**3GPP TSG-CT WG1 Meeting #125-eC1-205xxx**

**Electronic meeting, 20-28 August 2020 was C1-205062**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.587** | **CR** | **0113** | **rev** | **1** | **Current version:** | **16.1.0** |  |
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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 | **X** |

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| ***Title:***  | Radio parameters for UE neither served by E-UTRA nor served by NR |
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| ***Source to WG:*** | CATT |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-08-06 |
|  |  |  |  |  |
| ***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)* |
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| ***Reason for change:*** | 1. In 3GPP TS 23.287 v16.3.0, it is stated that the radio parameters information when the UE "not served by E-UTRA" and "not served by NR":

 “……1) Authorization policy:- When the UE is "served by E-UTRA" or "served by NR":- PLMNs in which the UE is authorized to perform V2X communications over PC5 reference point when "served by E-UTRA" or "served by NR". For each above PLMN:- RAT(s) over which the UE is authorized to perform V2X communications over PC5 reference point.- When the UE is "not served by E-UTRA" and "not served by NR":- Indicates whether the UE is authorized to perform V2X communications over PC5 reference point when "not served by E-UTRA" and "not served by NR".- RAT(s) over which the UE is authorized to perform V2X communications over PC5 reference point.NOTE 1: In this specification, *{When the UE is "served by E-UTRA" or "served by NR"}* and *{When the UE is "not served by E-UTRA" and "not served by NR"}* are relevant to V2X communications over PC5 reference point.2) Radio parameters when the UE is "not served by E-UTRA" and "not served by NR":- Includes the radio parameters per PC5 RAT (i.e. LTE PC5, NR PC5) with Geographical Area(s) and an indication of whether they are "operator managed" or "non-operator managed". These radio parameters (e.g., frequency bands) are defined in TS 36.331 [14] and TS 38.331 [15]. The UE uses the radio parameters to perform V2X communications over PC5 reference point when "not served by E-UTRA" and "not served by NR" only if the UE can reliably locate itself in the corresponding Geographical Area. Otherwise, the UE is not authorized to transmit.……”The policy/parameter specified here refers to the the RATs (i.e. LTE PC5 and/or NR PC5) over which the UE is authorized to perform V2X communication and the radio parameter per PC5 RAT when the UE is “not served by E-UTRA” and “not served by NR”.What is more, only the radio parameter for the RAT over which the UE is authorized to perform V2X communcations over PC5 reference point should be sent to UE. But the description in 3GPP TS 24.587 v16.1.0 is not aligned with it.1. Since both LTE PC5 and NR PC5 support broadcast mode V2X communciation. Correspondingly, if the UE uses the provisioned radio resouces for broadcast mode V2X commuication over PC5, it firstly should select an appropriated RAT for V2X communcation over PC5 based on provisioned policy/parameters.
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| ***Summary of change:*** | 1. Change the description regarding the RAT(s) over which the UE is authorized to perform V2X communcations over PC5 reference point and the corresponding radio parameters for the RAT when the UE is "not served by E-UTRA" and "not served by NR".
2. Update subsclause 6.1.3.2.1 to include the selection of RAT for V2X communcation.
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| ***Consequences if not approved:*** | 1. Erroneous description about the radio parameters when the UE is “not served by E-UTRA” and “not served by NR”.
2. Missing the process of RAT selection when the UE is “not served by E-UTRA” and “not served by NR” and both E-UTRA PC5 and NR PC5 is supported for the UE.
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| ***Clauses affected:*** | 5.2.3, 6.1.3.2.3 |
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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:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\*Start of change \*\*\*\*\*

### 5.2.3 Configuration parameters for V2X communication over PC5

The configuration parameters for V2X communication over PC5 consist of:

a) a validity timer for the validity of the configuration parameters for V2X communication over PC5;

b) a list of PLMNs and RATs in which the UE is authorized to use V2X communication over PC5 when the UE is served by E-UTRA or served by NR. Each entry of the list contains a PLMN ID and RATs in which the UE is authorized to use V2X communication over PC5;

c) an indication of whether the UE is authorized to use V2X communication over PC5 when the UE is not served by E-UTRA and not served by NR;

d) list of RATs in which the UE is authorized to use V2X communication over PC5 and the radio parameters of the RAT for V2X communication over PC5 applicable per geographical area with an indication of whether these radio parameters of the RAT are "operator managed" or "non-operator managed" when the UE is not served by E-UTRA and not served by NR;

e) void:

f) optionally, a list of V2X service identifier to a PC5 RAT and Tx profiles mapping rules. Each mapping rule contains one or more V2X service identifiers, a PC5 RAT and Tx profile s corresponding to the PC5 RAT (i.e. either the Tx profiles for E-UTRA-PC5 or the Tx profiles for NR-PC5);

g) configuration parameters for privacy support, consisting of:

1) a list of V2X services requiring privacy. Each entry of the list contains one or more V2X service identifiers and one or more geographical areas where the privacy is required; and

2) a privacy timer value as specified in 3GPP TS 24.588 [7] clause 5.3;

h) configuration parameters for a V2X communication over PC5 in E-UTRA-PC5, consisting of:

1) a list of V2X service identifier to destination layer-2 ID mapping rules. Each mapping rule contains one or more V2X service identifiers and the destination layer-2 ID;

2) optionally, a default destination layer-2 ID;

3) a list of PPPP to PDB mapping rules. Each mapping rule contains a ProSe Per-Packet Priority (PPPP) and a Packet Delay Budget (PDB);

4) optionally, list of V2X service identifier to V2X E-UTRA frequency mapping rules. Each mapping rule contains one or more V2X service identifiers and the V2X E-UTRA frequencies with associated geographical areas; and

5) optionally, a list of the V2X services authorized for ProSe Per-Packet Reliability (PPPR). Each entry of the list contains one or more V2X service identifiers and a ProSe Per-Packet Reliability (PPPR) value; and

i) configuration parameters for a V2X communication over PC5 in NR-PC5, consisting of:

1) optionally, a list of V2X service identifier to V2X NR frequency mapping rules. Each mapping rule contains one or more V2X service identifiers and the V2X NR frequencies with associated geographical areas;

2) a list of V2X service identifier to destination layer-2 ID for broadcast mapping rules. Each mapping rule contains one or more V2X service identifiers and the destination layer-2 ID for broadcast;

3) optionally, a default destination layer-2 ID for broadcast;

4) a list of V2X service identifier to destination layer-2 ID for groupcast mapping rules. Each mapping rule contains one or more V2X service identifiers and the destination layer-2 ID for groupcast;

5) a list of V2X service identifier to default destination layer-2 ID for unicast initial signaling mapping rules. Each mapping rule contains one or more V2X service identifiers and the default destination layer-2 ID for initial signalling to establish unicast connection;

6) a list of V2X service identifier to PC5 QoS parameters mapping rules. The PC5 QoS parameters are specified in clause 5.4.2 of 3GPP TS 23.287 [3];

7) an AS configuration, including a list of SLRB mapping rules applicable when the UE is not served by E-UTRA and is not served by NR. Each SLRB mapping rule contains a PC5 QoS profile and an SLRB. The PC5 QoS profile contains the following parameters:

i) the PC5 QoS profile contains a PQI;

ii) if the PQI of the PC5 QoS profile identifies a GBR QoS, the PC5 QoS profile contains a PC5 flow bit rates consisting of a guaranteed flow bit rate (GFBR) and a maximum flow bit rate (MFBR);

iii) if the PQI of the PC5 QoS profile identifies a non-GBR QoS, the PC5 QoS profile contains the PC5 link aggregated bit rate consisting of a per link aggregate maximum bit rate (PC5 LINK-AMBR);

NOTE: PC5 link aggregated bit rate is only used for unicast mode communications over PC5.

iv) the PC5 QoS profile contains a range, which is only used for groupcast mode communications over PC5; and

v) the PC5 QoS profile can contain the priority level, the averaging window, and the maximum data burst volume. If one or more of the priority level, the averaging window or the maximum data burst volume are not contained in the PC5 QoS profile, their default values apply;

8) a list of NR-PC5 unicast security policies. Each entry in the list contains an NR-PC5 unicast security policy composed of:

i) one or more V2X service identifiers;

ii) the signalling integrity protection policy for the V2X service identifier(s);

iii) the signalling ciphering policy for the V2X service identifier(s);

iv) the user plane integrity protection policy for the V2X service identifier(s);

v) the user plane ciphering policy for the V2X service identifier(s); and

vi) one or more geographical areas where the NR-PC5 unicast security policy applies; and

8) a list of V2X service identifier to default mode of communication mapping rules. Each mapping rule contains one or more V2X service identifiers and the default mode of communication (one of unicast, groupcast or broadcast).

\*\*\*\*\*Next 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 subclause 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 Registration 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.

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