**3GPP TSG-WG SA2 Meeting #146E e-meeting *S2-2106086***

**Elbonia, August 16 – 27, 2021 (revision of S2-2104312)**

**Source: Huawei**

**Title: New SID: Architectural enhancements for 5G multicast-broadcast services Phase 2**

**Document for: Approval**

**Agenda Item: 9.2**

**Work Item / Release: {FS\_5MBS\_Ph2} / Rel-18**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Study on architectural enhancements for 5G multicast-broadcast services Phase 2

Acronym: FS\_5MBS\_Ph2

Unique identifier

1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | **UICC apps** | **ME** | **AN** | **CN** | **Others (specify)** |
| **Yes** |  | X | X | X |  |
| **No** |  |  |  |  |  |
| **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** |
|  | **Building Block** |
|  | *Work Task* |
| X | **Study Item** |

2.2 Parent and child Work Items

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| --- |
| **Parent and child Work Items**  |
| **Unique ID** | **Title** | **Nature of relationship** |
| N/A | N/A |  |

2.3 Other related Work Items and dependencies

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| --- |
| **Other related Work Items (if any)** |
| **Unique ID** | **Title** | **Nature of relationship** |
| 830030 | Study on Architectural enhancements for 5G multicast-broadcast services | Antecedent study item (TR 23.757) |
| 900009 | Architectural enhancements for 5G multicast-broadcast services | Antecedent work item (TS 23.247) |

3 Justification

The architectural enhancements for 5G multicast-broadcast services defined in Rel-17 enable PLMN operators accommodate varies multicast and broadcast services. The work is based on requirements in clause 6.13 of TS 22.261, TS 22.146, TS 22.246 and clause 32 of TS 22.101. Specifically, distribution to configurable location areas, mobility, MBS session management, QoS, as well as interworking with E-UTRAN and EPC based eMBMS for Public Safety were studied in TR 23.757 and specified in TS 23.247.

SA2 Rel-17 normative work also was not able to address some overall system aspects that were excluded by RAN WGs from Rel-17 work. One aspect was enabling UEs to receive Multicast MBS Session data in RRC Inactive state, which would be beneficial for cases where power efficiency and serving large number of UEs in a geographical area have to be considered. Besides that, other potential enhancements in Rel-18 by the RAN WGs (e.g., SFN enhancement) may expose new MBS features. Thus, a feasibility study is needed to ensure the corresponding capabilities are addressed accordingly by SA2 in Rel-18.

For services shared by a group of users, e.g., background audio/video streams, status/warning update during the game, shared streaming of collaborative interactive application, enabling temporary multicast group for the streams in the service would be beneficial for operators to be more flexible to provide services with resource efficiency, i.e., dynamically creating multicast stream when required by the service, and releasing them when not required.

Moreover, in Rel-17 some issues were not handled due to time constraints, e.g., roaming and limited SMF serving area. Failing to provide support for some of these unaddressed aspects in the MBS system may lead to the system failing to provision related features correctly.

In addition, the support of receive only devices and devices with no subscription or with 3rd party content provider subscription only of the MBS system may need further enhancement.

TS 22.261 also mentions IoT applications as important broadcast/multicast applications. eMBMS supported group message delivery for IoT devices, but the 5G multicast-broadcast service does not yet provide this capability. Also, power saving may prevent IoT devices from receiving MBS content at coordinated times.

This feasibility study aims to identify the gaps that need to be filled to support the above-mentioned requirements, to study suitable solution to address these gaps. The study may also address the issues identified by RAN WGs.

4 Objective

The goal of this Study Item is to identify and evaluate further enhancements to the 5G Multicast/Broadcast Architecture in order to provide a wider usage for Multicast/Broadcast services. The following aspects are the objectives of the study based on the architecture and call-flow defined in Rel-17:

Study possible further enhancement of end-to-end procedures/functionalities and architecture of Multicast/Broadcast services for:

1. Enabling UE's receiving Multicast MBS Session data in RRC states different from RRC\_CONNECTED.

2. Further enhancement to the support of receive only devices and devices with no subscription or with 3rd party content provider subscription only;

3. Efficient resource utilization for the same multicast/broadcast service provided to different PLMNs with sharing NG-RAN nodes;

4. Efficient resource utilization for temporary multicast groups for the services where some streams need to be shared in group;

5. Whether is required and how to further optimize the resource usage for multicast in 5GC, e.g. related to enhancement on the associated PDU Session handling

6. IoT applications (i.e., Group message delivery, coexistence of power saving and MBS).

Outstanding issues in Rel-17:

7. Support the UEs reception of MBS session data in roaming scenario;

8. Support MBS session in deployment topologies with specific SMF Service Areas.

9. Potential enhancement identified by other WGs in their rel-18 MBS works and need SA2 cooperation.

Work in Rel-18 shall be backwards compatible with the Rel-17 defined architecture and call flow.

The NR is considered as wireless access technology.

Each of the above objectives can conclude independently from the other, and the impact on RAN is to be analysed by and coordinated with the relevant RAN WGs.

The estimated time for this study item is about 10 TUs and for the normative work 7(?) TUs.

5 Expected Output and Time scale

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| --- |
| **New specifications** |
| Type  | Series | Title | For info at TSG#  | For approval at TSG# | Remarks |
| New TR | 23.xxx | Study on architectural enhancements for 5G multicast-broadcast services Phase 2 | TBD | TBD |  |

|  |
| --- |
| **Impacted existing TS/TR** |
| TS/TR No. | Description of change  | Target completion plenary# |
|  |  |  |

6 Work item Rapporteur(s)

Meng Li, Huawei, raymond.limeng@huawei.com

7 Work item leadership

SA2

8 Aspects that involve other WGs

Security aspects should be analysed by the SA3 WG.

The impact on the service layer is to be analysed by and coordinated with SA4.

The work on public safety is to be coordinated with SA6.

9 Supporting Individual Members

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| **Supporting IM name** |
| Huawei |
| HiSilicon |
| CBN |
| Samsung |
| Vivo |
| ZTE |
| China Unicom |
| CATT |
| KPN |
| Nokia |
| Nokia Shanghai Bell |
| ATT |
| Ericsson |
| LG Electronics |
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