**3GPP TSG-CT WG1 Meeting #128-eC1-21abcd**

**Electronic meeting, 25 February – 5 March 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.486** | **CR** | **0060** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | V2X UE de-registration procedure response correction | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | V2XAPP | | | | |  | ***Date:*** | | | 2021-02-18 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The response from the server at V2X UE de-registration procedure by sending a <result> element is not captured in Structure and Semantics. Further the element inclusion in Client and Server cases are not correctly reflected. It is proposed to correct these errors. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The <result> element is added as an alternative in <de-registration-info> element  The combination of elements to include in <de-registration-info> element is corrected | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete specification can result in faulty and incompatible implementations | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 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 \*\*\*

## 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) a <registration-info> element;

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

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

d) a <message-info> element;

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

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

g) an <V2X-USD-announcement-info> element;

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

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

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

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

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

m) a <network-monitoring-subscription-info> element; or

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

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

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

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

The <service-discovery-data> 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, a <reception-uri> 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 one or more <V2X-service-id> element(s); or

b) a <result> element.

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

a) the following elements:

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

b) a <V2X-group-id>;

c) a <payload> element;

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

e) 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) a <V2X-UE-id> element and a <geo-id> element; or

b) a <result> element and optionally a <local-service-info-content> element which shall include:

1) a <V2X-server-USD> element which shall include:

i) a <TMGI> element;

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

iii) a <frequency> element; and

iv) a <V2X-mbms-sdp> element;

2) a <V2X-AS-address> element; and

3) a <V2X-server-USD> element which shall include:

i) a <TMGI> element;

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

iii) a <frequency> element; and

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

The <V2X-USD-announcement-info> element shall include the followings:

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

b) a <V2X-USD-configuration-data> element which shall include the followings:

1) a <TMGI> element;

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

3) a <frequency> element; and

4) 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) 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 <V2X-UE-id> element shall include a <V2X-UE-id> element; and

2) a <group-scope> element.

The <network-monitoring-subscription-info> element shall include either:

a) the following elements:

1) an <V2X-UE-id> 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 <registration-info>, <de-registration-info>, <location-tracking.info>, <message-info>, <service-discovery-info>, <local-service-info>, <V2X-USD-announcement-info>, <set-PC5-parameters-info>, <V2X-app-requirement-notification>, <layer2-group-id-mapping>, <id-list-notification>, <configure-dynamic-group-notification>, <network-monitoring-subscription-info> and <network-monitoring-info-notification> sub-elements.

<registration-info> element contains the following elements:

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

b) <reception-uri>, an element that contains the URI of the V2X UE; and

c) 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

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

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

<reception-uri> element indicates the destination URI of messages sent to the V2X UE, and includes a URI as specified in IETF RFC 2616 [19].

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

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

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); and

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

<location-tracking-info> element contains either:

a) a <V2X-UE-id> element set to the identity of the V2X UE that subscribes or unsubscribes to a geographical area;

b) a <geo-id> element set to the identity of the geographical area to be subscribed or unsubscribed; and

c) an <operation> element which indicates a value either "subscribe" or "unsubscribe";

or:

a) a <result> element set to the value "success" or "failure" indicating success or failure of the subscription or unsubscription; and

b) an <operation> element which indicates a value either "subscribe" or "unsubscribe".

<message-info> element contains the following elements;

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

b) <V2X-group-id>, an optional element contains the identity of the V2X group;

c) <payload>, an optional element contains the payload of the V2X message (e.g. ETSI ITS DENM);

d) <V2X-service-id>, an optional element contains the V2X service ID which the V2X message belongs to;

e) <geo-id>, an optional element contains a geographical area identity representing a geographical area;

f) <message-reception-ind>, an optional element used to indicate that a reception report is required to be sent;

g) <message-reception-uri>, an optional element indicates the destination URI of a requested reception report, and includes a URI as specified in IETF RFC 2616 [19]; or

h) <result>, an optional element contains a string set to either "success" or "failure" used to indicate success or failure of the V2X message reception.

<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 <V2X-UE-id> sub-element; or

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

The <service-discovery-data> is an optional 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].

<local-service-info> element contains either the following elements:

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

or the following elements:

a) a <result> element set to the value "success" or "failure" indicating success or failure of getting the local service information;

b) if the result is "success", shall include a <local-service-info-content> element which provides the local service information.

<geo-id> element contains a geographical area identity representing a geographical area.

<local-service-info-content> is an optional element and has the following sub-elements:

a) a <V2X-server-USD> element that specifying the information for V2X server USD and has the following sub-elements:

1) a <TMGI> element;

2) an <mbms-service-areas> element;

3) a <frequency> element; and

4) a <V2X-mbms-sdp> element;

b) a <V2X-AS-address> element that contains a V2X application server address as specified in 3GPP TS 23.285 [21]; and

c) a <V2X-USD> element that specifying the information for V2X USD and has the following sub-elements:

1) a <TMGI> element;

2) an <mbms-service-areas> element;

3) a <frequency> element; and

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

<V2X-USD-announcement-info> is an element used to describe the V2X USD information that V2X UE received from the VAE server which contains the <V2X-UE-id> and <V2X-USD-configuration-data> sub-elements.

<V2X-USD-configuration-data> element is a mandatory element set to the V2X USD configuration data as specified in 3GPP TS 23.285 [21] which contains the <TMGI>, <mbms-service-areas>, <frequency> and <V2X-mbms-sdp> sub-elements.

<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 or 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) 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) 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.

<network-monitoring-subscription-info> is an optional element which contains the <V2X-UE-id>, <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.

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 changes \*\*\*