



# XMPP

## XEP-0271: XMPP Nodes

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2009-06-26  
Version 0.1

Status	Type	Short Name
Deferred	Informational	N/A

This specification more clearly defines the nature of nodes as used in the Service Discovery and Publish-Subscribe extensions to the Extensible Messaging and Presence Protocol (XMPP).

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## 1 Introduction

Both [Service Discovery \(XEP-0030\)](#)<sup>1</sup> and [Publish-Subscribe \(XEP-0060\)](#)<sup>2</sup> refer to "nodes" in relation to XMPP entities. However, the concept of an XMPP node has never been clearly specified (e.g., in [RFC 3920](#)<sup>3</sup> or [RFC 6120](#)<sup>4</sup>). This document attempts to remedy that oversight.

## 2 Definition

To clarify the nature of a node, it is first helpful to describe the architecture of XMPP systems. Because XMPP is a client-server technology that relies on the Domain Name System, the fundamental building block of XMPP systems is the **"domain"**. The idea of an Internet domain is borrowed from the real world, where a domain is an area of physical territory over which an individual or organization has control (e.g., the United States of America). Similarly, an Internet domain (e.g., jabber.org or xmpp.org) is a virtual space or area that is controlled by an individual or organization (e.g., Jeremie Miller or the XMPP Standards Foundation). Given the workings of the Domain Name System, it is also possible to have "subdomains" such as planet.jabber.org or interop.xmpp.org, which can be seen as the virtual equivalent of administrative subdivisions in the real world (e.g., a particular state within the USA, such as Colorado). In any case, a domain identifier is the primary portion of a JabberID (e.g., "jabber.org" in the JID "stpeter@jabber.org"), and can stand alone as a complete JabberID.

A given physical domain contains particular points or places. Similarly, a given virtual domain can contain particular points or entities. These entities are often thought of as accounts (e.g., the URI `mailto:stpeter@jabber.org` represents an email account and the URI `xmpp:stpeter@jabber.org` represents an XMPP account), but other entity types are possible (e.g., `jdev@conference.jabber.org` happens to be a [Multi-User Chat \(XEP-0045\)](#)<sup>5</sup> room. Confusingly, the part of a JabberID that identifies an account or entity within the scope of an XMPP domain is called a node (e.g., the string "stpeter" in the JabberID `stpeter@jabber.org` is called a "node identifier"). Unfortunately, this usage collides with the term "node" as used in Service Discovery and Publish-Subscribe. Therefore we suggest the term **"localpart"** for a particular point or entity in an XMPP domain. A localpart identifier is an optional secondary portion of a JabberID (e.g., "stpeter" in the JID "stpeter@jabber.org").

A given domain or localpart can have various assets associated with it; in XMPP these assets are called **"resources"**. In the case of an account registered with an XMPP service, such resources are typically devices or connections. In the case of a multi-user chat room, such resources are usually room occupants. And so on. A resource identifier is an optional tertiary portion of a JabberID (e.g., "roundabout" in the JID "stpeter@jabber.org/roundabout" or "psa" in the JID "jdev@conference.jabber.org/psa").

The Service Discovery and Publish-Subscribe extensions to XMPP use an optional quaternary

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<sup>1</sup>XEP-0030: Service Discovery <<https://xmpp.org/extensions/xep-0030.html>>.

<sup>2</sup>XEP-0060: Publish-Subscribe <<https://xmpp.org/extensions/xep-0060.html>>.

<sup>3</sup>RFC 3920: Extensible Messaging and Presence Protocol (XMPP): Core <<http://tools.ietf.org/html/rfc3920>>.

<sup>4</sup>RFC 6120: Extensible Messaging and Presence Protocol (XMPP): Core <<http://tools.ietf.org/html/rfc6120>>.

<sup>5</sup>XEP-0045: Multi-User Chat <<https://xmpp.org/extensions/xep-0045.html>>.

identifier called a **”node”**, which identifies a particular facet or aspect of an XMPP domain, localpart, or resource. The exact nature of a node depends on the protocol in use:

- XEP-0030: Service Discovery -- Here a node is typically that facet or aspect of an XMPP entity that handles requests and provides responses related to a particular protocol or feature bundle. For example, a service discovery information request to the node `”http://jabber.org/protocol/commands”` may return all of the [Ad-Hoc Commands \(XEP-0050\)](#)<sup>6</sup> supported by the responding entity, a service discovery information request to the node `”http://jabber.org/protocol/muc#rooms”` may return all of the multi-user chat rooms in which an entity is an occupant, and a service discovery information request to the node `”pubsub/nodes”` may return all of the pubsub nodes that are hosted by a publish-subscribe service (thus this node acts as a kind of `”meta-node”`).
- XEP-0060: Publish-Subscribe -- Here a node is a particular `”channel”` or `”feed”` hosted at a publish-subscribe service, where the nature of the channel or feed is defined in part by the characteristic payload published at the node (e.g., Atom notifications) and in part by the focus or topic of such payloads (e.g., Atom notifications related triggered by new entries at the Planet Jabber weblog aggregation site).

As shown in the following examples, a node is not encapsulated in the JabberID but instead is communicated in protocol to indicate that the interaction is directed to or from a specific facet of a domain, a localpart, or a resource.

Listing 1: Nodes in Service Discovery: a disco#info request directed to a specific node

```
<iq type='get'
  from='romeo@montague.net/orchard'
  to='mim.shakespeare.lit'
  id='info3'>
  <query xmlns='http://jabber.org/protocol/disco#info'
    node='http://jabber.org/protocol/commands' />
</iq>
```

Listing 2: Nodes in Publish-Subscribe: a publish request directed to a specific node

```
<iq type='set'
  from='hamlet@denmark.lit/blogbot'
  to='pubsub.shakespeare.lit'
  id='pub1'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
  <publish node='princely_musings'>
    <item>
      <entry xmlns='http://www.w3.org/2005/Atom'>
```

<sup>6</sup>XEP-0050: Ad-Hoc Commands <<https://xmpp.org/extensions/xep-0050.html>>.

```

<title>Soliloquy</title>
<summary>
To be, or not to be: that is the question:
Whether 'tis nobler in the mind to suffer
The slings and arrows of outrageous fortune,
Or to take arms against a sea of troubles,
And by opposing end them?
</summary>
<link_rel='alternate'_type='text/html'
href='http://denmark.lit/2003/12/13/atom03' />
<id>tag:denmark.lit,2003:entry-32397</id>
<published>2003-12-13T18:30:02Z</published>
<updated>2003-12-13T18:30:02Z</updated>
</entry>
</item>
</publish>
</pubsub>
</iq>

```

### 3 Use in XMPP URIs

As authorized by [XMPP URI Query Components \(XEP-0147\)](#)<sup>7</sup>, the [XMPP Registrar](#)<sup>8</sup> maintains a registry of queries and key-value pairs for use in XMPP URIs at <https://xmpp.org/registrar/querytypes.html>.

The "disco" and "pubsub" querytypes are already registered, including the "node" key. In order to specify a node "foo" as a quaternary identifier without specifying a "disco" querytype or "pubsub" querytype, an XMPP URI can be constructed as follows:

Listing 3: XMPP URI With Node

```
xmpp:romeo@example.org?;node=foo
```

This URI can be parsed as follows:

1. Primary identifier: "example.org"
2. Secondary identifier: "romeo"
3. Tertiary identifier: [none]
4. Quaternary identifier: "foo"

<sup>7</sup>XEP-0147: XMPP URI Query Components <https://xmpp.org/extensions/xep-0147.html>.

<sup>8</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/registrar/>.

## 4 Internationalization Considerations

An XMPP node can include any UTF-8 character.

## 5 Security Considerations

This specification introduces no security considerations above and beyond those discussed in RFC 6120, XEP-0030, XEP-0060.

## 6 IANA Considerations

This document requires no interaction with the [Internet Assigned Numbers Authority \(IANA\)](#)<sup>9</sup>.

## 7 XMPP Registrar Considerations

This document requires no interaction with the [XMPP Registrar](#)<sup>10</sup>.

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<sup>9</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>10</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/registrar/>.