XEP-0478: Stream Limits Advertisement

Kim Alvefur
mailto:zash@zash.se
xmpp:zash@zash.se

Matthew Wild
mailto:mwild1@gmail.com
xmpp:me@matthewwild.co.uk

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This specification defines a way for an XMPP entity to announce the limits it will enforce for data received on a stream.

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Contents

1 Introduction

This documents describes a mechanism for communicating limits, such as stanza size limits that is in effect on a particular stream, in order to allow the sending party to avoid reaching those limits.

1.1 Problem statement

Where stanza size limits have been deployed, very often this leads to problems with large stanzas causing connection outages, most often User Avatar (XEP-0084) [1] and XMPP Registrar Function (XEP-0053) [2] result stanzas, which can be very large due to embedded images.
If stanza size limit violations are met with stream errors then this may lead to temporary connection outage, which may take a few seconds to recover from.

2 Requirements

- Enable discovery of the stanza size limit in use on a stream.

- Support for bi-directional streams.

These requirements will enable XMPP clients and servers to adapt data they generate, such that it will fit within the limits required by the recipient, or reject overly large stanzas early, rather than following a trial-and-error approach.

3 Use Cases

3.1 Server advertises limits to connecting entity

For any XMPP stream, there is an "initiating entity" (a client or server) and a "responding entity" that they are connecting to. The responding entity advertises its limits in the <stream:features/> element that it sends at the start of the stream.
The limits are enclosed in a <limits/> element qualified by the 'urn:xmpp:stream-limits:0' namespace. This element MAY contain the following child elements:

<max-bytes/> Contains an integer representing the maximum size of any first-level stream elements (including stanzas), in bytes the announcing entity is willing to accept. Guidance on acceptable limits is provided in RFC 6120 RFC 6120: Extensible Messaging and Presence Protocol (XMPP): Core <http://tools.ietf.org/html/rfc6120>. section 13.12. If the responding entity is unable to determine its limits, this child can be absent.

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[1]XEP-0084: User Avatar <https://xmpp.org/extensions/xep-0084.html>.
[2]XEP-0053: XMPP Registrar Function <https://xmpp.org/extensions/xep-0053.html>.

<idle-seconds/> Contains an integer representing the number of seconds without any traffic from the iniating entity after which the server may consider the stream idle, and either perform liveness checks (using e.g. Stream Management (XEP-0198) XEP-0198: Stream Management <https://xmpp.org/extensions/xep-0198.html>. or XMPP Ping (XEP-0199) XEP-0199: XMPP Ping <https://xmpp.org/extensions/xep-0199.html>.) or terminate the stream. Guidance on handling idle connections is provided in RFC 6120 RFC 6120: Extensible Messaging and Presence Protocol (XMPP): Core <http://tools.ietf.org/html/rfc6120>. section 4.6. If the responding entity is unable to determine its limits, this child can be absent.

Listing 1: Advertising limits to connecting entity

```
<stream:features>
  <mechanisms xmlns="urn:ietf:params:xml:ns:xmpp-sasl">
    <mechanism>SCRAM-SHA-1</mechanism>
    <mechanism>PLAIN</mechanism>
  </mechanisms>
  <limits xmlns="urn:xmpp:stream-limits:0">
    <max-bytes>10000</max-bytes>
    <idle-seconds>1800</idle-seconds>
  </limits>
</stream:features>
```

3.2 Connecting server announces limits on bidirectional stream

Servers using Bidirectional Server-to-Server Connections (XEP-0288) [3] to establish a bidirectional stream with another server do not get an opportunity to send <stream:features/> to the responding entity. For a server to advertise the limits about what it is willing to accept on such a stream, the <limits/> element can be included in the <bidi/> element.

Listing 2: Advertising limits to responding entity over bidirectional stream

```
<bidi xmlns='urn:xmpp:bidi'>
  <limits xmlns="urn:xmpp:stream-limits:0">
    <max-bytes>10000</max-bytes>
    <idle-seconds>1800</idle-seconds>
  </limits>
</bidi>
```

4 Business Rules

If, after serialization, a stanza exceeds the limits that have been advertised on a stream, it SHOULD NOT be sent on that stream. Instead, a server SHOULD return an error to the sender.

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[3]XEP-0288: Bidirectional Server-to-Server Connections <https://xmpp.org/extensions/xep-0288.html>.

Such an error SHOULD contain the <policy-violation/> error condition, and SHOULD NOT contain a 'by' attribute (as the policy being violated is not the current entity's). A <text/> may also be included, explaining the limit that would be exceeded.

It is acceptable for the limits on a stream to change whenever new stream features are announced - such as before and after authentication of the connecting entity.

5 Implementation Notes

OPTIONAL.

6 Accessibility Considerations

OPTIONAL.

7 Internationalization Considerations

OPTIONAL.

8 Security Considerations

REQUIRED.

Very large stanzas may incur memory and processing costs on the receiving entity. Advertising the actual limits could inform an attacker of how large a stanza to construct in order to maximize e.g. DoS effectiveness. Best combined with network level rate limits on raw bytes.

9 IANA Considerations

None.

10 XMPP Registrar Considerations

This specification defines the following namespace:

- urn:xmpp:stream-limits:0

Also, the following stream feature:

-
```
<limits xmlns='urn:xmpp:stream-limits:0'/>
```

11 Design Considerations

The ability for a client to announce limits on what it will receive on a client-to-server stream is deliberately not provided by this specification. This vastly simplifies discovery of the maximum limits between any two JIDs, and it avoids situations where the server is unable to deliver incoming stanzas to some or all of an account's connected clients. Clients will already be protected from denial-of-service through excessive stanza sizes due to the server's own limits.

12 XML Schema

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

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

  <xs:annotation>
    <xs:documentation>
      The protocol documented by this schema is defined in
      XEP-0478: https://xmpp.org/extensions/xep-0478.html
    </xs:documentation>
  </xs:annotation>

  <xs:element name='limits'>
    <xs:complexType>
      <xs:sequence>
        <xs:element ref='max-bytes' minOccurs='0'/>
        <xs:element ref='idle-seconds' minOccurs='0'/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:element name='max-bytes' type='xs:unsignedInt'/>

  <xs:element name='idle-seconds' type='xs:unsignedInt'/>

</xs:schema>
```