

Exporting Video

Learn how to export high-quality video in Premiere Pro.

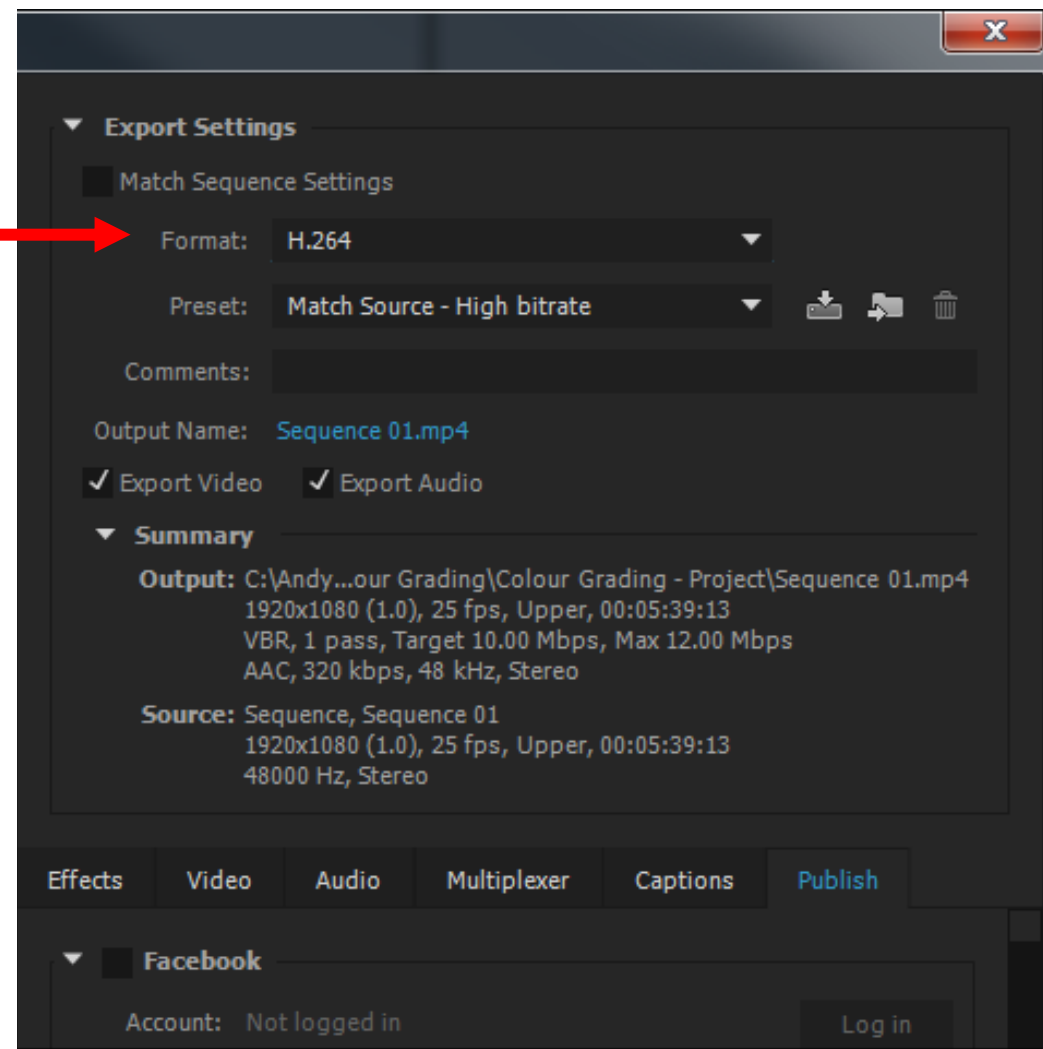
Exporting Video

In the **Export Settings** panel, you will list of options:

By selecting the **H.264 : format** you will produce a pretty good high-quality video.

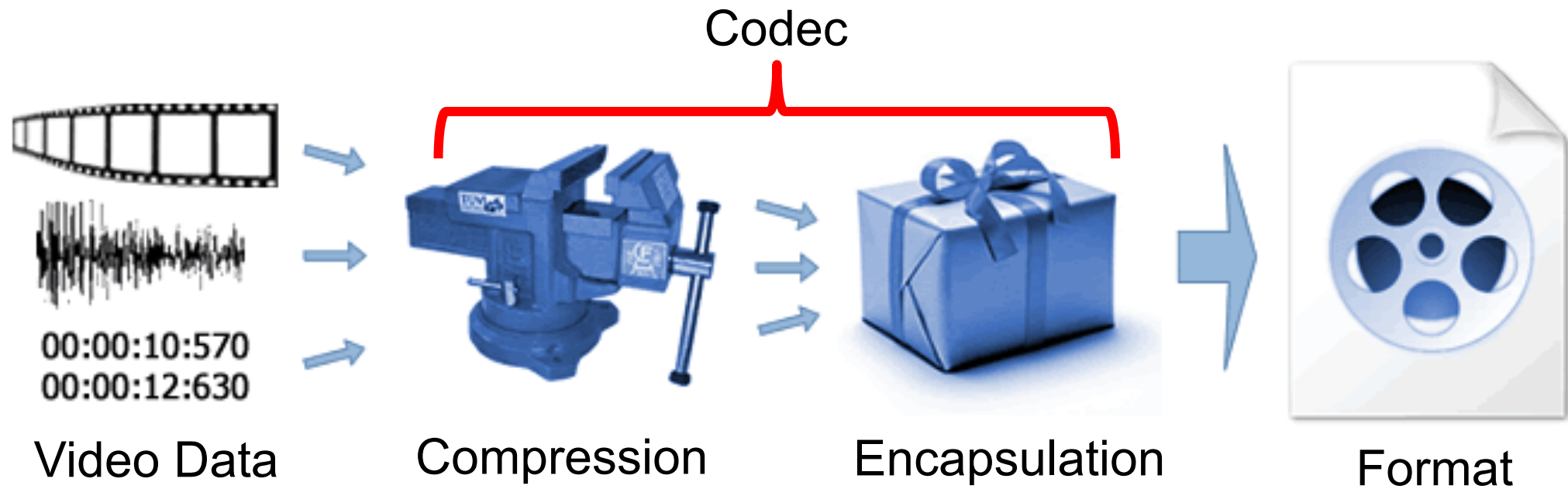
**But does any of this mean
..and who really cares?**

Just click the make video button and get on
with your life!



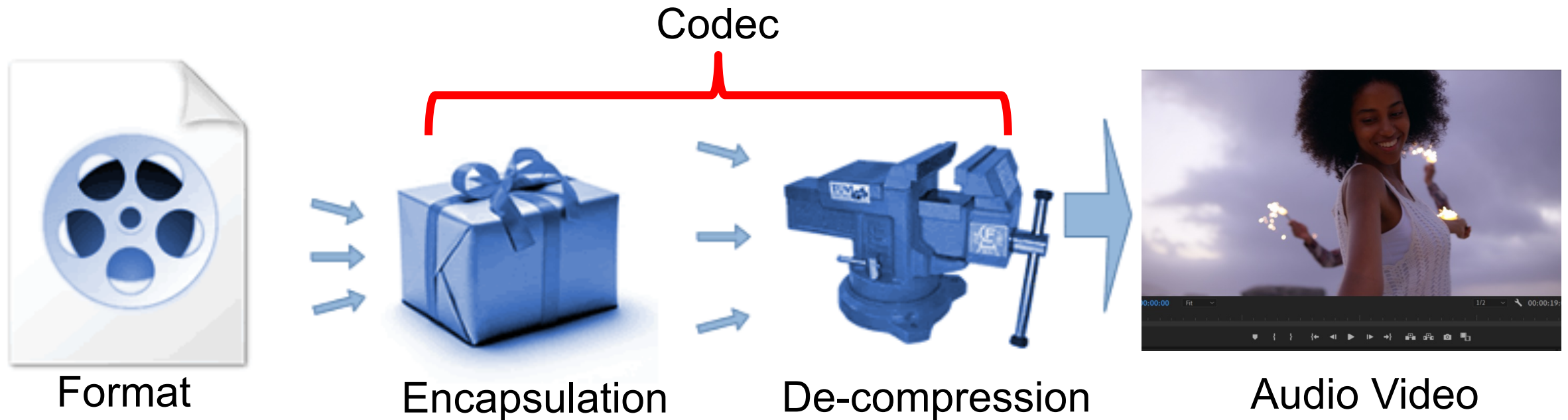
Exporting Video

High quality uncompressed video files are huge and therefore needs to be compressed before it can be transported..



Exporting Video

Then that compressed files need to be de-compressed before it can be viewed on another device...

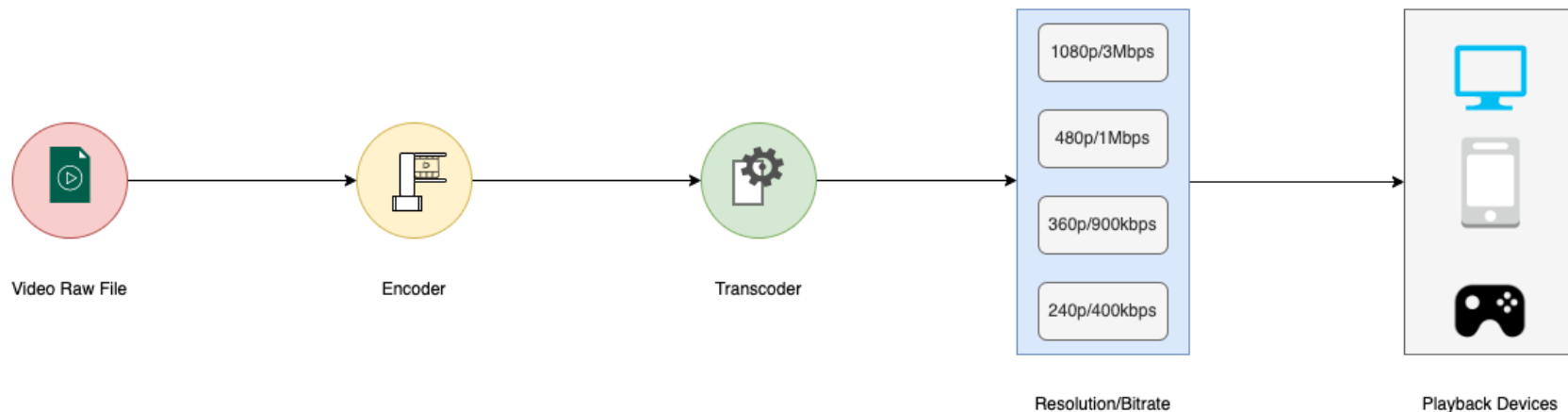


Exporting Video

Before clicking the “**Make Video Button**” we need to know a video file's encoding format, resolution, bit rate, or other parameters to ensure compatibility with different devices or platforms.

Video Transcoding is the process of converting a video file from one format to another.

Video Encoding is a process for making video files smaller using compression for video consumption via the web.



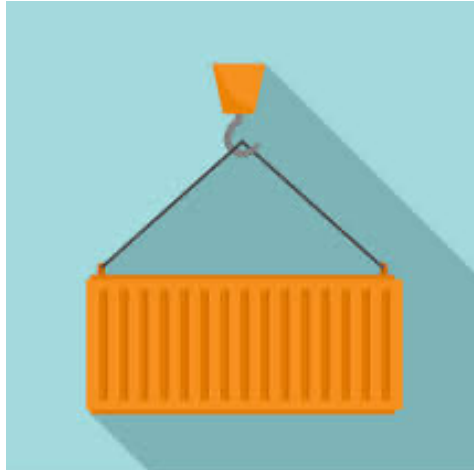
Exporting Video

Here are the most important thing you need to know!



Codec

+



Container

=



Format

Exporting Video

Topics:

1. Codecs
2. Containers
3. Formats
4. Export Settings

1. Codecs



Video compression uses two different parts: a **codec** and a **container**.

- compressing a video means removing some information which will almost always result in a loss of quality

Basically, a **Codec** is an algorithm that allows for compression and decompression of video with the least loss of quality:

- For example: **H.264** is the recommend **codec** to use with an **MP4 container** to produce an **.mp4 file format**

2. Codecs



Although, **codecs** are integrated into **containers** and video **formats** are largely defined by those containers:

- ...and most computers/ cameras come with several preinstalled **codecs**
- Not all **codecs** are compatible with all **containers**
- Not all **codecs** are compatible with all **devices**

2. Codecs



To better understand what a **codec** is we need to talk about why file compression is important...

1 minute of video shot on an iPhone

	720p at 30FPS	720p at 120FPS	720p at 240FPS	1080p at 30FPS	1080p at 60FPS	1080p at 120fps	1080p at 240fps	4K at 24fps	4K at 30fps	4K at 60fps
iPhone 5s	60MB	230MB	/	130MB	/	/	/	/	/	/
iPhone 6/Plus	60MB	230MB	300MB	130MB	175 - 200MB	/	/	/	/	/
iPhone 6s/Plus/SE	60MB	/	300MB	130MB	175 - 200MB	350 - 375MB	/	/	350 - 375MB	/
iPhone 7/Plus	40MB (HEVC) 60MB (H264)	/	170MB (HEVC) 300MB (H264)	60MB (HEVC) 130MB (H264)	90MB (HEVC) 175MB (H264)	170MB (HEVC) 350MB (H264)	/	/	170MB (HEVC) 350MB (H264)	/
iPhone 8 - iPhone 11	40MB (HEVC) 60MB (H264)	/	300MB (H264)	60MB (HEVC) 130MB (H264)	90MB (HEVC) 175MB (H264)	170MB (HEVC) 350MB (H264)	480MB (HEVC)	135MB (HEVC) 270MB (H264)	170MB (HEVC) 350MB (H264)	400MB (HEVC)

2. Codecs



Lossy compression creates smaller files, but it leaves out some of the data resulting in lower video quality and smaller files

Lossless compression keeps all of the data from the original file resulting in higher video quality and larger files

2. Codecs



H.264 was more or less the standard for video for quite a while:

- Developed for BluRay discs
- Adoption across all kinds of players and cameras
- Most compatibility for larger files good image quality and efficient compression
- It's the safest option but it's not as powerful as **H.265**

2. Codecs



H.265 aka **HEVC**, has become the preferred codec for many:

- It was designed specifically for **4K video**
- Offers very efficient compression, giving high-quality video with relatively small file sizes
- Most players will readily play **H.265**
- Is perhaps the most efficient codec currently available
- At least until **H.266** becomes available

2. Codecs



MPEG-4 was once an extremely common codec:

- It has lost popularity to **H.264** and **H.265**
- Is still very much usable...

But what does a codec actually do?

2. Codecs

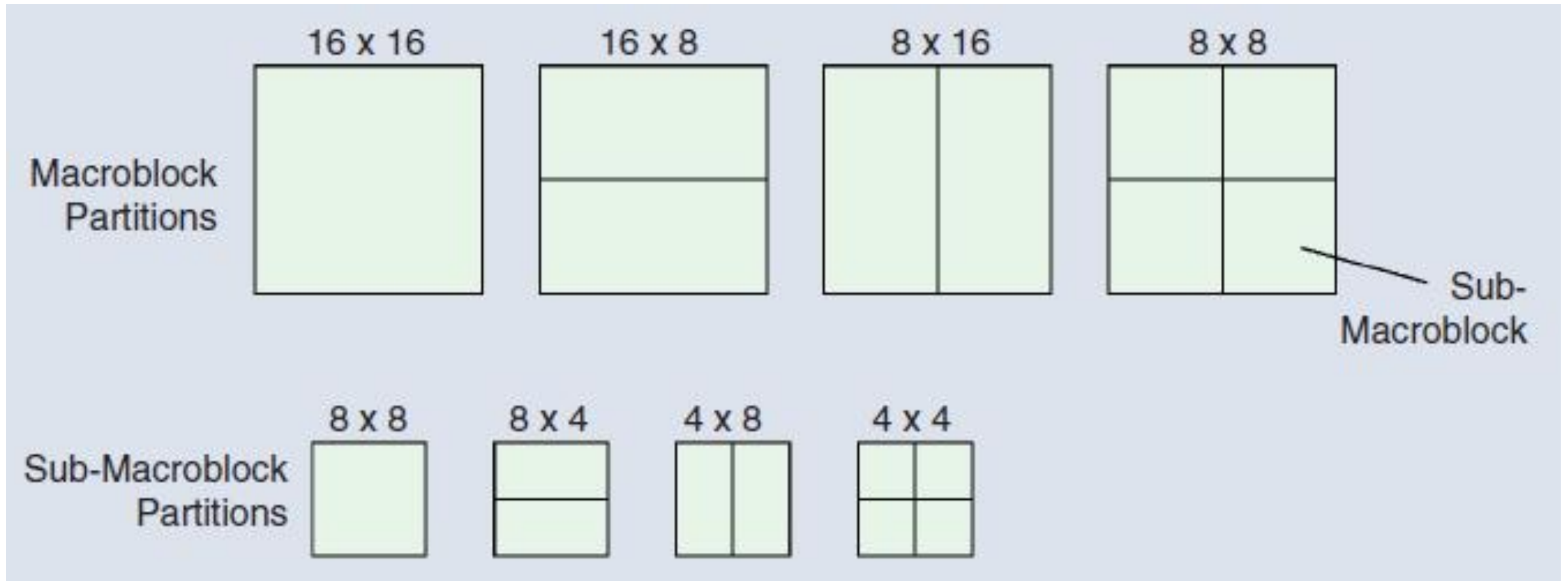


Codecs are in charge of interpreting data content by analysing different types of images **Macroblocks** and **motion Vectors**:

Then compressing that data and storing it in **GOPs** (Group of Pictures)

2. Codecs

Macroblocks consist of 4, 8 and 16 pixel blocks



2. Codecs



Macroblock and **motion Vectors (GOPs)** are processing units based on **Inter-Prediction** linear block transforms:

- Intra
- Predicted
- Bi-Directional Predicted

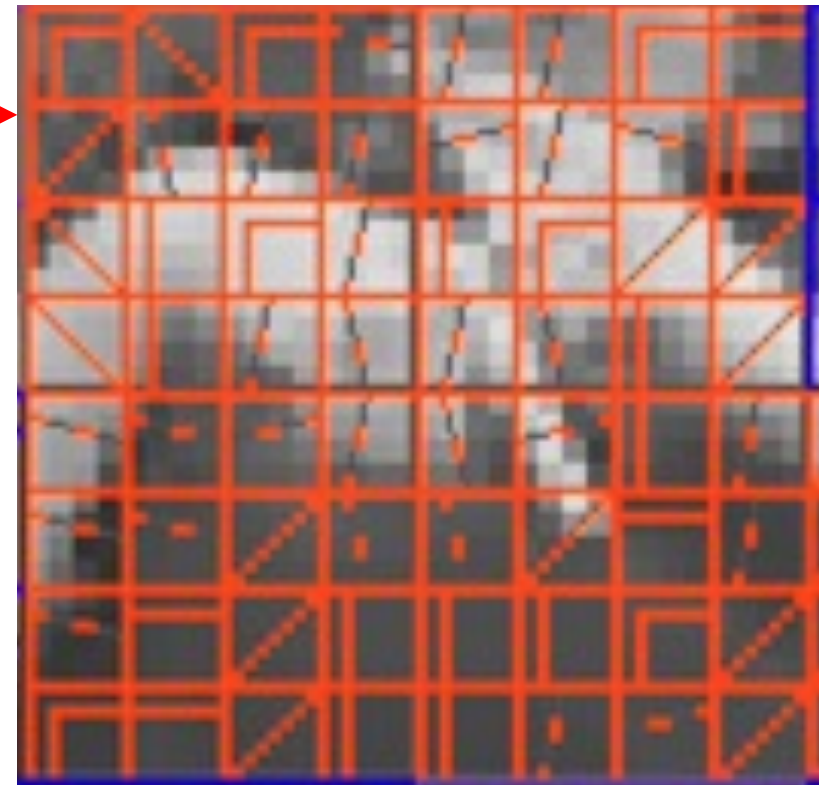
2. Codecs



A **Macroblock** filter allocates a colour to a **GOP** when a specific condition is met:

- **I (Intra)** → are completely refreshed frames where all the images are newly encoded

They only reference themselves and do not rely on any other images

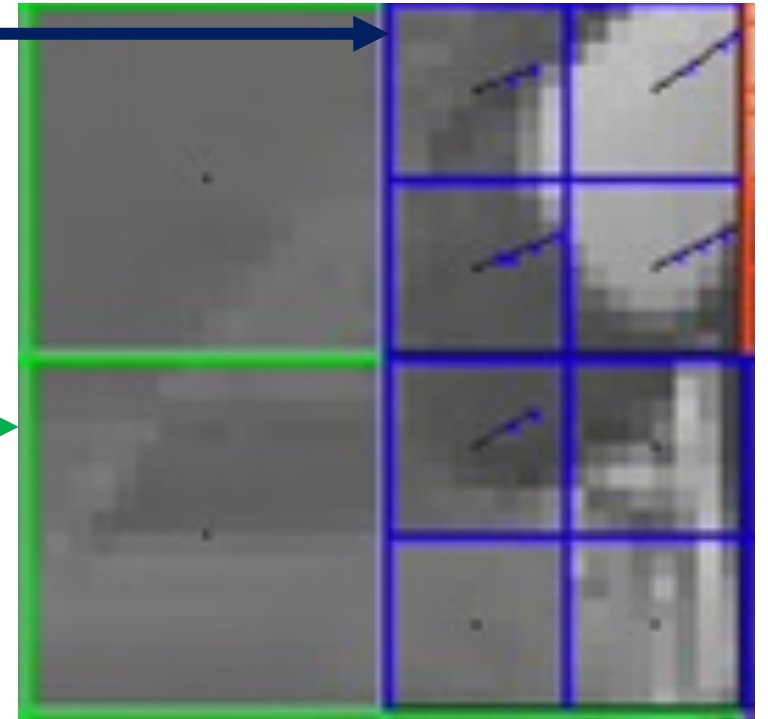


2. Codecs



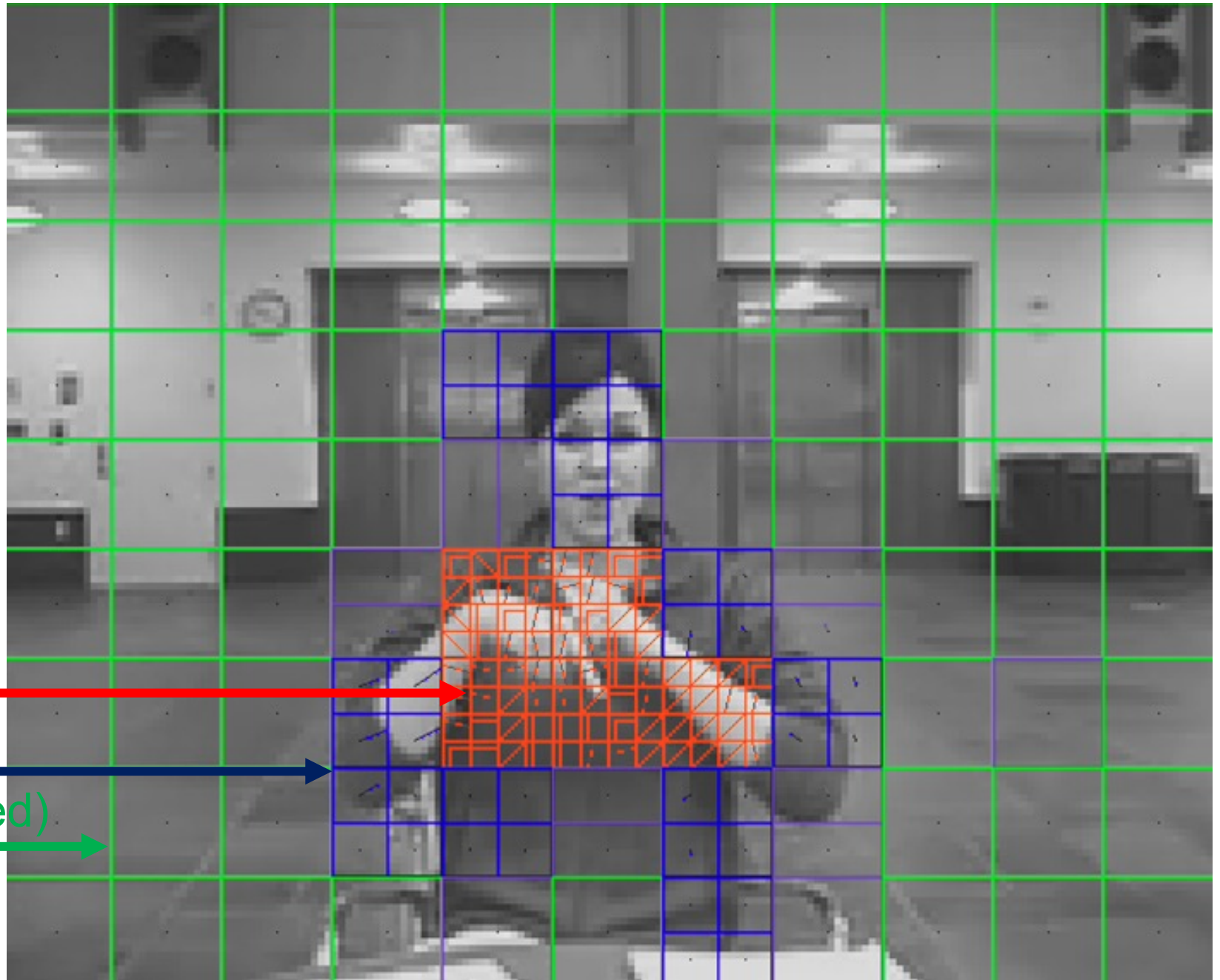
Predicted and **Bi-Directional** frames, use previously decoded reference images:

- **P** (Predicted) —————→ are newly encoded, copied, moved or changed to construct a full picture
- **B** (Bi-Directional Predicted) —————→ are encoded and decoded and referenced for future display

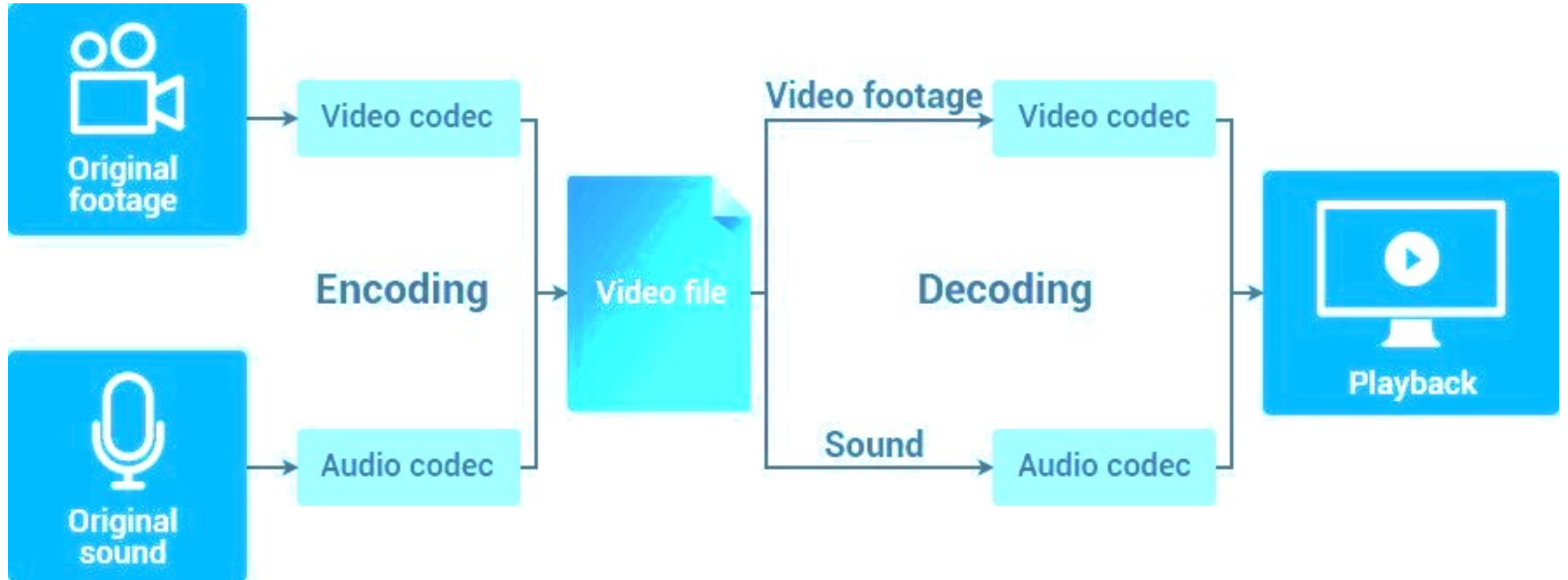


2. Codecs

- I** (Intra)
- P** (Predicted)
- B** (Bi-Directional Predicted)



2. Codecs



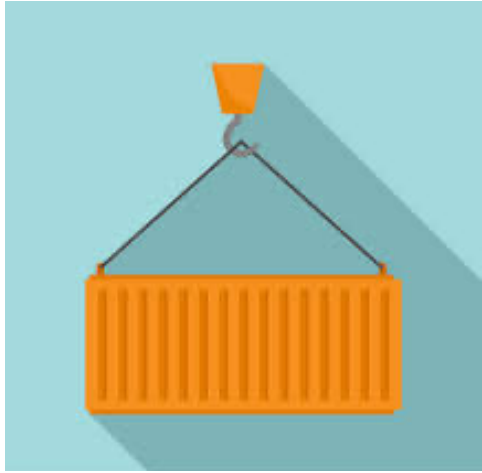
Guided Practice

Export a portion of your video for testing 5 -10 seconds:

- Export using the **Quicktime codec** pre-set
- click on **Output Name:** (*XX.mov*) save it to your project folder
- Press **Export** and wait...

Encoding a few seconds of your video shouldn't take very long

2. Containers



The average consumer is typically less concerned with **codecs** and far more concerned with **containers**:

- **Containers** are comprised of a **video codec** and an **audio codec**
- But may also contain subtitles and other metadata...

For example: a high-quality DTS audio soundtrack may be compressed to an MP3 to reduce the file size

2. Containers



Video containers bundle and store all elements of a video into one package:

- Each **container** is compatible with certain **codec**
- Your editing software should only allow you to choose compatible pairings
- **Containers** are best understood by file **formats** they produce

2. Containers



The most commonly used *video containers* are **AVI**, **MOV**, **MP4** and **MPEG**:

- These **pre-sets** may determine the video **file size** and **aspect ratio**
- higher bitrate = larger files = better quality and visa versa...



2. Containers



AVI is a container that produces the **.avi** file format:

- Once dominate the video container market
- can use an enormous range of codecs, resulting in a large variety of different file settings
- can be played on a wide range of players
- file sizes tend to be large making it less ideal for streaming or downloading
- It's a great option for videos you plan to store on a computer

2. Containers



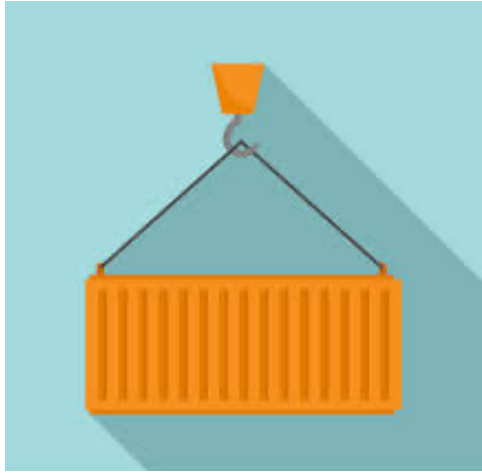
MP4 is a universal standard container that produces the **.mp4** file format:

- Popularized by Apple in the iTunes Store, iPad and AppleTV
- Is compatible with **H.265**, **H.264** and **MPEG-4 codecs**
- Is compatible with a huge range of players

Is capable of compressing high quality Video into relatively small file sizes without a great loss of quality:

- Preferred by YouTube and Vimeo
- can store video, audio, text and images

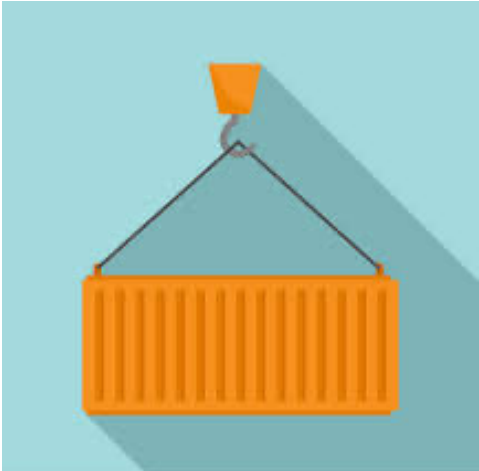
2. Containers



AVCHD (Advanced Video Coding, High Definition) is the result of a collaboration between Panasonic and Sony:

- designed for consumer equipment like digital camcorders
- it uses **H.264/MPEG-4 codecs**
- Perfect for storing hours of video using little data without significantly sacrificing visual quality
- The latest edition **AVCHD 2.0** supports 3D video.

2. Containers



Quick Time is a container that produces the **.mov** file format:

- also compatible with a wide range of **codecs**
- Metadata can be separated into a variety of tracks (fx: video, audio, effects, and/or text)

Matroska is a container that produces a **.mkv** file format:

- supports nearly every codec and is supported by nearly every player
- Produces High quality video with small file sizes

Guided Practice

Open the supplied video file in Premier Pro and identify the file:

- **Codec**
- **Container**
- **Format**
- **and file size**



3. Format



Format is the file type produced by the combination of the **codec** and the **container**:

- not every **format** is compatible with every platform

HDV comes in a variety of file **formats** [See the full list here](#)

3. Format



Some other examples of file **Formats** are:

- **Audio** - .mp3, .wav and .aiff
- **Graphic** - .jpg, .bmp and .png
- **Text** - .pdf, .doc and .html
- **System** – .exe, .cab and .dll



So which video **Format** is the best for high quality video?

That depends on what you are using it for...

3. Format



.3G2	3G Mobile Phone Video
.3GP	3G Mobile Phone Video
.ASF	Advanced Systems Format Video
.AVI	Audio Video Interleave
.BIK	Bink Video
.BIN	Binary DVD Video
.DAT	VCD Video
.DIVX	DivX Movie
.DV	Digital Video
.FLV	Flash Video
.GXF	General eXchange Format
.M1V	MPEG-1 Video
.M2TS	MPEG-2 Transport Stream Videos

.MPEG4	MPEG-4 Video
.MPG	MPEG Video
.MTS	AVCHD Video File
.MXF	Material eXchange Format
.OGM	Ogg Multimedia Container File
.RM	RealMedia Streaming Media File
.RMVB	RealMedia Variable Bitrate Media File
.SWF	Adobe Flash Movie
.TS	DVD Video
.VOB	DVD Video Object
.WMV	Windows Media Video

3. Format



The answer will drastically alter the kind of **container** and **codec** you should use:

- Consider how you will be distributing and delivering your video
- **H.265, H266** are good **codecs** for **.mp4 Format**
- but **H.264** is preferred by **YouTube** and is most common on all video cameras

3. Format



AVCHD (Advanced Video Coding High Definition) produces **.mp4 .mts (lossy)** and **.mxf (lossless)** format

- developed by **Sony** and **Panasonic** in 2006
- files can be transferred with **no conversion** required
- Most **HD video cameras** use this compression format

- But **.mts (lossy)** and **.mxf** can't be played in all players
- nor be recognised on iOS because of the exFAT file system

Read more here: <https://www.softwaretestinghelp.com/exfat-vs-ntfs>

3. Format



AVI (Audio Video Interleaved) is a media container that stores nearly any format of audio and video for **.avi format**.

- contains video and audio information
- based on an older **MPEG-4 Codec**
- can be played on compatible with most devices, smart TVs and disc players
- But produces huge files and is not good for streaming
- It was superseded by the **MKV** (Matroska) file format

3. Format



MP4, short for **MPEG-4 Part 14**, is a popular video **Container** also for the **.mp4 format**:

- will play on the majority of well-known media players
- Is accepted by most video sharing platforms
- is good for streaming with closed caption file formats
- supports 3D objects
- But some files may cause video software to crash if not paired with the suitable **codec**

3. Format



Microsoft video streaming format **.wmv** (Windows Media Video) drastically reduced file sizes for transfer:

- used to store video files in Windows operating system
- Used on Xboxes and live streams
- But image quality reduces after compression
- Not compatible with iOS devices

3. Format



Apple's **QuickTime** container produces **.mov** formats:

- is similar to the the **MP4 Codec**
- allows users to edit video in the **QuickTime Player**
- Metadata can be separated into numerous tracks and types
- can also be easily used in conjunction with other formats
- can be easily converted from **.mov** to an **.mp4 format**
- But it produces relatively large files compared to other formats

3. Format

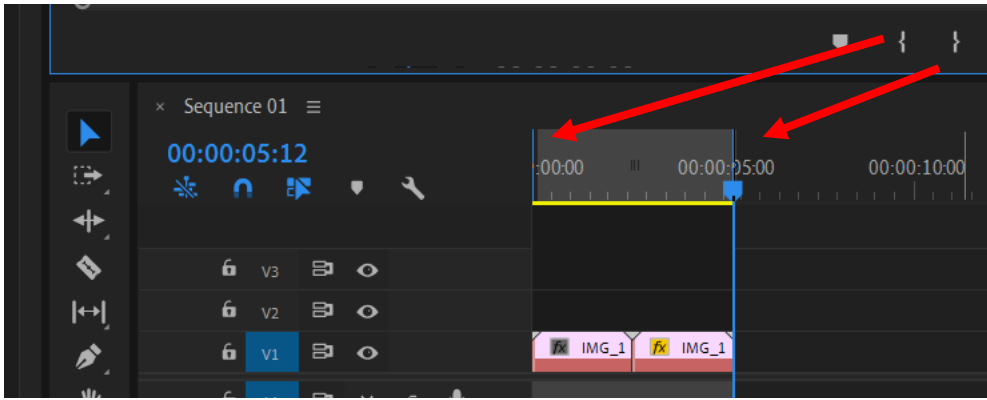


Google's **.webm** and Theora's **.ogg/ .ogv** are **HTML5** video container **formats**:

- supported by all browsers
 - Great for streaming and Chromecast
 - open source and royalty-free
 - can be edited in some software tools
-
- But is highly compress and metadata can't be separated

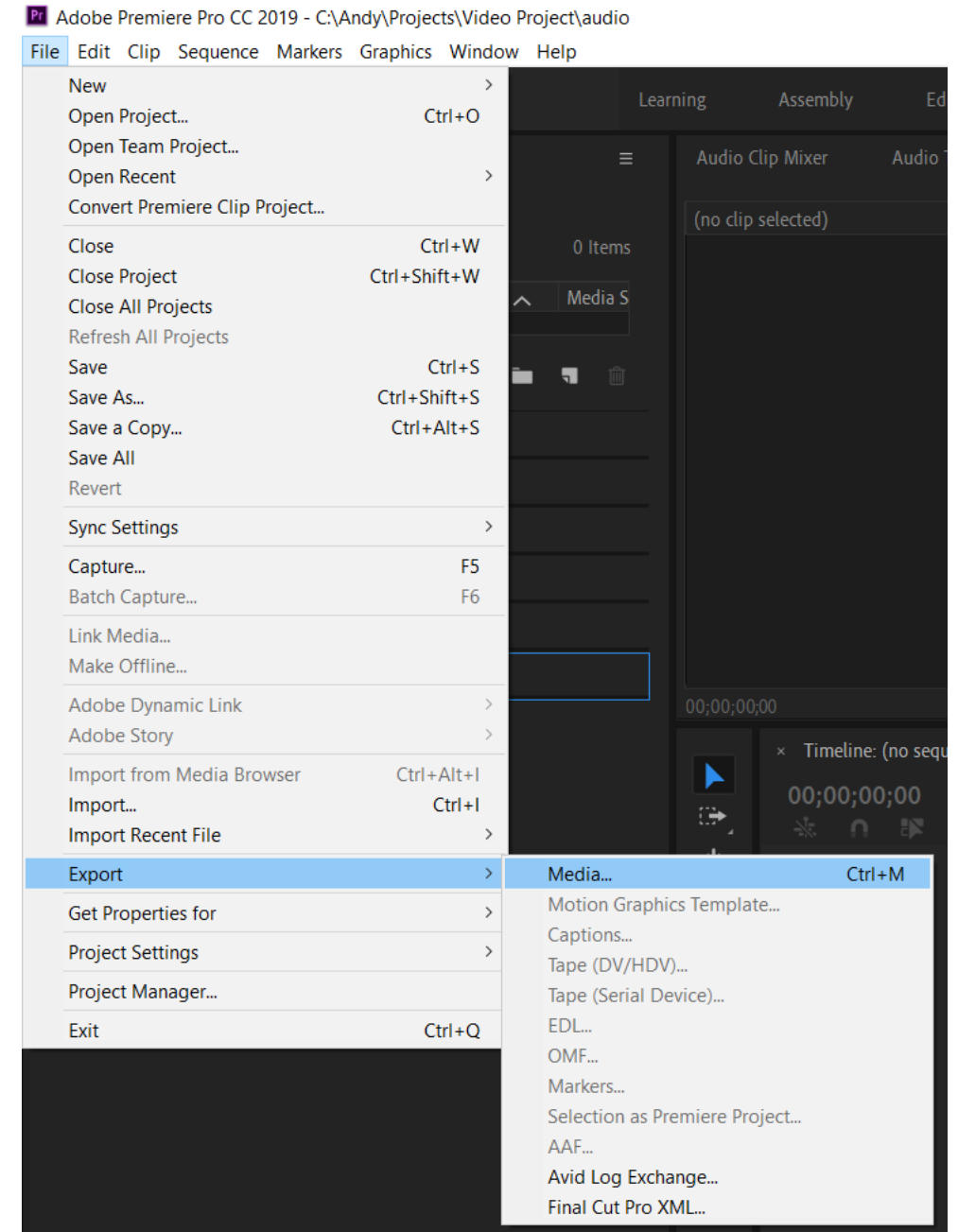
3. Format

Use the scrubbing bar to select a portion of video to test exporting:



Then open the **Export Settings Panel**:

- Choose **File > Export > Media**

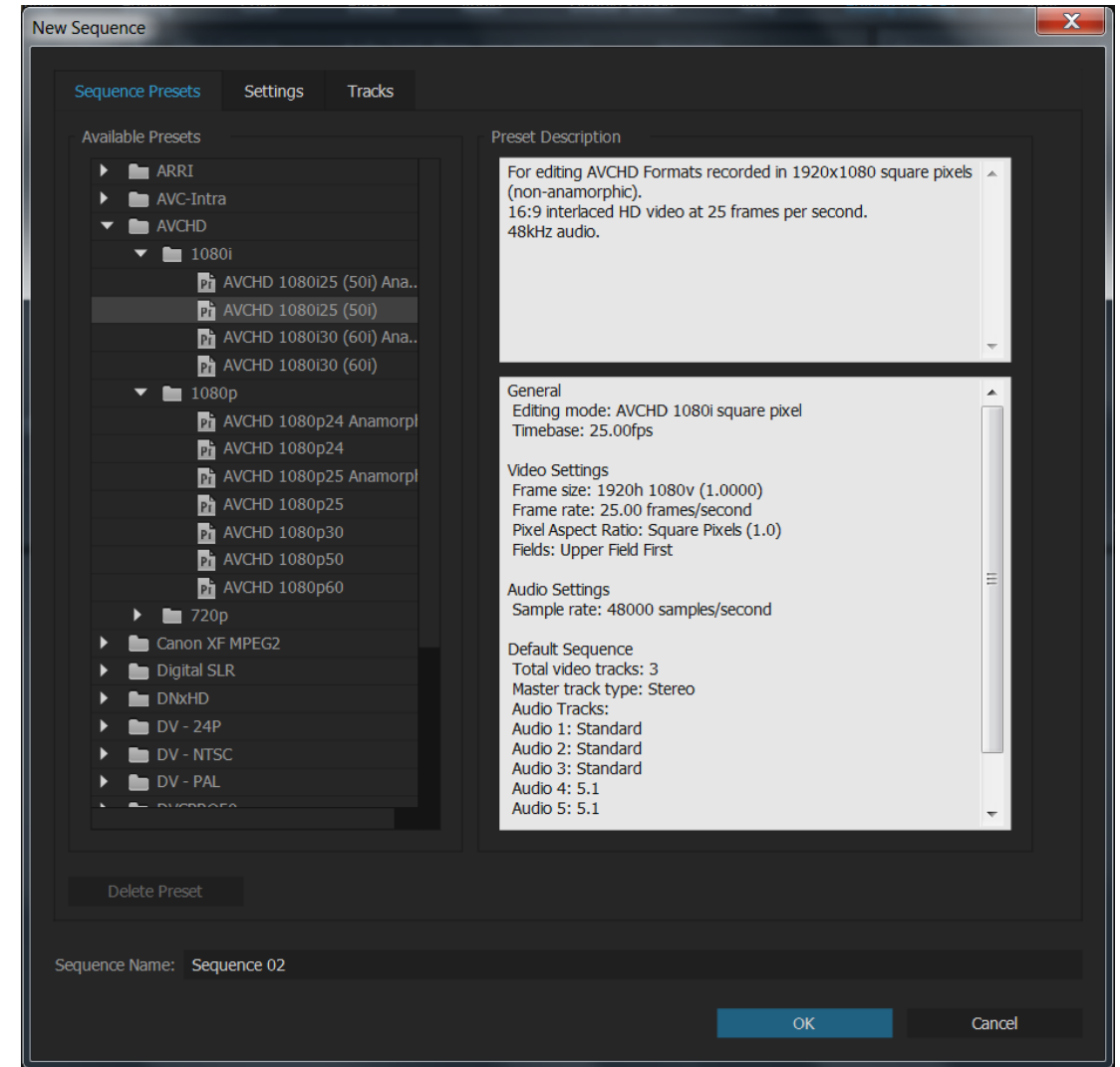


3. Format

Look at the sequence settings in **Adobe Premier Pro** to see all the different Digital video **Formats**:

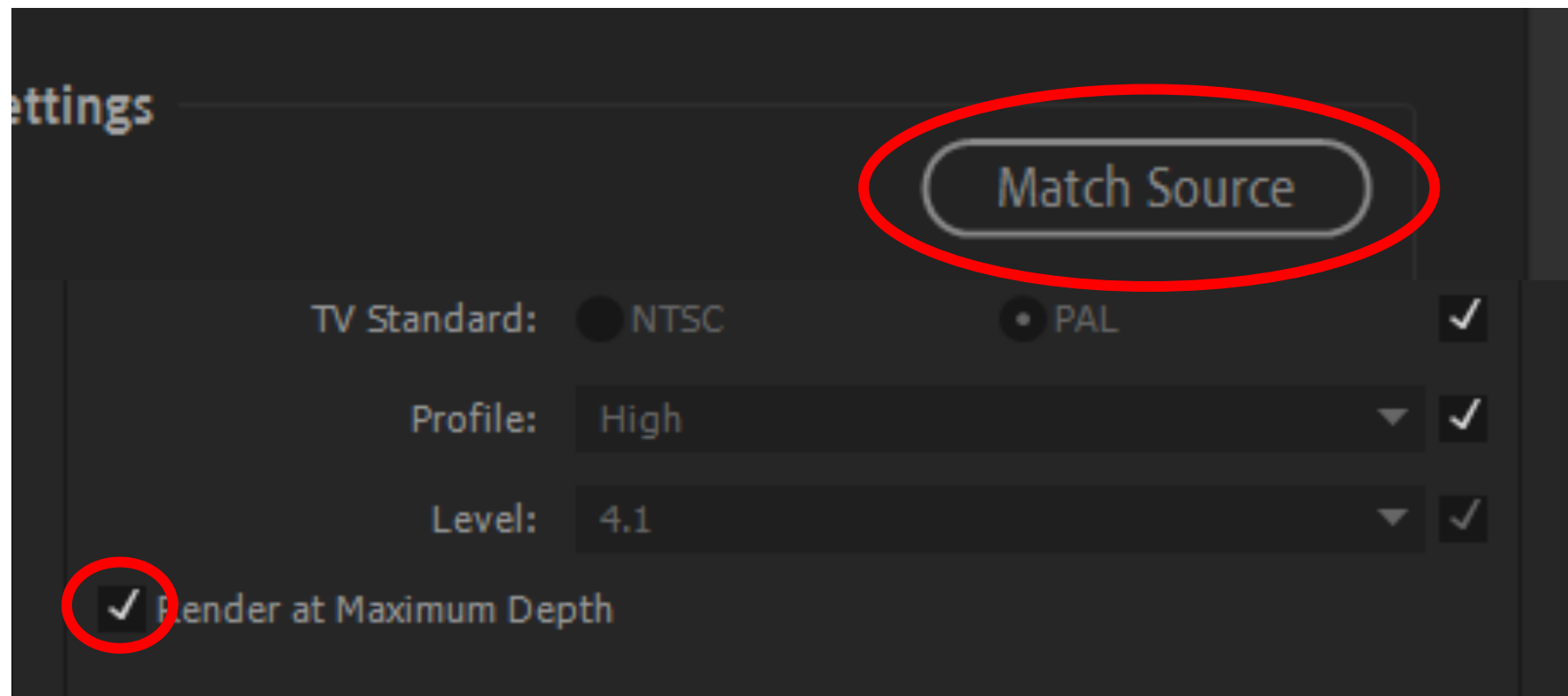
- The **Format** your video was recorded in will also determine how its **exported**

Let's look at the export settings..



3. Format

You can always allow **Premiere Pro** to auto-detect the correct settings based on the source material by leaving it to **Match Source**:



Guided Practice

Export a portion of your video for testing 5 -10 seconds:

- Export using the **H.264 codec** pre-set
- click on **Output Name:** (*XX.mp4*) save it to your project folder
- Press **Export** and wait...

Encoding a few seconds of your video shouldn't take very long

4. Export Settings

Choosing the best **Export** settings largely depends on what you are using the video for.

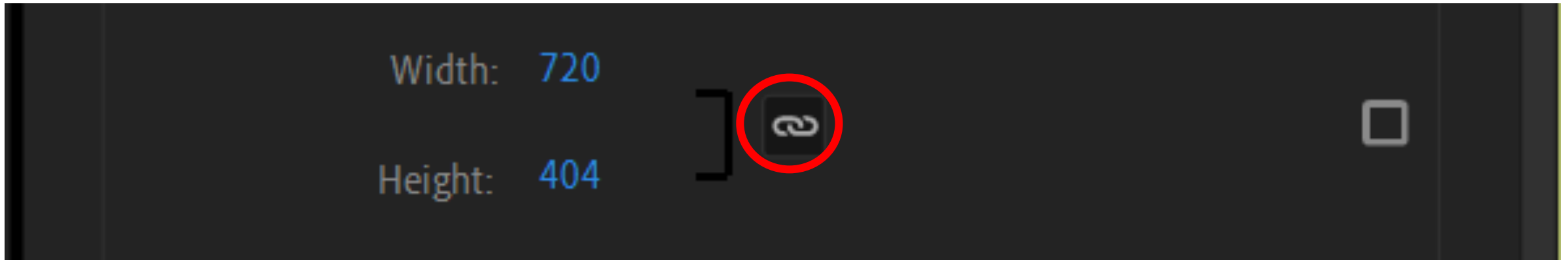
Therefor there are three main factors you need to understand about what makes a video file larger or smaller:

- Resolution
- Bitrate
- encoding

4. Export Settings

Resolution is the **Width** and **Height** of your video:

- The pre-set will decide the size of you video but you can change this
- Change the Width and Height by typing in the text field
- Click the link to change Width and Height independently from each other



4. Export Settings

For example an HD video has 1920 horizontal pixels and 1080 vertical

- Here are the resolutions that YouTube recommends for various measures of quality

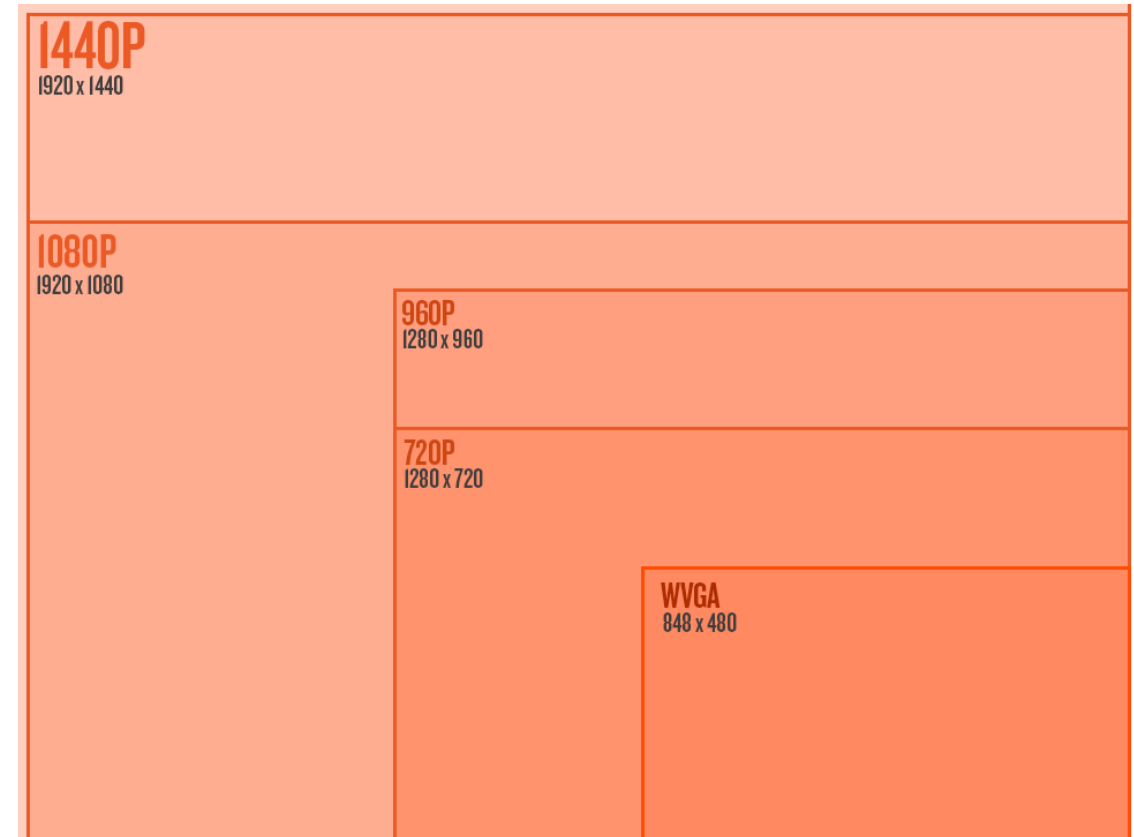
So which resolution should you use?

2160p	1440p	1080p	720p	480p	360p	240p
3840x2160	2560x1440	1920x1080	1280x720	854x480	640x360	426x240

4. Export Settings

HD (High Definition) refers to the number of pixels displayed or units denoting pixels.

- Display Resolutions range from 720 to 1080 pixels in height
- Requires support by a television or media player
- video needs to have been recorded in HD
- delivers a sharper, more detailed picture



4. Export Settings

If your video doesn't fit the formatted display resolution:

- Use a technique known as letterboxing

1.78 letterbox



1.33 frame

2.40 letterbox



1.33 frame

2.40 letterbox



1.78 frame

4. Export Settings

If your audience is likely to watch on their TVs, 1440p or 1080p is almost certainly fine for larger screens.

If your audience is likely to watch on their smartphone which have different resolutions, screen sizes, and pixel densities.

- The difference between 720p and 1080p is noticeable

New iPhone's use a 2436 x 1125 screen and has a pixel density that's far greater than the human eye can even appreciate.

4. Export Settings

The **Frame Rate** is the technical shorthand for motion quality, fx: the higher the frame rate = better the motion

- **Fps** = frames per second or **Hz** (cycles per second)
- It is last number after the slash (1080p/24 or 1080i/50)
- Common standards are - 24Hz for movies and 50Hz or 60Hz for TV and games
- [See this clip about fps](#)

Frame Rate:

50



Framerate Reference



4. Export Settings

Depending upon the area of the world you live in there are two video broadcasting formats you'll need to know before importing your video.

National Television Standards Committee or NTSC

- used in North America, parts of South America and Japan

Phase Alternating Line or PAL

- used in Europe, Australia and parts of Asia

4. Export Settings

International standards have different **Frame Rates** for example **HD TV**:

NTSC recorded and broadcasted at 60Hz = 30p and 60i

PAL recorded and broadcasted at 50Hz = 25p and 50i

General

Editing mode: AVCHD 1080i square pixel
Timebase: 25.00fps

Video Settings

Frame size: 1920h 1080v (1.0000)
Frame rate: 25.00 frames/second
Pixel Aspect Ratio: Square Pixels (1.0)
Fields: Upper Field First

Audio Settings

Sample rate: 48000 samples/second

For editing AVCHD Formats recorded in 1920x1080 square pixels (non-anamorphic).
16:9 interlaced HD video at 25 frames per second.
48kHz audio.

4. Export Settings

When watching a video on screen the picture will be transmitted in one of two ways depending on its **Field Order** (fps) of 25p and 50i:

- **Progressive (p)**
- **Interlaced (i)**

Most modern cameras offer the ability to record in both and most professional editing software supporting them too.

Field Order:

✓ Progressive

Upper First

Lower First

4. Export Settings

The (p) after the number is a shorthand for 'Progressive Scan'

- displaying whole frames as single images one after the other
- Progressive video contains more data
- Still images appear sharper and more detailed
- They are also higher file sizes

Progressive Scan



Frame A
(complete image)



Frame B
(complete image)



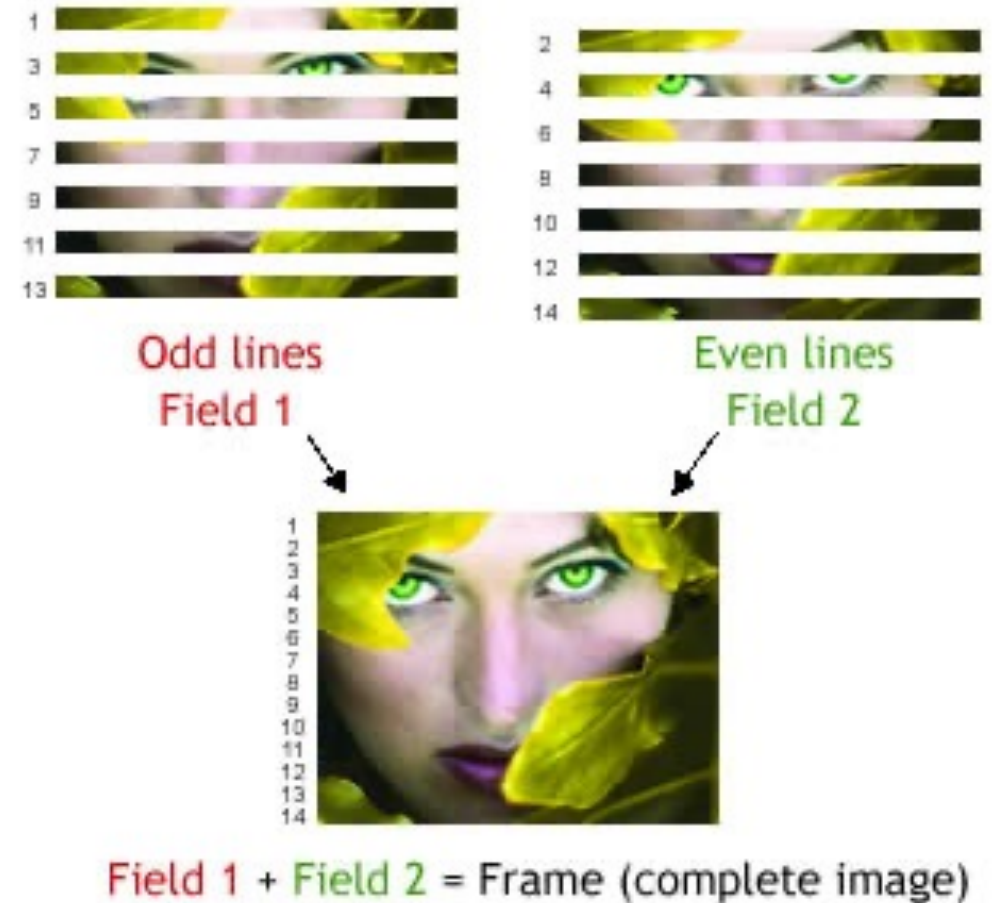
Frame A + Frame B
(complete image)

4. Export Settings

The (i) after the number is a shorthand for 'interlaced'

- splicing odd and even lines together to form each frame
- blending elements from two adjacent frames
- The process is known as deinterlacing
- Contains less data therefore it is used by TV broadcasters

Interlaced



4. Export Settings



4. Export Settings

Bitrate is how much information is transmitted every second measured in Mbps (Mega bits per second).

It's a good idea to use a variable bitrate:

- allows your video to go above or dip below your target bitrate
- While this gives you less control over your video size
- it will result in greater quality

4. Export Settings

Video data bit rates are calculations made based form a video's bits per second:

- 1 megabyte per second = ~ 8 megabits per second (8 mbps).
- HD Blu-ray video = ~ 20 mbps
- Standard-definition DVD = ~ 6 mbps
- High-quality web video = ~ 2 mbps
- Video for apps = ~ 500 kbps

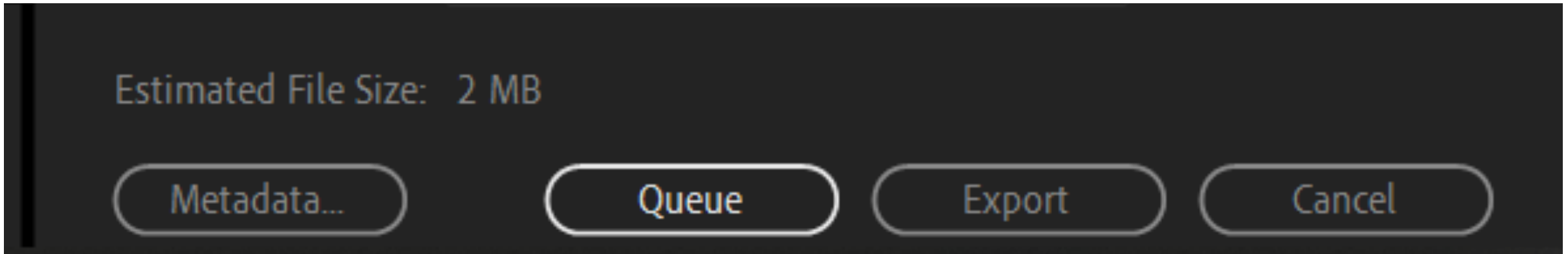
4. Export Settings

Type	Video Bitrate, Standard Frame Rate (24, 25, 30)	Video Bitrate, High Frame Rate (48, 50, 60)
2160p (4K)	35-45 Mbps	53-68 Mbps
1440p (2K)	16 Mbps	24 Mbps
1080p	8 Mbps	12 Mbps
720p	5 Mbps	7.5 Mbps
480p	2.5 Mbps	4 Mbps
360p	1 Mbps	1.5 Mbps

4. Export Settings

Premiere Pro has a feature that allows you to **Export** your video into various formats using **Adobe Media Encoder**:

- go to **File > Export** and look at your format options
- When you're ready, to export, click: **Queue**
- choose the format you want and export in from the list or export multiple formats in a **Queue**



Guided Practice

Export another portion of your video for testing and have some fun with it:

- Un-tick the **Maximum Render Quality** box
- Adjust the **Frame Size**
- Lower the **Frame Rate**
- Change the **Field Order**
- Change the **Pixel Aspect** ratio...

Today's Take Away...

All **video encoding methods** involve some degree of degradation:

Transcoding – joining, compressing of audio/video transportation

Format – the container holding audio/video data or its file type

Codec – a set of pre-sets that pertain to a certain playback device(s)

Encoding – the act of compressing audio/video files for online streaming

Encoder – software that can reduce the size of audio/video files

- capturing your videos in the highest quality format
- Export as uncompressed or use a low-compression
- Avoid using lower-quality formats

Exporting and Encoding video

Summary:

1. **Codecs** – pre-settings that determine different compression types
2. **Containers** – holds audio/video metadata information
3. **Formats** - file type produced by the combination of a **codec** and a **container**
4. **Export Settings** – Values that determine video output Size and Quality:
Aspect Ratio, FPS, Interlacing vs Progressive Scan and Bit rate

Independent Practice

Export your video using the **H.264 - MP4** file format to the lowest possible file size:

- **Bit rate** – higher the bit rate, bigger the file size
- **Frame Rate** – more frames higher bit rate
- **aspect ratio** – the bigger the screen higher bit rate
- Then try using a web service to encode your video into the highest quality **WEBM** file format

Encoding for the web

- Easy HTML5 Video was developed to convert videos into HTML5 supported formats
- Any Video Converter Is a fast and Free conversion tool for almost all video formats
- Free HD Video Converter Factory Free Video conversion and built-in editing tool with a drag and drop interface
- Videora Converter Was designed for converting video files for handheld device
- Free Video Converter Supports Batch conversion, merge several clips into a single file

Resources List

Literature

- Dockery, J. Schwartz, R. Chavez, C. 2016. Learn Adobe Premiere Pro CC for Video Communication. Adobe Press; Pp 93-109 <http://goo.gl/w7GRfm>
- Export a Sequence, clip or Frame: <https://helpx.adobe.com/premiere-pro/how-to/export-sequence-clip-premiere-cc.html>

Video

- Export Video from Premiere Pro: <http://tv.adobe.com/watch/learn-adobe-media-encoder-cc/export-video-from-premiere-pro/>
- Exporting (in HD) for H.264 (.mp4) in Premiere Pro CC: <https://www.youtube.com/watch?v=x6cv8kwNXUc>