**3GPP TSG-CT WG1 Meeting #123-eC1-202778**

**Electronic meeting, 16-24 Apr 2020 (revison of C1-202113)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | 2040 | **rev** |  | **Current version:** | **16.4.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | Pending NSSAI update for the configured NSSAI in the UCU message |
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| ***Source to WG:*** | China Telecom |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eNS |  | ***Date:*** | 2020-02-20 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | During the UCU procedure, the UE can receive CONFIGURATION UPDATE COMMAND message with configured NSSAI while network slice-specific authentication and authorization is ongoing. So any S-NSSAI stored in the pending NSSAI which is not in the configured NSSAI need to be deleted.For example:1)assume that the old configured NSSAI={a,b,c,d}, and the pending NSSAI= {d};2)if configured NSSAI udated that the new configured NSSAI={a,b,c }. However the pending NSSAI is still {d}, due to it will not delete d from the pending NSSAI in this specs;3)when NSSAA is completed, AMF update the NSSAA result by UCC, the UE receiving the allowed NSSAI={d} in UCU;4) after that, the UE may remove {d} from pending NSSAI to the allowed NSSAI, and then the UE may incorrectly use the {d }for PDU sesseion procedure, which acturally should not to be used. |
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| ***Summary of change:*** | During the UCU procedure, when the UE received the configured NSSAI in the CONFIGURATION UPDATE COMMAND message while network slice-specific authentication and authorization is ongoing, the UE should remove from the stored pending NSSAI, one or more S-NSSAIs, if any, not already included in the new configured NSSAI for the current PLMN or SNPN. |
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| ***Consequences if not approved:*** | If the S-NSSAI in the stored pending NSSAI but not already in the new configured NSSAI can’t be removed, these S-NSSAI will be incorrectly added into the allowed NSSAI, and then be incorrectly used, once the NSSAA result of these S-NSSAI is successful and is sended in the allowed NSSAI by UCU later, |
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| ***Clauses affected:*** | 4.6.2.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

#### 4.6.2.2 NSSAI storage

If available, the configured NSSAI(s) shall be stored in a non-volatile memory in the ME as specified in annex C.

The allowed NSSAI(s) should be stored in a non-volatile memory in the ME as specified in annex C.

Each of the configured NSSAI stored in the UE is a set composed of at most 16 S-NSSAIs. Each of the allowed NSSAI stored in the UE is a set composed of at most 8 S-NSSAIs and is associated with a PLMN identity or SNPN identity and an access type. Each of the configured NSSAI except the default configured NSSAI, and the rejected NSSAI is associated with a PLMN identity or SNPN identity. The S-NSSAI(s) in the rejected NSSAI for the current registration area are further associated with a registration area where the rejected S-NSSAI(s) is not available. The S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN shall be considered rejected for the current PLMN or SNPN regardless of the access type. There shall be no duplicated PLMN identities or SNPN identities in each of the list of configured NSSAI(s), allowed NSSAI(s), rejected NSSAI(s) for the current PLMN or SNPN, and rejected NSSAI(s) for the current registration area.

The UE stores NSSAIs as follows:

a) The configured NSSAI shall be stored until a new configured NSSAI is received for a given PLMN or SNPN. The network may provide to the UE the mapped S-NSSAI(s) for the new configured NSSAI which shall also be stored in the UE. When the UE is provisioned with a new configured NSSAI for a PLMN or SNPN, the UE shall:

1) replace any stored configured NSSAI for this PLMN or SNPN with the new configured NSSAI for this PLMN or SNPN;

2) delete any stored mapped S-NSSAI(s) for the configured NSSAI and, if available, store the mapped S-NSSAI(s) for the new configured NSSAI;

3) delete any stored allowed NSSAI for this PLMN or SNPN and, if available, the stored mapped S-NSSAI(s) for the allowed NSSAI, if the UE received the new configured NSSAI for this PLMN or SNPN and the Configuration update indication IE with the Registration requested bit set to "registration requested", in the same CONFIGURATION UPDATE COMMAND message but without any new allowed NSSAI for this PLMN or SNPN included;

4) delete any rejected NSSAI for the current PLMN or SNPN and rejected NSSAI for the current registration area; and

5) delete any stored pending NSSAI, if not already included in the new configured NSSAI for the current PLMN or SNPN;

 If the UE receives an S-NSSAI associated with a PLMN ID from the network during the PDN connection establishment procedure in EPS as specified in 3GPP TS 24.301 [15], the UE may store the received S-NSSAI in the configured NSSAI for the PLMN identified by the PLMN ID associated with the S-NSSAI, if not already in the configured NSSAI;

 The UE may continue storing a received configured NSSAI for a PLMN and associated mapped S-NSSAI(s), if available, when the UE registers in another PLMN.

NOTE 1: The maximum number of configured NSSAIs and associated mapped S-NSSAIs for PLMNs other than the HPLMN that need to be stored in the UE, and how to handle the stored entries, are up to UE implementation.

b) The allowed NSSAI shall be stored until a new allowed NSSAI is received for a given PLMN or SNPN. The network may provide to the UE the mapped S-NSSAI(s) for the new allowed NSSAI (see subclauses 5.5.1.2 and 5.5.1.3) which shall also be stored in the UE. When a new allowed NSSAI for a PLMN or SNPN is received, the UE shall:

1) replace any stored allowed NSSAI for this PLMN or SNPN with the new allowed NSSAI for this PLMN or SNPN;

2) delete any stored mapped S-NSSAI(s) for the allowed NSSAI and, if available, store the mapped S-NSSAI(s) for the new allowed NSSAI;

3) remove from the stored rejected NSSAI, the S-NSSAI(s), if any, included in the new allowed NSSAI for the current PLMN or SNPN; and

4) remove from the stored pending NSSAI, one or more S-NSSAIs, if any, included in the new allowed NSSAI for the current PLMN or SNPN.

 If the UE receives the CONFIGURATION UPDATE COMMAND message with the Registration requested bit of the Configuration update indication IE set to "registration requested" and contains no other parameters (see subclauses 5.4.4.2 and 5.4.4.3), the UE shall delete any stored allowed NSSAI for this PLMN or SNPN, and delete any stored mapped S-NSSAI(s) for the allowed NSSAI, if available;

NOTE 2: Whether the UE stores the allowed NSSAI and the mapped S-NSSAI(s) for the allowed NSSAI also when the UE is switched off is implementation specific.

c) When the UE receives the S-NSSAI(s) included in rejected NSSAI in the REGISTRATION ACCEPT message, the REGISTRATION REJECT message, the DEREGISTRATION REQUEST message or in the CONFIGURATION UPDATE COMMAND message, the UE shall:

1) store the S-NSSAI(s) into the rejected NSSAI based on the associated rejection cause(s);

2) remove from the stored allowed NSSAI for the current PLMN or SNPN, the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type;

ii) rejected NSSAI for the current registration area, associated with the same access type; and

iii) rejected NSSAI due to the failed or revoked network slice-specific authentication and authorization, for each and every access type;

Editor's note: It is FFS whether and how the network can update the rejected NSSAI due to failed NSSAA.

3) ju, if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type; and

ii) rejected NSSAI for the current registration area, associated with the same access type;

 When the UE:

i) deregisters with the current PLMN using explicit signalling or enters state 5GMM-DEREGISTERED for the current PLMN; or

ii) successfully registers with a new PLMN; or

iii) enters state 5GMM-DEREGISTERED following an unsuccessful registration with a new PLMN;

 and the UE is not registered with the current PLMN over another access, the rejected NSSAI for the current PLMN shall be deleted. Once the UE is deregistered over an access type, the rejected NSSAI for the current registration area corresponding to the access type shall be deleted. The UE shall delete, if any, the stored rejected NSSAI for the current registration area if the UE moves out of the registration area;

d) When the UE receives one or more S-NSSAIs included in pending NSSAI in the REGISTRATION ACCEPT message, the UE shall store one or more S-NSSAIs for the pending NSSAI.

Editor’s Note [WI: eNS, CR#1602]: The NSSAI storage update regarding Allowed NSSAI in scenario when re-authentication and re-authorization is challenged for one or more S-NSSAIs in the Allowed NSSAI of a UE is FFS.

 When the UE:

i) deregisters with the current PLMN using explicit signalling or enters state 5GMM-DEREGISTERED for the current PLMN; or

ii) successfully registers with a new PLMN; or

iii) enters state 5GMM-DEREGISTERED following an unsuccessful registration with a new PLMN;

 and the UE is not registered with the current PLMN over another access, the pending NSSAI for the current PLMN shall be deleted; and

e) In case of a PLMN, when the UE receives the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message or in the CONFIGURATION UPDATE COMMAND message, the UE shall delete the network slicing information for each of the PLMNs that the UE has slicing information stored for (excluding the current PLMN). The UE shall not delete the default configured NSSAI. Additionally, the UE shall update the network slicing information for the current PLMN (if received) as specified above in bullets a), b), c) and e).

Editor's note [WI: Vertical\_LAN, CR#1454]: It is FFS whether the Network slicing indication IE can be sent by an SNPN.

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