



# XMPP

## XEP-0203: Delayed Delivery

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This specification defines an XMPP protocol extension for communicating the fact that an XML stanza has been delivered with a delay, for example because a message has been stored on a server while the intended recipient was offline or because a message is contained in the history of a multi-user chat room.

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## 1 Introduction

Although the XMPP protocol extension defined in [Legacy Delayed Delivery](#)<sup>1</sup> provides a way to communicate that an XML stanza (typically a <message/> or <presence/> stanza) has been delivered with a delay, the timestamp format defined in that document does not adhere to the recommended date and time profiles for XMPP protocols defined in [XMPP Date and Time Profiles](#)<sup>2</sup>. Therefore, this document defines a replacement for XEP-0091 which enables communication of delayed delivery information while adhering to XEP-0082.

## 2 Protocol Definition

The XML namespace defined herein is used to provide timestamp information about data stored for later delivery. The most common uses of this namespace are to stamp:

- A message that is sent to an offline entity and stored for later delivery (see [Best Practices for Handling Offline Messages](#)<sup>3</sup>).
- The last available presence stanza sent by a connected client to a server.
- Messages cached by a [Multi-User Chat](#)<sup>4</sup> room for delivery to new participants when they join the room.

Information about the delivery delay is communicated by adding to the <message/> or <presence/> stanza one and only one <delay/> child qualified by a namespace to be issued when this specification advances to a status of Draft. This information is added by the server or component that delivers the stanza. The following attributes are defined for the <delay/> element:

Attribute	Definition	Inclusion
from	The Jabber ID of the entity that originally sent the XML stanza or that delayed the delivery of the stanza (e.g., the address of a multi-user chat room).	RECOMMENDED
stamp	The time when the XML stanza was originally sent. The format MUST adhere to the dateTime format specified in XEP-0082 and MUST be expressed in UTC.	REQUIRED

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<sup>1</sup>XEP-0091: Legacy Delayed Delivery <<http://xmpp.org/extensions/xep-0091.html>>.

<sup>2</sup>XEP-0082: XMPP Date and Time Profiles <<http://xmpp.org/extensions/xep-0082.html>>.

<sup>3</sup>XEP-0160: Best Practices for Handling Offline Messages <<http://xmpp.org/extensions/xep-0160.html>>.

<sup>4</sup>XEP-0045: Multi-User Chat <<http://xmpp.org/extensions/xep-0045.html>>.

In addition, the <delay/> element MAY contain XML character data that provides a natural-language description of the reason for the delay.

### 3 Examples

Listing 1: Receiving a Message Sent While Offline

```
<message
  from='romeo@montague.net/orchard'
  to='juliet@capulet.com'
  type='chat'>
  <body>
    O blessed, blessed night! I am afeard.
    Being in night, all this is but a dream,
    Too flattering-sweet to be substantial.
  </body>
  <delay xmlns='urn:xmpp:delay'
    from='capulet.com'
    stamp='2002-09-10T23:08:25Z'>
    Offline Storage
  </delay>
</message>
```

Listing 2: Receiving the Last Presence Update of Another Entity

```
<presence from='juliet@capulet.com/balcony' to='romeo@montague.net'>
  <status>anon!</status>
  <show>xa</show>
  <priority>1</priority>
  <delay xmlns='urn:xmpp:delay'
    from='juliet@capulet.com/balcony'
    stamp='2002-09-10T23:41:07Z' />
</presence>
```

Listing 3: Receiving Cached Messages from a Conference Room

```
<message
  from='coven@macbeth.shakespeare.lit/secondwitch'
  to='macbeth@shakespeare.lit/laptop'
  type='groupchat'>
  <body>
    By the pricking of my thumbs,
    Something wicked this way comes.
    Open, locks,
    Whoever knocks!
  </body>
  <delay xmlns='urn:xmpp:delay'
```

```
from='coven@macbeth.shakespeare.lit'  
stamp='2002-09-10T23:05:37Z' />  
</message>
```

## 4 Implementation Notes

This protocol was designed in a way that makes migration from XEP-0091 straightforward. All attributes present in the 'jabber:x:delay' namespace are present in the namespace defined herein. However, this document specifies a different format for the value of the <stamp> attribute (compliant with XEP-0082).

Implementations that support XEP-0091 should support the protocol defined herein as soon as possible, but should continue to support the protocol defined in XEP-0091 for backwards compatibility until the status of that specification is changed to Obsolete.

## 5 Security Considerations

Delayed delivery data can expose information about the sender's presence on the network at some time in the past. However, this introduces no new vulnerabilities, since the same information would have been available in real time.

Absent cryptographic signing of stanzas and parts of stanzas, it is possible for delayed delivery notations to be forged. For example, the originator of a message (or the originator's server) could include a notation that makes it appear as if delivery of the message was delayed by the recipient's server. The same is true of delayed delivery notations putatively added by a Multi-User Chat room, which could be forged by the message originator, the originator's server, the recipient's server, or the server that hosts the chatroom service. Although the recipient's server SHOULD discard a delayed delivery notation whose 'from' attribute matches the server's JabberID (or return a <not-acceptable/> error to the originator), this policy does not guard against forging of notations putatively from other entities (such as a chatroom hosted at a different trust domain). Therefore, a recipient SHOULD NOT rely on delayed delivery notations to provide a completely accurate representation of the delivery path or timing of a stanza it has received.

## 6 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](http://www.iana.org)<sup>5</sup>.

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<sup>5</sup>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/](http://www.iana.org).

## 7 XMPP Registrar Considerations

### 7.1 Protocol Namespace

The XMPP Registrar <sup>6</sup> includes 'urn:xmpp:delay' in its registry of protocol namespaces (see <<http://xmpp.org/registrar/namespaces.html>>).

## 8 XML Schema

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

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

  <xs:annotation>
    <xs:documentation>
      The protocol documented by this schema is defined in
      XEP-0203: http://www.xmpp.org/extensions/xep-0203.html
    </xs:documentation>
  </xs:annotation>

  <xs:element name='delay'>
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base='xs:string'>
          <xs:attribute name='from' type='xs:string' use='optional' />
          <xs:attribute name='stamp' type='xs:dateTime' use='required' />
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>

</xs:schema>
```

## 9 Acknowledgements

Thanks to Sergei Golovan for his feedback regarding forged timestamps.

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<sup>6</sup>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 <<http://xmpp.org/registrar/>>.