**3GPP TSG SA4 116-E** ***S4-211449***

**E-meeting, 10th-19th November, 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **TS 26.502** | **CR** | **–** | **rev** | **–** | **Current version:** | **0.1.0** |  |
|  | | | | | | | | |
| *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:*** | pCR to TS 26.502 on overview of delivery methods | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei Technologies Co.,Ltd. | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBUSA | | | | |  | ***Date:*** | | | 2021-11-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **D** |  | | | | | ***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)*. | | | | | | | |  | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Added text in reference architecture for 5G Multicast-Broadcast User Services | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add overview of delivery methods. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | WID not complete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.1.1, 6.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Changes against skeleton document TS 26.502 v0.1.0 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

First change

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[3] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[4] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[5] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[6] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[X] IETF RFC 3926: "FLUTE - File Delivery over Unidirectional Transport", T. Paila, M. Luby, R. Lehtonen, V. Roca, R. Walsh.

[Y] IETF RFC 3450: "Asynchronous Layered Coding (ALC) Protocol Instantiation", M. Luby, J. Gemmell, L. Vicisano, L. Rizzo, J. Crowcroft.

[Z] IETF RFC 3451: "Layered Coding Transport (LCT) Building Block", M. Luby, J. Gemmell, L. Vicisano, L. Rizzo, M. Handley, J. Crowcroft.

[A] IETF RFC 5052: "Forward Error Correction (FEC) Building Block", M. Luby, M. Watson, L. Vicisano.

second CHANGE

## 6.1 Object Distribution Method

### 6.1.1 Overview

The Obejct Distribution Mehod uses the FLUTE protocol (RFC 3926 [X]) to deliver binary obejcts over an MBS Session. T The Object Distribution Method supports the following Use Cases:

- Object carouselling for non-real-time file delivery.

- Object streaming of real-time media segments, for regular-latency or low-latency streaming delivery. In the latter case, the objects distributed may beLow-Latency CMAF segments.

FLUTE is built on top of the Asynchronous Layered Coding (ALC) protocol instantiation (RFC 3450 [Y]). ALC combines the Layered Coding Transport (LCT) building block [Z], a congestion control building block and the Forward Error Correction (FEC) building block ([A]) to provide congestion-controlled, reliable asynchronous delivery of content to an unlimited number of concurrent receivers from a single sender. RFC 3450 [Y] mentions that congestion control is not appropriate in the type of environment for which the Object Distribution Method is intended, and thus congestion control is not used here.

Figure 6.1.1‑1 illustrates the FLUTE building block structure. FLUTE is carried over UDP/IP, and is independent of the IP version and the underlying link layers used.



Figure 6.1.1‑1: Building block structure of FLUTE

- ALC uses the LCT building block to provide in-band session management functionality. The LCT building block has several specified and under-specified fields that are inherited and further specified by ALC.

- ALC uses the FEC building block to provide reliability. The FEC building block allows the choice of an appropriate FEC code to be used within ALC, including using the no-code FEC code that simply sends the original data using no FEC coding. ALC is under-specified and generally transports binary objects of finite or indeterminate length.

- FLUTE is a fully-specified protocol to transport files (any kind of discrete binary object), and uses special purpose objects – the File Description Table (FDT) Instances – to provide a running index of files and their essential reception parameters in band of a FLUTE session.

Second change

## 6.2 PDU Distribution Method

### 6.2.1 Overview

The PDU Distribution Method is used by the MBSTF to deliver Application Data Units in the form of UDP datagrams or IP packets to the MBS Client over an MBS session This distribution method complements the Object Distribution Method defined in clause 6.1 and is particularly useful for multicast and broadcast of IP-based services for which the media codecs and application protocols are defined outside the scope of the present document.

The PDU Distribution Method shall be used by the MBSTF to distribute service content received from the MBMS Content Provider over xMB-U [6] or from the Group Communication Server over MB2-U [6].

The MBSTF receives Application Data Units (ADUs) from the MBMS content provider or from the Group Communication Server, typically provided as UDP/IP packets, and forwards them to the configured destination multicast IP address and port number. Both IPv4 and IPv6 may be used by the PDU Distribution Method.

The PDU Distribution Method may be used in combination with MBS User Services, where the session description is delivered as a fragment of a User Service Description, or they may be used independently, where the content provider announces the session via external means.

A MBS Session using the PDU Distribution Method may be operated in one of two differentmodes:

- In the *Forward-only mode*, the transport protocol on top of IP is opaque to the MBS System and the session announcement may be handled by the MBMS Content Provider or by the Group Communication Server itself. Reference point Nmb10 between the AF and the MBSF re-uses the N33 or N5 interface design.

- In the *Proxy mode*, the UDP packet payload of the UDP streams is opaque to the MBS session and an MBS Client is expected to make the UDP Payloads available directly to an application, without further knowledge of the content carried.