XEP-0110: Generic Maps

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A protocol for transport of generic maps (graphical displays of specific subsets of buddies).

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1 Introduction

Generic maps provide a way to extending the roster into a general display showing contacts (JIDs) together with further additional information. The further information is provided by the position in the map (and possibly by the dot type - e.g. shape or colour). In addition to showing people belonging to one roster group, it is possible to cluster people, use more detailed inset maps etc. each of these features providing a unique context.
The motivations for this document are:

- It is faster and easier to find people using a rich graphical view as compared to linear lists/trees
- Maps provide easily understandable further information (context) about the contact
- Maps show relations among JIDs and give better idea about their distribution in a given space (e.g. geographic region, company, campus)

2 Requirements

The requirements for the protocol are:

- General definition of projection based on some attribute(s) of particular JIDs
- Scaleability - in display size and size of transmitted data

3 Use Cases

Generic Map is actually XML description of a graphical display, which can then be sent as a part of <message/> or <iq/> packet together with information about how to obtain attributes needed for its display (other resources required).

3.1 Generic Map message

Example 1 shows a typical message containing simple Generic Map.

Listing 1: Generic map message

```
<message to='joe@domain.com' from='john@domain.com' id='map1'>
  <subject>Map of our office</subject>
  <body>Cool stuff, I can see you on-line in the map.</body>
  <map xmlns='http://jabber.org/protocol/map' id='map1.ygf'>
    <layer id='inset_1' offset_x='0' offset_y='0' scale='1'>
      <img src='ortho_0.gif' width='242' height='243'/>
```

```
      <item jid='buddy1@jabber.org' x='135' y='35'/>
      <item jid='buddy2@jabber.org' x='175' y='155'/>
    </layer>
  </map>
  <x xmlns=jabber:x:oob>
    <url>http://domain.com/maps/ortho_0.gif</url>
    <desc>ortho_0.gif - map for map1.ygf</desc>
  </x>
</message>
```

Each map consists of one or more layers. The main purpose of layers is to combine maps and views to deliver information suitable for a particular context, and to offer greater flexibility to the user in respect to customization.
Layers can be defined either inline or by a reference to another map. Each layer has a specified position in the map, a scale and a priority. The maps defined inline contain also projection, underlying image and a list of entities lying inside it (i.e. typically JIDs or clusters of JIDs). The underlying images are sent out of band using the jabber:x:oob namespace or possibly defined in some other way (e.g. xml-based SVG).
The map in Example 1 uses an implicit map projection assuming that attributes x and y are directly the co-ordinates of a particular entity (e.g. buddy1@jabber.org) in the image (ortho_0.gif) expressed in pixels.

3.2 Definition of projection

A similar map with coordinates specified using geographic latitude + longitude (possibly obtained using Geographic Location Information [1] extension) is shown in Example 2 (only the map tag is shown).

Listing 2: Generic map tag using geographic coordinates

```
<map xmlns='http://jabber.org/protocol/map' id='map2.ygf'>
  <layer id='inset_1' offset_x='0' offset_y='0' scale='1'>
    <img src='ortho_0.gif' width='242' height='243'/>
    <projection x='(long-5)*10' y='(lat-40)*12'/>
    <item jid='buddy1@jabber.org' long='9' lat='51'/>
    <item jid='buddy2@jabber.org' long='12' lat='52'/>
  </layer>
</map>
```

As can be seen in Example 2, the projection can be specified using any parameters either explicitly set in the item tags or obtained for the particular JID from some other source (e.g. JUD or LDAP).

[1] XEP-0080: Geographic Location Information http://www.xmpp.org/extensions/xep-0080.html

3.3 Scaleability

Another important feature of this proposal is scaleability, which is achieved by grouping the individual JIDs with similar properties (e.g. 'near' locations) into clusters. Cluster is basically a list of constituting entities (JIDs) that share similar values of specified attribute (e.g. JIDs that are co-located in the same town/region/country). The size of clusters may depend on the resolution and intended scale of the map. In the map clusters can be displayed using a distinctive icon.

Listing 3: Generic map tag with clustered items

```
<map xmlns='http://jabber.org/protocol/map' id='map3.ygf'>
  <layer id='inset_1' offset_x='0' offset_y='0' scale='1'>
    <img src='ortho_0.gif' width='242' height='243'/>
    <item jid='buddy1@jabber.org' long='9' lat='51'/>
    <cluster size='10' x='38' y='135' size='5'>
      <item jid='buddy2@jabber.org'/>
      <item jid='buddy3@jabber.org'/>
    </cluster>
  </layer>
</map>
```

4 Implementation Notes

The following guidelines may assist the developers of a mapping plug-in in the Jabber clients.

4.1 Parsing equations for map projections

The expression in the <projection/> tag uses values of different attributes specified for the JID either directly in the <map/> tag or elsewhere in the environment.

4.2 Transfering image files

The image files (maps) are transferred as an extra extension of packet using the filename as a unique id.

4.3 Attributes for determination of coordinates

The attributes are either specified in the <map/> tag or known in the environment (e.g. presence), but they could be also provided by a subscribed service using Publish-Subscribe [2]

[2] XEP-0060: Publish-Subscribe http://www.xmpp.org/extensions/xep-0060.html

(e.g. GPS or LBS from a mobile operator).

4.4 Clusters - accumulation of attribute values

The clustering of items can be specified directly in the map tag or done using a pixel resolution of the display available.

5 Security Considerations

No security features or concerns related to this proposal.

6 IANA Considerations

No IANA interaction required.

7 XMPP Registrar Considerations

The XMPP Registrar [3] will need to register the new namespace of "http://jabber.org/protocol/map".

[3] 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/>.