**3GPP TSG-CT WG1 Meeting #130-eC1-21xxxx**

**Electronic meeting, 20-28 May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **3292** | **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 |  |

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| ***Title:***  | UE handling of S-NSSAI when interworking with ePDG and EPC |
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| ***Source to WG:*** | MediaTek Inc. |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc17 |  | ***Date:*** | 2021-05-26 |
|  |  |  |  |  |
| ***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:*** | Based on the discussion paper C1-213330, when the PDU session is transferred from N1 mode to ePDG, or from N1 mode to S1 mode (without N26 scenario), the stored S-NSSAI and the PLMN ID should be kept associating with the new PDN connection to ensure the session continuity. |
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| ***Summary of change:*** | * When handover from ePDG to N1 mode, the associated S-NSSAI is sent with the PDU session establishment request message, no matter whether the S-NSSAI is provided by the ePDG or not.
* When handover from N1 mode to S1 mode, the new PDN connection is associated with the S-NSSAI of the existing PDU session and the PLMN ID.
* The network can update the S-NSSAI in S1 mode.
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| ***Consequences if not approved:*** | Session continuity may not be maintained without associated S-NSSAI when handover to N1 mode. |
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| ***Clauses affected:*** | 6.1.4.2, 6.1.5 |
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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:*** |  |

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

#### 6.1.4.2 Coordination between 5GSM and ESM without N26 interface

When the network does not support N26 interface, the SMF does not provide the UE with the mapped EPS bearer context for a PDU session.

NOTE 1: Since the SMF does not provide the UE with the mapped EPS bearer context for a PDU session, the UE does not know whether interworking with EPS is supported for a PDU session before attempting to transfer the PDU session from N1 mode to S1 mode.

NOTE 2: It is up to UE implementation to decide which PDU session(s) to be attempted to transfer from N1 mode to S1 mode, e.g. based on UE policy or UE local configuration.

Upon inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE shall not transfer a PDU session for LADN to EPS.

Upon inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE shall not transfer a multi-homed IPv6 PDU session to EPS.

Upon inter-system change from N1 mode to S1 mode in EMM-IDLE mode, the UE shall use the parameters from each PDU session which the UE intends to transfer to EPS to create the contents of a PDN CONNECTIVITY REQUEST message as follows:

a) if the PDU session is an emergency PDU session, the request type shall be set to "handover of emergency bearer services". Otherwise the request type shall be set to "handover";

b) the PDU session type of the PDU session shall be mapped to the PDN type of the default EPS bearer context as follows:

1) the PDN type shall be set to "non-IP" if the PDU session type is "Unstructured";

2) the PDN type shall be set to "IPv4" if the PDU session type is "IPv4";

3) the PDN type shall be set to "IPv6" if the PDU session type is "IPv6";

4) the PDN type shall be set to "IPv4v6" if the PDU session type is "IPv4v6";

5) the PDN type shall be set to "non-IP" if the PDU session type is "Ethernet" and the UE, the network or both of them do not support Ethernet PDN type in S1 mode; and

6) the PDN type shall be set to "Ethernet" if the PDU session type is "Ethernet" and the UE and the network support Ethernet PDN type in S1 mode;

c) the DNN of the PDU session shall be mapped to the APN of the default EPS bearer context;

d) the PDU session ID parameter in the PCO IE shall be set to the PDU session identity of the PDU session; and

e) if the UE is the 5G-RG and the PDU session is an MA PDU session established over 3GPP access, the ATSSS request PCO parameter shall be included in the PCO IE.

After inter-system change from N1 mode to S1 mode, the UE shall associate the PDU session identity with the default EPS bearer context. If the PDU session being transferred is a non-emergency PDU session, the UE shall in addition associate the S-NSSAI and the PLMN ID of the current PLMN with the default EPS bearer context.

Upon successful completion of an EPS attach procedure after inter-system change from N1 mode to S1 mode (see 3GPP TS 24.301 [15]), the UE shall delete any UE derived QoS rules except when the UE is the 5G-RG and the PDU session is an MA PDU session established over 3GPP access and wireline access.

The UE shall perform a local release of the PDU session(s) and QoS flow(s) associated with the 3GPP access which have not been transferred to EPS. The UE shall also perform a local release of any QoS flow description not associated with any QoS rule.

For PDU session(s) associated with non-3GPP access in 5GS, if present, the UE may:

a) keep some or all of these PDU sessions still associated with non-3GPP access in 5GS, if supported;

b) release some or all of these PDU sessions explicitly by initiating the UE requested PDU session release procedure(s); or

c) attempt to transfer some or all of these PDU sessions from N1 mode to S1 mode by initiating the UE requested PDN connectivity procedure(s) with the PDN CONNECTIVITY REQUEST message created as above.

When the network does not support N26 interface, the MME does not provide the UE with the mapped PDU session for a PDN connection but provides the UE with an S-NSSAI if the PDN connection is not for emergency bearer services. When establishing a new PDN connection in S1 mode, to enable the UE to attempt to transfer the PDN connection from S1 mode to N1 mode in case of inter-system change, the UE shall allocate a PDU session identity, indicate the allocated PDU session identity in the PDU session ID parameter in the Protocol configuration options IE of the PDN CONNECTIVITY REQUEST message and associate the allocated PDU session identity with the default EPS bearer context of the PDN connection. If an N5CW device supports 3GPP access and establishes a new PDN connection in S1 mode, the N5CW device shall refrain from allocating "PDU session identity value 15". The network provides the UE with an S-NSSAI and the related PLMN ID in the Protocol configuration options IE or Extended protocol configuration options IE of the ACTIVATE DEFAULT EPS BEARER REQUEST message, the UE shall delete the stored S-NSSAI and the related PLMN ID, if any, and shall store the S-NSSAI and the related PLMN ID provided in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message.

NOTE 3: Since the MME does not provide the UE with the mapped PDU session for a PDN connection, the UE does not know whether interworking to 5GS is supported for a PDN connection for which the UE assigned a PDU Session identity before attempting to transfer the PDN connection from S1 mode to N1 mode.

NOTE 4: It is up to UE implementation to decide which PDN connection(s) to be attempted to transfer from S1 mode to N1 mode, e.g. based on UE policy or UE local configuration.

NOTE 5: If the PDN connection has been transferred from a PDN connection established via non-3GPP access to EPC, it is possible that the network provided the S-NSSAI already during the establishment via non-3GPP access (see 3GPP TS 24.302 [16]).

Upon inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, the UE uses the parameters from the default EPS bearer context of each PDN connection which the UE intends to transfer to 5GS and for which the UE has allocated a PDU session identity to create a PDU SESSION ESTABLISHMENT REQUEST message as follows:

a) if the PDN connection is for emergency bearer services, the request type shall be set to "existing emergency PDU session". Otherwise the request type shall be set to:

1) "MA PDU request", if the UE is the 5G-RG and the PDN connection to be transferred is a user-plane resource of an MA PDU session; or

2) "existing PDU session";

b) the PDN type of the default EPS bearer context shall be mapped to the PDU session type of the PDU session as follows:

1) if the PDN type is "non-IP":

- the PDU session type is set to the locally available information associated with the PDN connection (either "Ethernet" or "Unstructured"), if available; or

- otherwise, the PDU session type is set to "Unstructured";

2) if the PDN type is "IPv4" the PDU session type is set to "IPv4";

3) if the PDN type is "IPv6", the PDU session type is set to "IPv6";

4) if the PDN type is "IPv4v6", the PDU session type is set to "IPv4v6"; and

5) if the PDN type is "Ethernet", the PDU session type is set to "Ethernet"; and

c) the APN of the default EPS bearer context shall be mapped to the DNN of the PDU session;

d) the PDU session ID shall be set to the PDU session identity included by the UE in the Protocol configuration options IE or Extended protocol configuration options IE in the PDN CONNECTIVITY REQUEST message, or to the PDU session ID associated with the default EPS bearer context; and

e) if the PDU session is not an emergency PDU session, the S-NSSAI of the PDU session shall be set to the S-NSSAI included by the network in the Protocol configuration options IE or Extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER REQUEST message, if provided by the network, or the S-NSSAI associated with the default EPS bearer context, if available.

NOTE 6: If T3584 is running or deactivated for the S-NSSAI and optionally the DNN combination, the UE is allowed to initiate ESM procedures in EPS with or without APN corresponding to that DNN, and if the APN is congested in EPS, the MME can send a back-off timer for the APN to the UE as specified in 3GPP TS 24.301 [15].

The UE shall locally release the PDN connection(s) and EPS bearer(s) associated with the 3GPP access which have not been transferred to 5GS.

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

### 6.1.5 Coordination for interworking with ePDG connected to EPC

When the UE establishes a new PDN connection via an ePDG connected to EPC, to enable the transfer of the PDN connection to N1 mode in case of inter-system change, the UE allocates a PDU session identity and indicates its value in the PDU session ID field in the N1\_MODE\_CAPABILITY Notify payload of the IKE\_AUTH request message (see 3GPP TS 24.302 [16]). The network provides the UE with an S-NSSAI in the N1\_MODE\_INFORMATION Notify payload of the IKE\_AUTH response message (see 3GPP TS 24.302 [16]).

Upon inter-system change to N1 mode, for PDN connection(s) established via an ePDG connected to EPC, if present, the UE may:

a) keep some or all of these PDN connections still via ePDG connected to EPC, if supported;

b) release some or all of these PDN connections explicitly by initiating the UE initiated tunnel disconnection procedure(s) as specified in 3GPP TS 24.302 [16]; or

c) attempt to transfer some or all of these PDN connections to N1 mode using the parameters of the PDN connection for which the UE has allocated a PDU session identity by initiating the PDU session establishment procedure(s) with the PDU SESSION ESTABLISHMENT REQUEST message created. In that case, for each and every PDN connection to be transferred:

1) if the PDN connection is for emergency bearer services, the request type shall be set to "existing emergency PDU session". Otherwise the request type shall be set to "existing PDU session";

2) if the previously allocated home address information for a PDN connection consists of an IPv4 address only for an ePDG connected to EPC according to 3GPP TS 24.302 [16], the PDU session type shall be set to "IPv4";

3) if the previously allocated home address information for a PDN connection consists of an IPv6 prefix only for an ePDG connected to EPC according to 3GPP TS 24.302 [16], the PDU session type shall be set to "IPv6";

4) if the previously allocated home address information for a PDN connection consists of both an IPv4 address and an IPv6 prefix for an ePDG connected to EPC according to 3GPP TS 24.302 [16], the PDU session type shall be set to "IPv4v6";

5) the APN of the PDN connection shall be mapped to the DNN of the PDU session;

6) the PDU session ID shall be set to the PDU session identity in the N1\_MODE\_CAPABILITY Notify payload of the IKE\_AUTH request message establishing IPsec tunnel of the PDN connection; and

7) if the PDN connection is not for emergency bearer services, the S-NSSAI of the PDU session shall be set to the S-NSSAI associated with the PDN connection as specified in 3GPP TS 24.302 [16]. The UE shall not request to perform handover of an existing PDN connection to N1 mode if the associated S-NSSAI is not included in the allowed NSSAI for the target access.