**3GPP TSG-CT WG1 Meeting #141eC1-232582**

**Electronic, 17 – 21 April 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **24.554** | **CR** | **0332** | **rev** | **-** | **Current version:** | **18.0.0** |  |
|  |
| *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:***  | Update to ProSe direct link modification messages for U2U relay |
|  |  |
| ***Source to WG:*** | CATT |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5G\_ProSe\_Ph2 |  | ***Date:*** | 2023-04-10 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-18 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | In clause 6.7.1.1 of TS 23.304, it describes:"In the case of one source 5G ProSe Layer-3 End UE communicates with multiple target 5G ProSe Layer-3 End UEs, the PC5 link between the source 5G ProSe Layer-3 End UE and the 5G ProSe Layer-3 UE-to-UE Relay can be shared for multiple target 5G ProSe Layer-3 End UEs per RSC while the PC5 links may be established individually between the 5G ProSe Layer-3 UE-to-UE Relay and target 5G ProSe Layer-3 End UEs per RSC. For the shared PC5 link, the Layer-2 link modification procedure shall be used.In the case of multiple source 5G ProSe Layer-3 End UEs communicate with one target 5G ProSe Layer-3 End UE, the PC5 link between the 5G ProSe Layer-3 UE-to-UE Relay and the target 5G ProSe Layer-3 End UE can be shared per RSC while the PC5 links may be established individually between the source 5G ProSe Layer-3 End UEs and the 5G ProSe Layer-3 UE-to-UE Relay per RSC. For the shared PC5 link, the Layer-2 link modification procedure shall be used."Based on the above requirements, the ProSe direct link modification messages are updated to address the shared PC5 link scenarios for U2U relay. |
|  |  |
| ***Summary of change:*** | Update the ProSe direct link modification messages to address the shared PC5 link scenarios for U2U relay, i.e. one 5G ProSe layer-3 end UE using one shared PC5 link with the 5G ProSe layer-3 U2U relay UE to communicates with multiple 5G ProSe layer-3 end UEs. |
|  |  |
| ***Consequences if not approved:*** | Shared PC5 link scenarios for U2U relay is not supported. |
|  |  |
| ***Clauses affected:*** | 10.3.6.1, 10.3.6.3, 10.3.6.4, 10.3.6.x (new), 10.3.7.4, 10.3.7.5, 11.3.19 |
|  |  |
|  | **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 Change \* \* \* \*

#### 10.3.6.1 Message definition

This message is sent by the UE to another peer UE to initiate the direct link modification procedure. See table 10.3.6.1.1.

Message type: PROSE DIRECT LINK MODIFICATION REQUEST

Significance: dual

Direction: UE to peer UE

Table 10.3.6.1.1: PROSE DIRECT LINK MODIFICATION REQUEST message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | PROSE DIRECT LINK MODIFICATION REQUEST message identity | ProSe PC5 signalling message type11.3.1 | M | V | 1 |
|  | Sequence number | Sequence number11.3.2 | M | V | 1 |
|  | Link modification operation code | Link modification operation code11.3.19 | M | V | 1 |
|  | QoS flow descriptions | PC5 QoS flow descriptions11.3.5 | M | LV-E | 5-65537 |
| 7C | QoS rules | PC5 QoS rules11.3.29 | O | TLV-E | 7-65538 |
| XY | Source end UE info | User info ID11.3.xz | O | TLV | 3-257 |
| XZ | Target end UE info | User info ID11.3.xz | O | TLV | 3-257 |
| ZZ | Target end UE layer-2 ID | Layer-2 ID11.3.25 | O | TV | 4 |
| 7B | ProSe identifiers | ProSe identifier11.3.3 | O | TLV-E | 21-65538 |

Editor's note: It is FFS whether to include and how to set the ProSe identifier(s) for the 5G ProSe direct link between the source5G ProSe layer-3 end UE and 5G ProSe layer-3 UE-to-UE relay UE, and the 5G ProSe direct link between the 5G ProSe layer-3 UE-to-UE relay UE and the target 5G ProSe layer-3 end UE.

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

#### 10.3.6.3 Source end UE info

The UE shall include this IE to indicate the user info ID of the source 5G ProSe end UE if:

a) the UE acts as a 5G ProSe layer-3 UE-to-UE relay UE;

b) the 5G ProSe direct link is between the 5G ProSe layer-3 UE-to-UE relay UE and the target 5G ProSe layer-3 end UE; and

c) one of the following conditions is met:

1) multiple source 5G ProSe layer-3 end UEs have established direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link;

2) an additional source 5G ProSe end UE requests to establish direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link; or

3) one of the source 5G ProSe layer-3 end UEs requests to release the direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link.

The UE may include this IE to indicate the user info ID of the source 5G ProSe end UE if:

a) the UE acts as a 5G ProSe UE-to-UE relay UE;

b) the 5G ProSe direct link is between the 5G ProSe UE-to-UE relay UE and the target 5G ProSe end UE; and

c) only one source 5G ProSe end UE has established direct communication with the target 5G ProSe end UE via the 5G ProSe UE-to-UE relay UE using the 5G ProSe direct link.

#### 10.3.6.4 Target end UE info

The UE shall include this IE to indicate the user info ID of the target 5G ProSe end UE if:

a) the UE acts as a source 5G ProSe layer-3 end UE;

b) the 5G ProSe direct link is between the source 5G ProSe layer-3 end UE and the 5G ProSe layer-3 UE-to-UE relay UE; and

c) one of the following conditions is met:

1) the source 5G ProSe layer-3 end UE have established direct communication with multiple target 5G ProSe layer-3 end UEs via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link;

2) the source 5G ProSe layer-3 end UE requests to establish direct communication with an additional target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link; or

3) the source 5G ProSe layer-3 end UE requests to release the direct communication with one of the target 5G ProSe layer-3 end UEs via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link.

The UE may include this IE to indicate the user info ID of the target 5G ProSe end UE if:

a) the UE acts as a source 5G ProSe end UE, the 5G ProSe direct link is between the source 5G ProSe end UE and the 5G ProSe UE-to-UE relay UE, and the source 5G ProSe end UE has established direct communication with only one target 5G ProSe end UE via the 5G ProSe UE-to-UE relay UE using the 5G ProSe direct link; or

b) the UE acts as a 5G ProSe UE-to-UE relay UE and the 5G ProSe direct link is between the 5G ProSe UE-to-UE relay UE and the target 5G ProSe end UE.

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

#### 10.3.6.x ProSe identifiers

The UE shall include this IE if:

a) the UE acts as a source 5G ProSe layer-3 end UE, the 5G ProSe direct link is between the source 5G ProSe layer-3 end UE and the 5G ProSe layer-3 UE-to-UE relay UE, and the source 5G ProSe layer-3 end UE requests to communicate with an additional target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link; or

b) the UE acts as a 5G ProSe layer-3 UE-to-UE relay UE, the 5G ProSe direct link is between the 5G ProSe layer-3 UE-to-UE relay UE and the target 5G ProSe layer-3 end UE, and an additional source 5G ProSe end UE requests to communicate with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link.

Editor's note: It is FFS for the above cases whether the PQFI(s) and the corresponding PC5 QoS parameters, including the ProSe identifier(s), are included instead of the ProSe identifier(s) only.

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

#### 10.3.7.4 Source end UE info

The UE shall include this IE to indicate the user info ID of the source 5G ProSe end UE if:

a) the UE acts as a target 5G ProSe layer-3 end UE;

b) the 5G ProSe direct link is between the 5G ProSe layer-3 UE-to-UE relay UE and the target 5G ProSe layer-3 end UE; and

c) one of the following conditions is met:

1) multiple source 5G ProSe layer-3 end UEs have established direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link;

2) an additional source 5G ProSe end UE requests to establish direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link; or

3) one of the source 5G ProSe layer-3 end UEs requests to release the direct communication with the target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link.

The UE may include this IE to indicate the user info ID of the source 5G ProSe end UE if:

a) the UE acts as a target 5G ProSe end UE;

b) the 5G ProSe direct link is between the 5G ProSe UE-to-UE relay UE and the target 5G ProSe end UE; and

c) only one source 5G ProSe end UE has established direct communication with the target 5G ProSe end UE via the 5G ProSe UE-to-UE relay UE using the 5G ProSe direct link.

#### 10.3.7.5 Target end UE info

The UE shall include this IE to indicate the user info ID of the target 5G ProSe end UE if:

a) the UE acts as a 5G ProSe layer-3 UE-to-UE relay UE;

b) the 5G ProSe direct link is between the source 5G ProSe layer-3 end UE and the 5G ProSe layer-3 UE-to-UE relay UE; and

c) one of the following conditions is met:

1) the source 5G ProSe layer-3 end UE have established direct communication with multiple target 5G ProSe layer-3 end UEs via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link;

2) the source 5G ProSe layer-3 end UE requests to establish direct communication with an additional target 5G ProSe layer-3 end UE via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link; or

3) the source 5G ProSe layer-3 end UE requests to release the direct communication with one of the target 5G ProSe layer-3 end UEs via the 5G ProSe layer-3 UE-to-UE relay UE using the same 5G ProSe direct link.

The UE may include this IE to indicate the user info ID of the target 5G ProSe end UE if:

a) the UE acts as a 5G ProSe UE-to-UE relay UE;

b) the 5G ProSe direct link is between the source 5G ProSe end UE and the 5G ProSe UE-to-UE relay UE; and

c) the source 5G ProSe end UE has established direct communication with only one target 5G ProSe end UE via the 5G ProSe UE-to-UE relay UE using the 5G ProSe direct link.

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

### 11.3.19 Link modification operation code

The purpose of the Link modification operation code information element is to indicate what the operation of the 5G ProSe direct link modification procedure triggered by initiating UE is.

The Link modification operation code is a type 3 information element, with a length of 2 octets.

The Link modification operation code information element is coded as shown in figure 11.3.19.1 and table 11.3.19.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Link modification operation code IEI | octet 1 |
| Link modification operation code | octet 2 |

Figure 11.3.19.1: Link modification operation code information element

Table 11.3.19.1: Link modification operation code information element

|  |
| --- |
| Link modification operation code (octet 2) |
| Bits |
| 4 | 3 | 2 | 1 |  |  |
| 0 | 0 | 0 | 1 |  | void |
| 0 | 0 | 1 | 0 |  | void |
| 0 | 0 | 1 | 1 |  | Add new PC5 QoS flow(s) to the existing 5G ProSe direct link |
| 0 | 1 | 0 | 0 |  | Modify PC5 QoS parameters of the existing PC5 QoS flow(s) |
| 0 | 1 | 0 | 1 |  | Remove existing PC5 QoS flow(s) from the existing 5G ProSe direct link |
| 0 | 1 | 1 | 0 |  | Associate new ProSe application(s) with existing PC5 QoS flow(s) |
| 0 | 1 | 1 | 1 |  | Remove ProSe application(s) from existing PC5 QoS flow(s) |
| 1 | 0 | 0 | 0 |  | Add new 5G ProSe layer-3 end UE to the existing 5G ProSe direct link |
| 1 | 0 | 0 | 1 |  | Remove 5G ProSe layer-3 end UE from the existing 5G ProSe direct link |
| 1 | 0 | 1 | 0 |  |  |
| to |  | Spare |
| 1 | 1 | 1 | 0 |  |  |
| 1 | 1 | 1 | 1 |  | Reserved |
|  |
| Bit 5 to 8 of octet 2 are spare and shall be coded as zero. |

\* \* \* End of Changes \* \* \* \*