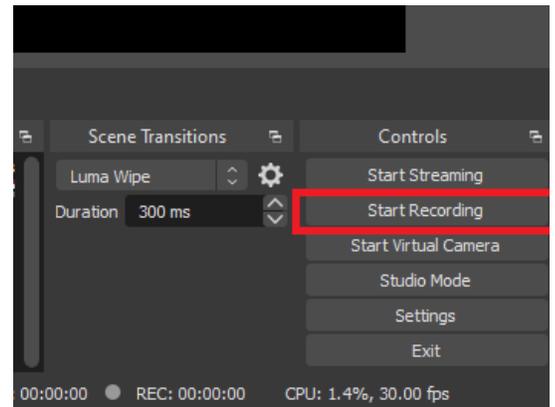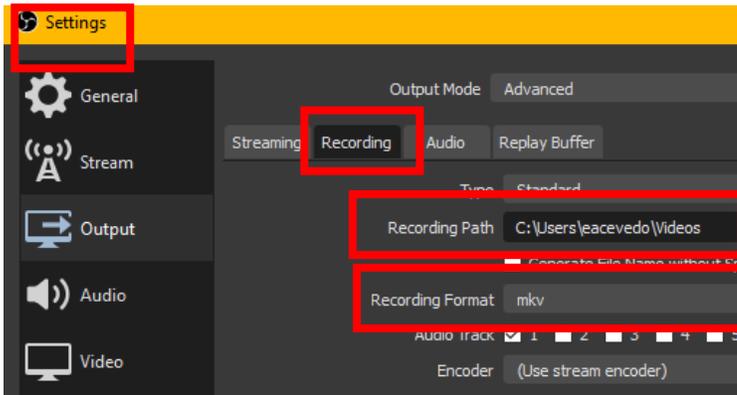
https://www.nvidia.com/en-us/geforce/guides/broadcasting-guide/

OBS RECORDING

One of the many useful features of OBS is the ability to record videos of your output. To do this, just click *'Start Recording'* (pending you're already designated the Save location and file type in the Recoding tab in Settings' Output tab from earlier in this handout).

To access the video recordings, go to *'File > Show Recordings'*.

NOTE: On Windows, the default location for OBS video recordings is your *'Videos'* folder unless changed in the Recording Tab in Output.

The OBS Encoder Overloaded Error Message

If OBS flashes an 'Encoding overloaded!' warning this means that your computer can't encode the video quickly enough. As a result, the output stream can freeze or lag.
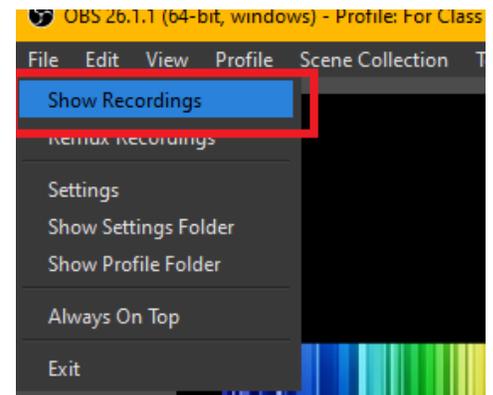
Encoding overloaded! Consider turning down video settings or using a faster encoding preset.

To resolve the issue, try downscaling the resolution. The resolution quality that you specify in OBS has a significant impact on your CPU usage. For instance, a 4K resolution has more than twice the number of pixels in each frame, as opposed to a 1080p resolution.

As your resolution increases, so does your CPU usage. Here's how to adjust it:

    Click on *'Settings'* when you open OBS
    Click on the *'Video'* option
    Skip the *'Base (Canvas) Resolution'* option and tweak the *'Output (Scaled) Resolution'* box.