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Location capabilities extension to pidf-lo object draft-hdesinen-geopriv-pidflo-extn-00.txt

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Abstract

The Presence Information Data Format Location Object (PIDF-LO) specification provides a flexible and versatile means to represent location information. The XML Schema presented in this memo extends the 'geopriv' element defined in PIDF-LO with a complex XML element called "device-loc-capabilities". A device can specify this element inside a 'geopriv' element to communicate the position determination methods and the location solutions supported by it to a location server. Knowledge of the device's location capabilities can permit a server along the path of an emergency voice over IP call to

immediately initiate position determination update procedures when needed.

Table of Contents

1. Introduction 3
2. Terminology 4
3. Use Case 5
4. Extensions to PIDF-LO to convey device location capabilities 6
4.1. location-method 6
4.2. location-signalling 6
4.3. Schema Definition 7
5. Example usage of 'device-capabilities' element 8
6. IANA Considerations for the 'location-signalling' element values 9
7. Security Considerations 10
8. Normative References 10
Author's Address 11
Intellectual Property and Copyright Statements 12

1. Introduction

The Presence Information Data Format Location Object (PIDF-LO) described in [2] is the IETF recommended way of encoding location information and associated privacy policies. The current schema defined for PIDF-LO lacks the ability to specify the supported location methods and solutions by a device. The XML schema extension described in this document extends the 'geopriv' element described in PIDF-LO with a complex XML element called "device-loc-capabilities". A device can use this element inside a 'geopriv' element to specify the position determination methods and the location solutions supported by it. This may be useful to enable the most appropriate location method and solution to be selected by a network server for any later positioning.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

3. Use Case

A device making an emergency call can use the "device-loc-capabilities" extension to convey the position determination methods and solutions supported by it. A location server can use this information to communicate with the device and extract the position details of the device. During an emergency call, a location server may be able to determine that the currently provided location is insufficient or out of date; knowing the client's capabilities allows it to initiate the appropriate signalling to update the location without wasting time trying mechanisms which the client does not support or communicating with other network entities to determine the client's capabilities.

4. Extensions to PIDF-LO to convey device location capabilities

The XML Schema presented in Section 4.3 extends the 'geopriv' element of PIDF with a complex element called 'device-loc-capabilities'. There are two subelements that are encapsulated within device-loc-capabilities: one for supported position determination methods, and one for supported location solutions. Both of these subelements are mandatory, and are described in subsequent sections. Each subelement can be repeated multiple times to specify multiple position determination methods and solutions supported by the device.

4.1. location-method

Each 'device-loc-capabilities' element MUST contain at least one 'location-method' element. Multiple 'location-method' elements can be listed to convey multiple position determination methods supported by the device.

An example of this element is:

```
<location-method> A-GPS </location-method>
```

The possible values of the 'location-method' element are enumerated within an IANA registry. The IANA registry for these values is located at http://www.iana.org/assignments/method-tokens. Implementations MUST limit the use of this method to the values listed by IANA.

4.2. location-signalling

Each 'device-loc-capabilities' element MUST contain at least one 'location-signalling' element. Multiple 'location-signalling' elements can be listed to convey multiple location solutions supported by the device. Each 'location-signalling' element identifies a specific position determination signalling procedure as specified by an appropriate standards body. The value combines a descriptive name for the signalling procedure and where appropriate a version for the published specification. The version identifier specifies an initial version; it implicitly includes all subsequent backwards-compatible updates, revisions, and versions.

An example of this element is:

```
<location-signalling> 3GPP_CP_UMTS_1.0 </location-signalling>
```

The possible values of the 'location-signalling' element are enumerated within an IANA registry. Implementations MUST limit the use of this method to the values limited by IANA. This document pre-

populates the IANA registry with eight possible values; see section Section 6 for more information.

4.3. Schema Definition

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema
  targetNamespace="urn:ietf:params:xml:ns:pidf:geopriv10:loccap"
  xmlns:tns="urn:ietf:params:xml:ns:pidf:geopriv10:loccap"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified" attributeFormDefault="unqualified">

  <!-- This import brings in the XML language attribute xml:lang-->

      <xs:import namespace="http://www.w3.org/XML/1998/namespace"
        schemaLocation="http://www.w3.org/2001/xml.xsd"/>

      <xs:element name="locap" type="tns:loccap"/>

   <xs:complexType name="loccap">
    <xs:sequence>
      <xs:element name="location-method" type="tns:locMethod"
         minOccurs="1" maxOccurs="unbounded"/>
      <xs:element name="location-signalling" type="tns:locSolution"
         minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
   </xs:complexType>


   <xs:complexType name="locMethod">
     <xs:simpleContent>
       <xs:extension base="xs:string">
         <xs:attribute ref="xml:lang" />
       </xs:extension>
     </xs:simpleContent>
   </xs:complexType>

   <xs:complexType name="locSolution">
        <xs:simpleContent>
          <xs:extension base="xs:string">
            <xs:attribute ref="xml:lang" />
          </xs:extension>
        </xs:simpleContent>
   </xs:complexType>

   </xs:schema>
```

5. Example usage of 'device-capabilities' element

The following XML instance document is an example of the use of the 'device-capabilities' element.

```
<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf"
   xmlns:gp="urn:ietf:params:xml:ns:pidf:geopriv10"
   xmlns:lc="urn:ietf:params:xml:ns:pidf:geopriv10:loccap"
   xmlns:gml="urn:opengis:specification:gml:schema-xsd:feature:v3.0"
   entity="pres:geotarget@example.com">
 <tuple id="sg89ae">
  <status>
   <gp:geopriv>
     <gp:location-info>
       <gml:location>
         <gml:Point gml:id="point1" srsName="epsg:4326">
           <gml:coordinates>37:46:30N 122:25:10W</gml:coordinates>
         </gml:Point>
        </gml:location>
     </gp:location-info>
     <gp:usage-rules>
  <gp:retransmission-allowed>no</gp:retransmission-allowed>
  <gp:retention-expiry>2003-06-23T04:57:29Z</gp:retention-expiry>
     </gp:usage-rules>
    <lc:device-capabilities>
    <lc:location-method> A-GPS </lc:location-method>
    <lc:location-method> A-FLT </lc:location-method>
  <lc:location-signalling>OMA_SUPL_1.0 </lc:location-signalling>
  <lc:location-signalling>3GPP_CP_UMTS_1.0</lc:location-signalling>
    </lc:device-capabilities>
   </gp:geopriv>
  </status>
  <timestamp>2006-03-22T20:57:29Z</timestamp>
 </tuple>
</presence>
```

6. IANA Considerations for the 'location-signalling' element values

This document requests that the IANA create a new registry for the values of 'location-signalling' element. The 'location-signalling' element value is a text string. The value string specifies a position determination signalling procedure and combines a descriptive name for the signalling procedure and where appropriate a version for the published specification. The version identifier specifies an initial version; it implicitly includes all subsequent backwards-compatible updates, revisions, and versions.

This section pre-registers eight new values for this element. Following are the location signalling values to be registered with the IANA.

- OMA_SUPL_1.0 (SUPL 1.0)
- OMA_SUPL_2.0 (SUPL 2.0)
- 3GPP_CP_GSM_1.0 (3GPP Control Plane for GSM starting with R98). See [4]
- 3GPP_CP_GPRS_1.0 (3GPP Control Plane for GPRS starting with Rel-5). See [5]
- 3GPP_CP_UMTS_1.0 (3GPP Control Plane for UMTS starting with R99). See [6]
- 3GPP2_CP_Rev0 (3GPP2 Control Plane Revision 0). See [7]
- 3GPP2_UP_X.S0024_Rev0 (3GPP2 User Plane X.S0024 Revision 0). See [8]
- 3GPP2_UP_V1_V2 (3GPP2 User Plane V1/V2). See [9]

Further entries may be registered following the "Specification Required" rules as defined in RFC 2434 [3]. For each new registration, it is mandatory that a permanent, stable, and publicly accessible document exists.

New values for the 'location-signalling' element SHOULD NOT be registered just because an updated version of the referenced specification is published. New values SHOULD only be registered when the new version is not backwards compatible with an existing registered value.

This document does not require IANA to assign any values in existing registries.

7. Security Considerations

Information about the client's capability may provide a hint that obfuscation or coarsening has occurred. (This is also the case with the existing 'method' value.) However, the client capability fields are not intended for general dissemination to location recipients; this information is primarily of value to a location server. During an emergency call, the location server may be able to determine that the currently provided location is insufficient or out of date; knowing the client's capability allows it to initiate the appropriate signalling to update the location without wasting time and any resources while trying mechanisms which the client does not support or communicating with other network entities to determine the client's capabilities.

Location servers SHOULD delete the 'device-capabilities' element before distributing the pidf-lo object except in the case where the location server is aware that an emergency call is being made and a downstream server may be able to make use of the information.

8. Normative References

[1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[2] Peterson, J., "A Presence-based GEOPRIV Location Object Format", RFC 4119, December 2005.

[3] Narten, T., "Guidelines for Writing an IANA Considerations Section in RFCs", RFC 2434, October 1998.

[4] "3GPP TS 03.71, Location Services (LCS); Functional description; Stage 2".

[5] "3GPP TS 43.059, Radio Access Network; Functional stage 2 description of Location Services (LCS) in GERAN".

[6] "3GPP TS 25.305, Stage 2 functional specification of User Equipment (UE) positioning in UTRAN".

[7] "C.S0022-0, Position Determination Service Standards for Dual Mode Spread Spectrum Systems; April 2001.".

[8] "X.S0002-0, TIA/EIA-41-D Location Services Enhancements; March 2004".

[9] "J-STD-036, Enhanced Wireless 9-1-1, Phase 2; June 2005".

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