**3GPP TSG-SA WG6 Meeting #45-bis S6-212269**

**e-meeting, 11th – 19th October 2021 (revision of S6-21xxxx)**

**Source: Ericsson**

**Title: Pseudo-CR on overall evaluation**

**Spec: 3GPP TR 23.783 v 1.6.0**

**Agenda item: 10.1**

**Document for: Approval**

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**1. Introduction**

The introduced pCR provides a part of the overall study evaluation, namely the overall evalution to the solutions under key issue 13.

**2. Reason for Change**

An anylsis and evaluation of the available solutions within key issue 13 is needed to have a better understanding and evaluation of the current study.

**3. Conclusions**

<Conclusion part (optional)>

**4. Proposal**

It is proposed to agree the following changes to 3GPP TR 23.783 v 1.6.0.

\* \* \* First Change \* \* \* \*

# 7 Overall evaluation

## 7.1 Key issue #13: MC service over 5G MBS

Table 7.1-1 provides an overview of the sub key issues within key issue #13 and their corresponding solutions, and dependencies on other WGs in order to keep track on solutions to be revised.

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Table 7.1-1: Sub-key issue #13 and the corresponding solutions and related dependencies.

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| Sub-key issue  | Corresponding solutions | WG dependencies |
| #13.1 identify 5G MBS features and configuration options which are applicable for MC service | Solution 10: MBS session configuration and service announcement aspectsSolution 12: Dynamic multicast MBS session and service announcementSolution 13: Pre-established multicast MBS session and service announcementSolution 14: Dynamic broadcast MBS session and service announcementSolution 15: Pre-established broadcast MBS session and service announcement | SA2:- session configuration vs management related updates - IE related to MBS service area during service announcement - PCC related session configurations |
| #13.2 how and when to use the broadcast and multicast service for the group communication | Solution 9: General use of 5G MBS services for MC service group communicationsSolution 20: Selection of multicast and broadcast service for a group communication |  |
| #13.3 how to make the group members aware of the broadcast/multicast service for the group communication | Solution 10: MBS session configuration and service announcement aspectsSolution 12: Dynamic multicast MBS session and service announcementSolution 13: Pre-established multicast MBS session and service announcementSolution 14: Dynamic broadcast MBS session and service announcementSolution 15: Pre-established broadcast MBS session and service announcement | SA2:- session configuration vs management related updates - IE related to MBS service area during service announcement - PCC related session configurations |
| #13.4 how to maintain the service continuity when switching between 5G MBS delivery and unicast delivery | Solution 18: Service continuity for multicast MBS sessionSolution 19: Service continuity for broadcast MBS sessionSolution Y (S6-212268): Service continuity for broadcast and multicast MBS sessions |  |
| #13.5 how the DL media, application-level control signalling (e.g., floor control messages), group status is delivered to the UE via the 5G MBS | Solution 11: MC service group data transmissions over 5G MBS sessionsSolution 16: Data delivery over multicast MBS sessionSolution 17: Data delivery over broadcast MBS sessionSolution 21: Use of MBS transmission in MCPTTSolution 22: Use of MBS transmission in MCVideoSolution 29: Use of broadcast and multicast MBS sessions in MCPTTSolution 30: Use of broadcast and multicast MBS sessions in MCVideo |  |
| #13.6 whether and how the MC services require the local 5G MBS services. And if required, how the MC service group communication is associated with the broadcast/multicast service area. | Solution 10: MBS session configuration and service announcement aspectsSolution 12: Dynamic multicast MBS session and service announcement Solution 13: Pre-established multicast MBS session and service announcementSolution 14: Dynamic broadcast MBS session and service announcementSolution 15: Pre-established broadcast MBS session and service announcement | SA2:- session configuration vs management related updates - IE related to MBS service area during service announcement - PCC related session configurations |
| #13.7 how and when service requirements, e.g., required QoS requirements, are provided to the 5GC for MC service group communication data transmitted over 5G MBS sessions for both broadcast and multicast. | Solution 10: MBS session configuration and service announcement aspectsSolution 13: Pre-established multicast MBS session and service announcementSolution 15: Pre-established broadcast MBS session and service announcement | SA2:- session configuration vs management related updates - IE related to MBS service area during service announcement - PCC related session configurations |
| #13.8 how to support the service continuity when the MC service is provided via both 4G eMBMS and 5G MBS  | Solution Z (S6-212264): Inter-system mobility between LTE and 5G |  |
| #13.9 identify the MC services application architecture supporting 5G MBS | Solution 8: Application architecture over 5G MBS for transport only mode |  |
| #13.10 identify the functionalities related to 5G MBS sessions for group communication purposes, and address the differences between broadcast and multicast sessions | Solution 9: General use of 5G MBS services for MC service group communications | SA2:- session configuration vs management related updates  |
| #13.11 how to de-announce the MBS session for the group members and how to remove the MBS session | Solution 23: UE multicast MBS session leave aspectsSolution 24: 5G MBS session release aspectsSolution 28: MBS service de-announcement |  |
| #13.12 how the DL data and application-level control signalling is delivered for specific MC services, e.g., MCPTT and MCVideo | Solution 21: Use of MBS transmission in MCPTTSolution 22: Use of MBS transmission in MCVideoSolution 29: Use of broadcast and multicast MBS sessions in MCPTTSolution 30: Use of broadcast and multicast MBS sessions in MCVideo |  |
| #13.13 how the MC service server can modify, i.e., update an MBS session with respect to media and service requirements, included service area, or update its status if applicable | Solution 25: 5G MBS session update for group communicationSolution X (S6-212263): Multicast MBS session activation and de-activation | SA2:- session configuration vs management related updates - IE related to MBS service area during service announcement - PCC related session configurations |

To address sub-key issue#13.9, solution 8 provides the MC service application architecture over 5G MBS in reference point representation in alignment with 3GPP TS 23.247 [19]. The solution provides an updated functional model for application plane to support MC services including MCPTT, MCVideo and MCData over 5GS and defines the reference points between the different nodes. These architecture models are assumed to be for transport only mode. Furthermore, the solution provides a list of functions done by the MC service server to enable group communications over 5G MBS sessions

To address sub-key issue#13.2, solution 9 provides a high-level overview and description of the broadcast and multicast 5G MBS sessions. It provides an understanding of the concepts related to the use of 5G MBS sessions for MC group communications. The solution is based on the 5G MBS sessions aspects defined in 3GPP TS 23.247 [19], and it is recommended to understand and identify the functional properties of 5G MBS sessions as it introduces the proper procedures related to the use of 5G MBS sessions. Furthermore, the solution discusses the life cycle of both broadcast and multicast MBS sessions based on 3GPP TS 23.247 [19] and identifies the difference between types or modes of MBS sessions (broadcast or multicast), and how each mode requires different subsequent procedures for MC group communications. Similar to eMBMS bearers, MBS sessions are first configured (with or without PCC) either as a broadcast or multicast session mode and announced to the associated MC service group. However, the session establishment stage depends on the mode of the configured MBS session. Therefore, the MBS session mode is an essential information element in MBS session related procedures - in specific MBS session configuration and service announcement. Hence, it facilitates having aligned procedures, which are common for both broadcast and multicast MBS sessions. Finally, solution 20 discusses which MBS session mode to be considered for a certain MC group communication. As it is implementation specific it can be discarded in normative work.

To address sub-key issue#13.1, sub-key issue#13.3 and sub-key issue#13.7: similar to the concepts of eMBMS bearers, MC service server can either request the configuration of MBS sessions to be either dynamically or prior to application layer call setup (known as pre-established bearers in LTE). Solutions 12 and 14 cover dynamically configured and announced sessions for multicast MBS and broadcast MBS sessions, respectively. Furthermore, solution 10 addresses as well the MBS session configuration and service announcement aspects rather in one procedure being common for both broadcast and multicast MBS sessions via the use of the MBS session mode information element. These solutions are aligned, however solution 10 emphasizes on the importance of MBS listening status report for both MBS session modes, and the information elements related to MBS service area may need to be revisited upon further updates in 3GPP TS 23.247 [19]. Solutions 13 and 15 cover the same aspects for pre-established multicast MBS and broadcast MBS sessions, respectively. In the normative work, these solutions can be combined in one common procedure per configuration option.

To address sub-key issue#13.5, solution 11 discusses MC data transmission over both broadcast and multicast MBS sessions along with the required information elements. Both solutions identify the required information elements associated with the corresponding procedures. Furthermore, MC data transmission are discussed in solutions 16 and 17 for multicast MBS sessions and broadcast MBS sessions, respectively. They provide separate procedures per MBS session mode where solution 11 is applicable to both modes. Solution 16 introduces multicast session status report information being sent from the MC service clients to the server indicating their successful join of the corresponding multicast MBS session ID. This information however can also be achieved by sending an acknowledgement of the MBS session UE join notification as indicated in solution 10. Moreover, solution 11 is aligned with the life cycle of MBS sessions described in 3GPP TS 23.247 [19]. Moreover, solution 11 considers the aspects related to the ability of an MC service server to activate the established multicast MBS session prior to MC data transmission.

During the broadcast MBS session configuration procedure, the session is also established and starts delivering the MC data to the associated MC service group. However, a configured multicast MBS session is only considered established once the first UE session join performed by MC service UE(s) get accepted. The multicast MBS session is then established and either has an active or inactive state. Such aspects are clearly highlighted in solutions X(S6-212263).

To address sub-key issue#13.3, The MC service server can configure several broadcast and multicast MBS sessions with certain aspects, such as service and media requirements, certain service area, or associated with a certain MC service group. However, the MC service server is still capable of updating and modifying any of the previously mentioned aspects once the need has emerged during its life cycle of the sessions. Solution 25 discusses the MBS session update procedure for MC group communication, which is applicable to both broadcast and multicast MBS sessions.

To address sub-key issue#13.11, Once the MC service server decides that a certain MBS session is no longer needed for any group communication purposes, it can decide to release the session by triggering an MBS session release procedure defined in solution 24. Furthermore, the server can decide to de-announce it as in solution 28 so that the MC service client can stop monitoring or perform a UE session leave in broadcast or multicast MBS sessions, respectively.

To address sub-key issue#13.4, In terms of service continuity, two main aspects are considered. First, intra-system service continuity which facilitates the switch of MC data delivery between unicast PDU session and MBS sessions (of both session modes) as in solutions 18, 19 and Y, where solution Y provides a common procedure which is applicable to both broadcast and multicast. Solution 18 provides guidance about SA2/RAN mechanism for supporting of individual delivery and shared delivery for 5G MBS multicast. It can be used as substitution of application layer mechanism as solution Y. Solution 19 assumes that either unicast PDU session or MBS session is enabled, whereas solution Y assumes that both of them are enabled in alignment with 3GPP TS 23.247 [19].

To address sub-key issue#13.8, inter-system service continuity between LTE and 5G is discussed in solutions Z (S6-212264), where the MC service clients are guided via the MC service server to switch between LTE and 5G (whether broadcast or multicast MBS sessions) to ensure service continuity when the same MC service is provided in both technologies.

To address sub-key issue#13.14 and sub-key issue#13.5, solutions 21 and 29 as well as 22 and 30 discuss aspects related to MCPTT and MCVideo call connect and disconnect over broadcast and multicast MBS sessions, respectively. However, solutions 29 and 30 provide common procedures for broadcast and multicast MBS sessions, and are aligned with the life cycle of MBS sessions described in 3GPP TS 23.247 [19], and service announcement concepts in 3GPP TS 23.280 [2].It is proposed to use the Sol#29 as the baseline candidate solution in the normative work. Furthermore, Solution 11 discusses MC DL delivery for MC group communication in general, which can be considered for normative work.

Editor's note: Update to this clause is FFS due to new solution being introduced.

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