                            vCard KIND:device

Abstract

   This document defines a value of "device" for the vCard KIND property
   so that the vCard format can be used to represent computing devices
   such as appliances, computers, or network elements (e.g., a server,
   router, switch, printer, sensor, or phone).

Status of This Memo

   This is an Internet Standards Track document.

   This document is a product of the Internet Engineering Task Force
   (IETF). It represents the consensus of the IETF community. It has
   received public review and has been approved for publication by the
   Internet Engineering Steering Group (IESG). Further information on
   Internet Standards is available in Section 2 of RFC 5741.

   Information about the current status of this document, any errata,
   and how to provide feedback on it may be obtained at
   http://www.rfc-editor.org/info/rfc6869.

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1. Introduction

   Version 4 of the vCard specification [RFC6350] defines a new "KIND"
   property to specify the type of entity that a vCard represents.
   During its work on the base vCard4 specification, the VCARDDAV
   Working Group defined values of "individual", "org", "group", and
   "location" for the KIND property.

   During working group discussion of the document that became
   [RFC6473], consideration was given to defining a more general value
   of "thing", but it was decided to split "thing" into software
   applications and hardware devices and to define only the
   "application" value at that time. Since then, use cases for device
   vCards have emerged. These use cases involve using vCards as a
   primer for inventory and asset tracking data specific to network
   elements. Therefore, this document complements [RFC6473] by defining
   a value of "device" for the KIND property to represent computing
   devices such as appliances, computers, or network elements. In this
   context, the concept of a device is constrained to computing devices
   and thus is distinct from purely mechanical devices such as
   elevators, electric generators, etc., that cannot communicate in any
   way over a network. This does not preclude, however, network-
   attached sensors that are connected to such mechanical devices.

2. Scope

   When the KIND property has a value of "device", the vCard represents
   a computing device such as an appliance, a computer, or a network
   element (e.g., a server, router, switch, printer, sensor, or phone).
   More formally, a "device" is functionally equivalent to the "device"
   object class used in the Lightweight Directory Access Protocol
   [RFC4519] as derived from the Open Systems Interconnection model
   [X.521] [X.200]. However, whereas [X.521] specifies that devices are
   "physical" elements, a device in this context can also be virtual
   such as a virtual machine running within another physical element.
   As one example of the "device" KIND, vCards can be embedded into
   devices at manufacturing time so that basic information such as

serial number, support email, and documentation URL can be retrieved
upon initial deployment. This vCard can be modified after the device
is deployed to contain user-specified data about the device's
characteristics. The vCard data can therefore be used for both asset
tracking and operational purposes.

A device might have a number of embedded vCards for varying purposes.
The process for discovering and accessing these vCards is
purposefully left unspecified in this document, as this process could
rely on any mechanism that makes sense for the device in question.
For example, a device could have one or more of the following vCard
instances:

o The device itself. For example, the FN ("full name") property
   might represent the hostname of a computing device; the URL
   property might represent a website that contains details on where
   to find documentation or get further information about the device;
   the KEY property might represent a digital certificate that was
   provisioned into the device at the time of manufacture
   [IEEE.802.1AR], or a public key certificate previously provisioned
   into the device; and the ADR, GEO, and TZ properties might
   represent the physical address, geographical location, and time
   zone where the device is deployed.

o An organization or person that produces or manufactures the
   device.

o A person or role that maintains or administers the device.

o Application-level vCards as described in [RFC6473] for each
   application installed on the device.

When a device has vCards other than its KIND:device vCard, those
vCards can be linked together with RELATED (see the definition of the
RELATED organizational property in Section 6.6.6 of [RFC6350]). In
multi-vCard instances, the KIND:device vCard would use the RELATED
property to express the relationship with the ancillary vCard(s).
Those supplementary vCards need not use RELATED to point back to the
KIND:device vCard. In this manner, the vCard for the device itself
can be easily distinguished from vCards referring to the vendor
organization, device administrator, and installed applications.

The following base properties make sense for vCards that represent
devices (this list is not exhaustive, and other properties might be
applicable as well):

   *   ADR
   *   EMAIL
   *   FN
   *   GEO
   *   IMPP
   *   KEY
   *   KIND
   *   LANG
   *   LOGO
   *   NOTE
   *   ORG
   *   PHOTO
   *   RELATED
   *   REV
   *   SOURCE
   *   TEL
   *   TZ
   *   UID
   *   URL

Although it might be desirable to define a more fine-grained taxonomy
of devices (e.g., a KIND of "device" with a subtype of "router" or
"computer"), such a taxonomy is out of scope for this document.

3. Example

The following is an example of a router device that contains both
manufacturing details as well as post-deployment attributes and uses
the XML representation of vCard (xCard) described in [RFC6351]. This
vCard points to another, related vCard that contains the details of
an administrative contact for the device. This vCard also leverages
the extensibility of the xCard format to reference additional
namespaces in order to provide richer details about the given device
(e.g., the serial number and software version are specified as xCard
extensions).

```
<vcard xmlns="urn:ietf:params:xml:ns:vcard-4.0">
  <kind><text>device</text></kind>
  <fn>
    <parameters>
      <type><text>x-model-name</text></type>
    </parameters>
    <text>RTR1001</text>
  </fn>
  <fn><text>core-rtr-1.example.net</text></fn>
  <url><uri>http://www.example.com/support/index.html</uri></url>
  <email><text>support@example.com</text></email>
  <email>
    <parameters>
      <type><text>x-local-support</text></type>
    </parameters>
    <text>network-support@example.net</text>
  </email>
  <impp><uri>xmpp:core-rtr-1@example.net</uri></impp>
  <related>
    <parameters>
      <type><text>contact</text></type>
    </parameters>
    <uri>urn:uuid:5CEF1870-0326-11E2-A21F-0800200C9A66</uri>
  </related>
  <logo><uri>http://www.example.com/images/logo.png</uri></logo>
  <geo><uri>geo:35.82,-78.64</uri></geo>
  <tz><text>America/New_York</text></tz>
  <rev><timestamp>20120104T213000Z</timestamp></rev>
  <uid><uri>urn:uuid:00CCFB88-155F-40F6-B9D9-B04D134860C0</uri></uid>
  <serial-number xmlns='http://example.org/profiles/serial-number'>
    FTX1234ABCD
  </serial-number>
  <note>
    <parameters>
      <type><text>x-contract-number</text></type>
    </parameters>
    <text>1234567</text>
  </note>
  <mac xmlns='http://example.org/profiles/mac'>
    00-00-5E-00-00-01
  </mac>
  <sw-version xmlns='http://example.org/profiles/sw-version'>
    2.1.5
  </sw-version>
</vcard>
```

4. IANA Considerations

   IANA has added the following entry to the "vCard Property Values"
   table of the "vCard Elements" registry
   (http://www.iana.org/assignments/vcard-elements):

```
              +----------+--------+---------------------+
              | Property | Value  |      Reference      |
              +----------+--------+---------------------+
              |   KIND   | device | RFC 6869, Section 3 |
              +----------+--------+---------------------+
```

        Table 1: IANA Registration of KIND:device vCard Property Value

   In conformance with Section 10.2.6 of [RFC6350], the registration
   template is as follows:

   Value: device

   Purpose: The entity represented by the vCard is a computing device
      such as an appliance, computer, or network element.

   Conformance: This value can be used with the "KIND" property.

   Example: See Section 3 of RFC 6869.

5. Security Considerations

   Registration of this vCard KIND to represent devices does not in
   itself introduce security considerations beyond those specified for
   vCards in general as described in [RFC6350]. Nevertheless, risks can
   arise for vulnerable Internet-connected devices as a result of the
   publication of the identification details provided by device vCards.
   Well-known publicly accessible device vCard repositories, while not
   defined in this document, can increase the probability of an
   exploitation of an existing vulnerability, especially for devices
   with no good way to update their software or firmware. It is the
   responsibility of the device administrator to adhere to best current
   security practices and employ proper strategies for software upgrades
   and security patches in order to mitigate vulnerability to attack.
   Specifications defining device-specific vCard extensions or profiles
   that might be included in such vCards also need to consider this
   potential increased risk.

6. References

6.1. Normative References

   [RFC6350]   Perreault, S., "vCard Format Specification",
                      RFC 6350, August 2011.

6.2. Informative References

   [IEEE.802.1AR] Institute of Electrical and Electronics Engineers,
                      "Secure Device Identity", IEEE 802.1AR, 2009.

   [RFC4519]   Sciberras, A., "Lightweight Directory Access Protocol
                      (LDAP): Schema for User Applications", RFC 4519,
                      June 2006.

   [RFC6351]   Perreault, S., "xCard: vCard XML Representation",
                      RFC 6351, August 2011.

   [RFC6473]   Saint-Andre, P., "vCard KIND:application", RFC 6473,
                      December 2011.

   [X.200]   International Telecommunication Union, "Information
                      Technology - Open Systems Interconnection - Basic
                      Reference Model: The Basic Model", ITU-T
                      Recommendation X.521, ISO Standard 9594-7,
                      February 2001.

   [X.521]   International Telecommunication Union, "Information
                      Technology - Open Systems Interconnection - The
                      Directory: Selected Object Classes", ITU-T
                      Recommendation X.200, ISO Standard 7498-1, July 1994.

Authors' Addresses

   Gonzalo Salgueiro
   Cisco Systems
   7200-12 Kit Creek Road
   Research Triangle Park, NC 27709
   US

   Phone: +1-919-392-3266
   EMail: gsalguei@cisco.com

   Joe Clarke
   Cisco Systems
   7200-12 Kit Creek Road
   Research Triangle Park, NC 27709
   US

   Phone: +1-919-392-2867
   EMail: jclarke@cisco.com

   Peter Saint-Andre
   Cisco Systems
   1899 Wynkoop Street, Suite 600
   Denver, CO 80202
   US

   Phone: +1-303-308-3282
   EMail: psaintan@cisco.com