**3GPP TSG-CT WG1 Meeting #132-eC1-216087**

**E-meeting, 11-15 October 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3603** | **rev** | **1** | **Current version:** | **17.4.1** |  |
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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 | **X** |

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| ***Title:*** | Active flag should be zero in the CPSR message when NAS connection release is requested, and other clarifications | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MUSIM | | | | |  | ***Date:*** | | | 24-09-2021 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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 can be 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:*** | | 1) When the CPSR message indicates that NAS connection release/paging reject is required, the active flag bit in the Control plane service type IE should be set to zero. This is currently missing although it is introduced for TAU.  2) Add an abnormal case that when the TAU message or CPSR message is received with NAS connection release (and additionally paging reject for the case of CPSR message), then the network ignores the active flag if it is set | | | | | | | | |
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| ***Summary of change:*** | | 1) Clarify that for NAS connection release/paging reject, the active flag bit in the Control plane service type IE should be set to zero.  2) The network ignores the active flag in TAU or CPSR when NAS connection release is requested (and additionally paging reject for the case of CPSR message). This is added as an abnormal case | | | | | | | | |
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| ***Consequences if not approved:*** | | The UE may request the user plane resources to be established when the UE also wants to release its NAS connection, leading to contradictory requests.  If NAS connection release is requested, then MME will establish UP even if active flag is set to 1, leading to contradictory requests. | | | | | | | | |
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| ***Clauses affected:*** | | 5.5.3.2.7, 5.6.1.2.2, 5.6.1.7 | | | | | | | | |
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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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*

##### 5.5.3.2.7 Abnormal cases on the network side

The following abnormal cases can be identified:

a) If a lower layer failure occurs before the message TRACKING AREA UPDATE COMPLETE has been received from the UE and a GUTI has been assigned, the network shall abort the procedure, enter EMM-IDLE mode and shall consider both, the old and new GUTI as valid until the old GUTI can be considered as invalid by the network (see clause 5.4.1.4). During this period the network may use the identification procedure followed by a GUTI reallocation procedure if the old GUTI is used by the UE in a subsequent message.

The network may page with IMSI if paging with old and new S-TMSI fails. Paging with IMSI causes the UE to re-attach as described in clause 5.6.2.2.2.

b) Protocol error

If the TRACKING AREA UPDATE REQUEST message has been received with a protocol error, the network shall return a TRACKING AREA UPDATE REJECT message with one of the following EMM cause values:

#96: invalid mandatory information element error;

#99: information element non-existent or not implemented;

#100: conditional IE error; or

#111: protocol error, unspecified.

c) T3450 time-out

On the first expiry of the timer, the network shall retransmit the TRACKING AREA UPDATE ACCEPT message and shall reset and restart timer T3450. The retransmission is performed four times, i.e. on the fifth expiry of timer T3450, the tracking area updating procedure is aborted. Both, the old and the new GUTI shall be considered as valid until the old GUTI can be considered as invalid by the network (see clause 5.4.1.4). During this period the network acts as described for case a above.

d) TRACKING AREA UPDATE REQUEST received after the TRACKING AREA UPDATE ACCEPT message has been sent and before the TRACKING AREA UPDATE COMPLETE message is received

- If one or more of the information elements in the TRACKING AREA UPDATE REQUEST message differ from the ones received within the previous TRACKING AREA UPDATE REQUEST message, the previously initiated tracking area updating procedure shall be aborted if the TRACKING AREA UPDATE COMPLETE message has not been received and the new tracking area updating procedure shall be progressed; or

- If the information elements do not differ for cases other than inter-system change from N1 mode to S1 mode in EMM-IDLE mode with the UE operating in the single-registration mode, then the TRACKING AREA UPDATE ACCEPT message shall be resent and the timer T3450 shall be restarted if a TRACKING AREA UPDATE COMPLETE message is expected. If the information elements do not differ for the case of inter-system change from N1 mode to S1 mode in EMM-IDLE mode with the UE operating in the single-registration mode, the MME should forward the new TRACKING AREA UPDATE REQUEST message which contains the same information elements as the previous TRACKING AREA UPDATE REQUEST message to the source AMF to run the integrity check, obtain the latest mapped EPS security context (to be used to protect any future NAS message sent to the UE) and continue with the new tracking area updating procedure. In these cases, the retransmission counter related to T3450 is not incremented.

NOTE 1: Instead of forwarding the new TRACKING AREA UPDATE REQUEST message which contains the same information elements to the source AMF, the MME can decide to initiate an authentication procedure followed by a security mode control procedure to take the new partial native EPS security context into use if the new partial native EPS security context is taken into use successfully, then resend the same TRACKING AREA UPDATE ACCEPT message protected using this new EPS security context.

e) More than one TRACKING AREA UPDATE REQUEST received and no TRACKING AREA UPDATE ACCEPT or TRACKING AREA UPDATE REJECT message has been sent

- If one or more of the information elements in the TRACKING AREA UPDATE REQUEST message differs from the ones received within the previous TRACKING AREA UPDATE REQUEST message, the previously initiated tracking area updating procedure shall be aborted and the new tracking area updating procedure shall be progressed;

- if the information elements do not differ for cases other than inter-system change from N1 mode to S1 mode in EMM-IDLE mode with the UE operating in the single-registration mode, then the network shall continue with the previous tracking area updating procedure and shall not treat any further this TRACKING AREA UPDATE REQUEST message. If the information elements do not differ for the case of inter-system change from N1 mode to S1 mode in EMM-IDLE mode with the UE operating in the single-registration mode, the MME should forward the new TRACKING AREA UPDATE REQUEST message which contains the same information elements as the previous TRACKING AREA UPDATE REQUEST message to the source AMF to run the integrity check, obtain the latest mapped EPS security context (to be used to protect any future NAS message sent to the UE) and continue with the previous tracking area updating procedure.

NOTE 2: Instead of forwarding the new TRACKING AREA UPDATE REQUEST message which contains the same information elements to the source AMF, the MME can decide to initiate an authentication procedure followed by a security mode control procedure to take the new partial native EPS security context into use and, if the new partial native EPS security context is taken into use successfully, use this new EPS security context to protect any future NAS message sent to the UE.

f) Lower layers indication of non-delivered NAS PDU due to handover

If the TRACKING AREA UPDATE ACCEPT message or TRACKING AREA UPDATE REJECT message could not be delivered due to an intra MME handover and the TAI of the target cell and the TAI of the source cell are the same, then upon successful completion of the intra MME handover the MME shall retransmit the TRACKING AREA UPDATE ACCEPT message or TRACKING AREA UPDATE REJECT message. If a failure of the handover procedure is reported by the lower layer and the S1 signalling connection exists, the MME shall retransmit the TRACKING AREA UPDATE ACCEPT message or TRACKING AREA UPDATE REJECT message.

g) DETACH REQUEST message received before the TRACKING AREA UPDATE ACCEPT message is sent or before the TRACKING AREA UPDATE COMPLETE message (in case of GUTI and/or TMSI was allocated) is received.

Detach containing cause "switch off":

The network shall abort the signalling for the tracking area updating procedure towards the UE and shall progress the detach procedure as described in clause 5.5.2.2.

NOTE 3: Internally in the network, before processing the detach request, the MME can perform the necessary signalling procedures for the tracking area updating procedure before progressing the detach procedure.

Detach containing other causes than "switch off":

The network shall proceed with the tracking area updating procedure and shall progress the detach procedure after successful completion of the tracking area updating procedure.

h) If the TRACKING AREA UPDATE REQUEST message with EPS update type IE indicating "periodic updating" is received by the new MME which does not have the EMM context data related to the subscription, the new MME may send the TRACKING AREA UPDATE REJECT message with EMM cause value #10 "Implicitly detached"

i) The TRACKING AREA UPDATE REQUEST message is received with the "active" flag set, and the message also contains the UE request type IE with the Request type indicating "NAS signalling connection release".

The network shall process the TRACKING AREA UPDATE REQUEST message and ignore the value of the "active" flag.

\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*

##### 5.6.1.2.2 UE is using EPS services with control plane CIoT EPS optimization

The UE shall send a CONTROL PLANE SERVICE REQUEST message, start T3417 and enter the state EMM-SERVICE-REQUEST-INITIATED.

For case a in clause 5.6.1.1, the Control plane service type of the CONTROL PLANE SERVICE REQUEST message shall indicate "mobile terminating request". The UE may include the ESM DATA TRANSPORT message. The UE shall not include any ESM message other than ESM DATA TRANSPORT message.

For case b in clause 5.6.1.1,

- if the UE has pending IP, non-IP or Ethernet user data that is to be sent via the control plane radio bearers, the Control plane service type of the CONTROL PLANE SERVICE REQUEST message shall indicate "mobile originating request". The UE shall include an ESM DATA TRANSPORT message in the ESM message container IE. If the UE supports the CP-EDT (see 3GPP TS 36.300 [20]), the UE shall provide the CONTROL PLANE SERVICE REQUEST message in the NAS request to the lower layer to establish a RRC connection as specified in clause 5.3.1.1.

For cases b and m in clause 5.6.1.1,

- if the UE has pending IP, non-IP or Ethernet user data that is to be sent via the user plane radio bearers, the UE shall set the Control plane service type of the CONTROL PLANE SERVICE REQUEST message to "mobile originating request" and the "active" flag in the Control plane service type IE to 1. The UE shall not include any ESM message container or NAS message container IE in the CONTROL PLANE SERVICE REQUEST message.

For case c in clause 5.6.1.1, the UE shall set the Control plane service type of the CONTROL PLANE SERVICE REQUEST message to "mobile originating request". If the CONTROL PLANE SERVICE REQUEST message is:

- for sending SMS , the UE shall include the SMS message in the NAS message container IE and shall not include any ESM message container IE in the CONTROL PLANE SERVICE REQUEST message; and

- for sending signalling different from SMS, the UE shall not include any ESM message container or NAS message container IE in the CONTROL PLANE SERVICE REQUEST message.

For cases p and q in clause 5.6.1.1, the UE shall send the CONTROL PLANE SERVICE REQUEST message as follows:

- for case p in clause 5.6.1.1, the UE shall set the Request type to "NAS signalling connection release" in the UE request type IE, the Control plane service type IE to "mobile originating request", and the "active" flag in the Control plane service type IE to 0; or

- for case q in clause 5.6.1.1, the UE shall set the Request type to "Rejection of paging" in the UE request type IE and Control plane service type IE to "mobile terminating request", and the "active" flag in the Control plane service type IE to 0; and

start T3417 and enter the state EMM-SERVICE-REQUEST-INITIATED. Further, the UE may include its paging restriction preferences in the Paging restriction IE in the CONTROL PLANE SERVICE REQUEST message and shall not include any ESM message container or NAS message container IE in the CONTROL PLANE SERVICE REQUEST message.

For case o in clause 5.6.1.1, the Control plane service type of the CONTROL PLANE SERVICE REQUEST message shall indicate "mobile originating request". The UE shall not include the Paging restriction IE in the CONTROL PLANE SERVICE REQUEST message.

\*\*\*\*\*\* NEXT CHANGES \*\*\*\*\*\*

#### 5.6.1.7 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Lower layer failure

If a lower layer failure occurs before a SERVICE REJECT message has been sent to the UE or the service request procedure has been completed by the network, the network enters/stays in EMM-IDLE.

b) Protocol error

If the SERVICE REQUEST, EXTENDED SERVICE REQUEST or the CONTROL PLANE SERVICE REQUEST message is received with a protocol error, the network shall return a SERVICE REJECT message with one of the following EMM cause values:

#96: invalid mandatory information;

#99: information element non-existent or not implemented;

#100: conditional IE error; or

#111: protocol error, unspecified.

The network stays in the current EMM mode.

c) More than one SERVICE REQUEST, EXTENDED SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST received before the procedure has been completed (i.e., before SERVICE REJECT message has been sent or service request procedure has been completed)

- If one or more of the information elements in the SERVICE REQUEST message, CONTROL PLANE SERVICE REQUEST or EXTENDED SERVICE REQUEST for packet services differs from the ones received within the previous SERVICE REQUEST, CONTROL PLANE SERVICE REQUEST or EXTENDED SERVICE REQUEST message for packet services, the previously initiated service request procedure shall be aborted and the new service request procedure shall be progressed;

NOTE: The network actions are implementation dependent for the case that more than one EXTENDED SERVICE REQUEST messages for CS fallback or 1xCS fallback are received and their information elements differ.

- If the information elements do not differ, then the network shall continue with the previous service request procedure and shall not treat any further this SERVICE REQUEST, EXTENDED SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST message.

d) ATTACH REQUEST received before a SERVICE REJECT message has been sent or the service request procedure has been completed

If an ATTACH REQUEST message is received and the service request procedure has not been completed or a SERVICE REJECT message has not been sent, the network may initiate the EMM common procedures, e.g. the EMM authentication procedure. The network may e.g. after a successful EMM authentication procedure execution, abort the service request procedure, delete the EMM context, EPS bearer contexts, if any, and progress the new ATTACH REQUEST.

e) TRACKING AREA UPDATE REQUEST message received before the service request procedure has been completed or a SERVICE REJECT message has been sent

If a TRACKING AREA UPDATE REQUEST message is received and the service request procedure has not been completed or a SERVICE REJECT message has not been sent, the network may initiate the EMM common procedures, e.g. the EMM authentication procedure. The network may e.g. after a successful EMM authentication procedure execution, abort the service request procedure and progress the tracking area updating procedure.

f) Default or dedicated bearer set up failure

If the lower layers indicate a failure to set up a radio or S1 bearer, the MME shall locally deactivate the EPS bearer as described in clause 6.4.4.6.

g) The CONTROL PLANE SERVICE REQUEST message is received with the "active" flag set, and the message also contains the UE request type IE with the Request type indicating "NAS signalling connection release" or "Rejection of paging".

The network shall process the CONTROL PLANE SERVICE REQUEST message and ignore the value of the "active" flag.

\*\*\*\*\*\* END CHANGES \*\*\*\*\*\*