**3GPP TSG-CT WG1 Meeting #127-eC1-207129**

**Electronic meeting, 13-20 November 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.587** | **CR** | **0152** | **rev** | **1** | **Current version:** | **16.2.1** |  |
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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:***  | Updates to the abnormal cases of the keep alive procedure |
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| ***Source to WG:*** | vivo |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-11-06 |
|  |  |  |  |  |
| ***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:*** | According to the following descriptions in clause 6.1.2.8.5.1 “Abnormal cases at the initiating UE”:….d) The initiating UE receives a PC5 signalling message other than a DIRECT LINK KEEPALIVE RESPONSE message or **PC5 user plane data** from the target UE over this PC5 unicast link while timer T5004 is running. The initiating UE shall stop timer T5004, **abort the PC5 unicast link keep-alive procedure,** start timer T5003 and increment the keep-alive counter for the PC5 unicast link.It can be seen the PC5 user plane data received from target UE also can be considered as a information that reflects the PC5 unicast link is still alive from the initiating UE’s pespective. Therefore, for the abnormal cases at the target UE during the keep alive procedure, there is also the possibility that the target UE receives a DIRECT LINK KEEPALIVE REQUEST message while it is generating the **PC5 user plane data** to be sent to the initiating UE over this PC5 unicast link. For this case, the target UE may also consider transmission of this PC5 user plane data to be an implicit DIRECT LINK KEEPALIVE RESPONSE message and skip generating a DIRECT LINK KEEPALIVE RESPONSE message. This target UE’s behaviors need to be specified. |
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| ***Summary of change:*** | Clarify that:During the keep alive procedure, if the target UE receives a DIRECT LINK KEEPALIVE REQUEST message while it is generating the **PC5 user plane data** to be sent to the initiating UE over this PC5 unicast link, the target UE may also consider transmission of this PC5 user plane data to be an implicit DIRECT LINK KEEPALIVE RESPONSE message and skip generating a DIRECT LINK KEEPALIVE RESPONSE message. |
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| ***Consequences if not approved:*** | The target UE’s behaviors are missing under the case where the target UE receives a DIRECT LINK KEEPALIVE REQUEST message while it is generating the PC5 user plane data to be sent to the initiating UE over this PC5 unicast link during the keep alive procedure. |
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| ***Clauses affected:*** | 6.1.2.8.5.2 |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* First Change \* \* \* \*

###### 6.1.2.8.5.2 Abnormal cases at the target UE

a) Timer T5005 expires.

 The target UE may:

1) initiate a PC5 unicast link keep-alive procedure to check the link; or

2) initiate the PC5 unicast link release procedure.

 Whether the UE chooses 1) or 2) is left to UE implementation.

b) The target UE receives a DIRECT LINK KEEPALIVE REQUEST message with a keep-alive counter value lower that the value which the target UE had included in the last sent DIRECT LINK KEEPALIVE RESPONSE message.

 The target UE shall discard the DIRECT LINK KEEPALIVE REQUEST message.

c) The target UE receives a DIRECT LINK KEEPALIVE REQUEST message if there is a pending PC5 signaling message or PC5 user plane data to be sent to the initiating UE over this PC5 unicast link.

 The target UE:

1) shall pass this PC5 signalling message to the lower layers for transmission along with the target UE's layer-2 ID for unicast communication and the initiating UE's layer-2 ID for unicast communication, or perform the data transmission over PC5 unicast link as specified in clause 6.1.2.9; and

2) may consider transmission of this PC5 signalling message or PC5 user plane data to be an implicit DIRECT LINK KEEPALIVE RESPONSE message and skip generating a DIRECT LINK KEEPALIVE RESPONSE message. If a maximum inactivity period is included in the DIRECT LINK KEEPALIVE REQUEST message, the target UE shall stop T5005, if running, and start T5005 with its value set to the maximum inactivity period.

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