

# **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.

<b>Q</b>	Columbia		
0.40			
A' man		200 files	
C and a second	feader	Seference (1994)	
Carlo contra	Auto Directo		
<b>4</b> 1) Andre		Endik Advand Drade Sellege	
-	Recording Factor	C Unerviel From	
City over 1		Conversite Tile Trans without Typece	
مد ا	Recording Quality		
Advent	face the face of		
	Called Now Sellings		
		Endin Tradity Suffer	

## **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

-bit, windows) - Profile: For Class - Scenes: For Class Profile Scene Collection Tools Help Auto-Configuration Wizard Decklink Captions Decklink Output Captions (Experimental) Automatic Scene Switcher Output Timer 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

Scripts			- 0	×
Scripts Python Settings				
Loaded Scripts	Description			
obs-bitate-settings-calculator.lua	Calculate best resolution made to OBS settings. - Select an optimization others. - When editing text conf fields.	n or frame rate for a target bitra target to have that value calcula trols, you must press Refresh to	te. No chang ated based or updated cak	es are n the culated
	KiloBitrate Target mbpp MillBits Per Pixel Resolution FPS () Optimization Target ()	2764 100 103 1280x720 30 bitrate Refresh		
+ — 'C; Defaults Script Log				
				Close

# 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

Enter Your Streaming Settings	
Your Upload Speed (Mbps):	Percent of Upload for Stream:
	50
Output Stream Resolution Width:	Output Stream Resolution Height:
1280	720
Output Frames Per Second (FPS):	
30	
Recommended Bitrate	Streams Max Bitrate
	11,500

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



#### If prompted to replace, choose to replace



Open your OBS installation folder, either C:\Program Files\obs-studio\ or

C:\Program Files (x86)\obs-studio\ then paste.



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

Destination	Folder Access Denied		-		×
You'll need	to provide administrator pe	ermission to copy	to this	folder	
and and	32bit Date created: 9/05/2020 6	:14 PM			
_					
Do this f	or 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:

# Scene Transitions Luma Wipe Controls Start Streaming Duration 300 ms Start Recording Start Virtual Camera Studio Mode Settings Exit 00:00:00 REC: 00:00:00 CPU: 2.0%, 30.00 fps

#### 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

General Output Hole: Single   Output Hole: Single Output Hole: Single   Output Hole: Single Made Bitade: 200 Apple   Output Hole: Single: Gelde Brade Advanced Single: Gelde   Value: Brade Advanced Single: Gelde   Witch: Recording Faith: C. Labers Sinceredo Nados   Brade Advanced Single: Generate Hie Itarse without Stoce: Bracedeg Coulti: Sins as at shears   Braced og Coulti: Sins as at shears   Counter Bit Itarse mithout Stoce: Braced og Coulti: Sins as at shears
Streaming     Streaming       When the stream 2000 Opport     Brooker Software (2000 Opport       Image: Software (2000 Opport     Brooker Software (2000 Opport       Image: Software (2000 Opport     Brooker Software (2000 Opport       Image: Velocity     Recording       Image: Velocity     Recording       Image: Velocity     Recording       Image: Velocity     Recording Velocity       Image: Velocity     Software Velocity
Iddeb Bitale 200 Rps Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   Image: Control to the Strate (2014) Image: Control to the Strate (2014)   <
Codput Broader Software (36%) C   Audo Btader 30 Audo Btader 30 C   Valor Excerding Inside Advanced Incoder Software   Valor Recording Inside Advanced Incoder Software   Without Recording Inside Advanced Incoder Software   Without Recording Fash C. Libert Piscewich (Modes)   Broader Quality Recording Fash C. Exercise Teic Tane without Soace   Advanced Recording fash at inside and tane without Soace C
Vides     Recording       Image: Huikays     Recording Fahl: C. (Johns Nexce-shi Vides)     Browne       Image: Huikays     Image: Concrete Facilitation without Space     Image: Concrete Facilitation without Space       X Advanced     Recording Fahl: C. (Johns Nexce-shi Vides)     Image: Concrete Facilitation without Space     Image: Concrete Facilitation without Space       Main: C. (Johns Nexce-shi Vides)     Image: Concrete Facilitation without Space     Image: Concrete Facilitation Wides     Image: Conconcrete Facilitation Wides     Image:
Vale     Recording       ₩ Hotkeys     Recording Path     C12berr (secneda)/blos     Broase       ★ Advanced     Recording famile     Concrete He hane without Soce     Concrete He hane without Soce       ★ Advanced     Recording famile     Concrete He hane without Soce     Concrete He hane without Soce
Hotkeys     Recording Path     C: Libert-place-reds/bibles     Browset            • Concrete Tiel tame without Space           • Concrete Tiel tame without Space           • Concrete Tiel tame without Space             X Advanced           Recording format           ©           ©
Atheneed Recording Quality Series existence in Second Provided International Second Pro
X Abanced Recording Quality Same as abeam 0 Recording Format Indo
Custom Pluxer Settings
■ Enable Replay Buffer

Settings		
🛱 General	Culturt Mode Advanced	
(*)) Stream	Streaming Recording Audio Replay Buffer	
- Outrut	Recording Path C: Vicerclevence Waless	fraze
- Contra	Generate File Name without Space	
() Audio	Recording Format mp4	
	Audo Track 🗹 1 🔜 2 🔜 3 🔜 4 🔜 5 🔜 6	
Video		
	Curtue Muser Fattlage	
Hotkeys		
Hotkeys	Warning: Recordings cannot be passed if the recording encoder is set to "(the stream encod Warning: Recordings arout to 1992/1992 will be unrecoverable if the life cannot be findered ( result of 8500b, power bioscs, etc.). Jhy our want to record multiple andle brack conduct waite remute the recording to 1994/1997 with etc. is almost file of the - Recording 1994	
Hotkeys	Warning: Recardings cannot be paraed if the recording encodes is yet to "(the stream encode Warning frequencing a severit to 1994/1999 will be moreoversiting d the file cannot be frequency remove the recording to 1994/1999 will be instanded (7 de — Remove Recordings)	
Hotkeys	Construction & Wary Warning: Recordings associa to the 2019/07 will be an encourceable of the file-caused be finalward ( Yarning becoming a social to 1920/07/100 will be an encourceable of the file-caused be finalward ( Young of the State of the Young of the State	
Hotkeys	Warning Recordings cannot be passed of the recording encoder is set to "(Use stream encoder Warning Recordings assed to 1994/1907 will be encoursed of the file caused be finalized of strain of (Str06, power losses, virt), it you such to record multiple and to fork transfer and remark the recording to 1994/1979 after it to finalized (He – Remark Recordings)	
Hotkeys	Warning, Recarding cannot be payed if the recording recorder is set to "Operational encode Warning Recardings accels to (947)/1979 will be uncovered and a description of the recordence of recard in Bottom, pages whereas (c): 3 grow and the record multiple intertrols cannot be interted at research the recording to 1987/1979 after it is funded () for — Remon Recordings)	
Hotkeys	Warning: Recordings soved to 1994/1997 will be moreoversiting the factor of the first stream encode Warning: Recordings soved to 1994/1997 will be moreoversiting the file cannot be facilitated ( remove the recording to 1994/1997 after it is familied () is — Remove Recordings)	
Hotkeys	Warning Recordings consult be passed if the recording encoder is set to "Une stream encod Warning Recording a special to (MP)(100 will be recording the disc course be beinked of receive of BOOMs, power warns, r.r. (F) was man the record installate and tracks counsils and the recording to (MP)(200 will if it is a funded if the - kannak Recordings)	
Hotkeys	Warning, Recarding cannot be payed if the recording recorder is set to "Operational encoded Warning Recarding a provide to (994/1997) will be unconverged at the for convolve to findewide ( with the flatters, prove the second set (1), and the intervent institution intervence the intervence (intervence researches to recording to 1994/1997 after it is fundered () for — Remon Recordingcy)	
Hotkeys	Warning: Recarding cannot be paraed if the recording encoder is yet to "One stream encode Warning Recardings averated to 992/1997 will be increasered in the file cannot be freshed of researcher recording to 1921/1937 will of its feashed (Tel = Remov Recordings)	
Holkeys	Warning Recordings consists be passed if the recording microler is set to "(the stream encod Warning Recordings served to (MP)(MP) will be recording the first course be finalized a result of BOOKs, prove warning, rel 2 year warning to record installed particular trans- remus the recording to (MV) plant it is finalized (The — Remus Recordings)	
Hotkeys	Warning, Recarding cannot be payed if the recording recorder is set to "Ope stream encod Warning Recarding a provide to (947/1979 will be uncovered by the interview of the stream of the interview of the intervi	
Holkoys	Warning: Recardings cannot be paraet if the recording encoder is yet to "One stream encode Warning Recardings avered to 992/1997 will be monocorrected at the file file cannot be finalized for researche recording to 1921/1997 will of its feasbed (7 de – Kenne Recordings)	

#### 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.

Rate Control	CBR
Bitrate	2500 Kbps
	Use Custom Buffer Size
Keyframe Interval (seconds, 0=auto)	0
CPU Usage Preset (higher = less CPU)	veryfast
Profile	ultrafast superfast
Tune	faster
x264 Options (separated by space)	fast medium slow slower veryslow placebo

#### **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.

**NOTE:** If your computers comes with an NVIDIA graphics card, nvidia has put together a whole guide as to what settings to use with OBS

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).



ъ Scen	e Transitions	Ŀ,	Controls	Ę.
Luma W	ipe 🗘	. ب	Start Streaming	
Duration	300 ms	$\Rightarrow$	Start Recording	
			Start Virtual Camera	
			Studio Mode	
			Settings	
			Exit	
00:00:00 ●	REC: 00:00:00	СР	U: 1.4%, 30.00 fps	

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.



🐨 OBS 26.1.1 (64-bit, windows) - Profile: For Class

