3GPP TSG|WG-4 Meeting #127 S4-240232r3

Sophia Antipolis, FR, 29th January 2024 - 2nd February 2024

**Source: Xiaomi**

**Title: New Study on Media delivery over QUIC-based protocols (FS\_MEQ)**

**Document for: Approval**

**Agenda Item: 9.2**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on Media delivery over QUIC-based protocols

Acronym: FS\_MEQ

Unique identifier: XXXXXX

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No | X |  | X |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1010032 | Study on Extended Reality and Media service (XRM) Phase 2 | This study has two objectives on QoS and traffic characteristics where SA4 collaboration is considered required. TR 23.700-70 uses QUIC as one of the protocols for the study. |
| 900029 | Study on 5G media streaming extensions | TR 26.804 documents deployment scenario and analysis of HTTP/3 usage in streaming services. HTTP/3 is based on QUIC. |

# 3 Justification

The QUIC protocol has been developed and its adoption has been tremendously accelerated by its use as the network protocol for HTTP/3. Since it is taking over (either through HTTP/3 or by replacing TCP) it is often used to carry media. In the IETF, the working group on Media Over QUIC (MOQ) is working towards an extensible protocol for publishing media for ingest and distribution with a mechanism of naming and receiving media. For real-time transmission use cases, the IETF has also started working on transmitting RTP over QUIC (RoQ). Monitoring the status of work in the MOQ working groups and related to the RoQ draft specification will also be encouraged, possibly using liaison with the IETF. Within 3GPP SA4, TR 26.804 compiled a significant amount of insights of deployment status of HTTP/3 for adaptive streaming.

Nonetheless, the impact and/or the extend of the benefits that QUIC can have on media delivery and respective applications has not been thoroughly studied. In particular, the usage of QUIC features such as QUIC streams on the User Plane for the delivery of media objects, e.g. media segments, NAL units, etc…, remains to be studied. Other developments (e.g. the rise of XR applications and formats) are also relevant since they do not share the traditional video application logic, even though they rely on similar media formats.

Within 3GPP, various groups have studied QUIC as a potential new protocol to be used in different contexts. Recently, SA2 has started a second phase to the XRM study called FS\_XRM Ph2 (SP-231671) for which QUIC will be considered as a potential protocol. Two objectives from FS\_XRM\_Ph2 are explicitly labelled as requiring “close collaboration between SA2 and SA4”. Those objectives are :

WT#1.1 Study whether and how to enhance PDU Set related (e.g. new standardized 5QI, enhancements to Alternative QoS profiles, FEC) and PDU Set information (including Control Plane and/or User plane information provided by the AF/AS) and the corresponding PDU Set QoS handling enhancement.

NOTE 1: This will require close coordination between SA4 and SA2.

WT#2.2 Study whether and how to support dynamic change (via user plane) in traffic characteristics (e.g. burst related parameters), provided by the application in the DN.

NOTE 2: This will require close coordination between SA4 and SA2.

The output of FS\_XRM Ph2, TR 23.700-70, is intended to be presented for information in SA#103 in March 2024 and for approval in SA#104 in June 2024. In the version 0.2.0, TR 23.700-70 contains the following text in clause 5.4 “Key Issue #4 - Traffic detection and QoS flow mapping for multiplexed data flows”:

For example, in XR service, several media streams could be multiplexed on a single IP 5-tuple with Transport protocol like IETF QUIC [11], using different QUIC connections or different QUIC streams.

Therefore, it is to be expected that SA2 will seek support from SA4 on the usage and behaviour of QUIC in the context of media delivery for which SA4 has not forged a group opinion yet.

Overall, this study will focus on collecting practices, specifications on how media is delivered over QUIC-based protocols and not defining new approaches.

# 4 Objective

The study has the following objectives:

1. Identify media applications existing today that are QUIC-aware, those that are QUIC-agnostic and those that are currently QUIC-agnostic but could benefit from being QUIC-aware. *(expected work to happen in both the MBS and RTC SWGs)*
2. Analyze how a media segment is carried over QUIC requested via HTTP/3; Identify the factors such as web browsers, security policies, transport encryption, OS libraries, etc. that can have an impact on the packetization of media segments over QUIC. *(expected work to happen in the MBS SWG)*
3. Analyze how packetized media would be carried over QUIC (e.g. RTP over QUIC (RoQ)); Identify the factors such as web browsers, security policies, transport encryption, OS libraries, etc. that can have an impact on the packetization of media over QUIC. *(expected work to happen in the RTC SWG)*
4. Examine whether the QUIC streams serve different purposes as documented in QUIC-based media protocols and assess their relevance for defining QoS policies, especially in the context of FS\_XRM\_Ph2. *(expected work to happen in both the MBS and RTC SWGs)*
5. Identify possible gaps and recommend potential normative work for stage-2 and stage-3.

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| TR | 26.8xx | Media delivery over QUIC-based protocols | SA#106(Dec 24) | SA#107(March 25) | Potetsianakis, Emmanouil, Xiaomi, emmanouil@xiaomi.com |
|  |  |  |  |  |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| N/A |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

Potetsianakis, Emmanouil, Xiaomi, emmanouil@xiaomi.com

<someone else???> for RTC topics

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

Potential communication with SA2 regarding QoS aspects (e.g. FS\_XRM\_Ph2).

# 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Xiaomi |
| BBC |
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