**3GPP TSG-CT WG1 Meeting #129-eC1-212120**

**Electronic meeting, 19-23 April 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.501** | **CR** | **3107** | **rev** | **1** | **Current version:** | **17.2.1** |  |
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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:*** | New back-off timer for rejected S-NSSAI due to maximum number of UEs per network slice reached | | | | | | | | | |
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| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNS\_Ph2 | | | | |  | ***Date:*** | | | 2021-4-10 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | In clause 4.2.11.2 of TS 23.502 v17.1.0, a new rejection cause for rejected S-NSSAI, 'maximum number of UEs per network slice reached', and a corresponding back-off timer, are defined.  The rejected S-NSSAI due to maximum number of UEs per network slice reached and optionally a corresponding back-off timer may be sent by the AMF to the UE in the REGISTRATION ACCEPT message, the REGISTRATION REJECT message, the CONFIGURATION UPDATE COMMAND message, or the DEREGISTRATION REQUEST message. | | | | | | | | |
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| ***Summary of change:*** | | It proposes to define a new timer for rejected S-NSSAI with rejection cause 'maximum number of UEs per network slice reached', to keep alignment with stage 2. | | | | | | | | |
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| ***Consequences if not approved:*** | | The back-off timer for rejected S-NSSAI with rejection cause 'maximum number of UEs per network slice reached' is not supported. | | | | | | | | |
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| ***Clauses affected:*** | | 8.2.7.1, 8.2.7.x, 8.2.9.1, 8.2.9.x, 8.2.14.1, 8.2.14.x, 8.2.19.1, 8.2.19.x, 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 \* \* \* \*

##### 5.5.1.2.4 Initial registration accepted by the network

During a registration procedure with 5GS registration type IE set to "emergency registration", the AMF shall not check for mobility and access restrictions, regional restrictions or subscription restrictions, or CAG restrictions when processing the REGISTRATION REQUEST message.

If the initial registration request is accepted by the network, the AMF shall send a REGISTRATION ACCEPT message to the UE.

For each of the information elements: 5GMM capability, S1 UE network capability, and UE security capability, the AMF shall store all octets received from the UE in the REGISTRATION REQUEST message, up to the maximum length defined for the respective information element.

NOTE 1: This information is forwarded to the new AMF during inter-AMF handover or to the new MME during inter-system handover to S1 mode.

The AMF shall assign and include a TAI list as a registration area the UE is registered to in the REGISTRATION ACCEPT message. The AMF shall not assign a TAI list containing both tracking areas in NB-N1 mode and tracking areas not in NB-N1 mode. The UE, upon receiving a REGISTRATION ACCEPT message, shall delete its old TAI list and store the received TAI list. If the REGISTRATION REQUEST message was received over non-3GPP access, the AMF shall include only the N3GPP TAI in the TAI list.

NOTE 2: The N3GPP TAI is operator-specific.

NOTE 3: When assigning the TAI list, the AMF can take into account the eNodeB's capability of support of CIoT 5GS optimization.

The AMF may include service area restrictions in the Service area list IE in the REGISTRATION ACCEPT message. The UE, upon receiving a REGISTRATION ACCEPT message with the service area restrictions shall act as described in subclause 5.3.5.

The AMF may also include a list of equivalent PLMNs in the REGISTRATION ACCEPT message. Each entry in the list contains a PLMN code (MCC+MNC). The UE shall store the list as provided by the network, and if the initial registration procedure is not for emergency services, the UE shall remove from the list any PLMN code that is already in the forbidden PLMN list as specified in subclause 5.3.13A. In addition, the UE shall add to the stored list the PLMN code of the registered PLMN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list.

If the initial registration procedure is not for emergency services, and if the PLMN identity of the registered PLMN is a member of the forbidden PLMN list as specified in subclause 5.3.13A, any such PLMN identity shall be deleted from the corresponding list(s).

If the Service area list IE is not included in the REGISTRATION ACCEPT message, any tracking area in the registered PLMN and its equivalent PLMN(s) in the registration area is considered as an allowed tracking area as described in subclause 5.3.5.

If the REGISTRATION REQUEST message contains the LADN indication IE, based on the LADN indication IE, UE subscription information, UE location and local configuration about LADN and:

- if the LADN indication IE includes requested LADN DNNs, the UE subscribed DNN list includes the requested LADN DNNs or the wildcard DNN, and the LADN service area of the requested LADN DNN has an intersection with the current registration area, the AMF shall determine the requested LADN DNNs included in the LADN indication IE as LADN DNNs for the UE;

- if no requested LADN DNNs included in the LADN indication IE and the wildcard DNN is included in the UE subscribed DNN list, the AMF shall determine the LADN DNN(s) configured in the AMF whose LADN service area has an intersection with the current registration area as LADN DNNs for the UE; or

- if no requested LADN DNNs included in the LADN indication IE and the wildcard DNN is not included in the UE subscribed DNN list, the AMF shall determine the LADN DNN(s) included in the UE subscribed DNN list whose LADN service area has an intersection with the current registration area as LADN DNNs for the UE.

If the LADN indication IE is not included in the REGISTRATION REQUEST message, the AMF shall determine the LADN DNN(s) included in the UE subscribed DNN list whose service area has an intersection with the current registration area as LADN DNNs for the UE, except for the wildcard DNN included in the UE subscribed DNN list.

If the UE supports WUS assistance information and the AMF supports and accepts the use of WUS assistance information for the UE, then the AMF shall determine the negotiated UE paging probability information for the UE, store it in the 5GMM context of the UE, and if the UE is not performing the initial registration for emergency services, the AMF shall include it in the Negotiated WUS assistance information IE in the REGISTRATION ACCEPT message. The AMF may consider the UE paging probability information received in the Requested WUS assistance information IE when determining the negotiated UE paging probability information for the UE.

NOTE 4: Besides the UE paging probability information requested by the UE, the AMF can take local configuration or previous statistical information for the UE into account when determining the negotiated UE paging probability information for the UE.

The AMF shall include the LADN information which consists of the determined LADN DNNs for the UE and LADN service area(s) available in the current registration area in the LADN information IE of the REGISTRATION ACCEPT message.

The UE, upon receiving the REGISTRATION ACCEPT message with the LADN information, shall store the received LADN information. If there exists one or more LADN DNNs which are included in the LADN indication IE of the REGISTRATION REQUEST message and are not included in the LADN information IE of the REGISTRATION ACCEPT message, the UE considers such LADN DNNs as not available in the current registration area.

The 5G-GUTI reallocation shall be part of the initial registration procedure. During the initial registration procedure, if the AMF has not allocated a new 5G-GUTI by the generic UE configuration update procedure, the AMF shall include in the REGISTRATION ACCEPT message the new assigned 5G-GUTI together with the assigned TAI list.

If the UE has set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the AMF needs to update the "CAG information list" stored in the UE, the AMF shall include the CAG information list IE in the REGISTRATION ACCEPT message.

If a 5G-GUTI or the SOR transparent container IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the Operator-defined access category definitions IE, the Extended emergency number list IE or the CAG information list IE are included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE is not in NB-N1 mode and the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message, the AMF may include either a UE radio capability ID IE or a UE radio capability ID deletion indication IE in the REGISTRATION ACCEPT message. If the UE radio capability ID IE or the UE radio capability ID deletion indication IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the MICO indication IE in the REGISTRATION ACCEPT message only if the MICO indication IE was included in the REGISTRATION REQUEST message, the AMF supports and accepts the use of MICO mode. If the AMF supports and accepts the use of MICO mode, the AMF may indicate "all PLMN registration area allocated" in the MICO indication IE in the REGISTRATION ACCEPT message. If "all PLMN registration area allocated" is indicated in the MICO indication IE, the AMF shall not assign and include the TAI list in the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message included an MICO indication IE indicating "all PLMN registration area allocated", the UE shall treat all TAIs in the current PLMN as a registration area and delete its old TAI list. If "strictly periodic registration timer supported" is indicated in the MICO indication IE in the REGISTRATION REQUEST message, the AMF may indicate "strictly periodic registration timer supported" in the MICO indication IE in the REGISTRATION ACCEPT message.

The AMF shall include an active time value in the T3324 IE in the REGISTRATION ACCEPT message if the UE requested an active time value in the REGISTRATION REQUEST message and the AMF accepts the use of MICO mode and the use of active time.

The AMF shall include the T3512 value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent over the 3GPP access.

The AMF shall include the non-3GPP de-registration timer value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent over the non-3GPP access.

If the UE requests "control plane CIoT 5GS optimization" in the 5GS update type IE, indicates support of control plane CIoT 5GS optimization in the 5GMM capability IE and the AMF decides to accept the requested CIoT 5GS optimization and the registration request, the AMF shall indicate "control plane CIoT 5GS optimization supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

The AMF may include the T3447 value IE set to the service gap time value in the REGISTRATION ACCEPT message if:

- the UE has indicated support for service gap control in the REGISTRATION REQUEST message; and

- a service gap time value is available in the 5GMM context.

If there is a running T3447 timer in the AMF and the Follow-on request indicator is set to "Follow-on request pending" in the REGISTRATION REQUEST message, the AMF shall ignore the flag and proceed as if the flag was not received except for the following cases:

a) the UE is configured for high priority access in the selected PLMN; or

b) the 5GS registration type IE in the REGISTRATION REQUEST message is set to "emergency registration".

If the UE has indicated support for the control plane CIoT 5GS optimizations, and the AMF decides to activate the congestion control for transport of user data via the control plane, then the AMF shall include the T3448 value IE in the REGISTRATION ACCEPT message.

If:

- the UE in NB-N1 mode is using control plane CIoT 5GS optimization; and

- the network is configured to provide the truncated 5G-S-TMSI configuration for control plane CIoT 5GS optimizations;

the AMF shall include the Truncated 5G-S-TMSI configuration IE in the REGISTRATION ACCEPT message and set the "Truncated AMF Set ID value" and the "Truncated AMF Pointer value" in the Truncated 5G-S-TMSI configuration IE based on network policies. The AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

Upon receipt of the REGISTRATION ACCEPT message, the UE shall reset the registration attempt counter, enter state 5GMM-REGISTERED and set the 5GS update status to 5U1 UPDATED.

If the UE receives the REGISTRATION ACCEPT message from a PLMN, then the UE shall reset the PLMN-specific attempt counter for that PLMN for the specific access type for which the message was received. The UE shall also reset the PLMN-specific N1 mode attempt counter for that PLMN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "SIM/USIM considered invalid for non-GPRS services" events, if any. If the message was received via non-3GPP access, the UE shall reset the counter for "USIM considered invalid for 5GS services over non-3GPP" events.

If the UE receives the REGISTRATION ACCEPT message from an SNPN, then the UE shall reset the SNPN-specific attempt counter for the current SNPN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for 3GPP access" events. If the message was received via non-3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events.

If the REGISTRATION ACCEPT message included a T3512 value IE, the UE shall use the value in the T3512 value IE as periodic registration update timer (T3512).

If the REGISTRATION ACCEPT message include a T3324 value IE, the UE shall use the value in the T3324 value IE as active timer (T3324).

If the REGISTRATION ACCEPT message included a non-3GPP de-registration timer value IE, the UE shall use the value in non-3GPP de-registration timer value IE as non-3GPP de-registration timer.

If the REGISTRATION ACCEPT message contained a 5G-GUTI, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the received 5G-GUTI, stop timer T3519 if running, and delete any stored SUCI. The UE shall provide the 5G-GUTI to the lower layer of 3GPP access if the REGISTRATION ACCEPT message is sent over the non-3GPP access, and the UE is in 5GMM-REGISTERED in both 3GPP access and non-3GPP access in the same PLMN.

If the REGISTRATION ACCEPT message contains the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed", or contains a configured NSSAI IE with a new configured NSSAI for the current PLMN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the successful update of the network slicing information.

If the REGISTRATION ACCEPT message contains the CAG information list IE and the UE had set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the UE shall:

a) replace the "CAG information list" stored in the UE with the received CAG information list IE when received in the HPLMN or EHPLMN;

b) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 5: When the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE are ignored.

c) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE does not contain the serving VPLMN's entry.

The UE shall store the "CAG information list" received in the CAG information list IE as specified in annex C.

If the received "CAG information list" includes an entry containing the identity of the registered PLMN, the UE shall operate as follows:

a) if the UE receives the REGISTRATION ACCEPT message via a CAG cell, the entry for the registered PLMN in the received "CAG information list" does not include any of the CAG-ID(s) supported by the current CAG cell, and:

1) the entry for the registered PLMN in the received "CAG information list" does not include an "indication that the UE is only allowed to access 5GS via CAG cells", then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list"; or

2) the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

i) if the entry for the registered PLMN in the received "CAG information list" includes one or more CAG-IDs, the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

ii) if the entry for the registered PLMN in the received "CAG information list" does not include any CAG-ID and:

A) the UE does not have an emergency PDU session, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [6] with the updated "CAG information list"; or

B) the UE has an emergency PDU session, then the UE shall perform a local release of all PDU sessions associated with 3GPP access except for the emergency PDU session and enter the state 5GMM-REGISTERED.LIMITED-SERVICE; or

b) if the UE receives the REGISTRATION ACCEPT message via a non-CAG cell and the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

1) if the "allowed CAG list" for the registered PLMN in the received "CAG information list" includes one or more CAG-IDs, the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

2) if the entry for the registered PLMN in the received "CAG information list" does not include any CAG-ID and:

i) the UE does not have an emergency PDU session, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [6] with the updated "CAG information list"; or

ii) the UE has an emergency PDU session, then the UE shall perform a local release of all PDU sessions associated with 3GPP access except for the emergency PDU session and enter the state 5GMM-REGISTERED.LIMITED-SERVICE.

If the received "CAG information list" does not include an entry containing the identity of the registered PLMN and the UE receives the REGISTRATION ACCEPT message via a CAG cell, the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list".

If the REGISTRATION ACCEPT message contains the Operator-defined access category definitions IE, the Extended emergency number list IE or the CAG information list IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the operator-defined access category definitions, the extended local emergency numbers list or the "CAG information list".

If the REGISTRATION ACCEPT message contains the UE radio capability ID IE or the UE radio capability ID deletion indication IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the UE radio capability ID IE or the UE radio capability ID deletion indication IE.

Upon receiving a REGISTRATION COMPLETE message, the AMF shall stop timer T3550 and change to state 5GMM-REGISTERED. The 5G-GUTI, if sent in the REGISTRATION ACCEPT message, shall be considered as valid, and the UE radio capability ID, if sent in the REGISTRATION ACCEPT, shall be considered as valid.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS supported", and SMSF selection is successful, then the AMF shall send the REGISTRATION ACCEPT message after the SMSF has confirmed that the activation of the SMS service was successful. When sending the REGISTRATION ACCEPT message, the AMF shall:

a) set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS allowed" in the REGISTRATION ACCEPT message, if the UE has set the SMS requested bit of the 5GS update type IE to "SMS over NAS supported" in the REGISTRATION REQUEST message and the network allows the use of SMS over NAS for the UE; and

b) store the SMSF address and the value of the SMS allowed bit of the 5GS registration result IE in the UE 5GMM context and consider the UE available for SMS over NAS.

If:

a) the SMSF selection in the AMF is not successful;

b) the SMS activation via the SMSF is not successful;

c) the AMF does not allow the use of SMS over NAS;

d) the SMS requested bit of the 5GS update type IE was set to "SMS over NAS not supported" in the REGISTRATION REQUEST message; or

e) the 5GS update type IE was not included in the REGISTRATION REQUEST message;

then the AMF shall set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS not allowed" in the REGISTRATION ACCEPT message.

When the UE receives the REGISTRATION ACCEPT message, if the UE is also registered over another access to the same PLMN, the UE considers the value indicated by the SMS allowed bit of the 5GS registration result IE as applicable for both accesses over which the UE is registered.

The AMF shall include the 5GS registration result IE in the REGISTRATION ACCEPT message. If the 5GS registration result IE value indicates:

a) "3GPP access", the UE:

- shall consider itself as being registered to 3GPP access only; and

- if in 5GMM-REGISTERED state over non-3GPP access and on the same PLMN as 3GPP access, shall enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over non-3GPP access and set the 5GS update status to 5U2 NOT UPDATED over non-3GPP access;

b) "Non-3GPP access", the UE:

- shall consider itself as being registered to non-3GPP access only; and

- if in the 5GMM-REGISTERED state over 3GPP access and is on the same PLMN as non-3GPP access, shall enter the state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over 3GPP access and set the 5GS update status to 5U2 NOT UPDATED over 3GPP access; or

c) "3GPP access and Non-3GPP access", the UE shall consider itself as being registered to both 3GPP access and non-3GPP access.

The AMF shall include the allowed NSSAI for the current PLMN and shall include the mapped S-NSSAI(s) for the allowed NSSAI contained in the requested NSSAI from the UE if available, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs in the requested NSSAI.

The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message. If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI shall be included in the Extended rejected NSSAI IE in the REGISTRATION ACCEPT message; otherwise the rejected NSSAI shall be included in the Rejected NSSAI IE in the REGISTRATION ACCEPT message.

If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s); otherwise the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s) with the following restrictions:

a) rejected NSSAI for the current PLMN or SNPN shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed; and

b) rejected NSSAI for the current registration area shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed.

NOTE 6: The UE that does not support extended rejected NSSAI can avoid requesting an S-NSSAI associated with a mapped S-NSSAI, which was included in the previous requested NSSAI but neither in the allowed NSSAI nor in the rejected NSSAI in the consequent registration procedures.

If the UE indicated the support for network slice-specific authentication and authorization, and if the Requested NSSAI IE includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

a) the allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s), if any:

1) which are not subject to network slice-specific authentication and authorization and are allowed by the AMF; or

2) for which the network slice-specific authentication and authorization has been successfully performed;

b) optionally, the rejected NSSAI;

c) pending NSSAI containing one or more S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing, and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing, if any; and

d) the "NSSAA to be performed" indicator in the 5GS registration result IE set to indicate that the network slice-specific authentication and authorization procedure will be performed by the network, if the allowed NSSAI is not included in the REGISTRATION ACCEPT message.

If the UE indicated the support for network slice-specific authentication and authorization, and if:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

b) all subscribed S-NSSAIs marked as default are subject to network slice-specific authentication and authorization; and

c) the network slice-specific authentication and authorization procedure has not been successfully performed for any of the subscribed S-NSSAIs marked as default,

the AMF shall in the REGISTRATION ACCEPT message include:

a) the "NSSAA to be performed" indicator in the 5GS registration result IE to indicate that the network slice-specific authentication and authorization procedure will be performed by the network;

b) pending NSSAI containing one or more subscribed S-NSSAIs marked as default for which network slice-specific authentication and authorization will be performed or is ongoing and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any); and

c) optionally, the rejected NSSAI.

If the UE indicated the support for network slice-specific authentication and authorization, and if:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed; and

b) one or more subscribed S-NSSAIs marked as default are not subject to network slice-specific authentication and authorization or the network slice-specific authentication and authorization procedure has been successfully performed for one or more subscribed S-NSSAIs marked as default;

the AMF shall in the REGISTRATION ACCEPT message include:

a) pending NSSAI containing one or more subscribed S-NSSAIs marked as default for which network slice-specific authentication and authorization will be performed or is ongoing (if any) and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any);

b) allowed NSSAI containing S-NSSAI(s) for the current PLMN each of which corresponds to a subscribed S-NSSAI marked as default which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed;

c) allowed NSSAI containing one or more subscribed S-NSSAIs marked as default, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed; and

d) optionally, the rejected NSSAI.

When the REGISTRATION ACCEPT message includes a pending NSSAI, the pending NSSAI shall contain all S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing from the requested NSSAI of the REGISTRATION REQUEST message that was received over the 3GPP access, non-3GPP access, or both the 3GPP access and non-3GPP access.

If the T35xx value is provided from the network to the UE, the UE shall start timer T35xx for each rejected S-NSSAI for the maximum number of UEs reached with the timer value received in the REGISTRATION ACCEPT message. Otherwise, the UE shall start timer T35xx for each rejected S-NSSAI for the maximum number of UEs reached with the default timer value. When timer T35xx expires, the UE can remove the rejected S-NSSAI for the maximum number of UEs reached from the rejected NSSAI.

The AMF may include a new configured NSSAI for the current PLMN in the REGISTRATION ACCEPT message if:

a) the REGISTRATION REQUEST message did not include the requested NSSAI;

b) the REGISTRATION REQUEST message included the requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN;

c) the REGISTRATION REQUEST message included the requested NSSAI containing S-NSSAI(s) with incorrect mapped S-NSSAI(s); or

d) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI".

If a new configured NSSAI for the current PLMN is included in the REGISTRATION ACCEPT message, the AMF shall also include the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN if available in the REGISTRATION ACCEPT message. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE requests ciphering keys for ciphered broadcast assistance data in the REGISTRATION REQUEST message and the AMF has valid ciphering key data applicable to the UE's subscription and current tracking area, then the AMF shall include the ciphering key data in the Ciphering key data IE of the REGISTRATION ACCEPT message.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The UE that has indicated the support for network slice-specific authentication and authorization receiving the pending NSSAI in the REGISTRATION ACCEPT message shall store the S-NSSAI(s) in the pending NSSAI as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received pending NSSAI for each of the equivalent PLMNs as specified in subclause 4.6.2.2. If the pending NSSAI is not included in the REGISTRATION ACCEPT message and the "NSSAA to be performed" indicator is not set to "Network slice-specific authentication and authorization is to be performed" in the 5GS registration result IE of the REGISTRATION ACCEPT message, then the UE shall delete the pending NSSAI for the current PLMN or SNPN, if existing, as specified in subclause 4.6.2.2.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected S-NSSAI(s):

"S-NSSAI not available in the current PLMN or SNPN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current PLMN or SNPN until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.2.2.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current registration area until switching off the UE, the UE moving out of the current registration area, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.2.2.

"S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the failed or revoked NSSAA as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.1 and 4.6.2.2.

If the UE sets the NSSAA bit in the 5GMM capability IE to "Network slice-specific authentication and authorization not supported", and:

a) if the Requested NSSAI IE only includes the S-NSSAI(s) subject to network slice-specific authentication and authorization and one or more subscribed S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) marked as default which are not subject to network slice-specific authentication and authorization are available, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI containing S-NSSAI(s) for the current PLMN each of which corresponds to a subscribed S-NSSAI marked as default which are not subject to network slice-specific authentication and authorization;

2) the allowed NSSAI containing the subscribed S-NSSAIs marked as default, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization; and

3) the rejected NSSAI containing the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI(s) is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; or

b) if the Requested NSSAI IE includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s) which are not subject to network slice-specific authentication and authorization; and

2) the rejected NSSAI containing:

i) the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; and

ii) the S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN" or the rejection cause indicating "S-NSSAI not available in the current registration area", if any.

If the UE does not indicate support for network slice-specific authentication and authorization, and if:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message; or

b) none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

and one or more subscribed S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) marked as default which are not subject to network slice-specific authentication and authorization are available, the AMF shall:

a) put the allowed S-NSSAI(s) for the current PLMN each of which corresponds to a subscribed S-NSSAI marked as default and not subject to network slice-specific authentication and authorization in the allowed NSSAI of the REGISTRATION ACCEPT message;

b) put the subscribed S-NSSAIs marked as default and not subject to network slice-specific authentication and authorization, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, in the allowed NSSAI of the REGISTRATION ACCEPT message; and

c) determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

If the REGISTRATION ACCEPT message contains the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed", the UE shall delete the network slicing information for each and every PLMN except for the current PLMN as specified in subclause 4.6.2.2.

If the REGISTRATION ACCEPT message contains the allowed NSSAI, then the UE shall store the included allowed NSSAI together with the PLMN identity of the registered PLMN and the registration area as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received allowed NSSAI in each of allowed NSSAIs which are associated with each of the PLMNs.

If the REGISTRATION ACCEPT message contains a configured NSSAI IE with a new configured NSSAI for the current PLMN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN, the UE shall store the contents of the configured NSSAI IE as specified in subclause 4.6.2.2.

If the REGISTRATION ACCEPT message:

a) includes the 5GS registration result IE with the "NSSAA to be performed" indicator set to "Network slice-specific authentication and authorization is to be performed"the "NSSAA to be performed" indicator in the 5GS registration result IE;

b) includes a pending NSSAI; and

c) does not include an allowed NSSAI,

the UE shall delete the stored allowed NSSAI, if any, as specified in subclause 4.6.2.2, and the UE:

a) shall not initiate a 5GSM procedure except for emergency services ; and

b) shall not initiate a service request procedure except for cases f) and i) in subclause 5.6.1.1;

until the UE receives an allowed NSSAI.

If the UE included S1 mode supported indication in the REGISTRATION REQUEST message, the AMF supporting interworking with EPS shall set the IWK N26 bit to either:

a) "interworking without N26 interface not supported" if the AMF supports N26 interface; or

b) "interworking without N26 interface supported" if the AMF does not support N26 interface

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

The UE supporting S1 mode shall operate in the mode for interworking with EPS as follows:

a) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface not supported", the UE shall operate in single-registration mode;

b) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE supports dual-registration mode, the UE may operate in dual-registration mode; or

NOTE 7: The registration mode used by the UE is implementation dependent.

c) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE only supports single-registration mode, the UE shall operate in single-registration mode.

The UE shall treat the received interworking without N26 interface indicator for interworking with EPS as valid in the entire PLMN and its equivalent PLMN(s).

The network informs the UE about the support of specific features, such as IMS voice over PS session, location services (5G-LCS), emergency services, emergency services fallback and ATSSS, in the 5GS network feature support information element. In a UE with IMS voice over PS session capability, the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator shall be provided to the upper layers. The upper layers take the IMS voice over PS session indicator into account when selecting the access domain for voice sessions or calls. In a UE with LCS capability, location services indicator (5G-LCS) shall be provided to the upper layers. When initiating an emergency call, the upper layers also take the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator into account for the access domain selection. In a UE with the capability for ATSSS, the network support for ATSSS shall be provided to the upper layers.

The AMF shall set the EMF bit in the 5GS network feature support IE to:

a) "Emergency services fallback supported in NR connected to 5GCN and E-UTRA connected to 5GCN" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN or an E-UTRA cell connected to 5GCN;

b) "Emergency services fallback supported in NR connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN;

c) "Emergency services fallback supported in E-UTRA connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN; or

d) "Emergency services fallback not supported" if network does not support the emergency services fallback procedure when the UE is in any cell connected to 5GCN.

NOTE 8: If the emergency services are supported in neither the EPS nor the 5GS homogeneously, based on operator policy, the AMF will set the EMF bit in the 5GS network feature support IE to "Emergency services fallback not supported".

NOTE 9: Even though the AMF's support of emergency services fallback is indicated per RAT, the UE's support of emergency services fallback is not per RAT, i.e. the UE's support of emergency services fallback is the same for both NR connected to 5GCN and E-UTRA connected to 5GCN.

If the UE is not operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RPLMN or equivalent PLMN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid", the UE shall act as a UE with access identity 1 configured for MPS as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid until the UE receives a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 not valid" or until the UE selects a non-equivalent PLMN. Access identity 1 is only applicable while the UE is in N1 mode.

c) the network informs the UE that the use of access identity 2 is valid in the RPLMN or equivalent PLMN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM; and

d) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid", the UE shall act as a UE with access identity 2 configured for MCS as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid until the UE receives a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 not valid" or until the UE selects a non-equivalent PLMN. Access identity 2 is only applicable while the UE is in N1 mode.

If the UE is operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RSNPN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid", the UE shall act as a UE with access identity 1 configured for MPS as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid until the UE receives a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 not valid" or until the UE selects another SNPN. Access identity 1 is only applicable while the UE is in N1 mode.

c) the network informs the UE that the use of access identity 2 is valid in the RSNPN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM; and

d) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid", the UE shall act as a UE with access identity 2 configured for MCS as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid until the UE receives a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 not valid" or until the UE selects another SNPN. Access identity 2 is only applicable while the UE is in N1 mode.

If the UE indicates support for restriction on use of enhanced coverage in the REGISTRATION REQUEST message and:

a) in WB-N1 mode, the AMF decides to restrict the use of CE mode B for the UE, then the AMF shall set the RestrictEC bit to "CE mode B is restricted";

b) in WB-N1 mode, the AMF decides to restrict the use of both CE mode A and CE mode B for the UE, then the AMF shall set the RestrictEC bit to " Both CE mode A and CE mode B are restricted"; or

c) in NB-N1 mode, the AMF decides to restrict the use of enhanced coverage for the UE, then the AMF shall set the RestrictEC bit to "Use of enhanced coverage is restricted",

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

If the UE has set the Follow-on request indicator to "Follow-on request pending" in the REGISTRATION REQUEST message, or the network has downlink signalling pending, the AMF shall not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use V2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported"; or

2) the V2XCNPC5 bit to "V2X communication over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.287 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the Requested DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated DRX parameters IE based on the received Requested DRX parameters IE and operator policy if available.

If the Requested NB-N1 mode DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated NB-N1 mode DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated NB-N1 mode DRX parameters IE based on the received Requested NB-N1 mode DRX parameters IE and operator policy if available.

The AMF shall include the Negotiated extended DRX parameters IE in the REGISTRATION ACCEPT message only if the Requested extended DRX parameters IE was included in the REGISTRATION REQUEST message, and the AMF supports and accepts the use of eDRX. The AMF may set the Negotiated extended DRX parameters IE based on the received Requested extended DRX parameters IE, operator policy, and the user's subscription context obtained from the UDM if available.

If:

a) the UE's USIM is configured with indication that the UE is to receive the SOR transparent container IE, the SOR transparent container IE is not included in the REGISTRATION ACCEPT message or the SOR transparent container IE does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

b) if the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), the ME shall store the received SOR counter as specified in annex C and proceed as follows:

a) the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; and

b) if the registration procedure is performed over 3GPP access and the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C, then the UE may locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message. Otherwise the UE shall send a REGISTRATION COMPLETE message and not release the current N1 NAS signalling connection locally. If an acknowledgement is requested in the SOR transparent container IE of the REGISTRATION ACCEPT message, the UE acknowledgement is included in the SOR transparent container IE of the REGISTRATION COMPLETE message.

If the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), indicates list of preferred PLMN/access technology combinations is provided and the list type indicates:

a) "PLMN ID and access technology list", then the ME shall replace the highest priority entries in the "Operator Controlled PLMN Selector with Access Technology" list stored in the ME and shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; or

b) "secured packet", then the ME shall behave as if a SMS is received with protocol identifier set to SIM data download, data coding scheme set to class 2 message and SMS payload as secured packet contents of SOR transparent container IE. The SMS payload is forwarded to UICC as specified in 3GPP TS 23.040 [4A] and the ME shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If required by operator policy, the AMF shall include the NSSAI inclusion mode IE in the REGISTRATION ACCEPT message (see table 4.6.2.3.1 of subclause 4.6.2.3). Upon receipt of the REGISTRATION ACCEPT message:

a) if the message includes the NSSAI inclusion mode IE, the UE shall operate in the NSSAI inclusion mode indicated in the NSSAI inclusion mode IE over the current access within the current PLMN and its equivalent PLMN(s), if any, in the current registration area; or

b) otherwise:

1) if the UE has NSSAI inclusion mode for the current PLMN and access type stored in the UE, the UE shall operate in the stored NSSAI inclusion mode;

2) if the UE does not have NSSAI inclusion mode for the current PLMN and the access type stored in the UE and if the UE is performing the registration procedure over:

i) 3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type;

ii) untrusted non-3GPP access, the UE shall operate in NSSAI inclusion mode B in the current PLMN and the current access type; or

iii) trusted non-3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type; or

3) if the 5G-RG does not have NSSAI inclusion mode for the current PLMN and wireline access stored in the 5G-RG, and the 5G-RG is performing the registration procedure over wireline access, the 5G-RG shall operate in NSSAI inclusion mode B in the current PLMN and the current access type.

The AMF may include operator-defined access category definitions in the REGISTRATION ACCEPT message.

If the UE receives Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the REGISTRATION ACCEPT message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message and:

- the REGISTRATION ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the new T3447 value with the timer T3447 next time it is started; or

- the REGISTRATION ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if exists and stop the timer T3447 if running.

If the T3448 value IE is present in the received REGISTRATION ACCEPT message and the value indicates that this timer is neither zero nor deactivated, the UE shall:

a) stop timer T3448 if it is running; and

b) start timer T3448 with the value provided in the T3448 value IE.

If the UE is using 5GS services with control plane CIoT 5GS optimization, the T3448 value IE is present in the REGISTRATION ACCEPT message and the value indicates that this timer is either zero or deactivated, the UE shall ignore the T3448 value IE and proceed as if the T3448 value IE was not present.

If the REGISTRATION ACCEPT message contains the Truncated 5G-S-TMSI configuration IE, then the UE shall store the included truncated 5G-S-TMSI configuration and return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the truncated 5G-S-TMSI configuration.

NOTE 10: The UE provides the truncated 5G-S-TMSI configuration to the lower layers.

If the UE is not in NB-N1 mode, the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message includes:

a) a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested", the UE shall delete any network-assigned UE radio capability IDs associated with the RPLMN or RSNPN stored at the UE, then the UE shall, after the completion of the ongoing registration procedure, initiate a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3.2 over the existing N1 NAS signalling connection; and

b) a UE radio capability ID IE, the UE shall store the UE radio capability ID as specified in annex C.

\* \* \* Next Change \* \* \* \*

##### 5.5.1.2.5 Initial registration not accepted by the network

If the initial registration request cannot be accepted by the network, the AMF shall send a REGISTRATION REJECT message to the UE including an appropriate 5GMM cause value.

If the initial registration request is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a value for back-off timer T3346.

In NB-N1 mode, if the registration request is rejected due to operator determined barring (see 3GPP TS 29.503 [20AB]), the network shall set the 5GMM cause value to #22 "congestion" and assign a value for back-off timer T3346.

If the REGISTRATION REJECT message with 5GMM cause #76 was received without integrity protection, then the UE shall discard the message. If the REGISTRATION REJECT message with 5GMM cause #62 was received without integrity protected, the behaviour of the UE is specified in subclause 5.3.20.2.

Based on operator policy, if the initial registration request is rejected due to core network redirection for CIoT optimizations, the network shall set the 5GMM cause value to #31 "Redirection to EPC required".

NOTE 1: The network can take into account the UE's S1 mode capability, the EPS CIoT network behaviour supported by the UE or the EPS CIoT network behaviour supported by the EPC to determine the rejection with the 5GMM cause value #31 "Redirection to EPC required".

If the initial registration request is rejected because:

a) all the S-NSSAI(s) included in the requested NSSAI are either rejected for the current PLMN, rejected for the current registration area, or rejected for the failed or revoked NSSAA; and

b) the UE set the NSSAA bit in the 5GMM capability IE to:

1) "Network slice-specific authentication and authorization supported" and:

i) there are no subscribed S-NSSAIs marked as default;

ii) all subscribed S-NSSAIs marked as default are not allowed; or

iii) network slice-specific authentication and authorization has failed or been revoked for all subscribed S-NSSAIs marked as default and based on network local policy, the network decides not to initiate the network slice-specific re-authentication and re-authorization procedures for any subscribed S-NSSAI marked as default requested by the UE; or

2) "Network slice-specific authentication and authorization not supported"; and

i) there are no subscribed S-NSSAIs which are marked as default; or

ii) all subscribed S-NSSAIs marked as default are either not allowed or are subject to network slice-specific authentication and authorization;

the network shall set the 5GMM cause value to #62 "No network slices available". If the UE had included requested NSSAI in the REGISTRATION REQUEST message, then the network shall include the rejected S-NSSAI(s) in the rejected NSSAI of the REGISTRATION REJECT message. Otherwise, the network may include the rejected S-NSSAI(s) in the rejected NSSAI of the REGISTRATION REJECT message.

If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected S-NSSAI(s) shall be included in the Extended rejected NSSAI IE of the REGISTRATION REJECT message. Otherwise the rejected S-NSSAI(s) shall be included in the Rejected NSSAI IE of the REGISTRATION REJECT message.

If the T35xx value is provided from the network to the UE, the UE shall start timer T35xx for each rejected S-NSSAI for the maximum number of UEs reached with the timer value received in the REGISTRATION REJECT message. Otherwise, the UE shall start timer T35xx for each rejected S-NSSAI for the maximum number of UEs reached with the default timer value. When timer T35xx expires, the UE can remove the rejected S-NSSAI for the maximum number of UEs reached from the rejected NSSAI.

If the AMF receives the initial registration request along with the authenticated indication over N2 reference point on non-3GPP access and does not receive the indication that authentication by the home network is not required over N12 reference point, the network shall set the 5GMM cause value to #72 "Non-3GPP access to 5GCN not allowed".

If the initial registration request from a UE supporting CAG is rejected due to CAG restrictions, the network shall set the 5GMM cause value to #76 "Not authorized for this CAG or authorized for CAG cells only" and should include the "CAG information list" in the CAG information list IE in the REGISTRATION REJECT message.

NOTE 2: The network cannot be certain that "CAG information list" stored in the UE is updated as result of sending of the REGISTRATION REJECT message with the CAG information list IE, as the REGISTRATION REJECT message is not necessarily delivered to the UE (e.g. due to abnormal radio conditions).

NOTE 3: The "CAG information list" can be provided by the AMF and include no entry if no "CAG information list" exists in the subscription.

If the initial registration request from a UE not supporting CAG is rejected due to CAG restrictions, the network shall operate as described in bullet j) of subclause 5.5.1.2.8.

The UE shall take the following actions depending on the 5GMM cause value received in the REGISTRATION REJECT message.

#3 (Illegal UE); or

#6 (Illegal ME).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI.

In case of PLMN, the UE shall consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed;

In case of SNPN, the UE shall consider the entry of the "list of subscriber data" with the SNPN identity of the current SNPN as invalid until the UE is switched off or the entry is updated. Additionally, if EAP based primary authentication and key agreement procedure using EAP-AKA' or 5G AKA based primary authentication and key agreement procedure was performed in the current SNPN, the UE shall consider the USIM as invalid for the current SNPN until switching off or the UICC containing the USIM is removed.

The UE shall delete the list of equivalent PLMNs (if any) and enter the state 5GMM-DEREGISTERED.NO-SUPI. If the message has been successfully integrity checked by the NAS, then the UE shall:

1) set the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "USIM considered invalid for 5GS services over non-3GPP access" events in case of PLMN; or

2) set the counter for "the entry for the current SNPN considered invalid for 3GPP access" events and the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events in case of SNPN;

to a UE implementation-specific maximum value.

3) delete the 5GMM parameters stored in non-volatile memory of the ME as specified in annex C.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value. The USIM shall be considered as invalid also for non-EPS services until switching off or the UICC containing the USIM is removed. If the message has been successfully integrity checked by the NAS and the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to a UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#7 (5GS services not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI.

In case of PLMN, the UE shall consider the USIM as invalid for 5GS services until switching off or the UICC containing the USIM is removed;

In case of SNPN, the UE shall consider the entry of the "list of subscriber data" with the SNPN identity of the current SNPN as invalid for 5GS services until the UE is switched off or the entry is updated. Additionally, if EAP based primary authentication and key agreement procedure using EAP-AKA' or 5G AKA based primary authentication and key agreement procedure was performed in the current SNPN, the UE shall consider the USIM as invalid for the current SNPN until switching off or the UICC containing the USIM is removed.

The UE shall enter the state 5GMM-DEREGISTERED.NO-SUPI. If the message has been successfully integrity checked by the NAS, then the UE shall:

1) set the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "USIM considered invalid for 5GS services over non-3GPP access" events in case of PLMN; or

2) set the counter for "the entry for the current SNPN considered invalid for 3GPP access" events and the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events in case of SNPN;

to a UE implementation-specific maximum value.

3) delete the 5GMM parameters stored in non-volatile memory of the ME as specified in annex C.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#11 (PLMN not allowed).

This cause value received from a cell belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall delete the list of equivalent PLMNs and reset the registration attempt counter and store the PLMN identity in the forbidden PLMN list as specified in subclause 5.3.13A. The UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform a PLMN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN to the UE implementation-specific maximum value.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list, eKSI and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same PLMN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#12 (Tracking area not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for regional provision of service" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the REGISTRATION REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for regional provision of service" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for regional provision of service" for the current SNPN and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the REGISTRATION REJECT is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for regional provision of service" for the current SNPN for non-integrity protected NAS reject message.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list, eKSI and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

#13 (Roaming not allowed in this tracking area).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall delete the list of equivalent PLMNs (if available) and reset the registration attempt counter.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE or optionally 5GMM-DEREGISTERED.PLMN-SEARCH. If the REGISTRATION REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE or optionally 5GMM-DEREGISTERED.PLMN-SEARCH. If the REGISTRATION REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for the current SNPN for non-integrity protected NAS reject message.

If the UE is registered in S1 mode and operating in dual-registration mode, the PLMN that the UE chooses to register in is specified in subclause 4.8.3. Otherwise the UE shall perform a PLMN selection or SNPN selection according to 3GPP TS 23.122 [5].

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list, eKSI and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

#15 (No suitable cells in tracking area).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the REGISTRATION REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the REGISTRATION REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for the current SNPN for non-integrity protected NAS reject message.

The UE shall search for a suitable cell in another tracking area according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C].

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list, eKSI and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

If received over non-3GPP access the cause shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.7.

#22 (Congestion).

If the T3346 value IE is present in the REGISTRATION REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below; otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.7.

The UE shall abort the initial registration procedure, set the 5GS update status to 5U2 NOT UPDATED, reset the registration attempt counter and enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION.

The UE shall stop timer T3346 if it is running.

If the REGISTRATION REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

If the REGISTRATION REJECT message is not integrity protected, the UE shall start timer T3346 with a random value from the default range specified in 3GPP TS 24.008 [12].

The UE stays in the current serving cell and applies the normal cell reselection process. The initial registration procedure is started if still needed when timer T3346 expires or is stopped.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach request procedure is rejected with the EMM cause with the same value.

#27 (N1 mode not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter and shall enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the message has been successfully integrity checked by the NAS, the UE shall set:

1) the PLMN-specific N1 mode attempt counter for 3GPP access and the PLMN-specific N1 mode attempt counter for non-3GPP access for that PLMN in case of PLMN; or

2) the SNPN-specific attempt counter for 3GPP access for the current SNPN in case of SNPN and the SNPN-specific attempt counter for non-3GPP access for the current SNPN;

to the UE implementation-specific maximum value.

The UE shall disable the N1 mode capability for the specific access type for which the message was received (see subclause 4.9).

If the message has been successfully integrity checked by the NAS, the UE shall disable the N1 mode capability also for the other access type (see subclause 4.9).

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED and shall delete any 4G-GUTI, last visited registered TAI, TAI list and eKSI. Additionally, the UE shall reset the attach attempt counter and enter the state EMM-DEREGISTERED.

#31 (Redirection to EPC required).

5GMM cause #31 received by a UE that has not indicated support for CIoT optimizations or received by a UE over non-3GPP access is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

This cause value received from a cell belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter.

The UE shall enable the E-UTRA capability if it was disabled, disable the N1 mode capability for 3GPP access (see subclause 4.9.2) and enter the 5GMM-DEREGISTERED.NO-CELL-AVAILABLE.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, TAI list, eKSI and attach attempt counter as specified in 3GPP TS 24.301 [15] for the case when the EPS attach procedure is rejected with the EMM cause with the same value.

#62 (No network slices available).

The UE shall abort the initial registration procedure, set the 5GS update status to 5U2 NOT UPDATED and enter state 5GMM-DEREGISTERED.NORMAL-SERVICE or 5GMM-DEREGISTERED.PLMN-SEARCH. Additionally, the UE shall reset the registration attempt counter.

The UE receiving the rejected NSSAI in the REGISTRATION REJECT message takes the following actions based on the rejection cause in the rejected S-NSSAI(s):

"S-NSSAI not available in the current PLMN or SNPN"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current PLMN or SNPN until switching off the UE, the UICC containing the USIM is removed, an entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.2.2.

"S-NSSAI not available in the current registration area"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as described in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current registration area until switching off the UE, the UE moving out of the current registration area, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.2.2.

"S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the failed or revoked NSSAA as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed or deleted as described in subclause 4.6.1 and 4.6.2.2.

If the UE has an allowed NSSAI or configured NSSAI that contains S-NSSAI(s) which are not included any of the rejected NSSAI for the current PLMN or SNPN, the rejected NSSAI for the current registration area, and the rejected NSSAI for the failed or revoked NSSAA, the UE may stay in the current serving cell, apply the normal cell reselection process and start an initial registration with a requested NSSAI that includes any S-NSSAI from the allowed NSSAI or the configured NSSAI that is neither in the rejected NSSAI for the PLMN or SNPN nor in the rejected NSSAI for the current registration area nor in the rejected NSSAI for the failed or revoked NSSAA. Otherwise the UE may perform a PLMN selection or SNPN selection according to 3GPP TS 23.122 [5] and additionally, the UE may disable the N1 mode capability for the current PLMN or SNPN if the UE does not have an allowed NSSAI and each S-NSSAI in configured NSSAI, if available, was rejected with cause "S-NSSAI not available in the current PLMN or SNPN" or "S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization" as described in subclause 4.9.

If the UE has neither allowed NSSAI for the current PLMN or SNPN nor configured NSSAI for the current PLMN and has a default configured NSSAI containing one or more S-NSSAIs that are not included in any of the rejected NSSAI for the PLMN or SNPN, the rejected NSSAI for the current registration area, and the rejected NSSAI for the failed or revoked NSSAA, the UE may stay in the current serving cell, apply the normal cell reselection process, and start an initial registration with a requested NSSAI with that default configured NSSAI. Otherwise, the UE may perform a PLMN selection or SNPN selection according to 3GPP TS 23.122 [5] and additionally, the UE may disable the N1 mode capability for the current PLMN or SNPN if each S-NSSAI in the default configured NSSAI was rejected with cause "S-NSSAI not available in the current PLMN or SNPN" or "S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization" as described in subclause 4.9.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU2 NOT UPDATED, reset the attach attempt counter and enter the state EMM-DEREGISTERED.

#72 (Non-3GPP access to 5GCN not allowed).

When received over non-3GPP access the UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI. Additionally, the UE shall reset the registration attempt counter and enter the state 5GMM-DEREGISTERED. If the message has been successfully integrity checked by the NAS, the UE shall set:

1) the PLMN-specific N1 mode attempt counter for non-3GPP access for that PLMN in case of PLMN: or

2) the SNPN-specific attempt counter for non-3GPP access for that SNPN in case of SNPN;

to the UE implementation-specific maximum value.

NOTE 4: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

The UE shall disable the N1 mode capability for non-3GPP access (see subclause 4.9.3).

As an implementation option, the UE may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

If received over 3GPP access the cause shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.5.1.2.7.

#73 (Serving network not authorized).

This cause value received from a cell belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall delete the list of equivalent PLMNs, reset the registration attempt counter, store the PLMN identity in the forbidden PLMN list as specified in subclause 5.3.13A, and enter state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN to the UE implementation-specific maximum value.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED and shall delete any 4G-GUTI, last visited registered TAI, TAI list and eKSI. Additionally, the UE shall reset the attach attempt counter and enter the state EMM-DEREGISTERED.

#74 (Temporarily not authorized for this SNPN).

5GMM cause #74 is only applicable when received from a cell belonging to an SNPN. 5GMM cause #74 received from a cell not belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall reset the registration attempt counter and store the SNPN identity in the "temporarily forbidden SNPNs" list for the specific access type for which the message was received. The UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter for 3GPP access and the SNPN-specific attempt counter for non-3GPP access for the current SNPN to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same SNPN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

NOTE 5: When 5GMM cause #74 is received over 3GPP access, the term "other access" in "the UE also supports the registration procedure over the other access to the same SNPN" is used to express access to SNPN services via a PLMN.

#75 (Permanently not authorized for this SNPN).

5GMM cause #75 is only applicable when received from a cell belonging to an SNPN with a globally-unique SNPN identity. 5GMM cause #75 received from a cell not belonging to an SNPN or a cell belonging to an SNPN with a non-globally-unique SNPN identity is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall reset the registration attempt counter and store the SNPN identity in the "permanently forbidden SNPNs" list for the specific access type for which the message was received. The UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter for 3GPP access and the SNPN-specific attempt counter for non-3GPP access for the current SNPN to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same SNPN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

NOTE 6: When 5GMM cause #75 is received over 3GPP access, the term "other access" in "the UE also supports the registration procedure over the other access to the same SNPN" is used to express access to SNPN services via a PLMN.

#76 (Not authorized for this CAG or authorized for CAG cells only).

This cause value received from a cell belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.5.1.2.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED, store the 5GS update status according to clause 5.1.3.2.2, and reset the registration attempt counter.

If 5GMM cause #76 is received from:

1) a CAG cell, and if the UE receives a "CAG information list" in the CAG information list IE included in the REGISTRATION REJECT message, the UE shall:

i) replace the "CAG information list" stored in the UE with the received CAG information list IE when received in the HPLMN or EHPLMN;

ii) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 7: When the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE are ignored.

iii) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE does not contain the serving VPLMN's entry.

Otherwise, then the UE shall delete the CAG-ID(s) of the cell from the "allowed CAG list" for the current PLMN. In addition:

i) if the entry in the "CAG information list" for the current PLMN does not include an "indication that the UE is only allowed to access 5GS via CAG cells" or if the entry in the "CAG information list" for the current PLMN includes an "indication that the UE is only allowed to access 5GS via CAG cells" and the updated "allowed CAG list" for the current PLMN includes one or more CAG-IDs, then the UE shall enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list";

ii) if the entry in the "CAG information list" for the current PLMN includes an "indication that the UE is only allowed to access 5GS via CAG cells" and the updated "allowed CAG list" for the current PLMN does not include any CAG-ID, then the UE shall enter the state 5GMM-DEREGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [6] with the updated "CAG information list"; or

iii) if the "CAG information list" does not include an entry for the current PLMN, then the UE shall enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list".

2) a non-CAG cell, and if the UE receives a "CAG information list" in the CAG information list IE included in the REGISTRATION REJECT message, the UE shall:

i) replace the "CAG information list" stored in the UE with the received CAG information list IE when received in the HPLMN or EHPLMN;

ii) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 8: When the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE are ignored.

iii) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE does not contain the serving VPLMN's entry.

Otherwise, the UE shall store an "indication that the UE is only allowed to access 5GS via CAG cells" in the entry of the "CAG information list" for the current PLMN, if any. If the "CAG information list" stored in the UE does not include the current PLMN's entry, the UE shall add an entry for the current PLMN to the "CAG information list" and store an "indication that the UE is only allowed to access 5GS via CAG cells" in the entry of the "CAG information list" for the current PLMN.

In addition:

i) if the "allowed CAG list" for the current PLMN includes one or more CAG-IDs, then the UE shall enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated CAG information; or

ii) if the "allowed CAG list" for the current PLMN does not include any CAG-ID, then the UE shall enter the state 5GMM-DEREGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [6] with the updated "CAG information list".

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED, reset the attach attempt counter and enter the state EMM-DEREGISTERED.

#77 (Wireline access area not allowed).

5GMM cause #77 is only applicable when received from a wireline access network by the 5G-RG or the W-AGF acting on behalf of the FN-CRG. 5GMM cause #77 received from a 5G access network other than a wireline access network and 5GMM cause #77 received by the W-AGF acting on behalf of the FN-BRG are considered as abnormal cases and the behaviour of the UE is specified in subclause 5.5.1.2.7.

When received over wireline access network, the 5G-RG and the W-AGF acting on behalf of the FN-CRG shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2), shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI, shall reset the registration attempt counter, shall enter the state 5GMM-DEREGISTERED and shall act as specified in subclause 5.3.23.

NOTE 9: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

Other values are considered as abnormal cases. The behaviour of the UE in those cases is specified in subclause 5.5.1.2.7.

\* \* \* First Change \* \* \* \*

#### 8.2.7.1 Message definition

The REGISTRATION ACCEPT message is sent by the AMF to the UE. See table 8.2.7.1.1.

Message type: REGISTRATION ACCEPT

Significance: dual

Direction: network to UE

Table 8.2.7.1.1: REGISTRATION ACCEPT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Registration accept message identity | Message type  9.7 | M | V | 1 |
|  | 5GS registration result | 5GS registration result  9.11.3.6 | M | LV | 2 |
| 77 | 5G-GUTI | 5GS mobile identity  9.11.3.4 | O | TLV-E | 14 |
| 4A | Equivalent PLMNs | PLMN list  9.11.3.45 | O | TLV | 5-47 |
| 54 | TAI list | 5GS tracking area identity list  9.11.3.9 | O | TLV | 9-114 |
| 15 | Allowed NSSAI | NSSAI  9.11.3.37 | O | TLV | 4-74 |
| 11 | Rejected NSSAI | Rejected NSSAI  9.11.3.46 | O | TLV | 4-42 |
| 31 | Configured NSSAI | NSSAI  9.11.3.37 | O | TLV | 4-146 |
| 21 | 5GS network feature support | 5GS network feature support  9.11.3.5 | O | TLV | 3-5 |
| 50 | PDU session status | PDU session status  9.11.3.44 | O | TLV | 4-34 |
| 26 | PDU session reactivation result | PDU session reactivation result  9.11.3.42 | O | TLV | 4-34 |
| 72 | PDU session reactivation result error cause | PDU session reactivation result error cause  9.11.3.43 | O | TLV-E | 5-515 |
| 79 | LADN information | LADN information  9.11.3.30 | O | TLV-E | 12-1715 |
| B- | MICO indication | MICO indication  9.11.3.31 | O | TV | 1 |
| 9- | Network slicing indication | Network slicing indication  9.11.3.36 | O | TV | 1 |
| 27 | Service area list | Service area list  9.11.3.49 | O | TLV | 6-114 |
| 5E | T3512 value | GPRS timer 3  9.11.2.5 | O | TLV | 3 |
| 5D | Non-3GPP de-registration timer value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 16 | T3502 value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 34 | Emergency number list | Emergency number list  9.11.3.23 | O | TLV | 5-50 |
| 7A | Extended emergency number list | Extended emergency number list  9.11.3.26 | O | TLV-E | 7-65538 |
| 73 | SOR transparent container | SOR transparent container  9.11.3.51 | O | TLV-E | 20-n |
| 78 | EAP message | EAP message  9.11.2.2 | O | TLV-E | 7-1503 |
| A- | NSSAI inclusion mode | NSSAI inclusion mode  9.11.3.37A | O | TV | 1 |
| 76 | Operator-defined access category definitions | Operator-defined access category definitions  9.11.3.38 | O | TLV-E | 3-8323 |
| 51 | Negotiated DRX parameters | 5GS DRX parameters  9.11.3.2A | O | TLV | 3 |
| D- | Non-3GPP NW policies | Non-3GPP NW provided policies  9.11.3.36A | O | TV | 1 |
| 60 | EPS bearer context status | EPS bearer context status  9.11.3.23A | O | TLV | 4 |
| 6E | Negotiated extended DRX parameters | Extended DRX parameters  9.11.3.26A | O | TLV | 3 |
| 6C | T3447 value | GPRS timer 3  9.11.2.5 | O | TLV | 3 |
| 6B | T3448 value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 6A | T3324 value | GPRS timer 3  9.11.2.5 | O | TLV | 3 |
| 67 | UE radio capability ID | UE radio capability ID  9.11.3.68 | O | TLV | 3-n |
| E- | UE radio capability ID deletion indication | UE radio capability ID deletion indication  9.11.3.69 | O | TV | 1 |
| 39 | Pending NSSAI | NSSAI  9.11.3.37 | O | TLV | 4-146 |
| 74 | Ciphering key data | Ciphering key data  9.11.3.18C | O | TLV-E | 34-n |
| 75 | CAG information list | CAG information list  9.11.3.18A | O | TLV-E | 3-n |
| 1B | Truncated 5G-S-TMSI configuration | Truncated 5G-S-TMSI configuration  9.11.3.70 | O | TLV | 3 |
| 1C | Negotiated WUS assistance information | WUS assistance information  9.11.3.71 | O | TLV | 3-n |
| 29 | Negotiated NB-N1 mode DRX parameters | NB-N1 mode DRX parameters  9.11.3.73 | O | TLV | 3 |
| 68 | Extended rejected NSSAI | Extended rejected NSSAI  9.11.3.75 | O | TLV | 4-74 |
| XX | T35XX value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |

\* \* \* Next Change \* \* \* \*

#### 8.2.7.x T35XX value

This IE may be included to indicate a value for timer T35XX if one or more S-NSSAIs that were included in the requested NSSAI in the REGISTRATION REQUEST message are rejected by the network due to maximum number of UEs per network slice reached.\* \* \* Next Change \* \* \* \*

#### 8.2.9.1 Message definition

The REGISTRATION REJECT message is sent by the AMF to the UE. See table 8.2.9.1.1.

Message type: REGISTRATION REJECT

Significance: dual

Direction: network to UE

Table 8.2.9.1.1: REGISTRATION REJECT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Registration reject message identity | Message type  9.7 | M | V | 1 |
|  | 5GMM cause | 5GMM cause  9.11.3.2 | M | V | 1 |
| 5F | T3346 value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 16 | T3502 value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 78 | EAP message | EAP message  9.11.2.2 | O | TLV-E | 7-1503 |
| 69 | Rejected NSSAI | Rejected NSSAI  9.11.3.46 | O | TLV | 4-42 |
| 75 | CAG information list | CAG information list  9.11.3.18A | O | TLV-E | 3-n |
| 68 | Extended rejected NSSAI | Extended rejected NSSAI  9.11.3.75 | O | TLV | 4-74 |
| XX | T35XX value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |

\* \* \* Next Change \* \* \* \*

#### 8.2.9.x T35XX value

This IE may be included to indicate a value for timer T35XX if one or more S-NSSAIs that were included in the requested NSSAI in the REGISTRATION REQUEST message are rejected by the network due to maximum number of UEs per network slice reached.

\* \* \* Next Change \* \* \* \*

#### 8.2.14.1 Message definition

The DEREGISTRATION REQUEST message is sent by the AMF to the UE. See table 8.2.14.1.1.

Message type: DEREGISTRATION REQUEST

Significance: dual

Direction: network to UE

Table 8.2.14.1.1: DEREGISTRATION REQUEST message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | De-registration request message identity | Message type  9.7 | M | V | 1 |
|  | De-registration type | De-registration type  9.11.3.20 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
| 58 | 5GMM cause | 5GMM cause  9.11.3.2 | O | TV | 2 |
| 5F | T3346 value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |
| 6D | Rejected NSSAI | Rejected NSSAI  9.11.3.46 | O | TLV | 4-42 |
| 75 | CAG information list | CAG information list  9.11.3.18A | O | TLV-E | 3-n |
| 68 | Extended rejected NSSAI | Extended rejected NSSAI  9.11.3.75 | O | TLV | 4-74 |
| XX | T35XX value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |

\* \* \* Next Change \* \* \* \*

#### 8.2.14.x T35XX value

This IE may be included to indicate a value for timer T35XX if one or more S-NSSAIs are rejected by the network due to maximum number of UEs per network slice reached.

\* \* \* Next Change \* \* \* \*

#### 8.2.19.1 Message definition

The CONFIGURATION UPDATE COMMAND message is sent by the AMF to the UE. See table 8.2.19.1.1.

Message type: CONFIGURATION UPDATE COMMAND

Significance: dual

Direction: network to UE

Table 8.2.19.1.1: CONFIGURATION UPDATE COMMAND message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Configuration update command message identity | Message type  9.7 | M | V | 1 |
| D- | Configuration update indication | Configuration update indication  9.11.3.18 | O | TV | 1 |
| 77 | 5G-GUTI | 5GS mobile identity  9.11.3.4 | O | TLV-E | 14 |
| 54 | TAI list | 5GS tracking area identity list  9.11.3.9 | O | TLV | 9-114 |
| 15 | Allowed NSSAI | NSSAI  9.11.3.37 | O | TLV | 4-74 |
| 27 | Service area list | Service area list  9.11.3.49 | O | TLV | 6-114 |
| 43 | Full name for network | Network name  9.11.3.35 | O | TLV | 3-n |
| 45 | Short name for network | Network name  9.11.3.35 | O | TLV | 3-n |
| 46 | Local time zone | Time zone  9.11.3.52 | O | TV | 2 |
| 47 | Universal time and local time zone | Time zone and time  9.11.3.53 | O | TV | 8 |
| 49 | Network daylight saving time | Daylight saving time  9.11.3.19 | O | TLV | 3 |
| 79 | LADN information | LADN information  9.11.3.30 | O | TLV-E | 3-1715 |
| B- | MICO indication | MICO indication  9.11.3.31 | O | TV | 1 |
| 9- | Network slicing indication | Network slicing indication  9.11.3.36 | O | TV | 1 |
| 31 | Configured NSSAI | NSSAI  9.11.3.37 | O | TLV | 4-146 |
| 11 | Rejected NSSAI | Rejected NSSAI  9.11.3.46 | O | TLV | 4-42 |
| 76 | Operator-defined access category definitions | Operator-defined access category definitions  9.11.3.38 | O | TLV-E | 3-8323 |
| F- | SMS indication | SMS indication  9.11.3.50A | O | TV | 1 |
| 6C | T3447 value | GPRS timer 3  9.11.2.5 | O | TLV | 3 |
| 75 | CAG information list | CAG information list  9.11.3.18A | O | TLV-E | 3-n |
| 67 | UE radio capability ID | UE radio capability ID  9.11.3.68 | O | TLV | 3-n |
| A- | UE radio capability ID deletion indication | UE radio capability ID deletion indication  9.11.3.69 | O | TV | 1 |
| 44 | 5GS registration result | 5GS registration result  9.11.3.6 | O | TLV | 3 |
| 1B | Truncated 5G-S-TMSI configuration | Truncated 5G-S-TMSI configuration  9.11.3.70 | O | TLV | 3 |
| C- | Additional configuration indication | Additional configuration indication  9.11.3.74 | O | TV | 1 |
| 68 | Extended rejected NSSAI | Extended rejected NSSAI  9.11.3.75 | O | TLV | 4-74 |
| XX | T35XX value | GPRS timer 2  9.11.2.4 | O | TLV | 3 |

\* \* \* Next Change \* \* \* \*

#### 8.2.19.x T35XX value

This IE may be included to indicate a value for timer T35XX if one or more S-NSSAIs are rejected by the network due to maximum number of UEs per network slice reached.

\* \* \* 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: Timers T3324, T3346, T3245 and T3247 are 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 or 5GMM-REGISTERED.NON-ALLOWED-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 | (a) 5s for case h) in subclause 5.6.1.1; or  (b) 15s for cases other than h) in subclause 5.6.1.1  NOTE 7  NOTE 8  In WB-N1/CE mode, 61s | 5GMM-SERVICE-REQUEST-INITIATED | Transmission of SERVICE REQUEST message, or CONTROL PLANE 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  see subclause 5.6.1.4.2 | 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 or 5GMM-REGISTERED.NON-ALLOWED-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 5GMM-REGISTERED.NON-ALLOWED-SERVICE,  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  NOTE 7 (applicable to case f) in subclause 5.3.1.3)  NOTE 8  In WB-N1/CE mode, 34s (applicable to case f) in subclause 5.3.1.3) | 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) and h) | 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  Release the NAS signalling connection for the case h) as described in subclause 5.3.1.3 |
| 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 |
| T35XX | Default 12 min  NOTE 9 | 5GMM-DEREGISTERED 5GMM-REGISTERED | Rejected S-NSSAI with rejection cause 'maximum number of UEs per network slice reached' received | None | Initiation of the registration procedure with the received rejected S-NSSAI included in the requested NSSAI, if still required |
| 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).  NOTE 9: The default value of this timer is used if the network does not indicate a value in the REGISTRATION ACCEPT message, the REGISTRATION REJECT message, the CONFIGURATION UPDATE COMMAND message, or the DEREGISTRATION REQUEST message. | | | | | |

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 as specified in subclause 5.5.1.2.4 and 5.5.1.3.4 | | 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  NGAP UE context resume request message as specified in 3GPP TS 38.413 [31] 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  NOTE 6  NOTE 8 | | 15s  In WB-N1/CE mode, 60s | | 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 | | NOTE 10 | | 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.  NOTE 10: If the AMF includes timer T3324 in the REGISTRATION ACCEPT message and if the UE is not registered for emergency services, the value of this timer is equal to the value of timer T3324. | | | | | | | | | | | |

\* \* \* End of Change \* \* \* \*