



# EMA Mezzanine Spec 2.0

Ben Waggoner

Amazon Instant Video





## Why new mezz spec?

- Still lots of big, low quality MPEG-2
- ProRes looks great, but is huge, and has interoperability challenges
- New technologies can improve on EMA 1.0 spec





## Improvements v. EMA 1.0

- Reduce file size 25-50%
- Add 10-bit support
- Move from .mov to .mp4 for standalone files
- Offer path to IMF interoperability





# Video

- HEVC (aka H.265)
- Main (8-bit) and Main 10 (10-bit) profiles
  - Both 4:2:0
- High Tier (4x peak bitrate for main tier)
- Plan support for range extensions in 2.1 spec
  - Up to 12-bit 4:4:4
- No requirement to letterbox; encode just active pixels
- Quality visually lossless to second generation





# Bitstream limitations

- Closed GOP
- Max GOP duration 5 seconds
- Up to 4096x2160p60
- Progressive and square pixel only >1920x1080
- Interlaced and anamorphic allowed 1920x1080 and below
- Lowest level compatible with frame size and fps





# Audio

- Same AES3 302m PCM as EMA 1.0 spec
- Main language audio only in video file
- Stereo, 5.1, or 5.1 + stereo in 8 channels





# Container

- MP4 with video and primary language audio
- Longer term interoperability with IMF
  - With with IMF & SMPTE for HEVC bitstream support
  - Also support MXF with IMF-compatible HEVC/PCM
  - Time to start conversations with other groups





## Q&A

- Any questions?
- Catch me later for some demos

