**3GPP TSG-CT WG1 Meeting #125-eC1-20abcd**

**Electronic meeting, 20-28 August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.486** | **CR** | **0006** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *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:*** | V2X service discovery procedure corrections | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | V2XAPP | | | | |  | ***Date:*** | | | 2020-08-13 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | The coding part of <service-discovery-info> misses the UL alternative when <identity> element is included.  Data semantics of <service-discovery-data> is missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The coding part of <service-discovery-info> is corrected.  Data semantics of <service-discovery-data> is added. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect coding definitions remain which can result in faulty implementations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 6.6.1, 6.6.2, 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 \*\*\*

# 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 23.003: "Numbering, addressing and identification".

[3] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[4] 3GPP TS 23.286: "Application layer support for V2X services; Functional architecture and information flows".

[5] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[6] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[7] 3GPP TS 24.385: "V2X services Management Object (MO)".

[8] 3GPP TS 24.386: "User Equipment (UE) to V2X control function; protocol aspects; Stage 3".

[9] 3GPP TS 24.544: "Group Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[10] 3GPP TS 24.545: "Location Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[11] 3GPP TS 24.546: "Configuration Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[12] 3GPP TS 24.547: "Identity Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[13] 3GPP TS 24.548: "Network Resource Management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[14] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

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

[16] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRAN); Overall description; Stage 2".

[17] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".

[18] ETSI TS 102 965 (V1.4.1): "Intelligent Transport Systems (ITS); Application Object Identifier (ITS-AID); Registration".

[19] IETF RFC 2616: "Hypertext Transfer Protocol -- HTTP/1.1".

[20] ISO TS 17419: "Intelligent Transport Systems - Cooperative systems - Classification and management of ITS applications in a global context".

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

\*\*\* 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 <PC5-parameters-request> element;

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

k) a <V2X-app-requirement-result> element;

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

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

n) a <configure-dynamic-group-result> element;

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

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

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

r) a <subscription-request> element;

s) a <subscription-response> element; or

t) 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) an <identity> element;

b) a <service> element; or

c) 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) an <identity> element; and

b) a <service> element.

The <location-tracking-info> element shall include one of the followings:

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

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

c) an <operation> element; or

d) a <result> element.

The <geographical-identifier> element shall include one or more <geo-id> elements which each shall include:

a) a <polygon-area> element; and

b) an <ellipsoid-arc-area> element.

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; or

g) a <result> element.

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

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

a) an <identity> element;

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

c) a <result> element; or

d) 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 <PC5-parameters-request> element shall include the followings:

a) a <expiration-time> element;

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

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

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

1) a <radio-parameters-content> element;

2) a <geographical-identifier> element; and

3) a <operator-managed> element;

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

1) a <V2X-service-id> element; or

2) a <layer-2-id> element.

The <V2X-app-requirement-request> element shall include the followings:

a) an <identity> element which shall include one of the following elements:

1) a <VAL-ue-id> element; or

2) a <VAL-group-id> element;

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

c) a <V2X-app-requirement> element; and

d) an <endpoint-info> element.

The <configure-dynamic-group-request> 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-leader-id> element; and

b) an <endpoint-info> 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-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 <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;

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

1) a <UE-id> element; and

2) a <group-scope> element.

The <subscription-request> element shall include the followings:

a) an <identity> element;

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

c) a <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 <subscription-response> element shall include the followings:

a) an <identity> element; and

b) a <result> element;

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

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

b) a <network-monitoring-info> element, which may include:

1) an <uplink-qulity-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>, <PC5-parameters-request>, <V2X-app-requirement-request>, <V2X-app-requirement-result>, <V2X-app-requirement-notification>, <configure-dynamic-group-request>, <configure-dynamic-group-result>, <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.

The <registration-info> element contains the <result> sub-element and may include a <service-discovery-info> sub-element.

<result> is a mandatory element which indicates a value either "success" or "fail".

<de-registration-info> is an optional element used to include the de-V2X registration information. The <de-registration-info> element contains the <identity> and <service> sub-elements.

<service> is a mandatory element used to include the types of V2X messages that the UE is no longer interested in receiving. The <service> element contains either a <V2X-service-id> attribute that contains one or more identifiers of V2X service identifiers as specified in ETSI TS 102 965 [18] and ISO TS 17419 [20] or a <V2X-MSG-type> attribute that contains one or more identifiers of a V2X service identifiers as specified in ETSI TS 102 965 [18] and ISO TS 17419 [20].

<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) a <V2X-service-id> attribute that contains one or more identifiers of V2X service identifiers 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 [x].

<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 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].

<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.

<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.

<expiration-timer> is a mandatory element encoded as specified in 3GPP TS 24.385 [7] clause 5.5.2.

<plmn-id> is a mandatory element encoded as specified in 3GPP TS 23.003 [2].

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

<radio-parameters-content> is a mandatory element encoded as specified in3GPP TS 36.331 [17] clause 9 for the SL-V2X-Preconfiguration.

<operator-managed> is a mandatory element encoded as specified in 3GPP TS 24.385 [7] clause 5.5.19.

<layer-2-id> is a mandatory element encoded as the DestinationLayer2ID specified in 3GPP TS 36.300 [16].

<V2X-app-requirement-request> element contains the following sub-elements:

a) <identity>, an element contains one of the following elements:

1) <VAL-ue-id>, an element contains the identity of the V2X UE for which V2X application requirement is initiated; and

2) <V2X-group-id>, an element contains the identity of the V2X group for which V2X application requirement is initiated;

b) <V2X-service-id>, an element contains the V2X service ID for which application requirement corresponds to;

c) <V2X-app-requirement>, an element contains the requirement information for V2X application change; and

d) <endpoint-info>, an element contains the endpoint information to which the notification shall be sent.

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

<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.

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

a) <dynamic-group-info>, an element contains the following sub elements:

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

2) <group-leader-id>, an element contains the identity of the group leader; and

b) <endpoint-info>, an element contains the endpoint information to which the configure dynamic group notification request has to be sent.

<configure-dynamic-group-result> element contains a string set to either "success" or "failure" used to indicate success or failure of the dynamic group creation.

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

a) <dynamic-group-info>, an element contains the following sub elements:

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

2) <group-leader-id>, an element contains the identity of the group leader; and

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

<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) <UE-id>, 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) <UE-id>, 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 subelements:

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 <network-monitoring-info-notification> 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 the following sub-elements:

1) <triggering-criteria>, an element identifies when the VAE-S will send the monitoring reports to the VAE-C;

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

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

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

5) <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;

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

7) <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 \*\*\*