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Simple Time Over MoQ Protocol (STOMP)
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Abstract

This document describes Simple Time Over MoQ Protocol (STOMP), a protocol for sending the local time and, optionally, location information via Media Over QUIC Transport (MOQT) protocol [I-D.ietf-moq-transport].

Such information enables observing endpoints to measure latencies and monitor health of MOQT delivery network from different geographical locations.

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1. Introduction

When sending media over the internet, it is often useful to measure latency. This applies to both streaming media (for example Netflix) or real time interactive media (for example Webex or Zoom).

The goal of this specification is to allow a set of time servers to periodically report timing and other optional metadata, over Media Over QUIC Transport (MOQT). This allows clients to connect to several of these STOMP servers to measure latencies across the relay networks from different geographical locations. This also enables monitoring the health of a relay network.

2. Requirements Notation and Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD","SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in {{!RFC2119}}.

3. Terminology

TODO

4. Naming

The value of <moq://stomp.moq.arpa/v1/> is defined in this specification as the first entry into the Track Namespace tuple. The track name identifies the device (i.e. STOMP server) reporting the data objects {{data}}. The track name is identified with <deviceID>.

When sending data over one or more QUIC streams, an additional tuple entry, "stream", is specified, with the full track name having the following components:

("moq://stomp.moq.arpa/v1","stream",<deviceID>)

When sending data over QUIC datagrams, the track namespace tuple has following 2 entries:

("moq://stomp.moq.arpa/v1","datagram")

and the full track name for the same has the following components:

("moq://stomp.moq.arpa/v1","datagram",<deviceID>)

The MOQT GroupID is a randomly generated 62 bit number that is updated every minute. Within a MOQT group, a new stomp data object {{data}} is generated periodically over a randomized range between 0.8 and 1.2 seconds. MOQT ObjectID starts with 0 and is incremented by 1 for every object published within a given group.

5. Data Objects

STOMP data objects are JSON [RFC8259] objects with the following fields:

1. The timestamp as UNIX Epoch time in microseconds since 00:00:00 UTC on 1 January 1970.

2. Optional fields capturing the longitude and latitude, represented as signed integer. If omitted, these values correspond to the most recent object 0 that had any these values.

6. STOMP Servers Discovery

Endpoints can learn about STOMP servers available within a given relay network. They do so by sending SUBSCRIBE_ANNOUNCE message to with Track Namespace Prefix set to <moq://stomp.moq.arpa/v1/>.

6.1. Examples

Here is an example of Object ID 0 data, represented in JSON format [RFC8259].

```
Group 10135, Object ID 0
{
  "timestamp": 1729538287,
  "latitude" : 18.25,
  "longitude" : -63.1667
}
```

Below is another example that shows data as continuation from the previous example, where the redundant information is omitted.

```
Group 18902, Object ID 0
{
  "timestamp": 1729539981
}
```

7. Normative References

[I-D.ietf-moq-transport]
Curley, L., Pugin, K., Nandakumar, S., Vasiliev, V., and I. Swett, "Media over QUIC Transport", Work in Progress, Internet-Draft, draft-ietf-moq-transport-08, 12 February 2025, <https://datatracker.ietf.org/doc/html/draft-ietf-moq-transport-08>.

8. Informative References

[RFC8259] Bray, T., Ed., "The JavaScript Object Notation (JSON) Data Interchange Format", STD 90, RFC 8259, DOI 10.17487/RFC8259, December 2017, <https://www.rfc-editor.org/info/rfc8259>.

Appendix A. Acknowledgments

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