3GPP TSG-WG SA2 Meeting #168 S2-2504372

Goteborg, Sweden, 07-11 April, 2025 (revision of S2-2503826)

**Source: Nokia**

**Title: Study on Extended Reality and Media Service (XRM) Phase 3**

**Document for: Approval**

**Agenda Item: 30.6**

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 Extended Reality and Media Service (XRM) Phase 3

Acronym: FS\_XRM\_Ph3

Unique identifier: TBD

Potential target Release: Rel-20

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes | X |  |  | X |  |
| No |  | 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) |
|  |  |  |  |

### 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 | Continuation of the Rel. 19 WID |

# 3 Justification

In Rel-19 the use of UDP and QUIC-aware proxying is limited to transporting media related information from AS to UPF. The proxy functionality is located only on the side of the AS, with UPF establishing a secure channel to the AS based on traffic detection and handling rules provided by AF. A secure in-band communication channel between the Application Client (AC) and the UPF, would enable direct information exchange between UPF and AC in a controlled manner, i.e., subject to operator policies/SLA etc. This can be realised by integrating the proxy functionality to the UPF itself. Thus, the UPF could expose e.g., Rate Limiting information, Available Data Rate to the AC, and depending on the application logic, the AC could use this information for either UL, DL or both directions. Similarly, the AC could provide the UPF direct updates about traffic characteristics such as maximum burst size, especially for the UL direction. Of particular interest is i) the alignment with recent IETF work on exposure to the application of useful performance information on both uplink and downlink, such as SCONE and ii) the support of better management of multiplexed e2e encrypted traffic.

Ultimately the objective of XRM features such as PDU Set handling, ECN marking for L4S, EoDB indication, support of dynamically changing traffic characteristics like Burst Size and Time to Next Burst marking, etc. is to improve subscriber QoE or increase capacity utilization. However, Rel-18 and Rel-19 analytics from the NWDAF do not support assessing the circumstances when XRM features actually achieve these goals, and how parameters or XRM features may be adjusted to produce better results. It is proposed to study how to use existing analytics to evaluate the impact of XRM features on subscriber experience and network performance.

So far, Rel-18 and Rel-19 have not studied in-network media delivery on user plane in 5GC/UPF to support service content sharing, including content caching, distribution, etc., in order to reduce transmission latency and bandwidth. Similarly, it is not studied how to support flexible mapping between MoQ metadata and XRM related information such as PDU Set related information.

# 4 Objective

The study item aims at investigating further enhancements to support extended reality and media services with the following work tasks:

- WT-1: Enhancements for information exposure to the application and improved traffic management

- Study whether and how to enable the Application Client (AC) to connect to the UPF for bi-directional UE-NW information exchange like rate limitation, available bit rate (from the network to the AC), uplink traffic characteristics (from the AC to the network), e.g. by allowing the proxy functionality to be located optionally also in the UPF in addition to the AS side. In addition, study cases like changes of CIDs in QUIC and how to handle them in the UPF in forwarding mode than tunnel mode to avoid double encryption.

NOTE 1: The information exchange shall be based on operator policies/SLAs.

NOTE 2: This WT only affects the Application Client in the UE.

- WT-2: Study how to use existing analytics to assess the impact/improvement (if any) of Rel. 18 and Rel. 19 XRM features (e.g. PDU Set handling, ECN marking for L4S, EoDB marking, use of burst size, etc.) on subscriber experience and network performance by providing input on which XRM features are activated.

NOTE 3: This WT shall not impact the NG-RAN nor the UE.

- WT-3: Study media delivery by the user plane in 5GC/UPF in order to reduce transmission latency and bandwidth, for the use of MoQ and other protocols e.g. http(s).

NOTE 4: This WT shall not impact the UE.

- WT-4: Study how to support flexible mapping between MoQ metadata and XRM related information such as PDU Set related information.

NOTE 5: This WT shall not impact the UE.

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Work Task ID** | **TU Estimate****(Study)** | **TU Estimate****(Normative)** | **RAN Dependency****(Yes/No/Maybe)**  | **Inter Work Tasks Dependency** Editor’s Note: This column should highlight if WT#x is self-contained, or is depended on completion of other WTs |
| WT-1 | 1 | 1 | No | WT-1 is self-contained |
|  |  |  |  |  |
|  |  |  |  |  |
| WT-2 | 1 | 1 | No | WT-2 is self-contained |
| WT-3 | 1 | 1 | No | WT-3 is self-contained |
| WT-4 | 0.5 | 0.5 | No | WT-4 is self-contained |

**Total TU estimates for the study phase: 3.5**

**Total TU estimates for the normative phase: 3.5**

**Total TU estimates: 7**

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| TR | 23.abc-de | Study on Extended Reality and Media Service (XRM) Phase 3 |  | TSG#111 |  |
|  |  |  |  |  |  |

|  |
| --- |
| Impacted existing TS/TR |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |

# 6 Work item Rapporteur(s)

TBD

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

Security aspects shall be covered by/and/or in collaboration with SA3.

Media content delivery aspects shall be covered in collaboration with SA4.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Nokia |
| Xiaomi |
| China Unicom? |
| China Telecom? |
| SK Telecom? |
| DOCOMO? |
| Huawei? |
| Ericsson? |
| ZTE? |
| CMCC? |
| Lenovo? |
| InterDigital? |
| Tencent?  |
| ? |