**3GPP TSG-WG SA2 Meeting #166S2-2411968**

**18th – 22nd November, 2024, Orlando, US (revision of S2-240xxxx)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.304** | **CR** | **0505** | **rev** | **-** | **Current version:** | **19.1.0** |  |
|  | | | | | | | | |
| *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 | **X** |

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| ***Title:*** | Update on QoS handling for Multihop U2U and U2N Relay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon, KPN.N.V. | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_ProSe\_Ph3 | | | | |  | ***Date:*** | | | 2024-11-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Addition of features to support QoS handling for multi-hop Layer-3 UE-to-UE Relay for non-IP PDU type based on the Conclusions for KI#2 in TR 23.700-03. | | | | | | | | |
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| ***Summary of change:*** | | 1. Update QoS handling for 5G ProSe Layer-3 UE-to-UE Relay in terms of multi-hop. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete and unclear description for U2U non-IP type PDU procedures. | | | | | | | | |
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| ***Clauses affected:*** | | 5.6.3.1, | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

#### 5.6.3.1 QoS handling for 5G ProSe Layer-3 UE-to-UE Relay

For a 5G ProSe Layer-3 End UE connecting with another 5G ProSe Layer-3 End UE(s) via 5G ProSe Layer-3 UE-to-UE Relay, the QoS requirement of the relay traffic between the peer 5G ProSe Layer-3 End UE(s) can be satisfied by the corresponding QoS control for the PC5 link between source 5G ProSe Layer-3 End UE and 5G ProSe Layer-3 UE-to-UE Relay (i.e. first hop PC5 QoS control) and the QoS control for the PC5 link between 5G ProSe Layer-3 UE-to-UE Relay and target 5G ProSe Layer-3 End UE (i.e. second hop PC5 QoS control). The first hop PC5 QoS and second hop PC5 QoS is controlled with PC5 QoS rules and PC5 QoS parameters (e.g. PQI, GFBR, MFBR, PC5 LINK-AMBR) as specified in clause 5.6.1.

As shown in figure 5.6.3.1-1 below, the end-to-end QoS is met only when the QoS requirements are properly translated and satisfied over the two legs respectively.



Figure 5.6.3.1-1: End-to-End QoS for 5G ProSe Layer-3 UE-to-UE Relay operation

To achieve this, the source 5G ProSe Layer-3 End UE initiates PC5 QoS Flows setup or modification during the Layer-2 link establishment or modification procedure, the source 5G ProSe Layer-3 End UE provides the QoS Info as described in clause 6.4.3.7.3 to the 5G ProSe Layer-3 UE-to-UE Relay. The received PC5 QoS parameters of the QoS Info (i.e. PQI and conditionally other parameters such as MFBR/GFBR, etc.) are interpreted as the end-to-end QoS requirements by the 5G ProSe Layer-3 UE-to-UE Relay for the traffic transmission between source 5G ProSe Layer-3 End UE and target 5G ProSe Layer-3 End UE. The source 5G ProSe Layer-3 End UE derives the end-to-end QoS parameters as defined in clause 5.6.1. The 5G ProSe Layer-3 UE-to-UE Relay, based on its implementation, decides the PQI for the first hop PC5 QoS control and the PQI for the second hop PC5 QoS control, by considering the received PC5 QoS parameters from the source 5G ProSe Layer-3 End UE. The 5G ProSe Layer-3 UE-to-UE Relay provides the QoS Info (including PQI value chosen by the 5G ProSe Layer-3 UE-to-UE Relay for the second hop) to the target 5G ProSe Layer-3 End UE. After accepted QoS Info of the second hop QoS from the target 5G ProSe Layer-3 End UE is received, 5G ProSe Layer-3 UE-to-UE Relay provides the QoS Info (including PQI value chosen by the 5G ProSe Layer-3 UE-to-UE Relay for the first hop) to the source 5G ProSe Layer-3 End UE with considering the received second hop QoS. If the source 5G ProSe Layer-3 End UE performs the Layer-2 link modification procedure to add new PC5 QoS Flow(s) or modify the existing PC5 QoS Flow(s) for IP traffic or Ethernet traffic over PC5 reference point, the source 5G ProSe Layer-3 End UE may also provide the PC5 QoS Rule(s) for the PC5 QoS Flow(s) to be added or modified to the 5G ProSe Layer-3 UE-to-UE Relay. The 5G ProSe Layer-3 UE-to-UE Relay may generate the Packet Filters used over the second hop based on the received PC5 QoS Rule(s).

For multi-hop 5G ProSe Layer-3 UE-to-UE Relay for non-IP type PDU, each 5G ProSe Layer-3 UE-to-UE Relays split the QoS parameters, according to the received QoS Info, into two parts: one part is the QoS parameters of the previous hop, the other part is the QoS parameters from the 5G ProSe Layer-3 UE-to-UE Relay to the target End UE (the rest QoS parameters). The 5G ProSe Layer-3 UE-to-UE Relay sends the rest QoS parameters to the next hop.

As shown in figure 5.6.3.1-2 below, the end-to-end QoS is met only when the QoS requirements are properly satisfied over the multiple legs respectively.

Figure 5.6.3.1-2: End-to-End QoS for Multi-hop 5G ProSe Layer-3 UE-to-UE Relay for non-IP type PDU operation

Source End UE1

UE-to-UE

Relay1

Target End UE2

UE-to-UE

Relay(s)

PC5

PC5

PC5

1st hop PC5 QoS (PQI)

E2E QoS for a relay service

PC5 QoS (PQI)

PC5 QoS (PQI)

To achieve this, when the source End UE sets up a PC5 QoS Flow, it provides the End-to-End QoS parameters to a 5G ProSe Layer-3 UE-to-UE Relay. Each 5G ProSe Layer-3 UE-to-UE Relay splits the QoS parameters, according to the received QoS Info, into the QoS parameters of the previous hop and the QoS parameters from itself to the target End UE. The 5G ProSe Layer-3 UE-to-UE Relay sends the rest PC5 QoS parameters to the next hop.

The target End UE and each 5G ProSe Layer-3 UE-to-UE Relay sends the accepted PC5 QoS parameters and the accumulated QoS parameters to the previous hop during the Layer-2 link establishment or modification procedure. The accepted PC5 QoS parameters can be determined based on the QoS parameters of the previous hop as mentioned above, with considering the received accumulated QoS from next hop, e.g. the accumulated QoS may not be equal to the rest PC5 QoS previously sent.

The accumulated QoS parameter is interpreted as the summation of accepted QoS parameters of the all PC5 links from the receiver to the target End UE.

\* \* \* \* End of changes \* \* \* \*