**3GPP TSG-CT WG1 Meeting #125-eC1-204766**

**Electronic meeting, 20-28 August 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3416** | **rev** | **-** | **Current version:** | **16.5.1** |  |
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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:***  | Requested PDN type after handover to non-3GPP access |
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| ***Source to WG:*** | vivo |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | SAES16 |  | ***Date:*** | 2020-08-08 |
|  |  |  |  |  |
| ***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)Rel-17 (Release 17)* |
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| ***Reason for change:*** | Call drop case was observed in real field when the user switches between VoLTE and VoWIFI. The scenario is as following:1. The UE sent the PDN CONNECTIVITY REQUEST message with the PDN type IE set to IPv4v6. The connectivity with the requested PDN is accepted, but with a restriction of IP version, for example, IPv6. ESM cause#51 "PDN type IPv6 only allowed" was be included in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message sent by the network
2. The UE performed IMS registrion using the above established PDN connection and got voice service over 3GPP access, i.e., VoLTE.
3. Due to the coverage condition, the above PDN connection for IMS service was handovered to non-3GPP access, i.e., VoWiFi, during which *the network initiated the EPS bearer context deactivation procedure* to deactivated the EPS bearer with QCI=5.
4. Due to the coverage condition changes, the above PDN connection for IMS had to be handovered back to 3GPP access, i.e., VoLTE, and the UE sent the PDN CONNECTIVITY REQUEST message with request type set to “handover”.
5. call drop happens when the UE set the PDN type IE set to “IPv4v6”.

In the above step 4, per the requirement in subclause 6.2.2 of TS24.301, the UE set the PDN type IE set to “IPv4v6” in the PDN CONNECTIVITY REQUEST message.“*The UE shall not subsequently initiate another UE requested PDN connectivity procedure to the same APN to obtain a PDN type different from the one allowed by the network until:**a) all EPS bearer contexts to the given APN are deactivated at the UE and the network as a result of:**i) EPS bearer context synchronization during tracking area updating or service request procedure;*ii) *an EPS bearer context deactivation procedure initiated by the network*;…….”However, the PDN connection transferred beween non-3GPP access and 3GPP access is served by the same PGW,and the UE’s subscription will not be changed during the handover, the restriction of IP version is still valid after handover.Besides, the EPS bearer context deactivation procedure initiated by the network is actually trigger by the handover-PDN connection request from the UE.Therefore, it is proposed that the UE shall follow the IP restriction received before the handover of PDN connection between 3GPP access and non-3GPP access. |
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| ***Summary of change:*** | The UE shall follow the IP restriction received before the handover of PDN connection between 3GPP access and non-3GPP access. |
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| ***Consequences if not approved:*** | Call drop will happen when the UE switch between VoLTE and VoWIFI. |
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| ***Clauses affected:*** | 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 \* \* \* \*

### 6.2.2 IP address allocation via NAS signalling

The UE shall set the PDN type IE in the PDN CONNECTIVITY REQUEST message, based on its IP stack configuration if it requests IP connectivity (e.g. the per APN settings specified in 3GPP TS 23.401 [10]) as follows:

a)- A UE, which is IPv6 and IPv4 capable and

- has not been allocated an IP address for this APN, shall set the PDN type IE to IPv4v6.

- has been allocated an IPv4 address for this APN and received the ESM cause #52 "single address bearers only allowed", and is requesting an IPv6 address, shall set the PDN type IE to IPv6.

- has been allocated an IPv6 address for this APN and received the ESM cause #52 "single address bearers only allowed", and is requesting an IPv4 address, shall set the PDN type IE to IPv4.

b) A UE, which is only IPv4 capable, shall set the PDN type IE to IPv4.

c) A UE, which is only IPv6 capable, shall set the PDN type IE to IPv6.

d) When the IP version capability of the UE is unknown in the UE (as in the case when the MT and TE are separated and the capability of the TE is not known in the MT), the UE shall set the PDN type IE to IPv4v6.

If the UE wants to use DHCPv4 for IPv4 address assignment, it shall indicate that to the network within the Protocol Configuration Options IE in the PDN CONNECTIVITY REQUEST.

If the UE wants to get PDN connectivity for non-IP, the UE shall set the PDN type IE in the PDN CONNECTIVITY REQUEST message to "non IP". If the UE wants to get PDN connectivity for Ethernet, the UE shall set the PDN type IE in the PDN CONNECTIVITY REQUEST message to "Ethernet".

On receipt of the PDN CONNECTIVITY REQUEST message sent by the UE, the network when allocating an IP address shall take into account the PDN type IE, the operator policies of the home and visited network, and the user's subscription data and:

- if the UE requests for PDN type IPv4v6, but the subscription is limited to IPv4 only or IPv6 only for the requested APN, the network shall override the PDN type requested by the UE to be limited to a single address PDN type (IPv4 or IPv6). In the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message sent to the UE, the network shall set the PDN type value to either "IPv4" or "IPv6" and the ESM cause value to #50 "PDN type IPv4 only allowed", or #51 "PDN type IPv6 only allowed", respectively. The UE shall not subsequently initiate another UE requested PDN connectivity procedure to the same APN to obtain a PDN type different from the one allowed by the network until:

a) all EPS bearer contexts to the given APN are deactivated at the UE as a result of:

i) EPS bearer context synchronization during tracking area updating or service request procedure;

ii) an EPS bearer context deactivation procedure initiated by the network except for the default EPS bearer context remains activated after handover to non-3GPP access;

iii) a local EPS bearer context deactivation without NAS signalling as specified in subclause 6.4.4.6;

iv) a detach procedure; or

v) a tracking area updating procedure or service request procedure that is rejected with a cause which results in the UE entering state EMM-DEREGISTERED;

b) the PDN type which is used to access to the APN is changed;

NOTE 1: Request to send another PDN CONNECTIVITY REQUEST message with a specific PDN type has to come from upper layers.

- if the UE requests PDN type IPv4v6, but the PDN GW configuration dictates the use of IPv4 addressing only or IPv6 addressing only for this APN, the network shall override the PDN type requested by the UE to limit it to a single address PDN type (IPv4 or IPv6). In the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message sent to the UE, the network shall set the PDN type value to either "IPv4" or "IPv6" and the ESM cause value to #50 "PDN type IPv4 only allowed", or #51 "PDN type IPv6 only allowed", respectively. The UE shall not subsequently initiate another UE requested PDN connectivity procedure to the same APN to obtain a PDN type different from the one allowed by the network until:

a) all EPS bearer contexts to the given APN are deactivated at the UE and the network as a result of:

i) EPS bearer context synchronization during tracking area updating or service request procedure;

ii) an EPS bearer context deactivation procedure initiated by the network except for the EPS bearer context deactivation procedure was triggered when the connectivity to a PDN is to be transferred between a non-3GPP access network and the 3GPP access network;

iii) a local EPS bearer context deactivation without NAS signalling as specified in subclause 6.4.4.6;

iv) a detach procedure; or

v) a tracking area updating procedure or service request procedure that is rejected with a cause which results in the UE entering state EMM-DEREGISTERED ;

b) the PDN type which is used to access to the APN is changed;

NOTE 2: Request to send another PDN CONNECTIVITY REQUEST message with a specific PDN type has to come from upper layers.

- if the UE requests PDN type IPv4v6, but the operator uses single addressing per bearer, e.g. due to interworking with nodes of earlier releases, the network shall override the PDN type requested by the UE to a single IP version only. In the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message sent to the UE, the network shall set the PDN type value to either "IPv4" or "IPv6" and the ESM cause value to #52 "single address bearers only allowed". The UE should subsequently request another PDN connection for the other IP version using the UE requested PDN connectivity procedure to the same APN with a single address PDN type (IPv4 or IPv6) other than the one already activated;

NOTE 3: If the MT and TE are separated, the UE might not be able to use ESM cause #52 "single address bearers only allowed" as a trigger for activating a second single-IP-stack EPS bearer context.

- if the network sets the PDN type to IPv4 or IPv4v6, the network shall include an IPv4 address in the PDN address information. In this case, if the IPv4 address is to be configured using DHCPv4, the network shall set the IPv4 address to 0.0.0.0; and

- if the network sets the PDN type to IPv6 or IPv4v6, the network shall include the interface identifier that the UE shall use for the link local address in the PDN address information.

The network shall include the PDN type and the PDN address information within the PDN address IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message sent to the UE.

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