**3GPP TSG-CT WG1 Meeting #123-eC1-202748**

**Electronic meeting, 16-24 April 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.386** | **CR** | **0024** | **rev** | **1** | **Current version:** | **15.2.0** |  |
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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:***  |  |
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| ***Source to WG:*** | LG Electronics |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-04-22 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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:*** | As explained in the discussion paper in C1-202159, V2X communications over NR-PC5 interface is supported in EPC according to the stage 2 requirements. However, it is missing in CT1 specifications, especially in TS 24.386 on V2X services protocol aspects. The scope and the reference clause need to be updated in order to include NR-PC5 functionality as an element of EPC V2X services. Also configuration parameters for V2X communications over NR-PC5 interface needs to be added to the existing parameters for PC5.Note that the configuration parameters for NR-PC5 in this CR include the proposed change on QoS related parameters in the CR C1-202163. If C1-202163 is revised, this CR also needs to be updated accordingly. |
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| ***Summary of change:*** | - The Scope of the TS is updated to include protocols for NR-PC5 interface- The reference is updated to refer relevant specifications.- Configuration parameters for V2X communications over NR-PC5 interface is added, based on the same parameters defined in TS 24.587 |
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| ***Consequences if not approved:*** | UE and MME cannot support V2X communications over NR-PC5 interface. |
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| ***Clauses affected:*** | 1, 2, 5.2.4 |
|  |  |
|  | **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:*** | Rev1* Proposed to use the terminology "NR-PC5" for the consistency
* In clause 1, modified existing bullets for specifying the scope of NR-PC5 instead of adding new paragraph.
* Fixed vaious editorial errors
* Bullet 7) in clause 5.2.4 is aligned with the change proposed in CR0012 against TS 24.587.
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\*\*\*\*\* First change \*\*\*\*\*

# 1 Scope

The present document specifies the protocols:

- for V2X authorization between the UE and the V2X control function (over the V3 interface);

- for V2X communication among the UEs (over the LTE-PC5 interface, and over the NR-PC5 interface as described in 3GPP TS 24.587 [xx] and 3GPP TS 38.331 [yy]); and

- for V2X communication between the UE and the V2X application server (over the LTE-Uu interface).

The present document defines the associated procedures for V2X authorization and V2X communication.

The present document also defines the message format, message contents, error handling and system parameters applied by the protocols for V2X.

The present document is applicable to:

- the UE;

- the V2X control function; and

- the V2X application server.

\*\*\*\*\* Next change \*\*\*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.285: "Architecture enhancements for V2X services".

[3] 3GPP TS 24.385: "V2X services Management Object (MO)".

[4] 3GPP TS 24.334: "Proximity-services (ProSe) User Equipment (UE) to Proximity-services (ProSe) Function Protocol aspects; Stage 3".

[5] IEEE 1609.3 2016: "IEEE Standard for Wireless Access in Vehicular Environments (WAVE) -- Networking Services".

[6] ISO 29281-1 2013: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP)".

[7] Void.

[8] 3GPP TS 36.323: "Packet Data Convergence Protocol (PDCP) specification".

[9] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".

[10] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[11] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[12] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[13] IETF RFC 1035: "DOMAIN NAMES - IMPLEMENTATION AND SPECIFICATION".

[14] 3GPP TS 23.003: "Numbering, addressing and identification".

[15] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE\_LTE); MB2 Reference Point; Stage 3".

[16] IETF RFC 4566: "SDP: Session Description Protocol".

[17] IETF RFC 2234: "Augmented BNF for Syntax Specification: ABNF".

[18] IETF RFC 768: "User Datagram Protocol".

[19] Void.

[20] 3GPP TS 33.185: "Security aspect for LTE support of V2X services".

[21] 3GPP TS 33.401: "3GPP System Architecture Evolution: Security Architecture".

[22] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[23] ETSI EN 302 636-3 v1.2.1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network Architecture".

[xx] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Stage 3".

[yy] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[zz] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support; Vehicle-to-Everything (V2X) services".

\*\*\*\*\* Next change \*\*\*\*\*

### 5.2.4 Configuration parameters for V2X communication over PC5

The configuration parameters for V2X communication over PC5 consist of:

a) an expiration time for the validity of the configuration parameters for V2X communication over PC5;

b) a list of PLMNs in which the UE is authorized to use V2X communication over PC5 when the UE is served by E-UTRAN for V2X communication;

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

d) per geographical area:

1) radio parameters for V2X communication over PC5 applicable when the UE is not served by E-UTRAN for V2X communication and is located in the geographical area, with an indication of whether these radio parameters are "operator managed" or "non-operator managed";

e) a list of the V2X services authorized for V2X communication over PC5. Each entry of the list contains:

1) a V2X service identifier; and

2) a destination Layer-2 ID;

f) PPPP to PDB mapping rules between the ProSe Per-Packet Priority (PPPP) and the Packet Delay Budget (PDB) for V2X communication over PC5;

g) optionally, a default destination Layer-2 ID;

h) optionally, a configuration for the applicability of privacy for V2X communication over PC5, containing:

1) a T5000 timer indicating how often the UE shall change the source Layer-2 ID and source IP address (for IP data) self-assigned by the UE for V2X communication over PC5; and

2) a list of the V2X services which require privacy for V2X communication over PC5. Each entry in the list contains:

A) a V2X service identifier; and

B) optionally, one or more associated geographical areas;

i) optionally, V2X service identifier to V2X frequency mapping rules between the V2X service identifiers and the V2X frequencies with associated geographical areas for V2X communication over PC5;

j) optionally, a list of the V2X services authorized for ProSe Per-Packet Reliability (PPPR). Each entry of the list contains a V2X service identifier and a ProSe Per-Packet Reliability (PPPR) value;

k) optionally, V2X service identifier to Tx Profile mapping rules between the V2X service identifiers and the Tx Profile for V2X communication over PC5; and

l) optionally, configuration parameters for V2X communication over 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 PC5 QoS mapping configuration which is a list of PC5 QoS mapping rules. Each PC5 QoS mapping rule contains a input consisting of one or more V2X service identifiers and optionally V2X application requirements for the V2X service, and an output consisting of PC5 QoS parameters as specified in clause 5.4.2 of 3GPP TS 23.287 [zz]. Specification of the V2X application requirements for the V2X service is out of scope of the present specification; and

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/or 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.

\*\*\*\*\* End change \*\*\*\*\*