**3GPP TSG-CT WG1 Meeting #141eC1-232597**

**Online 17– 21 April 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.545** | **CR** | **0068** | **rev** | **1** | **Current version:** | **18.0.1** |  |
|  | | | | | | | | |
| *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:*** | Add Location QoS in the related information | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GFLS | | | | |  | ***Date:*** | | | 2023-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to[S6-231052](https://www.3gpp.org/ftp/tsg_sa/WG6_MissionCritical/TSGS6_053_Athens/Docs/S6-231052.zip), stage2 has updated the location information subscription procedure and on-demand usage of location information procedure to add Location QoS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | update the location information subscription procedure and on-demand usage of location information procedure to add Location QoS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 3 does not align with Stage 2 specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.6.1.1.1, 6.2.6.2.1.1, 6.2.6.2.2, 6.2.8.1, 6.2.8.2, 7.3, 7.4.2, 7.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[5] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[6] 3GPP TS 24.547: "Identity management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[7] Void.

[8] IETF RFC 3261: "SIP: Session Initiation Protocol".

[9] IETF RFC 4825: "The Extensible Markup Language (XML) Configuration Access Protocol (XCAP)".

[10] IETF RFC 6050: "A Session Initiation Protocol (SIP) Extension for the Identification of Services".

[11] IETF RFC 6665: "SIP-Specific Event Notification".

[12] Void

[13] IETF RFC 6750: "The OAuth 2.0 Authorization Framework: Bearer Token Usage".

[14] IETF RFC 3428: "Session Initiation Protocol (SIP) Extension for Instant Messaging".

[15] 3GPP TS 24.379: "Mission Critical Push To Talk (MCPTT) call control Protocol specification".

[16] IETF RFC 7231 : "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".

[17] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[18] 3GPP TS 29.549: "Service Enabler Architecture Layer for Verticals (SEAL); Application Programming Interface (API) specification".

[19] IETF RFC 7159: "The JavaScript Object Notation (JSON) Data Interchange Format".

[20] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[21] IETF RFC 7252: "The Constrained Application Protocol (CoAP)".

[22] IETF RFC 7959: "Block-Wise Transfers in the Constrained Application Protocol (CoAP)".

[23] IETF RFC 7641: "Observing Resources in the Constrained Application Protocol (CoAP)".

[24] IETF RFC 8132: "PATCH and FETCH Methods for the Constrained Application Protocol (CoAP)".

[25] IETF RFC 8323: "CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets".

[26] IETF RFC 8949: "Concise Binary Object Representation (CBOR)".

[27] IETF RFC 9177: "Constrained Application Protocol (CoAP) Block-Wise Transfer Options Supporting Robust Transmission".

[28] IETF RFC 8610: "Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures".

[29] 3GPP TS 24.546: "Configuration management - Service Enabler Architecture Layer for Verticals (SEAL); Protocol specification".

[30] OMA OMA-TS-XDM\_Core-V2\_1-20120403-A: "XML Document Management (XDM) Specification".

[31] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[32] IETF RFC 6086: "Session Initiation Protocol (SIP) INFO Method and Package Framework".

[33] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

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

6.2.6.1.1.1 Create subscription

In order to subscribe location information of one or more VAL users or VAL UEs, if VAL server supports SIP, the VAL server shall generate an initial SIP MESSAGE request according to 3GPP TS 24.229 [5] and IETF RFC 3428 [14]. In the SIP MESSAGE request, the VAL server:

a) shall set the Request-URI to the public service identity identifying the originating SLM-S serving the VAL server;

b) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.seal" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [10];

c) shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the <location-info> root element;

1) shall include an <identity> element with a <VAL-user-id> child element set to the identity of the VAL server which requests the location information subscription;

2) shall include a <subscription> element which shall include:

i) an <identities-list> element with one or more <VAL-user-id> child elements set to the identities of the VAL users whose location information is requested;

ii) a <time-interval-length> element specifying the time between consecutive reports. The value is given in seonds;

iii) an <expiry-time> element specifying the time when the VAL server wants to receive the current status and later notification; and

iv) a <location-QoS> element specifying the location QoS as specified in TS 29.572 [33] clause 6.1.6.2.13 if the VAL users whose location information is requested; and

d) shall send the SIP MESSAGE request towards the SLM-S according to 3GPP TS 24.229 [5].

Upon receiving a SIP MESSAGE with an application/vnd.3gpp.seal-location-info+xml MIME body, the VAL server:

a) shall store the Subcription expiry value set in <expiry-time> element; and

b) may start subscription refresh timer and set expiry time for the subscription refresh timer to the 2/3 of Subcription expiry value.

NOTE: It is upto implementation to refressh subscribe upon expiry of subscription refresh timer.

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

6.2.6.2.1.1 Create subscription

Upon receiving a SIP MESSAGE request such that:

a) Request-URI of the SIP MESSAGE request contains the public service identity identifying the SLM-S of the served VAL server;

b) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.seal" (coded as specified in 3GPP TS 24.229 [5]), in a P-Asserted-Service header field according to IETF RFC 6050 [10]; and

c) the SIP MESSAGE request contains an application/vnd.3gpp.seal-location-info+xml MIME body with an <subscription> element included in the <location-info> root element;

the SLM-S:

a) shall identify the served VAL user ID in the <identity> element of the application/ vnd.3gpp.seal-location-info+xml MIME body of the SIP MESSAGE request;

b) if the Request-URI of the SIP MESSAGE request contains the public service identity identifying the SLM-S serving the VAL server, shall identify the originating VAL user ID from public user identity in the P-Asserted-Identity header field of the SIP MESSAGE request;

c) if the originating VAL user ID is different than the served VAL user ID, shall send a 403 (Forbidden) response and shall not continue with the rest of the steps; and

d) shall generate a 200 (OK) response to the SIP MESSAGE request according to 3GPP TS 24.229 [5] and send it towards VAL server.

e) shall store all users information contained in <VAL-user-id> element of <identities-list> element;

f) shall store the expiry time for the subscription to the <expiry-time> value; if the expiry time value as present in <expiry-time> element is not acceptable to the SLM-S, the SLM-S may change the expiry time value to a lower value;

g) shall store the time interval value to the <time-interval-length> element;

h) shall store the requested location QoS to the <location-QoS> element;

i) shall generate and assign a unique integer as subscription identifier to the subscription request received from VAL server;

j) shall generate a SIP MESSAGE request according to 3GPP TS 24.229 [5] and IETF RFC 3428 [14].

k) In the SIP MESSAGE, the SLM-S shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the <location-info> root element;

1) shall include a <subscription> element which shall include:

i) a <subscription-identifier> element set to the unique subscription identifier which is assigned to the subscription request;

ii) an <expiry-time> element set to the accepted expiry time value; and

iii) if the VAL users whose location information is requested as present in <identities-list> element is not fully acceptable to the SLM-S, the SLM-S may change the VAL users to a subset and shall include an <identities-list> with one or more <VAL-user-id> child elements set to the identities of the new VAL users;

l) shall send the SIP MESSAGE request towards the VAL server according to 3GPP TS 24.229 [5]; and

m) shall start the timer TLM-1 (subscription expiry) and set the expiry time of the timer to the expiry time for the subscription.

n) shall start the timer TLM-2 (notification interval) timer and set the internal time of the timer to the <time-interval-length> element value.

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

##### 6.2.6.2.2 HTTP based procedure

Upon receiving an HTTP POST request containing:

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

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

c) an application/vnd.3gpp.seal-location-info+xml MIME body with a <subscription> element included in the <location-info> root element;

the SLM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1; and

1) if the identity of the sender of the received HTTP POST request is not authorized to subscribe location information of another VAL user or VAL UE, shall respond with a HTTP 403 (Forbidden) response to the HTTP POST request and shall skip rest of the steps;

2) shall support handling an HTTP POST request from a SLM-C according to procedures specified in IETF RFC 4825 [9] "POST Handling";

3) may initiate location reporting configuration with the location management client of the UE for immediate reporting as specified in clause 6.2.3.2; and

4) may subscribe for the location of the UE as specified in clause 4.4.2.2.2 of 3GPP TS 29.122 [17];

b) shall store the expiry time for the subscription to the <expiry-time> value. If the expiry time value as present in <expiry-time> element is not acceptable to the SLM-S, the SLM-S may change the expiry time value to a lower value;

c) shall store the time interval value to the <time-interval-length> element. if the time interval value as present in <time-interval-length> element is not acceptable to the SLM-S, the SLM-S may change the time interval value to a lower value;

d) shall store the requested location QoS to the <location-QoS> element;

e) shall generate and assign a unique integer as subscription identifier to the subscription request received from VAL server;

f) shall store the users information contained in the <VAL-user-id> elements of <identities-list> element. If the VAL users whose location information is requested as present in <identities-list> element is not fully acceptable to the SLM-S, the SLM-S may change the VAL users to a subset and store the identities of the new VAL users;

g) shall generate an HTTP 200 (OK) response according to IETF RFC 7231 [16]. In the HTTP 200 (OK) message, the SLM-S:

1) shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the <location-info> root element:

i) a <subscription-identifier> element set to the unique subscription identifier which is assigned to the subscription request;

ii) an <expiry-time> element set to the accepted expiry time value; and

iii) if the VAL users whose location information is requested as present in <identities-list> element is not fully acceptable to the SLM-S, the SLM-S may change the VAL users to a subset and shall include an <identities-list> with one or more <VAL-user-id> child elements set to the identities of the new VAL users;

h) shall send the HTTP 200 (OK) message towards the VAL server according to IETF RFC 7231 [16];

i) shall start the timer TLM-1 (subscription expiry) and set the expiry time of the timer to the expiry time for the subscription; and

j) shall start the timer TLM-2 (notification interval) timer and set the internal time of the timer to the <time-interval-length> element value.

Upon receiving an HTTP POST request with an application/vnd.3gpp.seal-location-info+xml MIME body containing <subscription-identifier> element along with <expiry-time> element set to zero, the SLM-S:

a) shall delete all information related to subscription;

b) shall generate an HTTP 200 (OK) message according to IETF RFC 7231 [16]. In the HTTP 200 (OK) message, the SLM-S shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the <location-info> root element;

1) shall include a <subscription> element which shall include:

i) a <Subscription Identifier> element set to the unique subscription identifier which is assigned to the subscription request;

d) shall send the HTTP 200 (OK) message towards the VAL server according to IETF RFC 7231 [16];

e) shall stop TLM-1 (subscription expiry) timer if it is running; and

f) shall stop TLM-2 (notification interval) timer if it is running.

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

#### 6.2.8.1 VAL server procedure

If the VAL server needs to request UE location information, the VAL server shall send an HTTP POST request to the SLM-S according to procedures specified in IETF RFC 7231 [16]. In the HTTP POST request message, the VAL server:

a) shall include a Request-URI set to the URI corresponding to the identity of the SLM-S;

b) shall include an Accept header field set to "application/vnd.3gpp.seal-location-info+xml";

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

d) shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the<location-info> root element:

1) shall include an <identity> element with a <VAL-user-id> child element set to the identity of the VAL server which requests the location information;

2) shall include an <identities-list> element with one or more <VAL-user-id> child elements set to the identities of the VAL users whose location information is requested; and

3) may include a <location-QoS> element set to the requested location QoS as specified in TS 29.572 [33] clause 6.1.6.2.13 if the VAL users whose location information is requested.

Upon receiving an HTTP 200 (OK) response from the SLM-S containing:

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

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

the VAL server:

a) shall store the received location information; and

b) may share the information to a group or to another VAL user or VAL UE.

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

#### 6.2.8.2 Server procedure

Upon receiving an HTTP POST request containing:

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

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

c) an application/vnd.3gpp.seal-location-info+xml MIME body with the <location-info> root element which contains an < identities-list > element and optionally, <location-QoS> element;

the SLM-S:

a) shall determine the identity of the sender of the received HTTP POST request as specified in clause 6.2.1.1; and

1) if the identity of the sender of the received HTTP POST request is not authorized to obtain location information of another VAL user, shall respond with a HTTP 403 (Forbidden) response to the HTTP POST request and shall skip rest of the steps; and

b) shall support handling an HTTP POST request from the VAL server according to procedures specified in IETF RFC 4825 [9] "POST Handling";

c) shall generate an HTTP 200 (OK) response according to IETF RFC 7231 [16]. In the HTTP 200 (OK) response message, the SLM-S:

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

2) shall include an application/vnd.3gpp.seal-location-info+xml MIME body and in the <location-info> root element:

i) shall include an <identity> element with a <VAL-user-id> child element set to the identity of the VAL user for location reporting configuration;

ii) an <identities-list> element with one or more <VAL-user-id> child elements set to the identities of the VAL users whose location information is requested;

iii) a <reports> element containing one or more <loc-info-report> elements. The <loc-info-report> contains a <VAL-user-id> element set to the identity of the VAL user in the requested-identity-list and the latest location information corresponding to the VAL user; and

d) shall send an HTTP 200 (OK) response towards the VAL server.

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

## 7.3 Structure

The location management document shall conform to the XML schema described in clause 7.4.

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

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

a) an <identity> element;

b) a <subscription> element;

c) a <notification> element;

d) a <report> element;

e) a <configuration> element;

f) a <request> element;

g) a <requested-identity> element;

h) a <report-request> element;

i) a <location-based-query> element;

j) a <location-based- response> element; or

k) a <location-QoS> element.

The <identity> element shall include one of the following:

a) a <VAL-user-id> element may include a <VAL-client-id> element; or

b) a <VAL-group-id> element.

The <subscription> element shall include:

a) an <identities-list> element which shall include:

1) one or more <VAL-user-id> elements; and

b) a <time-interval-length> element;

c) a <subscription-identifier> element;

d) an <expiry-time> element;

e) a <location-QoS> element may include:

1) a <hAccuracy> element;

2) a <vAccuracy> element;

3) a <vertRequested> element;

4) a <responseTime> element;

5) a <minorLocQoses> element;or

6) a <lcsQosClass> element.

The <notification> element shall include:

a) an <identities-list> element which shall include:

1) one or more <VAL-user-id> elements;

b) a <trigger-id> element; and

c) a <reports> element containing one or more <loc-info-report> elements. The <loc-info-report> element shall include:

1) a <VAL-user-id> element;

2) a <latest-location> element, which shall include at least one of the following sub-elements:

i) a <latest-serving-NCGI> element;

ii) a <neighbouring-NCGI> element;

iii) an <mbms-service-area-id> element;

iv) an <mbsfn-area> element; or

v) a <latest-coordinate> element;

The <report> element shall contain a <report-id> attribute. The <report> shall include:

a) a <trigger-id> element; and

b) a <current-location> element which shall include at least one of the following:

1) a <current-serving-NCGI> element;

2) a <neighbouring-NCGI> element;

3) a <mbms-service-area-id> element; or

4) a <current-coordinate> element.

The <configuration> element includes:

a) a <location-information> element including:

1) a <current-serving-NCGI> element;

2) a <neighbouring-NCGI> element;

3) an <mbms-service-area-id> element;

4) an <mbsfn-area-id> element; or

5) a <current-geographical-coordinate> element;

b) a <triggering-criteria> element shall include at least one of the following sub-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; and

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; and

iii) an <exit-specific-tracking-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; and

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; and

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; and

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; and

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; and

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;

c) a <minimum-interval-length> element;

The <request> shall contain a <request-id> attribute.

The <requested-identity> element shall include one of the following sub-elements:

a) a <VAL-user-id> element may include a <VAL-client-id> element; or

b) a <VAL-group-id> element.

The <report-request> element shall include at least one of the following sub-elements:

a) an <immediate-report-indicator> element;

b) a <current-location> element which shall include at least one of the following sub-elements:

1) a <current-serving-NCGI> element;

2) a <neighbouring-NCGI> element;

3) an <mbms-service-area-id> element; or

4) a <current-coordinate> element;

c) a <triggering-criteria> element shall include at least one of the following sub-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) a <enter-specific-cell> element shall include a <trigger-id> element; and

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; and

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; and

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; and

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-areaChange> element shall include a <trigger-id> element;

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

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; and

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; and

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;

d) a <minimum-interval-length> element; and

e) an <endpoint-info> element.

The <location-based-query> element shall include at least one of the following:

a) a <polygon-area> element; or

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

The <location-based-response> element may include:

a) an <identities-list> element which shall include:

1) one or more <VAL-user-id> elements;

The <location-QoS> element may include:

a) a <hAccuracy> element;

b) a <vAccuracy> element;

c) a <vertRequested> element;

d) a <responseTime> element;

e) a <minorLocQoses> element;or

f) a <lcsQosClass> element.

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

### 7.4.2 XML schema

<?xml version="1.0" encoding="UTF-8"?>

<xs:schema xmlns:xs="<http://www.w3.org/2001/XMLSchema>"

targetNamespace="urn:3gpp:ns:sealLocationInfo:1.0"

xmlns:sealloc="urn:3gpp:ns:sealLocationInfo:1.0"

elementFormDefault="qualified"

attributeFormDefault="unqualified"

xmlns:xenc="http://www.w3.org/2001/04/xmlenc#">

<xs:import namespace="http://www.w3.org/XML/1998/namespace"

schemaLocation="http://www.w3.org/2001/xml.xsd"/>

<xs:element name="location-info" id="loc">

<xs:annotation>

<xs:documentation>Root element, contains all information related to location configuration, location request and location reporting for the SEAL service</xs:documentation>

</xs:annotation>

<xs:complexType>

<xs:choice>

<xs:element name="Identity" type="sealloc:tIdentityType"/>

<xs:element name="Configuration" type="sealloc:tConfigurationType"/>

<xs:element name="Report" type="sealloc:tReportType"/>

<xs:element name="LocationBasedQuery" type="sealloc:tLocationBasedQueryType"/>

<xs:element name="LocationBasedReponse" type="sealloc:tLocationBasedResponseType"/>

<xs:element name="Notification" type="sealloc:tNotificationType"/>

<xs:element name="Request" type="sealloc:tRequestType"/>

<xs:element name="RequestedID" type="sealloc:tRequestedIDType"/>

<xs:element name="Subscription" type="sealloc:tSubscriptionType"/>

<xs:element name="ReportRequest" type="sealloc:tReportRequestType"/>

<xs:element name="LocationQoS" type="sealloc:tLocationQoSType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:choice>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

</xs:element>

<xs:complexType name="tIdentityType">

<xs:choice>

<xs:element name="VAL-user-id" type="sealloc:contentType" minOccurs="0"/>

<xs:element name="VAL-group-id" type="xs:string" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

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<xs:anyAttribute namespace="##any" processContents="lax"/>

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<xs:complexType name="tConfigurationType">

<xs:sequence>

<xs:element name="LocationInformation" type="sealloc:tRequestedLocationType" minOccurs="0"/>

<xs:element name="TriggeringCriteria" type="sealloc:TriggeringCriteriaType"/>

<xs:element name="MinimumIntervalLength" type="xs:positiveInteger"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:attribute name="ConfigScope">

<xs:simpleType>

<xs:restriction base="xs:string">

<xs:enumeration value="Full"/>

<xs:enumeration value="Update"/>

</xs:restriction>

</xs:simpleType>

</xs:attribute>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tReportType">

<xs:sequence>

<xs:element name="TriggerId" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="CurrentLocation" type="sealloc:tCurrentLocationType"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:attribute name="ReportId" type="xs:string" use="optional"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tLocationBasedQueryType">

<xs:sequence>

<xs:element name="PolygonArea" type="sealloc:tPolygonAreaType" minOccurs="0"/>

<xs:element name="EllipsoidArcArea" type="sealloc:tEllipsoidArcType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tLocationBasedResponseType">

<xs:sequence>

<xs:element name="IDList" type="sealloc:tIDsListType"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/> </xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tNotificationType">

<xs:sequence>

<xs:element name="IDsList" type="sealloc:tIDsListType"/>

<xs:element name="Reports" type="sealloc:tReportsType"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

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<xs:extension base="sealloc:tEmptyType">

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</xs:complexContent>

</xs:complexType>

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<xs:choice>

<xs:element name="VAL-user-id" type="sealloc:contentType" minOccurs="0"/>

<xs:element name="VAL-group-id" type="xs:string" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

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</xs:complexType>

<xs:complexType name="tSubscriptionType">

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<xs:element name="IDsList" type="sealloc:tIDsListType"/>

<xs:element name="TimeIntervalLength" type="xs:positiveInteger"/>

<xs:element name="SubscriptionID" type="xs:string" minOccurs="0" maxOccurs="1"/>

<xs:element name="ExpiryTime" type="xs:nonPositiveInteger"/>

<xs:element name="LocationQoS" type="sealloc:tLocationQoSType" minOccurs="0"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tReportRequestType">

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<xs:element name="ImmediateReportIndicator" type="xs:boolean"/>

<xs:element name="CurrentLocation" type="sealloc:tCurrentLocationType"/>

<xs:element name="TriggeringCriteria" type="sealloc:TriggeringCriteriaType"/>

<xs:element name="MinimumIntervalLength" type="xs:positiveInteger" minOccurs="0" maxOccurs="1"/>

<xs:element name="endpoint-info" type="sealloc:contentType" minOccurs="0" maxOccurs="1"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tLocationQoSType">

<xs:sequence>

<xs:element name="hAccuracy" type="sealloc:tAccuracyType" minOccurs="0"/>

<xs:element name="vAccuracy" type="sealloc:tAccuracyType" minOccurs="0"/>

<xs:element name="vertRequested" type="xs:boolean" minOccurs="0"/>

<xs:element name="responseTime" type="sealloc:tResponseTimeType" minOccurs="0"/>

<xs:element name="minorLocQoses" type="sealloc:tMinorLocationQoSType" minOccurs="0"/>

<xs:element name="lcsQosClass" type="sealloc:tLcsQosClassType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

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</xs:sequence>

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<xs:complexType name="tMinorLocationQoSType">

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<xs:element name="vAccuracy" type="sealloc:tAccuracyType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:choice>

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</xs:complexType>

<xs:complexType name="tRequestedLocationType">

<xs:sequence>

<xs:element name="CurrentServingNcgi" type="sealloc:tEmptyType" minOccurs="0"/>

<xs:element name=" NeighbouringNcgi" type="sealloc:tEmptyType" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="MbmsSaId" type="sealloc:tEmptyType" minOccurs="0"/>

<xs:element name="MbsfnArea" type="sealloc:tEmptyType" minOccurs="0"/>

<xs:element name="CurrentGeographicalCoordinate" type="sealloc:tEmptyType" minOccurs="0"/>

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</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="TriggeringCriteriaType">

<xs:sequence>

<xs:element name="CellChange" type="sealloc:tCellChange" minOccurs="0"/>

<xs:element name="TrackingAreaChange" type="sealloc:tTrackingAreaChangeType" minOccurs="0"/>

<xs:element name="PlmnChange" type="sealloc:tPlmnChangeType" minOccurs="0"/>

<xs:element name="MbmsSaChange" type="sealloc:tMbmsSaChangeType" minOccurs="0"/>

<xs:element name="MbsfnAreaChange" type="sealloc:tMbsfnAreaChangeType" minOccurs="0"/>

<xs:element name="PeriodicReport" type="sealloc:tIntegerAttributeType" minOccurs="0"/>

<xs:element name="TravelledDistance" type="sealloc:tIntegerAttributeType" minOccurs="0"/>

<xs:element name="VerticalAppEvent" type="sealloc:tVerticalAppEventType" minOccurs="0"/>

<xs:element name="GeographicalAreaChange" type="sealloc:tGeographicalAreaChange"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tEmptyType"/>

<xs:complexType name="tCellChange">

<xs:sequence>

<xs:element name="AnyCellChange" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="EnterSpecificCell" type="sealloc:tSpecificCellType" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="ExitSpecificCell" type="sealloc:tSpecificCellType" minOccurs="0" maxOccurs="unbounded"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

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</xs:complexType>

<xs:simpleType name="tNcgi">

<xs:restriction base="xs:string">

<xs:pattern value="\d{3}\d{3}[0-1]{28}"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tSpecificCellType">

<xs:simpleContent>

<xs:extension base="sealloc:tNcgi">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name="tEmptyTypeAttribute">

<xs:complexContent>

<xs:extension base="sealloc:tEmptyType">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:complexContent>

</xs:complexType>

<xs:complexType name="tTrackingAreaChangeType">

<xs:sequence>

<xs:element name="AnyTrackingAreaChange" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="EnterSpecificTrackingArea" type="sealloc:tTrackingAreaIdentity" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="ExitSpecificTrackingArea" type="sealloc:tTrackingAreaIdentity" minOccurs="0" maxOccurs="unbounded"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="tTrackingAreaIdentityFormat">

<xs:restriction base="xs:string">

<xs:pattern value="\d{3}\d{3}[0-1]{16}"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tTrackingAreaIdentity">

<xs:simpleContent>

<xs:extension base="sealloc:tTrackingAreaIdentityFormat">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name="tPlmnChangeType">

<xs:sequence>

<xs:element name="AnyPlmnChange" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="EnterSpecificPlmn" type="sealloc:tPlmnIdentity" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="ExitSpecificPlmn" type="sealloc:tPlmnIdentity" minOccurs="0" maxOccurs="unbounded"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="tPlmnIdentityFormat">

<xs:restriction base="xs:string">

<xs:pattern value="\d{3}\d{3}"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tPlmnIdentity">

<xs:simpleContent>

<xs:extension base="sealloc:tPlmnIdentityFormat">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name="tMbmsSaChangeType">

<xs:sequence>

<xs:element name="AnyMbmsSaChange" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="EnterSpecificMbmsSa" type="sealloc:tMbmsSaIdentity" minOccurs="0"/>

<xs:element name="ExitSpecificMbmsSa" type="sealloc:tMbmsSaIdentity" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="tMbmsSaIdentityFormat">

<xs:restriction base="xs:integer">

<xs:minInclusive value="0"/>

<xs:maxInclusive value="65535"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tMbmsSaIdentity">

<xs:simpleContent>

<xs:extension base="sealloc:tMbmsSaIdentityFormat">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name="tMbsfnAreaChangeType">

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<xs:element name="EnterSpecificMbsfnArea" type="sealloc:tMbsfnAreaIdentity" minOccurs="0"/>

<xs:element name="ExitSpecificMbsfnArea" type="sealloc:tMbsfnAreaIdentity" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

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</xs:complexType>

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<xs:restriction base="xs:integer">

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<xs:maxInclusive value="255"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tMbsfnAreaIdentity">

<xs:simpleContent>

<xs:extension base="sealloc:tMbsfnAreaIdentityFormat">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name="tIntegerAttributeType">

<xs:simpleContent>

<xs:extension base="xs:integer">

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

</xs:extension>

</xs:simpleContent>

</xs:complexType>

<xs:complexType name=" tVerticalAppEventType">

<xs:sequence>

<xs:element name="InitialLogOn" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="LocConfigReceived" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="AnyOtherEvent" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="LocationConfigurationReceived" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

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<xs:complexType name="tCurrentLocationType">

<xs:sequence>

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<xs:element name=" NeighbouringNcgi" type="sealloc:tLocationType" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="MbmsSaId" type="sealloc:tLocationType" minOccurs="0"/>

<xs:element name="MbsfnArea" type="sealloc:tLocationType" minOccurs="0"/>

<xs:element name="CurrentCoordinate" type="sealloc:tPointCoordinate" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="protectionType">

<xs:restriction base="xs:string">

<xs:enumeration value="Normal"/>

<xs:enumeration value="Encrypted"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tLocationType">

<xs:choice minOccurs="1" maxOccurs="1">

<xs:element name="Ncgi" type="sealloc:tNcgi" minOccurs="0"/>

<xs:element name="SaId" type="sealloc:tMbmsSaIdentity" minOccurs="0"/>

<xs:element name="MbsfnAreaId" type="sealloc:tMbsfnAreaIdentity" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:choice>

<xs:attribute name="type" type="sealloc:protectionType"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tGeographicalAreaChange">

<xs:sequence>

<xs:element name="AnyAreaChange" type="sealloc:tEmptyTypeAttribute" minOccurs="0"/>

<xs:element name="EnterSpecificAreaType" type="sealloc:tSpecificAreaType" minOccurs="0"/>

<xs:element name="ExitSpecificAreaType" type="sealloc:tSpecificAreaType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tSpecificAreaType">

<xs:sequence>

<xs:element name="GeographicalArea" type="sealloc:tGeographicalAreaDef"/>

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<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:attribute name="TriggerId" type="xs:string" use="required"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tPointCoordinate">

<xs:sequence>

<xs:element name="longitude" type="sealloc:tCoordinateType"/>

<xs:element name="latitude" type="sealloc:tCoordinateType"/>

<xs:element name="altitude" type="sealloc:tCoordinateType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tCoordinateType">

<xs:choice minOccurs="1" maxOccurs="1">

<xs:element name="threebytes" type="sealloc:tThreeByteType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:choice>

<xs:attribute name="type" type="sealloc:protectionType"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:simpleType name="tThreeByteType">

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<xs:minInclusive value="0"/>

<xs:maxInclusive value="16777215"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tGeographicalAreaDef">

<xs:sequence>

<xs:element name="PolygonArea" type="sealloc:tPolygonAreaType" minOccurs="0"/>

<xs:element name="EllipsoidArcArea" type="sealloc:tEllipsoidArcType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tPolygonAreaType">

<xs:sequence>

<xs:element name="Corner" type="sealloc:tPointCoordinate" minOccurs="3" maxOccurs="15"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tEllipsoidArcType">

<xs:sequence>

<xs:element name="Center" type="sealloc:tPointCoordinate"/>

<xs:element name="Radius" type="xs:nonNegativeInteger"/>

<xs:element name="OffsetAngle" type="xs:unsignedByte"/>

<xs:element name="IncludedAngle" type="xs:unsignedByte"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tReportsType">

<xs:sequence >

<xs:element name="VAL-user-id" type="sealloc:contentType" minOccurs="0" maxOccurs="1"/>

<xs:element name="LatestLocation" type="sealloc:tLatestLocationType"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence >

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tLatestLocationType">

<xs:sequence>

<xs:element name="LatestServingNcgi" type="sealloc:tLocationType" minOccurs="0"/>

<xs:element name="NeighbouringNcgi" type="sealloc:tLocationType" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="MbmsSaId" type="sealloc:tLocationType" minOccurs="0"/>

<xs:element name="MbsfnArea" type="sealloc:tLocationType" minOccurs="0"/>

<xs:element name="LatestCoordinate" type="sealloc:tPointCoordinate" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:sequence>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="contentType">

<xs:choice>

<xs:element name="sealURI" type="xs:anyURI"/>

<xs:element name="sealString" type="xs:string"/>

<xs:element name="sealBoolean" type="xs:boolean"/>

<xs:any namespace="##other" processContents="lax"/>

</xs:choice>

<xs:attribute name="type" type="sealloc:protectionType"/>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

<xs:complexType name="tIDsListType">

<xs:choice>

<xs:element name="VAL-user-id" type="sealloc:contentType" minOccurs="0"/>

<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

<xs:element name="anyExt" type="sealloc:anyExtType" minOccurs="0"/>

</xs:choice>

<xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType> <xs:simpleType name="tAccuracyType">

<xs:restriction base="xs:float">

<xs:minInclusive value="0"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="tResponseTimeType">

<xs:restriction base="xs:string">

<xs:enumeration value="LOW\_DELAY"/>

<xs:enumeration value="DELAY\_TOLERANT"/>

<xs:enumeration value="NO\_DELAY"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="tLcsQosClassType">

<xs:restriction base="xs:string">

<xs:enumeration value="BEST\_EFFORT"/>

<xs:enumeration value="ASSURED"/>

<xs:enumeration value="MULTIPLE\_QOS"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="anyExtType">

<xs:sequence>

<xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

</xs:sequence>

</xs:complexType>

</xs:schema>

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

## 7.5 Data semantics

The <location-info> element is the root element of the XML document. The <location-info> element contains the <identity>, <subscription>, <request>, <configuration>, <location-QoS> and <report> sub-elements.

<identity> is a mandatory element used to include the identity of a VAL user, a VAL client or a VAL group. The <identity> element contains one of following sub-elements:

a) <VAL-user-id>, an element contains the identity of the VAL user. This element contains an optional <VAL-client-id> attribute that contains the identity of the VAL client; or

b) <VAL-group-id>, an element contains the group identity of a set of VAL users or VAL clients according to the VAL service.

<subscription> contains the following sub-elements:

a) <identities-list>, an element contains one or more <VAL-user-id> elements. Each <VAL-user-id> element contains the identity of the VAL user whose location information is requested.

b) <time-interval-length>, an element specifying the interval time the SLM-S needs to wait before sending location reports. The value is given in seconds.

c) <subscription-identifier>, an element specifying the value to uniquely identify the subscription.

d) <expiry-time>, an element specifying expiry time for subscription in seconds.

e) <location-QoS>, an element specifying the location QoS as specified in TS 29.572 [33] clause 6.1.6.2.13 contains the following sub-elements:

1) a <hAccuracy> element;

2) a <vAccuracy> element;

3) a <vertRequested> element;

4) a <responseTime> element;

5) a <minorLocQoses> element;or

6) a <lcsQosClass> element.

<notification> contains the following sub-elements:

a) <identities-list>, an element contains one or more <VAL-user-id> elements. Each <VAL-user-id> element contains the identity of the VAL user whose location information needs to be notified.

b) <trigger-id>, an element which can occur multiple times that contains the value of the <trigger-id> attribute associated with a trigger that has fired; and

c) <reports>, an element contains one or more <loc-info-report> elements. Each <loc-info-report> element contains the following sub-elements:

1) <VAL-user-id>, an element contains the identity of a VAL user in the identities list;

2) <latest-location >, an element contains at least one of the following sub-elements:

i) <latest-serving-NCGI>, an optional element containing the NR cell global identity (NCGI) of the serving cell coded as specified in clause 19.6A in 3GPP TS 23.003 [2];

ii) <neighbouring-NCGI>, an optional element that can occur multiple times. It contains the NCGI of any neighbouring cell the SLM-C can detect;

iii) <mbms-service-area-id>, an optional element containing the MBMS service area id the SLM-C is using coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI);

iv) <mbsfn-area> element, an optional element specifying that the MBSFN area Id needs to be reported; and

v) <latest-coordinate>, an optional element containing the longitude, latitude coded as specified in clause 6.1 in 3GPP TS 23.032 [3] and altitude coded as specified in clause 6.3 in 3GPP TS 23.032 [3].

<report> is a mandatory element used to include the location report. It contains a <report-id> attribute. The <report-id> attribute is used to return the value in the <request-id> attribute in the <request> element. The <report> element contains the following sub-elements:

a) <trigger-id>, a mandatory element which can occur multiple times that contain the value of the <trigger-id> attribute associated with a trigger that has fired; and

b) <current-location>, a mandatory element that contains the location information. The <current-location> element contains the following sub-elements:

1) <current-serving-NCGI>, an optional element containing the NR cell global identity (NCGI) of the serving cell coded as specified in clause 19.6A in 3GPP TS 23.003 [2];

2) <neighbouring-NCGI>, an optional element that can occur multiple times. It contains the NCGI of any neighbouring cell the SLM-C can detect;

3) <mbms-service-area-id>, an optional element containing the MBMS service area id the SLM-C is using coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI); and

4) <current-coordinate>, an optional element containing the longitude, latitude coded as specified in clause 6.1 in 3GPP TS 23.032 [3] and altitude coded as as specified in clause 6.3 in 3GPP TS 23.032 [3].

<request> is an element with a <request-id> attribute. The <request> element is used to request a location report. The value of the <request-id> attribute is returned in the corresponding <report-id> attribute in order to correlate the request and the report.

<requested-identity> is a mandatory element used to include the identity of a VAL user, a VAL client or a VAL group for which a location report is requested. The <requested-identity> element contains one of following sub-elements:

a) <VAL-user-id>, an element contains the identity of the VAL user. This element contains an optional <VAL-client-id> attribute that contains the identity of the VAL client; or

b) <VAL-group-id>, an element contains the group identity of a set of VAL users or VAL clients according to the VAL service.

<configuration> is an element with a <configuration-scope> attribute that can have the value "Full" or "Update" . The value "Full" means that the <configuration> element contains the full location configuration which replaces any previous location configuration. The value "Update" means that the location configuration is an addition to any previous location configuration. To remove configuration elements a "Full" configuration is needed. The <configuration> element contains the following sub-elements:

a) <location-information>, an optional element that specifies the location information. The <location-information> has the sub-elements:

1) <serving-NCGI>, an optional element containing the NR cell global identity (NCGI) of the serving cell coded as specified in clause 19.6A in 3GPP TS 23.003 [2];

2) <neighbouring-NCGI>, an optional element that can occur multiple times. It contains the NCGI of any neighbouring cell the SLM-C can detect;

3) <mbms-service-area-id>, an optional element containing the MBMS service area id that the SLM-C is using. The MBMS service area id is coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI);

4) <mbsfn-area-id>, an optional element specifying that the MBSFN area id that needs to be reported;

5) <current-geographical-coordinate>, an optional element containing the longitude, latitude coded as specified in clause 6.1 in 3GPP TS 23.032 [3] and altitude coded as specified in clause 6.3 in 3GPP TS 23.032 [3]; and

b) <triggering-criteria>, an optional element specifying the triggers for the SLM-C to request a location report of a VAL user, a VAL client or a VAL group. The <triggering-criteria> element contains at least one of the following sub-elements:

1) <cell-change>, an optional element specifying what cell changes trigger the request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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

iii) <exit-specific-cell>, an optional element specifying an NCGI which when exited triggers a request for a location 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;

2) <tracking-area-change>, an optional element specifying what tracking area changes trigger a request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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 a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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 a request for alocation report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

3) <plmn-change>, an optional element specifying what PLMN changes trigger a request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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 a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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 a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

4) <mbms-sa-change>, an optional element specifying what MBMS changes trigger location reporting. This element consists of the following sub-elements:

i) <any-mbms-sa-change>, an optional element. The presence of this element specifies that any MBMS SA change is a trigger for a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <enter-specific-mbms-sa>, an optional element specifying an MBMS service area id which when entered triggers a request for a location report. 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

iii) <exit-specific-mbms-sa>, an optional element specifying an MBMS service area id which when exited triggers a request a location report. 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;

5) <mbsfn-area-change>, an optional element specifying what MBSFN changes trigger a request for a location report. This element consists of the following sub-elements:

i) <any-mbsfn-area-change>, an optional element. The presence of this element specifies that any MBSFN area change is a trigger for a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <enter-specific-mbsfn-area>, an optional element specifying an MBSFN area which when entered triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <exit-specific-mbsfn-area>, an optional element specifying an MBSFN area which when exited triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

6) <periodic-report>, an optional element specifying that periodic request for a location report 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;

7) <travelled-distance>, an optional element specifying that the travelled distance shall trigger a request for a location report. The value in metres specified the travelled distance. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

8) <vertical-application-event>, an optional element specifying what application signalling events triggers a request for a location report. The <vertical-application-event> element has the following sub-elements:

i) <initial-log-on>, an optional element specifying that an initial log on triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <location-configuration-received>, an optional element specifying that a received location configuration triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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) <geographical-area-change>, an optional element specifying what geographical are changes trigger a request for a location reporting. This element consists of the following sub-elements:

i) <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;

ii) <enter-specific-area>, an optional element specifying a geographical area which when entered triggers a location report. 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:

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

I) <polygon-area>, an optional element specifying the area as a polygon specified in clause 5.2 in 3GPP TS 23.032 [2]; and

II) <ellipsoid-arc-area>, an optional element specifying the area as an ellipsoid arc specified in clause 5.7 in 3GPP TS 23.032 [2]; and

iii) <exit-specific-area-type>, an optional element specifying a geographical area which when exited triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string.

c) <minimum-interval-length>, a mandatory element specifying the minimum time the SLM-C needs to wait between sending location reports. The value is given in seconds;

<report-request> is a mandatory element used to include the requested location report. The <report-request> element contains at least one of the following sub-elements:

a) <immediate-report-indicator>, presence of the element indicates that an immediate location report is required;

b) <current-location>, an optional element that contains the location information. The <current-location> element contains the following sub-elements:

1) <current-serving-NCGI>, an optional element containing the NR cell global identity (NCGI) of the serving cell coded as specified in clause 19.6A in 3GPP TS 23.003 [2];

2) <neighbouring-NCGI>, an optional element that can occur multiple times. It contains the NCGI of any neighbouring cell the SLM-C can detect;

3) <mbms-service-area-id>, an optional element containing the MBMS service area id that the SLM-C is using. The MBMS service area id is coded as specified in clause 15.3 in 3GPP TS 23.003 [2] for service area identifier (SAI); and

4) <current-coordinate>, an optional element containing the longitude, latitude coded as specified in clause 6.1 in 3GPP TS 23.032 [3] and altitude coded as as specified in clause 6.3 in 3GPP TS 23.032 [3].

c) <triggering-criteria>, a mandatory element specifying the triggers for the SLM-C to request a location report of a VAL user, a VAL client or a VAL group. The <triggering-criteria> element contains at least one of the following sub-elements:

1) <cell-change>, an optional element specifying what cell changes trigger the request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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

iii) <exit-specific-cell>, an optional element specifying an NCGI which when exited triggers a request for a location 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;

2) <tracking-area-change>, an optional element specifying what tracking area changes trigger a request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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 a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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 a request for alocation report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

3) <plmn-change>, an optional element specifying what PLMN changes trigger a request for a location report. This element consists of the following sub-elements:

i) <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;

ii) <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 a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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 a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

4) <mbms-sa-change>, an optional element specifying what MBMS changes trigger location reporting. This element consists of the following sub-elements:

i) <any-mbms-sa-change>, an optional element. The presence of this element specifies that any MBMS SA change is a trigger for a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <enter-specific-mbms-sa>, an optional element specifying an MBMS service area id which when entered triggers a request for a location report. 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

iii) <exit-specific-mbms-sa>, an optional element specifying an MBMS service area id which when exited triggers a request a location report. 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;

5) <mbsfn-area-change>, an optional element specifying what MBSFN changes trigger a request for a location report. This element consists of the following sub-elements:

i) <any-mbsfn-area-change>, an optional element. The presence of this element specifies that any MBSFN area change is a trigger for a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <enter-specific-mbsfn-area>, an optional element specifying an MBSFN area which when entered triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <exit-specific-mbsfn-area>, an optional element specifying an MBSFN area which when exited triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

6) <periodic-report>, an optional element specifying that periodic request for a location report 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;

7) <travelled-distance>, an optional element specifying that the travelled distance shall trigger a request for a location report. The value in metres specified the travelled distance. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

8) <vertical-application-event>, an optional element specifying what application signalling events triggers a request for a location report. The <vertical-application-event> element has the following sub-elements:

i) <initial-log-on>, an optional element specifying that an initial log on triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

ii) <location-configuration-received>, an optional element specifying that a received location configuration triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string; and

iii) <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) <geographical-area-change>, an optional element specifying what geographical are changes trigger a request for a location reporting. This element consists of the following sub-elements:

i) <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;

ii) <enter-specific-area>, an optional element specifying a geographical area which when entered triggers a location report. 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:

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

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

II) <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

iii) <exit-specific-area-type>, an optional element specifying a geographical area which when exited triggers a request for a location report. This element contains a mandatory <trigger-id> attribute that shall be set to a unique string;

d) <minimum-interval-length>, an optional element that defaults to 0 if absent otherwise indicates the interval time between consecutive reports. The value is given in seconds.

e) <endpoint-info>, an optional element specifying information of the endpoint of the requesting VAL server to which the location report notification has to be sent. It is provided if Immediate Report Indicator is set to required.

<location-based-query> contains at least one of the following 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].

<location-based-response> contains the following sub-elements:

a) <identities-list>, an optional element contains one or more <VAL-user-id> elements. Each <VAL-user-id> element contains the identity of the VAL user to be queried.

<location-QoS> element is a optionally element used to indicate the location Quality of Service as specified in TS 29.572 [33] clause 6.1.6.2.13 for which the location information is requested and it may contains the following sub-elements:

a) a <hAccuracy> element;

b) a <vAccuracy> element;

c) a <vertRequested> element;

d) a <responseTime> element;

e) a <minorLocQoses> element;or

f) a <lcsQosClass> element.

The recipient of the XML ignores any unknown element and any unknown attribute.

\* \* \* End of changes \* \* \*