

WARP Update & issues

<https://moq-wg.github.io/warp-streaming-format/draft-ietf-moq-warp.html>

Will Law

IETF #124, November 2025

PR's merged since Toronto

Merged: **Adding Event timeline track #67**

An event timeline is a JSON document holding a series of records.

Each record has 2 fields

- Index
 - GroupID or
 - MediaPTS or
 - Wallclock time
- Data - holds data appropriate to the type.

A new track property in the catalog called '*eventTimelineType*' defines the structure of the data.

Example: Event timeline track with wallclock time indexing

Sports data feed

```
[
  {
    "t": 1756885678361,
    "data": { "status": "in_progress";"period": 1,"clock": "12:00";"homeScore": 0,
              "awayScore": 0,"lastPlay": "Game Start"}
  },
  {
    "t": 1756885981542,
    "data": {"status": "in_progress";"period": 1,"clock": "09:25";"homeScore": 2,
              "awayScore": 0,"lastPlay": "Team A: #23 makes 2-pt jump shot"}
  }
]
```

Example: Event timeline track with Location indexing

Drone GPS coordinates

```
[
  {
    "l": [0,0],
    "data": [47.1812,8.4592]
  },
  {
    "l": [1,0],
    "data": [47.1662,8.5155]
  }
]
```

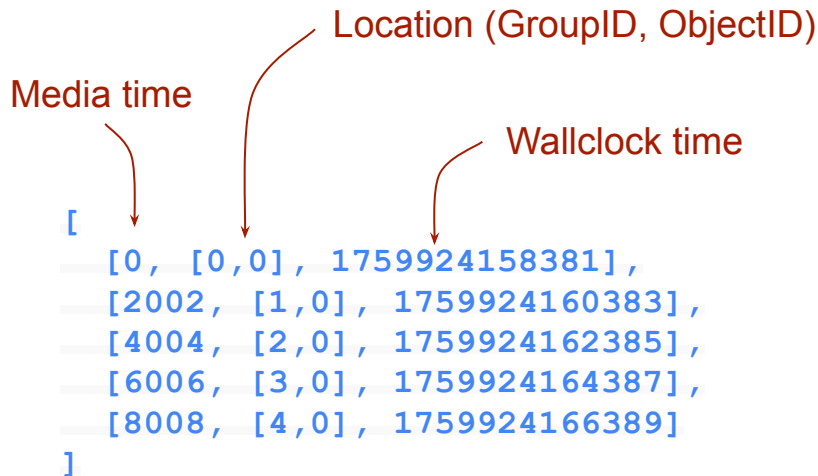
PR's merged since Toronto

Merged: **Changing media timeline to JSON #670**

The Media Timeline Track provides data about the previously published groups and their relationship to wallclock time and media time.

Media timeline tracks allow players to seek to precise points behind the live head in a live broadcast, or for random access in a VOD asset.

Note that metadata field was removed. Preference is to use the more flexible Event Timeline track for all metadata.



PR #60: URL syntax identifying both connection and track

Per issue #60, goal is to be able to represent both a connection to a MOQT endpoint and a WARP catalog track as a single URL.

A WARP URL is a String with the following components

moqt:// + authority + path + query

- The URL MUST conform with [RFC3986].
- The protocol is moqt and is required.
- The authority is required and holds the host and optional port. The default port will be 443. The authority holds the information needed for the client to connect to the distribution service, using either WebTransport or Raw QUIC.
- The path is optional. If present, it contains information that might be used by the server in initializing and configuring the connection.
- The query is optional. If present, it holds key-value data. Certain keys are reserved by this specification to hold special data. Multiple key/value pairs MAY be included, separated by an ampersand. Query options MUST be stripped from the path when the path is sent to the server at connection establishment. Query arguments are intended only for the player and MUST NOT be transmitted to the server.

<moqt://example.com/relay-app/relayID?c=customerID/broadcastID/catalog&c4m=12345>

Reserved query keys

Certain query keys are reserved

Name	Description
ns	The Namespace of the track
t	The Name of a non-catalog track
wallclock-range	A subclip defined by a wallclock time range
mediatime-range	A subclip defined by a media time range
location-range	A subclip defined by a MOQT Location range
c4m	A base64 encoded C4M token

- **ns** - the Namespace of the track. The '/' character in the String defines tuple field boundaries and is not included in the tuple fields. The '/' character MUST NOT be used other than to define tuple boundaries. A closing '/' for the last tuple field MUST NOT be included. This key MUST be included if 't' is present.
- **t** - the track name of a non-catalog track. This field MUST NOT be included if the URL is referencing a catalog track.
- **wallclock-range** - a range defined by start and end wallclock times, each expressed as milliseconds since Unix Epoch and separated by a "-" dash.
- **mediatime-range** - a range defined by start and end media times, each expressed as milliseconds and separated by a "-" dash.
- **location-range** - a range defined by start and end media MOQT Location tuples and expressed as Start Group ID, Start Object ID, End Group ID, End Object ID, each separated by a "-" dash

Example URLs

Example range-defining query arguments:

1. wallclock-range=1761759637565-1761759836189
2. mediatime-range=0-13421
3. location-range=34-0-2145-16

Example URLs

1. URL pointing at a catalog

moqt://example.com/relay-app/relayID?ns=customerID/broadcastID

2. URL pointing at a non-catalog track

moqt://example.com/relay-app/relayID?ns=customerID/broadcastID&t=video

3. URL pointing at a subclip of a catalog

moqt://example.com/relay-app/relayID?ns=customerID/broadcastID&location-range=34-0-64-16

4. URL pointing at a catalog and supplying a token

**moqt://example.com/relay-app/relayID?ns=customerID/broadcastID
&c4m=gqhkYWxnIGVzaGFyqGR0eXBNhdZ9hdWQAY3VybGZlbWlzcwZleWV2aW5u
ZWlhdGVwQWNyZW5lYnJmcmVqMTIzNDU2NzgwMHZpc3VlZF9hdD0xNzMwNDM**

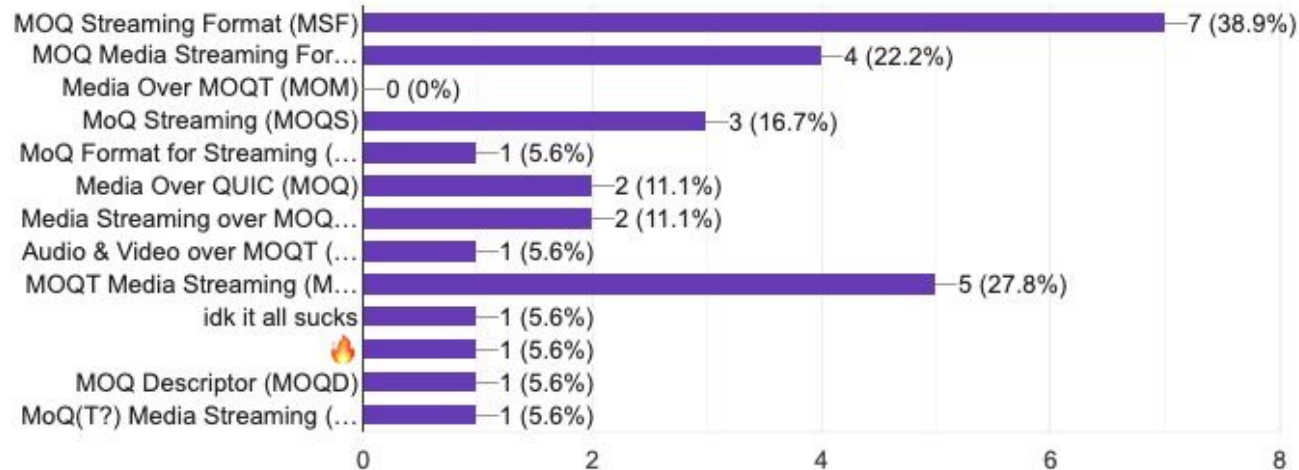
PR#71 Renames WARP to MOQT Streaming Format (MSF)

Fixes issue #69 - Rename WARP

New name for WARP

 [Copy chart](#)

18 responses



PR#71 Renames WARP to MOQT Streaming Format (MSF)

1st - MOQ Streaming Format

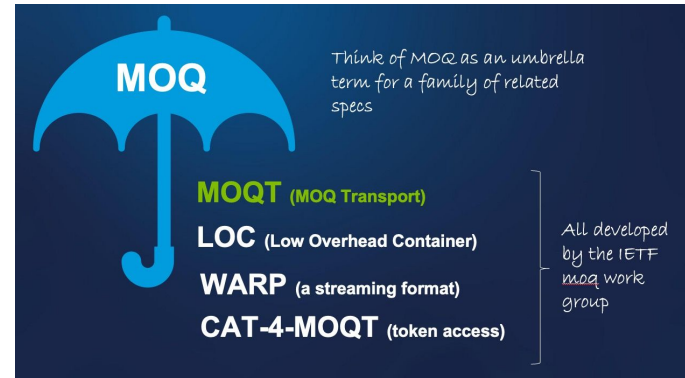
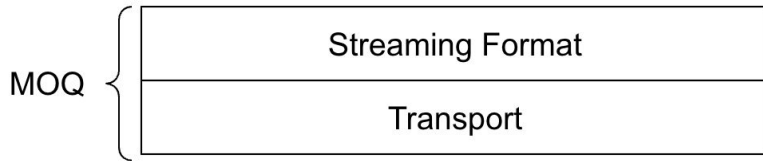


MOQT Streaming Format

2nd - MOQT Media Streaming Format

Argument was that MOQT is the actual transport we operate over, there is no draft for MOQ.

Objection noted that name MOQ is mentioned in our charter and that the WARP name should be MOQ Streaming Format



MOQ is an umbrella term for all tech relevant to MOQT. MOQT does not even mention media. We should update our charter to redefine MOQ.

Thank you for your time.