3GPP TSG SA WG4#117-e meeting ***S4-220023***

14th– 23rd February 2022

**Agenda item:** 8.8

**Source:** Qualcomm Incorporated (Rapporteur)

**Title:** [5MBP3] Proposed Specification Work

**Document for** Agreement

**Revision** 01

# Introduction

During SA4#116e the New Work Item on “5G Multicast-Broadcast Protocols” was agreed in [S4-211635](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_116-e/Docs/S4-211635.zip) and afterwards approved in by SA plenary #94-e in SP-211335.

The work item has the following objectives:

1. Specify the stage 3 format and protocol for User Service Announcement (between MBSF and MBS Client).
2. Specify the stage 3 protocols for the MBS distribution methods (between MBSTF and MBS Client) based on existing MBMS delivery methods.
	* + - Object distribution method, based on or reference to clause 7 of TS 26.346.
			- Packet distribution method, based on or reference to clause 8 and clause 8B of TS 26.346.
3. Specify stage 3 associated delivery procedures, specifically range-based File Repair based on TS 26.346.
4. Specify the relevant extensions to TS 26.512, TS 26.346 and TS 26.347 to support 5G Media Streaming via eMBMS.

This document provides proposed specification work to address the work item objectives.

# Objective 1: Stage 3 User Service Announcement

*Specify the stage 3 format and protocol for User Service Announcement (between MBSF and MBS Client).*

In order to address objective 1, it is proposed that the following is defined:

* Reuse the MBMS User Service Announcement Semantics as is, but
	+ Only use the relevant functions identified and required from TS 26.502. At this stage this is:
		- userServiceDescription
		- session Description
		- appService
		- schedule
		- An open question is as follows: It is possible to have more than one User Service Announcement active at the same time for a given MBS User Service. In this case, would the userServiceDescription
			* include multiple Session Descriptions, one for each FLUTE Session?
			* Include multiple m lines, one for each FLUTE Session?



* Provide a modern Restful APIs and JSON approach.
* Provide a legacy mode reusing and XML-based description
* Align with the stage-2 definitions

# Objective 2: Stage 3 MBS distribution methods

*Specify the stage 3 protocols for the MBS distribution methods (between MBSTF and MBS Client) based on existing MBMS delivery methods.*

* + - * *Object distribution method, based on or reference to clause 7 of TS 26.346.*
			* *Packet distribution method, based on or reference to clause 8 and clause 8B of TS 26.346.*

In order to address objective 2, it is proposed that the following is defined:

1. **Object Distribution Method that includes:**

- Download delivery method, File Delivery as defined in TS 26.346, clause 7.

- DASH/HLS over MBMS as defined in TS 26.346, clause 5.6 and 5.7.

For the object distribution method, it is proposed to differentiate two different cases.

1. Non-real-time file delivery including Carouselling
	1. Selected properties of this mode include
		1. Scheduled delivery
		2. File repair
		3. Carousel (for example supporting functionalities defined in DSM-CC)
		4. Post-delivery reporting
		5. File delivery QoS
		6. Usage of FEC for file delivery
		7. Support of single large file distribution
	2. On stage-3 it is expected that we use FLUTE as defined in TS 26.346 with the following proposal:
		1. for ALC/FLUTE/LCT
		2. Consider upgrading to the latest version of ALC, FLUTE and LCT
		3. Profile/remove any non-used functionalities based on MBMS Download Profile in TS 26.346, Annex L.4
2. Object Streaming addressing DASH/HLS
	1. Selected properties of this mode include
		1. Timed delivery
			1. Object deadline that is relevant for proper application operation.
		2. Concurrent metrics reporting
		3. Usage of FEC for object delivery
		4. Sequence of multiple objects
		5. Possibly multiple flows
		6. Limited size
		7. Partial objects as defined in TS 26.346
	2. Enhancements are would beneficial beyond the existing FLUTE.
		1. At least clarify object timing model (stage-3), i.e. how manifest availability times and object timing relates.
3. **A common packet delivery method that includes**

the relevant delivery aspects of transparent delivery method, group communication delivery method and streaming delivery method as defined in TS 26.346, clause 8B, 8A and 8 respectively.

For the packet distribution method, it is proposed to only support the Transparent Delivery Method as defined in clause 8B, both the proxy and the forward-only mode. This includes RTP-based delivery as a special case.

The following functions are expected to be included:

* Packet sequencing.
* FEC.
* QoS, bit rates.
* Multiple flows?
* Specific protocol support such as RTP/AVP.
* Anything specific around group communication, of considered necessary

The following functions are expected *not* to be included:

* Metrics – this is considered to be an application function.
* Unicast is not supported.
* Codecs will not be addressed. It is an assumption that an SDP is available with RTP/AVP.

# Objective 3: Stage 3 Associated Delivery Procedures

*Specify stage 3 associated delivery procedures, specifically range-based File Repair based on TS 26.346.*

tbd

# Objective 4: 5GMS via eMBMS

*Specify the relevant extensions to TS 26.512, TS 26.346 and TS 26.347 to support 5G Media Streaming via eMBMS.*

TS26.512

* M1:
	+ In addition, the content provider shall authorize via M1d that 5GMS content may be distributed via eMBMS.
* M2
	+ push-based ingest from 5GMSd AS to the BMSC is supported
* M5
	+ The 5GMS Service Access Information shall include the relevant information of the eMBMS Service Announcement in order to bootstrap reception of the MBMS service, typically via a service identifier (i.e., the **serviceId** attribute of the bundleDescription.userServiceDescription element of the USD – see TS 26.346 [19]). This is passed by the Media Session Handler to the MBMS Client via reference point MBMS-API-C [17]. When this information is present in the Service Access Information and when the UE is MBMS-capable, the 5GMSd Client shall invoke the MBMS Client to initiate reception of the corresponding MBMS User Service.
	+ The 5GMS Service Access Information shall include the relevant information of the eMBMS Service Announcement in order to collect metrics of the MBMS service. This metrics collection is initiated and these metrics are passed to the Media Session Handler from the MBMS Client via an extended reference point MBMS-API-C [17].

TS26.346

* Profile in Annex L to delivery 5GMS content
* Additional details are based on 26.501 updates.

TS 26.347

* Profile and APIs based on streaming delivery API and file delivery APIs to support 5GMS

# Proposed Skeleton for TS 26.517

* 5MBS System Overview
	+ Reference to TS 26.502
	+ Basic system overview
* User Service Announcement
	+ Data Model
		- Service Types
		- Capabilities
	+ Semantics
		- User Service Description
		- SessionDescription
		- Application Service
		- Scheduling
	+ Syntax
		- XML Instantation
		- JSON/RESTapi instantation
	+ Delivery
* Object Distribution Methods
	+ Session Description
	+ Protocols
	+ File Delivery
	+ Segment Streaming
	+ File Repair
* Packet Distribution Methods
	+ Session Description
	+ Protocols

# Proposal

It is proposed to

1. Create a skeleton for TS 26.517 to address objectives 1-3 according to clause 6 during SA4#117e and attempt send it to SA#95 for information.
2. Create draft CRs to TS 26.346 and TS 26.347 to address objective 4 during SA4#117e.
3. Ask for an exception to complete the work within Rel-17. See document S4-220024 for details.
4. Continue and complete the work during SA4#118e and SA4#119e according to the schedule proposed in S4-220022.