**3GPP TSG-CT WG1 Meeting #131-eC1-21jjjj**

**E-meeting, 19-27 August 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **3369** | **rev** | **1** | **Current version:** | **17.3.1** |  |
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| *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 |  |

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| ***Title:***  | Paging with TMGI for multicast services |
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| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5MBS |  | ***Date:*** | 2021-08-09 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)...Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | Stage 2 has agreed in TS 23.247 on the MBS session activation procedure. In this procedure, the paging step is described as follows:*If AMF determines that there are any UEs in CM-IDLE state and involved in the MBS Session, and AMF figures out the paging area considering all the UE(s), which need be paged. The AMF sends a paging request message to the NG-RAN node(s) belonging to this Paging Area with the TMGI as the identifier to be paged if the related NG-RAN node(s) support the MBS session.*The UE uses the TMGI in the paging message to determine whether it is interested in the multicast session or not and whether to respond to the paging or not. Currently, according to 24.501, the UE receiving paging from the NW must initiate the service request procedure to respond to the paging. There needs to be an exception for the scenario described above.  |
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| ***Summary of change:*** | For paging with TMGI the UE shall not respond to the paging unless the TMGI matches a MBS multicast session which the UE has joined. |
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| ***Consequences if not approved:*** | UE would have to respond to paging for any multicast service, even those that the user is not interested in. Degraded user experience. |
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| ***Clauses affected:*** | 5.6.2.2.1 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | R1: changes to the formulation of the text. Changes to the cover sheet. |

\*\*\* first change \*\*\*

##### 5.6.2.2.1 General

The network shall initiate the paging procedure for 5GS services when NAS signalling messages or user data is pending to be sent to the UE in 5GMM-IDLE mode over 3GPP access (see example in figure 5.6.2.2.1.1) and there is no paging restriction applied in the network for that paging.



Figure 5.6.2.2.1.1: Paging procedure

To initiate the procedure the 5GMM entity in the AMF requests the lower layer to start paging and shall start timer T3513.

If downlink signalling or user data is pending to be sent over non-3GPP access, the 5GMM entity in the AMF shall indicate to the lower layer that the paging is associated to non-3GPP access.

The network shall not page the UE to re-establish user-plane resources of PDU session(s) associated with non-3GPP access over 3GPP access if all the PDU sessions of the UE that are established over the 3GPP access are associated with control plane only indication.

The 5GMM entity in the AMF may provide the lower layer with the "allowed CAG list" and an "indication that the UE is only allowed to access 5GS via CAG cells" for the current PLMN, if available, and with the "allowed CAG list" and an "indication that the UE is only allowed to access 5GS via CAG cells" per equivalent PLMN, if available. If there is an active emergency PDU session, the 5GMM entity in the AMF shall not provide the lower layer with the "allowed CAG list" and an "indication that the UE is only allowed to access 5GS via CAG cells" for the current PLMN, even if available, or with the "allowed CAG list" and an "indication that the UE is only allowed to access 5GS via CAG cells" per equivalent PLMN, even if available.

Upon reception of a paging indication, the UE shall stop the timer T3346, if running, and:

a) if control plane CIoT 5GS optimization is not used by the UE, the UE shall:

1) initiate a service request procedure over 3GPP access to respond to the paging as specified in subclauses 5.6.1.2.1 if the UE is in 5GMM-REGISTERED.NORMAL-SERVICE or 5GMM-REGISTERED.NON-ALLOWED-SERVICE (as described in subclause 5.3.5.2) state and the UE is in the 5GMM-IDLE mode without suspend indication;

2) initiate a service request procedure over non-3GPP access to respond to the paging as specified in subclauses 5.6.1;

3) initiate a registration procedure for mobility and periodic registration update over 3GPP access to respond to the paging as specified in subclauses 5.5.1.3.2; or

4) proceed as specified in subclause 5.3.1.5 if the UE is in the 5GMM-IDLE mode with suspend indication; or

b) if control plane CIoT 5GS optimization is used by the UE, the UE shall:

1) initiate a service request procedure as specified in subclause 5.6.1.2.2 if the UE is in the 5GMM-IDLE mode without suspend indication;

2) initiate a registration procedure for mobility and periodic registration update over 3GPP access as specified in subclauses 5.5.1.3.2; or

3) proceed as specified in subclause 5.3.1.5 if the UE is in the 5GMM-IDLE mode with suspend indication.

NOTE 1: If the UE is in the 5GMM-IDLE mode without suspend indication and has an uplink user data to be sent to the network using control plane CIoT 5GS optimization when receiving the paging indication, the UE can piggyback the uplink user data during the service request procedure initiated to respond to the paging, as specified in subclause 5.6.1.2.2.

NOTE 2: As an implementation option, MUSIM-capable UE is allowed to not respond to paging based on the information available in the paging message, e.g. voice service indication.

Editor's note: The behaviour of the MUSIM capable UE when it decides not to accept the paging based on the received paging cause, if any, is FFS.

If TMGI is used as paging identity and the TMGI matches with MBS multicast session which the has UE joined, the UE shall respond to the paging. Otherwise, the UE shall not respond to the paging.

The network shall stop timer T3513 for the paging procedure when an integrity-protected response is received from the UE and successfully integrity checked by the network or when the 5GMM entity in the AMF receives an indication from the lower layer that it has received the NGAP UE context resume request message as specified in 3GPP TS 38.413 [31]. If the response received is not integrity protected, or the integrity check is unsuccessful, timer T3513 for the paging procedure shall be kept running unless:

a) the UE is registered for emergency services;

b) the UE has an emergency PDU session; or

c) the response received is a REGISTRATION REQUEST message for mobility and periodic registration update and the security mode control procedure or authentication procedure performed during mobility and periodic registration update has completed successfully.

Upon expiry of timer T3513, the network may reinitiate paging.

If the network, while waiting for a response to the paging sent without paging priority, receives downlink signalling or downlink data associated with priority user-plane resources for PDU sessions, the network shall stop timer T3513, and then initiate the paging procedure with paging priority.

\*\*\* next change \*\*\*