**3GPP TSG-S2 Meeting #147-e *S2-21xxxxx***

**Online, , 18–22 October 2021**

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| *CR-Form-v12.0* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **TR 23.247** | **CR** | **–** | **rev** |  | **Current version:** | **1.1.0** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Replacement reference point architecture figure |
|  |  |
| ***Source to WG:*** | BBC |
| ***Source to TSG:*** | S2 |
|  |  |
| ***Work item code:*** | 5MBS |  | ***Date:*** | 2021-09-XX |
|  |  |  |  |  |
| ***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). |  |
|  |  |
| ***Reason for change:*** | Clearer depiction of the 5MBS architecutre such that the same diagram can be used in TS 23.247 and TS 26.502. |
|  |  |
| ***Summary of change:*** | * Change of typeface.
* More white space between functions.
* Alignment of functions into two horizontal planes.
* Depiction of AF/AS spanning both planes.
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| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** | 5.1, C |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***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 22.146: "Multimedia Broadcast/Multicast Service (MBMS); Stage 1".

[3] 3GPP TS 22.246: "Multimedia Broadcast/Multicast Service (MBMS) user services; Stage 1".

[4] 3GPP TS 22.261: "Service requirements for the 5G system".

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

[6] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[7] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[8] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[9] 3GPP TS 38.300: "NR; Overall description; Stage-2".

[10] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE)".

[11] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[12] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[13] 3GPP TS 26.346: "MBMS: Protocols and Codecs".

[14] 3GPP TR 23.757: "Study on architectural enhancements for 5G multicast-broadcast services".

[15] 3GPP TS 38.413: "NG Application Protocol (NGAP)".

[16] 3GPP TS 38.401: "NG-RAN; Architecture description".

[17] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".

[18] 3GPP TS 26.502: "5G Multicast-Broadcast User Service Architecture".

[X] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

CONTINUES…

NEXT CHANGE

5.1 General architecture

In the following figures, mandatory functions and reference points in the 5G MBS System are depicted with a solid line while optional functions and reference points are depicted using a dotted line.

Figure 5.1-1 depicts the 5G MBS reference architecture. Service-based interfaces are used within the Control Plane.



Figure 5.1-1: 5G System architecture for Multicast and Broadcast Service.

NOTE 1: The MBSF is optional and may be collocated with the NEF or AF/AS, and the MBSTF is an optional network function.

NOTE 2: The existing service based interfaces of Nnrf, Nudm, and Nsmf are enhanced to support 5G MBS. The existing service based interfaces of Npcf and Nnef are enhanced to support 5G MBS.

NOTE 3: xMB-C/MB2-C and xMB-U/MB2-U are intended for legacy AS. A 5G MBS enabled AF uses either Nmbsf or Nnef to interact with the MBSF.

Editor's note: Which NF is used to store service parameters, including serving MB-SMF information will be updated in future versions.

Figure 5.1-2 depicts the 5G system architecture for MBS using the reference point representation.



Figure 5.1-2: 5G System architecture for Multicast and Broadcast Service in reference point representation.

NOTE 4: The existing reference points of N1, N2, N4, N10, N11, N30 and N33 are enhanced to support 5G MBS.

NOTE 5: Nmb10, xMB‑C and MB2‑C are distinct reference points used in different usages of the 5MBS System control plane. Similarly, Nmb8, xMB‑U and MB2‑U are distinct reference points used in different usages of the 5G MBS System user plane. The possible collaboration scenarios are illustrated in annex C.

NOTE 6: When the xMB‑C and xMB‑U reference points are used, the AF/AS function is referred to as a Legacy AS. See clause C.5.

NOTE 7: When the MB2‑C and MB2‑U reference points are used, the AF/AS function plays the role of the GCS AS. See clause C.6.

NEXT CHANGE

Annex C (informative): Northbound Collaboration Scenarios

# C.1 General

This annex documents various collaboration scenarios between the 5G MBS System and different types of Application Function (AF) and Application Server (AS). In the figures illustrating these collaborations, mandatory functions and reference points in the 5G MBS System are depicted with a solid line while functions and reference points that are optional in the deployment of the collaboration are depicted using a dotted line.

# C.2 Collaboration A: Service-based interaction with full 5G MBS System

Figure C.2 below illustrates a collaboration with a 5G MBS System that includes the optional MBSF and MBSTF which together offer the MBS User Services abstraction to northbound functions, as defined in TS 26.502 [18].

- In the control plane, a service-based AF invokes the Nmbsf service on the MBSF either directly at reference point Nmb10 or, in the case where the AF lies outside the trusted domain, indirectly via the NEF at reference point N33 then Nmb5.

- In the user plane, an AS interacts with the MBSTF via reference point Nmb8.



Figure C.2: Service-based interaction with full 5G MBS System in reference point notation

# C.3 Collaboration B: AF co-location with full 5G MBS System

Figure C.3 below depicts a simplified deployment of the full 5G MBS System in which the MBSF is realised as a subfunction of the AF, for example the 5GMS AF defined in TS 26.501 [X].

- Control plane interactions with the MBSF are subsumed into the AF and the northbound interface is defined by the AF.

- In the user plane, an AS interacts with the MBSTF via reference point Nmb8.



Figure C.3: AF co-location with full 5G MBS System in reference point notation

# C.4 Collaboration C: Service-based interaction with simplified 5G MBS System

Figure C.4 below illustrates a collaboration with a simplified 5G MBS System lacking the optional MBSF and MBSTF. In this case, some or all of the functions of the MBSF are performed instead by the AF, and those of the MBSTF are performed by the AS.

- In the control plane, a service-based AF invokes the Nmbsmf service on the MB‑SMF either directly at reference point Nmb13 or, in the case where the AF lies outside the trusted domain, indirectly via the NEF at reference point N33 then N29mb.

- In the user plane, an AS interacts with the MB‑UPF via reference point N6mb regardless of whether the AS is deployed inside or outside the trusted domain.



Figure C.4: Service-based interaction with simplified 5G MBS System in reference point notation

# C.5 Collaboration D: Legacy AS interaction with 5G MBS System

Figure C.5 below shows the interaction between a Legacy AS and the 5G MBS System using the MBMS Northbound API specified in TS 26.348 [11].

- Control plane interactions between the Legacy AS and the MBSF occur at reference point xMB‑C.

- User plane interactions between the Legacy AS and the MBSTF occur at reference point xMB‑U.

NOTE: The combination of the MBSF and MBSTF here emulates the functionality of the legacy BM‑SC from the perspective of the Legacy AS.



Figure C.5: Legacy AS interaction with 5G MBS System in reference point notation

# C.6 Collaboration E: GCS AS interaction with 5G MBS System

Figure C.6 below shows the interaction between a GCS AS and the 5G MBS System for the purposes of providing Group Communication System (GCS) services, as defined in TS 23.468 [10]. In this collaboration, the MBSF and MBSTF together emulate the functionality of the legacy BM‑SC function.

- Control plane interactions between the AF and the MBSF occur at reference point MB2‑C.

- User plane interactions between the AF and the MBSTF occur at reference point MB2‑U.

NOTE: The combination of the MBSF and MBSTF here emulates the functionality of the legacy BM‑SC from the perspective of the GCS AS.



Figure C.6: GCS AS interaction with 5G MBS System in reference point notation

END OF CHANGES