**3GPP TSG-CT WG1 Meeting #141e****C1-232596**

**Online 17– 21 April 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0067** | **rev** | **1** | **Current version:** | **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 access type and position method for location reporting configuration procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GFLS | | | | |  | ***Date:*** | | | 2023-04-07 |
|  |  | | | |  | |  | | |  |
| ***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 [S6-231053](https://www.3gpp.org/ftp/tsg_sa/WG6_MissionCritical/TSGS6_053_Athens/Docs/S6-231053.zip), stage2 has added information flow for location reporting configuration update. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add access type and position method for location reporting configuration procedure. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 3 does not align with Stage 2 specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2.2.3.1, 6.2.2.5.1, 6.2.4.3, 6.3.2.1.1, 7.3, 7.4.2, 7.5, B.2.3.2, B.3.1.5.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

##### 6.2.2.3.1 Fetching location reporting configuration

Upon receiving of an HTTP GET request where the Request-URI of the HTTP GET request identifies a location reporting configuration document as specified in the specific vertical application, the SLM-S:

a) shall determine the identity of the sender of the received HTTP GET request as specified in clause 6.2.1.1, and:

1) if the identity of the sender of the received HTTP GET request is not authorized to fetch requested configuration document, shall respond with a HTTP 403 (Forbidden) response to the HTTP GET request and skip rest of the steps;

b) shall support handling an HTTP GET request from a SLM-C according to procedures specified in IETF RFC 4825 [9] "GET 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 requesting for location reporting configuration;

ii) shall include a <configuration> element which shall include at least one of the followings:

A) the location reporting elements which are requested;

B) a <triggering-criteria> child element which provides the triggers for the SLM-C to request a location report as described in clause 7;

C) a <minimum-interval-length>child element specifying the minimum time between consecutive reports. The value is given in seconds;

D) the <access-type> element specifying the location access type for which the location information is requested; and

E) the <positioning-method> element specifying the positioning method for which the location information is requested;

3) shall include the <trigger-id> attribute where defined for the sub-elements defining the trigger criterion; and

d) shall send the HTTP 200 (OK) response towards the SLM-C.

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

##### 6.2.2.5.1 Fetching location reporting configuration

Upon receiving of a CoAP GET request where the CoAP URI of the CoAP GET request identifies a trigger configuration as specified in Annex B.3.1.2.2.3.1, the SLM-S:

a) shall determine the identity of the sender of the received CoAP GET request as specified in clause 6.2.1.2, and:

1) if the identity of the sender of the received CoAP GET request is not authorized to fetch requested trigger configuration, shall respond with a CoAP 4.03 (Forbidden) response to the CoAP GET request and skip rest of the steps;

b) shall generate a CoAP 2.05 (Content) response according to IETF RFC 7252 [21]. In the CoAP 2.05 (Content) response message, the SLM-S:

1) shall include a Content-Format option set to "application/vnd.3gpp.seal-location-configuration+cbor"; and

2) shall include a "LocationReportConfiguration" object:

i) shall include a "locationType" attribute which is requested; and

ii) shall include at least one of the followings:

A) a "triggeringCriteria" object which provides the triggers for the SLM-C to request a location report; and

B) a "minimum-interval-length" attribute specifying the minimum time between consecutive reports. The value is given in seconds; and

iii) may include an "accessType" attribute specifying the location access type for which the location information is requested; and

iv) may include a "positioningMethod" attribute specifying the positioning method for which the location information is requested; and

c) shall send the CoAP 2.05 (Content) response towards the SLM-C.

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

#### 6.2.4.3 SLM client CoAP procedure

Upon receiving a request from a VAL user to obtain the location information of another VAL user, the SLM-C shall:

a) if trigger configuration is provided, send a CoAP FETCH request according to procedures specified in IETF RFC 8132 [24] to SLM-S to observe the location information of another VAL user; and

b) otherwise, send a CoAP GET request according to procedure specified in in IETF RFC 7252 [21] to SLM-S to retrieve the location information of another VAL user.

In the CoAP FETCH request, the SLM-C shall:

a) set the CoAP URI identifying the location information to be observed according to the resource definition in Annex B.3.1.2.4.3.1;

1) the "apiRoot" is set to the SLM-S URI;

b) include an Accept option set to "application/vnd.3gpp.seal-location-info+cbor";

c) set an Observe option to 0 (Register);

d) set a Content-Format option set to "application/vnd.3gpp.seal-location-configuration+cbor";

e) include a "LocationReportConfiguration" object:

1) shall include a "valTgtUes" object set to the identity of the observed VAL users;

2) shall include a "locationType" attribute which is requested; and

3) shall include at least one of the following:

i) a "triggeringCriteria" object which provides the triggers for the SLM-C to request a location report as described in Annex X; and

ii) a "minimum-interval-length" attribute specifying the minimum time between consecutive reports. The value is given in seconds; and

4) may include an "accessType" attribute which is requested; and

5) may include a "positioningMethod" attribute which is requested; and

f) shall send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [6].

In the CoAP GET request, the SLM-C shall:

a) set the CoAP URI identifying the location information to be fetched according to the resource definition in Annex B.3.1.2.4.3.2;

1) the "apiRoot" is set to the SLM-S URI; and

2) the "val-tgt-ue" query option is set to either the VAL user identity or VAL UE identity for which the location is requested;

b) include an Accept option set to "application/vnd.3gpp.seal-location-info+cbor"; and

c) send the request protected with the relevant ACE profile (OSCORE profile or DTLS profile) as described in 3GPP TS 24.547 [6].

Upon receiving a CoAP 2.05 (Content) response from the SLM-S containing:

a) a Content-Format option set to "application/vnd.3gpp.seal-location-info+cbor"; and

b) including one or more "LocationReport" objects,

the SLM-C:

a) shall store the content of the received "LocationReport" object(s).

\* \* \* 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; or

j) a <location-based- response> 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;

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;

d) optionally, an <access-type> element; and

e) optionally, a <positioning-method> 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;

\* \* \* 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: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"/>

</xs:choice>

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

</xs:complexType>

<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:element name="accessType" type="sealloc:tAccessTypeType" minOccurs="0"/> <xs:element name="positioningMethod" type="sealloc:tPositioningMethodType" minOccurs="0"/>

<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"/>

</xs:complexType>

<xs:complexType name="tRequestType">

<xs:complexContent>

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

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

</xs:complexContent>

</xs:complexType>

<xs:complexType name="tRequestedIDType">

<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"/>

</xs:choice>

</xs:complexType>

<xs:complexType name="tSubscriptionType">

<xs:sequence>

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

</xs:sequence>

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

</xs:complexType>

<xs:complexType name="tReportRequestType">

<xs:sequence>

<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="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"/>

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

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

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<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"/>

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

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

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</xs:complexType>

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

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</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">

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<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"/>

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</xs:complexType>

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<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>

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

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

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</xs:complexType>

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</xs:extension>

</xs:simpleContent>

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<xs:sequence>

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

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

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</xs:complexType>

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</xs:restriction>

</xs:simpleType>

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<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">

<xs:sequence>

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

<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"/>

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

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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"/>

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

</xs:sequence>

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

</xs:complexType>

<xs:simpleType name="tAccessTypeType">

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

<xs:enumeration value="NR"/>

<xs:enumeration value="EUTRA\_CONNECTED\_TO\_5GC"/>

<xs:enumeration value="NON\_3GPP\_CONNECTED\_TO\_5GC"/>

<xs:enumeration value="NR\_LEO"/>

<xs:enumeration value="NR\_MEO"/>

<xs:enumeration value="NR\_GEO"/>

<xs:enumeration value="NR\_OTHER\_SAT"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="tPositioningMethodType">

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

<xs:enumeration value="CELLID"/>

<xs:enumeration value="ECID"/>

<xs:enumeration value="OTDOA"/>

<xs:enumeration value="BAROMETRIC\_PRESSURE"/>

<xs:enumeration value="WLAN"/>

<xs:enumeration value="BLUETOOTH"/>

<xs:enumeration value="MBS"/>

<xs:enumeration value="MOTION\_SENSOR"/>

<xs:enumeration value="DL\_TDOA"/>

<xs:enumeration value="DL\_AOD"/>

<xs:enumeration value="MULTI-RTT"/>

<xs:enumeration value="NR\_ECID"/>

<xs:enumeration value="UL\_TDOA"/>

<xs:enumeration value="UL\_AOD"/>

<xs:enumeration value="NETWORK\_SPECIFIC"/>

</xs:restriction>

</xs:simpleType>

<xs:complexType name="tCurrentLocationType">

<xs:sequence>

<xs:element name=" CurrentServingNcgi" 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="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"/>

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<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">

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

<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">

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<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: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> 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.

<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;

d) <access-type>, an optional element specifying the identity of the location access type for which the location information is requested; and

e) <positioning-method>, an optional element specifying the identity of the positioning method for which the location information is requested.

<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.

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

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

### B.2.3.2 Type: LocationReportConfiguration

Table B.2.3.2-1: Definition of type LocationReportConfiguration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valTgtUes | array(ValTargetUe) | M | 1..N | VAL users to whom the configuration information is applied |  |
| locationType | Accuracy | M | 1 | The type of location information is requested. |  |
| triggeringCriteria | TriggeringCriteriaType | O | 0..1 | The triggering criteria associated with this configuration. |  |
| minimumIntervalLength | Uinteger | O | 0..1 | The minimum time between consecutive reports. |  |
| accessType | AccessType | O | 0..1 | The identity of the location access type for which the location information is requested |  |
| positioningMethod | PositioningMethod | O | 0..1 | The identity of the positioning method for which the location information is requested |  |

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

### B.2.5.a Enumeration: AccessType

Table B.2.5.a-1: AccessType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| "NR" | NG Radio access |  |
| "EUTRA\_CONNECTED\_TO\_5GC" | E-URTAN access connected to 5GC |  |
| "NON\_3GPP\_CONNECTED\_TO\_5GC" | Non-3GPP access connected to 5GC |  |
| "NR\_LEO" | NR (LEO) satellite access |  |
| "NR\_MEO" | NR (MEO) satellite access |  |
| "NR\_GEO" | NR (GEO) satellite access |  |
| "NR\_OTHER\_SAT" | NR (OTHERSAT) satellite access |  |

### B.2.5.b Enumeration: PositioningMethod

Table B.2.5.a-1: PositioningMethod

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| "CELLID" | Cell ID positioning method |  |
| "ECID" | Enhanced cell ID methods based on LTE signals |  |
| "OTDOA" | Observed time difference of arrival positioning based on LTE signals |  |
| "BAROMETRIC\_PRESSURE" | Positioning method based on barometric Pressure Sensor |  |
| "WLAN" | WLAN positioning |  |
| "BLUETOOTH" | Bluetooth positioning |  |
| "MBS" | Terrestrial Beacon System (TBS) positioning based on MBS signals |  |
| "MOTION\_SENSOR" | Positioning method based on motion Sensor |  |
| "DL\_TDOA" | Downlink Time Difference of Arrival (DL-TDOA) based on NR signals |  |
| "DL\_AOD" | Downlink Angle-of-Departure (DL-AoD) based on NR signals |  |
| "MULTI-RTT" | Multi-Round Trip Time Positioning (Multi-RTT based on NR signals). |  |
| "NR\_ECID" | NR enhanced cell ID methods (NR E-CID) based on NR signals. |  |
| "UL\_TDOA" | Uplink Time Difference of Arrival (UL-TDOA) based on NR signals |  |
| "UL\_AOA" | Uplink Angle of Arrival (UL-AoA), including the Azimuth of Arrival (A-AoA) and the Zenith of Arrival (Z-AoA) based on NR signals. |  |
| "NETWORK\_SPECIFIC" | Network specific position methods. |  |

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

#### B.3.1.5.2 CDDL document

;;; LocationAreaQuery

LocationAreaQuery = {

geoArea: GeographicArea

}

;;; LocationAreaInfo

LocationAreaInfo = {

? valReqUe: ValTargetUe

? ueList: [\* UeInfo]

}

;;; UeInfo

UeInfo = {

? ueId: ValTargetUe

? ueLoc: LocationInfo

}

;;; LocationReportConfiguration

;;+ Represents Location reporting configuration information.

LocationReportConfiguration = {

valTgtUes: [\* ValTargetUe]

locationType: Accuracy

? triggeringCriteria: [\* TriggeringCriteriaType]

? minimumIntervalLength: Uinteger

? AccessType: [\* AccessTypeType]

? PositioningMethod: [\* PositioningMethodType]

}

;;; Accuracy

Accuracy = "CURRENT\_SERVING\_NCGI" / "NEIGHBOURING\_NCGI" / "MBMS\_SA" / "MBSFN\_AREA" / "CURRENT\_GEOGRAPHICAL\_COORDINATE"

;;; TriggeringCriteriaType

TriggeringCriteriaType = {

? cellChange: CellChange

? trackingAreaChange: TrackingAreaChange

? plmnChange: PlmnChange

? mbmsSaChange: MbmsSaChange

? mbsfnAreaChange: MbsfnAreaChange

? periodicReport: PeriodicReport

? travelledDistance: TravelledDistance

? verticalAppEvent: VerticalAppEvent

? geographicalAreaChange: GeographicalAreaChange

}

;;; CellChange

CellChange = {

? anyCellChange: BaseTrigger

? enterSpecificCells: SpecificCells

? exitSpecificCells: SpecificCells

}

;;; SpecificCells

SpecificCells = {

triggerId: TriggerId

cells: [\* CellId]

}

;;; TrackingAreaChange

TrackingAreaChange = {

? anyTrackingAreaChange: BaseTrigger

? enterSpecificTrackingAreas: SpecificTrackingAreas

? exitSpecificTrackingAreas: SpecificTrackingAreas

}

;;; SpecificTrackingAreas

SpecificTrackingAreas = {

triggerId: TriggerId

trackingAreas: [\* TaId]

}

;;; PlmnChange

PlmnChange = {

? AnyPlmnChange: BaseTrigger

? EnterSpecificPlmns: SpecificPlmns

? ExitSpecificPlmns: SpecificPlmns

}

;;; SpecificPlmns

SpecificPlmns = {

triggerId: TriggerId

plmns: [\* PlmnId]

}

;;; MbmsSaChange

MbmsSaChange = {

? anyPlmnChange: BaseTrigger

? enterSpecificPlmns: SpecificMbmsSas

? exitSpecificPlmns: SpecificMbmsSas

}

;;; SpecificMbmsSas

SpecificMbmsSas = {

triggerId: TriggerId

mbmsSas: [\* MbmsSaId]

}

;;; MbsfnAreaChange

MbsfnAreaChange = {

? anyPlmnChange: BaseTrigger

? enterSpecificMbsfnAreas: SpecificMbsfnAreas

? exitSpecificPlmn: SpecificMbsfnAreas

}

;;; SpecificMbsfnAreas

SpecificMbsfnAreas = {

triggerId: TriggerId

mbsfnAreas: [\* MbsfnAreaId]

}

;;; PeriodicReport

PeriodicReport = {

triggerId: TriggerId

interval: Uinteger

}

;;; TravelledDistance

TravelledDistance = {

triggerId: TriggerId

distance: Uinteger

}

;;; VerticalAppEvent

VerticalAppEvent = {

? initialLogOn: BaseTrigger

? locConfigReceived: BaseTrigger

? anyOtherEvent: BaseTrigger

}

;;; GeographicalAreaChange

GeographicalAreaChange = {

? AnyGeoAreaChange: BaseTrigger

? EnterSpecificGeoAreas: SpecificGeoAreas

? ExitSpecificGeoAreas: SpecificGeoAreas

}

;;; SpecificGeoAreas

SpecificGeoAreas = {

triggerId: TriggerId

geoAreas: [\* GeographicArea]

}

;;;AccessTypeType

AccessType = "NR" / "EUTRA\_CONNECTED\_TO\_5GC" / "NON\_3GPP\_CONNECTED\_TO\_5GC" / "NR\_LEO" / "NR\_MEO" / "NR\_GEO" / "NR\_OTHER\_SAT" / text

;;;PositioningMethodType

AccessType = "CELLID" / "ECID" / "OTDOA" / "BAROMETRIC\_PRESSURE" / "WLAN" / "BLUETOOTH" / "MBS" / "MOTION\_SENSOR" / "DL\_TDOA" / "DL\_AOD" / "MULTI-RTT" / "NR\_ECID" / "UL\_TDOA" / "UL\_AOA" / "NETWORK\_SPECIFIC" / text

;;; LocationReport

LocationReport = {

valTgtUe: ValTargetUe

triggerIds: [\* TriggerId]

locInfo: LocationInfo

}

;;; LocationInfo

LocationInfo = {

? cellId: CellId

? neighbouringCellIds: [\* CellId]

? mbmsSaId: MbmsSaId

? mbsfnAreaId: MbsfnAreaId

? currentCoordinate: GeographicalCoordinates

}

;;; BaseTrigger

BaseTrigger = {

triggerId: TriggerId

}

;;; TriggerId

;;+ Unique identifier of a trigger.

TriggerId = text

;;; ValTargetUe

;;+ Represents information identifying a VAL user ID or a VAL UE ID.

valUserId = {

valUserId: text ; Unique identifier of a VAL user.

}

valUeId = {

valUeId: text ; Unique identifier of a VAL UE.

}

ValTargetUe = valUserId / valUeId

;;; Uinteger

;;+ Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.

Uinteger = int .ge 0

;;; GeographicArea

;;+ Geographic area specified by different shape.

GeographicArea = Point / PointUncertaintyCircle / PointUncertaintyEllipse / Polygon / PointAltitude / PointAltitudeUncertainty / EllipsoidArc

;;; GADShape

;;+ Common base type for GAD shapes.

GADShape = {

shape: SupportedGADShapes

}

;;; Point

;;+ Ellipsoid Point.

Point = {

~GADShape

point: GeographicalCoordinates

}

;;; PointUncertaintyCircle

;;+ Ellipsoid point with uncertainty circle.

PointUncertaintyCircle = {

~GADShape

point: GeographicalCoordinates

uncertainty: Uncertainty

}

;;; PointUncertaintyEllipse

;;+ Ellipsoid point with uncertainty ellipse.

PointUncertaintyEllipse = {

~GADShape

point: GeographicalCoordinates

uncertaintyEllipse: UncertaintyEllipse

confidence: Confidence

}

;;; Polygon

;;+ Polygon.

Polygon = {

~GADShape

pointList: PointList

}

;;; PointAltitude

;;+ Ellipsoid point with altitude.

PointAltitude = {

~GADShape

point: GeographicalCoordinates

altitude: Altitude

}

;;; PointAltitudeUncertainty

;;+ Ellipsoid point with altitude and uncertainty ellipsoid.

PointAltitudeUncertainty = {

~GADShape

point: GeographicalCoordinates

altitude: Altitude

uncertaintyEllipse: UncertaintyEllipse

uncertaintyAltitude: Uncertainty

confidence: Confidence

}

;;; EllipsoidArc

;;+ Ellipsoid Arc.

EllipsoidArc = {

~GADShape

point: GeographicalCoordinates

innerRadius: InnerRadius

uncertaintyRadius: Uncertainty

offsetAngle: Angle

includedAngle: Angle

confidence: Confidence

}

;;; GeographicalCoordinates

;;+ Geographical coordinates.

GeographicalCoordinates = {

lon: -180.0..180.0

lat: -90.0..90.0

}

;;; UncertaintyEllipse

;;+ Ellipse with uncertainty.

UncertaintyEllipse = {

semiMajor: Uncertainty

semiMinor: Uncertainty

orientationMajor: Orientation

}

;;; PointList

;;+ List of points.

PointList = [3\*15 GeographicalCoordinates]

;;; Altitude

;;+ Indicates value of altitude.

Altitude = -32767.0..32767.0

;;; Angle

;;+ Indicates value of angle.

Angle = 0..360

;;; Uncertainty

;;+ Indicates value of uncertainty.

Uncertainty = float32 .ge 0

;;; Orientation

;;+ Indicates value of orientation angle.

Orientation = 0..180

;;; Confidence

;;+ Indicates value of confidence.

Confidence = 0..100

;;; InnerRadius

;;+ Indicates value of the inner radius.

InnerRadius = (0..327675) .and int32

;;; SupportedGADShapes

;;+ Indicates supported GAD shapes.

SupportedGADShapes = "POINT" / "POINT\_UNCERTAINTY\_CIRCLE" / "POINT\_UNCERTAINTY\_ELLIPSE" / "POLYGON" / "POINT\_ALTITUDE" / "POINT\_ALTITUDE\_UNCERTAINTY" / "ELLIPSOID\_ARC" / "LOCAL\_2D\_POINT\_UNCERTAINTY\_ELLIPSE" / "LOCAL\_3D\_POINT\_UNCERTAINTY\_ELLIPSOID" / text

;;; CellId

;;+ Unique identifier of a cell.

CellId = text

;;; TaId

;;+ Unique identifier of a tracking area.

TaId = text

;;; PlmnId

;;+ Unique identifier of a PLMN.

PlmnId = text

;;; MbmsSaId

;;+ Unique identifier of a MBMS serving area.

MbmsSaId = text

;;; MbsfnAreaId

;;+ Unique identifier of a MBSFN area.

MbsfnAreaId = text

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