XEP-0152: Reachability Addresses

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This document defines an XMPP protocol extension for communicating information about how an entity can be reached temporarily using methods other than the entity's normal JID.

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Contents

1 Introduction

Sometimes it is desirable to augment instant messaging (IM) with another real-time communications medium, such as a voice conversation conducted over the traditional public switched telephone network (PSTN) or Voice over Internet Protocol (VoIP) applications. In order to facilitate this functionality, a user needs to advertise the address(es) at which they can be reached. There are several possible ways to do this:

- Publish the address(es) in the user's vCard (see vcard-temp (XEP-0054) [1] and vCard4 over XMPP (XEP-0292) [2]); this is convenient, but is not very dynamic (e.g., reachability addresses might change when the user moves to a new conference room in an office building).

- Send the address(es) within a <presence/> stanza; this option is described in the Presence Transport section of this document and is consistent with RFC 6121 [3] since reachability is one aspect of a user's availability for communication.

- Send address(es) to the appropriate Publish-Subscribe (XEP-0060) [4] node; this option is described in the PEP Transport section of this document but might not be available at all service providers.

This document defines methods for publishing addresses at which a user can be reached temporarily, as opposed to semi-permanent addresses of the kind that are more appropriately communicated in a user's vCard. We illustrate this usage through the scenario of a user sending a reachability address upon entering a physical conference room and then sending an updated notification (without a reachability address) upon leaving the conference room. Similar scenarios might apply when an XMPP implementation is used with technologies such as WebRTC and in deployments of the combined use of SIP and XMPP ("CUSAX"; RFC 7081 [5]).

2 Requirements

This document addresses the following requirements:

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[1]XEP-0054: vcard-temp <https://xmpp.org/extensions/xep-0054.html>.

[2]XEP-0292: vCard4 over XMPP <https://xmpp.org/extensions/xep-0292.html>.

[3]RFC 6121: Extensible Messaging and Presence Protocol (XMPP): Instant Messaging and Presence <http://tools.ietf.org/html/rfc6121>.

[4]XEP-0060: Publish-Subscribe <https://xmpp.org/extensions/xep-0060.html>.

[5]RFC 7081: CUSAX: Combined Use of the Session Initiation Protocol (SIP) and the Extensible Messaging and Presence Protocol (XMPP) <http://tools.ietf.org/html/rfc7081>.

- Enable clients to dynamically publish reachability addresses.

- Minimize network traffic.

3 Data Format

The following is an example of the data format for reachability addresses:

Listing 1: Data Format for Reachability Addresses

```
<reach xmlns='urn:xmpp:reach:0'>
  <addr uri='tel:+1-303-555-1212'/>
  <addr uri='sip:room123@example.com'/>
</reach>
```

When publishing reachability addresses, the <reach/> element MUST contain at least one <addr/> element. Each <addr/> element MUST possess a 'uri' attribute, whose value MUST be the Uniform Resource Identifier (RFC 3986 [6]) or Internationalized Resource Identifier (RFC 3987 [7]) of an alternate communications method for reaching the user.

The <addr/> element MAY contain one or more <desc/> children whose XML character data is a natural-language description of the address; this element SHOULD possess an 'xml:lang' attribute whose value is a language tag that conforms to RFC 4646 [8] (although the default language MAY be specified at the stanza level; see RFC 6120 [9]). In order to preserve bandwidth, the <desc/> element SHOULD NOT be included when sending reachability data via presence broadcast, but MAY be included when using directed presence or the personal eventing protocol.

Listing 2: Reachability Addresses With Descriptions

```
<reach xmlns='urn:xmpp:reach:0'>
  <addr uri='tel:+1-303-555-1212'>
    <desc xml:lang='en'>Conference room phone</desc>
  </addr>
  <addr uri='sip:room123@example.com'>
    <desc xml:lang='en'>In-room video system</desc>
  </addr>
</reach>
```

---

[6]RFC 3986: Uniform Resource Identifiers (URI): Generic Syntax <http://tools.ietf.org/html/rfc3986>.

[7]RFC 3987: Internationalized Resource Identifiers (IRIs) <http://tools.ietf.org/html/rfc3987>.

[8]RFC 4646: Tags for Identifying Languages <http://tools.ietf.org/html/rfc4646>.

[9]RFC 6120: Extensible Messaging and Presence Protocol (XMPP): Core <http://tools.ietf.org/html/rfc6120>.

4 Data Transport

This document specifies two methods of advertising reachability addresses:

- Presence

- Personal Eventing Protocol (XEP-0163) [10] (PEP)

This document does not recommend one transport method over the other.
In addition, a contact MAY request a user's reachability addresses in an XMPP <iq/> stanza of type "get" and a user MAY send reachability addresses in an XMPP <message/> stanza. However, the presence and PEP transport methods are preferred.

4.1 Presence Transport

To broadcast reachability addresses in presence information, a user's client includes the <reach/> element in the <presence/> stanza it sends to its server.
For example, consider someone who walks into a conference room at the office. Via nearfield communication, the user's XMPP client might auto-discover a 'tel:' URI for the room audio system and a 'sip:' URI for the room video system.

Listing 3: User's Client Includes Reachability Addresses in Presence

```
<presence from='romeo@example.com/mobile'>
  <reach xmlns='urn:xmpp:reach:0'>
    <addr uri='tel:+1-303-555-1212'/>
    <addr uri='sip:room123@example.com'/>
  </reach>
</presence>
```

The user's server then broadcasts that presence stanza to all entities who are subscribed to the user's presence:

Listing 4: User's Server Broadcasts Presence Information

```
<presence from='romeo@montague.net/mobile' to='juliet@capulet.com'>
  <reach xmlns='urn:xmpp:reach:0'>
    <addr uri='tel:+1-303-555-1212'/>
    <addr uri='sip:room123@example.com'/>
  </reach>
</presence>
```

(Naturally, a reachability address MAY alternatively be included in directed presence.)
Upon leaving the conference room, the user's client would send updated presence without

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[10]XEP-0163: Personal Eventing Protocol <https://xmpp.org/extensions/xep-0163.html>.

the reachability extension.

Listing 5: User's Client Sends Updated Presence Without Reachability Addresses

```
<presence from='romeo@example.com/mobile'/>
```

4.2 Personal Eventing Protocol

To publish reachability addresses via the personal eventing protocol (XEP-0163), the entity publishes data to the "urn:xmpp:reach:0" node.

Listing 6: Entity Publishes Reachability Addresses via PEP

```
<iq type='set'
    from='romeo@example.com'
    to='pubsub.shakespeare.example'
    id='publish1'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:reach:0'>
      <item id='a1s2d3f4g5h6bjeh936'>
        <reach xmlns='urn:xmpp:reach:0'>
          <addr uri='tel:+1-303-555-1212'>
            <desc xml:lang='en'>Conference room phone</desc>
          </addr>
          <addr uri='sip:room123@example.com'>
            <desc xml:lang='en'>In-room video system</desc>
          </addr>
        </reach>
      </item>
    </publish>
  </pubsub>
</iq>
```

Listing 7: Subscriber Receives PEP Event with Payload

```
<message from='pubsub.shakespeare.lit'
         to='juliet@capulet.com'>
  <event xmlns='http://jabber.org/protocol/pubsub#event'>
    <items node='urn:xmpp:reach:0'>
      <item id='a1s2d3f4g5h6bjeh936'>
        <reach xmlns='urn:xmpp:reach:0'>
          <addr uri='tel:+1-303-555-1212'>
            <desc xml:lang='en'>Conference room phone</desc>
          </addr>
          <addr uri='sip:room123@example.com'>
            <desc xml:lang='en'>In-room video system</desc>
          </addr>
        </reach>
```

```
        </item>
      </items>
   </event>
</message>
```

As above, when leaving the conference room the user's client would publish an updated payload indicating that it no longer has any temporary reachability addresses.

Listing 8: Entity Publishes Payload with Empty Reachability Addresses

```
<iq type='set'
    from='romeo@example.com'
    to='pubsub.shakespeare.example'
    id='publish1'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:reach:0'>
      <item id='a1s2d3f4g5h6bjeh936'>
        <reach xmlns='urn:xmpp:reach:0'/>
      </item>
    </publish>
  </pubsub>
</iq>
```

5 Determining Support

If an entity supports reachability addresses, it MUST advertise that fact by returning a feature of "urn:xmpp:reach:0" (see Namespace Versioning regarding the possibility of incrementing the version number) in response to a Service Discovery (XEP-0030) [11] information request.

Listing 9: Service Discovery Information Request

```
<iq from='juliet@capulet.com/balcony'
    id='disco1'
    to='romeo@montague.net/orchard'
    type='get'>
  <query xmlns='http://jabber.org/protocol/disco#info'/>
</iq>
```

Listing 10: Service Discovery Information Response

```
<iq from='romeo@montague.net/orchard'
    id='disco1'
    to='juliet@capulet.com/balcony'
    type='result'>
  <query xmlns='http://jabber.org/protocol/disco#info'>
```

---

[11]XEP-0030: Service Discovery <https://xmpp.org/extensions/xep-0030.html>.

```
    <feature var='urn:xmpp:reach:0'/>
  </query>
</iq>
```

In order for an application to determine whether an entity supports this protocol, where possible it SHOULD use the dynamic, presence-based profile of service discovery defined in Entity Capabilities (XEP-0115) [12]. However, if an application has not received entity capabilities information from an entity, it SHOULD use explicit service discovery instead.

6 Implementation Notes

To preserve network bandwidth, the sender ought not include the <desc/> element unless that information is deemed necessary to enable communication.

A recipient ought to attempt communications with reachability addresses in the order that the <addr/> elements appear within the <reach/> element.

7 Internationalization Considerations

If included, the <desc/> element SHOULD possess an 'xml:lang' attribute specifying the language of the human-readable descriptive text for a particular address.

8 Security Considerations

Security considerations for XMPP presence and PEP publication are described in RFC 6120, RFC 6121, XEP-0060, and XEP-0163.

Advertising a telephone number, SIP URI, or other real-time communication address to multiple contacts in an unencrypted way (e.g., via XMPP presence or PEP in cases where not all hops are TLS-protected) introduces the possibility of information leakage and subsequent attacks such as unsolicited phone calls. Clients are advised to appropriately warn users about the dangers of such attacks. Alternatively, if the address is especially sensitive (say, a hashname RFC 6920 [13] for use in a system that enables direct private communication outside of XMPP), then a client could send it in a message that itself is end-to-end encrypted.

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[12]XEP-0115: Entity Capabilities <https://xmpp.org/extensions/xep-0115.html>.
[13]RFC 6920: Naming Things with Hashes <http://tools.ietf.org/html/rfc6920>.

9 IANA Considerations

This document requires no interaction with the Internet Assigned Numbers Authority (IANA) [14].

10 XMPP Registrar Considerations

10.1 Protocol Namespaces

This specification defines the following XML namespace:

- urn:xmpp:reach:0

Upon advancement of this specification from a status of Experimental to a status of Draft, the XMPP Registrar [15] shall add the foregoing namespace to the registry located at <https://xmpp.org/registrar/namespaces.html>, as described in Section 4 of XMPP Registrar Function (XEP-0053) [16].

10.2 Namespace Versioning

If the protocol defined in this specification undergoes a revision that is not fully backwards-compatible with an older version, the XMPP Registrar shall increment the protocol version number found at the end of the XML namespaces defined herein, as described in Section 4 of XEP-0053.

11 XML Schema

```
<?xml version='1.0' encoding='UTF-8'?>

<xs:schema
    xmlns:xs='http://www.w3.org/2001/XMLSchema'
    targetNamespace='urn:xmpp:reach:0'
    xmlns='urn:xmpp:reach:0'
    elementFormDefault='qualified'>
```

---

[14]The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols, such as port numbers and URI schemes. For further information, see <http://www.iana.org/>.

[15]The XMPP Registrar maintains a list of reserved protocol namespaces as well as registries of parameters used in the context of XMPP extension protocols approved by the XMPP Standards Foundation. For further information, see <https://xmpp.org/registrar/>.

[16]XEP-0053: XMPP Registrar Function <https://xmpp.org/extensions/xep-0053.html>.

```
<xs:annotation>
  <xs:documentation>
    The protocol documented by this schema is defined in
    XEP-0152: http://www.xmpp.org/extensions/xep-0152.html
  </xs:documentation>
</xs:annotation>

<xs:element name='reach'>
  <xs:complexType>
    <xs:sequence>
      <xs:element name='addr'
                  minOccurs='0'
                  maxOccurs='unbounded'
                  type='addrElementType'/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:complexType name='addrElementType'>
  <xs:sequence>
    <xs:element name='desc'
                minOccurs='0'
                maxOccurs='unbounded'
                type='xs:string'/>
  </xs:sequence>
  <xs:attribute name='uri' use='required' type='xs:anyURI'/>
</xs:complexType>

</xs:schema>
```