**3GPP TSG- SA4 Meeting #119e *S4-220693***

 **Electronic Meeting, 11th to 20th May 2022**

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| *CR-Form-v12.2* |
| **Psuedo CHANGE REQUEST** |
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|  | **26.517** | **CR** |  | **rev** | **-** | **Current version:** | **1.1.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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| ***Title:***  | [5MBP3]: Clause 6: Object Delivery Method |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5MBUSA |  | ***Date:*** | <Res\_date> |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | *Rel-17* |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** |  |
|  |  |
| ***Summary of change:*** | This pCR focuses on corrections and additions around Object Delivery Method. |
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| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\* First Change \*\*\*\*

# 6 Object Delivery Method

Editor’s Note:

1. Specify the stage 3 protocols for the MBS distribution methods (between MBSTF and MBS Client) based on existing MBMS delivery methods.
	1. Object distribution method, based on or reference to clause 7 of TS 26.346.
2. Agreements per S4-220023
3. Object delivery Method that includes:
	1. Download delivery method, File Delivery as defined in TS 26.346, clause 7.
	2. DASH/HLS over MBMS as defined in TS 26.346, clause 5.6 and 5.7.
4. For the object delivery 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. Upgrade to the latest version of ALC, FLUTE and LCT
			2. Keep a legacy version
			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
			2. Object deadline that is relevant for proper application operation.
			3. Concurrent metrics reporting
			4. Usage of FEC for object delivery
			5. Sequence of multiple objects
			6. Possibly multiple flows
			7. Limited size
			8. Partial objects
		2. Enhancements are needed beyond the existing FLUTE.
			1. Resolve and address object timing model (stage-3).

## 6.1 General

## 6.2 Usage of FLUTE for Object Distribution Method

### 6.2.1 General

If FLUTE is used Object Distribution Method, then the MBS Distribution Session shall conform to the MBMS Download Profile as defined in clause L.4 of TS 26.346 [7] with the additional requirements in this clause 6.2.

The usage of this method is identified in the Session Description metadata unit as defined in clause 6.2.3, in particular by the combination of using an MBS service type as defined in clause 6.2.3.2 as well as by the indication of the protocol being FLUTE/UDP.

In order to fetch missing portions of an object, the MBS Client may use the Object Repair services. The Object Repair service is realized as a Byte-Range based File Repair, as specified in clause 9.3.6.2 of TS 26.346 [7].

Editor’s Note: The usage of Alternate-Content-Location-1 and Alternate-Content-Location-2 elements should be supported for backward compatibility.

For MB Sessions, the MBSTF may use the Reduced FDT Schema according to clause L.6.

### 6.2.3 Session Description metadata unit

#### 6.2.3.1 General

The Session Description metadata unit contains the needed information to activate the reception of an Object Distribution Method. The Session Description metadata unit is formatted according to the Session Description Protocol [8]. The Session Description metadata unit for the Object Distribution Method is based on the Session Description parameters as defined in clause 7.3 of TS 26.346 [7] with the following restrictions and extensions.

Restrictions:

- The *Mode of MBMS bearer per media* parameter (clause 7.3.2.7 of [7]) shall not be used.

- The *QoE Metrics* (as defined in clauses 7.3.2.0 of [7]) shall not be used

- The *Service-language(s) per media* (clause 7.3.2.9 of [7]) shall not be used. It is assumed that the service languages are described within an application manifest.

- The *Alternative TMGI* (clause 7.3.2.12 of [7]) shall not be used.

- The *Start time* and *End time* (SDP t-line) should be set to zero. If a schedule document is present in the user service description, then this attribute shall document a superset of the active times documented in the schedule.

NOTE: Setting times to zero means that the times are undefined. The schedule of a distribution session can be provided in the schedule document of the user service announcement.

Editor’s Note: The relaxation of the number of FLUTE Sessions as defined in clause 7.3.2.4 is for future study. An alternative/better way would be to allow multiple Object Distribution Sessions within one USD and use a baseUrl for binding.

Extensions:

- When an MBS Session is of MBS Service Type *Broadcast* or when the Multicast MBS Session Type uses a TMGI as MBS Session ID, the *MBS service type of MBS Session* declaration attribute as defined in clause 6.2.3.2 shall be present in the Session Description.

#### 6.2.3.2 MBS service type of MBS Session

An MBS service type declaration attribute is defined which results in, e.g.

- a=mbs-servicetype:broadcast 123869108302929

or:

- a=mbs-servicetype:multicast 123869108302929

The MBS service type declaration attribute shall be used in session description metadata unit using one or more MBS broadcast sessions or multicast MBS sessions.

The SDP attribute shall be declared at session level. The session level attribute applies to all media entries without a media level occurrence of the mbs-servicetype attribute. The Session Description metadata unit shall include only a single instance of MBS service type declaration attribute.

Definition:

- mbs-service-type-declaration-line = "a=mbs-servicetype:" ("broadcast"/"multicast" SP tmgi) CRLF

- tmgi = 1\*15DIGIT

EXAMPLE:

UK MCC = 234 *(MCC Digit 1 = 2; MCC Digit 2 = 3 and MCC Digit 3 = 4)*.

Vodafone UK MNC = 15.

and, with padding, Vodafone UK MNC = 15F *(MNC Digit 1 = 1; MNC Digit 2 = 5 and MNC Digit 3 = F)*.

MBS Service ID = 70A886.

Therefore, TMGI = 70A886 32F451 (Hex) or 123869108302929 (Decimal)

The Temporary Mobile Group Identity (tmgi) information element is defined in TS 24.008 [11] including the coding of the fields. Octets 3 to 8 (MBS Service ID, MCC and MNC) shall be placed in the tmgi attribute of the MBS service type declaration line, and are encoded as a decimal number. Octet 3 is the most significant octet. Because this is encoded as a decimal number, leading zeros of the MBS Service ID field may be omitted.

#### 6.2.3.3 SDP Examples for MBS Distribution Session using Object Distribution Method

Listing 6.2.3.3‑1 provides a full example of SDP description describing an MBS Distribution Session using the Object Distribution Method with a TMGI as MBS Session Id:

Listing 6.2.3.3‑1: SDP description for MBS Distribution Session using
Object Distribution Method with TMGI

|  |
| --- |
| v=0o=user123 2890844526 2890842807 IN IP6 2201:056D::112E:144A:1E24s=Object Distribution session examplet=0 0a=mbs-servicetype:broadcast 123869108302929a=FEC-declaration:0 encoding-id=1a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9a=flute-tsi:3m=application 12345 FLUTE/UDP 0c=IN IP6 FF1E:03AD::7F2E:172A:1E24/1b=1000a=FEC:0 |

Listing 6.2.3.3‑2 provides a second example of an SDP description describing an MBS Distribution Session using the Object Distribution Method and which indicates that 25% redundant FEC protection is applied to the FEC encoding of the video Segments of the associated DASH-formatted content:

Listing 6.2.3.3‑2: SDP description for MBS Distribution Session using
Object Distribution Method with TMGI and 25% FEC redundancy

|  |
| --- |
| v=0o=user123 2890844526 2890842807 IN IP6 2201:056D::112E:144A:1E24s=Object Distribution session carrying DASH-packaged programi=More informationt=0 0a=mbs-servicetype:broadcast 123869108302929a=FEC-declaration:0 encoding-id=1a=FEC-redundancy-level:0 redundancy-level=25a=source-filter: incl IN IP6 \* 2001:210:1:2:240:96FF:FE25:8EC9a=flute-tsi:5m=video 10111 FLUTE/UDP 0c=IN IP6 FF1E:03AD::7F2E:172A:1E24/1b=2048a=lang:EN |

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### 6.2.4 Operating modes for Object Distribution Method

#### 6.2.4.1 General

Different operation modes for object distribution are defined according to TS 26.502 [X], clause X.X. Operation modes primarily describe the operation of the MBSTF to convert ingest data into an MBS distribution session.

Common to all object operating modes is the usage of the FLUTE Object distribution method as defined in this clause.

#### 6.2.4.2 Single object operating mode

#### 6.2.4.3 Object collection operating mode

#### 6.2.4.4 Object carousel operating mode

#### 6.2.4.5 Segment streaming operating mode

This operating mode is recommended for streaming DASH or HLS content to a media player in the UE using MBS User Services.

The Segment streaming operating mode assumes the availability of an Application Service Description metadata fragment which describes the service. As an example, this may be a DASH MPD.

In an abstracted fashion, for all objects that to be delivered in the MBS distribution session, referred to as object flow, the following information is available to the MBSTF for each object to be delivered:

* the URL of the object in the Application Service Description metadata fragment
* its latest required availability time as announced in the application service document
* its required availability duration of the object for the application after the latest required availability time

For the segment streaming operating mode, the MBSTF acts as follows

* it shall deliver the objects such that the last packet of the delivered object is available at the MBS Client latest at its latest availability
* The Content-Location element in the FDT for the delivered object shall match the URL in the application service document
* latest required availability time
* If the content of the Application Service Description document is updated during the MBS distribution session, then the updated shall be is delivered as an object in the segment streaming mode on the same MBS Distribution Session using the same principles as above.
* Content-MD5 and File-ETag may be used optional.
* We should add more

The MBS Distribution Session shall be provisioned to accommodate the aggregated object flow during the course of the session, including protocol header and FEC overhead.

\*\*\* REST COULD GO AWAY OR BE SAID HOW TO MAP \*\*\*

A presentation manifest (e.g. DASH MPD) shall be provided by the MBSF together with the other service description metadata units prior to the start time of the MBS Distribution Session. If the content of the presentation manifest changes during an MBS User Data Ingest Session the updated manifest is delivered in-band with the media segments on the same MBS Distribution Session. The MBS Client retains a copy of the latest presentation manifest until an updated one is received so that the media player can fetch it locally.

NOTE: It is assumed that these updates occur seldom, for instance once the MBS Distribution Session end time becomes known.

The media encoder upstream of the MBSTF shall be configured so as to ensure media players have enough data to sustain playback during the MBS Distribution Session.

Editor’s Note: Include considerations from Annex M (HLS).

The MBS Distribution Session shall be provisioned to accommodate the aggregated 3GP-DASH representation’s bit rate for all content at any time during the course of the session, including protocol header and FEC overhead.

Furthermore:

- The MBSTF shall ensure that media segments are delivered to (and therefore available on time at) the MBSTF Client such that they can be requested by the media player according to the timeline signalled in the presentation manifest.

- The MBS Client does not have to process the presentation manifest for normal operation of the service, or at least no modifications of it are necessary in order to properly operate the service.

Editor’s Note: It should be clarified what triggers the MBS Client to make an object or a partial object available.

Editor’s Note: The usage of Object Repair for Segment Streaming is for future study.

The MBS Distribution Session shall be provisioned to accommodate the aggregated 3GP-DASH representation’s bit rate for all content at any time during the course of the session, including protocol header and FEC overhead.

\*\*\*\* Last Change \*\*\*\*