**3GPP TSG-S4 Meeting #113-e *S4-210475***

**Online, , 6th–14th April 2021**

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| *CR-Form-v12.0* |
| **PSEUDO CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
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| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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). |  |
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| ***Reason for change:*** | Initial solution to Key Issue #1, Scenario #2. |
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| ***Summary of change:*** | Proposed architecture for interworking between the DVB-MABR reference model and the proposed 5MBS reference model. |
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| ***Consequences if not approved:*** | Failure to progress the study of this Key Issue and requirements will not be fed into other aspects of solution design. |
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| ***Clauses affected:*** | 7.2.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  |  |
| ***affected:*** |  |  |  Test specifications |  |
| ***(show related CRs)*** |  |  |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

FIRST CHANGE

# 7 Potential Solutions

This clause provides potential solutions for the standardization areas identified in Clause 6.

## 7.1 General

(SNIPPED)

## 7.2 Key Issue #1: Support of multicast ABR in 5G Media Streaming Architecture

### 7.2.1 Mapping of DVB‑MABR and CableLabs MABR reference architectures to 5MBS reference architecture for Scenario #1

(SNIPPED)

### 7.2.2 Interworking of DVB‑MABR reference architecture with 5MBS reference architecture for Scenario #2

#### 7.2.2.1 Introduction

With reference to an external Multicast ABR system interworking with a 5MBS System as described in clause 5.2.3, a different arrangement of logical functions and reference points is needed from that of Scenario #1.

Multicast ABR Scenario #2 may be realised by the following deployment models outlined in clause 5.4 of the present document:

- **Collaboration B2** (see clause 5.4.3) where all media-related functions are deployed in an External DN and a unidirectional packet stream is injected into the MBSTF in the Trusted DN at reference point xMB-U (Rel‑17), as depicted in Figure 4.4.1.3‑1. Because the externally generated multicast packet stream emulates the candidate 5MBS Delivery Method for segmented media, the 5MBS Client can receive it and can perform AL‑FEC and unicast repair procedures on the packet payloads as needed. Furthermore, a standard 5GMSd Client can play the role of the 5MBS-Aware Application.

 Unicast repair operations use the 5MBS AS as a proxy to a *Content hosting* function in the External DN.

**- Collaboration C** (see clause 5.4.4) where all media-related functions are deployed in an External DN and a multicast packet stream is injected into the MBSTF in the Trusted DN at reference point xMB-U (Rel‑17), as depicted in Figure 4.4.1.3‑1. Because the externally generated multicast packet stream emulates the candidate 5MBS Delivery Method for segmented media, the 5MBS Client can receive it and can perform AL‑FEC and unicast repair procedures on the packet payloads as needed. Furthermore, a standard 5GMSd Client can play the role of the 5BMS-Aware Application.

In this collaboration, the *Provisioning* function plays the role of an externally hosted 5GMSd AF; the *Content hosting* function plays the role of an externally hosted 5GMSd AS and the *Multicast* server provides the MBSTF-like function. As above, unicast repair operations use the 5MBS AS as a proxy to the *Content hosting* function in the External DN.

- **Collaboration D** (see clause 5.4.5) which is the same as Collaboration C except that the externally generated multicast packet stream is in an application-specific format that differs from the candidate 5MBS Delivery Method for segmented media, for example the DVB-MABR profile of ROUTE or the CableLabs profile of NORM. In this case, the 5MBS Client can receive the packet payloads, but cannot repair them using 5MBS AL‑FEC or 5MBS unicast repair procedures. The received packet payloads are instead delivered to a 5MBS-Aware Application at MBS‑7 that is responsible for media object reassembly, repair procedures and onward delivery to a media player. In this scenario, the DVB-MABR *Multicast gateway* function could, for example, play the role of the 5MBS-Aware Application.

#### 7.2.2.2 Interworking architecture for Collaboration D

Figure 7.2.2.2‑1 below shows how the DVB‑MABR reference model (blue functions and reference points) integrates with the 5MBS reference model for User Services (green functions and reference points) and the 5MBS reference model for 5GC (grey functions and reference points) particularly in the case of Collaboration D.



NOTE: Because use of the unicast path is uncoordinated with 5MBS functions in Collaboration D, reference point MB‑N9 between the MB-UPF and UPF is omitted.

Figure 7.2.2.2‑1: Interworking between the DVB‑MABR reference model and the 5MBS reference model

The following aspects of the interworking are noteworthy.

In the control plane:

1. The content provider’s *Provisioning* function is integrated with the MBSF at reference point xMB‑C (Rel‑17). This is used to provision a transport-only 5MBS delivery session for each target DVB-MABR multicast transport session (see point 4 below), plus an additional delivery session to convey the DVB-MABR multicast gateway configuration transport session.

As part of this interaction, the multicast addresses to be used in the data plane are nominated by the MBSF.

2. The MBSF configures the transport-only 5MBS delivery sessions in the MBSTF via interface Nx2.

3. The multicast addresses to be used in the data plane are included in the DVB-MABR multicast server configuration instance document passed by the *Provisioning* function to the *Multicast server* at reference point CMS. (This includes the transport parameters for each multicast transport session, plus those for the multicast gateway configuration transport session.)

4. The availability of the transport-only 5MBS delivery sessions is advertised to the 5MBS Client by the MBSF in the conventional manner at reference point MBS‑5.

5. The *Multicast gateway* is notified by the 5MBS Client about the availability of transport-only 5MBS delivery sessions via the MBS‑6 API.

In the user plane:

6. The *Multicast server* is integrated with the MBSTF at reference point xMB-U. Multicast packets are tunnelled across the network between the External DN and the Trusted DN.

7. The MBSTF uses the transport-only Delivery Method to deliver these multicast packets to the 5BMS Client on the UE via MBS‑4‑MC.

8. Using the notifications received from the 5MBS Client in step 5 above, the DVB‑MABR *Multicast gateway* function subscribes to the desired multicast transport sessions by invoking the appropriate MBS‑6 API call on the 5MBS Client. Dynamic adaptation between multicast transport sessions is achieved by making appropriate MBS‑6 API calls to unsubscribe from one and subscribe to another.

9. In particular, the *Multicast gateway* subscribes to the multicast gateway configuration transport session as soon as it is announced at MBS-6 in order to acquire the multicast gateway configuration instance document and any other multicast delivery objects provided on the multicast gateway configuration transport session, such as presentation manifests and/or initialisation segments.

10. The 5MBS Client on the UE receives multicast packets at MBS‑4‑MC for subscribed transport-only 5MBS delivery sessions and routes them to the correct 5MBS-Aware Application (here, the *Multicast gateway* function) via reference point MBS‑7.

NOTE: The 5MBS Client does not attempt to make good any missing or corrupted multicast packets in this collaboration scenario.

11. The *Multicast gateway* parses and reassembles received multicast packets into playback delivery objects, as normal. It may apply Application‑Level Forward Error Correction to repair missing packets, as configured in the multicast gateway configuration instance document received in step 9. It may also perform HTTP-based unicast repair at reference point A, as configured in the multicast gateway configuration instance document. Reference point A is realised via a conventional PDU Session.

12. Intact playback delivery objects are exposed to the *Content playback* function as normal at reference point L.

END OF CHANGES