







# <video/> 标签

从入门到入坑(MAYBE 放弃)



# 主要内容

-  **video标签基本用法** - 直接MP4链接
-  **主流视频网站video标签地址** - Blob URL
-  **视频格式、编码**
-  **流媒体协议** - 主要的流媒体协议有哪些
-  **点播/直播** - bilibili及主流视频网站用的哪些点播/直播协议
-  **手动下载个B站视频**

# video标签基本用法

## 最直接用法

```
<video src="./xxx.mp4" autoplay=true playsinline controls="controls"></video>
```

## 兼容不同格式

```
<video autoplay=true playsinline controls="controls">  
  <source src="https://www.bilibili.com/xx-demo-720p.webm" type="video/webm">  
  <source src="https://www.bilibili.com/xx-demo-720p.mp4" type="video/mp4">  
  浏览器不支持video  
</video>
```

# 主流视频网站video标签地址

B站/爱优腾, YouTube/Netflix等 基本都是用的 [Blob URL](#)

B站地址:

```
<video src="blob:https://www.bilibili.com/c21f2f47-52fb-46e6-a943-f02e708bceac"></video>
```

YouTube地址:

```
<video src="blob:https://www.youtube.com/250d7dd2-a387-4024-9325-ed4842c5c3d0"></video>
```

```
// blob:https://www.youtube.com/250d7dd2-a387-4024-9325-ed4842c5c3d0  
const objectURL = URL.createObjectURL(object)
```

`object` 可以为: `File`, `Blob`, or [MediaSource](#)

对于流媒体播放来说这里通过 `MediaSource` (MediaSource Extension API) 来创建 Object URL

# 视频格式， 编码

MDN: [https://developer.mozilla.org/en-US/docs/Web/Media/Formats/Video\\_codecs](https://developer.mozilla.org/en-US/docs/Web/Media/Formats/Video_codecs)

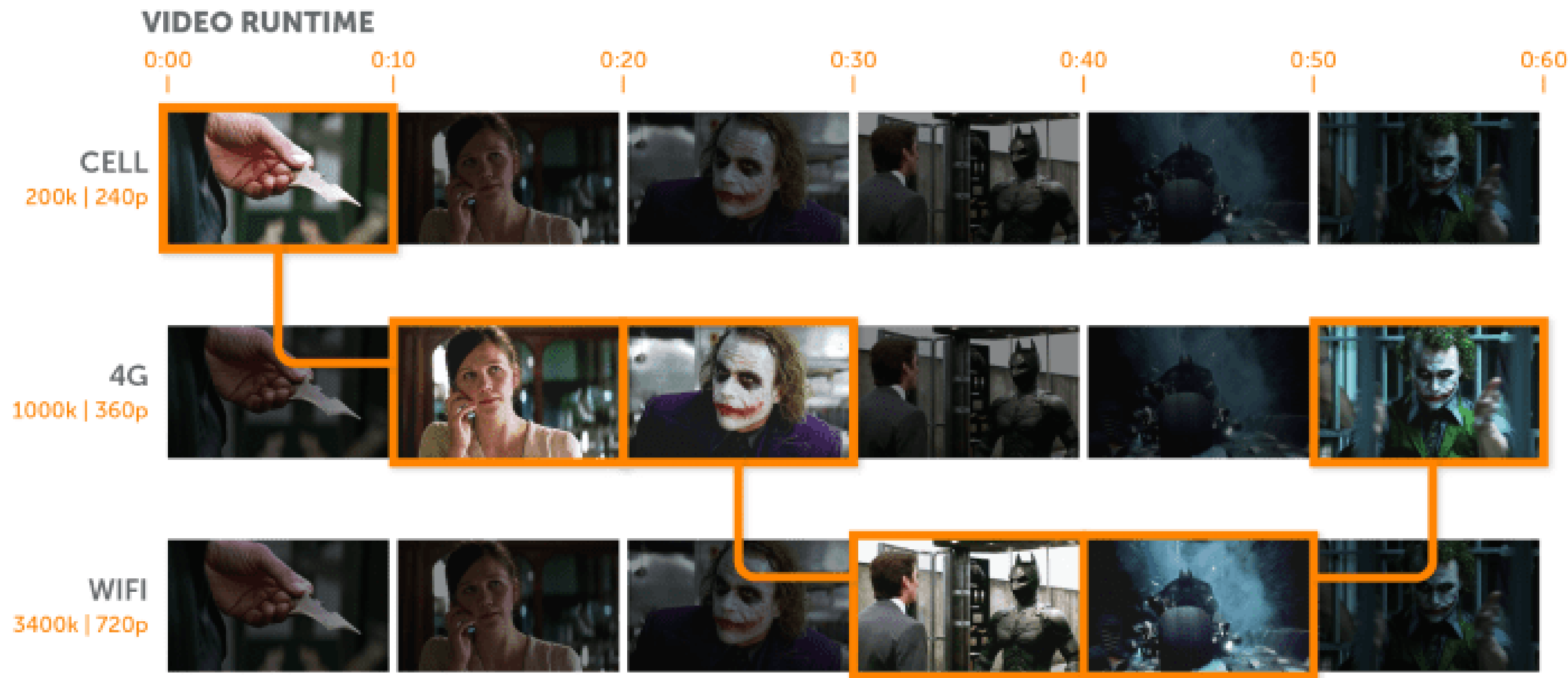
Codec name (short)	Full codec name	Container support
<a href="#">AV1</a>	AOMedia Video 1	<a href="#">MP4</a> , <a href="#">WebM</a>
<a href="#">AVC (H.264)</a>	Advanced Video Coding	<a href="#">3GP</a> , <a href="#">MP4</a>
<a href="#">H.263</a>	H.263 Video	<a href="#">3GP</a>
<a href="#">HEVC (H.265)</a>	High Efficiency Video Coding	<a href="#">MP4</a>
<a href="#">MP4V-ES</a>	MPEG-4 Video Elemental Stream	<a href="#">3GP</a> , <a href="#">MP4</a>
<a href="#">MPEG-1</a>	MPEG-1 Part 2 Visual	<a href="#">MPEG</a> , <a href="#">QuickTime</a>
<a href="#">MPEG-2</a>	MPEG-2 Part 2 Visual	<a href="#">MP4</a> , <a href="#">MPEG</a> , <a href="#">QuickTime</a>
<a href="#">Theora</a>	Theora	<a href="#">Ogg</a>
<a href="#">VP8</a>	Video Processor 8	<a href="#">3GP</a> , <a href="#">Ogg</a> , <a href="#">WebM</a>
<a href="#">VP9</a>	Video Processor 9	<a href="#">MP4</a> , <a href="#">Ogg</a> , <a href="#">WebM</a>

# 常用流媒体协议

协议	应用领域	优缺点
HTTP-FLV	直播	延迟低
HLS	直播/点播(自适应比特流)	Apple搞的协议，兼容性好，延迟高（通过`Low Latency HLS`解决）
MPEG-DASH	直播/点播(自适应比特流)	国际标准，对标苹果的HLS
RTMP	目前主要推流端	带宽消耗低，延迟低，播放需要Flash

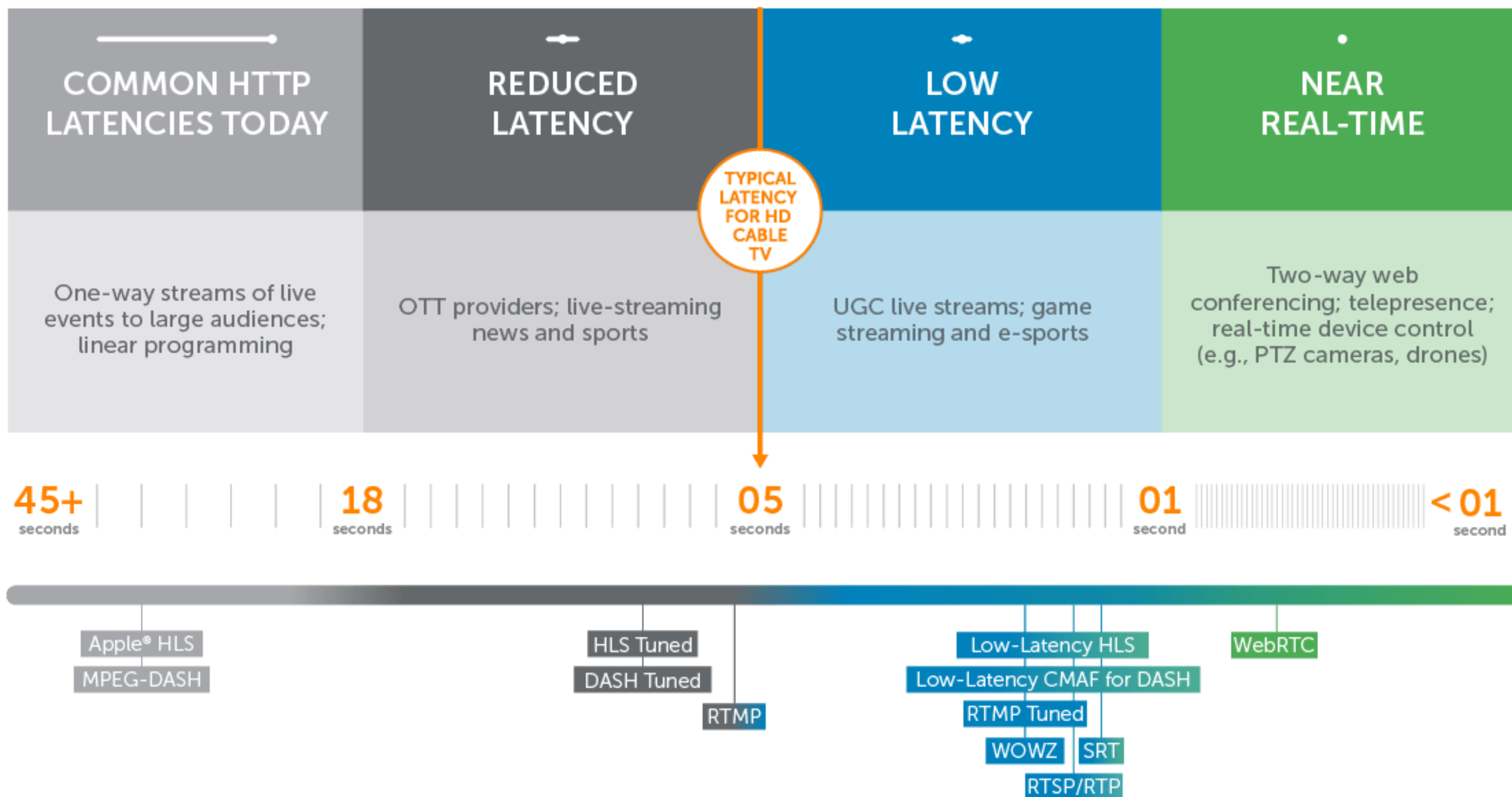
# 自适应比特流

点播主流基本就是HLS、MPEG-DASH的自适应比特流



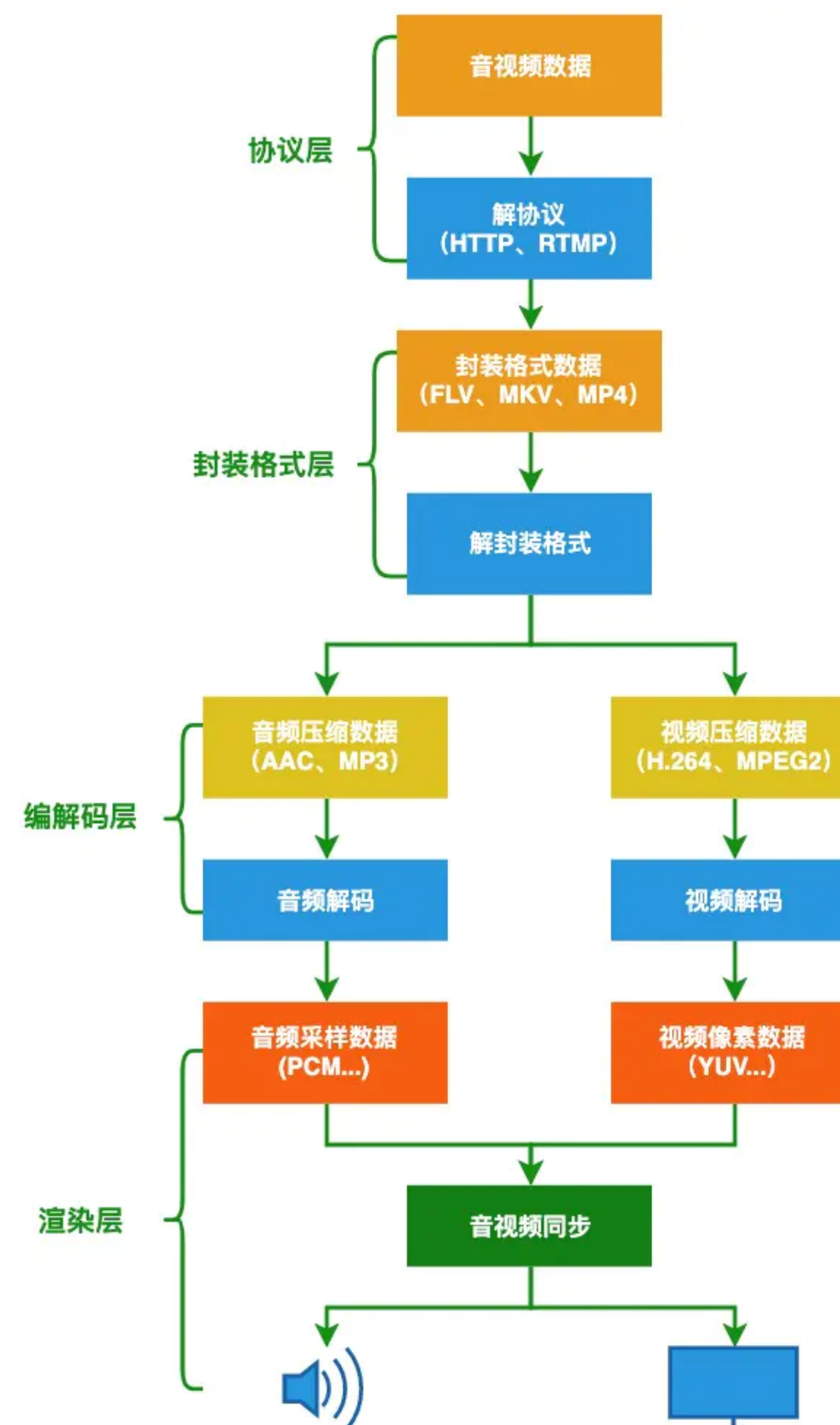
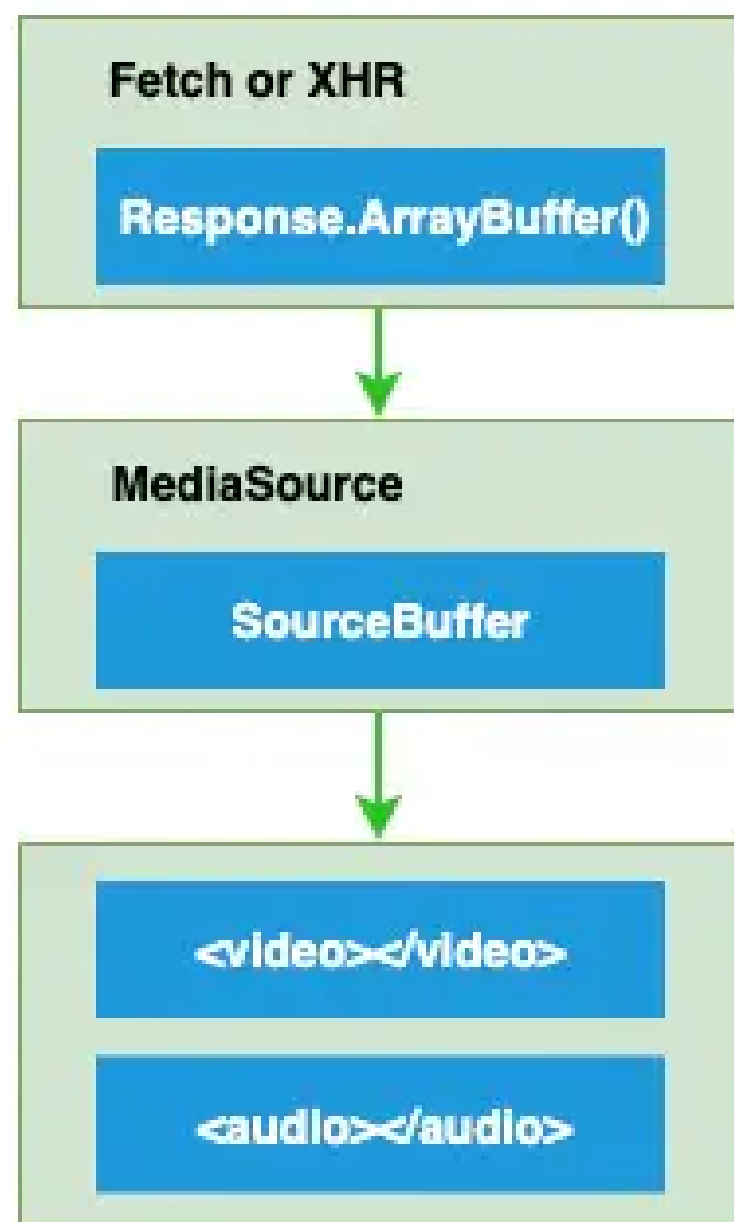
# 各协议延迟

## STREAMING LATENCY AND INTERACTIVITY CONTINUUM



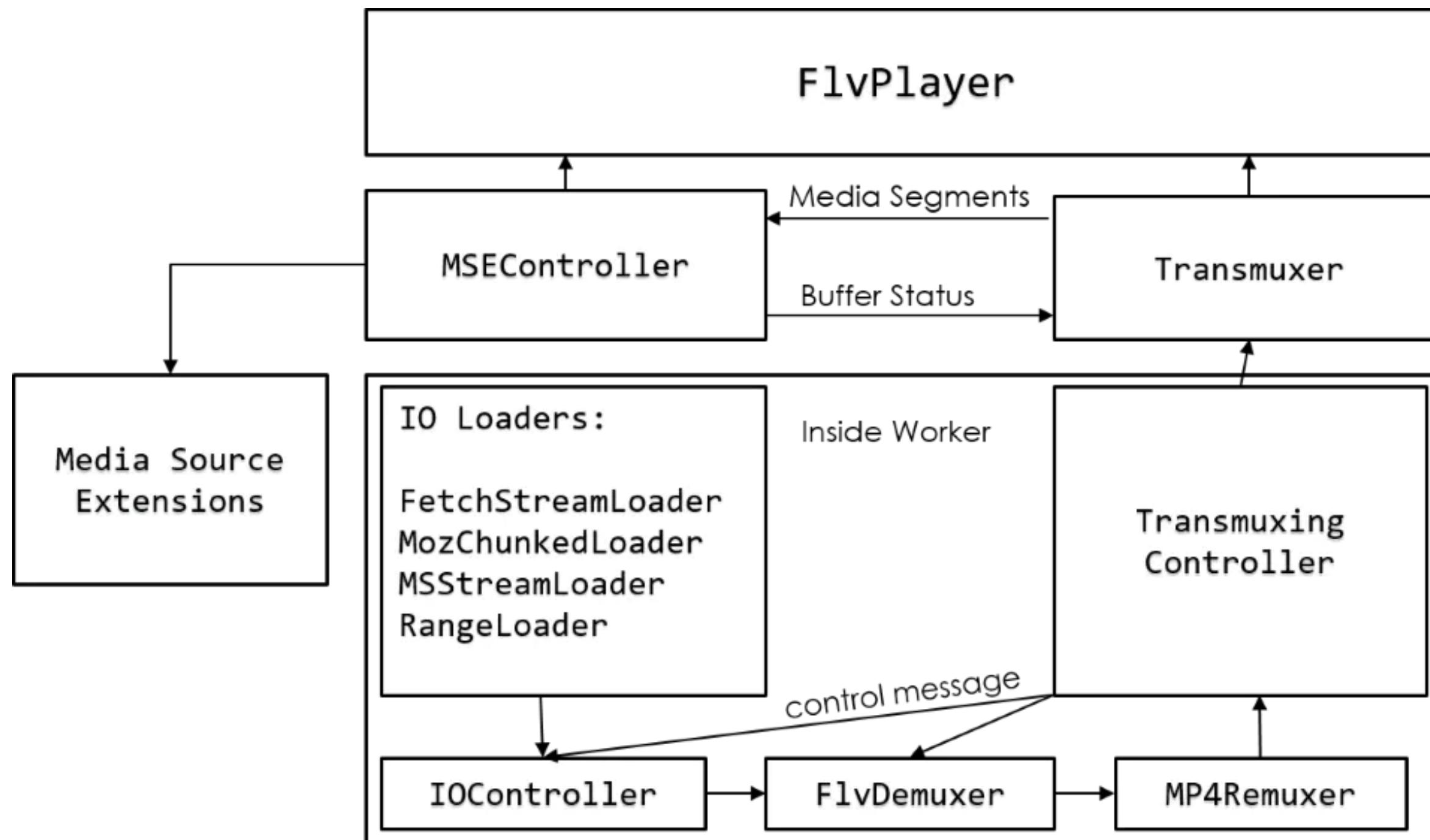


# 流媒体播放总体流程



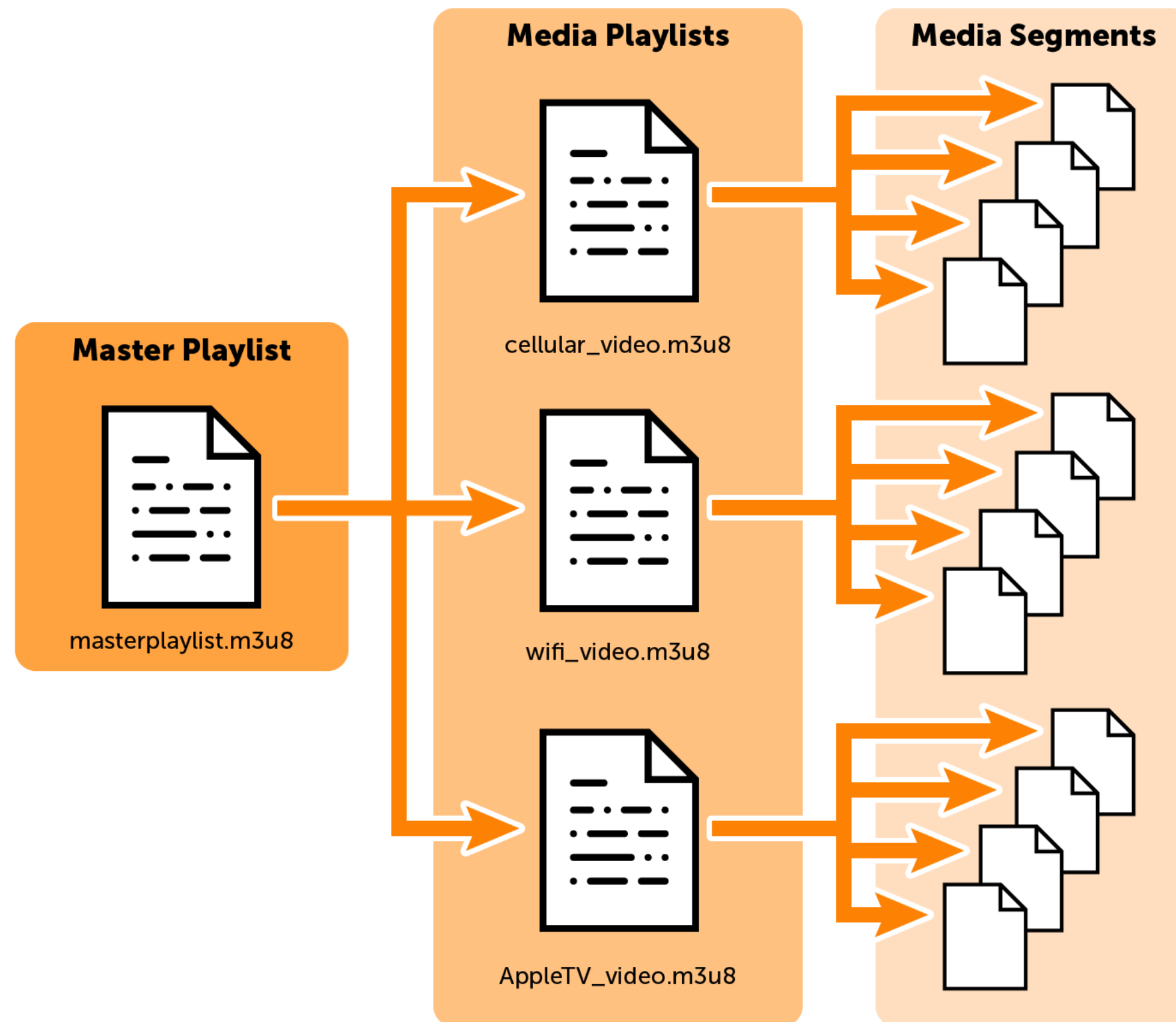
# FLV(FLASH Video) + flv.js

flv.js 的工作原理是将 FLV 文件流转换为 ISO BMFF (Fragmented MP4) 片段, 然后通过 Media Source Extensions API 将 mp4 段喂给 HTML5 video 元素



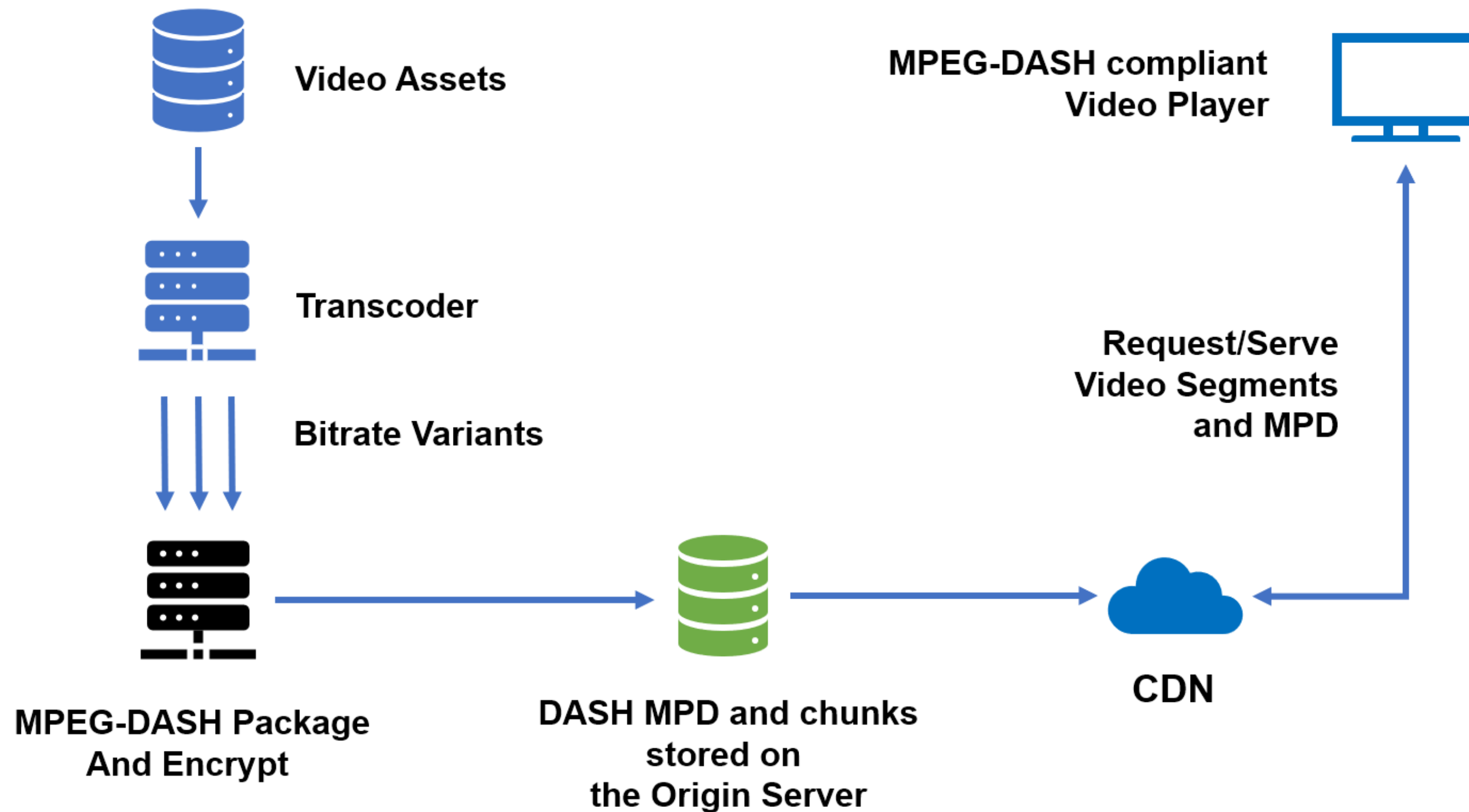
# HLS(HTTP Live Streaming)

HLS 基于 .m3u8 文件查找下面的各个切片文件, [m3u8 demo](#)



# MPEG-DASH(Dynamic Adaptive Streaming Over HTTP)

MPEG-DASH 基于 .mpd manifest 文件(xml文件)查找下面的各个切片文件, [mpd demo](#)





# 生成符合HLS, MPEG-DASH的工具, 前端播放器

协议	命令行工具	支持的播放器/JS库
HTTP-FLV	FFmpeg	flv.js
HLS	Apple HTTP Live Streaming tools; FFmpeg; Shaka Packager by Google; mp4box by GPAC; Bento4	hls.js, video.js, shaka-player
MPEG-DASH	FFmpeg; Shaka Packager by Google; mp4box by GPAC; Bento4	dash.js, video.js, shaka-player

# 手动下载个B站视频, 播放器看直播

bilibili点播用dash(.m4s --> MPEG-DASH Video Segment); 直播主要flv, hls



	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30280.m4s?e=ig8euxZM2rNcNbdlhoN... xy121x238x146x247xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30280.m4s?e=ig8euxZM2rNcNbdlhoN... xy121x238x146x247xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30280.m4s?e=ig8euxZM2rNcNbdlhoN... xy121x238x146x247xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30280.m4s?e=ig8euxZM2rNcNbdlhoN... xy121x238x146x247xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30280.m4s?e=ig8euxZM2rNcNbdlhoN... xy121x238x146x247xy.mcdn.bilivideo.cn/upgcxcod...
	345037925-1-30016.m4s?e=ig8euxZM2rNcNbdlhoN... xy122x244x230x222xy.mcdn.bilivideo.cn/upgcxcod...

**accept:** \*/\*

**accept-encoding:** identity

**accept-language:** en-US,en;q=0.9,zh-CN;q=

**cache-control:** no-cache

**dnt:** 1

**origin:** https://www.bilibili.com

**pragma:** no-cache

**range:** bytes=1002-2833

**referer:** https://www.bilibili.com/video/f

4.5

**sec-ch-ua:** " Not;A Brand";v="99", "Goog"

**sec-ch-ua-mobile:** ?0

**sec-fetch-dest:** empty

**sec-fetch-mode:** cors

**sec-fetch-site:** cross-site

**user-agent:** Mozilla/5.0 (Macintosh; Inte  
Gecko) Chrome/91.0.4472.77 Safari/537.3

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▼ **Query String Parameters** [view source](#)

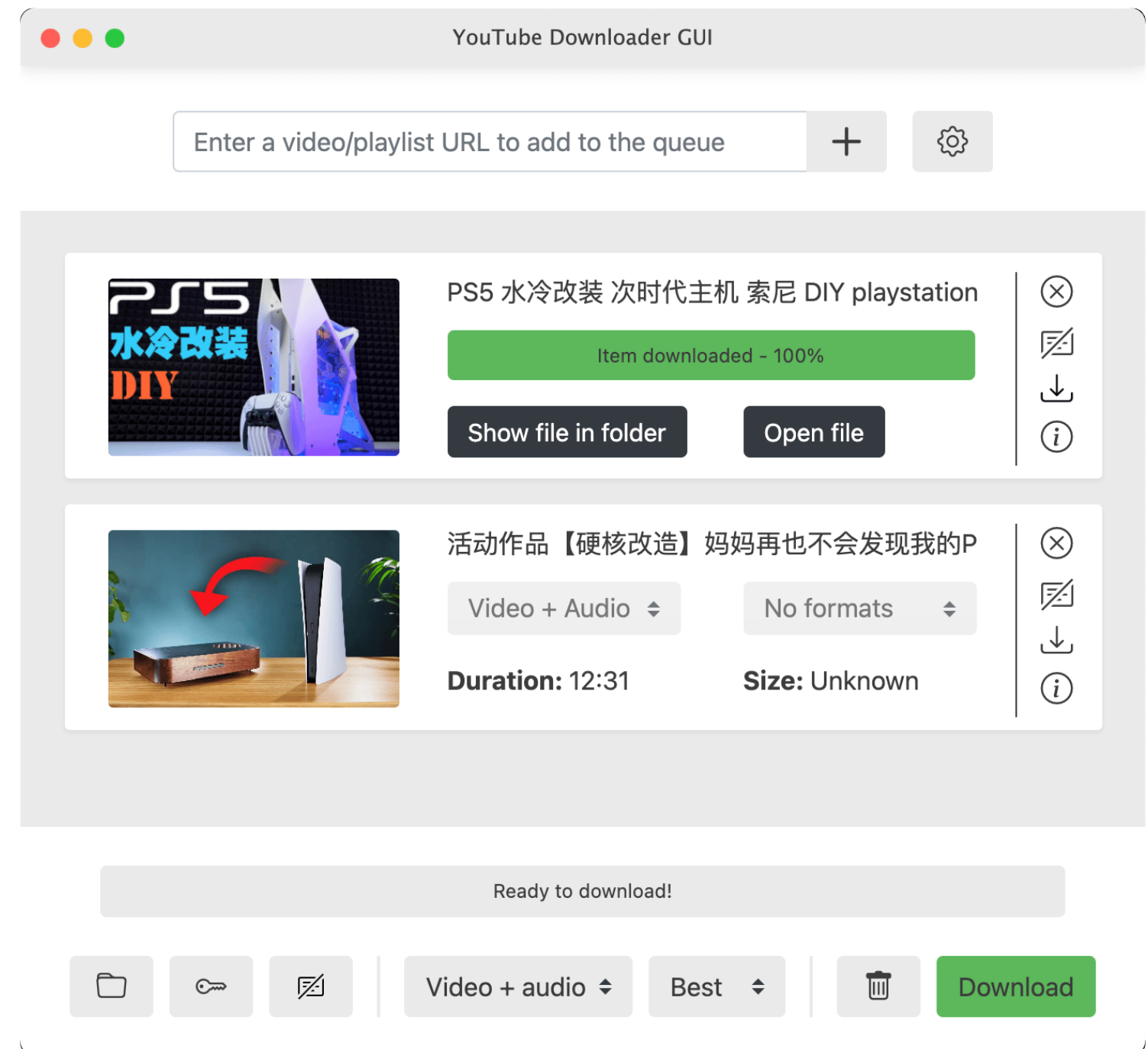
**e:** ig8euxZM2rNcNbdlhoNvNC8BqJIzNbfqXBvE  
N0B5tZlqNxTEto8BTnVnNeZVuJ10Kj\_g2UB02J0

# Bonus - 视频下载工具

Mac App: Downie 4, 支持1000+网站



开源: youtube-dl - <https://github.com/ytdl-org/youtube-dl>



🙌🙌 Thank You 🙌🙌