



# XMPP

## XEP-0221: Data Forms Media Element

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This specification defines an XMPP protocol extension for including media data in XEP-0004 data forms.

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## 1 Introduction

In certain protocols that make use of [Data Forms \(XEP-0004\)](#)<sup>1</sup>, it can be helpful to include media data such as small images. One example of such a "using protocol" is [CAPTCHA Forms \(XEP-0158\)](#)<sup>2</sup>. This document defines a method for including media data in a data form.

## 2 Media Element

The root element for media data is `<media/>`. This element MUST be qualified by the "urn:xmpp:media-element" namespace. The `<media/>` element MUST be contained within a `<field/>` element qualified by the 'jabber:x:data' namespace.

If the media is an image or video then the `<media/>` element SHOULD include 'height' and 'width' attributes specifying the recommended display size of the media in pixels.

The `<media/>` element SHOULD contain at least one `<uri/>` element to specify the out-of-band location of the media data.<sup>3</sup> If included, the `<uri/>` element MUST contain a URI that indicates the location and MUST include a 'type' attribute that specifies the MIME type of the media. If the URI scheme is cid: then the identifier MUST refer to a bit of binary data as described in [Bits of Binary \(XEP-0231\)](#)<sup>4</sup>.

The 'type' attribute of the `<uri/>` element is REQUIRED. The value of the 'type' attribute MUST match the syntax specified in [RFC 2045](#)<sup>5</sup>. That is, the value MUST include a top-level media type, the "/" character, and a subtype; in addition, it MAY include one or more optional parameters (e.g., the "audio/ogg" MIME type in the example shown below includes a "codecs" parameter as specified in [RFC 4281](#)<sup>6</sup>). The "type/subtype" string SHOULD be registered in the [IANA MIME Media Types Registry](#)<sup>7</sup>, but MAY be an unregistered or yet-to-be-registered value.

Listing 1: Audio Media Element

```
<media xmlns='urn:xmpp:media-element'>
  <uri type='audio/x-wav'>
    http://victim.example.com/challenges/speech.wav?F3A6292C
  </uri>
  <uri type='audio/ogg;_codecs=speex'>
    cid:sha1+a15a505e360702b79c75a5f67773072ed392f52a@bob.xmpp.org
  </uri>
```

<sup>1</sup>XEP-0004: Data Forms <<https://xmpp.org/extensions/xep-0004.html>>.

<sup>2</sup>XEP-0158: CAPTCHA Forms <<https://xmpp.org/extensions/xep-0158.html>>.

<sup>3</sup>Constrained execution environments prevent some clients (e.g., Web clients) from rendering media unless it has been received out-of-band.

<sup>4</sup>XEP-0231: Bits of Binary <<https://xmpp.org/extensions/xep-0231.html>>.

<sup>5</sup>RFC 2045: Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies <<http://tools.ietf.org/html/rfc2045>>.

<sup>6</sup>RFC 4281: The Codecs Parameter for "Bucket" Media Types <<http://tools.ietf.org/html/rfc4281>>.

<sup>7</sup>IANA registry of MIME media types <<http://www.iana.org/assignments/media-types>>.

```

<uri type='audio/mpeg'>
  http://victim.example.com/challenges/speech.mp3?F3A6292C
</uri>
</media>

```

The cid: URI points to data that can be retrieved using the protocol described in [Bits of Binary \(XEP-0231\)](#)<sup>8</sup> and the data element would be included along with the XMPP stanza containing the data form.

The following example is provided only for the purpose of illustration; consult the specifications for using protocols (e.g., [CAPTCHA Forms \(XEP-0158\)](#)<sup>9</sup>) to see canonical examples.

Listing 2: Inclusion in Data Form

```

<x xmlns='jabber:x:data' type='form'>
  [ ... ]
  <field var='ocr'>
    <media xmlns='urn:xmpp:media-element'
      height='80'
      width='290'>
      <uri type='image/jpeg'>
        http://www.victim.com/challenges/ocr.jpeg?F3A6292C
      </uri>
      <uri type='image/jpeg'>
        cid:sha1+f24030b8d91d233bac14777be5ab531ca3b9f102@bob.xmpp.org
      </uri>
    </media>
  </field>
  [ ... ]
</x>

```

### 3 Security Considerations

The ability to include arbitrary binary data implies that it is possible to send scripts, applets, images, and executable code, which may be potentially harmful. To reduce the risk of such exposure, an implementation MAY choose to not display or process such data but instead either completely ignore the data, show only the value of the 'alt' attribute (if included), or prompt a human user for approval (either explicitly via user action or implicitly via a list of approved entities from whom the user will accept binary data without per-event approval).

<sup>8</sup>XEP-0231: Bits of Binary <<https://xmpp.org/extensions/xep-0231.html>>.

<sup>9</sup>XEP-0158: CAPTCHA Forms <<https://xmpp.org/extensions/xep-0158.html>>.

## 4 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](http://www.iana.org/)<sup>10</sup>.

## 5 XMPP Registrar Considerations

### 5.1 Protocol Namespaces

The [XMPP Registrar](https://xmpp.org/registrars/)<sup>11</sup> includes "urn:xmpp:media-element" in its registry of protocol namespaces (see <https://xmpp.org/registrars/namespaces.html>).

## 6 XML Schema

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

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

  <xs:annotation>
    <xs:documentation>
      The protocol documented by this schema is defined in
      XEP-0221: http://www.xmpp.org/extensions/xep-0221.html
    </xs:documentation>
  </xs:annotation>

  <xs:element name='media'>
    <xs:complexType>
      <xs:sequence>
        <xs:element ref='uri' minOccurs='0' maxOccurs='unbounded' />
      </xs:sequence>
      <xs:attribute name='height' type='xs:unsignedShort' use='optional' />
      <xs:attribute name='width' type='xs:unsignedShort' use='optional' />
    </xs:complexType>
  </xs:element>
</xs:schema>
```

<sup>10</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/>.

<sup>11</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 <https://xmpp.org/registrars/>.

```
    </xs:complexType>
  </xs:element>

  <xs:element name='uri'>
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base='xs:anyURI'>
          <xs:attribute name='type' type='xs:string' use='required' />
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>

</xs:schema>
```