Are the Streaming Format Wars Over?
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INTERNET VIDEO ESSENTIALS

Reach
Reach all connected devices

Scale
Enable live and on-demand delivery to the mass market

Quality of Experience
Provide TV-like consistent rich viewer experience

Business
Enable revenue generation thru paid content, subscriptions, ads, etc.

Regulatory
Satisfy regulations such as captioning, ratings and parental control

HTTP ADAPTIVE STREAMING

DEAD, SURVIVING, MATURING AND NEWBORN TECHNOLOGIES

• Move Adaptive Stream (Long gone, but some components are in Slingbox)
  - http://www.moviatrack.com
• Microsoft Smooth Streaming (Legacy)
  - http://www.bca.net/request/SmoothStreaming
• Adobe Flash (Almost dead)
• Adobe HTTP Dynamic Streaming (Legacy)
• Apple HTTP Live Streaming (The elephant in the room)
  
HTTP GET

NEWBORN TECHNOLOGIES

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• NEWBORN TECHNOLOGIES

END-TO-END WORKFLOW FOR OTT

Production
Preparation and Staging
Distribution
Consumption

Encode and Package Once, Deliver Efficiently

COMMON MEDIA APPLICATION FORMAT (CMAF)

- CMAF defines the media format and can be used with any manifest (DASH MPD, HLS playlist, etc.)
- CMAF uses ISO-BMFF and common encryption (CENC)
- CENC means the media fragments can be decrypted/decoded by devices using different DRMs
- CMAF does not mandate CTR or CBC mode
- CMAF has media (video, audio, subtitle) and presentation profiles
- Any delivery method may be used for delivering CMAF content
- HTTP
  - RTP/unicast/cast
  - LTE broadcast
- Current status
  - 1st edition was published in Jan. 2016
  - Supported in iOS 10+ (with HLS playlists)
  - AMD: SHVC media profile and additional audio media profiles
  - AMD: e-AAC and other media profiles

CMAF MEDIA OBJECTS

(Each frame can be a CMAF chunk)

Manifets may provide URLs to

• Track files
  - curl http://example.com/video.mp4
• CMAF header + segments
  - curl http://example.com/video.mp4-H "Range: byte=0-517"
• Manifests may provide URLs to
  - CMAF chunk
  - manifest

CMAF objects

ENCODING AND PACKAGING

pick your favorite codec

LIVE STREAMING

RTP MultiCast
- Use RFC 4566 and 6285 for fast recovery and rapid acquisition

Peer-to-Peer
- Using RTCP: Clients fetch DASH/CMAF pieces from each other in addition to CDN server
  - This helps reduce the load on the CDN as well as the stream start times

Non-HTTP TRANSPORT OPTIONS

This results in

Higher Costs
Less Scalability
Frustration
Slow Adoption