WebCodecs
MoQ Media Format

draft-mzanaty-moq-loc-03

Mo Zanaty, Suhas Nandakumar, Peter Thatcher

IETF 119 – Brisbane, Australia – March 18, 2024

What is LOC? The ABCs…

Low-**O**verhead* **C**ontainer Media Format

- **A**lternative to CMAF
- **B**ased on WebCodecs
- **C**atalog bindings

*Minimal extra encapsulation and application overhead
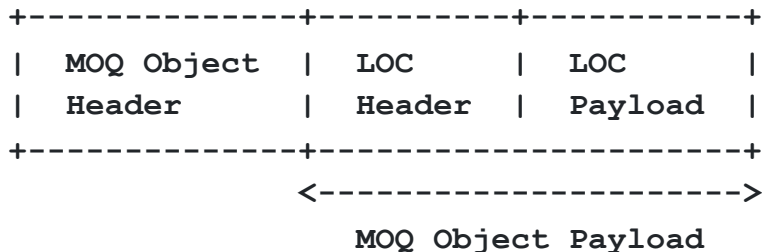 when interfacing with WebCodecs.

Motivation: Why not CMAF?

- CMAF overhead is >100 bytes per frame
    (can be much more depending on options)
- Prohibitive for audio, >100% overhead
- Complexity of nested header boxes
- Complexity of multi-frame packing options
    (chunks, fragments, segments)
- Requires unnecessary parsing and encapsulation / de-encapsulation of media stream to find frame boundaries.

Motivation: Why WebCodecs?

- Minimal overhead, no extra encapsulation
- EncodedAudioChunk / EncodedVideoChunk "internal data" is the raw elementary bitstream format of codecs without any encapsulation, so we use this directly as the LOC Payload.
- Referring to the WebCodecs Codec Registry avoids duplicating it in an identical IANA registry.
- Usable outside WebCodecs or a web browser.

LOC Format within MOQT Objects

```
+--------------+----------+----------+
|  MOQ Object  | LOC      | LOC      |
|  Header      | Header   | Payload  |
+--------------+----------------------+
               <---------------------->
                 MOQ Object Payload
```

- LOC Payload is the "internal data" of a WebCodecs
  EncodedAudioChunk / EncodedVideoChunk (frame).

- LOC Header is metadata, some of which may migrate to the
  MOQ Object Header (open issue). IANA registry for this metadata.

Updates in version -03

- Removed catalog section (moved to common catalog draft)
- Define and register LOQ Streaming Format (type=2) for use with common catalog
- Specify "loc" Packaging Format for use with common catalog
- Specify bindings of base fields and optional extensions for use with common catalog (details follow)
- Reference MLS and SecureObjects for end-to-end encryption (replacing Sframe)

Updates in version -03 (continued)

- Video optional extensions
  - temporalId, spatialId, depends
  - renderGroup, selectionParameters
- Video selection parameters
  - codec, framerate, bitrate
  - width, height, displayWidth, displayHeight
- Audio optional extensions
  - renderGroup, selectionParameters
- Audio selection parameters
  - codec, bitrate, samplerate, channelConfig, lang

Open Issues

- Separate packaging container format from MOQ Streaming Format?

- Video Parameter Sets in-band with keyframes? Or in separate init/config blobs in catalog, track header, group header, etc.?

- Sequence in LOC Header or reuse MOQ Object Header?
- Timestamp in LOC Header or MOQ Object Header? Format?

- Support arbitrary content protection schemes or specify?