

# STREAMING FROM ASSIMILATE SCRATCH

BY OSCAR MARTINEZ



# Streaming from:

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## ASSIMILATE SCRATCH

1. History and technology
2. Encoding
3. Transcoding
4. Delivery
5. SCRATCH options
6. Live Color Session example
7. Q&A

# History I

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## Ancient

1. When video files were first shared online, they were distributed using Hypertext Transfer Protocol (HTTP)
2. 1996 -Microsoft developed a third streaming protocol, Microsoft Media Server (MMS)
3. 1998 - RealNetworks and Netscape released Real Time Streaming Protocol (RTSP)
4. 2005 - Adobe buys Macromedia's Real Time Messaging Protocol (RTMP) for Flash-based video streaming

# History II

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## Actual - Getting old

1. 2008 - Microsoft introduced Smooth Streaming supporting adaptive bitrate (ABR) delivery
2. 2009 - Apple entered the market with the introduction of HTTP Live Streaming (HLS)
3. 2010 - Major streaming and media companies, including Microsoft, Google, Adobe, Netflix, Ericsson, and Samsung, have been collaborating on MPEG-DASH, an open standard

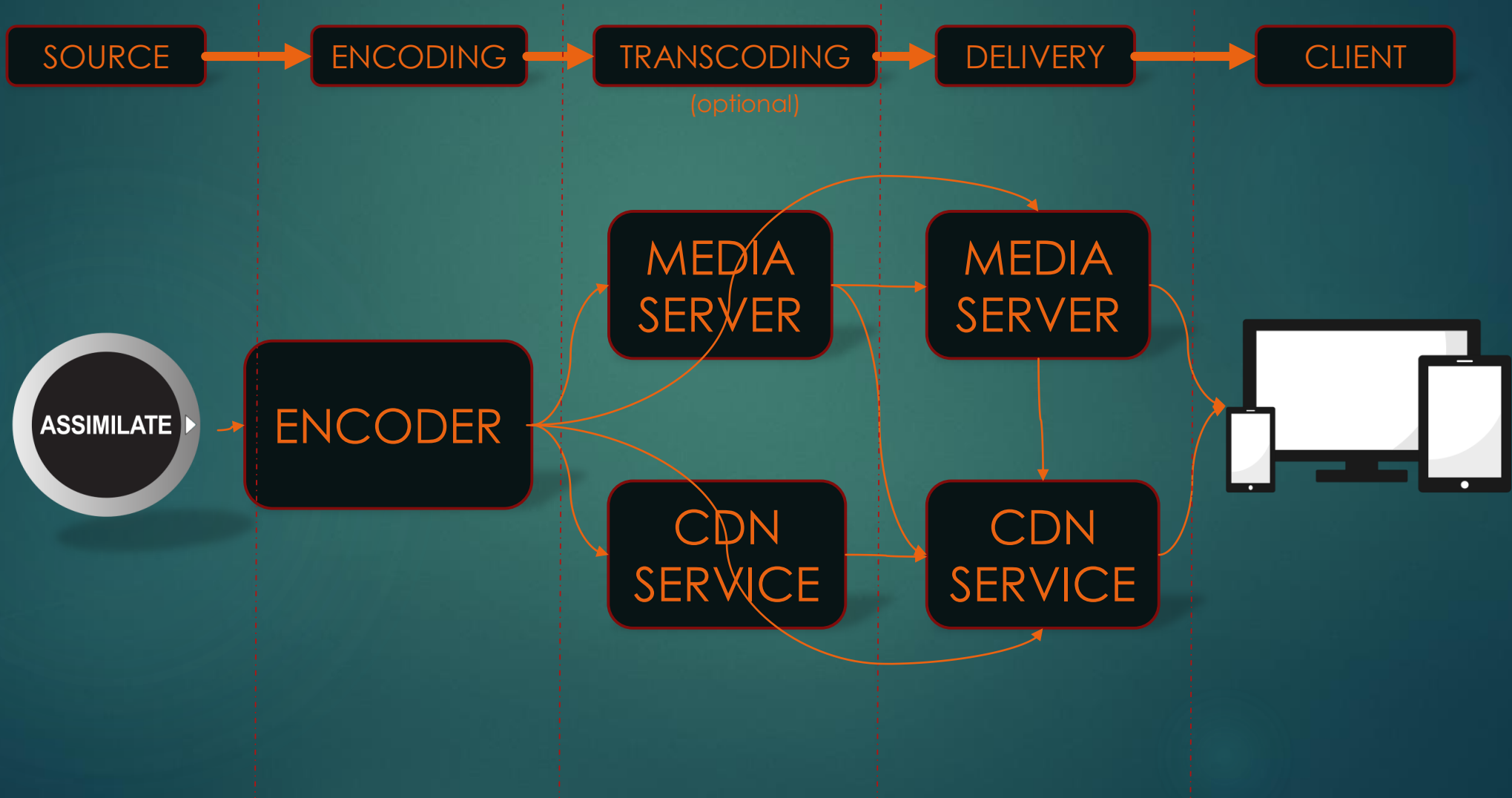
# History III

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## Actual – Near Future

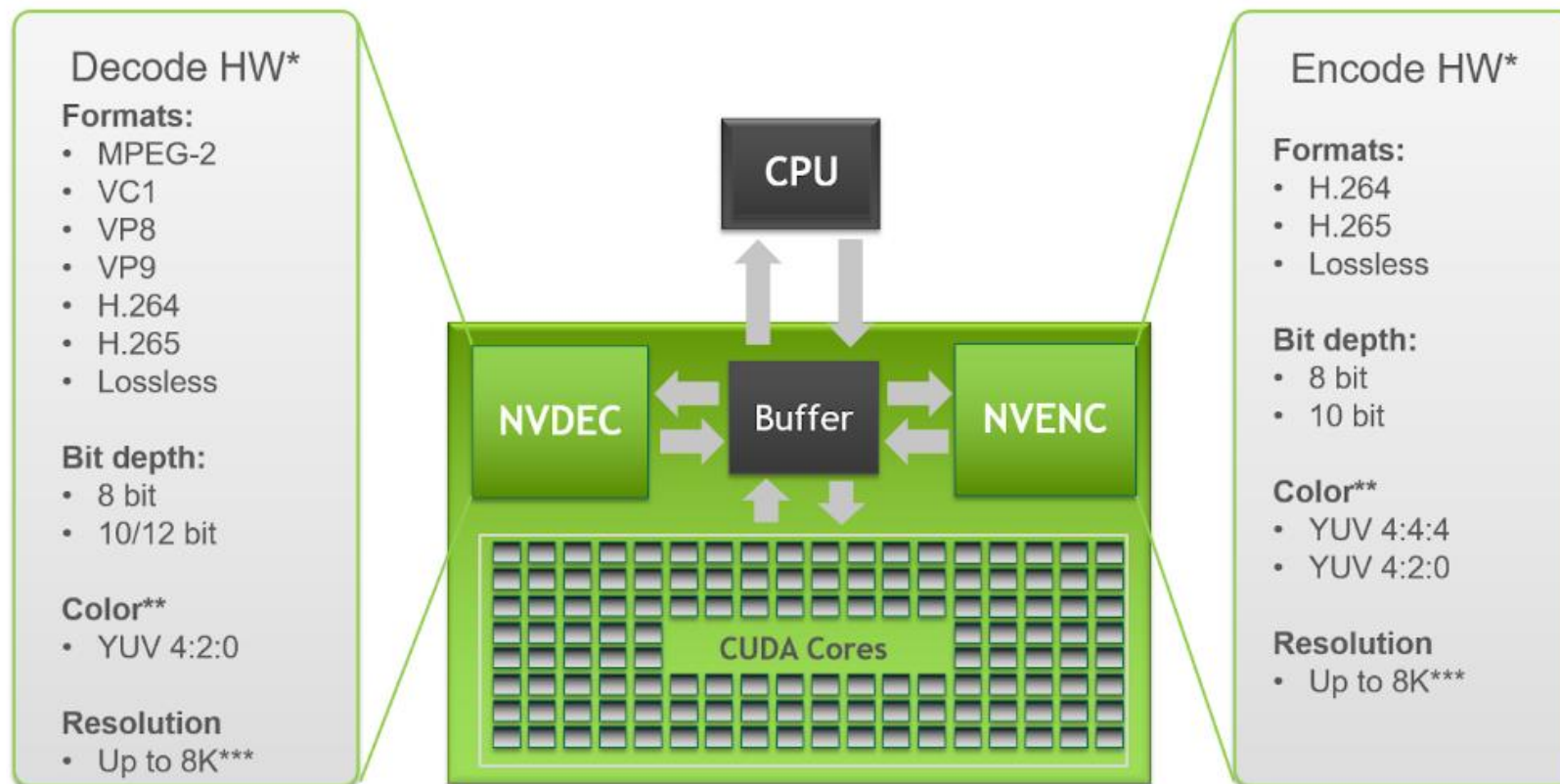
1. 2011 - Google opens WebRTC helping to provide real-time communications between browsers
2. 2016 - Microsoft buys Beam Faster Than Light (FTL) to use it with XBox
3. 2019 - Apple extended HTTP Live Streaming (HLS) to reduce latency

# Technology Structure



# Encoding

## Independent CUDA Cores & video Engines

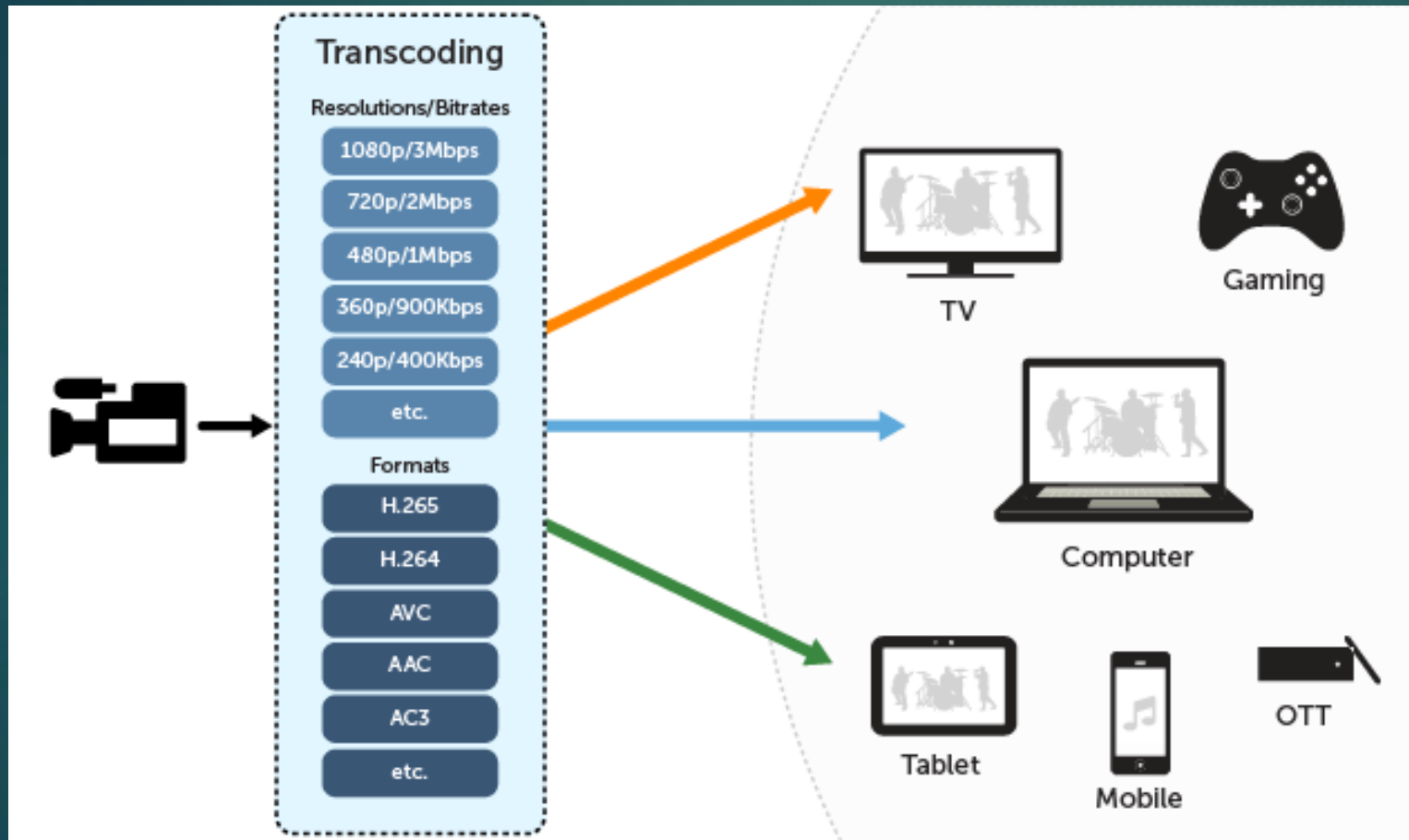


\* See support diagram for previous NVIDIA HW generations

\*\* 4:2:2 is not natively supported on HW

\*\*\* Support is codec dependent

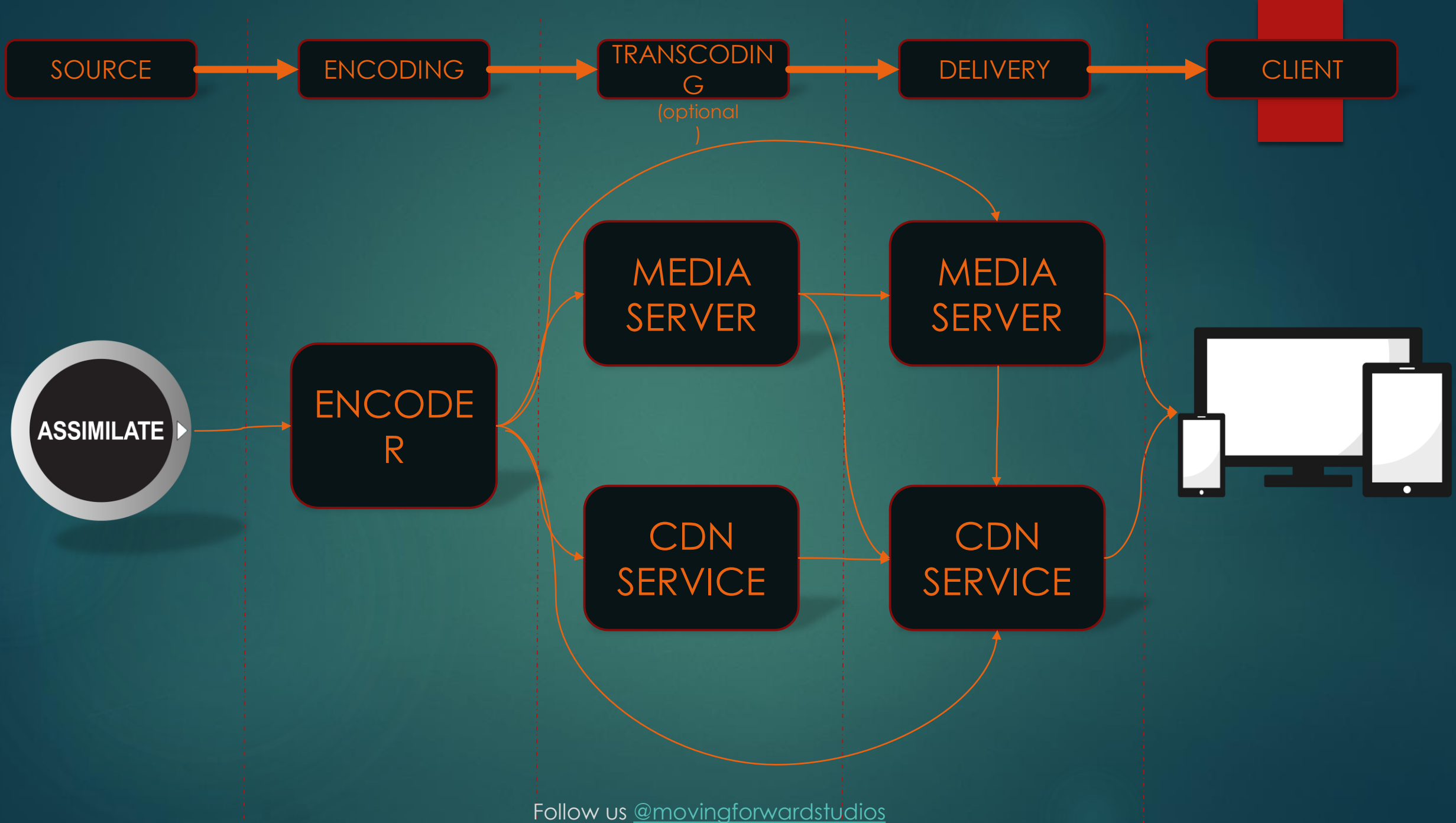
# Transcoding



Transcoding VS Transmuxing

- No Re-encoding



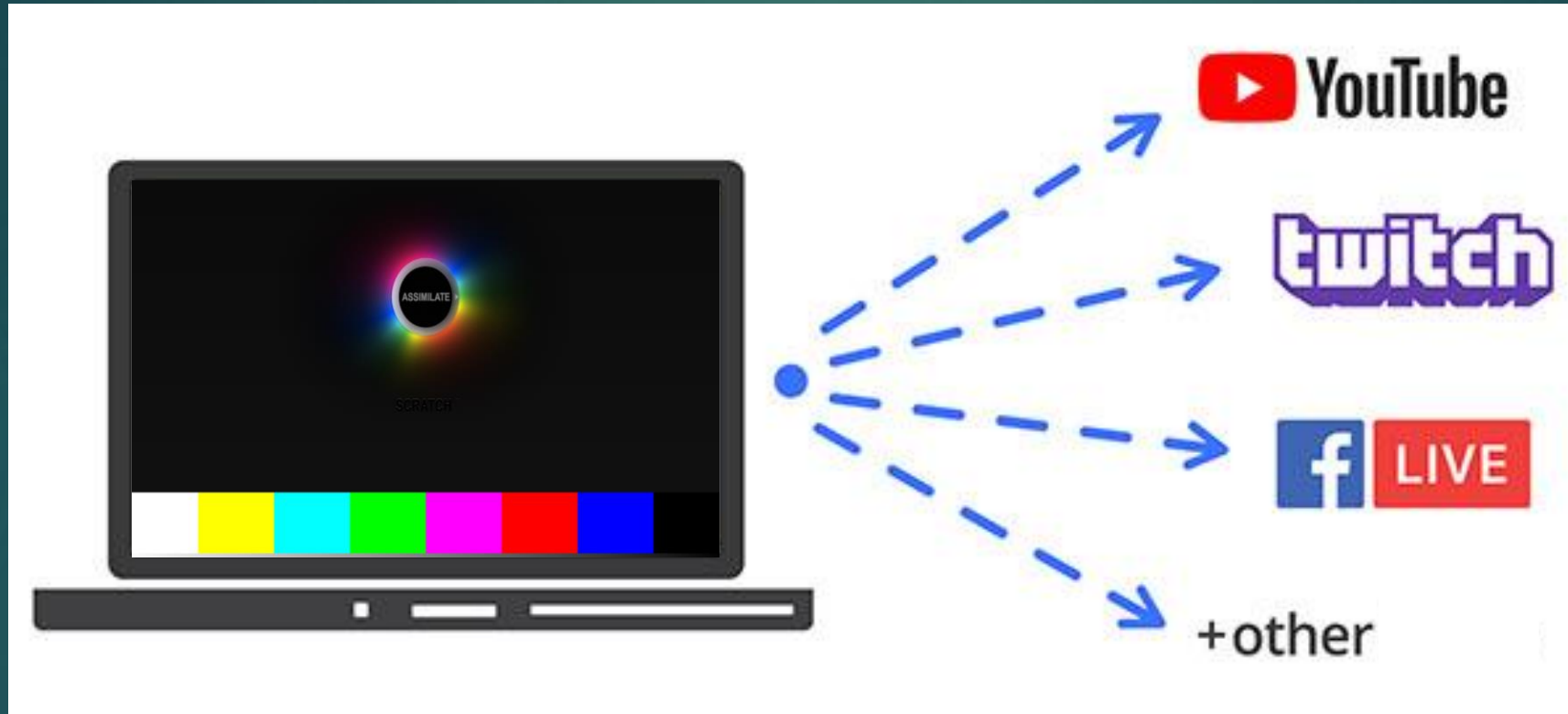


# Delivery

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1. CDN Based
  - Only CDN Service (Akamai, Amazon Web Services...)
  - Full Service Provider (YouTube, Facebook live, twitch...)
  
2. Media Server based
  - Commercial (i.e. Red5pro, Nginx)
  - Open Source (i.e. Nginx, VLC)

# Scratch Options



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# Links

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## Protocols info

[https://en.wikipedia.org/wiki/Real-Time Messaging Protocol](https://en.wikipedia.org/wiki/Real-Time_Messaging_Protocol)

[protocol extension for low-latency hls preliminary specification](#)

<https://en.wikipedia.org/wiki/WebRTC>

<https://dotesports.com/streaming/news/mixers-faster-than-light-streaming-protocol->

## Custom Server

<https://hub.docker.com/r/tiangolo/nginx-rtmp/>

<https://github.com/arut/nginx-rtmp-module/wiki/Directives>