



# XMPP

## XEP-0372: References

Kevin Smith

<mailto:kevin.smith@isode.com>

<xmpp:kevin.smith@isode.com>

2020-12-09

Version 0.5.0

Status	Type	Short Name
Experimental	Standards Track	Refs

This document defines a method for one XMPP stanza to provide references to another entity, such as mentioning users, HTTP resources, or other XMPP resources.

# Legal

## Copyright

This XMPP Extension Protocol is copyright © 1999 – 2024 by the [XMPP Standards Foundation](#) (XSF).

## Permissions

Permission is hereby granted, free of charge, to any person obtaining a copy of this specification (the "Specification"), to make use of the Specification without restriction, including without limitation the rights to implement the Specification in a software program, deploy the Specification in a network service, and copy, modify, merge, publish, translate, distribute, sublicense, or sell copies of the Specification, and to permit persons to whom the Specification is furnished to do so, subject to the condition that the foregoing copyright notice and this permission notice shall be included in all copies or substantial portions of the Specification. Unless separate permission is granted, modified works that are redistributed shall not contain misleading information regarding the authors, title, number, or publisher of the Specification, and shall not claim endorsement of the modified works by the authors, any organization or project to which the authors belong, or the XMPP Standards Foundation.

## Warranty

## NOTE WELL: This Specification is provided on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. ##

## Liability

In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall the XMPP Standards Foundation or any author of this Specification be liable for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising from, out of, or in connection with the Specification or the implementation, deployment, or other use of the Specification (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if the XMPP Standards Foundation or such author has been advised of the possibility of such damages.

## Conformance

This XMPP Extension Protocol has been contributed in full conformance with the XSF's Intellectual Property Rights Policy (a copy of which can be found at <https://xmpp.org/about/xsf/ipr-policy>) or obtained by writing to XMPP Standards Foundation, P.O. Box 787, Parker, CO 80134 USA).

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Discovery</b>	<b>1</b>
<b>3</b>	<b>Use Cases</b>	<b>2</b>
3.1	Generics . . . . .	2
3.2	Mentions . . . . .	2
3.3	Data . . . . .	3
3.4	Previous messages . . . . .	3
<b>4</b>	<b>Security Considerations</b>	<b>4</b>
<b>5</b>	<b>IANA Considerations</b>	<b>4</b>
<b>6</b>	<b>XMPP Registrar Considerations</b>	<b>4</b>
<b>7</b>	<b>XML Schema</b>	<b>4</b>

## 1 Introduction

It's often desirable to encode a reference to another entity within a chat message and to mark up the reference. Examples of this include HTTP URLs, 'mentions' (referring to another user), references to previous messages and references to [Form Discovery and Publishing \(XEP-0346\)](https://xmpp.org/extensions/xep-0346.html)<sup>1</sup> (FDP) forms. This document provides a mechanism for marking up a section of a message body with information about the target of the reference.

## 2 Discovery

If a client implements references, it MUST specify the 'urn:xmpp:reference:0' feature in its service discovery information features as specified in [Service Discovery \(XEP-0030\)](https://xmpp.org/extensions/xep-0030.html)<sup>2</sup> and the Entity Capabilities profile specified in [Entity Capabilities \(XEP-0115\)](https://xmpp.org/extensions/xep-0115.html)<sup>3</sup>.

Listing 1: Client queries for contact's features

```
<iq type='get'
  id='disco1'
  from='romeo@montegue.lit/30d3d8'
  to='juliet@capulet.lit/sabo239'>
  <query xmlns='http://jabber.org/protocol/disco#info' />
</iq>
```

Listing 2: Contact's client responds with features

```
<iq type='result'
  id='disco1'
  from='juliet@capulet.lit/sabo239'
  to='romeo@montegue.lit/30d3d8'>
  <query xmlns='http://jabber.org/protocol/disco#info'>
    ...
    <feature var='urn:xmpp:reference:0' />
    ...
  </query>
</iq>
```

TODO: Individual discovery of reference types - FDP, Mentions, ...

---

<sup>1</sup>XEP-0346: Form Discovery and Publishing <<https://xmpp.org/extensions/xep-0346.html>>.

<sup>2</sup>XEP-0030: Service Discovery <<https://xmpp.org/extensions/xep-0030.html>>.

<sup>3</sup>XEP-0115: Entity Capabilities <<https://xmpp.org/extensions/xep-0115.html>>.

## 3 Use Cases

### 3.1 Generics

References are provided in a 'reference' element of a message, with a namespace of 'urn:xmpp:reference:0'. The element MUST contain a 'type' attribute denoting the type of the reference and a 'uri' attribute of the thing that is referenced. It MAY contain 'begin', 'end' and 'anchor' elements.

The 'begin' and 'end' attributes are indexes denoting the beginning and end of the referenced substring in the message body. The Dijkstra convention of ranges<sup>4</sup> is used, which means that 'begin' is inclusive and 'end' is exclusive. In other words, the 'begin' attribute is the index of the first unicode code point in the referenced substring, with 0 being the index of the first code point in the body, and the 'end' attribute is one higher than the index of the last code point in the substring. This convention has three main advantages. It matches subsequence indexing in various programming languages, 'end' minus 'begin' equals the length of the substring, and when two substrings are adjacent, the 'end' attribute of the first one matches the 'begin' attribute of the second one. Where the reference is not a substring of the message body in the referring stanza, 'begin' and 'end' are not used.

An 'anchor' attribute is used when the referring message is not the one containing the reference element, and points to the previous message containing the reference (the referring message).

Note that the URIs of the reference and anchor do not need to refer to the same mechanism as that in which the reference was received. E.g., a service could listen for mentions in a MIX channels of users outside that channel, and send them messages containing a reference to let them know that they've been mentioned.

### 3.2 Mentions

Mentions are a reference to a user's bare JID, and have a type of 'mention'.

Listing 3: Romeo sends a message mentioning Juliet

```
<message type='groupchat'
  id='sotehu-bthbtp32h3'
  to='balcony@channels.shakespeare.lit'>
  <body>But, soft! what light through yonder window breaks? It is the
    east, and Juliet is the sun.</body>
  <reference xmlns='urn:xmpp:reference:0'
    begin='72'
    end='78'
    type='mention'
    uri='xmpp:juliet@capulet.lit' />
</message>
```

---

<sup>4</sup>Dijkstra convention of ranges <<https://www.cs.utexas.edu/users/EWD/transcriptions/EWD08xx/EWD831.html>>

### 3.3 Data

Data references are a generic reference without additional information. The URI points to an 'item' that is able to be fetched. This is useful for, for example, fetching an item from pubsub, as in the example below. TODO: check URI syntax for referring to a pubsub item.

Listing 4: A MIX Channel sends a message that a new FDP form has been submitted elsewhere

```
<message type='groupchat'
  id='sotehu-bthbtp32h4'
  from='balcony@channels.shakespeare.lit'
  to='romeo@montegue.lit/30d3d8'>
  <body>Form received</body>
  <reference xmlns='urn:xmpp:reference:0'
    type='data'
    uri='xmpp:fdp.shakespeare.lit?;node=fdp/submitted/stan.
      isode.net/accidentreport;item=ndina872be' />
</message>
```

### 3.4 Previous messages

Sometimes it's desirable to annotate a reference in a previous message. An example of this might be where a MIX channel asynchronously adds information about references made in previous messages by users. In this case the message MUST NOT contain a body. Here the anchor attribute is used to provide a URI to the previous message. TODO: URI scheme for messages.

Listing 5: A MIX Channel annotates a previous user message

```
<message type='groupchat'
  id='sotehu-bthbtp32h5'
  from='balcony@channels.shakespeare.lit'
  to='romeo@montegue.lit/30d3d8'>
  <reference xmlns='urn:xmpp:reference:0'
    type='data'
    anchor='xmpp:balcony@channels.shakespeare.lit?;node=
      messages;item=bnhob'
    begin='72'
    end='78'
    uri='xmpp:fdp.shakespeare.lit?;node=fdp/submitted/stan.
      isode.net/accidentreport;item=ndina872be' />
</message>
```

## **4 Security Considerations**

TODO.

## **5 IANA Considerations**

None.

## **6 XMPP Registrar Considerations**

Needs a namespace.

## **7 XML Schema**

When advanced.