**3GPP TSG-CT WG1 Meeting #132-eC1-216088**

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

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.501** | **CR** | **3624** | **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:*** | Uplink data status IE and NAS connection release | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MUSIM | | | | |  | ***Date:*** | | | 28-09-2021 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | The Registration Request, (Control Plane) Service Request message should not contain both the Uplink data status IE and the UE request type IE with the Request type indicating "NAS signalling connection release" (or "Rejection of paging" in case of (CP)SR message). | | | | | | | | |
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| ***Summary of change:*** | | When the Registration Request, (Control Plane) Service Request message contains both the Uplink data status IE and the UE request type IE with the Request type indicating "NAS signalling connection release" (or "Rejection of paging" in case of (CP)SR message), then the network ignores the Uplink data status IE. This is proposed as an abnormal case for registration procedure and service request procedure. | | | | | | | | |
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| ***Consequences if not approved:*** | | Contradictory requests from the UE to both establish the UP resources and release the NAS connection. | | | | | | | | |
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| ***Clauses affected:*** | | 5.5.1.3.8, 5.6.1.8 | | | | | | | | |
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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 \*\*\*\*\*\*

##### 5.5.1.3.8 Abnormal cases on the network side

The following abnormal cases can be identified:

a) If a lower layer failure occurs before the message REGISTRATION COMPLETE has been received from the UE and timer T3550 is running, the AMF shall abort the procedure, enter 5GMM-IDLE mode.

If a new 5G-GUTI was assigned to the UE in the REGISTRATION ACCEPT message, the AMF shall consider both, the old and new 5G-GUTIs as valid until the old 5G-GUTI can be considered as invalid by the AMF. If a new TAI list was provided in the REGISTRATION ACCEPT message, both the old and new TAI lists shall also be considered valid until the old TAI list can be considered invalid by the AMF. If the old 5G-GUTI was allocated by an AMF other than the current AMF, the current AMF does not need to retain the old 5G-GUTI.

During this period:

1) if the new 5G-GUTI is used by the UE in a subsequent message, the AMF shall consider the old 5G-GUTI as invalid and, additionally, the old TAI list as invalid if a new TAI list was provided with the new 5G-GUTI in the REGISTRATION ACCEPT message;

2) if the old 5G-GUTI is used by the UE in a subsequent message, the AMF may use the identification procedure followed by a generic UE configuration update procedure; and

3) if the UE needs to be paged:

i) the AMF may first use the old 5G-S-TMSI from the old 5G-GUTI for paging within the area defined by the old TAI list for an implementation dependent number of paging attempts. If a new TAI list was provided in the REGISTRATION ACCEPT message, the new TAI list should also be used for paging. Upon response from the UE, the AMF may initiate the generic UE configuration update procedure. If the response is received from a tracking area within the old and new TAI list, the network shall initiate the generic UE configuration update procedure; and

ii) if no response is received to the paging attempts using the old 5G-S-TMSI from the old 5G-GUTI, the AMF may use the new 5G-S-TMSI from the new 5G-GUTI for paging for an implementation dependent number of paging attempts. In this case, if a new TAI list was provided with the new 5G-GUTI in the REGISTRATION ACCEPT message, the new TAI list shall be used instead of the old TAI list.

b) Protocol error.

If the REGISTRATION REQUEST message has been received with a protocol error, the AMF shall return a REGISTRATION REJECT message with one of the following 5GMM cause values:

#96 invalid mandatory information;

#99 information element non-existent or not implemented;

#100 conditional IE error; or

#111 protocol error, unspecified.

c) T3550 time out.

On the first expiry of the timer, the AMF shall retransmit the REGISTRATION ACCEPT message and shall reset and restart timer T3550. The retransmission is performed four times, i.e. on the fifth expiry of timer T3550, the registration procedure for mobility and periodic update procedure is aborted.

If a new 5G-GUTI was assigned to the UE in the REGISTRATION ACCEPT message, both, the old and new 5G-GUTI shall be considered as valid until the old 5G-GUTI can be considered as invalid by the AMF. If a new TAI list was provided in the REGISTRATION ACCEPT message, both the old and new TAI lists shall also be considered valid until the old TAI list can be considered invalid by the AMF. If the old 5G-GUTI was allocated by an AMF other than the current AMF, the current AMF does not need to retain the old 5G-GUTI. During this period the AMF acts as described for case a) above.

d) REGISTRATION REQUEST with 5GS registration type IE set to "mobility registration updating" or "periodic registration updating" received after the REGISTRATION ACCEPT message has been sent and before the REGISTRATION COMPLETE message is received, if the REGISTRATION COMPLETE message is expected.

1) If one or more of the information elements in the REGISTRATION REQUEST message differ from the ones received within the previous REGISTRATION REQUEST message, the previously initiated registration procedure for mobility and periodic registration update shall be aborted if the REGISTRATION COMPLETE message has not been received and the new registration procedure for mobility and periodic registration update shall be progressed; or

2) if the information elements do not differ, then the REGISTRATION ACCEPT message shall be resent and timer T3550 shall be restarted. In that case, the retransmission counter related to timer T3550 is not incremented.

e) More than one REGISTRATION REQUEST message with 5GS registration type IE set to "mobility registration updating" or "periodic registration updating" received and neither REGISTRATION ACCEPT message nor REGISTRATION REJECT message has been sent.

1) If one or more of the information elements in the REGISTRATION REQUEST message differs from the ones received within the previous REGISTRATION REQUEST message, the previously initiated registration procedure for mobility and periodic registration update shall be aborted and the new registration procedure for mobility and periodic registration update shall be progressed; or

2) if the information elements do not differ, then the network shall continue with the previous registration procedure for mobility and periodic registration update and shall not treat any further this REGISTRATION REQUEST message.

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

If the REGISTRATION ACCEPT message or REGISTRATION REJECT message could not be delivered due to an intra AMF handover and the target TA is included in the TAI list, then upon successful completion of the intra AMF handover the AMF shall retransmit the REGISTRATION ACCEPT message or REGISTRATION REJECT message. If a failure of the handover procedure is reported by the lower layer and the N1 NAS signalling connection exists, the AMF shall retransmit the REGISTRATION ACCEPT message or REGISTRATION REJECT message.

g) DEREGISTRATION REQUEST message received before REGISTRATION COMPLETE message is received, if the REGISTRATION COMPLETE message is expected.

If the De-registration type IE is set to "switch off":

The AMF shall abort the signalling for the registration procedure for mobility and periodic update towards the UE and shall progress the de-registration procedure as described in subclause 5.5.2.2.

NOTE 1: Internally in the AMF, before processing the de-registration request, the AMF can perform the necessary signalling procedures for the registration procedure for mobility and periodic update before progressing the de-registration procedure.

If the De-registration type IE is set to other type than "switch off":

The AMF shall proceed with registration procedure for mobility and periodic update and shall progress the de-registration procedure after successful completion of the registration procedure for mobility and periodic update.

h) If the REGISTRATION REQUEST message with 5GS registration type IE indicating "periodic registration updating" is received by the new AMF which does not have the 5GMM context data related to the subscription, the new AMF may send the REGISTRATION REJECT message with 5GMM cause #10 "implicitly de-registered".

i) Based on operator policy, if the mobility and periodic registration update request from a UE not supporting CAG is rejected due to CAG restrictions, the network shall reject the mobility and periodic registration update request with a 5GMM cause value other than the 5GMM cause #76 (Not authorized for this CAG or authorized for CAG cells only).

NOTE 2: 5GMM cause #7 (5GS services not allowed), 5GMM cause #11 (PLMN not allowed), 5GMM cause #27 (N1 mode not allowed), 5GMM cause #73 (Serving network not authorized) can be used depending on the subscription of the UE and whether the UE roams or not.

j) The REGISTRATION REQUEST message is received with the Uplink data status IE indicating that the UE has pending user data to be sent for at least one PDU session, and the message also contains the UE request type IE with the Request type indicating "NAS signalling connection release".

The network shall process the REGISTRATION REQUEST message and ignore the Uplink data status IE.

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

#### 5.6.1.8 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 AMF, the AMF enters/stays in 5GMM-IDLE.

b) Protocol error.

If the SERVICE REQUEST message or the CONTROL PLANE SERVICE REQUEST message is received with a protocol error, the AMF shall return a SERVICE REJECT message with one of the following 5GMM cause values:

#96 invalid mandatory information;

#99 information element non-existent or not implemented;

#100 conditional IE error; or

#111 protocol error, unspecified.

The AMF stays in the current 5GMM mode.

c) More than one SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message 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 or CONTROL PLANE SERVICE REQUEST message differs from the ones received within the previous SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message, the previously initiated service request procedure shall be aborted, and the new service request procedure shall be progressed;

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

d) REGISTRATION REQUEST message received with "initial registration" or "emergency registration" in the 5GS registration type IE before a SERVICE REJECT message has been sent or the service request procedure has been completed.

If a REGISTRATION REQUEST message with "initial registration" or "emergency registration" in the 5GS registration type IE is received and the service request procedure has not been completed or a SERVICE REJECT message has not been sent, the AMF may initiate the 5GMM common procedures, e.g. the primary authentication and key agreement procedure. The AMF may e.g. after a successful primary authentication and key agreement procedure execution, abort the service request procedure, delete the 5GMM context, indicate towards the SMF that the 5GMM context has been deleted and progress the new REGISTRATION REQUEST message.

e) REGISTRATION REQUEST message received with "mobility registration updating" or "periodic registration updating" in the 5GS registration type IE received before the service request procedure has been completed or a SERVICE REJECT message has been sent.

If a REGISTRATION REQUEST message with "mobility registration updating" or "periodic registration updating" in the 5GS registration type IE is received and the service request procedure has not been completed or a SERVICE REJECT message has not been sent, the AMF may initiate the 5GMM common procedures, e.g. the primary authentication and key agreement procedure. The AMF may e.g. after a successful primary authentication and key agreement procedure execution, abort the service request procedure and progress the new REGISTRATION REQUEST message.

f) If a CONTROL PLANE SERVICE REQUEST message with Control plane service type indicating "mobile originating request" is received after the AMF initiated a paging procedure, the AMF shall treat this CONTROL PLANE SERVICE REQUEST as a paging response and handle the message according to subclauses 5.6.1.4 and 5.6.1.5.

g) CONTROL PLANE SERVICE REQUEST message received with the Data type field indicates "control plane user data" in the CIoT small data container IE or received with Payload container type IE set to "CIoT user data container" and:

1) the AMF does not have a PDU session routing context for the PDU session ID and the UE; or

2) the AMF unsuccessfully attempted to forward the user data container and the PDU session ID,

then the AMF may send back to the UE the CIoT user data container or control plane user data which was not forwarded as specified in subclause 5.4.5.3.1 case l1) or case l2).

h) Based on operator policy, if the service request from a UE not supporting CAG is rejected due to CAG restrictions, the network shall reject the service request with a 5GMM cause value other than the 5GMM cause #76 (Not authorized for this CAG or authorized for CAG cells only).

NOTE: 5GMM cause #7 (5GS services not allowed), 5GMM cause #11 (PLMN not allowed), 5GMM cause #27 (N1 mode not allowed), 5GMM cause #73 (Serving network not authorized) can be used depending on the subscription of the UE and whether the UE roams or not.

i) The SERVICE REQUEST message or the CONTROL PLANE SERVICE REQUEST message is received with the Uplink data status IE indicating that the UE has pending user data to be sent for at least one PDU session, 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 SERVICE REQUEST message or the CONTROL PLANE SERVICE REQUEST message and ignore the Uplink data status IE.

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