Internet Engineering Task Force (IETF)
Request for Comments: 6915
Updates: 6155
Category: Standards Track
ISSN: 2070-1721

R. Bellis
Nominet UK

April 2013

Flow Identity Extension for HTTP-Enabled Location Delivery (HELD)

Abstract

RFC 6155 specifies an extension for the HTTP-Enabled Location Delivery (HELD) protocol, allowing the use of an IP address and port number to request a Device location based on an individual packet flow.

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 an XML Schema and a URN Sub-Namespace for a Flow Identity Extension for HELD to support this requirement.

This document updates RFC 6155 by deprecating the port number elements specified therein.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6915.

Copyright Notice

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (http://trustee.ietf.org/license-info) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1. Introduction

Work at the Emergency Location Task Group of NICC Standards Limited (the UK's telecoms industry standards body) prompted the addition of port number identifiers in HELD Identity [RFC6155] to allow HELD [RFC5985] requests for Devices that are behind NAT devices.

Subsequent analysis has determined that in the presence of particular types of NAT devices, 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 subsequently the true Device.

This document specifies an XML Schema and a URN Sub-Namespace for a Flow Identity Extension to support this requirement and provides a more generally applicable means of identifying a Device based on the parameters of a network flow of which it is an endpoint.

Since the Location Recipient may not know in advance whether the Device is behind a NAT device, the port number elements from Section 3.3 of [RFC6155] are deprecated and MUST NOT be used in new client implementations. Note that server implementations of this specification may still encounter requests formed by clients that have implemented only [RFC6155], and those requests might contain the deprecated port element.

For implementation details not specified in this document, please refer to [RFC6155] and [RFC5985].

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].

The terms "Device" and "Target" are used as defined in [RFC6280].

3. Usage

An example HELD request is shown below:

```
<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>192.0.2.25</address>
      <port>1024</port>
    </src>
    <dst>
      <address>198.51.100.238</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.

- an <src> element and a <dst> element whose child elements contain the Layer 3 address (which MUST conform to the relevant "IPv4address" or "IPv6address" grammar as defined in [RFC3986]) and the Layer 4 port number of each end of the flow.

and MAY optionally contain:

- a "target" attribute with a value of "src" (default) or "dst" to indicate which end of the flow corresponds to the Target of the <locationRequest> with respect to the HELD protocol.

4. XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="urn:ietf:params:xml:ns:geopriv:held:flow"
  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/rfc6915.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:complexType name="flowEndpoint">
      <xs:all>
        <xs:element name="address">
          <xs:simpleType>
            <xs:restriction base="xs:token"/>
          </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>
  </xs:schema>
```

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].

URI: urn:ietf:params:xml:ns:geopriv:held:flow

Registrant Contact: IETF GEOPRIV Working Group (geopriv@ietf.org), Ray Bellis (ray.bellis@nominet.org.uk)

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/rfc6915.txt">
         RFC 6915</a>.</p>
    </body>
  </html>
END
```

5.2. XML Schema Registration

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

URI: urn:ietf:params:xml:ns:geopriv:held:flow

Registrant Contact: IETF GEOPRIV Working Group (geopriv@ietf.org), Ray Bellis (ray.bellis@nominet.org.uk)

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

6. Privacy Considerations

All of the considerations in [RFC6155] apply to the use of the mechanism defined in this document. Like [RFC6155], this specification assumes that the Location Server being queried already has access to the internal state of the network near one end of the flow being queried (for instance, access to the bindings in a NAT in the path of the flow). Clients making queries using this specification in environments where that assumption may not be true should be aware that the request provides information about that client's communications that the Location Server would not otherwise be able to discern and may represent additional privacy exposure for that client.

7. Security Considerations

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

8. Acknowledgements

The author wishes to thank the members of the NICC Emergency Location Task Group, the IETF GeoPriv Working Group, and the authors of [RFC6155], from which the text for the URN and XML Schema Registrations were derived.

9. References

9.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, January 2004.

[RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005.

[RFC5985] Barnes, M., "HTTP-Enabled Location Delivery (HELD)", RFC 5985, September 2010.

[RFC6155] Winterbottom, J., Thomson, M., Tschofenig, H., and R. Barnes, "Use of Device Identity in HTTP-Enabled Location Delivery (HELD)", RFC 6155, March 2011.

9.2. Informative References

[RFC0768] Postel, J., "User Datagram Protocol", STD 6, RFC 768, August 1980.

[RFC0793] Postel, J., "Transmission Control Protocol", STD 7, RFC 793, September 1981.

[RFC4340] Kohler, E., Handley, M., and S. Floyd, "Datagram Congestion Control Protocol (DCCP)", RFC 4340, March 2006.

[RFC4960] Stewart, R., "Stream Control Transmission Protocol", RFC 4960, September 2007.

[RFC6280] Barnes, R., Lepinski, M., Cooper, A., Morris, J., Tschofenig, H., and H. Schulzrinne, "An Architecture for Location and Location Privacy in Internet Applications", BCP 160, RFC 6280, July 2011.

Author's Address

Ray Bellis
Nominet UK
Edmund Halley Road
Oxford OX4 4DQ
United Kingdom

Phone: +44 1865 332211
EMail: ray.bellis@nominet.org.uk
URI: http://www.nominet.org.uk/