**3GPP TSG-SA WG2 Meeting #146E e-meetingS2-21xxxxx**

**Elbonia, 16-27 August, 2021**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **23.501** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **17.1.1** |  |
|  |
| *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:***  | TS23.501 Correction to the NSAC to maintain service continuity |
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| ***Source to WG:*** | NEC |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | eNS\_Ph2 |  | ***Date:*** | 2021-06-29 |
|  |  |  |  |  |
| ***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-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:*** | This CR proposes to fix the following editor's note in 23.501 section 5.15.11.14.Editor's note: It is FFS whether and how to support session continuity if either the current number of UE registration or the current number of PDU sessions reaches the maximum number when the UE moves from EPC to 5GC.If a UE is with an active PDN connection in EPS where NSAC is not supported and the UE handovers to 5GS where NSAC is supported and is applicable for the network slice on which the UE’s PDN connection is to be transferred, the UE may be rejected registration or may drop an active connection if target network slice has reached the maximum number of registered UEs or the maximum number of establisged PDU Sessions. While the NSAC is designed to reject access to new registrations or new service reguests, in the case of EPS to 5GS handover an already existing service would be dropped. This breaks the service continuity and would create a bad user experience.   |
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| ***Summary of change:*** | It is suggested that the NSACF in 5GS is made aware of the UE handover from EPS to 5GS and the NSACF does not reject the UE if the max number of registered UEs or max number of established PDU Sessions for the network slice has been reached unless the number of the registered UEs has reached an overflow threshold, if one is configured in the NSACF by the operator. |
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| ***Consequences if not approved:*** | Service continuity from EPS to 5GS is brocken. |
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| ***Clauses affected:*** | 5.15.11.14 |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**\* \* \* \* start of 1st change \* \* \* \***

### 5.15.11.14 Support of Network Slice Admission Control and Interworking with EPC

If EPS counting is required for a network slice, the Network Slice Admission Control for maximum number of UEs and/or for maximum number of PDU Sessions per network slice is performed at the time of PDN connection establishment in case of EPC interworking. To support the NSAC for maximum number of UEs and/or for maximum number of PDU Sessions per network slice in EPC, the SMF+PGW-C is configured with the information indicating which network slice is subject to NSAC. During PDN connection establishment in EPC, the SMF+PGW-C selects an S-NSSAI associated with the PDN connection as described in clause 5.15.7.1. If the selected S-NSSAI by the SMF+PGW-C is subject to the NSAC, the SMF+PGW-C triggers interaction with NSACF to check the availability of the network slice, before the SMF+PGW-C provides the selected S-NSSAI to the UE. If the network slice is available, the SMF+PGW-C continues to proceed with the PDN connection establishment procedure.

The NSACF performs the following for checking network slice availability prior to returning a response to the SMF+PGW-C:

 If:

- the UE identity is already included in the list of UE IDs registered with a network slice (if Network Slice Admission Control for maximum number of UEs is applicable) and the current number of PDU sessions is below the maximum number (if Network Slice Admission Control for maximum number of sessions is applicable); or

- the UE identity is not included in the list of UE IDs registered with a network slice and the current number of UE registration did not reach the maximum number (if Network Slice Admission Control for maximum number of UEs is applicable), and the current number of PDU sessions did not reach the maximum number (if Network Slice Admission Control for maximum number of sessions is applicable);

 then the NSACF responds to the SMF+PGW-C with the information that the network slice is available. The NSACF includes the UE identity in the list of UE IDs if not already on the list and increases the current number of UE registration (if Network Slice Admission Control for maximum number of UEs is applicable) and increases the current number of PDU sessions (if Network Slice Admission Control for maximum number of sessions is applicable).

When the UE with ongoing PDN connection(s) moves from EPC to 5GC, the SMF+PGW-C triggers a request to decrease the number of the UE registration in NSACF and the AMF triggers a request to increase the number of the UE registration in NSACF when the UE is registered in the new AMF. If there are more than one PDN connections associated with the S-NSSAI, the NSACF may receive multiple requests for the same S-NSSAI from different SMF+PGW-Cs. When the UE with ongoing PDU session(s) moves from 5GC to EPC, the SMF+PGW-C triggers a request to increase the number of the UE registration in NSACF and the old AMF triggers a request to decrease the number of the UE registration in NSACF when the UE is deregistered in old AMF. If there are more than one PDU sessions associated with the S-NSSAI, the NSACF may receive multiple requests for the same S-NSSAI from different SMF+PGW-Cs. The NSACF maintains a list of UE IDs based on the requests from SMF+PGW-C(s) and AMF, and adjusts the current number of registrations accordingly.

When the UE with ongoing PDN connection(s) moves from EPC to 5GC, or from 5GC to EPC, the session continuity is guaranteed as the admission was granted at the time of PDN connection establishment, i.e. the number of PDU session is not counted again in 5GC.

Editor's note: NSAC mechanism during the mobility between EPC and 5GC can be revisited to make it align with 5GC mechanism, i.e. mobility between AMFs.

If the PDN connection associated with S-NSSAI is released in EPC, the SMF+PGW-C triggers a request (i.e. decrease) to NSACF for maximum number of PDU sessions per network slice control. The NSACF determines to decrease the current number of registrations and remove the UE identity from the list of UE IDs if the PDN connection(s) associated with S-NSSAI are all released in EPC.

Editor's note: It is FFS whether one NSACF is in charge of registration and session admission control, or there are respective NSCAFs for registration and session admission control, depending on the deployment scenarios.

NOTE: Network Slice Admission Control in EPC is not performed for the attachment without PDN connectivity.

If EPS counting is not required for a network slice, the Network Slice Admission Control for maximum number of UEs and/or for maximum number of PDU Sessions per network slice is performed when the UE moves from EPC to 5GC, i.e. when the UE performs mobility Registration procedure from EPC to 5GC (Network Slice Admission Control for maximum number of UEs per network slice) and/or when the PDN connections are handed over from EPC to 5GC (Network Slice Admission Control for maximum number of PDU Sessions per network slice). The SMF+PGW-C is configured with the information indicating the network slice is subject to NSAC only in 5GS. The PDN connection interworking procedure is performed as described in clause 5.15.7.1.

If the NSAC is not supported in EPS and the EPS to 5GS handover takes place, the NSACF shall not reject the registration of the UE even if the maximum number of the registered UEs with the network slice in 5GS has been reached or has been exceeded unless the number of the registered UEs has reached an overflow threshold, if one is configured in the NSACF by the operator. Similary, the NSACF shall not reject the registration of the PDU Session even if the maximum number of the registered PDU Sessions with the network slice in 5GS has been reached or has been exceeded unless the number of the registered PDU Sessions has reached an overflow threshold, if one is configured in the NSACF by the operator.

**\* \* \* \* end of 1st change \* \* \* \***