**3GPP TSG-SA WG6 Meeting #41-e S6-210106**

**e-meeting, 18th – 26th January 2021 (revision of S6-21xxxx)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.286** | **CR** | **0037** | **rev** |  | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *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:*** | Clarifications on network monitoring | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eV2XAPP | | | | |  | ***Date:*** | | | 2021-01-13 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The 5G system offers various types of monitoring information to vertical applications (e.g. VAE layer) that may assist in V2V communication modes.  The VAE server may utilize the following information exposed by NEF:  - Monitoring events (e.g. UE reachability, roaming status, number of UEs in specific geographic area, etc.);  - Network status report for a specific geographic area or a specific UE (e.g. user data congestion analytics information derived or received from NWDAF);  - Data analytics generated from NWDAF (e.g. service experience for an V2X application, UE mobility analytics) when the VAE server is the external party to NWDAF.  The VAE server may also utilize the data analytics directly retrieved from NWDAF if it is trusted by NWDAF.  Based on discussion above, the existing procedure of network monitoring in subclause 9.7.4.2 needs to be expanded.  As the V2X UE may supports LTE Uu, LTE PC5, NR Uu, NR PC5 or a combination of these RAT types, the VAE server may collect the network monitoring information of the specific RAT (e.g. NR cell or LTE cell) based on UE’s supported RAT type. | | | | | | | | |
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| ***Summary of change:*** | | Remove the EN under registration request in subclause 9.2.2.1. Enhance the procedure of subclause 9.7.4.2 by adding 5G functions. Clarify the procedures of subclause 9.7.4.2 and 9.8.3 for the use of UE’s supported RAT type. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The VAE server may not be able to assist V2V communication mode selection. It is not clear what 5G capabilities of network exposure and data analytics are supported. | | | | | | | | |
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| ***Clauses affected:*** | | 9.2.2.1, 9.7.4.2, 9.8.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

#### 9.2.2.1 Registration request

Table 9.2.2.1-1 describes the information flow for a VAE client to register for specific V2X messages at the VAE server.

Table 9.2.2.1-1: Registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| V2X UE ID | M | Identifier of the V2X UE (e.g. StationID specified in ETSI TS 102 894-2 [16]) |
| V2X service ID | M | V2X service ID, the V2X UE is interested in receiving (e.g. PSID or ITS AID of ETSI ITS DENM, ETSI ITS CAM) |
| Supported RAT types | O | RAT types (e.g. NR, E-UTRA) supported by the V2X UE |

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

#### 9.7.4.2 Procedure

Figure 9.7.4.2-1 illustrates the procedure where the VAE server sends notification of the network monitoring information to the V2X UEs.

Pre-conditions:

1. The VAE server acting as a SCS/AS is configured with the SCEF information and is authorized to exchange information with the SCEF as specified in subclause 4.9 in 3GPP TS 23.682 [8]. The VAE server has subscribed to QoS notification service from 5GS (e.g. PCF/NWDAF). The notification may either include the request for QoS sustainability events as specified in 3GPP TS 23.288 [9] or can include a QoS change notification requests as provided by SMF and specified in 3GPP TS 23.287 [8];

2. The V2X UE1 and V2X UE2 have subscribed for the network monitoring information at the VAE server.

3. The VAE server may be aware of the RAT type the V2X UE supports from the registration of VAE client.



Figure 9.7.4.2-1: Notifications for network monitoring information

1. The VAE server communicates with the SCEF to receive network monitoring information as per the procedure in subclause 4.9 of 3GPP TS 23.682 [8], or communicates with NEF or NWDAF to receive QoS monitoring information and/or data analytics information as defined in 3GPP TS 23.228 [9]. If the V2X UE supports both RAT types of E-UTRA and NR, the VAE server may perform network monitoring with both SCEF and NEF/NWDAF. The VAE server subscription to QoS monitoring service from 5GS (e.g. PCF/NWDAF) may be active for a certain period of time or a given geographical area. The monitoring may either include the request for QoS sustainability events as specified in 3GPP TS 23.288 [9], or can include a QoS change notification requests as provided by SMF and specified in 3GPP TS 23.287 [8]. The reporting may be configured by the application enabler layer for a given area, time, periodicity etc taking into account the service requirement and other parameters (e.g. expected congestion in certain area, time of the day, road conditions). Based on the subscription, as specified in 3GPP TS 23.287 [8], 5GS provides the extended QoS monitoring report, over N33 interface. This report may come either from NWDAF or SMF via PCF/NEF.

Editor’s Note: It’s FFS how the 5GC differentiates RAT type for network monitoring.

2. The network monitoring information (e.g. uplink or downlink link degradations, congestions, etc.) available at the VAE server about the on-going V2V session(s) and the network status is based on the original network monitoring information provided by the SCEF in step 1, and/or based on QoS monitoring report or data analytics from 5GS as specified in step 1. The VAE server determines the network monitoring information to send to the UE.

3. The monitoring information is sent to the subscribed V2X UEs via network monitoring information notification.

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

### 9.8.3 Assistance for V2V communication mode switching

#### 9.8.3.1 General

The VAE server provides assistance information for V2V communication mode switching to the V2X UE. To provide the assistance the VAE server may acquire the application requirements, the communication status of the V2X UEs and the network monitoring information from the 3GPP network.

#### 9.8.3.2 Procedure

Figure 9.8.3.2-1 illustrates the procedure of assistance for V2V communication mode switching.

Pre-conditions:

1. The VAE server is aware of the RAT type the V2X UE supports.



Figure 9.8.3.2-1: Assistance for V2V communication mode switching

1. The VAE server may have acquired the application requirement from the V2X application specific server. The application requirements may include the conditions corresponding to the V2V communication modes (e.g. network status, UE's location, QoS, V2X service type, and other influential parameters for V2V communication mode).

2. The VAE server may send the communication status request to the VAE client to acquire the current communication status of the UE.

3. The VAE client responses to the VAE server with the communication status information (e.g. the current V2V communication mode, communication link quality and etc.)

4. The VAE server may have received the network monitoring information from the 3GPP network (e.g. from EPC, 5GC, or from both) based on V2X UE's supported RAT type.

5. Based on information acquired above the VAE server generates assistance information (configuration or recommendation) for V2V communication mode switching.

6. The VAE server sends the V2V communication assistance information to the VAE client.