**3GPP TSG-CT WG1 Meeting #138-eC1-225716**

**E-Meeting, 10th – 14th Oct 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.554** | **CR** | **0179** | **rev** | **-** | **Current version:** | **.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 | **X** | Core Network |  |

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| ***Title:*** | Apply PC5 DRX to Layer-2 relay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_ProSe | | | | |  | ***Date:*** | | | 2022-09-26 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | It has been clarified in Stage 2 that PC5 DRX is also applied to 5G ProSe layer-2 U2N relay, see TS 23.304 clause 5.4.2, 5.13.1, 5.13.2, 5.13.3 and 6.4.3.1. | | | | | | | | |
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| ***Summary of change:*** | | Corrections are made to indicate 5G ProSe layer-2 U2N relay also use PC5 DRX configuration/mechanism for discovery over PC5 interface.  Backward compatibility analysis:  This CR is backward compatible. Apply PC5 DRX to Layer-2 relay. There is no impact on existing implementations. | | | | | | | | |
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| ***Consequences if not approved:*** | | Stage 3 does not align with Stage 2 specifications. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.5, 8.2.1.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

### 5.2.5 Configuration parameters for 5G ProSe UE-to-network relay

The configuration parameters for the role of a ProSe UE-to-network relay UE over PC5 reference point consist of:

a) a validity timer for the validity of the configuration parameter for 5G ProSe UE-to-network relay over PC5 interface;

b) a list of PLMNs in which the UE is authorised to relay traffic for 5G ProSe layer-3 remote UEs when the UE is served by NG-RAN and in each PLMN, where that authorization also authorizes the use of both 5G ProSe UE-to-network relay discovery Model A and 5G ProSe UE-to-network relay discovery Model B;

c) a list of PLMNs in which the UE is authorised to relay traffic for 5G ProSe layer-2 remote UEs when the UE is served by NG-RAN and in each PLMN, where that authorization also authorizes the use of both 5G ProSe UE-to-network relay discovery Model A and 5G ProSe UE-to-network relay discovery Model B;

d) the default destination layer-2 ID(s) for sending the discovery signalling for announcement and additional information and for receiving the discovery signalling for solicitation;

NOTE 1: Which default destination layer-2 ID is selected is up to UE implementation when there are more than one default destination layer-2 ID.

e) a User info ID for the UE-to-network relay discovery;

f) one or more relay service code(s) for the UE-to-network relay discovery and for each relay service code:

1) security related content for 5G ProSe relay discovery that is used when the security procedure over control plane as specified in 3GPP TS 33.503 [34] is used, including a validity timer for that security related content;

2) an indication of whether the relay service code is offering 5G ProSe layer-2 or layer-3 UE-to-network relay service;

3) for 5G ProSe layer-3 UE-to-network relay UE, a set of PDU session parameters:

i) PDU Session type;

ii) optionally, DNN;

iii) optionally, SSC Mode;

iv) optionally, S-NSSAI; and

v) optionally, access type preference;

4) for 5G ProSe layer-2 UE-to-network relay UE and 5G ProSe layer-3 UE-to-network relay UE, security policies for 5G ProSe UE-to-network relay direct communication:

i) the signalling integrity protection policy;

ii) the signalling ciphering policy;

iii) the user plane integrity protection policy; and

iv) the user plane ciphering policy; and

5) for 5G ProSe layer-2 UE-to-network relay UE and 5G ProSe layer-3 UE-to-network relay UE, an indication whether to use the security procedure over control plane as specified in 3GPP TS 33.503 [34]. If that indication indicates not to use the security procedure over control plane, the 5G ProSe UE-to-network relay UE uses the security procedure over user plane as specified in 3GPP TS 33.503 [34];

NOTE 2: If that indication indicates to use the security procedure over control plane and the 5G ProSe UE-to-network relay UE doesn't support the security procedure over control plane, the 5G ProSe UE-to-network relay UE doesn't use that relay service code.

g) for 5G ProSe layer-3 UE-to-network relay UE, QoS mapping rules including:

1) a mapping between a 5QI value and a 5G ProSe PQI value over PC5 for traffic relayed over the PC5 interface;

2) a PDB adjustment factor of the standardized PDB identified by the PQI; and

3) optionally, the relay service code(s) associated with the QoS mapping rule;

h) the radio parameters of the 5G ProSe UE-to-network relay discovery applicable per geographical area with an indication of whether these radio parameters are "operator managed" or "non-operator managed" when the UE is not served by NG-RAN;

i) for 5G ProSe layer-3 UE-to-network relay UE, for Ethernet and Unstructured traffic using IP type PDU session, a list of ProSe identifier(s) to ProSe application server address mapping rule. Each mapping rule contains one or more ProSe identifier(s) and IP address/FQDN and transport layer port number;

j) the radio parameters of the 5G ProSe direct communication applicable per geographical area with an indication of whether these radio parameters are "operator managed" or "non-operator managed" when the UE is not served by NG-RAN; and

k) optionally, the 5G PKMF addressing information;

l) for 5G ProSe UE-to-network relay UE, the default PC5 DRX configuration for discovery as specified in 3GPP TS 38.331 [13] when the UE is not served by NG-RAN; and

m) the privacy timer value for changing the source layer-2 ID assigned by the 5G ProSe UE-to-network relay UE for direct communication, as specified in 3GPP TS 24.555 [17].

The configuration parameters for the role of a 5G ProSe remote UE consist of:

a) a validity timer for the validity of the configuration parameters for 5G ProSe remote UE;

b) an indication whether the UE is authorized to use a 5G ProSe layer-3 UE-to-network relay UE, where that authorization also authorizes the use of both 5G ProSe UE-to-network relay discovery Model A and 5G ProSe UE-to-network relay discovery Model B;

c) a list of PLMNs in which the UE is authorized to use a 5G ProSe layer-2 UE-to-network relay UE, where that authorization also authorizes the use of both 5G ProSe UE-to-network relay discovery Model A and 5G ProSe UE-to-network relay discovery Model B;

d) default destination layer-2 ID(s) for sending the discovery signalling for solicitation and for receiving the discovery signalling for announcement and additional information;

NOTE 3: Which default destination layer-2 ID is selected is up to UE implementation when there are more than one default destination layer-2 ID.

e) a user info ID for the UE-to-network relay discovery;

f) one or more relay service code(s) for the UE-to-network relay discovery and for each relay service code:

1) security related content for 5G ProSe relay discovery that is used when the security procedure over control plane as specified in 3GPP TS 33.503 [34] is used, including a validity timer for that security related content;

2) an indication of whether the relay service code is offering 5G ProSe layer-2 or layer-3 UE-to-network relay service; and

3) for 5G ProSe remote UE using 5G ProSe layer-3 UE-to-network relays, one of the following:

i) a set of PDU session parameters for the relayed traffic without using N3IWF access:

A) PDU Session type;

B) optionally, DNN;

C) optionally, SSC Mode;

D) optionally, S-NSSAI; and

E) optionally, access type preference; or

ii) an indication of using N3IWF access for the relayed traffic;

4) for 5G ProSe remote UE using 5G ProSe layer-2 UE-to-network relays or 5G ProSe layer-3 UE-to-network relays, security policies for 5G ProSe UE-to-network relay direct communication:

i) the signalling integrity protection policy;

ii) the signalling ciphering policy;

iii) the user plane integrity protection policy;

iv) the user plane ciphering policy;

5) optionally, for 5G ProSe remote UE using 5G ProSe layer-3 UE-to-network relays, the ProSe application traffic descriptor(s) (as defined in 3GPP TS 24.526 [5]) to be used for the relayed traffic; and

6) for 5G ProSe layer-2 remote UE and 5G ProSe layer-3 remote UE, an indication whether to use the security procedure over control plane as specified in 3GPP TS 33.503 [34]. If that indication indicates not to use the security procedure over control plane, the 5G ProSe remote UE uses the security procedure over user plane as specified in 3GPP TS 33.503 [34];

NOTE 4: If that indication indicates to use the security procedure over control plane and the 5G ProSe remote UE doesn't support the security procedure over control plane, the 5G remote UE doesn't use that relay service code.

g) the radio parameters of the 5G ProSe Relay Discovery applicable per geographical area with an indication of whether these radio parameters are "operator managed" or "non-operator managed" when the UE is not served by NG-RAN;

h) the radio parameters of the 5G ProSe direct communication applicable per geographical area with an indication of whether these radio parameters are "operator managed" or "non-operator managed" when the UE is not served by NG-RAN;

NOTE 3: Whether a frequency band is "operator managed" or "non-operator managed" in a given Geographical Area is defined by local regulations.

i) the N3IWF selection information for 5G ProSe layer-3 remote UE:

1) N3IWF identifier configuration (either FQDN or IP address); and

2) 5G ProSe layer-3 UE-to-network relays, access node selection information consists of a prioritized list of PLMNs for N3IWF selection and an indication that the selection of an N3IWF in a PLMN should be based on Tracking Area Identity FQDN or on Operator Identifier FQDN;

j) optionally, the 5G PKMF addressing information;

k) for 5G ProSe remote UE, the default PC5 DRX configuration for discovery as specified in 3GPP TS 38.331 [13] when the UE is not served by NG-RAN; and

l) the privacy timer value for changing the source layer-2 ID assigned by the 5G ProSe remote UE for direct communication, as specified in 3GPP TS 24.555 [17].

\* \* \* next change \* \* \*

#### 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 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]:

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]:

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 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 \* \* \*