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Presence Information Data Format (PIDF) Extension for Partial Presence

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

The Presence Information Document Format (PIDF) specifies the baseline XML-based format for describing presence information. One of the characteristics of the PIDF is that the document always needs to carry all presence information available for the presentity. In some environments where low bandwidth and high latency links can exist, it is often beneficial to limit the amount of transported information over the network. This document introduces a new MIME type that enables transporting of either only the changed parts or the full PIDF-based presence information.

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1. Introduction

The Presence Information Document Format (PIDF) [RFC3863] specifies the baseline XML-based format for describing presence information. One of the characteristics of the PIDF is that the document always needs to carry all presence information available for the presentity. In some environments where low bandwidth and high latency links can exist, it is often beneficial to limit the amount of transported information over the network.

This document introduces a new MIME-Type 'application/pidf-diff+xml', which enables transporting of either only the changed parts or the full PIDF based presence information. The root element of the document distinguishes whether the partial or full PIDF document content was transported.

> Note: With this new MIME-Type, applications can easily negotiate the support of partial updates of presence by using the Accept header. If PIDF had initially been designed for partial updates, a new separate MIME-Type would have been unnecessary.

2. Conventions

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 [RFC2119] and indicate requirement levels for compliant implementations.

This memo makes use of the vocabulary defined in RFC 2778 [RFC2778]. In addition, the following terms are defined:

Full presence document: A presence document that contains all the presentity's presence information that is available to a particular watcher.

Partial presence document: A presence document that represents a fragment of the full presence document. A partial presence document can only be understood in the context of the full presence document, i.e., a partial presence document modifies a cached copy of the full presence document.

3. Structure of PIDF Diff Documents

The MIME type 'application/pidf-diff+xml' defines the new content type for partial PIDF documents.

The XML Schema imports the PIDF [RFC3863] schema so that the full PIDF document content with the addition of a 'version' attribute can be transported. The root element of the document is then <pidf-full>, and the 'version' attribute information can be included within it. Otherwise, the content of <pidf-full> element is exactly the same as what would have been if 'application/pidf+xml' content type had been used. Although the XML Schema also allows using <presence> as the document root element, it is disallowed from applications utilizing this document format.

When only the changes of the presence document are transported, the model described in XML patch operations [RFC5261] is used. The root element of the document is then <pidf-diff>. The patch operation elements: <add>, <remove>, and <replace> allow changing the partial content of the cached local copy of the full presence document. The <add> element is used to add new content, the <replace> element updates, and the <remove> element removes existing content.

The optional 'version' attribute within the two possible document root elements contains a sequence number which is incremented by one between subsequent document updates, i.e., a more recent document update has a higher 'version' value than the previous one. This number can be used to ensure consistent updates as the recipient of

the document can use the 'version' number to properly order received documents and to ensure that updates have not been lost. The usage of this attribute thus allows "state delta" processing described in [RFC3265]. Partial notification [RFC5263] uses a similar model. This number increments independently regardless of whether the <pidf-full> or the <pidf-diff> content is transported. In other words, a single version counter is maintained across <pidf-full> and <pidf-diff> documents.

Implementations using this document format MUST follow guidelines specified in the PIDF [RFC3863] and PIDF extension formats, for example, DataModel [RFC4479], Rich Presence Information Data (RPID) [RFC4480], and Contact Information in PIDF (CIPID) [RFC4482] MUST support the usage of the XML schema data type ID [W3C.REC-xmlschema-2-20041028] of these listed RFCs. Specifically, the XML document MUST be well formed and SHOULD be valid. This specification makes use of XML namespaces for identifying presence documents and document fragments. The namespace URI for elements defined by this specification is a URN [RFC2141], using the namespace identifier 'ietf' specified in RFC 2648 [RFC2648] and extended by RFC 3688 [RFC3688]. This URN is:

urn:ietf:params:xml:ns:pidf-diff

3.1. 'version' Attribute

Every presence document compliant with this specification MAY contain a 'version' attribute within the <pidf-diff> and <pidf-full> element.

3.2. 'entity' Attribute

Every presence document compliant with this specification MAY contain an 'entity' attribute within the <pidf-diff> element. Its content, a presentity URI, MUST then be the same as the 'entity' attribute value of the <presence> element described in [RFC3863]. The usage of this presentity URI is described in more detail in Section 3.1 of [RFC4479].

4. Usage of 'application/pidf-diff+xml'

The partial presence document SHOULD only contain those elements or attributes that have changed. However, when there are a lot of changes, the full presence document content can then be transported instead.

5. IANA Considerations

IANA has performed the following actions:

- registered a new XML namespace URN per [RFC3688].
- registered a new MIME type 'application/pidf-diff+xml' according to the procedures of RFC 4288 [RFC4288] and guidelines in RFC 3023 [RFC3023].
- registered a new XML Schema according to the procedures of RFC 3688 [RFC3688].

5.1. URN Sub-Namespace Registration for 'urn:ietf:params:xml:ns:pidf-diff'

This specification registers a new XML namespace, as per the guidelines in RFC 3688 [RFC3688].

URI:
urn:ietf:params:xml:ns:pidf-diff

Description:
This is the XML namespace for XML elements defined by RFC 5262 to describe the 'application/pidf-diff+xml' content type for partial PIDF.

Registrant Contact:
IETF, SIMPLE working group, (simple@ietf.org)
Jari Urpalainen, (jari.urpalainen@nokia.com)

XML:

```
BEGIN
<?xml version="1.0"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML Basic 1.0//EN"
  "http://www.w3.org/TR/xhtml-basic/xhtml-basic10.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="content-type"
          content="text/html;charset=iso-8859-1"/>
    <title>PIDF extension for partial PIDF</title>
  </head>
  <body>
    <h1>Namespace for PIDF extension for partial
        notifications</h1>
    <h2>urn:ietf:params:xml:ns:pidf-diff</h2>
    <p>See <a href="http://www.rfc-editor.org/rfc/rfc5262.txt">
     RFC5262</a>.</p>
  </body>
</html>
END
```

5.2. application/pidf-diff+xml MIME Type

MIME media type name: application

MIME subtype name: pidf-diff+xml

Mandatory parameters: none

Optional parameters:
Same as charset parameter of application/xml as specified in RFC 3023 [RFC3023]. Default value is UTF-8.

Encoding considerations:
Same as encoding considerations of application/xml as specified in RFC 3023 [RFC3023].

Security considerations:
See Section 10 of RFC 3023 [RFC3023]. This content type is designed to carry presence data, which may be considered private information. Appropriate precautions should be adopted to limit disclosure of this information.

Interoperability considerations: none

Published specification: RFC 5262

Applications that use this media type: SIP-based presence systems

Additional information:

Magic Number: None

File Extension: .xml

Macintosh file type code: "TEXT"

Personal and email address for further information: Jari Urpalainen, jari.urpalainen@nokia.com

Intended usage: LIMITED USE

Restrictions on usage: Presence [RFC3863] based systems.

Author:
This specification is a work item of the IETF SIMPLE working group, with mailing list address <simple@ietf.org>.

Author/Change controller: the IETF.

5.3. XML Schema Registration

This section calls for IANA to register a new XML Schema, the sole content of which can be found in Section 7.

URI:
urn:ietf:params:xml:schema:pidf-diff

Registrant Contact:
IETF, SIMPLE working group, <simple@ietf.org>
Jari Urpalainen, <jari.urpalainen@nokia.com>

6. Examples

An 'application/pidf-diff+xml' document that contains the full state presence information:

```
<?xml version="1.0" encoding="UTF-8"?>
<p:pidf-full xmlns="urn:ietf:params:xml:ns:pidf"
       xmlns:p="urn:ietf:params:xml:ns:pidf-diff"
       xmlns:r="urn:ietf:params:xml:ns:pidf:rpid"
       xmlns:ci="urn:ietf:params:xml:ns:pidf:cipid"
       xmlns:c="urn:ietf:params:xml:ns:pidf:caps"
       xmlns:dm="urn:ietf:params:xml:ns:pidf:data-model"
       entity="pres:someone@example.com"
       version="567">

 <tuple id="sg89ae">
  <status>
   <basic>open</basic>
  </status>
  <c:servcaps>
   <c:audio>true</c:audio>
   <c:message>true</c:message>
   <c:video>false</c:video>
  </c:servcaps>
  <contact priority="0.8">tel:09012345678</contact>
 </tuple>

 <tuple id="cg231jcr">
  <status>
   <basic>open</basic>
  </status>
  <contact priority="1.0">im:pep@example.com</contact>
 </tuple>

 <tuple id="r1230d">
  <status>
   <basic>closed</basic>
  </status>
  <ci:homepage>http://example.com/~pep/</ci:homepage>
  <ci:icon>http://example.com/~pep/icon.gif</ci:icon>
  <ci:card>http://example.com/~pep/card.vcd</ci:card>
  <contact priority="0.9">sip:pep@example.com</contact>
 </tuple>

 <note xml:lang="en">Full state presence document</note>

 <dm:person id="p123">
  <r:activities>
```

```
      <r:on-the-phone/>
      <r:busy/>
     </r:activities>
    </dm:person>
    <dm:device id="u600b40c7">
     <c:devcaps>
      <c:mobility>
       <c:supported>
        <c:mobile/>
       </c:supported>
      </c:mobility>
     </c:devcaps>
     <dm:deviceID>urn:esn:600b40c7</dm:deviceID>
    </dm:device>

   </p:pidf-full>
```

An example partial update document with the <pidf-diff> root element:

```
   <?xml version="1.0" encoding="UTF-8"?>
   <p:pidf-diff
        xmlns="urn:ietf:params:xml:ns:pidf"
        xmlns:p="urn:ietf:params:xml:ns:pidf-diff"
        xmlns:r="urn:ietf:params:xml:ns:pidf:rpid"
        xmlns:d="urn:ietf:params:xml:ns:pidf:data-model"
        entity="pres:someone@example.com"
        version="568">

   <p:add sel="presence/note" pos="before">
    <tuple id="ert4773">
     <status>
      <basic>open</basic>
     </status>
     <contact priority="0.4">mailto:pep@example.com</contact>
     <note xml:lang="en">This is a new tuple inserted
          between the last tuple and person element</note>
    </tuple>
   </p:add>

   <p:replace sel="*/tuple[@id='r1230d']/status/basic/text()"
      >open</p:replace>

   <p:remove sel="*/d:person/r:activities/r:busy" ws="after"/>

   <p:replace sel="*/tuple[@id='cg231jcr']/contact/@priority"
      >0.7</p:replace>

   </p:pidf-diff>
```

An updated local composition presence document after applying the patches:

```
<?xml version="1.0" encoding="UTF-8"?>
<p:pidf-full xmlns="urn:ietf:params:xml:ns:pidf"
       xmlns:p="urn:ietf:params:xml:ns:pidf-diff"
       xmlns:r="urn:ietf:params:xml:ns:pidf:rpid"
       xmlns:ci="urn:ietf:params:xml:ns:pidf:cipid"
       xmlns:c="urn:ietf:params:xml:ns:pidf:caps"
       xmlns:dm="urn:ietf:params:xml:ns:pidf:data-model"
       entity="pres:someone@example.com"
       version="568">

 <tuple id="sg89ae">
  <status>
   <basic>open</basic>
  </status>
  <c:servcaps>
   <c:audio>true</c:audio>
   <c:message>true</c:message>
   <c:video>false</c:video>
  </c:servcaps>
  <contact priority="0.8">tel:09012345678</contact>
 </tuple>

 <tuple id="cg231jcr">
  <status>
   <basic>open</basic>
  </status>
  <contact priority="0.7">im:pep@example.com</contact>
 </tuple>

 <tuple id="r1230d">
  <status>
   <basic>open</basic>
  </status>
  <ci:homepage>http://example.com/~pep/</ci:homepage>
  <ci:icon>http://example.com/~pep/icon.gif</ci:icon>
  <ci:card>http://example.com/~pep/card.vcd</ci:card>
  <contact priority="0.9">sip:pep@example.com</contact>
 </tuple>

 <tuple id="ert4773">
  <status>
   <basic>open</basic>
  </status>
  <contact priority="0.4">mailto:pep@example.com</contact>
```

```
     <note xml:lang="en">This is a new tuple inserted
         between the last tuple and note element</note>
    </tuple>

    <note xml:lang="en">Full state presence document</note>

    <dm:person id="p123">
     <r:activities>
      <r:on-the-phone/>
     </r:activities>
    </dm:person>

    <dm:device id="u600b40c7">
     <c:devcaps>
      <c:mobility>
       <c:supported>
        <c:mobile/>
       </c:supported>
      </c:mobility>
     </c:devcaps>
     <dm:deviceID>urn:esn:600b40c7</dm:deviceID>
    </dm:device>

   </p:pidf-full>
```

7. XML Schema

The XML schema for the 'application/pidf-diff+xml' data format. The included schema "urn:ietf:params:xml:schema:xml-patch-ops" is defined in [RFC5261], and the PIDF Schema "pidf.xsd" is imported from [RFC3863].

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

 <!-- include patch-ops type definitions -->
 <xsd:include
      schemaLocation="urn:ietf:params:xml:schema:patch-ops"/>

 <!-- import PIDF definitions -->
 <xsd:import namespace="urn:ietf:params:xml:ns:pidf"
             schemaLocation="pidf.xsd"/>
```

```
    <!-- partial updates -->
    <xsd:element name="pidf-diff">
     <xsd:complexType>
      <xsd:sequence minOccurs="0" maxOccurs="unbounded">
       <xsd:choice>
        <xsd:element name="add" type="tns:add"/>
        <xsd:element name="replace" type="tns:replace"/>
        <xsd:element name="remove" type="tns:remove"/>
       </xsd:choice>
      </xsd:sequence>
      <xsd:attribute name="version" type="xsd:unsignedInt"/>
      <xsd:attribute name="entity" type="xsd:anyURI"/>
     </xsd:complexType>
    </xsd:element>

    <!-- full PIDF in addition to optional version -->
    <xsd:element name="pidf-full">
     <xsd:complexType>
      <xsd:complexContent>
       <xsd:extension base="pidf:presence">
        <xsd:attribute name="version" type="xsd:unsignedInt"/>
       </xsd:extension>
      </xsd:complexContent>
     </xsd:complexType>
    </xsd:element>

   </xsd:schema>
```

8. Interoperability Considerations

Systems compliant with Common Profile for Presence (CPP) [RFC3859] will not be by default able to use this specification. However, this will not cause any interoperability problems because all endpoints and gateways must support the default MIME type (application/pidf+xml) regardless of if they support this specification. Thus, if a gateway or another end point does not understand this specification it will not be used. In SIMPLE-based systems, use of this MIME type is negotiated using SIP content type negotiation mechanism as specified in partial notification [RFC5263].

Other CPP-compliant (other than SIP-based) systems can also support this specification if they have a mechanism to indicate support for it. If they do, it is possible to build a gateway that will preserve end-to-end integrity with usage of partial PIDF.

9. Security Considerations

All security considerations identified for PIDF [RFC3863] apply unchanged for this document as presence information may contain highly sensitive information. Furthermore, the protocol SHOULD provide authorization policies what presence information can be given to which watchers, and when, see [RFC5025].

10. Internationalization Considerations

The PIDF [RFC3863] format is represented in XML that performs all character processing in terms of the Universal Character Set (UCS). Conformant XML processors MUST support both UTF-8 and UTF-16 encodings of the UCS. UTF-8 is the RECOMMENDED encoding of this partial presence format.

If the character set of the initial <pidf-full> document has been accepted by a receiving application, it MUST continue to accept the same character set with the subsequent <pidf-diff> documents. However, it MUST NOT need to accept a possible character set change.

11. Error Handling

Error conditions MAY be indicated by errors defined in [RFC5261]. This document doesn't define any additional error elements. If the 'version' or 'entity' attributes have incorrect content, it MAY be indicated by the <invalid-attribute-value> error element.

12. Acknowledgments

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