

Source: Ericsson
Title: Signaling efficiency for Shared Delivery and others
Document for: Discussion
Agenda Item: 8.9
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General

- MBS Session Management (i.e. for shared delivery) is currently based on per UE/PDU Session signaling,
 - Resulting in inefficient signalling handling if no improvement is made.
- Improvement were attempted during SA2#143E in [S2-2101017](#) and [S2-2100343r01](#) but no agreement was reached:
 - [S2-2101017](#) intends to improve signalling efficiency for MBS Session (re-)activation by SMF sending “Active List of UEs” to AMF. For MBS Session deactivation (or stop/release), MB-SMF sends requests to NG-RAN via AMF.
 - [S2-2100343r01](#) attempts to involve AMF in the MBS Session handling for shared delivery, so that the MBS Session management is handled on MBS Session level.

[Proposal-1] For shared delivery, continue to work on improving signaling efficiency.

For MBS session deactivation, assume the improvement follows [S2-2101017](#) and [S2-2100343r01](#):

[Observation-2.0] [S2-2101017](#) proposes that MB-SMF maintain NG-RAN node list (i.e. NG-RAN “registers” itself in MB-SMF for shared delivery, regardless of unicast transport or multicast transport over MB-N3), and then MB-SMF sends deactivation requests to the list of NG-RANs.

[Observation-2.1] [S2-2100343r01](#) propose that AMF be informed of UE join state and get involved in MBS Session handling.

Currently SMF is only aware of UP tunnel entity of NG-RAN but has no knowledge about the global ID of NG-RAN serving the UE. In our view, the same principle should be applied to MB-SMF in 5MBS.

Besides, if multicast transport over MB-N3 interface, NG-RAN does not need to contact MB-SMF.

[Proposal-2] Involve AMF in MBS Session management for shared delivery. Maintain the same principle as for unicast delivery, i.e. MB-SMF handles only NG-RAN’s tunnel entity (when applicable) without being aware of the global IDs of NG-RAN.

With **[Proposal-2]**, NG-RAN does not need to “register” itself into MB-SMF when multicast transport over MB-N3 is used.

For MBS Session activation, assume the improvement follows [S2-2101017](#) and [S2-2100343r01](#):

[Observation-3.1] [S2-2101017](#) proposes that SMF send “Activate List of UEs” to AMF for group paging. It’s not clear whether the list include both IDLE and CONNECTED joined UEs, or only IDLE joined UEs.

If the former, implication to handle inactive MBS Session in NG-RAN is to be investigated.

If the latter, SMF needs to be aware of UE state which may increase CN signaling drastically.

[Observation-3.2] [S2-2100343r01](#) propose to make use of connection management (CM-IDLE and CONNECTED) which is a functionality inherent in AMF.

[Proposal-3] Involve AMF in MBS Session management for shared delivery, so that the functions inherent in AMF (e.g. managing UE’s state and awareness of NG-RAN nodes) can be utilized.

[Conclusion-1] AMF is aware of the connected RAN nodes and is responsible for connection management. If there is requirement based on knowledge of NG-RAN node list and/or UE IDLE/CONNECTED state, any solution bypassing AMF would require workaround to solve issues due to not being aware of RAN nodes and not being aware of UE state.

For MBS Session Update,

[Observation-4] MBS Session update for multicast MBS Session is not yet addressed.

[Proposal-4] It's proposed to address MB Session Update.

Note that an MBS Session update may result in modification of existing MBS QoS Flow, addition of new MBS QoS Flow and/or deletion of MBS QoS Flow. This is not addressed yet.

To support **[Proposal-1] ~ [Proposal-4]**, to have consistent handling for different procedures (e.g. MBS Session Start/Stop, Activate/Deactivation and MBS Session Update), to avoid situation that the attempt to resolve one issue will create more issues, and to have a framework that is future proof (e.g., to support network deployment with multiple SMF Service Areas), the following is proposed (as in [S2-2100343r01](#)):

[Proposal-5] Enhance the solution and involve AMF in MBS Session management for shared delivery, but UE join is still received in the SMF and informs AMF, and AMF interacts with MB-SMF so that the MBS Session management for shared delivery is on per MBS Session level.



Discussion (5)

Aspects related to GC AS

— In TR 23.757 v1.3.0 (2.0.0), the following states are proposed in 5GC:

8.2.2.2 Multicast session

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The following states are proposed:

- *Configured multicast session: No multicast data are transmitted. Some information about the multicast session is configured, but no resources are reserved. For instance, TMGIs can be allocated but no complete session information be provided UEs may be allowed to join (subject to authorization check and configuration), but the first accepted UE join request will trigger the multicast session establishment.*

- *Inactive multicast session: **Established multicast session in inactive state.** No multicast data are transmitted. UEs that joined the multicast session may be in CM CONNECTED or CM IDLE state. UEs are allowed to join the multicast session (subject to authorization check).*

[Observation-6] AF is expected to establish multicast session in inactive state.

Implication-4: AF triggering establishment of multicast session in **inactive** state and activating the multicast session later impose new requirement to legacy Public Safety application.

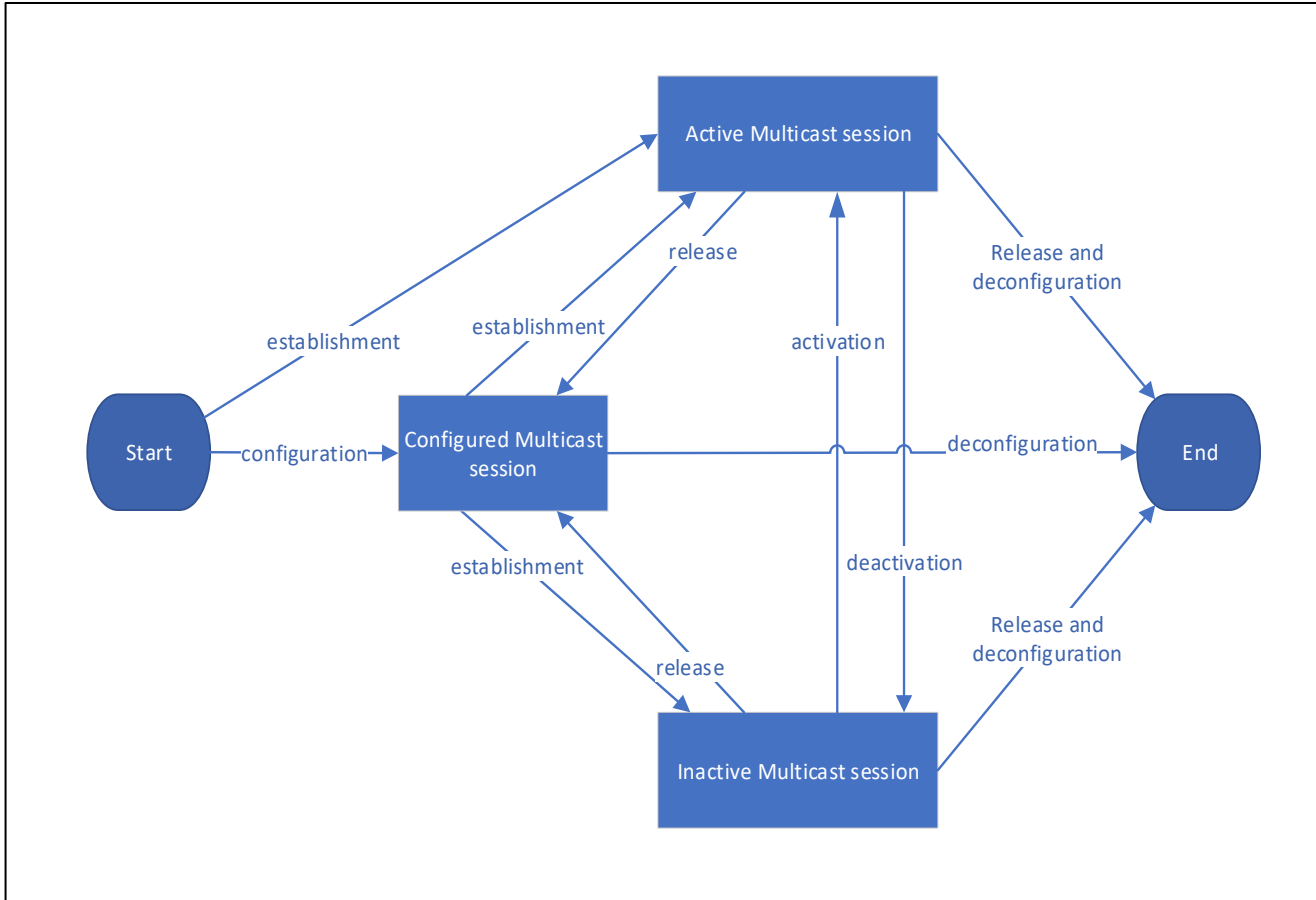
Implication-5: If the AF establishes an inactive MBS Session and activates it later, the (preliminary) service requirement provided during establishment may be updated during activation, which may be modification of existing MBS QoS Flow as well as adding new MBS QoS Flow. This is not addressed yet.

Q1: How is the (preliminary) service requirement determined by the AF?

Q2: Correspondingly, if AF requested MBS Session deactivation, does it also imply some existing MBS QoS Flow may be removed ?

[Proposal-6] Keep the legacy GC AS behavior (i.e. allocate TMGI, start MBS Session which is active) to avoid new logic in the legacy AS.

Thank You!



- **Configured multicast session:** No multicast data are transmitted. Some information about the multicast session is configured, but no resources are reserved. For instance, TMGIs can be allocated but no complete session information be provided. UEs may be allowed to join (subject to authorization check and configuration), but the first accepted UE join request will trigger the multicast session establishment.
- **Active multicast session:** Established multicast session in active state. Multicast data are transmitted to UEs that joined the multicast session. 5GC resources for the multicast session are reserved. Corresponding Radio resources are reserved depending on participating UE locations. UEs that joined the multicast session are in CM CONNECTED state. UEs are allowed to join the multicast session (subject to authorization check)
- **Inactive multicast session:** Established multicast session in inactive state. No multicast data are transmitted. UEs that joined the multicast session may be in CM CONNECTED or CM IDLE state. UEs are allowed to join the multicast session (subject to authorization check).



Info from [S2-2101017](#)

