**3GPP TSG-CT WG1 Meeting #133e-bisC1-22xxxx**

**E-meeting, 17-21 January 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **3905** | **rev** | **1** | **Current version:** | **17.5.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | NSAC for S-NSSAI used for onboarding services in SNPN |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | eNPN, eNS\_Ph2 |  | ***Date:*** | 2022-01-10 |
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| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)...Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | About NSAC for onboarding services, CT1 has sent an LS C1-215159 to SA2 and was received a reply LS from SA2 (see C1-220098/S2-2109257) which includes following information:"*SA2 Answer:* *SA2 assumes that in case UE is registering for onboarding service in PLMN, network slice admission control is applied for slice(s) used for onboarding depending on operator policies. In case of registration for onboarding services in SNPN, the UE does not provide the S-NSSAI in the Registration request to the onboarding SNPN. In SA2 understanding the UE is aware of the S-NSSAI that is rejected due to network slice admission control as it is signalled to the UE using the cause “S-NSSAI not available due to maximum number of UEs reached” in Extended rejected NSSAI.* *SA2 Question:* *When the UE does not provide any Requested NSSAI (as in case of UE onboarding within a SNPN) can the UE associate the “S-NSSAI not available due to maximum number of UEs reached” with the Onboarding Registration attempt in order to avoid subsequent Onboarding Registration attempts?* *If the answer to above question is that the UE is not able to associate the “S-NSSAI not available due to maximum number of UEs reached” with the Onboarding Registration attempt, then SA2 agrees that network slice admission control cannot be used on network slices used for onboarding.*"Some observations based on above SA2 information:1. Based on above pink text, NSAC will be applied to slice(s) used for onboarding in case of ON-PLMN, based on operator policies.
2. Based on above pink and yellow text, SA2 has agreed a CR (attached to the reply LS, see CR#3241/S2-2108472) which specified that the NSAC can be applied to the S-NSSAI used for SNPN Onboarding in both ON-PLMN and ON-SNPN cases, based on operator policies.
3. Based on above green text, SA2 has not made the final decision on ON-SNPN case and then asks CT1 to confirm a key point whether the UE is able to associate the “S-NSSAI not available due to maximum number of UEs reached” with the Onboarding Registration attempt.

For above (3), based on below general principle provided in TS 24.501 section 4.14.2, the AMF will not provide any rejected NSSAI to the UE, including "*rejected NSSAI for the maximum number of UEs reached*". Hence, the answer to above SA2 question in the reply LS should be: No, the UE cannot." *t) when registering or registered for onboarding services in SNPN, the AMF shall not provide the configured NSSAI, the allowed NSSAI or the rejected NSSAI to the UE, shall use the S-NSSAI included in the AMF onboarding configuration data for onboarding services in SNPN and shall not perform NSSAA procedure for S-NSSAI used for onboarding services in SNPN;*"With above general principle, it does not make any sense for the AMF and SMF to perform NSAC for S-NSSAI(s) used for SNPN onboarding in ON-SNPN case.Note that similar as emergency services, onboarding services are special and temproary services provided by the serving SNPN and hence, it is reasonable to provide similar special handling on onboarding services for NSAC. |
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| ***Summary of change:*** | For ON-SNPN case, it proposes that based on operator policy, NSAC is not applied to S-NSSAI(s) used for SNPN onboarding. |
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| ***Consequences if not approved:*** | It is unspecified that whether NSAC is applied to S-NSSAI(s) used for SNPN onboarding in ON-SNPN case. |
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| ***Clauses affected:*** | 4.6.2.5, 4.6.3.1 |
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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 \* \* \* \*

#### 4.6.2.5 Mobility management based network slice admission control

A serving PLMN or SNPN can perform network slice admission control for the S-NSSAI(s) subject to NSAC to monitor and control the number of registered UEs per network slice. The timing of the network slice admission control is managed by the EAC mode, which can be either activated or deactivated for the network performing network slice admission control.

If the EAC mode is activated, the AMF performs network slice admission control before the S-NSSAI subject to NSAC is included in the allowed NSSAI sent to the UE. During a registration procedure (including initial registration or mobility registration updating from another AMF), if the AMF determines that the maximum number of UEs has been reached for:

a) one or more S-NSSAIs but not all S-NSSAIs in the requested NSSAI, then the AMF includes the allowed NSSAI and the rejected NSSAI accordingly in the REGISTRATION ACCEPT message as specified in the subclauses 5.5.1.2.4 and 5.5.1.3.4;

b) all S-NSSAIs in the requested NSSAI but there are one or more subscribed S-NSSAIs marked as default which can be allowed to the UE, then the AMF includes the allowed NSSAI containing these subscribed S-NSSAIs marked as default and the rejected NSSAI accordingly in the REGISTRATION ACCEPT message as specified in the subclauses 5.5.1.2.4 and 5.5.1.3.4; or

c) all S-NSSAIs in the requested NSSAI and there are no subscribed S-NSSAIs marked as default which can be allowed to the UE, then the AMF includes the rejected NSSAI accordingly in the REGISTRATION REJECT message as specified in the subclauses 5.5.1.2.5 and 5.5.1.3.5.

If the EAC mode is deactivated, the AMF performs network slice admission control after the S-NSSAI subject to NSAC is included in the allowed NSSAI sent to the UE. While the AMF is waiting for response from the NSCAF for the S-NSSAI, the AMF processes the NAS signalling message related to the S-NSSAI as usual i.e. like S-NSSAI in the allowed NSSAI. After the network performs the network slice admission control, if the AMF determines that the maximum number of UEs has been reached for:

a) one or more S-NSSAIs but not all S-NSSAIs in the allowed NSSAI, then the AMF updates the allowed NSSAI and the rejected NSSAI accordingly using the generic UE configuration update procedure as specified in the subclause 5.4.4;

b) for all S-NSSAIs in the allowed NSSAI but there are one or more subscribed S-NSSAIs marked as default which can be allowed to the UE, then the AMF updates the allowed NSSAI containing these subscribed S-NSSAIs marked as default and the rejected NSSAI accordingly using the generic UE configuration update procedure as specified in the subclause 5.4.4; or

c) for all S-NSSAIs in the allowed NSSAI and there are no subscribed S-NSSAIs marked as default which can be allowed to the UE, then the AMF performs the network-initiated de-registration procedure and includes the rejected NSSAI in the DEREGISTRATION REQUEST message as specified in the subclause 5.5.2.3 except when the UE has an emergency PDU session established or the UE is establishing an emergency PDU session.

 When the UE has an emergency PDU session established or the UE is establishing an emergency PDU session, the AMF updates the rejected NSSAI using the generic UE configuration update procedure as specified in the subclause 5.4.4 and informs the SMF to release all PDU sessions associated with the S-NSSAI. During the generic UE configuration update procedure, the AMF includes the 5GS registration result IE in the CONFIGURATION UPDATE COMMAND message and sets the Emergency registered bit of the 5GS registration result IE to "Registered for emergency services". After the emergency PDU session is released, the AMF performs the network-initiated de-registration procedure as specified in the subclause 5.5.2.3.

Editor's note [WI: eNS-Ph2, CR#3417]: Whether NSAC is applicable in an SNPN is FFS.

Based on operator policy, the mobility management based network slice admission control is not applicable for the S-NSSAI included in the AMF emergency configuration data.

The mobility management based network slice admission control is not applicable for the S-NSSAI used for onboarding services in SNPN.

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

#### 4.6.3.1 Session management based network slice admission control

A serving PLMN or the HPLMN can perform network slice admission control for the S-NSSAI(s) subject to NSAC to monitor and control the total number of established PDU sessions per network slice. The SMF performs network slice admission control on the S-NSSAI during the PDU session establishment procedure. If the maximum number of PDU sessions on a network slice associated with an S-NSSAI has been already reached, the SMF rejects the PDU session establishment request using S-NSSAI based congestion control as specifed in subclause 6.2.8 and 6.4.1.4.2.

Based on operator policy, the session management based network slice admission control is not applicable for the S-NSSAI included in the SMF emergency configuration data.

The session management based network slice admission control is not applicable for the S-NSSAI used for onboarding services in SNPN.

NOTE: For the MA PDU session during the PDU session establishment procedure, the SMF performs network slice admission control only when it is newly established over the associated access type.

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