**3GPP TSG-CT WG1 Meeting #126-eC1-206039**

**Electronic meeting, 15-23 October 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.587** | **CR** | **0125** | **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:***  | Correction on using provisioned radio resources |
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| ***Source to WG:*** | OPPO, Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-9-2 |
|  |  |  |  |  |
| ***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:*** | In 23.287 subclause 5.1.2.2, there is the following description related to V2X triggered PLMN selection:- If the UE intends to use "operator-managed" radio resources (i.e. carrier frequency) for V2X service that are not operated by the UE's serving cell, as specified in clause 5.1.2.1, or if the UE is out of coverage, the UE shall search for a cell in any PLMN that is operating the provisioned radio resources (i.e. carrier frequency) as defined in TS 36.300 [9] and TS 36.304 [10] (if LTE based PC5 is selected for the V2X communication) or as defined in TS 38.300 [11] and TS 38.304 [12] (if NR based PC5 is selected for the V2X communication), and:- If the UE finds such a cell in the registered PLMN or a PLMN equivalent to the registered PLMN, and authorization for V2X communications over PC5 reference point to this PLMN is confirmed, the UE shall use the radio resource description indicated by that cell. If that cell does not provide radio resources for V2X service, the UE shall not perform V2X message transmission and reception on those radio resources.- If the UE finds such a cell but not in the registered PLMN or a PLMN equivalent to the registered PLMN, and that cell belongs to a PLMN authorized for V2X communications over PC5 reference point and provides radio resources for V2X service then the UE shall perform PLMN selection triggered by V2X communications over PC5 reference point as defined in TS 23.122 [13]. If the UE has an ongoing emergency session via IMS, it shall not trigger any PLMN selection due to V2X communication over PC5 reference point.The corresponding stage 3 discription has already be specified for broadcast and groupcast, however, for unicast the description is still missing.Also registration procedure is performed when UE is in connected mode is wrong when UE wants to select another PLMN. UE should perform deregistration procedure before selecting another PLMN. |
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| ***Summary of change:*** | 1. Add the procedure for UE to use provisioned radio resources for unicast.2. “Registration”->”Deregistration”.3. Hard space is used for reference. |
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| ***Consequences if not approved:*** | 1. The procedure for UE to use provisioned radio resources for unicast is missing in stage 3.2. Wrong procedure is performed by UE before PLMN selection. |
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| ***Clauses affected:*** | 6.1.2.9.1(new), 6.1.2.9.2(new), 6.1.3.2.3, 6.1.4.2.3 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

\*\*\*\*\* First of change \*\*\*\*\*

#### 6.1.2.9 Data transmission over PC5 unicast link

##### 6.1.2.9.1 Transmission

When receiving user data from upper layers to be sent over PC5 unicast link to a specific UE, the transmitting UE shall determine the PC5 unicast link context corresponding to the application layer ID, and then shall tag each outgoing protocol data unit with the following information before passing it to the lower layers for transmission:

a) a layer-3 protocol data unit type (see 3GPP TS 38.323 [10]) set to:

1) IP packet, if the V2X message contains IP data; or

2) non-IP packet, if the V2X message contains non-IP data;

b) the PC5 link identifier associated with the PC5 unicast link context;

c) optionally, the source layer-2 ID set to the source layer-2 ID associated with the PC5 unicast link context;

d) optionally, the destination layer-2 ID set to the destination layer-2 ID associated with the PC5 unicast link context; and

e) the PQFI set to the value corresponding to the V2X service identifier and the optional V2X application requirements according to the mapping rules specified in clause 5.2.3.

##### 6.1.2.9.2 Procedure for UE to use provisioned radio resources for V2X communication over PC5

The procedures described for using NR-PC5 in clause 6.1.3.2.3 apply.

\*\*\*\*\* Second of change \*\*\*\*\*

##### 6.1.3.2.3 Procedure for UE to use provisioned radio resources for V2X communication over PC5

When the UE is not served by NR and not served by E-UTRA for V2X communication and is authorized to use V2X communication over PC5, the UE shall identify the RAT to be used for V2X communication over PC5 according to the list of RATs in which the UE is authorized to use V2X communication over PC5. If both E-UTRA-PC5 and NR-PC5 for V2X are authorized to the UE for V2X communication over PC5, the UE selects a RAT used for V2X communication over PC5 according to local policy. After identifying E-UTRA-PC5 to be used for V2X communication over PC5, the UE performs the procedure defined in clause 6.1.2.3 of 3GPP TS 24.386 [5]. After identifying NR-PC5 to be used for V2X communication over PC5, the UE shall select the corresponding radio parameters to be used for V2X communication over PC5 as follows:

a) if the UE can determine itself located in a geographical area, and the UE is provisioned with radio parameters for the geographical area, the UE shall select the radio parameters associated with that geographical area; or

b) in all other cases, the UE shall not initiate V2X communication over PC5.

It is out of scope of the present specification to define how the UE can locate itself in a specific geographical area. When the UE is in coverage of a 3GPP RAT it can for example use information derived from the serving PLMN. When the UE is not in coverage of a 3GPP RAT it can use other techniques, e.g. global navigation satellite system (GNSS). The UE shall not consider user provided location as a valid input to locate itself in a specific geographical area.

If the UE intends to use "non-operator managed" radio parameters as specified in clause 5.2.3, the UE shall initiate V2X communication over PC5 with the selected radio parameters.

If the UE intends to use "operator managed" radio parameters as specified in clause 5.2.3, before initiating V2X communication over PC5, the UE shall check with lower layers whether the selected radio parameters can be used in the current location without causing interference to other cells as specified in 3GPP TS 38.331 [11], and:

a) if the lower layers indicate that the usage would not cause any interference, the UE shall initiate V2X communication over PC5; or

NOTE: If the lower layers find that there exists a cell operating the provisioned radio resources (i.e., carrier frequency), and the cell belongs to the registered PLMN or a PLMN equivalent to the registered PLMN, and the UE is authorized for V2X communication over PC5 in this PLMN, the UE can use the radio parameters indicated by the cell as specified in 3GPP TS 38.331 [11].

b) else if the lower layers report that one or more PLMNs operate in the provisioned radio resources (i.e. carrier frequency) then:

1) if the following conditions are met:

i) none of the PLMNs reported by the lower layers is the registered PLMN or equivalent to the registered PLMN;

ii) at least one of the PLMNs reported by the lower layers is in the list of authorized PLMNs for V2X communication over PC5 and provides radio resources for V2X communication over PC5 as specified in 3GPP TS 38.331 [11]; and

iii) the UE does not have an emergency PDU session;

 then the UE shall:

i) if in 5GMM-IDLE mode, perform PLMN selection triggered by V2X communication over PC5 as specified in 3GPP TS 23.122 [2]; or

ii) else if in 5GMM-CONNECTED mode, either:

A) perform a Deregistration procedure as specified in 3GPP TS 24.501 [6] and then perform PLMN selection triggered by V2X communication over PC5 as specified in 3GPP TS 23.122 [2]; or

B) not initiate V2X communication over PC5.

 Whether the UE performs i) or ii) above is left up to UE implementation; or

2) else the UE shall not initiate V2X communication over PC5.

If the registration to the selected PLMN is successful, the UE shall proceed with the procedure to initiate V2X communication over PC5 as specified in clause 6.1.3.2.1.

If the UE is performing V2X communication over PC5 using radio parameters associated with a geographical area and moves out of that geographical area, the UE shall stop performing V2X communication over PC5 and then:

a) if the UE is not served by NR and not served by E-UTRA for V2X communication over PC5 or the UE intends to use radio resources for V2X communication over PC5 other than those operated by the serving cell, the UE shall select appropriate radio parameters for the new geographical area as specified above; or

b) if the UE is served by NR or served by E-UTRA for V2X communication over PC5 and intends to use radio resources for V2X communication over PC5 operated by the serving cell, the UE shall proceed with the procedure to initiate V2X communication over PC5 when served by NR or served by E-UTRA for V2X communication over PC5.

\*\*\*\*\* Third of change \*\*\*\*\*

##### 6.1.4.2.3 Procedure for UE to use provisioned radio resources for V2X communication over PC5

The procedures described for using NR-PC5 in clause 6.1.3.2.3 apply with using the privacy timer T5030 for groupcast.

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