**3GPP TSG-SA4 Meeting #129-eS4aI24xxxx**

**Online, , 19th Aug 2024 - 23rd Aug 2024** revision of S4-241670

**Agenda item:** 2.5

**Source:** Qualcomm Incorporated (Rapporteur)

**Title:** [FS\_AMD] Time and Work Plan for Advanced Media Delivery

**Version:** 0.3.1

**Document for** Agreement

# Introduction

During SA4#127 the Feasibility Study on “Advanced Media Delivery” was agreed in S4-240518 and afterwards approved in by SA plenary #103 in SP-240514. The work item was updated and approved at SA plenary #104 in [SP-241011](https://www.3gpp.org/ftp/TSG_SA/TSG_SA/TSGS_104_Shanghai_2024-06/Docs/SP-241011.zip).

The objective of this study is in the context of the above potential improvements and extensions, referred to as key topics. Specifically, for each of the above key topics, the following objectives are identified:

1. Document the above key topics

a) Common Client Metadata

b) Common Server-and Network-Assisted Streaming

c) Multi-Access and Multi-CDN Delivery

d) Modem-Usage Optimized Media Streaming

e) DRM and Conditional Access

f) In-session Unicast Repair for MBS Object Delivery

g) MBS User Service and Delivery Protocols for eMBMS

h) Selected MBMS Functionalities not supported in MBS

i) DASH/HLS Interoperability

j) Further harmonization of RTC and Streaming for Advanced Medial Delivery

k) Issues identified by Market Representation Partners

l) Improved QOS support

m) Impacts and opportunities of QUIC for segmented content delivery

in more detail, in particular how they relate to the 3GPP Media Delivery Architecture and/or the MBS User Service Architecture.

2. Study collaboration scenarios between the 5G System and Application Provider for each of the key topics.

3. Based on existing architectures, develop one or more deployment architectures that address the key topics and the collaboration models.

4. Map the key topics to basic functions and develop high-level call flows.

5. Identify the issues that need to be solved.

6. Provide candidate solutions including call flows, protocols and APIs for each of the identified issues.

7. Coordinate work with other 3GPP groups e.g. SA2, SA3, SA5, SA6 and others as needed.

8. Coordinate work with external organizations such as DASH-IF, CTA WAVE, ISO/IEC JTC29 WG3 (MPEG Systems), 5G-MAG, DVB or IETF, as needed.

9. Identify gaps and recommend potential normative work for stage-2 and stage-3 , including which existing specifications would be impacted and/or if any new specifications would preferably be developed.

The overall timeline is as follows

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Remarks |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| 26.802 | MBS User Service Enhancements and Extensions | SA#106  (Dec 24) | Individual CRs for each of the key topics may be provided. |
| 26.804 | Advanced Media Delivery | SA#106  (Dec 24) | Individual CRs for each of the key topics may be provided. |

This document provides an

- a vision towards potential normative work in 3GPP within Release -19 in clause 2.

- initial work plan to consider the completion of the work in the envisaged timelines in clause 3.

In scheduling telcos, guidance from the SA4 chair has been sent

*To WI/SI rapporteurs, when preparing post SA4#129-e WI/SI work plans, please beware of the following guidelines:*

* *Available weeks:*

*Note 1: according to a decision by 3GPP SA#90-e, meetings are not allowed during certain weeks. E.g. in this case, we should avoid:*

*- 2 weeks before and after SA#105 plenary Sep 10 – 13, 2024*

*- Golden week, Oct 1 – 7, 2024*

*- All Saints, Nov 1, 2024*

*- the week before SA4#130, Nov 18 – 22, 2024*

*Also, for some SWGs we should be aware of collisions with IBC 2024, Sep 13 – 16, 2024; AES convention Oct 8-10, 2024; and MPEG#148, Nov 4 – 8, 2024.*

*Note 2: it is expected that not all weeks will be filled with SA4 AH Telcos.*

*Here is the proposed list of available weeks for SA4 AH meetings:*

* *Sep 23 – 27, 2024*
* *Oct 8-11, 2024 (Golden week ends on Oct 7, AES convention Oct 8-10)*
* *Oct 14 – 18, 2024 (Proposed MBS Ad hoc e-meeting Oct 16-18, 2024)*
* *Oct 21 – 25, 2024*
* *Oct 28 – 31, 2024 (All Saints, Nov 1, 2024)*
* *Nov 4-8, 2024 (MPEG#148, Nov 4 – 8, 2024)*

*Reminder on preferred day of the week per SWG:*

* 1. *Monday – Audio SWG*
  2. *Tuesday – Video SWG*
  3. *Wednesday – RTC SWG*
  4. *Thursday – MBS SWG*
  5. *Friday –  Audio SWG*

This study also includes a proposal for

1. A proposed MBS AHG October 16-18 2024 held online.

# Vision towards normative work

This study is considered as an extension study of the existing Media Delivery Architecture as well as related stage-3 protocols, APIs and reference points. It is planned to identify topics for normative work to be addressed in the Rel-19 timeline as follows

* Completion of study by 09/2024 for stage-2 and by 12/2024 for stage-3
* Stage-2 normative work until 12/2024 (1 cycle work item, 100% completion within one cycle). An AHG meeting or an SA4#130bis in September/October 2024 should be considered to support the completion of the work.
* Stage-3 normative work until 09/2025 (3 cycle work item, 30% 03/2025, 70% 06/2025, 100% 09/2025)

The study may only conclude in a subset of the work topics on what normative work will be addressed in Rel-19. Conclusions in the study may include that certain topics are for further study. Those topics may be addressed with lower priority in Rel-19 timeline, with a clear understanding that they very likely not be addressed in Rel-19 timeline.

The timelines above 09/2024 for stage-2 and 12/2024 are considered are strict deadlines for what is addressed in Rel-19 normative work. This study as well as the follow-up normative work is expected to address the following

* Study:
  + TR 26.802: Documents key issues and work topics only related to MBS
  + TR 26.804: Documents key issues and work topics primarily related to 5G Media Streaming, but may include also hybid aspects as issues related to topic 1j)
* Stage-2 normative work (note not all work may be done based on topics completed in the study phase and what is not completed)
  + TS 26.500 (new) "Media Delivery Architecture" may be created to harmonize commonalities between TS 26.501 and TS 26.506, and to address advances that apply to both.
  + TS 26.501: Documents stage-2 enhancements for 5G Media Streaming and creates references to TS 26.500 as needed
  + TS 26.502: Documents stage-2 enhancements for MBS and creates references to TS 26.500 as needed
  + TS 26.506: Documents stage-2 enhancements for RTC and creates references to TS 26.500 as needed
* Stage-3 normative work (note not all work may be done based on topics completed in the study phase as well as in stage-2)
  + TS 26.510: Addresses enhancements to the Media Delivery: Session Handling Reference points and APIs
  + TS 26.512: Addresses enhancements to 5G Media Streaming: Protocols and APIs
  + TS 26.517: Addresses enhancements to MBS User Services: Protocols and APIs
  + TS 26.51x (new): Addresses common Media Delivery Content Delivery Protocols

# Agreed Processes and Status

## Preferred way of Contributions to Study

The following working methods were agreed.

* We create an individual CRs for each work topic
* The status of each work topic is tracked in the Work Plan table in clause 3.2 of this document
* A merged CR for each topics is provided after each meeting and tracked in the Work Plan
* We have designated a 'lead' to manage each key topic's individual Change Requests (CRs) to TR 26.804 and TR 26.802.
* Only the CR "owner" should book formal revisions of that CR, and can propose changes directly there at a meeting.
* We define a "contribution to a CR (co-CR)" from other contributors and they are expected to be sub-mitted as 'text proposals' using the pCR template and submitted as "discussion" Tdoc submitted for "endorsement" or "agreement"
* Other contributors (including possibly the CR owner, if preferred) raise "co-CRs" against the latest endorsed baseline CR revision for consideration at a meeting.
  + Often, the "co-CRs" will be adding non-conflicting clauses anyway.
  + In case of modifying an existing clause in the baseline endorsed CR, the "co-CR" author should take care to rebaseline if the existing clause has been modified since the previous baseline.
* All changes in the CR are accepted in the revision presented by the "owner" for endorsement so that there is a clean baseline available for use in the next meeting.
  + (A version with revision marks can optionally be provided in the TDoc zipfile in addition.)
* "co-CRs" always use change marks to clearly show new/modified text versus the baseline, simplifying the eventual merger into the CR by the CR "owner" when this action is agreed.
* The source companies of the "co-CR" are added as source companies to the CR, including a description of the additions in the cover page.

## Leads and Supporters for Each Work Topic

A work plan for each topic is available online here: <https://docs.google.com/spreadsheets/d/1PusEdliKFm0h5ZzqBX-KfeCuwV04KHCq0Sf4JMkeUBM/edit?usp=sharing>

The version taking into account the status after SA4#129-e provided below. More details are provided in the work sheet.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Topic | Title | Lead | Latest Document and Status | Related spec and CR number | Clause in spec | Completion | Completion New |
| 0 | Specification Structure | Thomas Stockhammer, Qualcomm | [S4-241472](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241472.zip) (n) | 26804-0014rev2 | 5.15, 6.15 | 10% | 10% |
| 1 | Common Client Metadata | Thomas Stockhammer, Qualcomm | [S4-241466](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241466.zip) (e) | 26804-0015rev3 | 5.16, 6.16 | 60% | 70% |
| 2 | Common Server-and Network-Assisted Streaming | Gilles Teniou, Tencent | [S4-241661](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241661.zip) (e) | 26804-0009rev4 | 5.17, 6.17 | 10% | 15% |
| 3a | Multi-CDN Media Delivery | Jason Cloud, Dolby | [S4-241665](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241665.zip) (e), S4-241609 (n) | 26804-0006rev13 | 5.19, 6.19 | 25% | 30% |
| 3b | Multi-Access Media Delivery | Prakash Kolan, Samsung | [S4-241676](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241676.zip) (e) | 26804-0013rev5 | 5.18, 6.18 | 20% | 50% |
| 4 | Modem Usage Optimized Media Streaming | Gilles Teniou, Tencent | [S4-241758](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241758.zip) (e), S4-241691 (n) | 26804-0010rev4 | 5.20, 6.20 | 10% | 20% |
| 5 | DRM and Conditional Access | Thomas Stockhammer, Qualcomm | [S4-241655](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241655.zip) (e) | 26804-0016rev3 | 5.10, 6.10 | 20% | 40% |
| 6 | In-session Unicast Repair for MBS Object Distribution | Thomas Stockhammer, Qualcomm | [S4-241677](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241677.zip) (e) | 26802-0001rev3 | 5.9 | 20% | 30% |
| 7 | MBS User Service and Delivery Protocols for eMBMS | Thomas Stockhammer, Qualcomm | [S4-241738](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241738.zip) (e) | 26802-0002rev3 | 5.10 | 10% | 15% |
| 8 | Selected MBMS Functionalities not supported in MBS | Thomas Stockhammer, Qualcomm | [S4-241467](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241467.zip) (e) | 26802-0003rev2 | 5.11 | 10% | 15% |
| 9 | DASH/HLS Interoperability | Gilles Teniou, Tencent | [S4-241760](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241760.zip) (e) | 26804-0011rev5 | 5.21, 6.21 | 10% | 15% |
| 10 | Further harmonization of RTC and Streaming for Advanced Media Delivery |  |  | 26804-xxxx | 5.22, 6.22 | 0% | 0% |
| 11 | Issues identified by Market Representation Partners | Thomas Stockhammer, Qualcomm | [S4-240908](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_128_Jeju/Docs/S4-240908.zip) (e) |  |  | 20% | 20% |
| 12 | Improved QoS support | Qi Pan, Huawei | [S4-241748](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241748.zip) (e), [S4-241692](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241699.zip) (m), S4-241746(m) | 26804-0007rev5 | 5.23, 6.23 | 30% | 50% |
| 13 | Impacts and opportunities of QUIC for segmented content delivery | Emmanouil Potetsianakis, Xiaomi | [S4-241251(e) S4-241698](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241698.zip) (e) [S4-241699](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241699.zip) (e) | 26804-0012rev1,  26804-0020rev1,  26804-0019rev1, | 5.4, 6.4 5.24.1.1, 5.24.2 5.24, 6.24 | 10% | 30% |
| 14 | In-band Signaling of QoS for 5G Media Streaming | Thomas Stockhammer, Qualcomm | [S4-241680](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241680.zip) (e) | 26804-0017rev1 | 5.25, 6.25 | 0% | 5% |
| 15 | Multi AS dynamic content generation and a sample solution | Rufael Mekuria, Huawei | [S4-241756](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_129-e/Docs/S4-241756.zip) (n) | 26804-0017rev2 | 5.26, 6.26 | 0% | 0% |
|  | Overall progress |  |  |  |  | 17% | 26% |

# Proposed Time and Work Plan

|  |  |  |
| --- | --- | --- |
| Meeting | Feasibility Study on “Advanced Media Delivery” - #1030006 | Completion Status |
| SA4#127 (29 January - 2 February 2024, Sophia Antipolis, FR) | Agree work item in S4-240518Start identifying leads for each work topicDiscuss vision for overall Rel-19 scheduleDiscuss initial work and time plan | Target 0%Real |
| SA#103 (March 19 - 22 2023, Maastrict, NL) | Approve work item in SP-240514 |  |
| 3GPP SA4 MBS SWG Telco (March 28, 2024, 15:30 – 17:30 CET, Host Qualcomm) | Initiate CRs for each work topicInitiate documenting each work topics and collaboration scenariosContinue identifying leads for each work topicSee clause 3Submission Deadline March 27, noon CET | Target 5%Real |
| SA4#127bis-e (8 - 12 April 2024, Online) | Agree vision for overall Rel-19 scheduleAgree initial work and time planAgree on leads for each work topic based on clause 3Continue documenting each work topics and collaboration scenariosInitiate CRs for each work topicAgree on workshop with 5G-MAGDiscuss SA4 MBS AHG for fall 2024Communicate with other 3GPP working groups and external organizations, in particular 5G-MAG, on need basis | Target 10%Real 5% |
| 3GPP SA4 MBS SWG Telco (May 2, 2024, 15:30 – 17:30 CEST, Host Qualcomm) | Workshop with 5G-MAG – get input and feedback on agreed work topics and potential new aspects.Discuss other issues with 5G-MAGProgress definition of work topicsSubmission Deadline April 30, noon CEST | Target 15%Real 10% |
| 3GPP SA4 MBS SWG Telco (May 7, 2024, 15:30 – 17:30 CEST, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline May 6, noon CEST | Target 20%Real 12% |
| SA4#128 (20 – 24 May 2024, Jeju Island, KR) | Complete documenting each work topic and collaboration scenariosStart developing high-level call flows.Start identifying the issues that need to be solved.Start candidate solutions including call flows, protocols and APIs for each of the identified issues.Progress CRs for each work topicCommunicate with other 3GPP working groups and external organizations, in particular 5G-MAG, on need basis | Target 25%Real 10% |
| 3GPP SA4 MBS SWG Telco (June 6, 2024, 15:30 – 17:30 CET, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline June 5, noon CEST | Target 30 %Real 12% |
| SA#104 (18 – 21 June 2024, China) | Updates of the study item description |  |
| 3GPP SA4 MBS SWG Telco (June 27, 2024, 15:30 – 17:30 CET, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline June 26, noon CEST | Target 35%Real |
| 3GPP SA4 MBS SWG Telco (July 11, 2024, 15:30 – 17:30 CET, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline July 10, noon CEST | Target 37%Real |
| 3GPP SA4 MBS SWG Telco (July 25, 2024, 15:30 – 17:30 CET, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline July 24, noon CEST | Target 40%Real 19% |
| SA4#129-e (19 – 23 August 2024, online) | Complete high-level call flows.Progress identifying the issues that need to be solved.Progress candidate solutions including call flows, protocols and APIs for each of the identified issues.Complete identifying gaps and recommend potential normative work for stage-2 for relevant work topics.Agree CRs addressing potential normative work for stage-2 for relevant work topicsProgress CRs relevant for stage-3Communicate with other 3GPP working groups and external organizations, in particular 5G-MAG, on need basis | Target 50%Real 26% |
| SA#105 (10– 13 September 2024, Melbourne, AU) | no actions |  |
| 3GPP SA4 MBS SWG Telco (Sep 26, 2024, 15:30 – 17:30 CEST, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline Sep 25, noon CEST | Target 55%Real |
| 3GPP SA4 MBS SWG Telco (Oct 10, 2024, 15:30 – 17:30 CEST, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline Oct 9, noon CEST | Target 55%Real |
| 3GPP SA4 MBS SWG Meeting (October 16-18 2024, online, Host Qualcomm) | Progress candidate solutions including call flows, protocols and APIs for each of the identified issues.Progress identifying gaps for stage-3 for relevant work topics.Progress CRs relevant for potential issues related to stage-3Communicate with other 3GPP working groups and external organizations, in particular 5G-MAG, on need basisCalls are held each day between 15:00 to 18:15 CEST (with 15min break at 16:30).For October 17, 2024, a joint session with 5G-MAG from 15:00 to 16:30 is planned.Submission deadline Oct 14, 23:59 CEST | Target 70%Real |
| 3GPP SA4 MBS SWG Telco (Oct 24, 2024, 15:30 – 17:30 CEST, Host Qualcomm) | Progress definition of work topicsProgress CRs for each work topicSubmission Deadline Oct 23, noon CEST | Target 75%Real |
| SA4#130 (18 – 22 November 2024, Orlando, FL, US) | Complete evalution of candidate solutions including call flows, protocols and APIs for each of the identified issues.Complete identifying gaps and recommend potential normative work for stage-3 for relevant work topics.Agree CRs addressing potential normative work for stage-3 for relevant work topicsCommunicate with other 3GPP working groups and external organizations, in particular 5G-MAG, on need basis | Target 90%Real |
| SA#106 (10 – 13 December 2024, Madrid, ES TBC) | Approve CRs addressing potential normative work for stage-2 and stage-3 for relevant work topics |  |