



# XMPP

## XEP-0309: Service Directories

Peter Saint-Andre  
<mailto:xsf@stpeter.im>  
<xmpp:peter@jabber.org>  
<http://stpeter.im/>

2012-05-29  
Version 0.3

Status	Type	Short Name
Deferred	Standards Track	NOT_YET_ASSIGNED

This specification shows how to combine and extend a number of existing XMPP protocols for improved sharing of information about XMPP servers.

# Legal

## Copyright

This XMPP Extension Protocol is copyright © 1999 – 2018 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>Gathering Information</b>	<b>1</b>
2.1	Server Discovers Directory . . . . .	2
2.2	Service Subscribes to Directory . . . . .	3
2.3	Directory Queries Server . . . . .	3
2.3.1	Disco Query . . . . .	3
2.3.2	vCard Query . . . . .	4
<b>3</b>	<b>Publishing Information</b>	<b>6</b>
<b>4</b>	<b>Security Considerations</b>	<b>7</b>
<b>5</b>	<b>IANA Considerations</b>	<b>8</b>
<b>6</b>	<b>XMPP Registrar Considerations</b>	<b>8</b>
6.1	Protocol Namespaces . . . . .	8
6.2	Service Discovery Category/Type . . . . .	8
6.3	Service Discovery Features . . . . .	9
<b>7</b>	<b>XML Schema</b>	<b>9</b>
7.1	Registration URI . . . . .	9
7.2	Certification Authority Information . . . . .	9

## 1 Introduction

Several directories (e.g., at [xmpp.net](http://xmpp.net) and [jabberes.org](http://jabberes.org)) have long provided information about public XMPP services so that end users can more easily find servers to register with, add-on components to use for features such as [Multi-User Chat \(XEP-0045\)](https://xmpp.org/extensions/xep-0045.html)<sup>1</sup>, etc. These service directories tend to rely on humans to gather and in some cases verify the information they publish before providing it via the World Wide Web or the XMPP network for use by end users and IM client software. However, relying on humans to gather and verify such information can result in significant delays and errors. It would be better to automate the information-gathering functions as much as possible.

This document shows how to combine and extend a number of existing XMPP protocols for (mostly) automated gathering of information about public XMPP services. Widespread deployment of this specification will result in more timely, accurate information about the services available on the XMPP network.

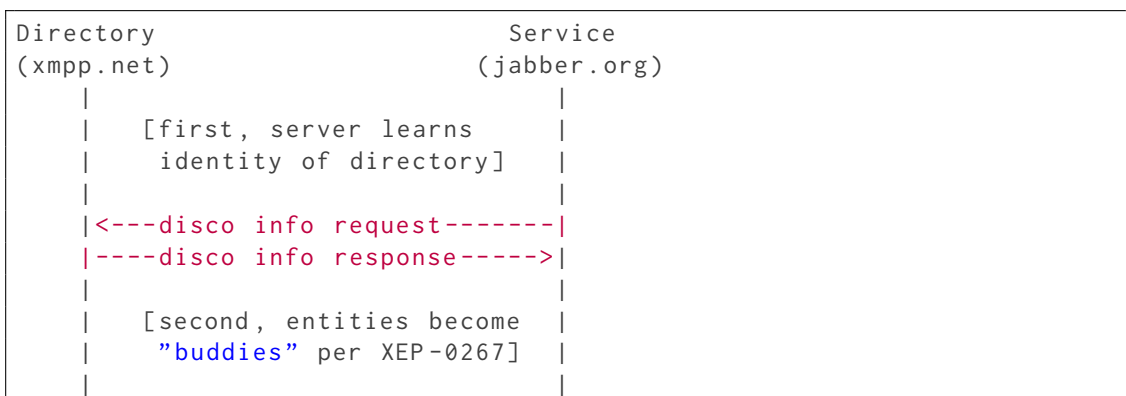
## 2 Gathering Information

The following scenario involves two entities:

- A server directory: [xmpp.net](http://xmpp.net)
- A public XMPP service: [jabber.org](http://jabber.org)

Note: Although the entity that gathers information for a directory could be a client or a component, here we assume that it is a server (“xmpp.net”).

These two entities use [Server Buddies \(XEP-0267\)](https://xmpp.org/extensions/xep-0267.html)<sup>2</sup>, [Service Discovery \(XEP-0030\)](https://xmpp.org/extensions/xep-0030.html)<sup>3</sup>, and [vCard4 over XMPP \(XEP-0292\)](https://xmpp.org/extensions/xep-0292.html)<sup>4</sup> in the following ways.



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

<sup>2</sup>XEP-0267: Server Buddies <<https://xmpp.org/extensions/xep-0267.html>>.

<sup>3</sup>XEP-0030: Service Discovery <<https://xmpp.org/extensions/xep-0030.html>>.

<sup>4</sup>XEP-0292: vCard4 over XMPP <<https://xmpp.org/extensions/xep-0292.html>>.

```

|<---presence subscribe-----|
|----presence subscribed----->|
|----presence subscribe----->|
|<---presence subscribed-----|
|
|   [third, directory
|     gathers server data]
|
|----disco info request----->|
|<---disco info response-----|
|
|----vcard request----->|
|<---vcard response----->|
|

```

## 2.1 Server Discovers Directory

In order to determine the exact identity of the directory, the server sends a service discovery information request to the directory.

Listing 1: Server Queries Directory

```

<iq type='get'
  from='jabber.org'
  to='xmpp.net'
  id='xh1f37n5'>
  <query xmlns='http://jabber.org/protocol/disco#info' />
</iq>

```

Listing 2: Directory Returns Disco Info

```

<iq type='result'
  from='xmpp.net'
  to='jabber.org'
  id='xh1f37n5'>
  <query xmlns='http://jabber.org/protocol/disco#info'>
    <identity category='directory' type='server' />
    <feature var='http://jabber.org/protocol/disco#info' />
    <feature var='http://jabber.org/protocol/disco#items' />
    <feature var='urn:xmpp:server-presence' />
  </query>
</iq>

```

Note: Inclusion of the "directory/server" identity indicates that xmpp.net is a service directory.

## 2.2 Service Subscribes to Directory

If the service wishes to have its information aggregated, it sends a presence subscription request to the directory as described in XEP-0267.

Listing 3: Service Sends Subscription Request to Directory

```
<presence from='jabber.org'
  to='xmpp.net'
  type='subscribe' />
```

Upon receiving the presence subscription request, the directory approves it.

Listing 4: Directory Sends Approval to Server

```
<presence from='xmpp.net'
  to='jabber.org'
  type='subscribed' />
```

The directory also sends a subscription request to the server.

Listing 5: Directory Sends Subscription Request to Server

```
<presence from='xmpp.net'
  to='jabber.org'
  type='subscribe' />
```

The service then approves that subscription request, as well.

Listing 6: Service Sends Approval to Directory

```
<presence from='jabber.org'
  to='xmpp.net'
  type='subscribed' />
```

## 2.3 Directory Queries Server

After the subscription handshake has been completed, the directory queries the server for information. There are two aspects: service discovery (“disco”) information and vCard information.

### 2.3.1 Disco Query

In order to determine the exact identity of the server, the directory sends a service discovery information request to the server.

Listing 7: Directory Queries Server

```
<iq type='get'
  from='xmpp.net'
  to='jabber.org'
  id='i3vs51b9'>
  <query xmlns='http://jabber.org/protocol/disco#info' />
</iq>
```

Listing 8: Server Returns Disco Info

```
<iq type='result'
  from='jabber.org'
  to='xmpp.net'
  id='i3vs51b9'>
  <query xmlns='http://jabber.org/protocol/disco#info'>
    <identity category='server' type='im' />
    <feature var='http://jabber.org/protocol/disco#info' />
    <feature var='http://jabber.org/protocol/disco#items' />
    <feature var='jabber:iq:register' />
    <feature var='urn:xmpp:server-presence' />
    <feature var='urn:xmpp:public-server' />
  </query>
</iq>
```

Note: If the server is a public node on the XMPP network, it includes a service discovery feature of "urn:xmpp:public-server". This feature is defined below.

Note: If the server allows [In-Band Registration \(XEP-0077\)](#)<sup>5</sup>, it includes a service discovery feature of "jabber:iq:register". If the server does not allow in-band registration but allows account registration at a website, it includes the registration URL in its vCard as described below.

The foregoing examples show the gathering of disco#info data (identity and supported features). A directory MAY also gather disco#items data about components and other services associated with the base XMPP service at a domain.

### 2.3.2 vCard Query

In order to gather additional information about the server, the directory sends a vCard information request to the server.

Note: Because vCard4 enables the XMPP community to more easily define extensions to vCard (e.g., for registration URLs), it is RECOMMENDED for servers to support [vCard4 over XMPP \(XEP-0292\)](#)<sup>6</sup> in addition to, or instead of, [vcards-temp \(XEP-0054\)](#)<sup>7</sup>.

<sup>5</sup>XEP-0077: In-Band Registration <<https://xmpp.org/extensions/xep-0077.html>>.

<sup>6</sup>XEP-0292: vCard4 over XMPP <<https://xmpp.org/extensions/xep-0292.html>>.

<sup>7</sup>XEP-0054: vcard-temp <<https://xmpp.org/extensions/xep-0054.html>>.

Listing 9: Directory Requests vCard Data from Server

```
<iq from='xmpp.net'
  id='lw71bs73'
  to='jabber.org'
  type='get'>
  <vcard xmlns='urn:ietf:params:xml:ns:vcard-4.0' />
</iq>
```

Listing 10: Server Returns vCard Data

```
<iq from='jabber.org'
  id='lw71bs73'
  to='xmpp.net'
  type='result'>
  <vcard xmlns='urn:ietf:params:xml:ns:vcard-4.0'>
    <fn><text>jabber.org IM service</text></fn>
    <url><uri>http://www.jabber.org/</uri></url>
    <lang>
      <parameters><pref>1</pref></parameters>
      <language-tag>en</language-tag>
    </lang>
    <adr>
      <region>IA</region>
      <country>US</country>
    </adr>
    <email><text>xmpp@jabber.org</text></email>
    <impp><uri>xmpp:jabber.org</uri></impp>
    <logo><uri>http://www.jabber.org/images/logo.png</uri></logo>
    <geo><uri>geo:42.25,-91.05</uri></geo>
    <tz><text>America/Chicago</text></tz>
    <kind><text>application</text></kind>
    <registration xmlns='urn:xmpp:vcard:registration:1'>
      <uri>https://register.jabber.org/</uri>
    </registration>
  </vcard>
</iq>
```

It is RECOMMENDED for public server vCards to include the following information:

- A friendly name for the service (<fn/>)
- A URL for general information about the service (<url/>)
- The country where the service is located (<adr><country/></adr>)
- An email address or alias for contacting the administrators (<email/>)
- The XMPP address for the service (<impp/>)



- A vCard KIND of "application" (<kind><text>application</text></kind>) as defined in [RFC 6473](#) <sup>8</sup>

It is OPTIONAL for public server vCards to include the following information:

- Preferred language of communication with the administrators (<lang/>)
- Region where the service is located (<adr><region/></adr>)
- Logo for the service (<logo/>)
- Geographical coordinates for the service (<geo/>)
- Registration URI (<registration xmlns='urn:xmpp:vcard:registration:1'/> and its <uri/> child)
- Certification authority name and URI (<ca xmlns='urn:xmpp:vcard:ca:0'/> and its <name/> and <uri/> children)
- Software name (<name/> element qualified by the 'jabber:iq:version' namespace defined in [Software Version \(XEP-0092\)](#) <sup>9</sup>)

It is best for the server directory to discover the last two elements in-band (by means of TLS negotiation and software version, respectively), then add them to the contact vCard as described in the next section.

### 3 Publishing Information

Currently, service directories such as xmpp.net and jabberes.org publish their information on the World Wide Web, typically at a human-friendly website and sometimes also by means of machine-readable files at a well-known URI for use by IM clients to pre-populate drop-down boxes showing XMPP servers that allow in-band registration. (For example, the xmpp.net service publishes a file listing registered public servers using the [Service Discovery \(XEP-0030\)](#) <sup>10</sup> format.)

In addition to publishing such information on the web, this document defines a second publishing path: the XMPP network itself. The directory can do this by creating a public [Publish-Subscribe \(XEP-0060\)](#) <sup>11</sup> node at the directory's bare domain (e.g., xmpp.net) that pushes data in the vCard4 format, as described more fully in XEP-0292. Other entities can then subscribe to this node to receive updated information about services that are added to or removed from the directory.

For example, the following stanza shows an information push from the xmpp.net directory

---

<sup>8</sup>RFC 6473: vCard KIND:application <<http://tools.ietf.org/html/rfc6351>>.

<sup>9</sup>XEP-0092: Software Version <<https://xmpp.org/extensions/xep-0092.html>>.

<sup>10</sup>XEP-0030: Service Discovery <<https://xmpp.org/extensions/xep-0030.html>>.

<sup>11</sup>XEP-0060: Publish-Subscribe <<https://xmpp.org/extensions/xep-0060.html>>.

about the jabber.org service, sent to a subscriber at example.com.

Listing 11: Directory Pushes Server Data to Subscriber

```
<message from='xmpp.net'
  to='example.com'
  type='headline'
  id='hx61cs8k'>
  <event xmlns='http://jabber.org/protocol/pubsub#event'>
    <items node='urn:xmpp:contacts'>
      <item id='3B55FBC7-8149-4693-A1A1-5367E2A49C83'>
        <vcard xmlns='urn:ietf:params:xml:ns:vcard-4.0'>
          <fn><text>jabber.org IM service</text></fn>
          <url><uri>http://www.jabber.org/</uri></url>
          <lang>
            <parameters><pref>1</pref></parameters>
            <language-tag>en</language-tag>
          </lang>
          <adr>
            <region>IA</region>
            <country>US</country>
          </adr>
          <email><text>xmpp@jabber.org</text></email>
          <impp><uri>xmpp:jabber.org</uri></impp>
          <logo><uri>http://www.jabber.org/images/logo.png</uri></logo>
          <geo><uri>geo:42.25,-91.05</uri></geo>
          <tz><text>America/Chicago</text></tz>
          <kind><text>application</text></kind>
          <registration xmlns='urn:xmpp:vcard:registration:1'>
            <uri>https://register.jabber.org/</uri>
          </registration>
          <ca xmlns='urn:xmpp:vcard:ca:0'>
            <name>StartSSL</uri>
            <uri>http://www.startssl.com/</uri>
          </ca>
          <name xmlns='jabber:iq:version'>Iside M-Link</name>
        </vcard>
      </item>
    </items>
  </event>
</message>
```

## 4 Security Considerations

Because a service directory does not know about an XMPP service unless the administrator of the service initiates a presence subscription to the directory, information leakage is

minimized.

Use of the "urn:xmpp:public-server" service discovery feature provides a way for an XMPP server to explicitly indicate that its information is public.

Use of the "directory/server" service discovery identity provides a way for a service directory to explicitly indicate that it gathers service information obtained from XMPP servers that contact it.

## 5 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](#)<sup>12</sup>.

## 6 XMPP Registrar Considerations

### 6.1 Protocol Namespaces

This document registers the following XML namespaces:

- 'urn:xmpp:vcard:registration:1' (used to qualify the XMPP-specific vCard4 extension for account registration URLs)
- 'urn:xmpp:vcard:ca:0' (used to qualify the XMPP-specific vCard4 extension for information about certification authorities)

The XMPP Registrar shall add these namespaces to its registry at <https://xmpp.org/registrar/namespaces.html>.

### 6.2 Service Discovery Category/Type

This document specifies that a service directory is identified by the "directory" category and the "server" type within XMPP Service Discovery.

The XMPP Registrar shall add the "server" type to the "directory" category already listed in the registry at <https://xmpp.org/registrar/disco-categories.html>. The registration is as follows.

```
<category>
  <name>directory</name>
```

---

<sup>12</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/>.

```

<type>
  <name>server</name>
  <desc>A directory of XMPP servers</desc>
  <doc>XEP-0309</doc>
</type>
</category>

```

### 6.3 Service Discovery Features

This document specifies that a public server on the XMPP network is identified by the "urn:xmpp:public-server" Service Discovery feature.

The XMPP Registrar shall add this feature to its registry at <https://xmpp.org/registrar/disco-features.html>. The registration is as follows.

```

<var>
  <name>urn:xmpp:public-server</name>
  <desc>The server is a public node on the XMPP network</desc>
  <doc>XEP-0309</doc>
</var>

```

## 7 XML Schema

### 7.1 Registration URI

```

<?xml version='1.0' encoding='UTF-8'?>
<xs:schema
  xmlns:xs='http://www.w3.org/2001/XMLSchema'
  targetNamespace='urn:xmpp:vcard:registration:1'
  xmlns='urn:xmpp:vcard:registration:1'
  elementFormDefault='qualified'>
  <xs:element name='registration'>
    <xs:complexType>
      <xs:sequence>
        <xs:element name='uri' type='xs:anyURI' />
      </xs:choice>
    </xs:complexType>
  </xs:element>
</xs:schema>

```

### 7.2 Certification Authority Information

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

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

  <xs:element name='ca'>
    <xs:complexType>
      <xs:sequence>
        <xs:element name='name' type='xs:string' />
        <xs:element name='uri' type='xs:anyURI' />
      </xs:choice>
    </xs:complexType>
  </xs:element>

</xs:schema>
```