Flow Identity Extension for HELD
draft-bellis-geopriv-flow-identity-01

Abstract

Identity Extensions using an IP address and port number to request a location based on an individual packet flow have been previously specified by the GEOPRIV Working Group.

However certain kinds of NAT require that identifiers for both ends of the packet flow must be specified in order to unambiguously satisfy the location request.

This document specifies a Flow Identity Extension for the HTTP-Enabled Location Delivery (HELD) Protocol to support this requirement.

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1. Introduction

Work at the Emergency Location Working Group of NICC Standards Ltd (the UK’s telecoms standards body) prompted the addition of Port Number identifiers in HELD Identity [RFC6155] to allow HELD [RFC5985] requests for target Devices that are behind a NAT device.

Subsequent analysis has determined that in the presence of particular types of NAT device, and in particular Carrier Grade NATs, it is necessary to know the complete tuple of (layer 3 protocol, layer 4 protocol, source address, source port, destination address, destination port) in order to unambiguously identify a flow, and therefore the true target Device.

This document creates an XML Schema and URN Sub-Namespace for a Flow Identity Extension to support this requirement.
2. Conventions used in this document

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 [RFC2119].
3. Usage

An example HELD request is shown below:

```xml
<locationRequest xmlns="urn:ietf:params:xml:ns:geopriv:held"
    responseTime="8">
    <locationType exact="true">geodetic</locationType>
    <flow xmlns="urn:ietf:params:xml:ns:geopriv:held:flow"
        layer4="tcp" layer3="ipv4">
        <src>
            <address>192.168.1.1</address>
            <port>1024</port>
        </src>
        <dst>
            <address>10.0.0.1</address>
            <port>80</port>
        </dst>
    </flow>
</locationRequest>
```

The `<flow>` element MUST contain:

- a "layer3" attribute with a value of "ipv4" or "ipv6".
- a "layer4" attribute with a value of "udp" [RFC0768], "tcp" [RFC0793], "sctp" [RFC4960], "dccp" [RFC4340], or a decimal integer representing any applicable protocol from the IANA Assigned Internet Protocol Numbers Registry.

and MAY optionally contain:

- a "target" attribute with a value of "src" (default) or "dst" to indicate which end of the flow is the "target" of the `<locationRequest>` with respect to the HELD protocol.
4. XML Schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:flow="urn:ietf:params:xml:ns:geopriv:held:flow"
  elementFormDefault="qualified">
  <xs:annotation>
    <xs:appinfo
      source="urn:ietf:params:xml:schema:geopriv:held:flow">
      HELD Flow Identity</xs:appinfo>
    <xs:documentation
      source="http://www.rfc-editor.org/rfc/rfcNEW1.txt">
      This document defines Flow Identity elements for HELD.
    </xs:documentation>
  </xs:annotation>
  <xs:element name="flow" type="flow:flowIdentity"/>
  <xs:complexType name="flowIdentity">
    <xs:sequence>
      <xs:element name="src" type="flow:flowEndpoint"/>
      <xs:element name="dst" type="flow:flowEndpoint"/>
    </xs:sequence>
    <xs:attribute name="target" default="src">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:pattern value="(src|dst)"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="layer3" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:pattern value="(ipv4|ipv6)"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="layer4" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:token">
          <xs:pattern value="(udp|tcp|sctp|dccp|\d+)"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:schema>
```
<xs:complexType name="flowEndpoint">
  <xs:all>
    <xs:element name="address">
      <xs:simpleType>
        <xs:restriction base="xs:string"/>
      </xs:simpleType>
    </xs:element>
    <xs:element name="port">
      <xs:simpleType>
        <xs:restriction base="xs:unsignedShort">
          <xs:minInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:all>
</xs:complexType>
5. IANA Considerations

5.1. URN Sub-Namespace Registration for
urn:ietf:params:xml:ns:geopriv:held:flow

This section registers a new XML namespace,
"urn:ietf:params:xml:ns:geopriv:held:flow", as per the guidelines in
[RFC3688].


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XML:

BEGIN
<?xml version="1.0"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">
<head>
<title>HELD Flow Identity Parameters</title>
</head>
<body>
<h1>Namespace for HELD Flow Identity Parameters</h1>
<h2>urn:ietf:params:xml:ns:geopriv:held:flow</h2>
<p>See <a href="http://www.rfc-editor.org/rfc/rfcNEW1.txt">
RFC NEW1</a>.</p>
</body>
</html>
END

5.2. XML Schema Registration

This section registers an XML schema as per the guidelines in
[RFC3688]


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Schema: The XML for this schema can be found as the entirety of
Section 4 of this document.
6. Privacy Considerations

This document introduces no new privacy considerations beyond those in [RFC6155]
7. Security Considerations

This document introduces no new security considerations beyond those in [RFC6155]
8. References

8.1. Normative References


8.2. Informative References


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