**3GPP TSG-CT WG1 Meeting #125-eC1-204629**

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

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.486** | **CR** | **0005** | **rev** | **-** | **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 message delivery 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 stage 2 requirements for V2X message distribution originated from the V2X application specific layer are specified in 23.286. The corresponding stage 3 requirements in subclause 6.5 and the coding on subclause 8.1 are not fully clear and correct.  It is proposed to correct and clarify the stage 3 requirements following the stage 2 requirements.  1) At receiving a message, specification of a received Accept header field is specified both for client and server procedures. This is not incorrect, but no other procedures in 24.486 includes such specification even though equally applicable. Further there are no requirements of setting the Accept header field at sending messages in 24.486. It is therefore proposed to align procedures and not include an explicit requirement for Accept header field in V2X message delivery procedure.  2) At receiving a requested reception report, it is specified that the client/server shall provide this result to the V2X application/V2X application server. This is not inline with stage 2 where a reception result is for the requesting entity only (VAE-C/VAE-S). It is therefore proposed to modify the action at Reception of a V2X message reception report accordingly.  3) The URI to include in sending reception report is not received in the request message. It is proposed to add a new element to include this information.  4) Incorrect reference to V2X service discovery procedure  5) Duplicated subclause numbering  6) The desription of VAE-C action at selecting target UE Id is incorrect and not inline with stage 2 for V2X message delivery based on geographical location and for V2X group Id.  7) At V2X message delivery based on V2X group Id, there is no <identity> element but a <group> element directly under the <message-info> element  8) Minor editorial corrections | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1) Accept header field requirements are removed.  2) V2X message reception report is not provided to V2X application and V2X application server.  3)Addition of the <message-reception-uri> element.  4) Corrected reference  5) Corrected subclause numbering  6) Correct VAE-S action at determining UE Id/V2X group Id for receiving a V2X message.  7) Remove <identity> element in V2X group message delivery.  8) Editorial corrections | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The stage 3 requirements for V2X message delivery are unclear and not correctly following stage 2 requirements, which results in non-implementable procedures. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.5.1.1, 6.5.1.2, 6.5.1.3, 6.5.1.4, 6.5.1.1, 6.5.1.2, 6.5.1.3, 6.5.1.4, 6.5.1.5, 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 \*\*\*

## 6.5 V2X message delivery procedure

### 6.5.1 Client procedure

#### 6.5.1.1 Reception of a V2X message

Upon receiving an HTTP POST request containing:

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

b) an application/vnd.3gpp.vae-info+xml MIME body with either a <identity> element or a <group> element, a <payload>element and a <service> element included in the <message-info> root element;

the VAE-C:

a) shall provide the received information to the V2X application identified by the service indicated in the V2X message, if the identity or group of theV2X message matches the identity of the V2X UE or the group of the VAE client; and

b) shall send a V2X message reception report as specified in clause 6.5.1.3 if the <message-reception-ind> element and <message-reception-uri> element are included in the received V2X message.

\*\*\* Next change \*\*\*

#### 6.5.1.2 Reception of a V2X message reception report

Upon receiving an HTTP POST request containing:

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

b) an application/vnd.3gpp.vae-info+xml MIME body with a <result> element included in the <message-info> root element;

the VAE-C:

a) evaluates the content of the <result> element.

\*\*\* Next change \*\*\*

#### 6.5.1.3 Sending of a V2X message reception report

In order to send a V2X message reception report, the VAE-C shall send a HTTP POST request message according to procedures specified in IETF RFC 2616 [19]. In the HTTP POST request message, the VAE-C:

a) shall set the Request-URI to the URI included in the <message-reception-uri> element in the received HTTP POST request message for reception of a V2X message (see clause 6.5.1.1);

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

c) shall include an application/vnd.3gpp.vae-info+xml MIME body and a <result> element of the <message-info> element set to a value "success" or "fail".

\*\*\* Next change \*\*\*

#### 6.5.1.4 Sending of a V2X message

In order to send a V2X message, the VAE-C shall send an HTTP POST request message according to procedures specified in IETF RFC 2616 [19]. In the HTTP POST request message, the VAE-C:

a) shall set the Request-URI to the URI included in the received HTTP response message for V2X service discovery procedure (see clause 6.6);

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 and in the <message-info> root element:

1) shall include a <identity> element with a <V2X-UE-id> child element set to the identity of the UE which requests the sending of the V2X message;

2) shall include a <service> element with a <V2X-service-id> child element set to the identity of the V2X service which is interested in sending the V2X message;

3) may include a <geographical-identifier> element with one or more <geo-id> child elements set to the identity of the geographical locations of the V2X UE;

4) may include a <message-reception-ind> element to indicate to the VAE server that a reception report is required; and

5) if a <message-reception-ind> element is included, shall include a <message-reception-uri> element set to the URI for a response to the VAE-C.

### 6.5.2 Server procedure

\*\*\* Next change \*\*\*

#### 6.5.2.1 Reception of a V2X message

Upon receiving an HTTP POST request containing:

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

b) an application/vnd.3gpp.vae-info+xml MIME body with either a <identity> element or a <group> element, a <payload> element and a <service> element included in the <message-info> root element;

the VAE-S:

a) shall provide the received information to the V2X application server identified by the service indicated in the V2X message; and

b) shall send a V2X message reception report as specified in clause 6.5.2.3 if the <message-reception-ind> element and <message-reception-uri> element are included in the received V2X message.

\*\*\* Next change \*\*\*

#### 6.5.2.2 Reception of a V2X message reception report

Upon receiving an HTTP POST request containing:

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

b) an application/vnd.3gpp.vae-info+xml MIME body with a <result> element included in the <message-info> root element;

the VAE-S:

a) evaluates the content of the <result> element.

\*\*\* Next change \*\*\*

#### 6.5.2.3 Sending of a V2X message reception report

In order to send a V2X message reception report, the VAE-S shall send a HTTP POST request message according to procedures specified in IETF RFC 2616 [19]. In the HTTP POST request message, the VAE-S:

a) shall set the Request-URI to the URI included in the <message-reception-uri> element in the received HTTP POST request message for reception of a V2X message (see clause 6.5.2.1);

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

c) shall include an application/vnd.3gpp.vae-info+xml MIME body and a <result> element of the <message-info> element set to a value "success" or "fail".

\*\*\* Next change \*\*\*

#### 6.5.2.4 Sending of a V2X message to target geographical areas

In order to send a V2X message received from a V2X application server to target geographical areas, the VAE-S shall send a HTTP POST request message according to procedures specified in IETF RFC 2616 [19]. In the HTTP POST request message, the VAE-S:

a) shall set the Request-URI to the URI included in the received HTTP response message for V2X service discovery procedure (see clause 6.6);

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 and in the <message-info> root element:

1) shall include a <identity> element with a <V2X-UE-id> child element set to the identity of the UE to receive the V2X message, determined by association from the target geographical area indicated by the V2X application server;

2) shall include a <service> element with a <V2X-service-id> child element set to the identity of the V2X service which is interested in sending the V2X message;

3) may include a <geographical-identifier> element with a <geo-id> child element set to the identity of the geographical location of the V2X UE;

4) may include a <message-reception-ind> element to indicate to the VAE server that a reception report is required; and

5) if a <message-reception-ind> element is included, shall include a <message-reception-uri> element set to the URI for a response to the VAE-S.

\*\*\* Next change \*\*\*

#### 6.5.2.5 Sending of a V2X message to a V2X group

In order to send a V2X message received from a V2X application server, the VAE-S shall send a HTTP POST request message according to procedures specified in IETF RFC 2616 [19] to each VAE-C which has subscribed to the V2X message delivery service. In the HTTP POST request message, the VAE-S:

a) shall set the Request-URI to the URI of each VAE-C subscribed for V2X message delivery service;

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 and in the <message-info> root element:

1) shall include a <V2X-group-id> child element set to the V2X group identity of the VAE-C to receive the V2X message, determined by registration with the identity of the V2X group indicated by the V2X application server;

2) shall include a <service> element with a <V2X-service-id> child element set to the identity of the V2X service which is interested in sending the V2X message;

3) may include a <geographical-identifier> element with a <geo-id> child element set to the identity of the geographical location;

4) may include a <message-reception-ind> element to indicate to the VAE-C that a reception report is required; and

5) if a <message-reception-ind> element is included, shall include a <message-reception-uri> element set to the URI for a response to the VAE-C.

\*\*\* 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 <result> element and may include a <service-discovery-data> element.

The <service-discovery-data> element shall include the following:

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

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

2) 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;

g) <message-reception-uri>; 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>, <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> is a mandatory element used to include the V2X service discovery response information. The <service-discovery-info> element contains an <identity> sub-element.

<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.

<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].

<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 \*\*\*