**3GPP TSG-CT WG4 Meeting #110-eC4-223196v1**

**E-Meeting, 12th – 20th May 2022** *Revision of C4-222211, 2297, 2311*

**3GPP TSG-CT WG3 Meeting #122-eC3-223040**

**E-Meeting, 12th – 20th May 2022** *Revision of C3-222053, 2387, 2461*

**3GPP TSG-CT WG1 Meeting #136-eC1-223493**

**E-Meeting, 12th – 20th May 2022** *Revision of C1-222671, 2993, 3147*

**3GPP TSG-CT WG6 Meeting #111-eC6-220231**

**E-Meeting, 17th – 20th May 2022**

(revision of CP-220402)

**Source: Huawei**

**Title: Revised WID on CT aspects of the architectural enhancements for 5G multicast-broadcast services**

**Document for: Approval**

**Agenda Item: 5**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: CT aspects of the architectural enhancements for 5G multicast-broadcast services

## Acronym: 5MBS

## Unique identifier: 910002

Potential target Release: Rel-17

Note that this field above indicates the proposed Release at the time of submission of the WID to TSG approval. It can later be changed without a need to revise the WID. The updated target Release is indicated in the Work Plan.

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  | X |  |
| **No** |  |  | X |  |  |
| **Don't know** | X |  |  |  | X |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
|  | Feature |
| X | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| 5MBS | SA2 | 900038 | Architectural enhancements for 5G multicast-broadcast services (5MBS) |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  | *{optional free text}*  |

**Dependency on non-3GPP (draft) specification**: none.

## 3 Justification

3GPP TS 23.247 "Architectural enhancements for 5G multicast-broadcast services" specifies stage 2 requirements for the SA2 5MBS WID (900038). 5MBS work will likely impact the foundation of the stage 2 specifications – 3GPP TS 23.501, 3GPP TS 23.502 and 3GPP TS 23.503.

5MBS needs to support interworking with EPC/eMBMS for Public Safety.

Implications on stage 3 interfaces and also protocol enhancements need to be developed by CT WGs.

## 4 Objective

The objective of this work item is to specify protocol enhancements and related APIs for 5G multicast-broadcast services based on the normative stage 2 technical specifications developed by SA2 WG, e.g. 3GPP TS 23.247.

The following impacts on 3GPP CT working groups are identified.

Editor's note 1: SA2, SA3 and SA4 are discussing further changes to TS 23.247, TS 33.501 and to TS 26.502. The normative technical specifications updates and future changes to stage 2 can trigger a WID revision, where the implications on stage 3 work will be captured.

**CT1**

- Adding new, MBS specific features to the existing 3GPP TS 24.501. The existing reference points of N1 needs to be enhanced to support MBS (e.g. establishing a PDU Session associated with multicast sessions, responding to paging with MBS session ID). Support of signalling for joining and leaving multicast session needs to be added.

- Adding UE pre-configuration for broadcast service.

Editor's note 2: The parameters for UE pre-configuration are FFS.

**CT3**

- Impacts to the PCC framework to support MBS session and QoS management:

- Definition of a new Npcf\_MBSPolicyControl service exposed by the PCF, to support MBS Policy Association management and MBS QoS control procedures.

- Potential definition of a new Npcf\_MBSPolicyAuthorization service exposed by the PCF to support MBS Policy Authorization.

- Potential enhancements to the BSF services to support MBS session binding (e.g. support that a PCF (service) instance registers itself as the PCF handling an MBS Session at the BSF, support that the NEF/MBSF/AF request the retrieval of the PCF (service) instance that handles an MBS session).

- Potential impacts to the UDR services to support the storage, provisioning and retrieval/update of preconfigured/provisioned MBS session related policy information for MBS Session configuration and management procedures.

Editor's note 3: There are still some remaining details of how dynamic PCC is applied to 5MBS that are under discussion in SA2 WG.

- Impacts to the northbound interfaces to support MBS session configuration and management by an AF (e.g. service provisioning, MBS session and QoS management, etc.).

- Definition of two new NEF services, Nnef\_MBSTMGI service and Nnef\_MBSSession service, to support MBS session management procedures and operation towards 5GC (e.g. TMGI allocation, MBS session management, MBS Session Delivery Status Indication for Broadcast, etc.).

- Definition of two new NEF service APIs, Nnef\_MBSUserService and Nnef\_MBSUserDataIngestSession, corresponding to the new Nmbsf APIs, in order to support the case where these MBSF service APIs are accessed via the NEF (i.e. case of an external untrusted AF).

- Impacts to the Nnef\_ParameterProvision service API to support that an AF provisions MBS Session authorization information.

- Definition of a new Nmbsf interface (i.e. Nmb10 and Nmb5 interfaces):

- Support MBS User Service provisioning, retrieval, update and removal.

- Support MBS User Data Ingest Session creation, retrieval, update and removal, in addition to MBS User Data Ingest Session events monitoring subscription creation/deletion and the related notifications.

- N6mb interface between MB-UPF and AF/AS, Nmb8 interface between an AF/AS and an MBSTF and Nmb9 interface between MB-UPF and MBSTF: Impacts to the N6 interface defined in 3GPP TS 29.561 to support MBS data delivery.

**CT4**

- New 3GPP TS for MB-SMF provided services for the new 5BMS features required across the following interfaces:

- Nmb1 between MB-SMF and MBSF/AF.

- N11mb between MB-SMF and AMF.

- Nmb13 between MB-SMF and AF.

- N16mb between MB-SMF and SMF.

- N29mb between MB-SMF and NEF.

- Nmb2 between MBSF and MBSTF.

- Adding new, MBS specific features to the existing 3GPP TSes (for anticipated impacts see table "Impacted existing TS" in clause 5):

- Enhancements to 3GPP TS 23.003, 3GPP TS 29.502, 3GPP TS 29.503, 3GPP TS 29.510, 3GPP TS 29.571.

- Enhancements to 3GPP TS 29.518 by adding new APIs for AMF MBSBroadcast and MBSCommunication services and also an extension to the AMF MT service for group reachability.

- Enhancements to 3GPP TS 29.244 to support N4mb interface between MB-SMF and MB-UPF and also support over N4 for the 5GC Individual traffic delivery.

- Enhancements to 3GPP TS 29.281 to support N3mb interface between MB-UPF and NG-RAN and N19mb interface between MB-UPF and UPF.

- Restoration procedures at a failure with or without restart of a 5GC NF or NG-RAN involved in the delivery of MBS services.

-    Impacts to support MBS security requirements (e.g. MBS keys management) defined in Annex W of 3GPP TS 33.501.

**CT6**

- Adding UE pre-configuration for broadcast service in the USIM.

## 5 Expected Output and Time scale

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| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| TS | 29.532 | 5G System; 5G Multicast-Broadcast Session Management Services; Stage 3 | TSG#94 (2021-12) | TSG#95 (2022-03) | CT4 responsibilityGulbani, Giorgi, Huawei, giorgi.gulbani@huawei.com |
| TS | 29.537 | 5G System; Multicast/Broadcast Policy Control services;Stage 3 | TSG#96 (2022-06) | TSG#96 (2022-06) | CT3 responsibilityEl Moatamid, Abdessamad, Huawei, abdessamad.el.moatamid@huawei.com |
| TS | 29.580 | 5G System; Multicast/Broadcast Service Function services;Stage 3 | TSG#96 (2022-06) | TSG#96 (2022-06) | CT3 responsibilityEl Moatamid, Abdessamad, Huawei, abdessamad.el.moatamid@huawei.com |
| TS | 29.581 | 5G System; Multicast/Broadcast Service Transport Function services; Stage 3 | TSG#96 (2022-06) | TSG#96 (2022-06) | CT4 responsibilityVarini Gupta, Samsung varini.gupta@samsung.com |
| TS | 24.575 | 5G System; Multicast/Broadcast UE pre-configuration Management Object (MO) | TSG#96 (2022-06) | TSG#96 (2022-06) | CT1 responsibilityHerrero-Veron, Christian, Huawei Christian.Herrero@huawei.com |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 24.501 | Impacted. For example, UE sends NAS message to the AMF that indicates establishing a PDU Session associated with multicast session(s); to join the multicast group, the UE sends the PDU Session Modification Request (MBS Session ID), etc. | TSG#96 (2022-06) | CT1 |
| TS 23.003 | Impacted, e.g. to define MBS Session ID, TMGI, MBS Service Areas for 5GS. | TSG#95 (2022-03) | CT4 |
| TS 23.527 | Impacted, to document restoration procedures at a failure with or without restart of a 5GC NF or NG-RAN involved in the delivery of MBS services. | TSG#96 (2022-06) | CT4 |
| TS 29.244 | Impacted. Implications of N4mb interface between MB-SMF and MB-UPF. Also, N4 enhancements to support 5GC Individual traffic delivery, etc. | TSG#95 (2022-03) | CT4 |
| TS 29.281 | Impacted. Implications of N3mb (MB-UPF and NG-RAN) and N19mb (MB-UPF and UPF) interfaces. | TSG#95 (2022-03) | CT4 |
| TS 29.502  | Impacted. For example, AMF invokes Nsmf\_PDUSession\_UpdateSMContext to SMF with the MBS session leaving information (i.e. leave indication, MBS session ID), etc. | TSG#95 (2022-03) | CT4 |
| TS 29.503  | Impacted. For example, MBS subscription data is provided by the UDM to the SMF during PDU session establishment to give user permission to use multicast services, etc. | TSG#95 (2022-03) | CT4 |
| TS 29.510 | Impacted. For example, to enable exchanging MBS specific information, e.g. MBS Session ID, to support registration, discovery and selections of MB-SMF, MB-UPF, etc. | TSG#95 (2022-03) | CT4 |
| TS 29.518 | Impacted. New APIs for the AMF MBSBroadcast and MBSCommunication services and extension of the AMF MT service for group reachability. Potential other changes e.g. for inter-AMF mobility of UE with multicast sessions. | TSG#95 (2022-03) | CT4 |
| TS 29.571 | Impacted. New, MBS specific data types need to be defined. For example, MBS Session ID, etc. | TSG#95 (2022-03) | CT4 |
|  |  |  |  |
| TS 29.513 | Impacts to support 5G MBS session and QoS management procedures (e.g. definition of the procedures related to MBS policy control). | TSG#96 (2022-06) | CT3 |
| TS 29.519 | Potential impacts to support 5G MBS (e.g. management of UE authorization information for multicast session). | TSG#96 (2022-06) | CT3 |
| TS 29.521 | Possible impacts to support 5G MB session binding. | TSG#96 (2022-06) | CT3 |
| TS 29.522 | Impacts to support 5G MBS Session configuration and management by an AF (e.g. service provisioning, MBS session and QoS management, etc.).New APIs, Nnef\_MBSTMGI and Nnef\_MBSSession, to be defined for this purpose.* Impacts to support accessing the MBSF APIs via the NEF. New APIs, Nnef\_MBSUserService and Nnef\_MBSUserDataIngestSession, to be defined.
 | TSG#96 (2022-06) | CT3 |
| TS 29.561 | Impacts to support 5G MBS. | TSG#96 (2022-06) | CT3 |
| TS 31.102 | Impacts to allow UE pre-configuration for broadcast service in the USIM | TSG#95 (2022-06) | CT6 |

## 6 Work item Rapporteur(s)

Gulbani, Giorgi, Huawei, giorgi.gulbani@huawei.com

## 7 Work item leadership

CT4.

## 8 Aspects that involve other WGs

SA3 (security), SA5 (charging), SA4 (stage 2 for Nmb2).

## 9 Supporting Individual Members

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| Supporting IM name |
| Huawei |
| HiSilicon |
| one2many |
| Nokia |
| Nokia Shanghai Bell |
| Vodafone |
| Ericsson |
| Airbus |
| Samsung |
| ZTE |
| CATT |