



XMPP

XEP-0275: Entity Reputation

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This specification defines an XMPP protocol extension for communicating the reputation of any entity on the network.

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1 Introduction

Reputation systems are used in many online communities to increase trust and to encourage communication, commerce, and other forms of interaction. The public XMPP network might benefit from instituting a reputation system for servers, for end users, or both. The benefits might include fast blacklisting of rogue servers and other bad actors, differential quality of service based on reputation, delayed entry to [Multi-User Chat](#)¹ rooms for low-reputation users, integration with [Privacy Lists](#)², and the like.

2 Terminology

The following terms identify the entities mentioned in this document:

- Relying Party -- the entity that queries a Vouching Party about the reputation score of a Subject
- Subject -- the entity whose reputation is vouched for by a Vouching Party
- Vouching Party -- an entity that maintains a reputation score about a Subject, such as a server vouching for an account, a server vouching for a chatroom at a chat service associated with the server, a third party vouching service, etc.

3 Approach

The approach taken here is that an XMPP entity (a "Subject") is innocent until proven guilty, so it starts out with a score of zero. Good behaviors will increase a Subject's score (up to a maximum of +127), whereas bad behaviors will decrease a Subject's score (potentially down to a minimum of -128). Any entity (a "Relying Party") can query another entity (a "Vouching Party") about the reputation score of a Subject. A Vouching Party might be a fellow IM user (e.g., a buddy in one's roster as defined in [XMPP IM](#)³), the server to which a client connects, a fellow server to which a server connects (see [Server Rosters](#)⁴), or a specialized reputation service (similar to a DNSBL on the email network). Changes in reputation scores can also be sent in real time to Relying Parties, either as part of [Incident Reporting](#)⁵ or as separate notifications.

To determine reputation in an objective way, it is important to define the specific behaviors that are used as measurable dimensions of good or bad reputation. The following sections

¹XEP-0045: Multi-User Chat <<http://xmpp.org/extensions/xep-0045.html>>.

²XEP-0016: Privacy Lists <<http://xmpp.org/extensions/xep-0016.html>>.

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

⁴XEP-0267: Server Rosters <<http://xmpp.org/extensions/xep-0267.html>>.

⁵XEP-0268: Incident Reporting <<http://xmpp.org/extensions/xep-0268.html>>.

attempt to do so for XMPP servers and XMPP users, with some rough point values.

3.1 Server Reputation

On the theory that it is more important to reward positive behavior than to punish negative behavior, we first define a number of criteria for increasing the reputation score of an XMPP server (naturally this list of criteria is not meant to be exclusive).

Criterion

Presents a certificate issued by a recognized certification authority.

Requires CAPTCHAs or other hurdles for account registration (see CAPTCHA Forms XEP-0158: CAPTCHA Forms <

Supports XEP-0268: Incident Reporting.

Supports reputation scores for its users (i.e., this protocol).

Requires use of Transport Layer Security (TLS) for client-to-server connections.

Provides the `_xmpp-client` DNS SRV record.

Provides the `_xmpp-server` DNS SRV record.

Provides a website with accurate information and contact addresses.

Service answers Service Discovery XEP-0030: Service Discovery <<http://xmpp.org/extensions/xep-0030.html>>. i

Administrator answers email sent to `mailto:xmpp@domain.tld` (see XMPP Core RFC 6120: Extensible Messaging a

Time online (e.g., based on whois lookup or known deployment of an XMPP service).

Admin factor (average of admins' reputation scores, divided by ten and rounded up).

For example, a server that (1) meets all of the foregoing criteria, (2) has been online for 7 years, and (3) whose admins have an average score of 37 would have a reputation number of $15+5+5+5+5+5+5+5+5+5+4+21 = 85$.

By contrast, a server that does not have a CA-issued cert, does not require CAPTCHAs for account registration, does not support incident reporting, does not support reputation scores, does not require TLS, does have SRV records (+10), has no website, does not answer service discovery requests about its users, has not verified the `xmpp@domain.tld` email address, has been online for 1 week, and whose administrators are unknown would have a reputation score of 10.

3.2 Account Reputation

The reputation associated with an XMPP account (typically but not always a user) is harder to quantify and easier to fake than server reputation. The following are some possible criteria.

Criterion	Suggested Value	Point Value
Account has service discovery identity of account/admin	+15	
Account has service discovery identity of account/registered	+5	
Age of account	+5 for each year	
Verified email address	+5	
Verified website	+5	
Password strength	Measured on a scale from 0 (e.g., "password") to 5	
Reputation of buddies known to server	Divide average reputation by 10	
User has PGP key, X.509 certificate, or other public key	+10	
User has passed a CAPTCHA test (e.g., during account provisioning)	+5	
Chatroom ownership / administration	For each room owned, divide room's reputation by 10; for each room administered, divide room's reputation by 20 (e.g., +6 and +3 for a room with a reputation of 60).	
Chatroom banning	For each room in which the user is banned (XEP-0045 "outcast"), divide the room's reputation by 10 and decrement the user's score by the result (e.g., -6 for a room with a reputation of 60).	
Rate limiting	For each rate limiting incident, -5.	
Incident reports	For each validated incident report, -10.	

For example, an account that is an admin of a server (+15), has been online for 5 years (+25), has a verified email address (+5) and website (+5), has a strong password (+5), has a "buddy reputation average" of 40 (+4), uses a public key (+10), has passed a CAPTCHA test (+5), owns 3 chatrooms with an average reputation of 30 (+9), and has not been banned from any chatrooms, rate limited, or been the subject of any incident reports would have a reputation

number of 83.

By contrast, an account that is registered (+5), was just created, has no verified email address or website, has a strong password (+5), has a "buddy reputation average" of 10 (+1), does not use a public key, has not passed a CAPTCHA test, owns or administers no chatrooms, has been banned from 3 chatrooms with an average reputation of 30 (-9), has been rate limited twice (-10), and has been the subject of 2 incident reports (-20) would have a reputation number of -28.

3.3 Other Entities

Any entity can have a reputation score: servers, end-user accounts, chatrooms, chatroom servers, publish-subscribe servers, vouching services, etc. Criteria for entities other than servers and accounts are yet to be described.

4 Protocol

In order to query a Vouching Party about the reputation of a Subject, a Relying Party sends an IQ stanza of type "get" containing a <score/> element qualified by the 'urn:xmpp:reputation:0' namespace (see [Namespace Versioning](#) regarding the possibility of incrementing the version number).

Listing 1: Score request

```
<iq from='juliet@capulet.lit/chamber'  
  to='shakespeare.lit'  
  id='bn4c297j'  
  type='get'>  
  <score xmlns='urn:xmpp:reputation:0' jid='romeo@montague.lit' />  
</iq>
```

The Vouching Party would then return an error or a score.

Listing 2: Score response

```
<iq from='shakespeare.lit'  
  to='juliet@capulet.lit/chamber'  
  id='bn4c297j'  
  type='result'>  
  <score xmlns='urn:xmpp:reputation:0'  
    jid='romeo@montague.lit'  
    num='65' />  
</iq>
```

Any XMPP error might be appropriate (e.g., <forbidden/> if the Relying Party is not trusted at all by the Vouching Party).

5 Determining Support

To advertise its support for reputation scores, when replying to [Service Discovery](#)⁶ information requests an entity MUST return a feature for 'urn:xmpp:reputation:0'.

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](#)⁷. However, if an application has not received entity capabilities information from an entity, it SHOULD use explicit service discovery instead.

6 Security Considerations

Any entity can keep a reputation score for any other entity. Although some entities might be considered more knowledgeable than others, that judgment is up to the entity that makes a request for a reputation score and is not a feature of the network itself.

7 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](#)⁸.

8 XMPP Registrar Considerations

8.1 Protocol Namespaces

This specification defines the following XML namespace:

- urn:xmpp:reputation:0

Upon advancement of this specification from a status of Experimental to a status of Draft, the [XMPP Registrar](#)⁹ shall add the foregoing namespace to the registry located at <http://xmpp.org/registrar/namespaces.html>, as described in Section 4 of [XMPP Registrar Function](#)¹⁰.

⁶XEP-0030: Service Discovery <http://xmpp.org/extensions/xep-0030.html>.

⁷XEP-0115: Entity Capabilities <http://xmpp.org/extensions/xep-0115.html>.

⁸The 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/>.

⁹The 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/>.

¹⁰XEP-0053: XMPP Registrar Function <http://xmpp.org/extensions/xep-0053.html>.

8.2 Protocol 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.

9 XML Schema

```
<?xml version='1.0' encoding='UTF-8'?>
<xs:schema
  xmlns:xs='http://www.w3.org/2001/XMLSchema'
  targetNamespace='urn:xmpp:reputation:0'
  xmlns='urn:xmpp:reputation:0'
  elementFormDefault='qualified'>
  <xs:element name='score'>
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base='xs:string'>
          <xs:attribute name='jid' type='xs:string' use='required'/>
          <xs:attribute name='num' type='xs:byte' use='optional'/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

10 Acknowledgements

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