**3GPP TSG-CT WG1 Meeting #136-e *Rev\_*C1-223664**

**E-Meeting, 12th – 20th May 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **4358** | **rev** | **1** | **Current version:** | **17.6.1** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Abnormal cases in Generic UE configuration update procedure for handling Paging subgroup ID |
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| ***Source to WG:*** | Apple |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | 5GProtoc17, NR\_UE\_pow\_sav\_enh |  | ***Date:*** | 2022-04-30 |
|  |  |  |  |  |
| ***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 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:*** | If the UE supports NR Paging subgrouping and the network supports and accepts the use of the PEIPS assistance information for the UE, the network provides to the UE the Negotiated PEIPS assistance information, including the Paging subgroup ID, in the CONFIGURATION UPDATE COMMAND message. The Paging subgroup ID is used to determine the NR paging subgroup for paging the UE.There can be a lower layer failure when delivering the CONFIGURATION UPDATE COMPLETE message. If the network does not receive the CONFIGURATION UPDATE COMPLETE message due to a lower layer failure, the UE and network are out of sync as to which negotiated Paging subgroup ID to use. There needs to be appropriate handling of this abnormal case, so that both the UE and network are in sync with respect to the UE paging configurationand that the network can continue to deliver Paging messages to UE in a deterministic and efficient manner. |
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| ***Summary of change:*** |  In case of lower layer failure and if the network does not receive the CONFIGURATION UPDATE COMPLETE message, the network should consider two different Paging subgroup IDs. Each of these Paging subgroup ID is associated with a corresponding GUTI as well. The network should page the UE with both the Paging subgroup IDs and based on the GUTI included in the message with which the UE responds, use the Paging subgroup ID associated with that GUTI, and consider the other Paging subgroup ID as invalid. |
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| ***Consequences if not approved:*** | The generic UE configuration update procedure was not completed successfully. The UE and network are out of sync with regards to UE paging configuration and use of appropriate Paging subgroup ID. As such the UE may miss paging messages leading to service degradation on UE and poor paging KPI from the network side. |
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| ***Clauses affected:*** | 5.4.4.6 |
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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:*** |  |

\*\*\*\*\* First change \*\*\*\*\*

#### 5.4.4.6 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Expiry of timer T3555.

 The network shall, on the first expiry of the timer T3555, retransmit the CONFIGURATION UPDATE COMMAND message and shall reset and start timer T3555. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3555, the procedure shall be aborted. In addition, if the CONFIGURATION UPDATE COMMAND message includes the 5G-GUTI IE, the network shall behave as described in case b)-1) below.

b) Lower layer failure.

 If a lower layer failure is detected before the CONFIGURATION UPDATE COMPLETE message is received and:

1) if the CONFIGURATION UPDATE COMMAND message includes the 5G-GUTI IE, the old and the 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 CONFIGURATION UPDATE COMMAND message, the old and new TAI list shall also be considered as valid until the old TAI list can be considered as invalid by the AMF.

 Additionally, if the Updated PEIPS assistance information IE in the CONFIGURATION UPDATE COMMAND message includes a new Paging subgroup ID and the UE is previously assigned a different Paging subgroup ID then, the AMF shall consider both, the old and new Paging subgroup IDs as valid until the old Paging subgroup ID can be considered as invalid by the AMF.

During this period the AMF:

i) may first use the old 5G-S-TMSI from the old 5G-GUTI and the old Paging subgroup ID, if any, for paging within the area defined by the old TAI list for an implementation dependent number of paging attempts for network originated transactions. If a new TAI list was provided in the CONFIGURATION UPDATE COMMAND message, the new TAI list should also be used for paging. Upon response from the UE, the AMF may re-initiate the CONFIGURATION UPDATE COMMAND. If the Updated PEIPS assistance information IE in the CONFIGURATION UPDATE COMMAND message includes a new Paging subgroup ID, then the AMF may re-initiate the CONFIGURATION UPDATE COMMAND. If the response is received from a tracking area within the old and new TAI list, the network shall re-initiate the CONFIGURATION UPDATE COMMAND message. If no response is received to the paging attempts, the network may use the new 5G-S-TMSI from the new 5G-GUTI and the new Paging subgroup ID, if any, for paging for an implementation dependent number of paging attempts. In this case, if a new TAI list was provided with new 5G-GUTI in the CONFIGURATION UPDATE COMMAND message, the new TAI list shall be used instead of the old TAI list. Upon response from the UE the AMF shall consider the new 5G-GUTI and the new PEIPS assistance information as valid and the old 5G-GUTI and the old PEIPS assistance information as invalid.

ii) shall consider the new 5G-GUTI as valid if it is used by the UE and, additionally, the new TAI list as valid if it was provided with this 5G-GUTI in the CONFIGURATION UPDATE COMMAND message; and

iii) may use the identification procedure followed by a new generic UE configuration update procedure if the UE uses the old 5G-GUTI; or

2) if the CONFIGURATION UPDATE COMMAND message does not include the 5G-GUTI IE and:

i) the CONFIGURATION UPDATE COMMAND message does not contain the Allowed NSSAI IE, the Rejected NSSAI IE, the Extended rejected NSSAI IE, or the Updated PEIPS assistance information IE, the network shall abort the procedure; or

ii) the CONFIGURATION UPDATE COMMAND message contains the Allowed NSSAI IE, the Rejected NSSAI IE, the Extended rejected NSSAI IE, or the Updated PEIPS assistance information IE, the network shall either abort the procedure or retransmit the CONFIGURATION UPDATE COMMAND message on expiry of the timer T3555. The retransmission shall not be repeated more than four times. If the retransmission is repeated for four times, the network shall abort the procedure.

c) Generic UE configuration update and UE initiated de-registration procedure collision.

 If the network receives a DEREGISTRATION REQUEST message before the ongoing generic UE configuration update procedure has been completed, the network shall abort the generic UE configuration update procedure and shall progress the de-registration procedure.

d) Generic UE configuration update and registration procedure for mobility and periodic registration update collision

 If the network receives a REGISTRATION REQUEST message before the ongoing generic UE configuration update procedure has been completed, the network shall abort the generic UE configuration update procedure and shall progress the registration procedure for mobility and periodic registration update procedure.

e) Generic UE configuration update and service request procedure collision

 If the network receives a SERVICE REQUEST message before the ongoing generic UE configuration update procedure has been completed and the SERVICE REQUEST message does not include UE request type IE with Request type value set to "NAS signalling connection release", both the procedures shall be progressed.

 If the network receives a SERVICE REQUEST message before the ongoing generic UE configuration update procedure has been completed and the SERVICE REQUEST message includes UE request type IE with Request type value set to "NAS signalling connection release", the network shall abort the generic UE configuration update procedure and shall progress the service request procedure.

\*\*\*\*\* End of changes \*\*\*\*\*