**3GPP TSG-CT WG1 Meeting #141eC1-232143**

**Online 17– 21 April 2023**

**Source: Nokia, Nokia Shanghai Bell, Qualcomm Incorporated, Ericsson**

**Title: Pseudo-CR on** **Provisioning of parameters for A2X configuration**

**Spec: 3GPP TS 24.577 v0.0.0**

**Agenda item: 18.2.21**

**Document for: Approval**

**1. Introduction**

This p-CR provides content of Provisioning of parameters for A2X configuration (Section 5) in 3GPP TS 24.577 specification related to the UAS\_Ph2 work item.

**2. Reason for Change**

Provisioning of parameters for A2X configuration (Section 5) in 3GPP TS 24.577 specification needs to be defined based on SA2 requirements as per clause 4.2.1.2.2 in 3GPP TS 23.256.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TS 24.577 v0.0.0.

\* \* \* First 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".

[A] 3GPP TS 23.256: " Support of Uncrewed Aerial Systems (UAS) connectivity, identification and tracking; Stage 2 ".

[B] 3GPP TS 24.501: "Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[C] 3GPP TS 24.578: "Aircraft-to-Everything (A2X) services in 5G System (5GS); UE policies".

[D] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services); Stage 2".

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

[F] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Protocol aspects; Stage 3”.\* \* \* Next Change \* \* \* \*

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

Abbreviation format (EW)

<ABBREVIATION> <Expansion>

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.256 [A] apply:

**A2X**

\* \* \* Next Change \* \* \* \*

# 5 Provisioning of parameters for A2X configuration

## 5.1 General

A2X communication is configured using A2X configuration parameters and related procedures which allow configuration of necessary A2X configuration parameters.

## 5.2 Configuration and precedence of A2X configuration parameters

### 5.2.1 General

UE's usage of A2X communication is controlled by A2X configuration parameters.

The A2X configuration parameters consist of the configuration parameters for A2X communication over PC5.

### 5.2.2 Precedence of A2X configuration parameters

The A2X configuration parameters can be:

a) pre-configured in the ME;

b) configured in the UICC;

c) provided as a A2XP using the UE policy delivery service as specified in 3GPP TS 24.501 [B] annex D;

d) provided by a A2X application server via A2X1 reference point; or

e) a combination of case a), b), c) or d) above.

The UE shall use the A2X configuration parameters in the following order of decreasing precedence:

a) the A2X configuration parameters provided as a A2XP using the UE policy delivery service as specified in annex D of 3GPP TS 24.501 [B];

b) the A2X configuration parameters provided by a A2X application server via A2X1 reference point;

c) the A2X configuration parameters configured in the UICC; and

d) the A2X configuration parameters pre-configured in the ME.

### 5.2.3 Configuration parameters for A2X communication over PC5

The configuration parameters for A2X communication over PC5 consist of:

a) a validity timer for the validity of the configuration parameters for A2X communication over PC5;

b) a list of PLMNs and RATs in which the UE is authorized to use A2X 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 A2X communication over PC5;

c) an indication of whether the UE is authorized to use A2X 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 A2X communication over PC5 and the radio parameters of the RAT for A2X communication over PC5 applicable per altitude range 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) optionally, a list of A2X service identifier to PC5 RAT(s) and Tx profiles mapping rules. Each mapping rule contains one or more A2X service identifiers, PC5 RAT(s) and:

1) if the PC5 RAT(s) include E-UTRA-PC5, Tx profiles corresponding to the E-UTRA-PC5;

2) if the PC5 RAT(s) include NR-PC5, NR Tx profile corresponding to the NR-PC5 for broadcast mode A2X communication over PC5; or

3) if the PC5 RAT(s) include NR-PC5, NR Tx profile corresponding to transmitting and receiving initial signalling of the A2X PC5 unicast link establishment;

f) configuration parameters for privacy support, consisting of:

1) a list of A2X services requiring privacy. Each entry of the list contains one or more A2X service identifiers and one or more geographical areas where the privacy is required; and

2) a privacy timer value as specified in 3GPP TS 24.578 [C] clause 5.3;

g) configuration parameters for a A2X communication over PC5 in E-UTRA-PC5, consisting of:

1) a list of A2X service identifier to destination layer-2 ID mapping rules. Each mapping rule contains one or more A2X 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 A2X service identifier to A2X E-UTRA frequency mapping rules. Each mapping rule contains one or more A2X service identifiers and the A2X E-UTRA frequencies with associated altitude ranges and geographical areas;

5) optionally, a list of the A2X services authorized for ProSe Per-Packet Reliability (PPPR). Each entry of the list contains one or more A2X service identifiers and a ProSe Per-Packet Reliability (PPPR) value; and

h) configuration parameters for a A2X communication over PC5 in NR-PC5, consisting of:

1) optionally, a list of A2X service identifier to A2X NR frequency mapping rules. Each mapping rule contains one or more A2X service identifiers and the A2X NR frequencies with associated altitude ranges and geographical areas;

2) a list of A2X service identifier to destination layer-2 ID for broadcast mapping rules. Each mapping rule contains one or more A2X service identifiers and the destination layer-2 ID for broadcast;

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

4) a list of A2X service identifier to default destination layer-2 ID for unicast initial signalling mapping rules. Each mapping rule contains one or more A2X service identifiers and the default destination layer-2 ID for initial signalling to establish unicast connection;

5) a list of A2X service identifier to PC5 QoS parameters mapping rules. The PC5 QoS parameters are specified in clause 5.4.2 of 3GPP TS 23.287 [D];

6) 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); and

NOTE 1: PC5 link aggregated bit rate is only used for unicast mode communications over PC5.

iv) 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;

7) 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 A2X service identifiers;

ii) the signalling integrity protection policy for the A2X service identifier(s);

iii) the signalling ciphering policy for the A2X service identifier(s);

iv) the user plane integrity protection policy for the A2X service identifier(s);

v) the user plane ciphering policy for the A2X service identifier(s); and

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

8) a list of A2X service identifier to default mode of communication mapping rules. Each mapping rule contains one or more A2X service identifiers and the default mode of communication (one of unicast or broadcast); and

9) for broadcast mode and initial signalling of the A2X PC5 unicast link establishment, PC5 DRX configurations (see 3GPP TS 38.331 [E]), including the mapping of PC5 QoS profile(s) to PC5 DRX cycle(s) and the default PC5 DRX configuration, when the UE is not served by E-UTRA and not served by NR.

## 5.3 Procedures

### 5.3.1 General

The procedure for provisioning of parameters for A2X configuration allows the UE to obtain information necessary for A2X communication.

### 5.3.2 UE-requested A2X policy provisioning procedure

#### 5.3.2.1 General

The UE-requested A2X policy provisioning procedure enables the UE to request A2X policy from the PCF in the following cases:

a) if the Tklmn for a UE policy for A2X communication over PC5 expires; or

b) if there are no valid configuration parameters, e.g., for the current area, or due to abnormal situation.

The UE shall follow the principles of PTI handling for UE policy delivery service procedures defined in 3GPP TS 24.501 [B] clause D.1.2.

#### 5.3.2.2 UE-requested A2X policy provisioning procedure initiation

In order to initiate the UE-requested A2X policy provisioning procedure, the UE shall create a UE POLICY PROVISIONING REQUEST message (see example in figure 5.3.2.2.1). The UE:

a) shall allocate a PTI value currently not used and set the PTI IE to the allocated PTI value;

b) shall include the Requested UE policies IE indicating whether the UE policies for A2X communication over PC5 is requested;

c) shall transport the UE POLICY PROVISIONING REQUEST message using the NAS transport procedure as specified in 3GPP TS 24.501 [B] clause 5.4.5; and

d) shall start timer T5040.



Figure 5.3.2.2.1: UE-requested A2X policy provisioning procedure

#### 5.3.2.3 UE-requested A2X policy provisioning procedure accepted by the network

Handling in 3GPP TS 24.587 [F] clause 5.3.2.3 shall apply.

If new UE policies for A2X are included in the MANAGE UE POLICY COMMAND message, the UE shall stop timer Tklmn if it is running and start timer Tklmn with the value included in the UE policies for A2X, and start using the new UE policies for A2X included in the MANAGE UE POLICY COMMAND message.

#### 5.3.2.4 UE-requested A2X policy provisioning procedure not accepted by the network

Handling in 3GPP TS 24.587 [F] clause 5.3.2.4 shall apply.

#### 5.3.2.5 Abnormal cases on the network side

Handling in 3GPP TS 24.587 [F] clause 5.3.2.5 shall apply.

#### 5.3.2.6 Abnormal cases on the UE

Handling in 3GPP TS 24.587 [F] clause 5.3.2.6 shall apply.

\* \* \* Next Change \* \* \* \*

# X List of system parameters

## X.1 General

The description of timers in the following tables should be considered a brief summary. The complete descriptions of the timers are in the procedures defined in clauses 5 and 6.

## X.2 Timers of provisioning of parameters for A2X configuration procedures

Timers of provisioning of parameters for A2X configuration are shown in table X.2.1.

NOTE: Timer T5040 is defined in 3GPP TS 24.587 [C].

Table X.2.1: Timers of provisioning of parameters for A2X configuration – UE side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON EXPIRY | |
| --- | --- | --- | --- | --- | --- |
| Tklmn | NOTE 1 | Start using the new UE policies for A2X communication over PC5 received in MANAGE UE POLICY COMMAND message | Stop using the old UE policies for A2X communication over PC5 | Initiate the UE-requested A2X policy provisioning procedure | |
| NOTE 1: The value of this timer is the validity timer value which is one of the configuration parameters for A2X communication over PC5 (see clause 5.2) and it is specified in 3GPP TS 24.578 [C] clause 5.3. | | | | | |

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