This document specifies an XMPP extension for use of the vCard4 XML format in XMPP systems, with the intent of obsoleting the vcard-temp format.
Legal

Copyright

This XMPP Extension Protocol is copyright © 1999 – 2024 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

1 Introduction 1

2 Requirements 1

3 Reuse of vCard4 1

4 Self vCards 2
   4.1 PEP Publication and Retrieval 2
      4.1.1 Retrieval 2
      4.1.2 Publication 5
   4.2 Event Notifications 5
      4.2.1 Subscribing to vCard Notifications 6
      4.2.2 Receiving a vCard Notification 6

5 Contact vCards 6
   5.1 Format 7
   5.2 Storage 7

6 vCards of Automated Entities 10

7 Determining Support 11

8 Security Considerations 12

9 IANA Considerations 12

10 XMPP Registrar Considerations 12
   10.1 Well-Known Service Discovery Nodes 12

11 Mapping from vcard-temp to vCard4 12
   11.1 Properties Defined in vcard-temp but not in vCard3 or vCard4 13
      11.1.1 DESC 13
      11.1.2 JABBERID 13
      11.1.3 MIDDLE 14
   11.2 Properties Defined Incorrectly in vcard-temp 14
      11.2.1 KEY 14
      11.2.2 SOUND 14
      11.2.3 VERSION 15
   11.3 Properties Defined Differently in vcard-temp, vCard3, and vCard4 15
      11.3.1 ADR 15
      11.3.2 AGENT 15
      11.3.3 ORG 16
      11.3.4 SORT-STRING 16
      11.3.5 TEL 16
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.4</td>
<td>Properties Defined Similarly in vcard-temp, vCard3, and vCard4</td>
<td>16</td>
</tr>
<tr>
<td>11.5</td>
<td>Properties Defined in vCard3 but Removed from vCard4</td>
<td>17</td>
</tr>
<tr>
<td>12</td>
<td>Migration Tools</td>
<td>17</td>
</tr>
<tr>
<td>12.1</td>
<td>Extensible Stylesheet Language Transformation (XSLT) from vcard-temp to vCard4</td>
<td>18</td>
</tr>
<tr>
<td>12.2</td>
<td>Example of vcard-temp Data</td>
<td>29</td>
</tr>
<tr>
<td>12.3</td>
<td>Example of vCard4 XML Data</td>
<td>34</td>
</tr>
<tr>
<td>13</td>
<td>Acknowledgements</td>
<td>41</td>
</tr>
</tbody>
</table>
1 Introduction

Since 1999, the Jabber/XMPP community has used an interim, unofficial XML representation of vCard data for personal contacts, called vcard-temp (XEP-0054). Recently, the IETF has upgraded vCard from vCard3 to vCard 4 (RFC 6350), and at the same time has defined an official XML format for vCard4 (RFC 6351). This document specifies an XMPP extension for use of the vCard4 XML format in XMPP systems, with the intent of obsoleting the vcard-temp format. Primarily this document defines the encapsulation method itself; secondarily it also defines transport methods and a mapping to the vcard-temp format for migration by clients and servers.

2 Requirements

This specification was designed with the following requirements in mind.

1. Reuse vCard4 as defined in RFC 6350.
2. Reuse the vCard4 XML format as defined in RFC 6351.
3. Ensure that clients and servers can easily migrate from vcard-temp to the new encapsulation format.
5. Support vCards for non-human entities such as XMPP servers and Multi-User Chat (XEP-0045) rooms.

3 Reuse of vCard4

Because there is now an XML namespace for the official vCard format, we can simply re-use that namespace: "urn:ietf:params:xml:ns:vcard-4.0".

The vCard XML format defined at the IETF specifies that the root element is <vcard/>, where the only defined child element is <vcard/>. For use in XMPP, we specify that the root element shall be <vcard/>, not <vcards/>.

---

4 Self vCards

This section describes the use of the vCard format for self-publication and retrieval of publicly-accessible information about any entity on an XMPP network, thus fulfilling all the use cases of the old vcard-temp format.

4.1 PEP Publication and Retrieval

The primary method for publishing and retrieving vCards is via Best Practices for Persistent Storage of Public Data via Publish-Subscribe (XEP-0222) using the node name 'urn:xmpp:vcard4'.

4.1.1 Retrieval

An XMPP entity retrieves the vCard of another entity (or itself) by sending a PEP-get to the target entity for the 'urn:xmpp:vcard4' node.

Listing 1: vCard Retrieval Request

```xml
<iq from='samizzi@cisco.com/foo'
    id='bx81v356'
    to='stpeter@jabber.org'
    type='get'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <items node='urn:xmpp:vcard4'/>
  </pubsub>
</iq>
```

If a vCard exists for the target entity, the responsible entity (e.g., the XMPP server that hosts the account for a bare JID) MUST return the data in an IQ-result:

Listing 2: Server Returns vCard

```xml
<iq from='stpeter@jabber.org'
    id='bx81v356'
    to='samizzi@cisco.com/foo'
    type='result'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <items node='urn:xmpp:vcard4'/>
    <item id='e0bf7714-a8dd-4749-8a18-e1979525b0d5'>
      <vcard xmlns="urn:ietf:params:xml:ns:vcard-4.0">
        <fn><text>Peter Saint-Andre</text></fn>
      </vcard>
    </item>
  </pubsub>
</iq>
```

---

<n><surname>Saint-Andre</.surname><given>Peter</given><additional/></additional></n>
<nickname><text>stpeter</text></nickname>
<nickname><text>psa</text></nickname>
<photo><uri>https://stpeter.im/images/stpeter_oscon.jpg</uri></photo>
<bday><date>1966-08-06</date></bday>
<adr>
<parameters>
  <type><text>work</text><text>voice</text></type>
  <pref><integer>1</integer></pref>
</parameters>
<ext>Suite 600</ext>
<street>1899 Wynkoop Street</street>
<locality>Denver</locality>
<region>CO</region>
<code>80202</code>
<country>USA</country>
</adr>
<adr>
<parameters><type><text>home</text></type></parameters>
<ext></ext>
<street></street>
<locality>Parker</locality>
<region>CO</region>
<code>80138</code>
<country>USA</country>
</adr>
<tel>
<parameters>
  <type><text>work</text><text>voice</text></type>
  <pref><integer>1</integer></pref>
</parameters>
<uri>tel:+1-303-308-3282</uri>
</tel>
<tel>
<parameters><type><text>work</text><text>fax</text></type></parameters>
<uri>tel:+1-303-308-3219</uri>
</tel>
<tel>
<parameters>
  <type><text>cell</text><text>voice</text><text>phone</text></type>
</parameters>
<uri>tel:+1-720-256-6756</uri>
</tel>
4.1.2 Publication

An XMPP entity publishes or updates its vCard by doing a PEP publish to its own 'urn:xmpp:vcard4' node. The publication request needs to include the entire vCard, not a "diff" against the prior data (if any).

Listing 3: vCard Publication Request

```xml
<iq from='stpeter@jabber.org/squire' id='h3vz319m' type='set'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:vcard4'>
      <item>
        <vcard xmlns='urn:ietf:params:xml:ns:vcard-4.0'>
          [...]
        </vcard>
      </item>
    </publish>
  </pubsub>
</iq>
```

If no error occurs, the responsible entity returns an IQ-result.

Listing 4: Server Acknowledges Publication

```xml
<iq from='stpeter@jabber.org' id='bx81v356' to='stpeter@jabber.org/squire' type='result'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:vcard4'>
      <item id='1e3fdd90-f542-41d3-82ae-33d183467a7a'/>
    </publish>
  </pubsub>
</iq>
```

Note: An entity MAY have authorization to update the vCard of another entity (e.g., a server administrator might have authorization to modify the server’s vCard).

4.2 Event Notifications

Personal Eventing Protocol (XEP-0163)\(^7\) also provides a way to subscribe to events. It can be used to automatically generate event notifications when a user's vCard is modified.

4.2.1 Subscribing to vCard Notifications

Let us imagine that Juliet wishes to receive the updates that Romeo publishes to his vCard. She has two options:

1. Implicitly subscribe by advertising support for "urn:xmpp:vcard4+notify" in her Entity Capabilities (XEP-0115)\(^8\) data. Romeo’s PEP service then automatically send vCard updates to her when it receives presence from her, until and unless she sends presence of type unavailable or stops advertising an interest in vCard updates. This is in accordance with Publish-Subscribe (XEP-0060)\(^9\), section 6.1.

2. Explicitly subscribe by sending a formal subscription request to the "urn:xmpp:vcard4" node at Romeo’s JabberID. Romeo’s PEP service might send her all vCard updates even if she is offline at the time (depending on service policies regarding presence integration).

4.2.2 Receiving a vCard Notification

Because Juliet has sent presence to Romeo including Entity Capabilities data that includes the "urn:xmpp:vcard4+notify" feature, Romeo’s XMPP server will send a PEP notification to Juliet.

Listing 5: Receiving a vCard publication/update

```
<message from='romeo@montague.lit' to='juliet@capulet.lit' type='headline'>
  <event xmlns='http://jabber.org/protocol/pubsub#event'>
    <items node='urn:xmpp:vcard4'>
      <item id='1e3fdd90-f542-41d3-82ae-33d183467a7a'/>
    </items>
  </event>
</message>
```

Note: There is no payload, because this is a pure notification (the receiver needs to retrieve the vCard as described earlier).

5 Contact vCards

In addition to enabling the publication and retrieval of vCards about any entity on an XMPP network, the vCard format can also be used to store information about an entity’s contacts.

5 CONTACT VCARDS

5.1 Format
A contact is simply a vCard about someone else (or something else, in the case of automated entities). If the other person or entity is in the user’s roster RFC 6121, the vCard SHOULD contain the Jabber ID of the person or entity. This enables a user to store information about the contact outside of the roster, thus obviating the need for changes or extensions to the roster namespace itself (as in Annotations (XEP-0145)).

Listing 6: Contact

```
<vcard xmlns="urn:ietf:params:xml:ns:vcard-4.0">
  <fn><text>Samantha Mizzi</text></fn>
  <n>
    <surname>Mizzi</surname>
    <given>Samantha</given>
    <additional></additional>
  </n>
  <nickname><text>Sam</text></nickname>
  <nickname><text>samizzi</text></nickname>
  <geo><uri>geo:39.59,-105.01</uri></geo>
  <org parameters>
    <type><text>work</text></type>
    <text>Cisco</text>
  </org>
  <note>
    My co-author on XEP-0292. She's cool!
  </note>
  <impp parameters>
    <type><text>work</text></type>
    <uri>xmpp:samizzi@cisco.com</uri>
  </impp>
</vcard>
```

5.2 Storage
Because contact vCards are private information, they are best stored using Best Practices for Persistent Storage of Private Data via Publish-Subscribe (XEP-0223). The canonical location is a well-known pubsub node "urn:xmpp:contacts". In accordance with XEP-0223, this node MUST have an access type of "whitelist" by default. When a client stores items at this node, it

---

MUST include an ItemID set to the bare JID of the contact.

Listing 7: Storing a Contact vCard

```xml
<iq from='stpeter@stpeter.im/squire' type='set' id='h3vs7163'>
  <pubsub xmlns='http://jabber.org/protocol/pubsub'>
    <publish node='urn:xmpp:contacts'>
      <item id='samizzi@cisco.com'>
        <vcard xmlns='urn:ietf:params:xml:ns:vcard-4.0'>
          <fn>Samantha Mizzi</fn>
          <n>
            <given>Samantha</given>
            <additional>Mizzi</additional>
          </n>
          <nickname>Sam</nickname>
          <nickname>samizzi</nickname>
          <geo>geo:39.59,-105.01</geo>
          <org>
            <parameters type='work'>Cisco</parameters>
          </org>
          <note>
            My co-author on XEP-0292. She's cool!
          </note>
        </vcard>
      </item>
    </publish>
  </pubsub>
</iq>
```

8
When a contact’s vCard is stored in a private node, it is pushed out to all of the user’s resources that have included in their entity capabilities (XEP-0115) data a service discovery feature of "urn:xmpp:contacts+notify" (in the following example those resources are "squire" and "roundabout").

Listing 8: Publisher resources receive event notification

```xml
<message from='stpeter@stpeter.im'
to='stpeter@stpeter.im/squire'
type='headline'
id='ka92g1b5'>
  <event xmlns='http://jabber.org/protocol/pubsub#event'>
    <items node='urn:xmpp:contacts'>
      <item id='samizzi@cisco.com'>
        <vcard xmlns="urn:ietf:params:xml:ns:vcard-4.0">
          <fn><text>Samantha Mizzi</text></fn>
          <n>
            <surname>Mizzi</surname>
            <given>Samantha</given>
            <additional/>
          </n>
          <nickname><text>Sam</text></nickname>
          <nickname><text>samizzi</text></nickname>
          <geo><uri>geo:39.59,-105.01</uri></geo>
          <org>
            <parameters><type><text>work</text></type><parameters>
              <text>Cisco</text>
            </org>
            <note>
              <text>My co-author on XEP-0292. She’s cool!</text>
            </note>
            <impp>
              <parameters><type><text>work</text></type><parameters>
                <uri>xmpp:samizzi@cisco.com</uri>
              </impp>
              <vcard/>
            </item>
          </items>
        </vcard>
      </event>
    </message>
```
6 vCards of Automated Entities

Traditionally, vCards have been used on the XMPP network for entities other than human users, e.g. by XMPP servers and chatrooms. When such automated entities use vCards, it is RECOMMENDED to specify a value of "application" for the vCard4 KIND property RFC 6473, as illustrated in the following example:

Listing 9: vCard for a Thing

```
<iq from='jabber.org' id='yhx51c35' to='samizzi@cisco.com/boo' type='result'>
```
7 Determining Support

If an XMPP client or server supports the vCard4 namespace, it MUST advertise that fact in its responses to Service Discovery (XEP-0030)\(^\text{14}\) information ("disco#info") requests by returning a feature of "urn:ietf:params:xml:ns:vcard-4.0":

Listing 10: A disco#info query

```
<iq type='get' 
from='stpeter@jabber.org/squire'
   to='samizzi@cisco.com/foo'
   id='disco1'>
   <query xmlns='http://jabber.org/protocol/disco#info'/>
</iq>
```

Listing 11: A disco#info response

```
<iq type='result' 
from='samizzi@cisco.com/foo'
   to='stpeter@jabber.org/squire'
   id='disco1'>
   <query xmlns='http://jabber.org/protocol/disco#info'>
     ...
     <feature var='urn:ietf:params:xml:ns:vcard-4.0'/>
     ...
   </query>
</iq>
```

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 (XEP-0115)\(^15\). However, if an application has not received entity capabilities information from an entity, it SHOULD use explicit service discovery instead.

### 8 Security Considerations

The vCard information published to one’s XMPP server is world-readable; therefore, users should exercise due caution when determining what information to include (e.g., street addresses, personal telephone numbers, or email addresses).

### 9 IANA Considerations

This document does not require interaction with the Internet Assigned Numbers Authority (IANA)\(^16\).

### 10 XMPP Registrar Considerations

#### 10.1 Well-Known Service Discovery Nodes

The XMPP Registrar\(^17\) shall include ‘urn:xmipp:contact’ and ‘urn:xmipp:vcard4’ in its registry of Nodes for Service Discovery and Publish-Subscribe at <https://xmpp.org/registrar/nodes.html>.

### 11 Mapping from vcard-temp to vCard4

This section provides a more detailed description of mapping vcard-temp properties to vcard4 properties.

---


\(^{16}\)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/>.

\(^{17}\)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/>.
11.1 Properties Defined in vcard-temp but not in vCard3 or vCard4

11.1.1 DESC

The vcard-temp specification defined a `<DESC/>` element. This element was not part of the vCard3 schema. Mapping the vcard-temp `<DESC/>` element to the vCard4 NOTE property is appropriate.

```
<DESC>
    More information about me is located on my personal website: https://stpeter.im/
</DESC>
```

Listing 12: Deprecated DESC element

```
<note>
    <text>
        More information about me is located on my personal website: https://stpeter.im/
    </text>
</note>
```

Listing 13: NOTE property

11.1.2 JABBERID

The vcard-temp specification defined a `<JABBERID/>` element:

```
<JABBERID>stpeter@jabber.org</JABBERID>
```

Although the JABBERID field was not part of the vCard3 schema and was simply hacked into vcard-temp, RFC 4770 18 defined an IMPP property for instant messaging and presence addresses, which was ported to vCard4. In the vCard4 XML format, the IMPP property for a JabberID would be as follows.

```
<impp>
    <uri>xmpp:stpeter@jabber.org</uri>
</impp>
```

Listing 15: IMPP property

11.1.3 MIDDLE

The vcard-temp specification defined a <MIDDLE/> element as the third allowable element within the <N/> ("name") element. This element was not part of the vCard3 schema, although the Dawson drafts did contain an <other/> element in the third position of child elements within the <n/> element. It is appropriate to map the vcard-temp <MIDDLE/> element to the vCard4 "Additional Name" part of the "N" structured property value, which in xCard is the <additional/> child of the <n/> element.

11.2 Properties Defined Incorrectly in vcard-temp

Several of the properties in vcard-temp are defined differently in vCard3. In fact, the definitions even differ from those provisionally made in the so-called "Dawson drafts" from which vcard-temp was supposedly derived (for reference, the last of these is archived at <http://www.watersprings.org/pub/id/draft-dawson-vcard-xml-dtd-03.txt>). The reasons for these discrepancies are unknown. However, care must be taken in correctly mapping these properties from vcard-temp to vCard4.

11.2.1 KEY

The DTD in XEP-0054 provided this definition for the KEY element:

```xml
<!ELEMENT KEY ( TYPE?, CRED )>
```

However, the DTD in the final Dawson draft provided the following definition:

```xml
<!ELEMENT key ( extref | b64bin )>
```

The relevant RelaxNG definition in vCard4 XML is as follows:

```xml
property-key = element key {
  ( value-uri | value-text )
}
```

The source of the spurious <TYPE/> and <CRED/> elements is unknown. The vcard-temp <CRED/> element is mapped to the vCard4 value-text construction.

11.2.2 SOUND

The DTD in XEP-0054 provided this definition for the SOUND element:

```xml
<!ELEMENT SOUND ( PHONETIC | BINVAL | EXTVAL )>
```
However, the DTD in the final Dawson draft provided the following definition:

```xml
<!ELEMENT sound (extref | b64bin)>
```

The source of the spurious vcard-temp `<PHONETIC/>` element is unknown. However, it does not exist in vCard4 and therefore is simply discarded when mapping. The vcard-temp `<BIN-VAL/>` element is mapped to the vCard4 b64bin construction and the vcard-temp `<EXTVAL/>` element is mapped to the vCard4 extref construction.

### 11.2.3 VERSION

As explained in XEP-0054, the `<VERSION/>` element from the final Dawson draft was not used in vcard-temp; instead, the vcard-temp protocol used a 'version' attribute (in fact the Dawson drafts were inconsistent, since the DTD defined a `<VERSION/>` element and the body of the specification used a 'version' attribute).

### 11.3 Properties Defined Differently in vcard-temp, vCard3, and vCard4

The following properties are defined differently in vcard-temp and vCard4. As a result, the mappings are workable but might not preserve all information that could have been contained in vcard-temp data.

#### 11.3.1 ADR

The following address type values allowed in vCard3 were removed from vCard4:

- DOM
- INTL
- PARCEL
- POSTAL

#### 11.3.2 AGENT

In vCard3 and vcard-temp, the AGENT property was allowed to contain the inline vCard of someone who could act as an agent for the primary owner of the referenced vCard. In vCard4, inline vCards are disallowed. Therefore only pointers to external vCard objects are now allowed, by means of a URI.
11.3.3 ORG
The ORGUNIT property was removed from vCard4, with the result that the ORGNAME property becomes the only child of ORG.

11.3.4 SORT-STRING
The SORT-STRING property from vCard3 was renamed to SORT-AS in vCard4.

11.3.5 TEL
The following telephony type values allowed in vCard3 were removed from vCard4:

- BBS
- ISDN
- MODEM
- MSG
- PCS

In addition, in vCard4 the telephone number is represented as a tel: URI, not by means of a NUMBER property.

11.4 Properties Defined Similarly in vcard-temp, vCard3, and vCard4
The following properties are defined similarly in vcard-temp, vCard3, and vCard4. The mappings are fairly straightforward (a future version of this document might provide more detailed narrative descriptions of the mappings).

- BDAY
- CATEGORIES
- EMAIL
- FN
- GEO
- LOGO
- N
• NICKNAME
• NOTE
• PHOTO (mapped to a ‘data:’ URI in vCard4, see RFC 2397\(^{19}\))
• PRODID
• REV
• ROLE
• TITLE
• TZ
• UID
• URL

11.5 Properties Defined in vCard3 but Removed from vCard4

The following properties were defined in vCard3 but were removed from vCard4:

• CLASS
• LABEL
• MAILER

There is no mapping from these properties to vCard4.

12 Migration Tools

This section contains three tools that are intended to help developers in migrating from vcard-temp to vCard4 XML:

1. An Extensible Stylesheet Language Transformation (XSLT) script for automatically translating the vcard-temp XML format into the vCard4 XML format.

2. An example of vcard-temp data that uses most of the elements defined in XEP-0054 that can be mapped to vCard4 properties (note that some of these elements were never used in practice).

3. An example of vCard4 XML data showing the transformation of the vcard-temp example using the XSLT stylesheet.

The tools are purely informational and are not a normative part of this specification.

12.1 Extensible Stylesheet Language Transformation (XSLT) from vcard-temp to vCard4

```xml
<?xml version='1.0' encoding='UTF-8'?>
<!--
Copyright (c) 1999 - 2021 XMPP Standards Foundation

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
-->

<!-- Author: stpeter@jabber.org -->
<!-- Version: 0.0.3 -->
<!-- Last Updated: 2012-09-12 -->
<xsl:stylesheet
    xmlns='urn:ietf:params:xml:ns:vcard-4.0'
    xmlns:xhtml='http://www.w3.org/1999/xhtml'
    xmlns:xml='http://www.w3.org/1999/xhtml'
    xmlns:xlink='http://www.w3.org/1999/xlink'
    xmlns:xsl='http://www.w3.org/1999/XSL/Transform'>
```
xmlns:xsl='http://www.w3.org/1999/XSL/Transform'
version='1.0'>

<xsl:output method='xml'/>

<xsl:template match='/'>
  <vcard>
    <!-- BEGIN VARIABLES -->
    <!-- in case we need them, count instances of the vcard-temp elements per the DTD in XEP-0054 -->
    
    <xsl:variable name='FN.count' select='count(/vCard/FN)'/>
    <xsl:variable name='N.count' select='count(/vCard/N)'/>
    <xsl:variable name='NICKNAME.count' select='count(/vCard/NICKNAME)'/>
    <xsl:variable name='PHOTO.count' select='count(/vCard/PHOTO)'/>
    <xsl:variable name='BDAY.count' select='count(/vCard/BDAY)'/>
    <xsl:variable name='ADR.count' select='count(/vCard/ADR)'/>
    <xsl:variable name='LABEL.count' select='count(/vCard/LABEL)'/>
    <xsl:variable name='TEL.count' select='count(/vCard/TEL)'/>
    <xsl:variable name='EMAIL.count' select='count(/vCard/EMAIL)'/>
    <xsl:variable name='JABBERID.count' select='count(/vCard/JABBERID)'/>
    <xsl:variable name='MAILER.count' select='count(/vCard/MAILER)'/>
    <xsl:variable name='TZ.count' select='count(/vCard/TZ)'/>
    <xsl:variable name='GEO.count' select='count(/vCard/GEO)'/>
    <xsl:variable name='TITLE.count' select='count(/vCard/TITLE)'/>
    <xsl:variable name='ROLE.count' select='count(/vCard/ROLE)'/>
    <xsl:variable name='LOGO.count' select='count(/vCard/LOGO)'/>
    <xsl:variable name='AGENT.count' select='count(/vCard/AGENT)'/>
    <xsl:variable name='ORG.count' select='count(/vCard/ORG)'/>
    <xsl:variable name='CATEGORIES.count' select='count(/vCard/CATEGORIES)'/>
    <xsl:variable name='NOTE.count' select='count(/vCard/NOTE)'/>
    <xsl:variable name='PRODID.count' select='count(/vCard/PRODID)'/>
    <xsl:variable name='REV.count' select='count(/vCard/REV)'/>
    <xsl:variable name='SORT-STRING.count' select='count(/vCard/SORT-STRING)'/>
    <xsl:variable name='SOUND.count' select='count(/vCard/SOUND)'/>
    <xsl:variable name='UID.count' select='count(/vCard/UID)'/>
    <xsl:variable name='URL.count' select='count(/vCard/URL)'/>
    <xsl:variable name='CLASS.count' select='count(/vCard/CLASS)'/>
    <xsl:variable name='KEY.count' select='count(/vCard/KEY)'/>
    <xsl:variable name='DESC.count' select='count(/vCard/DESC)'/>
  </vcard>
<! -- END VARIABLES -->
<! -- BEGIN VCARD4 OUTPUT -->
<! -- FN is required -->
<fn><text><xsl:value-of select="/vCard/FN"/></text></fn>
<! -- N is required -->
<xsl:apply-templates select="/vCard/N"/>
<! -- NICKNAME can be included one or more times -->
<xsl:for-each select="/vCard/NICKNAME">
  <nickname><text><xsl:value-of select="."/></text></nickname>
</xsl:for-each>
<! -- PHOTO can be included one or more times -->
<! -- content is either a pointer to a URL or inline binary, which is mapped to a data: URI in vCard4 -->
<xsl:for-each select="/vCard/PHOTO">
  <xsl:variable name="PHOTO.ext" select="count(EXTVAL)"/>
  <xsl:variable name="PHOTO.type" select="TYPE"/>
  <xsl:choose>
    <xsl:when test="$PHOTO.ext=1">
      <photo><uri><xsl:value-of select="EXTVAL"/></uri></photo>
    </xsl:when>
    <xsl:otherwise>
      <photo>
        <uri data:><xsl:text><xsl:value-of select="TYPE"/>
          ;<xsl:text><xsl:value-of select="BINVAL"/>
        </xsl:text></uri>
      </photo>
    </xsl:otherwise>
  </xsl:choose>
</xsl:for-each>
<! -- BDAY can be included once -->
<xsl:if test="$BDAY.count=1">
  <bday><date><xsl:value-of select="/vCard/BDAY"/></date></bday>
</xsl:if>
<! -- ADR can be included one or more times -->
<xsl:apply-templates select='vCard/ADR'/>

<!-- NOTE: vcard-temp allowed a LABEL element, but it was removed from vCard4 -->

<!-- one or more TEL elements can be included -->
<xsl:apply-templates select='vCard/TEL'/>

<!-- one or more EMAIL elements can be included -->
<xsl:apply-templates select='vCard/EMAIL'/>

<!-- JABBERID can be included one or more times -->
<!-- we map this to the vCard4 IMPP property -->
<xsl:for-each select='vCard/JABBERID'>
  <impp>
  </impp>
</xsl:for-each>

<!-- NOTE: vcard-temp allowed a MAILER element, but it was removed from vCard4 -->

<!-- one or more TZ elements can be included -->
<xsl:for-each select='vCard/TZ'>
  <tz><text><xsl:value-of select='.'/></text></tz>
</xsl:for-each>

<!-- one or more GEO elements can be included -->
<xsl:for-each select='vCard/GEO'>
  <geo>
    <uri><xsl:text>geo:</xsl:text><xsl:value-of select='LAT'/></uri>
  </geo>
</xsl:for-each>

<!-- one or more TITLE elements can be included -->
<xsl:for-each select='vCard/TITLE'>
  <title><text><xsl:value-of select='.'/></text></title>
</xsl:for-each>

<!-- one or more ROLE elements can be included -->
<xsl:for-each select='vCard/ROLE'>
  <role><text><xsl:value-of select='.'/></text></role>
</xsl:for-each>
<!-- one or more LOGO elements can be included -->
<!-- content is either a pointer to a URL or inline binary, 
which is mapped to a data: URI in vCard4 -->

<xsl:for-each select='/vCard/LOGO'>
  <xsl:variable name='LOGO.ext' select='count(EXTVAL)'/>
  <xsl:variable name='LOGO.type' select='TYPE'/>
  <xsl:choose>
    <xsl:when test='$LOGO.ext=1'>
      <logo><uri><xsl:value-of select='EXTVAL'/></uri></logo>
    </xsl:when>
    <xsl:otherwise>
      <logo>
      </logo>
    </xsl:otherwise>
  </xsl:choose>
</xsl:for-each>

<!-- one or more AGENT elements can be included -->
<!-- however, inline vcards are not supported in vCard4 -->
<!-- the relevant vCard4 property is RELATED -->
<!-- only EXTVAL is supported now via URIs -->
<!-- NOTE: this element was probably unused in vcard-temp -->

<xsl:for-each select='/vCard/AGENT'>
  <xsl:variable name='AGENT.ext' select='count(EXTVAL)'/>
  <xsl:if test='$AGENT.ext=1'>
    <agent><uri><xsl:value-of select='EXTVAL'/></uri></agent>
  </xsl:if>
</xsl:for-each>

<!-- one or more ORG elements can be included -->
<!-- NOTE: ORGUNIT is no longer used in vCard4 -->

<xsl:for-each select='/vCard/ORG'>
  <org>
    <xsl:variable name='ORGNAME.count' select='count(ORGNAME)'/>
    <xsl:if test='$ORGNAME.count=1'>
      <text><xsl:value-of select='ORGNAME'/></text>
    </xsl:if>
  </org>
</xsl:for-each>

<!-- one or more CATEGORIES elements can be included -->
<!-- NOTE: this element was probably unused in vcard-temp -->
<xsl:for-each select='/vCard/CATEGORIES'>
    <categories><text><xsl:value-of select='.'/></text></categories>
</xsl:for-each>

<!-- one or more NOTE elements can be included -->
<!-- NOTE: this element was probably unused in vcard-temp -->
<xsl:for-each select='/vCard/NOTE'>
    <note><text><xsl:value-of select='.'/></text></note>
</xsl:for-each>

<!-- PRODID can be included exactly once -->
<!-- NOTE: this element was probably unused in vcard-temp -->
<xsl:if test='$PRODID.count=1'>
    <prodid><text><xsl:value-of select='.'/></text></prodid>
</xsl:if>

<!-- REV can be included exactly once -->
<!-- NOTE: this element was probably unused in vcard-temp -->
<xsl:if test='$REV.count=1'>
    <rev><timestamp><xsl:value-of select='.'/></timestamp></rev>
</xsl:if>

<!-- one or more SORT-STRING elements can be included -->
<!-- this element maps to SORT-AS in vCard4 -->
<xsl:for-each select='/vCard/SORT-STRING'>
    <sort-as><xsl:value-of select='.'/></sort-as>
</xsl:for-each>

<!-- one or more SOUND elements can be included -->
<!-- NOTE: for some reason, vcard-temp allowed a <PHONETIC/> child element, but that was not documented in the original Dawson I-Ds and is not supported in vCard4 -->
<xsl:for-each select='/vCard/SOUND'>
    <xsl:variable name='SOUND.ext' select='count(EXTVAL)'/>
    <xsl:variable name='SOUND.bin' select='count(BINVAL)'/>
    <xsl:choose>
        <xsl:when test='$SOUND.ext=1'>
            <sound><uri><xsl:value-of select='EXTVAL'/></uri></sound>
        </xsl:when>
    </xsl:choose>
</xsl:for-each>
<xsl:variable name='SUFFIX.count' select='count(SUFFIX)'/>
<xsl:if test='$FAMILY.count=1'>
  <surname><xsl:value-of select='FAMILY'/></surname>
</xsl:if>
<xsl:if test='$GIVEN.count=1'>
  <given><xsl:value-of select='GIVEN'/></given>
</xsl:if>
<xsl:if test='$MIDDLE.count=1'>
  <additional><xsl:value-of select='MIDDLE'/></additional>
</xsl:if>
<xsl:if test='$PREFIX.count=1'>
  <prefix><xsl:value-of select='PREFIX'/></prefix>
</xsl:if>
<xsl:if test='$SUFFIX.count=1'>
  <suffix><xsl:value-of select='SUFFIX'/></suffix>
</xsl:if>
</xsl:template>

<xsl:template match='ADR'>
<adr>
  <xsl:variable name='HOME.count' select='count(HOME)'/>
  <xsl:variable name='WORK.count' select='count(WORK)'/>

  <!-- NOTE: vcard-temp allowed address types of POSTAL, PARCEL, DOM, and INTL, but they were removed from vCard4 -->
  <xsl:variable name='PREF.count' select='count(PREF)'/>
  <xsl:variable name='POBOX.count' select='count(POBOX)'/>
  <xsl:variable name='EXTADD.count' select='count(EXTADD)'/>
  <xsl:variable name='STREET.count' select='count(STREET)'/>
  <xsl:variable name='LOCALITY.count' select='count(LOCALITY)'/>
  <xsl:variable name='REGION.count' select='count(REGION)'/>
  <xsl:variable name='PCODE.count' select='count(PCODE)'/>

  <!-- NOTE: yes, vcard-temp has CTRY, not COUNTRY -->
  <xsl:variable name='CTRY.count' select='count(CTRY)'/>

  <!-- first we count the number of vCard TYPE parameters -->
  <xsl:variable name='TYPE.count' select='HOME.count+$WORK.count'/>

  <!-- now we output all the parameters -->
  <xsl:if test='$TYPE.count &gt; 0'>
    <parameters>
      <type>
<!-- NOTE: vcard-temp allowed telephony types of MSG, BBS,
MODEM, ISDN, and PCS but they were removed from vCard4 -->

<xsl:variable name='PREF.count' select='count(PREF)'/>
<xsl:variable name='NUMBER.count' select='count(NUMBER)'/>
<!-- first we count the number of vCard TYPE parameters -->
<xsl:variable name='TYPE.count' select='$HOME.count + $WORK.count + $TEXT.count + $VOICE.count + $FAX.count + $CELL.count + $VIDEO.count + $PAGER.count + $TEXTPHONE.count'/>

</!-- now we output all the parameters -->

<xsl:if test='$TYPE.count &gt; 0'>
<parameters>
<type>
<xsl:if test='$HOME.count=1'>
<text>home</text>
</xsl:if>
<xsl:if test='$WORK.count=1'>
<text>work</text>
</xsl:if>
<xsl:if test='$TEXT.count=1'>
<text>text</text>
</xsl:if>
<xsl:if test='$VOICE.count=1'>
<text>voice</text>
</xsl:if>
<xsl:if test='$FAX.count=1'>
<text>fax</text>
</xsl:if>
<xsl:if test='$CELL.count=1'>
<text>cell</text>
</xsl:if>
<xsl:if test='$VIDEO.count=1'>
<text>video</text>
</xsl:if>
<xsl:if test='$PAGER.count=1'>
<text>pager</text>
</xsl:if>
<xsl:if test='$TEXTPHONE.count=1'>
<text>texphone</text>
</xsl:if>
</type>
</parameters>
12 MIGRATION TOOLS

12.2 Example of vcard-temp Data

```xml
<vCard>
  <FN>Peter Saint-Andre</FN>
  <N>
    <FAMILY>Saint-Andre</FAMILY>
    <GIVEN>Peter</GIVEN>
  </N>
  <NICKNAME>stpeter</NICKNAME>
  <NICKNAME>psa</NICKNAME>
  <PHOTO><EXTVAL>http://stpeter.im/images/stpeter_oscon.jpg</EXTVAL></PHOTO>
  <PHOTO><EXTVAL>http://stpeter.im/images/stpeter_hell.jpg</EXTVAL></PHOTO>
  <BDAY>1966-08-06</BDAY>
  <ADR>
    <PREF/>
    <EXTADD>Suite 600</EXTADD>
    <STREET>1899 Wynkoop Street</STREET>
    <LOCALITY>Denver</LOCALITY>
    <REGION>CO</REGION>
    <PCODE>80202</PCODE>
    <CTRY>USA</CTRY>
  </ADR>
  <ADR>
    <HOME/>
    <EXTADD/>
    <STREET/>
    <LOCALITY>Parker</LOCALITY>
    <REGION>CO</REGION>
    <PCODE>80138</PCODE>
    <CTRY>USA</CTRY>
  </ADR>
  <TEL><PREF/><WORK/><VOICE/><NUMBER>+1-303-308-3282</NUMBER></TEL>
  <TEL><WORK/><FAX/><NUMBER>+1-303-308-3219</NUMBER></TEL>
  <TEL><CELL/><VOICE/><TEXT/><NUMBER>+1-720-256-6756</NUMBER></TEL>
  <TEL><HOME/><VOICE/><NUMBER>+1-303-555-1212</NUMBER></TEL>
  <EMAIL><INTERNET/><PREF/><USERID>stpeter@jabber.org</USERID></EMAIL>
  <EMAIL><WORK><USERID>psaintan@cisco.com</USERID></EMAIL>
  <JABBERID><EMAIL>stpeter@jabber.org</EMAIL>
  <TZ>America/Denver</TZ>
  <GEO><LAT>39.59</LAT><LON>-105.01</LON></GEO>
</vCard>
```
Executive Director

Patron Saint

MjIyMjIyMjIyMjIy/8AAEQgAgQB7AwIeAAIRAQMRAF/
EABsAAAMAawEBAAAAAABBBAAAQBFgA8/
BwIB/8
QPRAAAAgEDAwIDBDQJBAEFAAAAAQIDAAQRBRIhMUEGE1eiYXGBkRQyobEHFSmzNEJScsEKh

12 MIGRATION TOOLS
12 MIGRATION TOOLS

```
MIGRATION TOOLS

l1xHzDqP5ZBnW7i1Fr5yQOmfLZAw+
fN7e3jV17DrXs0qoha2aNV0uDUekEMqxSIXdIDHibIHHu
qQvrK5sJRHPEVcaA4PZvgasb28gXVIFD+YcOlzG/
ga2UYjL3C46qT3rGeFVYa0TQKXDNKw1OT0y
F93fS1To5ihiQZAWJB0/2iPrGwiqNlSnICjA6mqaa1DuG2/wAqjQewAqFpp0zRHJKNR/
eCte1/x
ArKyvVZmEah+9Wgv/gzKXqsp10CiZ3buV16r/dwV1Z0x4maF/6wvz/ADN0TB/
eFx8A8jV1Uzc
aPYXq3BEfUbCfxyFZWUMQCh0LTP4S+2nx/sn4V1Zxvq/VEz7EF19/50
bfp8SPZrKrKuA0P43
\v\nx/+oqw7D4D8qyrszc7v7joro/9k=
<\BINVAL>
</LOGO>
</ORG>
</ORGNAME>XMPP Standards Foundation</ORGNAME>
</ORGUNIT/>
</ORG>
</URL>https://stpeter.im/
</URL>
</URL>http://www.saint-andre.com/</URL>
</KEY>
</CRED>

-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: GnuPG/MacGPG2 v2.0.18 (Darwin)
mQINBFETdzbSEAC8F0v1N3JzIIxN6cKD475KS9CHDPeyp1cOPlnP5eY1DCh4h
/IwS1S7RcePtm1ybN0v9FsI4PUKnznXQA6LVEaDR/UL1hgJKjq+gsgp81qBEILh
g13ecH66HW59arbBQK477TL8miPBFC6E3A4Lq1L+eueO6UcLiHkoYkmxOjdi
WrMgKtnVpCh5yDlKpm/z0Z0o8zRq1lPuTeCrXXYnjjHXLVFN2xy0u0zS7P5u5Kv
fx5Z7uQisr8Pxy1T66SP405HZq15u5zQxhSJoji0OFWznAja5SFU0URq9
Ck1G5cMIOUAT8TN7ftv0KtsxawDL1ELDVPYp1m7mtzo+VREG+0xmU6AjMo/GHblIWU
U7M1yqCiuMLsp/HlRFuiosqLVZ85wulQ2junPe3tkf815UCX1ACOpQ1vIpQdfBe
uLOXjTF8YHpHdHyt/ZM117ZBKG40aoy87ud7w7J9D3guzwdz9fFjWv7IoK7ATo
1FL1zmwDn+zMygbH0GUMX5hSaas8eDSieiR2QolDn27Fip7KMBT12+GIrSnfJTN/
QVvmjDXXadxHmU24QgmZbkjoe35n129yzXn9NcqrGrLroV621L3gX6CSh15i7
GgWY6CApBnMoV4K759nFDS4riq4QS0yKlA30P5AkrIrp2TNAk4iWARAQAB
tCZQRXlciBTYW1uc1BmRyZS4Ac3RwZXR1ckBdHB1DGVyLmlpOCKQ9TQAi
IwUCURMPOwIbAwcLCQgHawsIBHBUlAqgKCCwQWAGMBAh4BAdhAeAAOeDOGp7RecA2p
6bgQAKpxu07cM0DLc4+EGBH19NWXIVYyb0EvGuHYZaLkJKprhrMzW110bypISN
r9aqzX1eLCEvaqaoEvXk8DfM0CzFK17j37J1BW/Ybr7fFXYy2BaAXx49e1n6
c1slogMrvmFaeoDmPITZ909aUBv9S0nGr036EweLEhAvQv4Dj1071hz6+Cv7lZ
QgBj9rK6hcf4CSnCQaKLGn9lAv4FqX17FSnPKnx6quhX3JNGLnV3wij+j/FcOK
|Irntmhc1c/kbcx6g32prjHEPX0ALMBhmu2u2Ua+TE0zCEC965MYAXAUnDncFwY
be1EJb6z6e51M1L38aVAqOH/GqncnMGN0M0batn17dz/vkLoj1y7bPc01ULF
k5491xPFlfrHHwDrXp6uwC88cfChTMHPZVtuvj20rnKVPv+Y0GLSMMTcrXZJR
7a0l1Y7V1/pJpzgFWsaaxl1DIzZ6B+76yrIhhUWiGo/wNf+DN6B1ICZ66xj6xxj
4962cu02KuhIILKt2p2azOuFtBWXu0JuZk/KPK2Fay/41x7p7vVw0Rc4UiKsLJNL
PS7Ea4BUUXEnFPlDLoqW11Bh2se98PLM188Xkcíc3UXMVd9a110YQh+IbP1
NaszmBhuiwAvCspNGBImJoRzgEEGcKwPv/fNey6M1FMyfakeuQINBFETDzsBEADB
z0SeHPumhkuRujH9TeK87dn5P/Yh/L/HptGCG40TL+CkYdks3HyteMEF061Pnms
-----END PGP PUBLIC KEY BLOCK-----
```
12.3 Example of vCard4 XML Data

```xml
<vcard xmlns="urn:ietf:params:xml:ns:vcard-4.0">
  <fn>
    <text>Peter Saint-Andre</text>
  </fn>
  <n>
    <given>Peter</given>
    <family>Saint-Andre</family>
  </n>
  <nickname>psa</nickname>
</vcard>
```
<nickname>http://stpeter.im/images/stpeter_oscon.jpg</nickname>

<photo>
  <uri>http://stpeter.im/images/stpeter_hell.jpg</uri>
</photo>

<email>
  <uri>mailto:<email></uri>
</email>

<bday>
  <date>1966-08-06</date>
</bday>

<adr>
  <parameters>
    <type><text>work</text></type>
    <pref><integer>1</integer></pref>
  </parameters>
  <ext>Suite 600</ext>
  <street>1899 Wynkoop Street</street>
  <locality>Denver</locality>
  <region>CO</region>
  <code>80202</code>
  <country>USA</country>
</adr>

<adr>
  <parameters>
    <type><text>home</text></type>
    <ext></ext>
    <street></street>
    <locality>Parker</locality>
    <region>CO</region>
    <code>80138</code>
    <country>USA</country>
</adr>

<tel>
  <parameters>
    <type><text>work</text><text>voice</text></type>
    <pref><integer>1</integer></pref>
  </parameters>
  <uri>tel:+1-303-308-3282</uri>
</tel>

<tel>
  <parameters>
    <type><text>work</text><text>fax</text></type>
  </parameters>
  <uri>tel:+1-303-308-3219</uri>
</tel>

<tel>
  <parameters>
    <type><text>cell</text><text>voice</text><text>text</text></type>
  </parameters>
</tel>
12 MIGRATION TOOLS

ilSR3kZR0ZcYI6H48kJvH2zRjLTd0ngh+23
gS0GFdzPMvKgE4g4Pr299bt8w3es8kenwoljgvs
BaMKPZ0ex+HrQxIRjdQul0m0kLwwkCUR0kk/wDFe3zo/
wAP6kqyxy8h0SwHIHfXFZs5jS0beNXO
ZUK2pmyaKH75XaAlPspC48P3qysvnJE5VFVUPuq/
TszYhSckkD4u4uNLt6L1CzP7XzhwR8xWKu7LeK
eMcKk0a8VZGmkByFgc7qagQb8+
izSyMj7h6316N0x4brsfrUmYly2k16F2JApko0ZWfFtC0x4xTSboEI
KPR7zxp98vemSskoOmQKPR2N9bTKgtzuI7H1h1XW9XsYrq4kWZC0R3HfJk8LXayfsL0bo3mjuo
x1xQj1wutt3kDzwX8REEkTA9G6H1Hvq41gznv8ASp0LMSCeZQIiwhwbiP07Vvh0j7PEPt0eY3rj
AHw9KUKa3c3Evmy7Ay3lfexHxHGeFsnSOTsbhy+Jmm61JLdHS9e/02
oqTHHdng7KF6x9D6HtP0j9yk
af125JIB6qf+4xK08
AWPnHIJmH8yMnyevFEaVq1ips8WozNLZiK4ckmP0Uk9vf2quLdBPKmq
k0ig3A3xY0WPl0I0g5zp2IYYWYpo+RcigEdw7n/xXolj+5
TIMCOY6cjl0ldC0dtjZcBh2KnOae
vFeCysNzKQTpbS3lAkk6lcfm2oW3t718nTiwcYB7ntjPz+
1P14juxcxtTPHCRRukjq0b+hx+
NYObho1s5DDBG0+3id/MJKaOad45Pfj6U6s7t0j0WYCMxud3Ze+
WKLx2c1r5YjM9yLgLmg4y
PfK0PqazRaaxip1xuQuAw62ArOnysWMqdlihY3ow9KVPv1XeWGJycYHqaTmG0+
DjznRSE9a
ju1Mm7vBuHxrdJjuy0yZi1XTxa8sjsm9v8AvsiaJ+
yvUnTSw8b6TtKx7x0uWNRL3u1qiczmq44z0pQ
+1TirWWjnJACA08YJPsDyy9I68fE2jX0ixy3Pkk9Gz3oLT/FC+e9MV6syMVV+
Mr2nFnpNnXhNG
8rIwzk5YGnh01kYSEhXcd6E1T00s19o6C2qpcIVGDxSHxBMShP+/51i/anEafE9/
oKvaFLLFNtkp
ToFWvdpiu92zW2QHL/tSfdyD+bDHxKmdQbQfeuNp0G2uI0Q0fjkjM/m4yR+
BPPYa77t5gQ8cCyh1B
HUHzSfxJIX0doCwvxQgD19k1k483H3u+0e11bLRANCPicED5mKpLbKDTHN1/
o7pZJbMH8xsCdO9R9P
7FT3+6mhu1FJUTK20MQbQ+NaBc+Vew7sja+X16+8VN+
JpLS08R3C20MgRc2M87RkFI8FKhdHUR
Eqs826JiFJ3GJicNj8Q1K7QasY41UJuwDGHA+
Jr5QoGZEC7QWvccUB0S7tbjUYWj6RsrsqTJga
nBOPXsCzCveN2P6FzXvFalyCu15qaACe3zzTXWjpr2y0uNUyBMXGbcAOYmc/
Kt6gAz6rHBCQx
8sbQPuscQvifmHz9G8uEYFsQkheAdofw+
flVehC6bMWwG3nVQyDIfFeHq2Q0eK3TbJgsUQbBjnFLv
CImltaizrgzewYDoomci/NZHCsAJAcEGpsiuW1/
G6jsMH61juRccogyV12tG3TPrT8AV0nMuJNO
1RIwO5FJzw0r4rnx7m2U7chjFdy6heWr/swwhEC8Ckv7N0os3X/h+O
kikksoj02z7041fzpRhpN5
YxexdcGVmzuH9NUFpfoV0pQzQMemelBajMzXMa59r1rm/S0CujzzyDwX04+
KNNbNzePti10Ax+PJ

38
12 MIGRATION TOOLS

/wA0RDxQhAVtVypNLMMmzJ3At9a2wQp2SeRk1xRaeLNsWi2sCHOJUUn4IRU/
/o119j1uyJ0BhLh
h6yu980880c6Qs82Ga4Gz3AKT/
  kV1GETE8HUOCPqKo5J0dqkhsknJI0fISZ7zqzkzl1Fe53EuXQ8
55/In lb/AL/AGhg/8U0g01Lm2i1jiZJFzkDPAXCuccuxs1L+
  YoYnbj0eMVqeFjere77GjtBcyYLLKcv
lO8h5xXVXw6L4fsmdRWMMSmI85zvP0PFbri+McCKJKrcYAXyGvPhv+T0c/
/oU6rpzk6p9ufbcuW
Ks2BkKf9aC3tg+
  DgF3T7BUyk1ySreE5z76AmAw2wNoearsrj4RpGVtnrJfBD91iQ1gXgD/vNKn
  tbbnBM0LXHdHbfPMUgdT1aMd0uy4D0fDx1eRheOfJdHoY8inCn2AS6TrChtrH7uMBj0p3JnFtMVQ
RqSSecdTuf2qMWt2eeooSKS4jcmRZI6ZrHgnsp5GTFcXsKo7sAm3sOKQrc+
  bcTMM37Gh2nk9M
8AUHBLecxe2HqF71v1907lw+i1gFesiqR7hz/
  ihGK5DKs3GW7Dw3Uy0curHn8wvrVbWzXtDB
082RUJ9Mmmtvo11runW1/AngZBGi5InbaxK8Zhr2r5Z2k1rrVbSxvE5uEB3jbgZ5q9xa/a
  wgu2OP
HE4k+x1h/ZoZAMd8bak15j1bb1/MVTeNCpWw8v7oMqjj4c/
  WphWw5VxyDSJ6CdYdV9Ynk4cI1swlq
4tYwsqC44GKmCfz29gGz3qxJozYQfmsK/A/W100XyXmV3LbuBjqFOGK86VWsu3gcdC0E1/
  Pavtcs
wHGCc0aBJbcJ51s6h+pu165McudxGXYtx00gFCzXgSJgcRgd+rGjmkim02T9n10Mi1v/
  aoMWOGJ
/wcmhK60cgAX0x/bJJIY1vWeSBtybnU9QBS2aNi5?n79Mc1ndMDsyfQZP9qmbt+
  Mhradpl+0Dc
0 +
tBeQ6ScjkVkdSJNqYt7OMyqAd2Ty3rj4UwhxOqyRZKn6j3GomMmNReiqMu2b7RHWcR1tivaQyf
Y45w0sPOU04x5ERZuTj6UhdUtol3eEFxMowP6F9ce+
  kxQhVhysqIrtdjks9DSJ5W3GvUt7e4h
1jXzHDaqP5BNHw711FrL5YQomFlZaw+
  fNKn7e3jv17DrXs8qoha2aNV0uDuOkEmqxS1xIDHIbIHhu
qQvKs5JRHPEVcaAPZvgasb28gX1VFD+YczoiZG/
  ga2uyj1L3G46qT3rGFeV0otQKDWNk10T0y
F93fS51o5iH1QAZWBJ0/2ipRgWiaQnLsNicDjA6mqaa1DuG2/wAqjqewAqFppz0RHKNR/
  eCtel/x
ArKyvVZmEah+9Wwp/gz8Kyspl0cIZ/3buvi6r/dWVI5Z0x4maF/6wvz/ADNoTB/
  eXf8A8jv1iUCz
aPYXq38EFnUbcfxXYFZWUMQch0LTP4SH+2nx/sn4V1ZXqx/VEz7EF19/50
  bpf8SPgPzrKyAU0A3P
0vx/0q7W7D4qysrzcv7jro/9k=
</uRi>
</text>
<xMmpp Standards Foundation></text>
</org>
</url>
</uri>https://stpeter.im/</uri>
mQINBFETdSbBEACOFv1N3JzIIXn6CkD475KVS9CHDepeYpegcOIPnL5eY1DChEh
/IS1xSI7ReeqiYbNoV9FsI4PKUhnxZ0xAx6LvedAR/Lu1hjkqjgq/gsp8lbeqEilh
G13e6H6HlwL9rAbmGqC477kl8imIPBFC6IE3A4Lq1L1+eue06lUeLKhGq0ykMoxjdi
WrMGkTnVpch5ydLkPm/zo20o8zRgq1PulTeCrXZynNjHLVFN2yvy04Uz05s5u5KV
fs5z7wqUitly6DspTzo6ShgkbV15uz0rqxhsJojigt0XfWznAjaS5FU0ORq9
C1K15cMOUAT8TNfvt0ktxsawDL1ELDVQPy1m7mtzo+FREG+0xU6aAJoMo/Ghb1W1U
U7M9yCiulMls/P/HrfuisosLVZ85wuLQ2jumPe3tK8h15UcxIACpQ1VqIa0QfBe
uLOXJTf8YHdpHdyHT/ZeM11172BKgAo8ydz7U7wJ9D3uazwd29fJfJW70I7A7wO
1f1lzmWdn+M2ygbH0GUMGX5hSa8eOsieR2QoLdn2Fip7kBMTJ2+G5irefjTN/
OQvmJ806eAxDMu24CqgzBkge35n129yzXzn9NcqqrGlor621L3x6cBH5i7
GgW6C6Apb1mpMogV0k475n9FvOS6r14q50sqyKiA30p5uKrIRp2TNAk14wARAQAB
ct2QxzR1iCpYlwudC1Bbmyz5A8bc3RwzXR1cKbdhB1dGvylMlmtPCQ0QJTAQA1
IwUCURMP0iWbAwUcQgHawIBBHU1agkkCvwQaMBAH4BAeAAeAAeOOpJexRaxe2p
6bgQAKpxu87cMDOcE+EG8H19NWXIVyovBzyuHAyZaLKPKhrM2jwI0wBpyISNR
H9gqX1LECVaojaE06xkD8MGc5ZkFfjy3y37J1BWL1Yr7ffXYy2BAXX49eIn6
C19LmBmrmYfvaE6nDNPITZ9N9oUb9vS0nrg036EwteEHAeQvDj017hze+Cv71Z
Qg8j9rZ6khfcQ4s3nStCOaKLQ9Iav4fQxISfUpKnxq6uqH3N]3glvO3w1j+j/fokC
1ItmhcX1c3k/bx632pqRhjEPX0ALMBhmzU2uncia+TE0zeC9ecmg9yXAYCwDncfWy
beIEbte6pm651ML13kAaYqO0H/GqcnncMGN0Mbdatn1WdZ/vkLlojiy7QbocPoQ1UFX
v5491xPfIhrHhW0Dxpr6i4fCqYVMHPrvtusjornKVv1+y0GqrsMMCTcrXJRg
7A0o1yV72tpj3pZfGwosaax1D168B+76jlrIuiHugo/4f+Nd6BII1CZJQ6xjxjxj
462cu02khhU1LTk2zaa0uFUBxuUJhZk/KP2Fay/41X7pvWovRC4iu1ksLsNJKL
PS7E6a4BUExeNfd/L9qOgwU1IIBS8eB98PMLI8xKxgcic3UXMvd91lYHqA+a1bP
NasznmBhwicysgPnGfMsjuRzmqEeGckW/PeNeyp6MlfyfYeQINBFETdSbEAD8
z0E5EPnHupMrkRUj9htek87dn5P/Yh/L/HtptcGk404L/Ck+y3dkh3yeteMeF01PnM
S/Rqk837fU3vOYb95PyXtqgksK5SyUt1KPKvao09KQNWPqWyUWnF6+iAmJimVdua
EVF7j7BHF30ArDl5WvCeXtSvG+v+1+i7g72wdWdpD+zl38036C4yBKjsJW8xW8
Cn2f7D7vNi1E6NChTsz2ZD2V1mgyPRxnwq8S8TEPGC7hsLIWgC33h1e9QjnpW9CPa
mQEnpD6yeCwxCF5u0we02JEOcDwsK1Nbn0gafwF3izib+Gclujtju94JUgV25jATwM
9WtgcfZe404U9DxlB8uWuFQLqQG0RZLztXNMGmHyimJr2vrx3g5xup+j1O
qhi1y7Kbgx8ibmhHEF59h2ZK8vHgmW577TvNiri6N5j31qwVBWbhnu62F01skGny
SiqNRbd0QfhhakcKCK7b1oet8YtCYSyG5Lbzo6HTbgx2uWluThuqjgb1dQGLmMrOhi
Wkl1XRsnn1PmnweyFApens5tasy2Cn9qjpttNdAh7PB8iBuii1mrFT/9XdpvFBA
G3CDV7Q2QbngA166QhL3aMz2P635G83mdATKXQXLHdYjTtn+WFVUF7m4u4lt+L
OcDSwU8IjXQHwyN9P9UrKhusDAUdHFxcq/on/1qVbWArAAQAB1QFBBGbgAABjqQ3
Ew87AhsMMAAe0Et0gJpex2arppfqg/Am+TRu2BbIgwdr3AznSrsaw45DIPXUDH3
udZrQrGuU83Z/aE1i6E/qmmBw2LGaUq0JNlLTQ381yTP+E5Q7j7H7FXVgoh
UyvRmyFy31M9ajg2zZ0L6eZjyjFiFmNa0R0Gud/ub07QZl1kwNlS03h08L0h
wqBHXEOlioi1suNzajKvITbKwKwZ6PHRj1mW1wK40i16VLqHggj792zL3uhML26
63m7imShvz1QcHTwryR5i8c2bNOEkoTzYERiAlp7YHuruS+Qtv13ZPoQbnMUB3a7
13 Acknowledgements

Thanks to Dave Cridland, Todd Herman, Joe Hildebrand, Waqas Hussain, and Matt Miller for their feedback.