**3GPP TSG-CT WG1 Meeting #122-eC1-200791**

**Electronic meeting, 20-28 February 2020 revision of C1-200432**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.501** | **CR** | **1915** | **rev** | **1** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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:*** | Cleanup for NSSAA message and coding | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNS | | | | |  | ***Date:*** | | | 2020-02-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | T35xx is not defined yet and the message IEI is also not defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | A new IE mapped S-NSSAI is defined.  The T35xx and IEI is defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The IEI can not be identified by the receiver. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.4.7.1, 5.4.7.2.1, 5.4.7.2.2, 5.4.7.2.3, 9.7,10.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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

#### 5.4.7.1 General

The purpose of the network slice-specific authentication and authorization procedure is to enable the authentication, authorization and accounting server (AAA-S) to (re-)authenticate or (re-)authorize the upper layers of the UE.

The network slice-specific authentication and authorization procedure can be invoked for a UE supporting network slice-specific authentication and authorization procedure and for a HPLMN S-NSSAI (see subclause 5.15.10 in 3GPP TS 23.501 [8] and subclause 4.2.9.2 of 3GPP TS 23.502 [9]).

The network (re-)authenticates the UE using the EAP as specified in IETF RFC 3748 [34].

EAP has defined four types of EAP messages:

a) an EAP-request message;

b) an EAP-response message;

c) an EAP-success message; and

d) an EAP-failure message.

The EAP-request message is transported from the network to the UE using the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message of the network slice-specific EAP message reliable transport procedure.

The EAP-response message to the EAP-request message is transported from the UE to the network using the NETWORK SLICE-SPECIFIC SESSION AUTHENTICATION COMPLETE message of the network slice-specific EAP message reliable transport procedure.

If the (re-)authentication of the UE completes successfully or unsuccessfully, the EAP-success message or the EAP-failure message, respectively, is transported from the network to the UE using the NETWORK SLICE-SPECIFIC AUTHENTICATION RESULT message of the network slice-specific result message transport procedure.

There can be several rounds of exchange of an EAP-request message and a related EAP-response message for the AAA-S to complete the (re-)authentication and (re-)authorization of the request for an S-NSSAI (see example in figure 5.4.7.1.1).

The AMF shall set the authenticator retransmission timer specified in subclause 4.3 of IETF RFC 3748 [34] to infinite value.

NOTE: The network slice-specific authentication and authorization procedure provides a reliable transport of EAP messages and therefore retransmissions at the EAP layer of the AMF do not occur.



Figure 5.4.7.1.1: Network slice-specific authentication and authorization procedure

\*\*\*\*\* Next change \*\*\*\*\*

##### 5.4.7.2.1 Network slice-specific EAP message reliable transport procedure initiation

In order to initiate the network slice-specific EAP message reliable transport procedure, the AMF shall create a NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message.

The AMF shall set the EAP message IE of the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message to the EAP-request message which is generated by the AMF or provided by the AAA-S.

The AMF shall set the S-NSSAI IE of the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message to the HPLMN S-NSSAI to which the EAP-request message is related.

The AMF shall send the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message and start timer T3575 per S-NSSAI (see example in figure 5.4.7.1.1).

Upon receipt of a NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message, the UE shall pass:

a) the EAP-request message received in the EAP message IE; and

b) the HPLMN S-NSSAI in the S-NSSAI IE;

to the upper layers. Apart from this action, the network slice-specific authentication and authorization procedure is transparent to the 5GMM layer of the UE.

\*\*\*\*\* Next change \*\*\*\*\*

##### 5.4.7.2.2 Network slice-specific EAP message reliable transport procedure accepted by the UE

When the upper layers provide an EAP-response message associated with the HPLMN S-NSSAI, the UE shall create a NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message.

The UE shall set the EAP message IE of the NETWORK SLICE-SPECIFIC SESSION AUTHENTICATION COMPLETE message to the EAP-response message.

The UE shall set the S-NSSAI IE of the NETWORK SLICE-SPECIFIC SESSION AUTHENTICATION COMPLETE message to the HPLMN S-NSSAI associated with the EAP-response message.

The UE shall send the NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message. Apart from this action, the network slice-specific authentication and authorization procedure is transparent to the 5GMM layer of the UE.

Upon receipt of a NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message, the AMF shall stop timer T3575 and:

a) pass the EAP-request message received in the EAP message IE of the NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message associated with the HPLMN S-NSSAI in the S-NSSAI IE to the upper layers; or

b) provide the EAP-response message received in the EAP message IE of the NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message associated with the HPLMN S-NSSAI in the S-NSSAI IE to the AAA-S.

\*\*\*\*\* Next change \*\*\*\*\*

##### 5.4.7.2.3 Abnormal cases on the network side

The following abnormal cases can be identified:

a) T3575 expiry

The AMF shall, on the first expiry of the timer T3575, retransmit the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message and shall reset and start timer T3575. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3575, the AMF shall abort the network slice-specific authentication and authorization procedure for the S-NSSAI. The AMF shall consider that the network slice-specific authentication and authorization procedure for the S-NSSAI is completed as a failure.

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

If the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message could not be delivered due to an intra AMF handover and the target TAI is included in the TAI list, then upon successful completion of the intra AMF handover the AMF shall retransmit the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message. If a failure of handover procedure is reported by the lower layer and the N1 NAS signalling connection exists, the AMF shall retransmit the NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message.

c) Network slice-specific authentication and authorization procedure and de-registration procedure collision

If the network receives a DEREGISTRATION REQUEST message before the ongoing network slice-specific authentication and authorization procedure has been completed and the access type included in the DEREGISTRATION REQUEST message is the same as the one for which the network slice-specific authentication and authorization procedure is ongoing, the network shall abort the network slice-specific authentication and authorization procedure and shall progress the UE-initiated de-registration procedure. The AMF may initiate the network slice-specific authentication and authorization procedure for the S-NSSAI via is completed as a failure, if available.

\*\*\*\*\* Next change \*\*\*\*\*

## 9.7 Message type

The Message type IE and its use are defined in 3GPP TS 24.007 [11]. Tables 9.7.1 and 9.7.2 define the value part of the message type IE used in the 5GS mobility management protocol and 5GS session management protocol.

Table 9.7.1: Message types for 5GS mobility management

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | | | | | | | | | |  | |  | |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |  | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| 0 | | 1 | | - | | - | | - | | - | | - | | - | |  | | 5GS mobility management messages | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 0 | | 0 | | 1 | |  | | Registration request | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 0 | | 1 | | 0 | |  | | Registration accept | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 0 | | 1 | | 1 | |  | | Registration complete | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 1 | | 0 | | 0 | |  | | Registration reject | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 1 | | 0 | | 1 | |  | | Deregistration request (UE originating) | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 1 | | 1 | | 0 | |  | | Deregistration accept (UE originating) | |
| 0 | | 1 | | 0 | | 0 | | 0 | | 1 | | 1 | | 1 | |  | | Deregistration request (UE terminated) | |
| 0 | | 1 | | 0 | | 0 | | 1 | | 0 | | 0 | | 0 | |  | | Deregistration accept (UE terminated) | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| 0 | | 1 | | 0 | | 0 | | 1 | | 1 | | 0 | | 0 | |  | | Service request | |
| 0 | | 1 | | 0 | | 0 | | 1 | | 1 | | 0 | | 1 | |  | | Service reject | |
| 0 | | 1 | | 0 | | 0 | | 1 | | 1 | | 1 | | 0 | |  | | Service accept | |
| 0 | | 1 | | 0 | | 0 | | 1 | | 1 | | 1 | | 1 | |  | | Control plane service request | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 0 | | 0 | | 0 | |  | | Network slice-specific authentication command | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 0 | | 0 | | 1 | |  | | Network slice-specific authentication complete | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 0 | | 1 | | 0 | |  | | Network slice-specific authentication result | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 1 | | 0 | | 0 | |  | | Configuration update command | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 1 | | 0 | | 1 | |  | | Configuration update complete | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 1 | | 1 | | 0 | |  | | Authentication request | |
| 0 | | 1 | | 0 | | 1 | | 0 | | 1 | | 1 | | 1 | |  | | Authentication response | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 0 | | 0 | | 0 | |  | | Authentication reject | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 0 | | 0 | | 1 | |  | | Authentication failure | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 0 | | 1 | | 0 | |  | | Authentication result | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 0 | | 1 | | 1 | |  | | Identity request | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 1 | | 0 | | 0 | |  | | Identity response | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 1 | | 0 | | 1 | |  | | Security mode command | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 1 | | 1 | | 0 | |  | | Security mode complete | |
| 0 | | 1 | | 0 | | 1 | | 1 | | 1 | | 1 | | 1 | |  | | Security mode reject | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| 0 | | 1 | | 1 | | 0 | | 0 | | 1 | | 0 | | 0 | |  | | 5GMM status | |
| 0 | | 1 | | 1 | | 0 | | 0 | | 1 | | 0 | | 1 | |  | | Notification | |
| 0 | | 1 | | 1 | | 0 | | 0 | | 1 | | 1 | | 0 | |  | | Notification response | |
| 0 | | 1 | | 1 | | 0 | | 0 | | 1 | | 1 | | 1 | |  | | UL NAS transport | |
| 0 | | 1 | | 1 | | 0 | | 1 | | 0 | | 0 | | 0 | |  | | DL NAS transport | |
|  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |

Table 9.7.2: Message types for 5GS session management

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | |  |  |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |  |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | - | - | - | - | - | - |  | 5GS session management messages |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |  | PDU session establishment request |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |  | PDU session establishment accept |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |  | PDU session establishment reject |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |  | PDU session authentication command |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |  | PDU session authentication complete |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |  | PDU session authentication result |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |  | PDU session modification request |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |  | PDU session modification reject |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |  | PDU session modification command |
| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |  | PDU session modification complete |
| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |  | PDU session modification command reject |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |  | PDU session release request |
| 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  | PDU session release reject |
| 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |  | PDU session release command |
| 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |  | PDU session release complete |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |  | 5GSM status |
|  |  |  |  |  |  |  |  |  |  |

\*\*\*\*\* Next change \*\*\*\*\*

## 10.2 Timers of 5GS mobility management

Timers of 5GS mobility management are shown in table 10.2.1 and table 10.2.2

NOTE: Timer T3346 is defined in 3GPP TS 24.008 [12]. Timers T3444, T3445, T3447 and T3448 are defined in 3GPP TS 24.301 [15].

Table 10.2.1: Timers of 5GS mobility management – UE side

| TIMER NUM. | TIMER VALUE | STATE | CAUSE OF START | NORMAL STOP | ON  EXPIRY |
| --- | --- | --- | --- | --- | --- |
| T3502 | Default 12 min.  NOTE 1 | 5GMM-DEREGISTERED 5GMM-REGISTERED | At registration failure and the attempt counter is equal to 5 | Transmission of REGISTRATION REQUEST message | Initiation of the registration procedure, if still required |
| T3510 | 15s  NOTE 7  NOTE 8  In WB-N1/CE mode, 85s | 5GMM-REGISTERED-INITIATED | Transmission of REGISTRATION REQUEST message | REGISTRATION ACCEPT message received or REGISTRATION REJECT message received | Start T3511 or T3502 as specified in subclause 5.5.1.2.7 if T3510 expired during registration procedure for initial registration.  Start T3511 or T3502 as specified in subclause 5.5.1.3.7 if T3510 expired during the registration procedure for mobility and periodic registration update |
| T3511 | 10s | 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION  5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE  5GMM-REGISTERED.NORMAL-SERVICE | At registration failure due to lower layer failure, T3510 timeout or registration rejected with other 5GMM cause values than those treated in subclause 5.5.1.2.5 for initial registration or subclause 5.5.1.3.5 for mobility and periodic registration | Transmission of REGISTRATION REQUEST message  5GMM-CONNECTED mode entered (NOTE 5) | Retransmission of the REGISTRATION REQUEST, if still required |
| T3512 | Default 54 min  NOTE 1  NOTE 2 | 5GMM-REGISTERED | In 5GMM-REGISTERED, when 5GMM-CONNECTED mode is left and if the NW does not indicate support for strictly periodic registration timer as specified in subclause 5.3.7.  If the network indicates support for strictly periodic registration timer, T3512 is started after the successful completion of registration update procedure. T3512 is restarted if it expires in 5GMM-CONNECTED mode as specified in subclause 5.3.7. | When entering state 5GMM-DEREGISTERED  When entering 5GMM-CONNECTED mode if the NW does not indicate support for strictly periodic registration timer as specified in subclause 5.3.7. | In 5GMM-IDLE mode, Initiation of the periodic registration procedure if the UE is not registered for emergency services.  In 5GMM-CONNECTED mode, restart the timer T3512.  Locally deregister if the UE is registered for emergency services |
| T3516 | 30s  NOTE 7  NOTE 8  In WB-N1/CE mode, 48s | 5GMM-REGISTERED-INITIATED  5GMM-REGISTERED  5GMM-DEREGISTERED-INITIATED  5GMM-SERVICE-REQUEST-INITIATED | RAND and RES\* stored as a result of an 5G authentication challenge | SECURITY MODE COMMAND received  SERVICE REJECT received  REGISTRATION ACCEPT received  AUTHENTICATION REJECT received  AUTHENTICATION FAILURE sent  5GMM-DEREGISTERED, 5GMM-NULL or  5GMM-IDLE mode entered | Delete the stored RAND and RES\* |
| T3517 | 15s  NOTE 7  NOTE 8  In WB-N1/CE mode, 61s | 5GMM-SERVICE-REQUEST-INITIATED | Transmission of SERVICE REQUEST message | (a) Indication from the lower layers that the UE has changed to S1 mode or E-UTRA connected to 5GCN for case h) in subclause 5.6.1.1; or  (b) SERVICE ACCEPT message received, or  SERVICE REJECT message received for cases other than h) in subclause 5.6.1.1 | Abort the procedure |
| T3519 | 60s  NOTE 7  NOTE 8  In WB-N1/CE mode, 90s | 5GMM-REGISTERED-INITIATED  5GMM-REGISTERED  5GMM-DEREGISTERED-INITIATED  5GMM-SERVICE-REQUEST-INITIATED (NOTE 6) | Transmission of IDENTITY RESPONSE message, REGISTRATION REQUEST message, or DEREGISTRATION REQUEST message with freshly generated SUCI | REGISTRATION ACCEPT message with new 5G-GUTI received  CONFIGURATION UPDATE COMMAND message with new 5G-GUTI received DEREGISTRATION ACCEPT message | Delete stored SUCI |
| T3520 | 15s  NOTE 7  NOTE 8  In WB-N1/CE mode, 33s | 5GMM-REGISTERED-INITIATED  5GMM-REGISTERED  5GMM-DEREGISTERED-INITIATED  5GMM-SERVICE-REQUEST-INITIATED | Transmission of AUTHENTICATION FAILURE message with any of the 5GMM cause #20, #21, #26 or #71  Transmission of AUTHENTICATION RESPONSE message with an EAP-response message after detection of an error as described in subclause 5.4.1.2.2.4 | AUTHENTICATION REQUEST message received or AUTHENTICATION REJECT message received  or  SECURITY MODE COMMAND message received  when entering 5GMM-IDLE mode  indication of transmission failure of AUTHENTICATION FAILURE message from lower layers | On first expiry during a 5G AKA based primary authentication and key agreement procedure, the UE should consider the network as false and follow item g of subclause 5.4.1.3.7, if the UE is not registered for emergency services.  On first expiry during a 5G AKA based primary authentication and key agreement procedure, the UE will follow subclause 5.4.1.3.7 under "For items c, d, e and f:", if the UE is registered for emergency services.  On first expiry during an EAP based primary authentication and key agreement procedure, the UE should consider the network as false and follow item e of subclause 5.4.1.2.4.5, if the UE is not registered for emergency services.  On first expiry during an EAP based primary authentication and key agreement procedure, the UE will follow subclause 5.4.1.2.4.5 under "For item e:", if the UE is registered for emergency services |
| T3521 | 15s  NOTE 7  NOTE 8  In WB-N1/CE mode, 45s | 5GMM-DEREGISTERED-INITIATED | Transmission of DEREGISTRATION REQUEST message when de-registration procedure is not due to a "switch off" | DEREGISTRATION ACCEPT message received | Retransmission of DEREGISTRATION REQUEST message |
| T3525 | Default 60s  NOTE 3  NOTE 7  NOTE 8  In WB-N1/CE mode, default 120s | 5GMM-REGISTERED.NORMAL-SERVICE | T3517 expires and service request attempt counter is greater than or equal to 5 | When entering state other than 5GMM-REGISTERED.NORMAL-SERVICE state,  or  UE camped on a new PLMN other than the PLMN on which timer started,  or  User-plane resources established with the network | The UE may initiate service request procedure |
| T3540 | 10s | 5GMM-DEREGISTERED  5GMM-REGISTERED | REGISTRATION REJECT message or DEREGISTRATION REQUEST message received with any of the 5GMM cause #3, #6, #7, #11, #12, #13, #15, #27, #31, #62, #72, #73, #74, #75 or #76  SERVICE REJECT message received with any of the 5GMM cause #3, #6, #7, #11, #12, #13, #15, #27, #72, #73, #74, #75 or #76.  REGISTRATION ACCEPT message received as described in subclause 5.3.1.3 case b)  SERVICE ACCEPT message received as described in subclause 5.3.1.3 case f)  AUTHENTICATION REJECT message received | N1 NAS signalling connection released  PDU sessions have been set up | Release the NAS signalling connection for the cases a), b), f) and g) as described in subclause 5.3.1.3 |
| 5GMM-REGISTERED | CONFIGURATION UPDATE COMMAND message received as described in subclause 5.3.1.3 case e) | N1 NAS signalling connection released | Release the NAS signalling connection for the case e) and perform a new registration procedure as described in subclause 5.5.1.3.2 |
| 5GMM-DEREGISTERED  5GMM-DEREGISTERED.NORMAL-SERVICE  5GMM-REGISTERED.NON-ALLOWED-SERVICE | REGISTRATION REJECT message received with the 5GMM cause #9 or #10  SERVICE REJECT message received with the 5GMM cause #9, #10 or #28 | Release the NAS signalling connection for the cases c) and d) as described in subclause 5.3.1.3 and initiation of the registration procedure as specified in subclause 5.5.1.2.2 or 5.5.1.3.2 |
| Non-3GPP de-registration timer | Default 54 min.  NOTE 1  NOTE 2  NOTE 4 | All 5GMM state over non-3GPP access except 5GMM-DEREGISTERED over non-3GPP access | Entering 5GMM-IDLE mode over non-3GPP access | N1 NAS signalling connection over non-3GPP access established or when entering state 5GMM-DEREGISTERED over non-3GPP access | Implicitly de-register the UE for non-3GPP access on 1st expiry |
| NOTE 1: The value of this timer is provided by the network operator during the registration procedure.  NOTE 2: The default value of this timer is used if the network does not indicate a value in the REGISTRATION ACCEPT message and the UE does not have a stored value for this timer.  NOTE 3: The value of this timer is UE implementation specific, with a minimum value of 60 seconds if not in NB-N1 mode and if not in WB-N1/CE mode.  NOTE 4: If the T3346 value received in the mobility management messages is greater than the value of the non-3GPP de-registration timer, the UE sets the non-3GPP de-registration timer value to be 4 minutes greater than the value of timer T3346.  NOTE 5: The conditions for which this applies are described in subclause 5.5.1.3.7.  NOTE 6: The conditions for which this applies to the 5GMM-SERVICE-REQUEST-INITIATED state are described in subclause 5.4.1.3.7 case c) and case d).  NOTE 7: In NB-N1 mode, the timer value shall be calculated as described in subclause 4.17.  NOTE 8: In WB-N1 mode, if the UE supports CE mode B and operates in either CE mode A or CE mode B, then the timer value is as described in this table for the case of WB-N1/CE mode (see subclause 4.19). | | | | | |

Table 10.2.2: Timers of 5GS mobility management – AMF side

| TIMER NUM. | | TIMER VALUE | | STATE | | CAUSE OF START | | NORMAL STOP | | ON  EXPIRY | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T3513  NOTE 7  NOTE 9 | | NOTE 4 | | 5GMM-REGISTERED | | Paging procedure initiated | | Paging procedure completed as specified in subclause 5.6.2.2.1 | | Network dependent | |
| T3522  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 24s | | 5GMM-DEREGISTERED-INITIATED | | Transmission of DEREGISTRATION REQUEST message | | DEREGISTRATION ACCEPT message received | | Retransmission of DEREGISTRATION REQUEST message | |
| T3550  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 18s | | 5GMM-COMMON-PROCEDURE-INITIATED | | Transmission of REGISTRATION ACCEPT message with 5G-GUTI, with SOR transparent container IE, the Extended emergency number list IE or the Operator-defined access category definitions IE  Transmission of REGISTRATION ACCEPT message with any of a) Network slicing subscription changed indication, and b) new configured NSSAI and optionally new mapped S-NSSAI(s) | | REGISTRATION COMPLETE message received | | Retransmission of REGISTRATION ACCEPT message | |
| T3555  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 24s | | 5GMM-REGISTERED | | Transmission of CONFIGURATION UPDATE COMMAND message with "acknowledgement requested" set in the Acknowldgement bit of the Configuration update indication IE | | CONFIGURATION UPDATE COMPLETE message received | | Retransmission of CONFIGURATION UPDATE COMMAND message | |
| T3560  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 24s | | 5GMM-COMMON-PROCEDURE-INITIATED | | Transmission of AUTHENTICATION REQUEST message  Transmission of SECURITY MODE COMMAND message | | AUTHENTICATION RESPONSE message received  AUTHENTICATION FAILURE message received  SECURITY MODE COMPLETE message received  SECURITY MODE REJECT message received | | Retransmission of AUTHENTICATION REQUEST message or SECURITY MODE COMMAND message | |
| T3565  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 24s | | 5GMM-REGISTERED | | Transmission of NOTIFICATION message | | SERVICE REQUEST message received  NOTIFICATION RESPONSE message received  REGISTRATION REQUEST  Message received  DEREGISTRATION REQUEST message received | | Retransmission of NOTIFICATION message | |
| T3570  NOTE 6  NOTE 8 | | 6s  In WB-N1/CE mode, 24s | | 5GMM-COMMON-PROCEDURE-INITIATED | | Transmission of IDENTITY REQUEST message | | IDENTITY RESPONSE message received | | Retransmission of IDENTITY REQUEST message | |
| T3575 | | 15s | | 5GMM-REGISTERED | | Transmission of NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message | | NETWORK SLICE-SPECIFIC AUTHENTICATION COMPLETE message received | | Retransmission of NETWORK SLICE-SPECIFIC AUTHENTICATION COMMAND message | |
| Active timer | | TBD | | All except 5GMM-DEREGISTERED | | Entering 5GMM-IDLE mode after indicating MICO mode activation to the UE with an active timer value. | | N1 NAS signalling  connection established | | Activate MICO mode for the UE. | |
| Implicit de-registration timer | | NOTE 2 | | All except 5GMM-DEREGISTERED | | The mobile reachable timer expires while the network is in 5GMM-IDLE mode  Entering 5GMM-IDLE mode over 3GPP access if the MICO mode is activated and strictly periodic monitoring timer is not running  The strictly periodic monitoring timer expires while the network is in 5GMM-IDLE mode | | N1 NAS signalling connection established | | Implicitly de-register the UE on 1st expiry | |
| Mobile reachable timer | | NOTE 1 | | All except 5GMM-DEREGISTERED | | Entering 5GMM-IDLE mode | | N1 NAS signalling connection established | | Network dependent, but typically paging is halted on 1st expiry, and start implicit de-registration timer, if the UE is not registered for emergency services.  Implicitly de-register the UE which is registered for emergency services | |
| Non-3GPP implicit de-registration timer | | NOTE 3 | | All except 5GMM-DEREGISTERED | | Entering 5GMM-IDLE mode over non-3GPP access | | N1 NAS signalling connection over non-3GPP access established | | Implicitly de-register the UE for non-3GPP access on 1s expiry | |
| Strictly periodic monitoring timer | | NOTE 5 | | All except 5GMM-DEREGISTERED | | At the successful completion of registration update procedure if strictly periodic registration timer indication is supported as specified in subclause 5.3.7. | | Entering 5GMM-DEREGISTERED. | | In 5GMM-IDLE mode, start implicit de-registration timer as specified in subclause 5.3.7.  In 5GMM-CONNECTED mode, Strictly periodic monitoring timer is started again as specified in subclause 5.3.7. | |
| NOTE 1: The default value of this timer is 4 minutes greater than the value of timer T3512. If the UE is registered for emergency services, the value of this timer is set equal to the value of timer T3512. If the T3346 value provided in the mobility management messages is greater than the value of the timer T3512, the AMF sets the mobile reachable timer and the implicit de-registration timer such that the sum of the timer values is greater than the value of timer T3346.  NOTE 2: The value of this timer is network dependent. If MICO is activated, the default value of this timer is 4 minutes greater than the value of timer T3512.  NOTE 3: The value of this timer is network dependent. The default value of this timer is 4 minutes greater than the non-3GPP de-registration timer. If the T3346 value provided in the mobility management messages is greater than the value of the non-3GPP de-registration timer, the AMF sets the non-3GPP implicit de-registration timer value to be 8 minutes greater than the value of timer T3346.  NOTE 4: The value of this timer is network dependent.  NOTE 5: The value of this timer is the same as the value of timer T3512.  NOTE 6: In NB-N1 mode, the timer value shall be calculated as described in subclause 4.17.  NOTE 7: In NB-N1 mode, the timer value shall be calculated by using an NAS timer value which is network dependent.  NOTE 8: In WB-N1 mode, if the UE supports CE mode B and operates in either CE mode A or CE mode B, then the timer value is as described in this table for the case of WB-N1/CE mode (see subclause 4.19).  NOTE 9: In WB-N1 mode, if the UE supports CE mode B, then the timer value shall be calculated by using an NAS timer value which value is network dependent. | | | | | | | | | | | |

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