**3GPP TSG-CT WG1 Meeting #127-eC1-207259**

**Electronic meeting, 13-20 November 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.486** | **CR** | **0048** | **rev** | **-** | **Current version:** | **16.1.0** |  |
|  | | | | | | | | |
| *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:*** | Update to PC5 parameters provisioning procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | V2XAPP | | | | |  | ***Date:*** | | | 2020-11-01 |
|  |  | | | |  | |  | | |  |
| ***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 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As C1-206619 was agreed in CT1 meeting #126e, the name of the elements were updated in the XML schema for PC5 parameters provisioning procedure. The related procedure therefore needs to be updated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Update the name of elements of PC5 parameters provisioning procedure; | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | XML schema is not aligned with procedures and with Stage 2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.3.2, 7.3.3, 8.3, 8.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

### 7.3.2 Client procedure

Upon receiving an HTTP POST request message containing:

a) an Accept header field set to "application/vnd.3gpp.vae-info+xml";

b) a Content-Type header field set to "application/vnd.3gpp.vae-info+xml"; and

c) an application/vnd.3gpp.vae-usd-announcement-info+xml MIME body with an <set-PC5-parameters-info> element;

the VAE-C:

a) shall store the received PC5 parameters; and

b) shall send an HTTP 200(OK) response message including a <set-PC5-parameters-info> element with a <result> child element set to "success" or "failure" in the <VAE-info> root element as an acknowledgement of the PC5 parameters to the VAE-S.

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

### 7.3.3 Server procedure

For each VAE-C that the VAE-S is sending PC5 parameters to, the VAE-S shall generate an HTTP POST request message request according to procedures specified in IETF RFC 2616 [19]. In the HTTP POST request, the VAE-S:

a) shall set the Request-URI to the URI corresponding to the identity of the V2X UE;

b) shall include a Content-Type header field set to "application/vnd.3gpp.vae-info+xml";

c) shall include an application/vnd.3gpp.vae-info+xml MIME body with a <set-PC5-parameters-info> element in the <VAE-info> root element which:

1) shall include a <V2X-UE-id> element set to the identity of the V2X UE;

2) may include a <PC5-parameters-configuration-data> element set to the PC5 parameters configuration data as specified in 3GPP TS 23.285 [21] which shall include:

i) an <expiration-time> set to the validity of the configuration parameters for V2X communication over PC5;

ii) one or more <plmn-id> elements in the <plmn-list> element which indicate the PLMNs in which the UE is authorized to use V2X communication over PC5 when the UE is served by E-UTRAN for V2X communication;

iii) an <authorized-when-not-served-by-E-UTRAN> element which indicates that the UE is authorized to use V2X communication over PC5 when the UE is not served by E-UTRAN; and

iv) a <radio-parameters> element which shall include the following elements:

A) one or more <radio-parameters-content> elements set to the radio parameters for V2X communication over PC5 applicable when the UE is not served by E-UTRAN;

B) a <geographical-area> element set to the geographical location where the radio parameters are applicable; and

C) an <operator-managed> element which indicates that the radio parameters are "operator managed";

3) may include one or more <V2X-service-id> elements and one or more <layer-2-id> elements in the <V2X-service-ids-list> element which indicate the V2X services authorized for V2X communication over PC5; and

4) may include a <result> element set to either "success" or "failure" used to indicate success or failure of the PC5 parameters provisioning; and

d) shall send the HTTP POST request towards the VAE-C according to IETF RFC 2616 [19].

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

## 8.3 Structure

The VAE document shall conform to the XML schema described in clause 8.4.

The <VAE-info> element shall be the root element of the VAE document.

The <VAE-info> element shall include at least one of the followings:

a) an <identity> element;

b) a <registration-info> element;

c) a <de-registration-info> element;

d) a <location-tracking-info> element;

e) a <message-info> element;

f) a <service-discovery-info> element;

g) a <local-service-info> element;

h) an <announcement> element;

i) a <set-PC5-parameters-info> element;

j) a <V2X-app-requirement-notification> element;

k) a <layer2-group-id-mapping> element;

l) an <id-list-notification> element;

m) a <configure-dynamic-group-notification> element;

n) a <subscription-request> element;

o) a <subscription-response> element; or

p) a <network-monitoring-info-notification> element.

The <identity> element shall include a <V2X-UE-id> child element.

The <service-discovery-info> element shall include:

a) an <identity> element; or

b) a <result> element and may include a <service-discovery-data> element.

The <service-discovery-data> element shall include a <V2X-service-mapping-list> element.

The <V2X-service-mapping-list> element shall include one or more <V2X-service-map> elements. Each <V2X-service-map> element shall include following elements:

a) one or more <V2X-service-id> element(s); and

b) a <V2X-AS-address> element.

The <registration-info> element shall include at least one of the followings:

a) a <V2X-UE-id> element and one or more <V2X-service-ID> element(s); or

b) a <result> element.

The <service> element shall include a <V2X-service-id> or a <V2X-MSG-type> child element.

The <de-registration-info> element shall include the followings:

a) a <V2X-UE-id> element; and

b) one or more <V2X-service-id> element(s).

The <location-tracking-info> element shall include either:

a) the following elements:

- an <identity> element shall include a <V2X-UE-id> element;

- a <geographical-identifier> element shall include a <geo-id> element; and

- an <operation> element; or

b) the following elements:

- a <result> element; and

- an <operation> element.

The <geographical-identifier> element shall include one or more <geo-id> elements.

The <message-info> element shall include at least one of the followings:

a) an <identity> element shall include a <V2X-UE-id> element;

b) a <group> element shall include a <V2X-group-id>;

c) a <payload> element;

d) a <service> element shall include a <V2X-service-id>;

e) a <geographical-identifier> element shall include a <geo-id> element;

f) a <message-reception-ind> element;

g) <message-reception-uri>; or

h) a <result> element.

The <group> element shall include a <V2X-group-id> child element.

The <local-service-info> element shall include one of the following:

a) an <identity> element and a <geographical-identifier> element; or

b) a <result> element and optionally a <local-service-info-content> element.

The <announcement> element shall include the followings:

a) a <TMGI> element;

b) a <mbms-service-areas> element;

c) a <frequency> element; and

d) a <V2X-mbms-sdp> element.

The <set-PC5-parameters-info> element shall include the followings:

a) a <V2X-UE-id> element;

b) a <PC5-parameters-configure-data> element which shall include:

1) an <expiration-time> element;

2) a <plmn-list> element which shall include one or more <plmn-id> elements;

3) an < authorized-when-not-served-by-E-UTRAN> element;

4) a <radio-parameters> element which shall include:

i) one or more <radio-parameters-content> elements;

ii) a <geographical-area> element which shall include:

A) a <polygon-area> element; or

B) an <ellipsoid-arc-area> element; and

iii) an <operator-managed> element; and

5) a <V2X-service-ids-list> element which shall include the following elements:

i) one or more <V2X-service-id> elements; or

ii) one or more <layer-2-id> elements; or

c) a <result> element.

The <layer2-group-id-mapping> element shall include the followings:

a) a <dynamic-group-info> element which shall include the following elements:

1) a <dynamic-group-id> element;

2) a <group-definition> element; and

3) a <group-leader-id> element; and

b) a <prose-layer2-group-id> element.

The <id-list-notification> element shall include the followings:

a) a <dynamic-group-id> element;

b) one or more <group-member-id> element(s), each of which shall include the followings:

1) an <identity> element shall include a <V2X-UE-id> element; and

2) a <group-scope> element.

The <configure-dynamic-group-notification> element shall include the followings:

a) a <dynamic-group-id> element; and

b) one or more <group-member-id> element(s), each of which shall include the followings:

1) an <identity> element shall include a <V2X-UE-id> element; and

2) a <group-scope> element.

The <subscription-info> element shall include either:

a) the following elements:

1) an <identity> element;

2) a <subscription-events> element which shall include one or more <event> elements; and

3) a <triggering-criteria> element; or

b) the following elements:

1) an <identity> element; and

2) a <result> element.

The <triggering-criteria> element shall include at least one of the following elements:

1) a <cell-change> element shall include one of the following sub-elements:

i) an <any-cell-change> element shall include a <trigger-id> element;

ii) an <enter-specific-cell> element shall include a <trigger-id> element; or

iii) an <exit-specific-cell> element include a <trigger-id> element;

2) a <tracking-area-change> element shall include one of the following sub-elements:

i) an <any-tracking-area-change> element shall include a <trigger-id> element;

ii) an <enter-specific-tracking-area> element shall include a <trigger-id> element; or

iii) an <exit-specific-trackin-area> element shall include a <trigger-id> element;

3) a <plmn-change> element shall include one of the following sub-elements:

i) an <any-plmn-change> element shall include a <trigger-id> element;

ii) an <enter-specific-plmn>element shall include a <trigger-id> element; or

iii) an <exit-specific-plmn> element shall include a <trigger-id> element;

4) an <mbms-sa-change> element shall include one of the following sub-elements:

i) an <any-mbms-sa-change> element shall include a <trigger-id> element;

ii) an <enter-specific-mbms-sa> element shall include a <trigger-id> element; or

iii) an <exit-specific-mbms-sa> element shall include a <trigger-id> element;

5) an <mbsfn-area-change> element shall include one of the following sub-elements:

i) an <any-mbsfn-area-change> element shall include a <trigger-id> element;

ii) an <enter-specific-mbsfn-area> element shall include a <trigger-id> element; or

iii) an <exit-specific-mbsfn-area> element shall include a <trigger-id> element;

6) a <periodic-report> element shall include a <trigger-id> element;

7) a <travelled-distance> element shall include a <trigger-id> element;

8) a <vertical-application-event> element shall include one of the following sub-elements:

i) an <initial-log-on> element shall include a <trigger-id> element;

ii) a <location-configuration-received> element shall include a <trigger-id> element; or

iii) an <any-other-event>, an optional element specifying that any other application signalling event than initial-log-on and location-configuration-received triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

9) a <geographical-area-change> element shall include one of the following sub-elements:

i) an <any-area-change> element shall include a <trigger-id> element;

ii) an <enter-specific-area> element shall include the following sub-element:

A) a <geographical-area> element shall include the following two sub-elements:

I) a <polygon-area> element shall include a <trigger-id> element; or

II) an <ellipsoid-arc-area> element shall include a <trigger-id> element;

iii) an <exit-specific-area-type> element shall include a <trigger-id> element;

The <notification-info> element shall include the followings:

a) a <V2X-ue-id> element; and

b) a <network-monitoring-info> element, which shall include one or more <trigger-id> elements and may include:

1) an <uplink-quality-level> element;

2) a <congestion-level> element;

3) a <overload-level> element;

4) a <geographical-area> element which shall include at least one of the followings:

i) a <cell-area> element; or

ii) a <tracking-area> element;

5) a <time-validity> element; or

6) an <MBMS-level> element which may include:

i) an <MBMS-coverage-level> element; or

ii) an <MBMS-bearer-level-event> element.

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

## 8.5 Data semantics

The <VAE-info> element is the root element of the XML document. The <VAE-info> element contains the <identity>, <registration-info>, <de-registration-info>, <location-tracking.info>, <message-info>, <service-discovery-info>, <local-service-info>, <announcement>, <set-PC5-parameters-info>, <V2X-app-requirement-notification>, <layer2-group-id-mapping>, <id-list-notification>, <configure-dynamic-group-notification>, <subscription-request>, <subscription-response> and <network-monitoring-info-notification> sub-elements.

<identity> is a mandatory element used to include the identity of a VAL client. The <identity> element contains a <V2X-UE-id> attribute that contains the identity of the VAL client.

<registration-info> element contains the following elements:

a) <V2X-UE-id>, an element contains the identity of the V2X UE; and

b) one or more <V2X-service-id> elements. Each <V2X-service-id> element contains the V2X service ID which the V2X UE is interested in receiving (e.g. PSID or ITS AID of ETSI ITS DENM, ETSI ITS CAM); or

c) <result>, an element which indicates a value either "success" or "fail".

<de-registration-info> element contains the following elements:

a) <V2X-UE-id>, an element contains the identity of the V2X UE; and

b) one or more <V2X-service-id> elements. Each <V2X-service-id> element contains the V2X service ID which the V2X UE is no longer interested in receiving (e.g. PSID or ITS AID of ETSI ITS DENM, ETSI ITS CAM).

<service-discovery-info> is a mandatory element used to include the V2X service discovery response information. The <service-discovery-info> element contains either:

a) an <identity> sub-element; or

b) a <result> sub-element and an optional <service-discovery-data> sub-element.

The <service-discovery-data> is an optional element shall include a <V2X-service-mapping-list> element which shall include one or more <V2X-service-map> elements.

The <V2X-service-map> element shall include following attributes:

1) one or more <V2X-service-id> attributes that each contains a V2X service identifier as specified in ETSI TS 102 965 [18] and ISO TS 17419 [20]; and

2) a <V2X-AS-address> attribute that contains a V2X application server address as specified in 3GPP TS 23.285 [21].

<geographical-identifier>, an optional element specifying one or more geographical area identifiers. This element consists of one or more <geo-id> elements. The <geo-id> element contains a geographical area identity representing a geographical area.

<operation> is a mandatory element which indicates a value either "subscribe" or "unsubscribe".

<group> is an optional element used to include the identity of a VAL group. The <group> element contains a <V2X-group-id> attribute that contains the group identity of a set of VAL clients according to the VAL service.

<payload> is an optional element used to include the payload of the V2X message as specified in ETSI TS 102 965 [18].

<message-reception-ind> is an optional element used to indicate that a reception report is required to be sent.

<message-reception-uri> is an optional element to indicate the destination URI of a requested reception report, and includes a URI as specified in IETF RFC 2616 [19].

<local-service-info-content> is an optional element: V2X server USD information, V2X application server address information and V2X USD information.

<TMGI> is a mandatory element encoded as specified in 3GPP TS 24.008 [6] excluding the Temporary mobile group identity IEI and the length of Temporary mobile group identity IE contents.

<mbms-service-areas> is a mandatory element which contains one or more <mbms-service-area-id> elements. Each <mbms-service-area-id> contains a MBMS SAI, encoded as specified in 3GPP TS 23.003 [2].

<frequency> is an optional element encoded as specified in 3GPP TS 29.468 [15].

<V2X-mbms-sdp> is mandatory element which contains SDP configuration information encoded as specified in 3GPP TS 24.386 [8] clause 7.2.2.

<set-PC5-parameters-info> element contains the following elements:

a) <V2X-UE-id>, an element contains the identity of the V2X UE;

b) <PC5-parameters-configuration-data>, an optional element set to the PC5 parameters configuration data as specified in 3GPP TS 23.285 [21] contains the following elements:

1) <expiration-time>, a mandatory element encoded as specified in 3GPP TS 24.385 [7] clause 5.5.2;

2) <plmn-list>, a mandatory element which contains one or more <plmn-id> elements, each <plmn-id> element is encoded as specified in 3GPP TS 23.003 [2];

3) <authorized-when-not-served-by-E-UTRAN>, a mandatory element encoded as specified in 3GPP TS 24.385 [7] clause 5.5.8;

4) <radio-parameters>, a mandatory element contains the following elements:

i) one ore more <radio-parameters-content> elements, each <radio-parameters-content> element is encoded as specified in3GPP TS 36.331 [17] clause 9 for the SL-V2X-Preconfiguration;

ii) <geographical-area>, a mandatory element specifying a geographical area and has the following sub-elements:

A) <polygon-area>, an optional element specifying the area as a polygon specified in clause 5.2 of 3GPP TS 23.032 [3]; and

B) <ellipsoid-arc-area>, an optional element specifying the area as an ellipsoid arc specified in clause 5.7 of 3GPP TS 23.032 [3]; and

iii) <operator-managed>, a mandatory element encoded as specified in 3GPP TS 24.385 [7] clause 5.5.19; and

5) <V2X-service-ids-list>, a mandatory element contains the following elements:

i) one or more <V2X-service-id> elements. Each <V2X-service-id> element contains the V2X service ID which the V2X UE is no longer interested in receiving (e.g. PSID or ITS AID of ETSI ITS DENM, ETSI ITS CAM); and

ii) one or more <layer2-id> elements. Each <layer2-id> element is encoded as the DestinationLayer2ID specified in 3GPP TS 36.300 [16]; or

c) <result>, an optional element which indicates a value either "success" or "failure".

<V2X-app-requirement-notification> element contains a string set to either "success" or "failure" used to indicate success or failure of the network resource adaptation corresponding to the V2X application requirement.

<layer2-group-id-mapping> element contains the following elements:

a) <dynamic-group-info> element; and

b) <prose-layer2-group-id>, an element contains the identity of the ProSe Layer-2 Group.

<dynamic-group-info> element contains the following elements:

a) <dynamic-group-id>, an element contains the identity of the dynamic group;

b) <group-definition>, an element containing dynamic group definition information; and

c) <group-leader-id>, an element contains the identity of the group leader.

<id-list-notification> element contains the following sub-elements:

a) <dynamic-group-id>, an element set to the identity of the dynamic group; and

b) one or more <group-member-id> element(s), each <group-member-id> element contains the following sub-elements:

1) <identity> element shall include a <V2X-UE-id> element, an element set to the identity of the joined or left V2X UE; and

2) <group-scope>, an element that has the value "joined" or "left". The value "joined" means that the V2X UE joined the group. The value "left" means that the V2X UE left the group.

<configure-dynamic-group-notification> element contains the following sub-elements:

a) <dynamic-group-id>, an element set to the identity of the dynamic group; and

b) one or more <group-member-id> element(s), each <group-member-id> element contains the following sub-elements:

1) <identity> element shall include a <V2X-UE-id> element, an element set to the identity of the joined or left V2X UE; and

2) <group-scope>, an element that has the value "joined" or "left". The value "joined" means that the V2X UE joined the group. The value "left" means that the V2X UE left the group.

<subscription-request> is an optional element which contains the <identity>, <subscription-events> and <triggering-criteria> sub-elements.

<subscription-events> is a mandatory element which contains one or more <events> sub-elements.

<event> element contains a string set to either "uplink degradation" or "congestion" or "overload" or "coverage".

<triggering-criteria>, a mandatory element which contains at least one of the following sub-elements:

a) <cell-change>, an optional element specifying what cell changes trigger the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-cell-change>, an optional element. The presence of this element specifies that any cell change is a trigger. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-cell>, an optional element specifying an NCGI which when entered triggers a request for alocation report coded as specified in clause 19.6A in 3GPP TS 23.003 [2]. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <exit-specific-cell>, an optional element specifying an NCGI which when exited triggers the VAE-S to send monitoring reports to the VAE-C coded as specified in clause 19.6A in 3GPP TS 23.003 [2]. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

b) <tracking-area-change>, an optional element specifying what tracking area changes trigger the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-tracking-area-change>, an optional element. The presence of this element specifies that any tracking area change is a trigger. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-tracking-area>, an optional element specifying a tracking area identity coded as specified in clause 19.4.2.3 in 3GPP TS 23.003 [2] which when entered triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <exit-specific-tracking-area>, an optional element specifying a tracking area identity coded as specified in clause 19.4.2.3 in 3GPP TS 23.003 [2] which when exited triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

c) <plmn-change>, an optional element specifying what PLMN changes trigger the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-plmn-change>, an optional element. The presence of this element specifies that any PLMN change is a trigger. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-plmn>, an optional element specifying a PLMN id (MCC+MNC) coded as specified in 3GPP TS 23.003 [2] which when entered triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <exit-specific-plmn>, an optional element specifying a PLMN id (MCC+MNC) coded as specified in 3GPP TS 23.003 [2] which when exited triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

d) <mbms-sa-change>, an optional element specifying what MBMS changes trigger the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-mbms-sa-change>, an optional element. The presence of this element specifies that any MBMS SA change is a trigger for the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-mbms-sa>, an optional element specifying an MBMS service area id which when entered triggers the VAE-S to send monitoring reports to the VAE-C. The MBMS service area id is coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI). This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <exit-specific-mbms-sa>, an optional element specifying an MBMS service area id which when exited triggers the VAE-S to send monitoring reports to the VAE-C. The MBMS service area id is coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI). This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

e) <mbsfn-area-change>, an optional element specifying what MBSFN changes trigger a request for the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-mbsfn-area-change>, an optional element. The presence of this element specifies that any MBSFN area change is a trigger for the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-mbsfn-area>, an optional element specifying an MBSFN area which when entered triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <exit-specific-mbsfn-area>, an optional element specifying an MBSFN area which when exited triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

f) <periodic-report>, an optional element specifying that periodic request for the VAE-S to send monitoring reports to the VAE-C shall be sent. The value in seconds specifies the reporting interval. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

g) <travelled-distance>, an optional element specifying that the travelled distance shall trigger a request for the VAE-S to send monitoring reports to the VAE-C. The value in metres specified the travelled distance. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

h) <vertical-application-event>, an optional element specifying what application signalling events triggers the VAE-S to send monitoring reports to the VAE-C. The <vertical-application-event> element has the following sub-elements:

1) <initial-log-on>, an optional element specifying that an initial log on triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <location-configuration-received>, an optional element specifying that a received location configuration triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

3) <any-other- event>, an optional element specifying that any other application signalling event than initial-log-on and location-configuration-received triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

i) <geographical-area-change>, an optional element specifying what geographical are changes trigger the VAE-S to send monitoring reports to the VAE-C. This element consists of the following sub-elements:

1) <any-area-change>, an optional element. The presence of this element specifies that any geographical area change is a trigger. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

2) <enter-specific-area>, an optional element specifying a geographical area which when entered triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string. The <enter-specific-area> element has the following sub-elements:

i) <geographical-area>, an optional element containing a <trigger-id> attribute and the following two sub-elements:

A) <polygon-area>, an optional element specifying the area as a polygon specified in clause 5.2 in 3GPP TS 23.032 [3]; and

B) <ellipsoid-arc-area>, an optional element specifying the area as an ellipsoid arc specified in clause 5.7 in 3GPP TS 23.032 [3]; and

3) <exit-specific-area-type>, an optional element specifying a geographical area which when exited triggers the VAE-S to send monitoring reports to the VAE-C. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string.

<subscription-response> is an optional element which contains the <identity> and <result> sub-elements.

The <notification-info> element contains the following sub-elements:

a) <VAL-UE-id>, an element contains the identity of the V2X UE who subscribes the network monitoring information;

b) <network-monitoring-info>, an element contains one or more <trigger-id> attributes that identifies the triggering criteria that resulted in the VAE-S sending the monitoring report to the VAE-C. In addition, the <network-monitoring-info> contains the following sub-elements:

1) <uplink-quality-level>, an optional element contains an integer used to indicate the uplink quality level;

2) <congestion-level>, an optional element contains an integer used to indicate the congestion level;

3) <overload-level>, an optional element contains an integer used to indicate the overload level;

4) <geographical-area>, an optional element contains the following elements:

i) <cell-area>, an optional element specifying an NCGI which when entered triggers a request for alocation report coded as specified in clause 19.6A in 3GPP TS 23.003 [2] for which the monitoring applies;

ii) <tracking-area>, an optional element specifying a tracking area identity coded as specified in clause 19.4.2.3 in 3GPP TS 23.003 [2] for which the monitoring applies;

5) <time-validity>, an optional element specifies the period for which the monitoring applies; and

6) <MBMS-level>, an optional element contains the following elements:

i) <MBMS-coverage-level>, an optional element contains an integer used to indicate the MBMS coverage level; or

ii) <MBMS-bearer-level-event>, an optional element contains an integer used to indicate the MBMS bearer level events.

\* \* \* End of Change \* \* \* \*