**3GPP TSG-CT WG1 Meeting #141eC1-232551**

**Online 17– 21 April 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **24.554** | **CR** | **0319** | **rev** |  | **Current version:** | **18.0.0** |  |
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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:***  | Support of Emergency service relaying by 5G ProSe UE-to-Network  |
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| ***Source to WG:*** | C1 |
| ***Source to TSG:*** | China Telecom |
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| ***Work item code:*** | 5G\_ProSe\_Ph2 |  | ***Date:*** | 2023-04-10 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***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)* |
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| ***Reason for change:*** | S2-2303868 has introduced the emergency functionality concluded for KI#7 in TR 23.700-33 v18.0.0.*The following conclusions are* ***common to Layer-2 and Layer-3 UE-to-Network Relaying****:**- For emergency service, the UE shall prioritise direct connection to network. If direct connection is not possible (including the case that the RAN broadcast SIB indicates no emergency support), the UE shall attempt to obtain emergency service via UE-to-Network Relay.**- A 5G ProSe enabled UE acting as Relay shall have a normal registration (including also normal registration for a 5G ProSe Relay enabled UE in Non-Allowed Area). A 5G ProSe Relay enabled UE in limited-service state shall not act as Relay. Mobility Restrictions that are overruled for UE requesting direct emergency service are overruled also for 5G ProSe UE-to-Network Relay that is relaying emergency service.**- A 5G ProSe enabled UE without direct connection to the network for emergency service may request emergency service via the 5G ProSe Relay.**- RSC(s) dedicated for emergency service needs to be provisioned in the 5G ProSe enabled UEs with capability of Relay UE and Remote UE using procedure as specified in clause 5.1.4 of TS 23.304 [3]. The dedicated RSC(s) are used by the 5G ProSe UE-to-Network Relay UE and Remote UE during discovery and PC5 link establishment.**- A dedicated PC5 link associated with an emergency RSC is only used for emergency service. A 5G ProSe enabled UE shall not advertise its support for relaying emergency service unless the serving network has provided an indication of support of relaying of emergency service.**NOTE 1: Whether a 5G ProSe Layer-2 UE-to-Network Relay needs the indication of support of relaying emergency services from its serving PLMN before advertising its support of relaying emergency services is to be determined in normative phase.**- If the 5G ProSe Relay needs to establish RRC Connection when the 5G ProSe Remote UE has requested emergency service over PC5, the 5G ProSe Relay shall use "Emergency" RRC Establishment Cause.**- Emergency call back for 5G ProSe UE-to-Network Remote UE regulatory requirements will be supported using existing functionality defined for Emergency Services.**- The existing positioning function are reused for the 5G ProSe Remote UE. If no other information is available, the location of the 5G ProSe UE-to-Network Relay can be used as Remote UE location estimate.**NOTE 2: Whether and how PC5 security is used for emergency services is to be determined in the normative phase as part of SA3 alignment.**The following conclusions apply to* ***Layer-2 UE-to-Network Relaying****:**- For a 5G ProSe Layer-2 UE-to-Network Relay to advertise its support of emergency service, the serving NG-RAN support of emergency services is required as the Layer-2 Remote UE may select a different PLMN from the Layer-2 Relay.**- A 5G ProSe Layer-2 Remote UE will set its RRC establishment cause to "emergency" when establishing RRC connection from RRC\_IDLE.**- When NG-RAN receives an emergency RRC establishment from a 5G ProSe Layer-2 Remote UE it may need to direct the initial UE message towards its PLMN as in legacy.**The following conclusions apply to* ***Layer-3 UE-to-Network Relaying****:**- A 5G ProSe Layer-3 UE-to-Network Relay participates the relay discovery procedure for emergency service only when it receives the Emergency Service Support indicator in Registration Accept.**- If PC5 connection was requested using emergency RSC, then the 5G ProSe Layer-3 Relay sets the RRC Establishment cause to "emergency" when establishing an RRC connection from RRC\_IDLE.**- The emergency number(s) may be preconfigured in the 5G ProSe Remote UE**- For Layer-3 UE to Network Relaying, the Remote UE may obtain P-CSCF address from the Relay UE via DHCP or may be preconfigured with P-CSCF address.**NOTE 3: Remote UE obtaining P-CSCF address via DHCP is specified in clause 14A.2.1 of TS 24.379 [26].**- A Layer-3 UE-to-Network Relay sets up ~~or modifies~~ an emergency PDU session to support the Remote UE's emergency service.**- When a 5G ProSe Layer-3 UE-to-Network Relay UE initiates emergency service, the 5G ProSe Relay UE shall not advertise its support of emergency service and reject any Remote UE’s requests for relaying emergency services. The 5G ProSe Layer-3 UE-to-Network Remote UE can attempt to select other 5G ProSe Layer-3 UE-to-Network Relay.**- If the 5G ProSe Layer-3 Relay is relaying an emergency service for a 5G ProSe Layer-3 Remote UE, then it shall prioritise its own emergency service establishment and stop relaying the Remote UEs emergency service.**Editor's note: SA WG1 is expected to verify the service requirement for pre-empting relayed emergency service.**- A 5G ProSe Layer-3 Remote UE should attempt to use 5G ProSe Communication via 5G ProSe Layer-3 UE-to-Network Relay without N3IWF procedures before attempting to establish an emergency PDU Session via 5G ProSe Layer-3 UE-to-Network Relay with N3IWF support.* |
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| ***Summary of change:*** | Add some description of Emergency service for UE-to-Network Relaying in the stage-3 spec |
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| ***Consequences if not approved:*** | Emergency service via 5G ProSe Remote UE is not specified in the stage-3 spec. |
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| ***Clauses affected:*** | 8.2.1.1 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* Start of Changes \* \* \*

\* \* \* Next Changes \* \* \*

#### 8.2.1.1 General

This clause describes the procedures for both layer-3 and layer-2 UE-to-network relay discovery for public safety use and commercial services at a ProSe-enabled UE over the PC5 interface. The purpose of the UE-to-network relay discovery procedure over PC5 interface is to enable a ProSe-enabled UE to detect and identify another ProSe-enabled UE over PC5 interface for UE-to-network relay communication between a UE and 5GC.

NOTE 1: Relaying Multicast/Broadcast Service traffic to a 5G ProSe remote UE by a 5G ProSe UE-to-network relay is not supported in this release of the specification.

A 5G ProSe UE-to-network relay supporting multiple relay service codes can advertise the relay service codes using multiple discovery messages, with one relay service code per discovery message.

The following principles for 5G ProSe UE-to-network relay apply when the 5G ProSe UE-to-network relay UE or the 5G ProSe remote UE is in service area restriction as defined in clause 5.3.5 of 3GPP TS 24.501 [11], except the case when the 5G ProSe UE-to-network relay UE is relaying the emergency service for the 5G ProSe remote UE:

a) in non-allowed area of its serving PLMN, the 5G ProSe layer-3 UE-to-network relay UE is not allowed to perform relay operations (e.g., UE-to-network relay discovery as specified in clause 8.2.1, or accept the 5G ProSe direct link establishment procedure as specified in clause 7.2.2) except for e.g. high priority access as defined in clause 5.3.5 of 3GPP TS 24.501 [11] based on relay service codes as specified in clause 5.2.5;

b) service area restriction is not applicable to the 5G ProSe layer-3 remote UE;

c) in non-allowed area of its serving PLMN, the 5G ProSe layer-2 UE-to-network relay UE is not allowed to perform relay operations (e.g., UE-to-network relay discovery as specified in clause 8.2.1, or accept the 5G ProSe direct link establishment procedure as specified in clause 7.2.2); and

d) in non-allowed area of its serving PLMN, the 5G ProSe layer-2 remote UE follows the same principles of service area restrictions as specified in clause 5.3.5 of 3GPP TS 24.501 [11] for communication with the network via the 5G ProSe layer-2 UE-to-network relay UE, taking into account the TAI in the RRC container received from the 5G ProSe layer-2 UE-to-network relay UE.

NOTE 2: Closed access group information is not specified for 5G ProSe.

NOTE 3: Principles of operation for emergency services (incl. exceptions from mobility restrictions) are not specified in this release of the specification.

The following principles for 5G ProSe UE-to-network relay apply when the relay UE or the 5G ProSe remote UE is in 5GS forbidden tracking areas as defined in clause 5.3.13 of 3GPP TS 24.501 [11], except the case when the 5G ProSe UE-to-network relay UE is relaying the emergency service for the 5G ProSe remote UE:

a) in a 5GS forbidden tracking area of its serving PLMN, the 5G ProSe UE-to-network relay UE is not allowed to perform relay operations; and

b) in a 5GS forbidden tracking area of its serving PLMN, the 5G ProSe remote UE is not allowed to access the network via the 5G ProSe UE-to-network relay UE, taking into account the TAI in the RRC container received from the 5G ProSe layer-2 UE-to-network relay UE.

To perform UE-to-network relay discovery over PC5 interface, the UE is configured with the related information as described in clause 5.2.5. The following models for UE-to-network relay discovery procedure over PC5 interface as specified in 3GPP TS 23.304 [2] are supported:

a) Model A uses a single discovery protocol message (Announcement); and

b) Model B uses two discovery protocol messages (Solicitation and Response).

NOTE 4: If the UE is authorized to perform both 5G ProSe UE-to-network relay discovery Model A and 5G ProSe UE-to-network relay discovery Model B, it is up to UE implementation to select which model to perform or perform both models simultaneously.

The 5G ProSe UE-to-network relay UE and 5G ProSe layer-3 remote UE may use the PC5 DRX mechanism to perform 5G ProSe UE-to-network relay discovery over PC5 interface when the UE is not served by NG-RAN as specified in clause 5.2.5.

The following procedures are defined for UE-to-network relay discovery procedure over PC5 interface:

a) UE-to-network relay discovery over PC5 interface with Model A:

1) Announcing UE procedure for UE-to-network relay discovery initiation;

2) Announcing UE procedure for UE-to-network relay discovery completion;

3) Monitoring UE procedure for UE-to-network relay discovery initiation;

4) Monitoring UE procedure for UE-to-network relay discovery completion;

5) Announcing UE procedure for UE-to-network relay discovery additional information; and

6) Monitoring UE procedure for UE-to-network relay discovery additional information; and

b) UE-to-network relay discovery over PC5 interface with Model B:

1) Discoverer UE procedure for UE-to-network relay discovery initiation;

2) Discoverer UE procedure for UE-to-network relay discovery completion;

3) Discoveree UE procedure for UE-to-network relay discovery initiation; and

4) Discoveree UE procedure for UE-to-network relay discovery completion.

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