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S. Perreault
Viagenie

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# vCard Format Specification
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## Abstract

This document defines the vCard data format for representing and exchanging a variety of information about individuals and other entities (e.g., formatted and structured name and delivery addresses, email address, multiple telephone numbers, photograph, logo, audio clips, etc.). This document obsoletes RFCs 2425, 2426, and 4770, and updates RFC 2739.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on November 27, 2011.

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# 1. Introduction

Electronic address books have become ubiquitous. Their increased presence on portable, connected devices as well as the diversity of platforms exchanging contact data call for a standard. This memo defines the vCard format, which allows the capture and exchange of information normally stored within an address book or directory application.

A high-level overview of the differences from RFCs 2425 and 2426 can be found in Appendix A.

# 2. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

# 3. vCard Format Specification

The text/vcard MIME content type (hereafter known as "vCard", see Section 10.1) contains contact information, typically pertaining to a single contact or group of contacts. The content consists of one or more lines in the format given below.

## 3.1. Charset

The charset (see [RFC3536] for internationalization terminology) for vCard is UTF-8 as defined in [RFC3629]. There is no way to override this. It is invalid to specify a value other than "UTF-8" in the "charset" MIME parameter (see Section 10.1).

## 3.2. Line Delimiting and Folding

Individual lines within vCard are delimited by the [RFC5322] line break, which is a CRLF sequence (U+000D followed by U+000A). Long logical lines of text can be split into a multiple-physical-line representation using the following folding technique. Content lines SHOULD be folded to a maximum width of 75 octets, excluding the line break. Multi-octet characters MUST remain contiguous. The rationale for this folding process can be found in [RFC5322], Section 2.1.1.

A logical line MAY be continued on the next physical line anywhere between two characters by inserting a CRLF immediately followed by a single white space character (space (U+0020) or horizontal tab (U+0009)). The folded line MUST contain at least one character. Any sequence of CRLF followed immediately by a single white space

character is ignored (removed) when processing the content type. For example the line:

```
NOTE:This is a long description that exists on a long line.
```

can be represented as:

```
NOTE:This is a long description
  that exists on a long line.
```

It could also be represented as:

```
NOTE:This is a long descrip
 tion that exists o
 n a long line.
```

The process of moving from this folded multiple-line representation of a property definition to its single line representation is called unfolding. Unfolding is accomplished by regarding CRLF immediately followed by a white space character (namely HTAB (U+0009) or SPACE (U+0020)) as equivalent to no characters at all (i.e., the CRLF and single white space character are removed).

> Note: It is possible for very simple implementations to generate improperly folded lines in the middle of a UTF-8 multi-octet sequence. For this reason, implementations SHOULD unfold lines in such a way as to properly restore the original sequence.
>
> Note: Unfolding is done differently than in [RFC5322]. Unfolding in [RFC5322] only removes the CRLF, not the space following it.

Folding is done after any content encoding of a type value. Unfolding is done before any decoding of a type value in a content line.

### 3.3. ABNF Format Definition

The following ABNF uses the notation of [RFC5234], which also defines CRLF, WSP, DQUOTE, VCHAR, ALPHA, and DIGIT.

```
vcard-entity = 1*vcard

vcard = "BEGIN:VCARD" CRLF
        "VERSION:4.0" CRLF
        1*contentline
        "END:VCARD" CRLF
  ; A vCard object MUST include the VERSION and FN properties.
  ; VERSION MUST come immediately after BEGIN:VCARD.
```

```
   contentline = [group "."] name *(";" param) ":" value CRLF
     ; When parsing a content line, folded lines must first
     ; be unfolded according to the unfolding procedure
     ; described in section 3.2.
     ; When generating a content line, lines longer than 75
     ; characters SHOULD be folded according to the folding
     ; procedure described in section 3.2.

   group = 1*(ALPHA / DIGIT / "-")
   name  = "SOURCE" / "KIND" / "FN" / "N" / "NICKNAME"
         / "PHOTO" / "BDAY" / "ANNIVERSARY" / "GENDER" / "ADR" / "TEL"
         / "EMAIL" / "IMPP" / "LANG" / "TZ" / "GEO" / "TITLE" / "ROLE"
         / "LOGO" / "ORG" / "MEMBER" / "RELATED" / "CATEGORIES"
         / "NOTE" / "PRODID" / "REV" / "SOUND" / "UID" / "CLIENTPIDMAP"
         / "URL" / "KEY" / "FBURL" / "CALADRURI" / "CALURI" / "XML"
         / iana-token / x-name
     ; Parsing of the param and value is based on the "name" as
     ; defined in ABNF sections below.
     ; Group and name are case-insensitive.

   iana-token = 1*(ALPHA / DIGIT / "-")
     ; identifier registered with IANA

   x-name = "x-" 1*(ALPHA / DIGIT / "-")
     ; Names that begin with "x-" or "X-" are
     ; reserved for experimental use, not intended for released
     ; products, or for use in bilateral agreements.

   param = language-param / value-param / pref-param / pid-param
         / type-param / geo-parameter / tz-parameter / sort-as-param
         / calscale-param / any-param
     ; Allowed parameters depend on property name.

   param-value = *SAFE-CHAR / DQUOTE *QSAFE-CHAR DQUOTE

   any-param  = (iana-token / x-name) "=" param-value *("," param-value)

   NON-ASCII = UTF8-2 / UTF8-3 / UTF8-4
     ; UTF8-{2,3,4} are defined in [RFC3629]

   QSAFE-CHAR = WSP / "!" / %x23-7E / NON-ASCII
     ; Any character except CTLs, DQUOTE

   SAFE-CHAR = WSP / "!" / %x23-39 / %x3C-7E / NON-ASCII
     ; Any character except CTLs, DQUOTE, ";", ":"

   VALUE-CHAR = WSP / VCHAR / NON-ASCII
     ; Any textual character
```

A line that begins with a white space character is a continuation of the previous line, as described in Section 3.2. The white space character and immediately preceeding CRLF should be discarded when reconstructing the original line. Note that this line-folding convention differs from that found in [RFC5322], in that the sequence <CRLF><WSP> found anywhere in the content indicates a continued line and should be removed.

Property names and parameter names are case insensitive (e.g., the property name "fn" is the same as "FN" and "Fn"). Parameter values MAY be case-sensitive or case-insensitive, depending on their definition. Parameter values that are not explicitly defined as being case-sensitive are case-insenstive. Based on experience with vCard 3 interoperability, it is RECOMMENDED that property and parameter names be upper-case on output.

The group construct is used to group related properties together. The group name is a syntactic convention used to indicate that all property names prefaced with the same group name SHOULD be grouped together when displayed by an application. It has no other significance. Implementations that do not understand or support grouping MAY simply strip off any text before a "." to the left of the type name and present the types and values as normal.

Property cardinalities are indicated using the following notation, which is based on ABNF (see [RFC5234], section 3.6):

| Cardinality | Meaning |
|---|---|
| 1 | Exactly one instance per vCard MUST be present. |
| *1 | Exactly one instance per vCard MAY be present. |
| 1* | One or more instances per vCard MUST be present. |
| * | One or more instances per vCard MAY be present. |

Properties defined in a vCard instance may have multiple values depending on the property cardinality. The general rule for encoding multi-valued properties is to simply create a new content line for each value (including the property name). However, it should be noted that some value types support encoding multiple values in a single content line by separating the values with a comma ",". This approach has been taken for several of the content types defined below (date, time, integer, float).

### 3.4. Property Value Escaping

Some properties may contain one or more values delimited by a COMMA character (U+002C). Therefore, a COMMA character in a value MUST be escaped with a BACKSLASH character (U+005C), even for properties that don't allow multiple instances (for consistency).

Some properties (e.g. N and ADR) comprise multiple fields delimited by a SEMI-COLON character (U+003B). Therefore, a SEMI-COLON in a field of such a "compound" property MUST be escaped with a BACKSLASH character. SEMI-COLON characters in non-compound properties MAY be escaped. On input, an escaped SEMI-COLON character is never a field separator. An unescaped SEMI-COLON character may be a field separator, depending on the property in which it appears.

Furthermore, some fields of compound properties may contain a list of values delimited by a COMMA character. Therefore, a COMMA character in one of a field's values MUST be escaped with a BACKSLASH character, even for fields that don't allow multiple values (for consistency). Compound properties allowing multiple instances MUST NOT be encoded in a single content line.

Finally, BACKSLASH characters in values MUST be escaped with a BACKSLASH character. NEWLINE (U+000A) characters in values MUST be encoded by two characters: a BACKSLASH followed by either an 'n' (U+006E) or an 'N' (U+004E).

In all other cases, escaping MUST NOT be used.

## 4. Property Value Data Types

Standard value types are defined below.

```
  value = text
        / text-list
        / date-list
        / time-list
        / date-time-list
        / date-and-or-time-list
        / timestamp-list
        / boolean
        / integer-list
        / float-list
        / URI               ; from Section 3 of [RFC3986]
        / utc-offset
        / Language-Tag
        / iana-valuespec
    ; Actual value type depends on property name and VALUE parameter.
```

```
text = *TEXT-CHAR

TEXT-CHAR = "\\" / "\," / "\n" / WSP / NON-ASCII
          / %x21-2B / %x2D-5B / %x5D-7E
   ; Backslashes, commas, and newlines must be encoded.

component = "\\" / "\," / "\;" / "\n" / WSP / NON-ASCII
          / %x21-2B / %x2D-3A / %x3C-5B / %x5D-7E
list-component = component *("," component)

text-list             = text             *("," text)
date-list             = date             *("," date)
time-list             = time             *("," time)
date-time-list        = date-time        *("," date-time)
date-and-or-time-list = date-and-or-time *("," date-and-or-time)
timestamp-list        = timestamp        *("," timestamp)
integer-list          = integer          *("," integer)
float-list            = float            *("," float)

boolean = "TRUE" / "FALSE"
integer = [sign] 1*DIGIT
float   = [sign] 1*DIGIT ["." 1*DIGIT]

sign = "+" / "-"

year   = 4DIGIT  ; 0000-9999
month  = 2DIGIT  ; 01-12
day    = 2DIGIT  ; 01-28/29/30/31 depending on month and leap year
hour   = 2DIGIT  ; 00-23
minute = 2DIGIT  ; 00-59
second = 2DIGIT  ; 00-58/59/60 depending on leap second
zone   = utc-designator / utc-offset
utc-designator = %x5A  ; uppercase "Z"

date          = year    [month  day]
              / year "-" month
              / "--"     month [day]
              / "--"      "-"   day
date-noreduc  = year     month  day
              / "--"     month  day
              / "--"      "-"   day
date-complete = year     month  day

time          = hour [minute [second]] [zone]
              /  "-"  minute [second]  [zone]
              /  "-"   "-"    second   [zone]
time-notrunc  = hour [minute [second]] [zone]
time-complete = hour  minute  second   [zone]
```

```
time-designator = %x54  ; uppercase "T"
date-time = date-noreduc  time-designator time-notrunc
timestamp = date-complete time-designator time-complete

date-and-or-time = date-time / date / time-designator time

utc-offset = sign hour [minute]

Language-Tag = <Language-Tag, defined in [RFC5646], Section 2.1>

iana-valuespec = <value-spec, see Section 12>
                 ; a publicly-defined valuetype format, registered
                 ; with IANA, as defined in section 12 of this
                 ; document
```

### 4.1. TEXT

"text": The "text" value type should be used to identify values that contain human-readable text. As for the language, it is controlled by the LANGUAGE property parameter defined in Section 5.1.

Examples for "text":

```
this is a text value
this is one value,this is another
this is a single value\, with a comma encoded
```

A formatted text line break in a text value type MUST be represented as the character sequence backslash (U+005C) followed by a Latin small letter n (U+006E) or a Latin capital letter N (U+004E), that is "\n" or "\N".

For example a multiple line NOTE value of:

```
Mythical Manager
Hyjinx Software Division
BabsCo, Inc.
```

could be represented as:

```
NOTE:Mythical Manager\nHyjinx Software Division\n
 BabsCo\, Inc.\n
```

demonstrating the \n literal formatted line break technique, the CRLF-followed-by-space line folding technique, and the backslash escape technique.

### 4.2. URI

"uri": The "uri" value type should be used to identify values that are referenced by a Uniform Resource Identifier (URI) instead of encoded in-line. These value references might be used if the value is too large, or otherwise undesirable to include directly. The format for the URI is as defined in Section 3 of [RFC3986]. Note that the value of a property of type "uri" is what the URI points to, not the URI itself.

Examples for "uri":

```
http://www.example.com/my/picture.jpg
ldap://ldap.example.com/cn=babs%20jensen
```

### 4.3. DATE, TIME, DATE-TIME, DATE-AND-OR-TIME, and TIMESTAMP

"date", "time", "date-time", and "timestamp": Each of these value types is based on the definitions in [ISO.8601.2004] standard. Multiple such values can be specified using the comma-separated notation.

Only the basic format is supported.

#### 4.3.1. DATE

A calendar date as specified in [ISO.8601.2004] section 4.1.2.

Reduced accuracy, as specified in [ISO.8601.2004] sections 4.1.2.3 a) and b), but not c), is permitted.

Expanded representation, as specified in [ISO.8601.2004] section 4.1.4, is forbidden.

Truncated representation, as specified in [ISO.8601.2000] sections 5.2.1.3 d), e), and f), is permitted.

Examples for "date":

```
19850412
1985-04
1985
--0412
---12
```

Note the use of YYYY-MM in the second example above. YYYYMM is disallowed to prevent confusion with YYMMDD. Note also that YYYY-MM-DD is disallowed since we are using the basic format instead

of the extended format.

#### 4.3.2. TIME

A time of day as specified in [ISO.8601.2004] section 4.2.

Reduced accuracy, as specified in [ISO.8601.2004] section 4.2.2.3, is permitted.

Representation with decimal fraction, as specified in [ISO.8601.2004] section 4.2.2.4, is forbidden.

The midnight hour is always represented by 00, never 24 (see [ISO.8601.2004] section 4.2.3).

Truncated representation, as specified in [ISO.8601.2000] sections 5.3.1.4 a), b), and c), is permitted.

Examples for "time":

```
102200
1022
10
-2200
--00
102200Z
102200-0800
```

#### 4.3.3. DATE-TIME

A date and time of day combination as specified in [ISO.8601.2004] section 4.3.

Truncation of the date part, as specified in [ISO.8601.2000] section 5.4.2 c), is permitted.

Examples for "date-time":

```
19961022T140000
--1022T1400
---22T14
```

#### 4.3.4. DATE-AND-OR-TIME

Either a DATE-TIME, a DATE, or a TIME value. To allow unambiguous interpretation, a standalone TIME value is always preceded by a "T".

Examples for "date-and-or-time":

```
19961022T140000
--1022T1400
---22T14
19850412
1985-04
1985
--0412
---12
T102200
T1022
T10
T-2200
T--00
T102200Z
T102200-0800
```

#### 4.3.5. TIMESTAMP

A complete date and time of day combination as specified in [ISO.8601.2004] section 4.3.2.

Examples for "timestamp":

```
19961022T140000
19961022T140000Z
19961022T140000-05
19961022T140000-0500
```

### 4.4. BOOLEAN

"boolean": The "boolean" value type is used to express boolean values. These values are case insensitive.

Examples:

```
TRUE
false
True
```

### 4.5. INTEGER

"integer": The "integer" value type is used to express signed integers in decimal format. If sign is not specified, the value is assumed positive "+". Multiple "integer" values can be specified using the comma-separated notation. The maximum value is 9223372036854775807 and the minimum value is -9223372036854775808.

These limits correspond to a signed 64-bit integer using two's-complement arithmetic.

Examples:

```
1234567890
-1234556790
+1234556790,432109876
```

### 4.6. FLOAT

"float": The "float" value type is used to express real numbers. If sign is not specified, the value is assumed positive "+". Multiple "float" values can be specified using the comma-separated notation. Implementations MUST support a precision equal or better than that of the IEEE "binary64" format [IEEE.754.2008].

> Note: Scientific notation is disallowed. Implementors wishing to use their favorite language's %f formatting should be careful.

Examples:

```
20.30
1000000.0000001
1.333,3.14
```

### 4.7. UTC-OFFSET

"utc-offset": The "utc-offset" value type specifies that the property value is a signed offset from UTC. This value type can be specified in the TZ property.

The value type is an offset from Coordinated Universal Time (UTC). It is specified as a positive or negative difference in units of hours and minutes (e.g., +hhmm). The time is specified as a 24-hour clock. Hour values are from 00 to 23, and minute values are from 00 to 59. Hour and minutes are 2-digits with high order zeroes required to maintain digit count. The basic format for ISO 8601 UTC offsets MUST be used.

### 4.8. LANGUAGE-TAG

"language-tag": A single language tag, as defined in [RFC5646].

## 5. Property Parameters

A property can have attributes associated with it. These "property parameters" contain meta-information about the property or the

property value. In some cases the property parameter can be multi-valued in which case the property parameter value elements are separated by a COMMA (U+002C).

Property parameter value elements that contain the COLON (U+003A), SEMICOLON (U+003B) or COMMA (U+002C) character separators MUST be specified as quoted-string text values. Property parameter values MUST NOT contain the DQUOTE (U+0022) character. The DQUOTE character is used as a delimiter for parameter values that contain restricted characters or URI text.

Applications MUST ignore x-param and iana-param values they don't recognize.

### 5.1. LANGUAGE

The LANGUAGE property parameter is used to identify data in multiple languages. There is no concept of "default" language, except as specified by any "Content-Language" MIME header parameter that is present [RFC3282]. The value of the LANGUAGE property parameter is a language tag as defined in Section 2 of [RFC5646].

Examples:

```
ROLE;LANGUAGE=tr:hoca
```

ABNF:

```
language-param = "LANGUAGE=" Language-Tag
  ; Language-Tag is defined in section 2.1 of RFC 5646
```

### 5.2. VALUE

The VALUE parameter is OPTIONAL, used to identify the value type (data type) and format of the value. The use of these predefined formats is encouraged even if the value parameter is not explicitly used. By defining a standard set of value types and their formats, existing parsing and processing code can be leveraged. The predefined data type values MUST NOT be repeated in COMMA separated value lists except within the N, NICKNAME, ADR, and CATEGORIES properties.

ABNF:

```
value-param = "VALUE=" value-type

value-type = "text"
           / "uri"
           / "date"
           / "time"
           / "date-time"
           / "date-and-or-time"
           / "timestamp"
           / "boolean"
           / "integer"
           / "float"
           / "utc-offset"
           / "language-tag"
           / iana-token  ; registered as described in section 12
           / x-name
```

### 5.3. PREF

The PREF parameter is OPTIONAL and is used to indicate that the corresponding instance of a property is preferred by the vCard author. Its value MUST be an integer between 1 and 100 that quantifies the level of preference. Lower values correspond to a higher level of preference, 1 being most preferred.

When the parameter is absent, the default MUST be to interpret the property instance as being least preferred.

Note that the value of this parameter is to be interpreted only in relation to values assigned to other instances of the same property in the same vCard. A given value, or the absence of a value, MUST NOT be interpreted on its own.

This parameter MAY be applied to any property that allows multiple instances.

ABNF:

```
pref-param = "PREF=" (1*2DIGIT / "100")
                     ; An integer between 1 and 100.
```

### 5.4. ALTID

The ALTID parameter is used to "tag" property instances as being alternative representations of the same logical property. For example, translations of a property in multiple languages generates

multiple property instances having different LANGUAGE (Section 5.1) parameter which are tagged with the same ALTID value.

This parameter's value is treated as an opaque string. Its sole purpose is to be compared for equality against other ALTID parameter values.

Two property instances are considered alternative representations of the same logical property if and only if their names as well as the value of their ALTID parameters are identical. Property instances without the ALTID parameter MUST NOT be considered an alternative representation of any other property instance. Values for the ALTID parameter are not globally unique: they MAY be reused for different property names.

Property instances having the same ALTID parameter value count as 1 toward cardinality. Therefore, since N (Section 6.2.2) has cardinality *1 and TITLE (Section 6.6.1) has cardinality *, these three examples would be legal:

```
N;ALTID=1;LANGUAGE=jp:<U+5C71><U+7530>;<U+592A><U+90CE>;;;
N;ALTID=1;LANGUAGE=en:Yamada;Taro;;;
(<U+XXXX> denotes a UTF8-encoded Unicode character.)

TITLE;ALTID=1;LANGUAGE=fr:Patron
TITLE;ALTID=1;LANGUAGE=en:Boss

TITLE;ALTID=1;LANGUAGE=fr:Patron
TITLE;ALTID=1;LANGUAGE=en:Boss
TITLE;ALTID=2;LANGUAGE=en:Chief vCard Evangelist
```

while this one would not:

```
N;ALTID=1;LANGUAGE=jp:<U+5C71><U+7530>;<U+592A><U+90CE>;;;
N:Yamada;Taro;;;
(Two instances of the N property.)
```

and these three would be legal but questionable:

```
TITLE;ALTID=1;LANGUAGE=fr:Patron
TITLE;ALTID=2;LANGUAGE=en:Boss
(Should probably have the same ALTID value.)

TITLE;ALTID=1;LANGUAGE=fr:Patron
TITLE:LANGUAGE=en:Boss
(Second line should probably have ALTID=1.)

N;ALTID=1;LANGUAGE=jp:<U+5C71><U+7530>;<U+592A><U+90CE>;;;
N;ALTID=1;LANGUAGE=en:Yamada;Taro;;;
N;ALTID=1;LANGUAGE=en:Smith;John;;;
(The last line should probably have ALTID=2. But that would be
 illegal because N has cardinality *1.)
```

The ALTID property MAY also be used in may contexts other than with the LANGUAGE parameter. Here's an example with two representations of the same photo in different file formats:

```
PHOTO;ALTID=1:...
PHOTO;ALTID=1;...
```

ABNF:

```
altid-param = "ALTID=" param-value
```

## 5.5. PID

The PID parameter is used to identify a specific property among multiple instances. It plays a role analogous to the UID property (Section 6.7.6) on a per-property instead of per-vCard basis. It MAY appear more than once in a given property. It MUST NOT appear on properties that may have only one instance per vCard. Its value is either a single small positive integer or a pair of small positive integers separated by a dot. Multiple values may be encoded in a single PID parameter by separating the values with a comma ",". See Section 7 for more details on its usage.

ABNF:

```
pid-param = "PID=" pid-value *("," pid-value)
pid-value = 1*DIGIT ["." 1*DIGIT]
```

## 5.6. TYPE

The TYPE parameter has multiple, different uses. In general, it is a way of specifying class characteristics of the associated property. Most of the time, its value is a comma-separated subset of a pre-defined enumeration. In this document, the following properties make

use of this parameter: FN, NICKNAME, PHOTO, ADR, TEL, EMAIL, IMPP, LANG, TZ, GEO, TITLE, ROLE, LOGO, ORG, RELATED, CATEGORIES, NOTE, SOUND, URL, KEY, FBURL, CALADRURI, and CALURI. The TYPE parameter MUST NOT be applied on other properties defined in this document.

The "work" and "home" values act like tags. The "work" value implies that the property is related to an individual's work place, while the "home" value implies that the property is related to an individual's personal life. When neither "work" nor "home" is present, it is implied that the property is related to both an individual's work place and personal life in the case that the KIND property's value is "individual", or to none in other cases.

ABNF:

```
type-param = "TYPE=" type-value *("," type-value)

type-value = "work" / "home" / type-param-tel
           / type-param-related / iana-token / x-name
  ; This is further defined in individual property sections.
```

## 5.7. MEDIATYPE

The MEDIATYPE parameter is used with properties whose value is a URI. Its use is OPTIONAL. It provides a hint to the vCard consumer application about the media type [RFC2046] of the resource identified by the URI. Some URI schemes do not need this parameter. For example, the "data" scheme allows the media type to be explicitly indicated as part of the URI [RFC2397]. Another scheme, "http", provides the media type as part of the URI resolution process, with the Content-Type HTTP header [RFC2616]. The MEDIATYPE parameter is intended to be used with URI schemes that do not provide such functionality (e.g. "ftp" [RFC1738]).

ABNF:

```
mediatype-param = "MEDIATYPE=" mediatype
mediatype = type-name "/" subtype-name *( ";" attribute "=" value )
  ; "attribute" and "value" are from [RFC2045]
  ; "type-name" and "subtype-name" are from [RFC4288]
```

## 5.8. CALSCALE

The CALSCALE parameter is identical to the CALSCALE property in iCalendar (see [RFC5545], section 3.7.1). It is used to define the calendar system in which a date or date-time value is expressed. The only value specified by iCalendar is "gregorian", which stands for the Gregorian system. It is the default when the parameter is

absent. Additional values may be defined in extension documents and registered from IANA (see Section 10.3.4). A vCard implementation MUST ignore properties with a CALSCALE parameter value that it does not understand.

ABNF:

```
calscale-param = "CALSCALE=" calscale-value

calscale-value = "gregorian" / iana-token / x-name
```

## 5.9. SORT-AS

The "sort-as" parameter is used to specify the string to be used for national-language-specific sorting. Without this information, sorting algorithms could incorrectly sort this vCard within a sequence of sorted vCards. When this property is present in a vCard, then the given strings are used for sorting the vCard.

This parameter's value is a comma-separated list which MUST have as many or fewer elements as the corresponding property value has components. This parameter's value is case-sensitive.

ABNF:

```
sort-as-param = "SORT-AS=" sort-as-value

sort-as-value = param-value *("," param-value)
```

Examples: For the case of surname and given name sorting, the following examples define common sort string usage with the N property.

```
FN:Rene van der Harten
N;SORT-AS="Harten,Rene":van der Harten;Rene,J.;Sir;R.D.O.N.

FN:Robert Pau Shou Chang
N;SORT-AS="Pau Shou Chang,Robert":Shou Chang;Robert,Pau;;

FN:Osamu Koura
N;SORT-AS="Koura,Osamu":Koura;Osamu;;

FN:Oscar del Pozo
N;SORT-AS="Pozo,Oscar":del Pozo Triscon;Oscar;;

FN:Chistine d'Aboville
N;SORT-AS="Aboville,Christine":d'Aboville;Christine;;

FN:H. James de Mann
N;SORT-AS="Mann,James":de Mann;Henry,James;;
```

If sorted by surname the results would be:

```
Christine d'Aboville
Rene van der Harten
Osamu Koura
H. James de Mann
Robert Pau Shou Chang
Oscar del Pozo
```

If sorted by given name the results would be:

```
Christine d'Aboville
H. James de Mann
Osamu Koura
Oscar del Pozo
Rene van der Harten
Robert Pau Shou Chang
```

### 5.10. GEO

The GEO parameter can be used to indicate global positioning information that is specific to an address. Its value is the same as that of the GEO property (see Section 6.5.2).

ABNF:

```
geo-parameter = "GEO=" DQUOTE URI DQUOTE
```

### 5.11. TZ

The TZ parameter can be used to indicate time zone information that is specific to an address. Its value is the same as that of the TZ property.

ABNF:

```
tz-parameter = "TZ=" (param-value / DQUOTE URI DQUOTE)
```

## 6. vCard Properties

What follows is an enumeration of the standard vCard properties.

### 6.1. General Properties

#### 6.1.1. BEGIN

Purpose: To denote the beginning of a syntactic entity within a text/vcard content-type.

Value type: text

Cardinality: 1

Special notes: The content entity MUST begin with the BEGIN property with a value of "VCARD". The value is case-insensitive.

The BEGIN property is used in conjunction with the END property to delimit an entity containing a related set of properties within an text/vcard content-type. This construct can be used instead of including multiple vCards as body parts inside of a multipart/alternative MIME message. It is provided for applications that wish to define content that can contain multiple entities within the same text/vcard content-type or to define content that can be identifiable outside of a MIME environment.

ABNF:

```
BEGIN-param = 0" "  ; no parameter allowed
BEGIN-value = "VCARD"
```

Example:

```
BEGIN:VCARD
```

### 6.1.2. END

Purpose: To denote the end of a syntactic entity within a text/vcard content-type.

Value type: text

Cardinality: 1

Special notes: The content entity MUST end with the END type with a value of "VCARD". The value is case-insensitive.

The END property is used in conjunction with the BEGIN property to delimit an entity containing a related set of properties within an text/vcard content-type. This construct can be used instead of or in addition to wrapping separate sets of information inside additional MIME headers. It is provided for applications that wish to define content that can contain multiple entities within the same text/vcard content-type or to define content that can be identifiable outside of a MIME environment.

ABNF:

```
END-param = 0" "  ; no parameter allowed
END-value = "VCARD"
```

Example:

```
END:VCARD
```

### 6.1.3. SOURCE

Purpose: To identify the source of directory information contained in the content type.

Value type: uri

Cardinality: *

Special notes: The SOURCE property is used to provide the means by which applications knowledgable in the given directory service protocol can obtain additional or more up-to-date information from the directory service. It contains a URI as defined in [RFC3986] and/or other information referencing the vCard to which the information pertains. When directory information is available from more than one source, the sending entity can pick what it considers to be the best source, or multiple SOURCE properties can be included.

ABNF:

```
SOURCE-param = "VALUE=uri" / pid-param / pref-param / altid-param
             / mediatype-param / any-param
SOURCE-value = URI
```

Examples:

```
SOURCE:ldap://ldap.example.com/cn=Babs%20Jensen,%20o=Babsco,%20c=US

SOURCE:http://directory.example.com/addressbooks/jdoe/
 Jean%20Dupont.vcf
```

#### 6.1.4. KIND

Purpose: To specify the kind of object the vCard represents.

Value type: A single text value.

Cardinality: *1

Special notes: The value may be one of the following:

"individual" for a vCard representing a single person or entity. This is the default kind of vCard.

"group" for a vCard representing a group of persons or entities. The group's member entities can be other vCards or other types of entities, such as email addresses or web sites. A group vCard will usually contain MEMBER properties to specify the members of the group, but it is not required to. A group vCard without MEMBER properties can be considered an abstract grouping, or one whose members are known empirically (perhaps "IETF Participants" or "Republican U.S. Senators").

All properties in a group vCard apply to the group as a whole, and not to any particular MEMBER. For example, an EMAIL property might specify the address of a mailing list associated with the group, and an IMPP property might refer to a group chat room.

"org" for a vCard representing an organization. An organization vCard will not (in fact, MUST NOT) contain MEMBER properties, and so these are something of a cross between "individual" and "group". An organization is a single entity, but not a person. It might represent a business or government, a department or division within a business or government, a club, an association, or the like.

All properties in an organization vCard apply to the organization as a whole, as is the case with a group vCard. For example, an EMAIL property might specify the address of a contact point for the organization.

"location" for a named geographical place. A location vCard will usually contain a GEO property, but it is not required to. A location vCard without a GEO property can be considered an abstract location, or one whose definition is known empirically (perhaps "New England" or "The Seashore").

All properties in a location vCard apply to the location itself, and not with any entity that might exist at that location. For example, in a vCard for an office building, an ADR property might give the mailing address for the building, and a TEL property might specify the telephone number of the receptionist.

An x-name. vCards MAY include private or experimental values for KIND. Remember that x-name values are not intended for general use, and are unlikely to interoperate.

An iana-token. Additional values may be registered with IANA (see Section 10.3.4). A new value's specification document MUST specify which properties make sense for that new kind of vCard and which do not.

Implementations MUST support the specific string values defined above. If this property is absent, "individual" MUST be assumed as the default. If this property is present but the implementation does not understand its value (the value is an x-name or iana-token that the implementation does not support), the implementation SHOULD act in a neutral way, which usually means treating the vCard as though its kind were "individual". The presence of MEMBER properties MAY, however, be taken as an indication that the unknown kind is an extension of "group".

Clients often need to visually distinguish contacts based on what they represent, and the KIND property provides a direct way for them to do so. For example, when displaying contacts in a list, an icon could be displayed next to each one, using distinctive icons for the different kinds; a client might use an outline of a single person to represent an "individual", an outline of multiple people to represent a "group", and so on. Alternatively, or in addition, a client might choose to segregate different kinds of vCards to different panes, tabs, or selections in the user interface.

Some clients might also make functional distinctions among the kinds, ignoring "location" vCards for some purposes and considering only "location" vCards for others.

When designing those sorts of visual and functional distinctions, client implementations have to decide how to fit unsupported kinds into the scheme. What icon is used for them? The one for "individual"? A unique one, such as an icon of a question-mark? Which tab do they go into? It is beyond the scope of this specification to answer these questions, but these are things implementors need to consider.

ABNF:

```
KIND-param = "VALUE=text" / any-param
KIND-value = "individual" / "group" / "org" / "location"
           / iana-token / x-name
```

Example:

This represents someone named Jane Doe working in the marketing department of the North American division of ABC Inc.

```
BEGIN:VCARD
VERSION:4.0
KIND:individual
FN:Jane Doe
ORG:ABC\, Inc.;North American Division;Marketing
END:VCARD
```

This represents the department itself, commonly known as ABC Marketing.

```
BEGIN:VCARD
VERSION:4.0
KIND:org
FN:ABC Marketing
ORG:ABC\, Inc.;North American Division;Marketing
END:VCARD
```

#### 6.1.5. XML

Purpose: To include extended XML-encoded vCard data in a plain vCard.

Value type: A single text value.

Cardinality: *

Special notes: The content of this property is a single XML 1.0 [W3C.REC-xml-20081126] element whose namespace MUST be explicitly specified using the xmlns attribute and MUST NOT be the vCard 4 namespace ("urn:ietf:params:xml:ns:vcard-4.0"). (This implies that it cannot duplicate a standard vCard property.) The element is to be interpreted as if it was contained in a <vcard> element, as defined in [I-D.ietf-vcarddav-vcardxml].

The fragment is subject to normal line folding and escaping, i.e. replace all backslashes with "\\", then replace all newlines with "\n", then fold long lines.

Support for this property is OPTIONAL, but implementations of this specification MUST preserve instances of this property when propagating vCards.

See [I-D.ietf-vcarddav-vcardxml] for more information on the intended use of this property.

ABNF:

```
XML-param = "VALUE=text" / altid-param
XML-value = text
```

## 6.2. Identification Properties

These types are used to capture information associated with the identification and naming of the entity associated with the vCard.

### 6.2.1. FN

Purpose: To specify the formatted text corresponding to the name of the object the vCard represents.

Value type: A single text value.

Cardinality: 1*

Special notes: This property is based on the semantics of the X.520 Common Name attribute. The property MUST be present in the vCard object.

ABNF:

```
  FN-param = "VALUE=text" / type-param / language-param / altid-param
           / pid-param / pref-param / any-param
  FN-value = text
```

Example:

```
      FN:Mr. John Q. Public\, Esq.
```

### 6.2.2. N

Purpose: To specify the components of the name of the object the vCard represents.

Value type: A single structured text value. Each component can have multiple values.

Cardinality: *1

Special note: The structured property value corresponds, in sequence, to the Family Names (also known as surnames), Given Names, Additional Names, Honorific Prefixes, and Honorific Suffixes. The text components are separated by the SEMI-COLON character (U+003B). Individual text components can include multiple text values separated by the COMMA character (U+002C). This property is based on the semantics of the X.520 individual name attributes. The property SHOULD be present in the vCard object when the name of the object the vCard represents follows the X.520 model.

The SORT-AS parameter MAY be applied to this property.

ABNF:

```
  N-param = "VALUE=text" / sort-as-param / language-param
          / altid-param / any-param
  N-value = list-component 4(";" list-component)
```

Examples:

```
          N:Public;John;Quinlan;Mr.;Esq.

          N:Stevenson;John;Philip,Paul;Dr.;Jr.,M.D.,A.C.P.
```

### 6.2.3. NICKNAME

Purpose: To specify the text corresponding to the nickname of the object the vCard represents.

Value type: One or more text values separated by a COMMA character (U+002C).

Cardinality: *

Special note: The nickname is the descriptive name given instead of or in addition to the one belonging to a the object the vCard represents. It can also be used to specify a familiar form of a proper name specified by the FN or N properties.

ABNF:

```
  NICKNAME-param = "VALUE=text" / type-param / language-param
                 / altid-param / pid-param / pref-param / any-param
  NICKNAME-value = text-list
```

Examples:

```
NICKNAME:Robbie

NICKNAME:Jim,Jimmie

NICKNAME;TYPE=work:Boss
```

### 6.2.4. PHOTO

Purpose: To specify an image or photograph information that annotates some aspect of the object the vCard represents.

Value type: A single URI.

Cardinality: *

ABNF:

```
  PHOTO-param = "VALUE=uri" / altid-param / type-param
              / mediatype-param / pref-param / pid-param / any-param
  PHOTO-value = URI
```

Examples:

```
PHOTO:http://www.example.com/pub/photos/jqpublic.gif

PHOTO:
 AQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05ldHNjYXBlIENvbW11bm
 ljYXRpb25zIENvcnBvcmF0aW9uMRwwGgYDVQQLExNJbmZvcm1hdGlvbiBTeXN0
 <...remainder of base64-encoded data...>
```

### 6.2.5. BDAY

Purpose: To specify the birth date of the object the vCard represents.

Value type: The default is a single date-and-or-time value. It can also be reset to a single text value.

Cardinality: *1

ABNF:

```
BDAY-param = BDAY-param-date / BDAY-param-text
BDAY-value = date-and-or-time / text
  ; Value and parameter MUST match.

BDAY-param-date = "VALUE=date-and-or-time"
BDAY-param-text = "VALUE=text" / language-param

BDAY-param =/ altid-param / calscale-param / any-param
  ; calscale-param can only be present when BDAY-value is
  ; date-and-or-time and actually contains a date or date-time.
```

Examples:

```
BDAY:19960415
BDAY:--0415
BDAY;19531015T231000Z
BDAY;VALUE=text:circa 1800
```

### 6.2.6. ANNIVERSARY

Purpose: The date of marriage, or equivalent, of the object the vCard represents.

Value type: The default is a single date-and-or-time value. It can also be reset to a single text value.

Cardinality: *1

ABNF:

```
ANNIVERSARY-param = "VALUE=" ("date-and-or-time" / "text")
ANNIVERSARY-value = date-and-or-time / text
  ; Value and parameter MUST match.

ANNIVERSARY-param =/ altid-param / calscale-param / any-param
  ; calscale-param can only be present when ANNIVERSARY-value is
  ; date-and-or-time and actually contains a date or date-time.
```

Examples:

```
ANNIVERSARY:19960415
```

### 6.2.7. GENDER

Purpose: To specify the components of the sex and gender identity of the object the vCard represents.

Value type: A single structured value with two components. Each component has a single text value.

Cardinality: *1

Special notes: The components correspond, in sequence, to the sex (biological), and gender identity. Each component is optional.

Sex component: A single letter. M stands for "male", F stands for "female", O stands for "other", N stands for "none or not applicable", U stands for "unknown".

Gender identity component: Free-form text.

ABNF:

```
GENDER-param = "VALUE=text" / any-param
GENDER-value = sex [";" text]

sex = "" / "M" / "F" / "O" / "N" / "U"
```

Examples:

```
GENDER:M
GENDER:F
GENDER:M;Fellow
GENDER:F;grrrl
GENDER:O;intersex
GENDER:;it's complicated
```

### 6.3. Delivery Addressing Properties

These types are concerned with information related to the delivery addressing or label for the vCard object.

#### 6.3.1. ADR

Purpose: To specify the components of the delivery address for the vCard object.

Value type: A single structured text value, separated by the SEMI-COLON character (U+003B).

Cardinality: *

Special notes: The structured type value consists of a sequence of address components. The component values MUST be specified in their corresponding position. The structured type value corresponds, in sequence, to

- the post office box;
- the extended address (e.g. apartment or suite number);
- the street address;
- the locality (e.g., city);
- the region (e.g., state or province);
- the postal code;
- the country name (full name in the language specified in Section 5.1).

When a component value is missing, the associated component separator MUST still be specified.

Experience with vCard 3 has shown that the first two components (post office box and extended address) are plagued with many interoperability issues. To ensure maximal interoperability, their values SHOULD be empty.

The text components are separated by the SEMI-COLON character (U+003B). Where it makes semantic sense, individual text components can include multiple text values (e.g., a "street" component with multiple lines) separated by the COMMA character (U+002C).

The property can include the "PREF" parameter to indicate the preferred delivery address when more than one address is specified.

The GEO and TZ parameters MAY be used with this property.

The property can also include a "LABEL" parameter to present a delivery delivery address label for the address. Its value is a plain-text string representing the formatted address. Newlines are encoded as \n, as they are for property values.

ABNF:

```
label-param = "LABEL=" param-value

ADR-param = "VALUE=text" / label-param / language-param
          / geo-parameter / tz-parameter / altid-param / pid-param
          / pref-param / type-param / any-param
ADR-value = ADR-component-pobox ";" ADR-component-ext ";"
            ADR-component-street ";" ADR-component-locality ";"
            ADR-component-region ";" ADR-component-code ";"
            ADR-component-country
ADR-component-pobox    = list-component
ADR-component-ext      = list-component
ADR-component-street   = list-component
ADR-component-locality = list-component
ADR-component-region   = list-component
ADR-component-code     = list-component
ADR-component-country  = list-component
```

Example: In this example the post office box and the extended address are absent.

```
ADR;GEO="geo:12.3457,78.910";LABEL="Mr. John Q. Public, Esq.\n
 Mail Drop: TNE QB\n123 Main Street\nAny Town, CA  91921-1234\n
 U.S.A.":;;123 Main Street;Any Town;CA;91921-1234;U.S.A.
```

### 6.4. Communications Properties

These properties describe information about how to communicate with the object the vCard represents.

#### 6.4.1. TEL

Purpose: To specify the telephone number for telephony communication with the object the vCard represents.

Value type: By default it is a single free-form text value (for backward compatibility with vCard 3), but it SHOULD be reset to a URI value. It is expected that the URI scheme will be "tel", as specified in [RFC3966], but other schemes MAY be used.

Cardinality: *

Special notes: This property is based on the X.520 Telephone Number attribute.

The property can include the "PREF" parameter to indicate a preferred-use telephone number.

The property can include the parameter "TYPE" to specify intended use for the telephone number. The predefined values for the TYPE parameter are:

| Value | Description |
|---|---|
| text | Indicates that the telephone number supports text messages (SMS). |
| voice | Indicates a voice telephone number. |
| fax | Indicates a facsimile telephone number. |
| cell | Indicates a cellular or mobile telephone number. |
| video | Indicates a video conferencing telephone number. |
| pager | Indicates a paging device telephone number. |
| textphone | Indicates a telecommunication device for people with hearing or speech difficulties.. |

The default type is "voice". These type parameter values can be specified as a parameter list (e.g., TYPE=text;TYPE=voice) or as a value list (e.g., TYPE="text,voice"). The default can be overridden to another set of values by specifying one or more alternate values. For example, the default TYPE of "voice" can be reset to a VOICE and FAX telephone number by the value list TYPE="voice,fax".

If this property's value is a URI that can also be used for instant messaging, the IMPP (Section 6.4.3) property SHOULD be used in addition to this property.

ABNF:

```
  TEL-param = TEL-text-param / TEL-uri-param
  TEL-value = TEL-text-value / TEL-uri-value
    ; Value and parameter MUST match

  TEL-text-param = "VALUE=text"
  TEL-text-value = text

  TEL-uri-param = "VALUE=uri" / mediatype-param
  TEL-uri-value = URI

  TEL-param =/ type-param / pid-param / pref-param / altid-param
             / any-param

  type-param-tel = "text" / "voice" / "fax" / "cell" / "video"
                 / "pager" / "textphone" / iana-token / x-name
    ; type-param-tel MUST NOT be used with a property other than TEL.
```

Example:

```
  TEL;VALUE=uri;PREF=1;TYPE="voice,home":tel:+1-555-555-5555;ext=5555
  TEL;VALUE=uri;TYPE=home:tel:+33-01-23-45-67
```

#### 6.4.2. EMAIL

Purpose: To specify the electronic mail address for communication with the object the vCard represents.

Value type: A single text value.

Cardinality: *

Special notes: The property can include tye "PREF" parameter to indicate a preferred-use email address when more than one is specified.

Even though the value is free-form UTF-8 text, it is likely to be interpreted by an MUA as an "addr-spec", as defined in [RFC5322], section 3.4.1. Readers should also be aware of the current work toward internationalized email addresses [I-D.ietf-eai-rfc5335bis].

ABNF:

```
  EMAIL-param = "VALUE=text" / pid-param / pref-param / type-param
              / altid-param / any-param
  EMAIL-value = text
```

Example:

```
EMAIL;TYPE=work:jqpublic@xyz.example.com

EMAIL;PREF=1:jane_doe@example.com
```

#### 6.4.3. IMPP

Purpose: To specify the URI for instant messaging and presence protocol communications with the object the vCard represents.

Value type: A single URI.

Cardinality: *

Special notes: The property may include the "PREF" parameter to indicate that this is a preferred address and has the same semantics as the "PREF" parameter in a TEL property.

If this property's value is a URI that can be used for voice and/or video, the TEL property (Section 6.4.1) SHOULD be used in addition to this property.

This property is adapted from [RFC4770], which is made obsolete by this document.

ABNF:

```
IMPP-param = "VALUE=uri" / pid-param / pref-param / type-param
           / mediatype-param / altid-param / any-param
IMPP-value = URI
```

Example:

```
IMPP;PREF=1:xmpp:alice@example.com
```

#### 6.4.4. LANG

Purpose: To specify the language(s) that may be used for contacting the entity associated with the vCard.

Value type: A single language-tag value.

Cardinality: *

ABNF:

```
  LANG-param = "VALUE=language-tag" / pid-param / pref-param
             / altid-param / type-param / any-param
  LANG-value = Language-Tag
```

Example:

```
    LANG;TYPE=work;PREF=1:en
    LANG;TYPE=work;PREF=2:fr
    LANG;TYPE=home:fr
```

### 6.5. Geographical Properties

These properties are concerned with information associated with geographical positions or regions associated with the object the vCard represents.

#### 6.5.1. TZ

Purpose: To specify information related to the time zone of the object the vCard represents.

Value type: The default is a single text value. It can also be reset to a single URI or utc-offset value.

Cardinality: *

Special notes: It is expected that names from the public-domain Olson database [TZ-DB] will be used, but this is not a restriction. See also [I-D.lear-iana-timezone-database].

Efforts are currently being directed at creating a standard URI scheme for expressing time zone information. Usage of such a scheme would ensure a high level of interoperability between implementations that support it.

Note that utc-offset values SHOULD NOT be used because the UTC offset varies with time - not just because of the usual daylight saving time shifts that occur in may regions, but often entire regions will "re-base" their overall offset. The actual offset may be +/- 1 hour (or perhaps a little more) than the one given.

ABNF:

```
TZ-param = "VALUE=" ("text" / "uri" / "utc-offset")
TZ-value = text / URI / utc-offset
  ; Value and parameter MUST match

TZ-param =/ altid-param / pid-param / pref-param / type-param
          / mediatype-param / any-param
```

Examples:

```
TZ:Raleigh/North America

TZ;VALUE=utc-offset:-0500
  ; Note: utc-offset format is NOT RECOMMENDED.
```

#### 6.5.2. GEO

Purpose: To specify information related to the global positioning of the object the vCard represents.

Value type: A single URI.

Cardinality: *

Special notes: The "geo" URI scheme [RFC5870] is particularly well-suited for this property, but other schemes MAY be used.

ABNF:

```
GEO-param = "VALUE=uri" / pid-param / pref-param / type-param
          / mediatype-param / altid-param / any-param
GEO-value = URI
```

Example:

```
GEO:geo:37.386013,-122.082932
```

### 6.6. Organizational Properties

These properties are concerned with information associated with characteristics of the organization or organizational units of the object that the vCard represents.

#### 6.6.1. TITLE

Purpose: To specify the position or job of the object the vCard represents.

Value type: A single text value.

Cardinality: *

Special notes: This property is based on the X.520 Title attribute.

ABNF:

```
  TITLE-param = "VALUE=text" / language-param / pid-param
              / pref-param / altid-param / type-param / any-param
  TITLE-value = text
```

Example:

```
        TITLE:Research Scientist
```

### 6.6.2. ROLE

Purpose: To specify the function or part played in a particular situation by the object the vCard represents.

Value type: A single text value.

Cardinality: *

Special notes: This property is based on the X.520 Business Category explanatory attribute. This property is included as an organizational type to avoid confusion with the semantics of the TITLE property and incorrect usage of that property when the semantics of this property is intended.

ABNF:

```
  ROLE-param = "VALUE=text" / language-param / pid-param / pref-param
             / type-param / altid-param / any-param
  ROLE-value = text
```

Example:

```
        ROLE:Project Leader
```

### 6.6.3. LOGO

Purpose: To specify a graphic image of a logo associated with the object the vCard represents.

Value type: A single URI.

Cardinality: *

ABNF:

```
LOGO-param = "VALUE=uri" / language-param / pid-param / pref-param
           / type-param / mediatype-param / altid-param / any-param
LOGO-value = URI
```

Examples:

```
LOGO:http://www.example.com/pub/logos/abccorp.jpg

LOGO:
 AQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05ldHNjYXBlIENvbW11bm
 ljYXRpb25zIENvcnBvcmF0aW9uMRwwGgYDVQQLExNJbmZvcm1hdGlvbiBTeXN0
 <...the remainder of base64-encoded data...>
```

### 6.6.4. ORG

Purpose: To specify the organizational name and units associated with the vCard.

Value type: A single structured text value consisting of components separated by the SEMI-COLON character (U+003B).

Cardinality: *

Special notes: The property is based on the X.520 Organization Name and Organization Unit attributes. The property value is a structured type consisting of the organization name, followed by zero or more levels of organizational unit names.

The SORT-AS parameter MAY be applied to this property.

ABNF:

```
ORG-param = "VALUE=text" / sort-as-param / language-param
          / pid-param / pref-param / altid-param / type-param
          / any-param
ORG-value = component *(";" component)
```

Example: A property value consisting of an organizational name, organizational unit #1 name and organizational unit #2 name.

```
ORG:ABC\, Inc.;North American Division;Marketing
```

#### 6.6.5. MEMBER

Purpose: To include a member in the group this vCard represents.

Value type: A single URI. It MAY refer to something other than a vCard object. For example, an e-mail distribution list could employ the "mailto" URI scheme [RFC6068] for efficiency.

Cardinality: *

Special notes: This property MUST NOT be present unless the value of the KIND property is "group".

ABNF:

```
MEMBER-param = "VALUE=uri" / pid-param / pref-param / altid-param
             / mediatype-param / any-param
MEMBER-value = URI
```

Examples:

```
BEGIN:VCARD
VERSION:4.0
KIND:group
FN:The Doe family
MEMBER:urn:uuid:03a0e51f-d1aa-4385-8a53-e29025acd8af
MEMBER:urn:uuid:b8767877-b4a1-4c70-9acc-505d3819e519
END:VCARD
BEGIN:VCARD
VERSION:4.0
FN:John Doe
UID:urn:uuid:03a0e51f-d1aa-4385-8a53-e29025acd8af
END:VCARD
BEGIN:VCARD
VERSION:4.0
FN:Jane Doe
UID:urn:uuid:b8767877-b4a1-4c70-9acc-505d3819e519
END:VCARD
```

```
BEGIN:VCARD
VERSION:4.0
KIND:group
FN:Funky distribution list
MEMBER:mailto:subscriber1@example.com
MEMBER:xmpp:subscriber2@example.com
MEMBER:sip:subscriber3@example.com
MEMBER:tel:+1-418-555-5555
END:VCARD
```

#### 6.6.6. RELATED

Purpose: To specify a relationship between another entity and the entity represented by this vCard.

Value type: A single URI. It can also be reset to a single text value. The text value can be used to specify textual information.

Cardinality: *

Special notes: The TYPE parameter MAY be used to characterize the related entity. It contains a comma-separated list of values that are registered from IANA as described in Section 10.2. The registry is pre-populated with the values defined in [xfn]. This document also specifies two additional values:

agent: an entity who may sometimes act on behalf of the entity associated with the vCard.

emergency: indicates an emergency contact

ABNF:

```
RELATED-param = RELATED-param-uri / RELATED-param-text
RELATED-value = URI / text
  ; Parameter and value MUST match.

RELATED-param-uri = "VALUE=uri" / mediatype-param
RELATED-param-text = "VALUE=text" / language-param

RELATED-param =/ pid-param / pref-param / altid-param / type-param
                / any-param

type-param-related = related-type-value *("," related-type-value)
  ; type-param-related MUST NOT be used with a property other than
  ; RELATED.

related-type-value = "contact" / "acquaintance" / "friend" / "met"
                   / "co-worker" / "colleague" / "co-resident"
                   / "neighbor" / "child" / "parent"
                   / "sibling" / "spouse" / "kin" / "muse"
                   / "crush" / "date" / "sweetheart" / "me"
                   / "agent" / "emergency"
```

Examples:

```
RELATED;TYPE=friend:urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
RELATED;TYPE=contact:http://example.com/directory/jdoe.vcf
RELATED;TYPE=co-worker;VALUE=text:Please contact my assistant Jane
 Doe for any inquiries.
```

### 6.7. Explanatory Properties

These properties are concerned with additional explanations, such as that related to informational notes or revisions specific to the vCard.

#### 6.7.1. CATEGORIES

Purpose: To specify application category information about the vCard. Also known as "tags".

Value type: One or more text values separated by a COMMA character (U+002C).

Cardinality: *

ABNF:

```
CATEGORIES-param = "VALUE=text" / pid-param / pref-param
                 / type-param / altid-param / any-param
```

```
  CATEGORIES-value = text-list
```

Example:

```
        CATEGORIES:TRAVEL AGENT

        CATEGORIES:INTERNET,IETF,INDUSTRY,INFORMATION TECHNOLOGY
```

#### 6.7.2. NOTE

Purpose: To specify supplemental information or a comment that is associated with the vCard.

Value type: A single text value.

Cardinality: *

Special notes: The property is based on the X.520 Description attribute.

ABNF:

```
  NOTE-param = "VALUE=text" / language-param / pid-param / pref-param
             / type-param / altid-param / any-param
  NOTE-value = text
```

Example:

```
        NOTE:This fax number is operational 0800 to 1715
          EST\, Mon-Fri.
```

#### 6.7.3. PRODID

Purpose: To specify the identifier for the product that created the vCard object.

Type value: A single text value.

Cardinality: *1

Special notes: Implementations SHOULD use a method such as that specified for Formal Public Identifiers in [ISO9070] or for Universal Resource Names in [RFC3406] to ensure that the text value is unique.

ABNF:

```
  PRODID-param = "VALUE=text" / any-param
  PRODID-value = text
```

Example:

```
        PRODID:-//ONLINE DIRECTORY//NONSGML Version 1//EN
```

#### 6.7.4. REV

Purpose: To specify revision information about the current vCard.

Value type: A single timestamp value.

Cardinality: *1

Special notes: The value distinguishes the current revision of the information in this vCard for other renditions of the information.

ABNF:

```
  REV-param = "VALUE=timestamp" / any-param
  REV-value = timestamp
```

Example:

```
        REV:19951031T222710Z
```

#### 6.7.5. SOUND

Purpose: To specify a digital sound content information that annotates some aspect of the vCard. This property is often used to specify the proper pronunciation of the name property value of the vCard.

Value type: A single URI.

Cardinality: *

ABNF:

```
  SOUND-param = "VALUE=uri" / language-param / pid-param / pref-param
              / type-param / mediatype-param / altid-param
              / any-param
  SOUND-value = URI
```

Example:

```
SOUND:CID:JOHNQPUBLIC.part8.19960229T080000.xyzMail@example.com

SOUND:data:audio/basic;base64,MIICajCCAdOgAwIBAgICBEUwDQYJKoZIh
 AQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05ldHNjYXBlIENvbW11bm
 ljYXRpb25zIENvcnBvcmF0aW9uMRwwGgYDVQQLExNJbmZvcm1hdGlvbiBTeXN0
 <...the remainder of base64-encoded data...>
```

### 6.7.6. UID

Purpose: To specify a value that represents a globally unique identifier corresponding to the entity associated with the vCard.

Value type: A single URI value. It MAY also be reset to free-form text.

Cardinality: *1

Special notes: This property is used to uniquely identify the object that the vCard represents. The "uuid" URN namespace defined in [RFC4122] is particularly well-suited to this task, but other URI schemes MAY be used. Free-form text MAY also be used.

ABNF:

```
UID-param = UID-uri-param / UID-text-param
UID-value = UID-uri-value / UID-text-value
  ; Value and parameter MUST match.

UID-uri-param = "VALUE=uri"
UID-uri-value = URI

UID-text-param = "VALUE=text"
UID-text-value = text

UID-param =/ any-param
```

Example:

```
UID:urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6
```

### 6.7.7. CLIENTPIDMAP

Purpose: To give a global meaning to a local PID source identifier.

Value type: A semicolon-separated pair of values. The first field is a small integer corresponding to the second field of a PID parameter instance. The second field is a URI. The "uuid" URN namespace defined in [RFC4122] is particularly well-suited to this

task, but other URI schemes MAY be used.

Cardinality: *

Special notes: PID source identifiers (the source identifier is the second field in a PID parameter instance) are small integers that only have significance within the scope of a single vCard instance. Each distinct source identifier present in a vCard MUST have an associated CLIENTPIDMAP. See Section 7 for more details on the usage of CLIENTPIDMAP.

PID source identifiers MUST be strictly positive. Zero is not allowed.

As a special exception, the PID parameter MUST NOT be applied to this property.

ABNF:

```
CLIENTPIDMAP-param = any-param
CLIENTPIDMAP-value = 1*DIGIT ";" URI
```

Example:

```
TEL;PID=3.1,4.2;VALUE=uri:tel:+1-555-555-5555
EMAIL;PID=4.1,5.2:jdoe@example.com
CLIENTPIDMAP:1;urn:uuid:3df403f4-5924-4bb7-b077-3c711d9eb34b
CLIENTPIDMAP:2;urn:uuid:d89c9c7a-2e1b-4832-82de-7e992d95faa5
```

### 6.7.8. URL

Purpose: To specify a uniform resource locator associated with the object that the vCard refers to. Examples for individuals include personal web sites, blogs, and social networking site identifiers.

Cardinality: *

Value type: A single uri value.

ABNF:

```
URL-param = "VALUE=uri" / pid-param / pref-param / type-param
          / mediatype-param / altid-param / any-param
URL-value = URI
```

Example:

```
URL:http://example.org/restaurant.french/~chezchic.html
```

### 6.7.9. VERSION

Purpose: To specify the version of the vCard specification used to format this vCard.

Value type: A single text value.

Cardinality: 1

Special notes: This property MUST be present in the vCard object, and it must appear immediately after BEGIN:VCARD. The value MUST be "4.0" if the vCard corresponds to this specification. Note that earlier versions of vCard allowed this property to be placed anywhere in the vCard object, or even to be absent.

ABNF:

```
VERSION-param = "VALUE=text" / any-param
VERSION-value = "4.0"
```

Example:

```
VERSION:4.0
```

## 6.8. Security Properties

These properties are concerned with the security of communication pathways or access to the vCard.

### 6.8.1. KEY

Purpose: To specify a public key or authentication certificate associated with the object that the vCard represents.

Value type: A single URI. It can also be reset to a text value.

Cardinality: *

ABNF:

```
KEY-param = KEY-uri-param / KEY-text-param
KEY-value = KEY-uri-value / KEY-text-value
  ; Value and parameter MUST match.

KEY-uri-param = "VALUE=uri" / mediatype-param
KEY-uri-value = URI

KEY-text-param = "VALUE=text"
KEY-text-value = text

KEY-param =/ altid-param / pid-param / pref-param / type-param
           / any-param
```

Examples:

```
KEY:http://www.example.com/keys/jdoe.cer

KEY;MEDIATYPE=application/pgp-keys:ftp://example.com/keys/jdoe

KEY:data:application/pgp-keys;base64,MIICajCCAdOgAwIBAgICBE
 UwDQYJKoZIhvcNAQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05l
 <... remainder of base64-encoded data ...>
```

### 6.9. Calendar Properties

These properties are further specified in [RFC2739].

#### 6.9.1. FBURL

Purpose: To specify the URI for the busy time associated with the object that the vCard represents.

Value type: A single URI value.

Cardinality: *

Special notes: Where multiple FBURL properties are specified, the default FBURL property is indicated with the PREF parameter. The FTP [RFC1738] or HTTP [RFC2616] type of URI points to an iCalendar [RFC5545] object associated with a snapshot of the next few weeks or months of busy time data. If the iCalendar object is represented as a file or document, its file extension should be ".ifb".

ABNF:

```
FBURL-param = "VALUE=uri" / pid-param / pref-param / type-param
            / mediatype-param / altid-param / any-param
```

```
  FBURL-value = URI
```

Examples:

```
  FBURL;PREF=1:http://www.example.com/busy/janedoe
  FBURL;MEDIATYPE=text/calendar:ftp://example.com/busy/project-a.ifb
```

### 6.9.2. CALADRURI

Purpose: To specify the calendar user address [RFC5545] to which a scheduling request [RFC5546] should be sent for the object represented by the vCard.

Value type: A single URI value.

Cardinality: *

Special notes: Where multiple CALADRURI properties are specified, the default CALADRURI property is indicated with the PREF parameter.

ABNF:

```
  CALADRURI-param = "VALUE=uri" / pid-param / pref-param / type-param
                  / mediatype-param / altid-param / any-param
  CALADRURI-value = URI
```

Example:

```
  CALADRURI;PREF=1:mailto:janedoe@example.com
  CALADRURI:http://example.com/calendar/jdoe
```

### 6.9.3. CALURI

Purpose: To specify the URI for a calendar associated with the object represented by the vCard.

Value type: A single URI value.

Cardinality: *

Special notes: Where multiple CALURI properties are specified, the default CALURI property is indicated with the PREF parameter. The property should contain a URI pointing to an iCalendar [RFC5545] object associated with a snapshot of the user's calendar store. If the iCalendar object is represented as a file or document, its file extension should be ".ics".

ABNF:

```
CALURI-param = "VALUE=uri" / pid-param / pref-param / type-param
             / mediatype-param / altid-param / any-param
CALURI-value = URI
```

Examples:

```
CALURI;PREF=1:http://cal.example.com/calA
CALURI;MEDIATYPE=text/calendar:ftp://ftp.example.com/calA.ics
```

### 6.10. Extended Properties and Parameters

The properties and parameters defined by this document can be extended. Non-standard, private properties and parameters with a name starting with "X-" may be defined bilaterally between two cooperating agents without outside registration or standardization.

## 7. Synchronization

vCard data often needs to be synchronized between devices. In this context, synchronization is defined as the intelligent merging of two representations of the same object. vCard 4.0 includes mechanisms to aid this process.

### 7.1. Mechanisms

Two mechanisms are available: the UID property is used to match multiple instances of the same vCard, while the PID parameter is used to match multiple instances of the same property.

The term "matching" is used here to mean recognizing that two instances are in fact representations of the same object. For example, a single vCard that is shared with someone results in two vCard instances. After they have evolved separately, they still represent the same object, and therefore may be matched by a synchronization engine.

#### 7.1.1. Matching vCard Instances

vCard instances for which the UID properties (Section 6.7.6) are equivalent MUST be matched. Equivalence is determined as specified in [RFC3986], Section 6.

In all other cases, vCard instances MAY be matched at the discretion of the synchronization engine.

#### 7.1.2. Matching Property Instances

Property instances belonging to unmatched vCards MUST NOT be matched.

Property instances whose name (e.g. EMAIL, TEL, etc.) is not the same MUST NOT be matched.

Property instances whose name is CLIENTPIDMAP are handled separately and MUST NOT be matched. The synchronization MUST ensure that there is consistency of CLIENTPIDMAPs among matched vCard instances.

Property instances belonging to matched vCards, whose name is the same, and whose maximum cardinality is 1 MUST be matched.

Property instances belonging to matched vCards, whose name is the same, and whose PID parameters match MUST be matched. See Section 7.1.3 for details on PID matching.

In all other cases, property instances MAY be matched at the discretion of the synchronization engine.

#### 7.1.3. PID Matching

Two PID values for which the first fields are equivalent represent the same local value.

Two PID values representing the same local value and for which the second fields point to CLIENTPIDMAP properties whose second field URIs are equivalent (as specified in [RFC3986], Section 6) also represent the same global value.

PID parameters for which at least one pair of their values represent the same global value MUST be matched.

In all other cases, PID parameters MAY be matched at the discretion of the synchronization engine.

For example, PID value "5.1", in the first vCard below, and PID value "5.2", in the second vCard below, represent the same global value.

```
BEGIN:VCARD
VERSION:4.0
EMAIL;PID=4.2,5.1:jdoe@example.com
CLIENTPIDMAP:1;urn:uuid:3eef374e-7179-4196-a914-27358c3e6527
CLIENTPIDMAP:2;urn:uuid:42bcd5a7-1699-4514-87b4-056edf68e9cc
END:VCARD
```

```
BEGIN:VCARD
VERSION:4.0
EMAIL;PID=5.1,5.2:john@example.com
CLIENTPIDMAP:1;urn:uuid:0c75c629-6a8d-4d5e-a07f-1bb35846854d
CLIENTPIDMAP:2;urn:uuid:3eef374e-7179-4196-a914-27358c3e6527
END:VCARD
```

## 7.2. Example

### 7.2.1. Creation

The following simple vCard is first created on a given device.

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN;PID=1.1:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
END:VCARD
```

This new vCard is assigned the UID "urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1" by the creating device. The FN and EMAIL properties are assigned the same local value of 1, and this value is given global context by associating it with "urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556", which represents the creating device. We are at liberty to reuse the same local value since instances of different properties will never be matched. The N property has no PID because it is forbidden by its maximum cardinality of 1.

### 7.2.2. Initial Sharing

This vCard is shared with a second device. Upon inspecting the UID property, the second device understands that this is a new vCard (i.e. unmatched) and thus the synchronization results in a simple copy.

### 7.2.3. Adding and Sharing a Property

A new phone number is created on the first device, then the vCard is shared with the second device. This is what the second device receives:

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN;PID=1.1:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
TEL;PID=1.1;VALUE=uri:tel:+1-555-555-5555
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
END:VCARD
```

Upon inspecting the UID property, the second device matches the vCard it received to the vCard that it already has stored. It then starts comparing the properties of the two vCards in same-named pairs.

The FN properties are matched because the PID parameters have the same global value. Since the property value is the same, no update takes place.

The N properties are matched automatically because their maximum cardinality is 1. Since the property value is the same, no update takes place.

The EMAIL properties are matched because the PID parameters have the same global value. Since the property value is the same, no update takes place.

The TEL property in the new vCard is not matched to any in the stored vCard because no property in the stored vCard has the same name. Therefore, this property is copied from the new vCard to the stored vCard.

The CLIENTPIDMAP property is handled separately by the synchronization engine. It ensures that it is consistent with the stored one. If it was not, the results would be up to the synchronization engine, and thus undefined by this document.

### 7.2.4. Simultaneous Editing

A new email address and a new phone number are added to the vCard on each of the two devices, and then a new synchronization event happens. Here are the vCards that are communicated to each other:

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN;PID=1.1:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
EMAIL;PID=2.1:boss@example.com
TEL;PID=1.1;VALUE=uri:tel:+1-555-555-5555
TEL;PID=2.1;VALUE=uri:tel:+1-666-666-6666
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
END:VCARD
```

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN;PID=1.1:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
EMAIL;PID=2.2:ceo@example.com
TEL;PID=1.1;VALUE=uri:tel:+1-555-555-5555
TEL;PID=2.2;VALUE=uri:tel:+1-666-666-6666
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
CLIENTPIDMAP:2;urn:uuid:1f762d2b-03c4-4a83-9a03-75ff658a6eee
END:VCARD
```

On the first device, the same PID source identifier (1) is reused for the new EMAIL and TEL properties. On the second device, a new source identifier (2) is generated, and a corresponding CLIENTPIDMAP property is created. It contains the second device's identifier, "urn:uuid:1f762d2b-03c4-4a83-9a03-75ff658a6eee".

The new EMAIL properties are unmatched on both sides since the PID global value is new in both cases. The sync thus results in a copy on both sides.

Although the situation appears to be the same for the TEL properties, in this case the synchronization engine is particularly smart and matches the two new TEL properties even though their PID global values are different. Note that in this case, the rules of section Section 7.1.2 state that two properties MAY be matched at the discretion of the synchronization engine. Therefore, the two properties are merged.

All this results in the following vCard which is stored on both devices:

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
EMAIL;PID=2.1:boss@example.com
EMAIL;PID=2.2:ceo@example.com
TEL;PID=1.1;VALUE=uri:tel:+1-555-555-5555
TEL;PID=2.1,2.2;VALUE=uri:tel:+1-666-666-6666
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
CLIENTPIDMAP:2;urn:uuid:1f762d2b-03c4-4a83-9a03-75ff658a6eee
END:VCARD
```

#### 7.2.5. Global Context Simplification

The two devices finish their synchronization procedure by simplifying their global contexts. Since they haven't talked to any other device, the following vCard is for all purposes equivalent to the above. It is also shorter.

```
BEGIN:VCARD
VERSION:4.0
UID:urn:uuid:4fbe8971-0bc3-424c-9c26-36c3e1eff6b1
FN:J. Doe
N:Doe;J.;;;
EMAIL;PID=1.1:jdoe@example.com
EMAIL;PID=2.1:boss@example.com
EMAIL;PID=3.1:ceo@example.com
TEL;PID=1.1;VALUE=uri:tel:+1-555-555-5555
TEL;PID=2.1;VALUE=uri:tel:+1-666-666-6666
CLIENTPIDMAP:1;urn:uuid:53e374d9-337e-4727-8803-a1e9c14e0556
END:VCARD
```

The details of global context simplification are unspecified by this document. They are left up to the synchronization engine. This example is merely intended to illustrate the possibility, which investigating would be, in the authors' opinion, worthwhile.

## 8. Example: Author's vCard

```
BEGIN:VCARD
VERSION:4.0
FN:Simon Perreault
N:Perreault;Simon;;;ing. jr,M.Sc.
BDAY:--0203
ANNIVERSARY:20090808T1430-0500
GENDER:M
LANG;PREF=1:fr
LANG;PREF=2:en
ORG;TYPE=work:Viagenie
ADR;TYPE=work:;Suite D2-630;2875 Laurier;
 Quebec;QC;G1V 2M2;Canada
TEL;VALUE=uri;TYPE="work,voice";PREF=1:tel:+1-418-656-9254;ext=102
TEL;VALUE=uri;TYPE="work,cell,voice,video,text":tel:+1-418-262-6501
EMAIL;TYPE=work:simon.perreault@viagenie.ca
GEO;TYPE=work:geo:46.772673,-71.282945
KEY;TYPE=work;VALUE=uri:
 http://www.viagenie.ca/simon.perreault/simon.asc
TZ:-0500
URL;TYPE=home:http://nomis80.org
END:VCARD
```

## 9. Security Considerations

- Internet mail is often used to transport vCards and is subject to many well known security attacks, including monitoring, replay, and forgery. Care should be taken by any directory service in allowing information to leave the scope of the service itself, where any access controls or confidentiality can no longer be guaranteed. Applications should also take care to display directory data in a "safe" environment

- vCards can carry cryptographic keys or certificates, as described in Section 6.8.1.

- vCards often carry information that can be sensitive (e.g. birthday, address, and phone information). Although vCards have no inherent authentication or confidentiality provisions, they can easily be carried by any security mechanism that transfers MIME objects to address authentication or confidentiality (e.g. S/MIME [RFC5751], OpenPGP [RFC4880]). In cases where the confidentiality or authenticity of information contained in vCard is a concern, the vCard SHOULD be transported using one of these secure mechanisms. The KEY property (Section 6.8.1) can be used to transport the public key used by these mechanisms.

- The information in a vCard may become out of date. In cases where the vitality of data is important to an originator of a vCard, the SOURCE property (Section 6.1.3) SHOULD be specified. In addition, the "REV" type described in section Section 6.7.4 can be specified to indicate the last time that the vCard data was updated.

- Many vCard properties may be used to transport URIs. Please refer to [RFC3986] section 7 for considerations related to URIs.

# 10. IANA Considerations

## 10.1. Media Type Registration

IANA is asked to register the following Media Type (in <http://www.iana.org/assignments/media-types/>), and to mark the text/directory Media Type as DEPRECATED.

To: ietf-types@iana.org

Subject: Registration of media type text/vcard

Type name: text

Subtype name: vcard

Required parameters: none

Optional parameters: version

> The "version" parameter is to be interpreted identically as the VERSION vCard property. If this parameter is present, all vCards in a text/vcard body part MUST have a VERSION property with value identical to that of this MIME parameter.
>
> "charset": as defined for text/plain [RFC2046]; encodings other than UTF-8 [RFC3629] MUST NOT be used.

Encoding considerations: 8bit

Security considerations: See Section 9.

Interoperability considerations: The text/vcard media type is intended to identify vCard data of any version. There are older specifications of vCard [RFC2426][vCard21] still in common use. While these formats are similar, they are not strictly compatible. In general, it is necessary to inspect the value of the VERSION property (see Section 6.7.9) for identifying the standard to which a given vCard object conforms.

In addition, the following media types are known to have been used to refer to vCard data. They should be considered deprecated in favor of text/vcard.

* text/directory

* text/directory; profile=vcard

* text/x-vcard

Published specification: draft-ietf-vcarddav-vcardrev-22

Applications that use this media type: They are numerous, diverse, and include mail user agents, instant messaging clients, address book applications, directory servers, customer relationship management software.

Additional information:

Magic number(s):

File extension(s): .vcf .vcard

Macintosh file type code(s):

Person & email address to contact for further information: vCard discussion mailing list <vcarddav@ietf.org>

Intended usage: COMMON

Restrictions on usage: none

Author: Simon Perreault

Change controller: IETF

### 10.2. Registering New vCard Elements

This section defines the process for registering new or modified vCard elements (i.e. properties, parameters, value data types, and values) with IANA. It does not contain any immediate IANA actions.

#### 10.2.1. Registration Procedure

The IETF will create a mailing list, vcarddav@ietf.org [1], which can be used for public discussion of vCard element proposals prior to registration. Use of the mailing list is strongly encouraged. The IESG will appoint a designated expert who will monitor the

vcarddav@ietf.org [1] mailing list and review registrations.

Registration of new vCard elements MUST be reviewed by the designated expert and published in an RFC. A Standard Track RFC is REQUIRED for the registration of new value data types that modify existing properties. A Standard Track RFC is also REQUIRED for registration of vCard elements that modify vCard elements previously documented in a Standard Track RFC.

The registration procedure begins when a completed registration template, defined in the sections below, is sent to vcarddav@ietf.org [1] and iana@iana.org [2]. The designated expert is expected to tell IANA and the submitter of the registration within two weeks whether the registration is approved, approved with minor changes, or rejected with cause. When a registration is rejected with cause, it can be re-submitted if the concerns listed in the cause are addressed. Decisions made by the designated expert can be appealed to the IESG Applications Area Director, then to the IESG. They follow the normal appeals procedure for IESG decisions.

Once the registration procedure concludes successfully, IANA creates or modifies the corresponding record in the vCard registry. The completed registration template is discarded.

An RFC specifying new vCard elements MUST include the completed registration templates, which MAY be expanded with additional information. These completed templates are intended to go in the body of the document, not in the IANA Considerations section.

Finally, note that there is an XML representation for vCard defined in [I-D.ietf-vcarddav-vcardxml]. An XML representation SHOULD be defined for new vCard elements.

#### 10.2.2. Vendor Namespace

The vendor namespace is used for vCard elements associated with commercially available products. "Vendor" or "producer" are construed as equivalent and very broadly in this context.

A registration may be placed in the vendor namespace by anyone who needs to interchange files associated with the particular product. However, the registration formally belongs to the vendor or organization handling the vCard elements in the namespace being registered. Changes to the specification will be made at their request, as discussed in subsequent sections.

vCard elements belonging to the vendor namespace will be distinguished by the "VND-" prefix. This is followed by an IANA-

registered Private Enterprise Number (PEN), a dash, and a vCard element designation of the vendor's choosing (e.g., "VND-123456-MUDPIE").

While public exposure and review of vCard elements to be registered in the vendor namespace is not required, using the vcarddav@ietf.org [1] mailing list for review is strongly encouraged to improve the quality of those specifications. Registrations in the vendor namespace may be submitted directly to the IANA.

#### 10.2.3. Registration Template for Properties

A property is defined by completing the following template.

Namespace: Empty for the global namespace, "VND-NNNN-" for a vendor-specific property (where NNNN is replaced by the vendor's PEN).

Property name: The name of the property.

Purpose: The purpose of the property. Give a short but clear description.

Value type: Any of the valid value types for the property value needs to be specified. The default value type also needs to be specified.

Cardinality: See Section 6.

Property parameters: Any of the valid property parameters for the property MUST be specified.

Description: Any special notes about the property, how it is to be used, etc.

Format definition: The ABNF for the property definition needs to be specified.

Example(s): One or more examples of instances of the property needs to be specified.

#### 10.2.4. Registration Template for Parameters

A parameter is defined by completing the following template.

Namespace: Empty for the global namespace, "VND-NNNN-" for a vendor-specific property (where NNNN is replaced by the vendor's PEN).

Parameter name: The name of the parameter.

Purpose: The purpose of the parameter. Give a short but clear description.

Description: Any special notes about the parameter, how it is to be used, etc.

Format definition: The ABNF for the parameter definition needs to be specified.

Example(s): One or more examples of instances of the parameter needs to be specified.

#### 10.2.5. Registration Template for Value Data Types

A value data type is defined by completing the following template.

Value name: The name of the value type.

Purpose: The purpose of the value type. Give a short but clear description.

Description: Any special notes about the value type, how it is to be used, etc.

Format definition: The ABNF for the value type definition needs to be specified.

Example(s): One or more examples of instances of the value type needs to be specified.

#### 10.2.6. Registration Template for Values

A value is defined by completing the following template.

Value: The value literal.

Purpose: The purpose of the value. Give a short but clear description.

Conformance: The vCard properties and/or parameters that can take this value needs to be specified.

Example(s): One or more examples of instances of the value needs to be specified.

The following is a fictitious example of a registration of a vCard value:

Value: supervisor

Purpose: It means that the related entity is the direct hierarchical superior (i.e. supervisor or manager) of the entity this vCard represents.

Conformance: This value can be used with the "TYPE" parameter applied on the "RELATED" property.

Example(s):

RELATED;TYPE=supervisor:urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf6

### 10.3. Initial vCard Elements Registries

The IANA is requested to create and maintain the following registries for vCard elements with pointers to appropriate reference documents. The registries will be grouped together under the heading "vCard Elements".

#### 10.3.1. Properties Registry

The following table is to be used to initialize the properties registry.

| Namespace | Property | Reference |
|---|---|---|
| | SOURCE | RFCXXXX, Section 6.1.3 |
| | KIND | RFCXXXX, Section 6.1.4 |
| | XML | RFCXXXX, Section 6.1.5 |
| | FN | RFCXXXX, Section 6.2.1 |
| | N | RFCXXXX, Section 6.2.2 |
| | NICKNAME | RFCXXXX, Section 6.2.3 |
| | PHOTO | RFCXXXX, Section 6.2.4 |
| | BDAY | RFCXXXX, Section 6.2.5 |
| | ANNIVERSARY | RFCXXXX, Section 6.2.6 |
| | GENDER | RFCXXXX, Section 6.2.7 |
| | ADR | RFCXXXX, Section 6.3.1 |
| | TEL | RFCXXXX, Section 6.4.1 |
| | EMAIL | RFCXXXX, Section 6.4.2 |
| | IMPP | RFCXXXX, Section 6.4.3 |
| | LANG | RFCXXXX, Section 6.4.4 |
| | TZ | RFCXXXX, Section 6.5.1 |
| | GEO | RFCXXXX, Section 6.5.2 |
| | TITLE | RFCXXXX, Section 6.6.1 |
| | ROLE | RFCXXXX, Section 6.6.2 |
| | LOGO | RFCXXXX, Section 6.6.3 |
| | ORG | RFCXXXX, Section 6.6.4 |
| | MEMBER | RFCXXXX, Section 6.6.5 |
| | RELATED | RFCXXXX, Section 6.6.6 |
| | CATEGORIES | RFCXXXX, Section 6.7.1 |
| | NOTE | RFCXXXX, Section 6.7.2 |
| | PRODID | RFCXXXX, Section 6.7.3 |
| | REV | RFCXXXX, Section 6.7.4 |
| | SOUND | RFCXXXX, Section 6.7.5 |
| | UID | RFCXXXX, Section 6.7.6 |
| | CLIENTPIDMAP | RFCXXXX, Section 6.7.7 |
| | URL | RFCXXXX, Section 6.7.8 |
| | VERSION | RFCXXXX, Section 6.7.9 |
| | KEY | RFCXXXX, Section 6.8.1 |
| | FBURL | RFCXXXX, Section 6.9.1 |
| | CALADRURI | RFCXXXX, Section 6.9.2 |
| | CALURI | RFCXXXX, Section 6.9.3 |

### 10.3.2. Parameters Registry

The following table is to be used to initialize the parameters registry.

| Namespace | Parameter | Reference |
|---|---|---|
| | LANGUAGE | RFCXXXX, Section 5.1 |
| | VALUE | RFCXXXX, Section 5.2 |
| | PREF | RFCXXXX, Section 5.3 |
| | ALTID | RFCXXXX, Section 5.4 |
| | PID | RFCXXXX, Section 5.5 |
| | TYPE | RFCXXXX, Section 5.6 |
| | MEDIATYPE | RFCXXXX, Section 5.7 |
| | CALSCALE | RFCXXXX, Section 5.8 |
| | SORT-AS | RFCXXXX, Section 5.9 |
| | GEO | RFCXXXX, Section 5.10 |
| | TZ | RFCXXXX, Section 5.11 |

### 10.3.3. Value Data Types Registry

The following table is to be used to initialize the parameters registry.

| Value Data Type | Reference |
|---|---|
| BOOLEAN | RFCXXXX, Section 4.4 |
| DATE | RFCXXXX, Section 4.3.1 |
| TIME | RFCXXXX, Section 4.3.2 |
| DATE-TIME | RFCXXXX, Section 4.3.3 |
| DATE-AND-OR-TIME | RFCXXXX, Section 4.3.4 |
| TIMESTAMP | RFCXXXX, Section 4.3.5 |
| FLOAT | RFCXXXX, Section 4.6 |
| INTEGER | RFCXXXX, Section 4.5 |
| TEXT | RFCXXXX, Section 4.1 |
| URI | RFCXXXX, Section 4.2 |
| UTC-OFFSET | RFCXXXX, Section 4.7 |
| LANGUAGE-TAG | RFCXXXX, Section 4.8 |

### 10.3.4. Values Registries

Separate tables will be used for property and parameter values.

The following table is to be used to initialize the property values registry.

| Property | Value | Reference |
|---|---|---|
| BEGIN | VCARD | RFCXXXX, Section 6.1.1 |
| END | VCARD | RFCXXXX, Section 6.1.2 |
| KIND | individual | RFCXXXX, Section 6.1.4 |
| KIND | group | RFCXXXX, Section 6.1.4 |
| KIND | org | RFCXXXX, Section 6.1.4 |
| KIND | location | RFCXXXX, Section 6.1.4 |

The following table is to be used to initialize the parameter values registry.

| Property | Parameter | Value | Reference |
|---|---|---|---|
| FN, NICKNAME, PHOTO, ADR, TEL, EMAIL, IMPP, LANG, TZ, GEO, TITLE, ROLE, LOGO, ORG, RELATED, CATEGORIES, NOTE, SOUND, URL, KEY, FBURL, CALADRURI, and CALURI | TYPE | work | RFCXXXX, Section 5.6 |
| FN, NICKNAME, PHOTO, ADR, TEL, EMAIL, IMPP, LANG, TZ, GEO, TITLE, ROLE, LOGO, ORG, RELATED, CATEGORIES, NOTE, SOUND, URL, KEY, FBURL, CALADRURI, and CALURI | TYPE | home | RFCXXXX, Section 5.6 |
| TEL | TYPE | text | RFCXXXX, Section 6.4.1 |
| TEL | TYPE | voice | RFCXXXX, Section 6.4.1 |
| TEL | TYPE | fax | RFCXXXX, Section 6.4.1 |
| TEL | TYPE | cell | RFCXXXX, Section 6.4.1 |
| TEL | TYPE | video | RFCXXXX, Section 6.4.1 |
| TEL | TYPE | pager | RFCXXXX, Section 6.4.1 |
| BDAY, ANNIVERSARY | CALSCALE | gregorian | RFCXXXX, Section 6.2.5 |

| | | | |
|---|---|---|---|
| RELATED | TYPE | contact | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | acquaintance | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | friend | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | met | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | co-worker | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | colleague | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | co-resident | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | neighbor | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | child | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | parent | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | sibling | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | spouse | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | kin | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | muse | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | crush | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | date | RFCXXXX, Section 6.6.6 and [xfn] |

| | | | |
|---|---|---|---|
| RELATED | TYPE | sweetheart | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | me | RFCXXXX, Section 6.6.6 and [xfn] |
| RELATED | TYPE | agent | RFCXXXX, Section 6.6.6 |
| RELATED | TYPE | emergency | RFCXXXX, Section 6.6.6 |

## 11. Acknowledgements

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URIs

[1] <mailto:vcarddav@ietf.org>

[2] <mailto:iana@iana.org>

## Appendix A. Differences from RFCs 2425 and 2426

This appendix contains a high-level overview of the major changes that have been made in the vCard specification from RFCs 2425 and 2426. It is incomplete as it only lists the most important changes.

### A.1. New Structure

- [RFC2425] and [RFC2426] have been merged.
- vCard is now not only a MIME type but a stand-alone format.
- A proper MIME type registration form has been included.
- UTF-8 is now the only possible character set.
- New vCard elements can be registered from IANA.

## A.2. Removed Features

- The CONTEXT and CHARSET parameters are no more.
- The NAME, MAILER, LABEL, and CLASS properties are no more.
- The "intl", "dom", "postal", and "parcel" TYPE parameter values for the ADR property have been removed.
- Inline vCards (such as the value of the AGENT property) are no longer supported.

## A.3. New Properties and Parameters

- The KIND, GENDER, LANG, ANNIVERSARY, XML, and CLIENTPIDMAP properties have been added.
- [RFC2739], which defines the FBURL, CALADRURI, CAPURI, and CALURI properties, has been merged in.
- [RFC4770], which defines the IMPP property, has been merged in.
- The "work" and "home" TYPE parameter values are now applicable to many more properties.
- The "pref" value of the TYPE parameter is now a parameter of its own, with a positive integer value indicating the level of preference.
- The ALTID and PID parameters have been added.
- The MEDIATYPE parameter has been added and replaces the TYPE parameter when it was used for indicating the media type of the property's content.

## A.4. Other Changes

- Synchronization is addressed in Section 7.
- The N property is no longer mandatory.
- In the N property, each component may now contain multiple comma-separated values.
- The value of TEL is now a URI.
- The AGENT property was replaced with a type of RELATED.

- Date and time values now only support the basic format. Truncation is now supported.

## Appendix B. Change Log (to be removed by RFC Editor prior to publication)

### B.1. Changes in -22

- Made reference to RFC3536 informative instead of normative.
- Adjusted ABNF for readability (no normative changes).
- Added informative reference to draft-lear-iana-timezone-database.
- Tweaked Appendix A a little bit.
- s/privacy/confidentiality/
- Changed all references to ASCII characters into Unicode code points.
- Added pointer to URI security considerations.
- Adjusted GENDER examples.
- Clearly ask IANA to mark text/directory as DEPRECATED.
- Adjusted updating/obsoleting text in abstract.

### B.2. Changes in -21

- Minor ABNF clarification.

### B.3. Changes in -20

- Reworded security considerations.
- Specified range of integer and float value types.
- Adjusted IANA considerations wording.
- Added missing date-and-or-type to the VALUE ABNF.
- s/vcard@ietf.org/vcarddav@ietf.org/
- More precise wording: charset instead of character set

- Make parameter values case-insensitive by default.
- Escaping newlines can be done with \n or \N.
- Make SORT-AS value case-sensitive.
- Better formatting for ADR special notes.
- Removed Pete Resnick's example vCard.
- vcarddav@ietf.org is the contact person for the media type.
- Add missing pref-param, pid-param, and any-param to the PHOTO property.
- Re-added missing section on UTC-OFFSET value type.

### B.4. Changes in -19

- Fixed nits.
- Fixed MEDIATYPE ABNF.

### B.5. Changes in -18

- Fix missing text in KIND section.

### B.6. Changes in -17

- s/individual/entity/
- Moved section 3.4 for better flow.
- Removed text overriding general MIME and HTTP rules.
- Fixed redundant ABNF.
- Fixed parameter value quoting in examples.
- Added informative reference for Content-Language header.
- Moved cardinality table earlier for better flow.
- Added normative reference for XML 1.0.
- Added informative reference for mailto: scheme.

- Clarified where the VERSION property must go.
- Created the MEDIATYPE parameter.
- Fixed text/vcard encoding considerations.
- Added .vcard file extension.
- Removed need for extension documents to contain tables in their IANA Considerations section.
- Removed underspecified "Status" column in IANA registry.
- Moved obsoleted references to Informative section.
- Moved iCalendar references to Normative section.
- Expanded specification of KIND values.
- Recommend defining an XML representation for new vCard elements.

### B.7. Changes in -16

- RELATED: Added XFN values into IANA registry.
- RELATED: Added values "agent" and "emergency".
- EMAIL is now free-form text, with informative reference to EAI.
- GENDER now has two components: one for biological sex, the other for gender identity.
- Bugfixes to the core ABNF.
- Clarified IANA considerations.
- UID may be reset to free-form text.

### B.8. Changes in -15

- Reverted N to the 5-component format of vCard 3.
- Removed DDAY, BIRTH, and DEATH.
- First two components in ADR SHOULD be empty.
- Removed the LABEL property.

- Removed the binary value type and the ENCODING and FMTTYPE parameters.
- Renamed SEX to GENDER. Set predefined values to "male" and "female".
- Reverted TEL to take a text value by default, but SHOULD be reset to a URI.
- Refer to iCalendar for CALSCALE.
- Removed the "thing" value for KIND.
- RELATED now uses XFN 1.1 for its value.
- Dropped the VERSION parameter. XML MUST be version 1.0.
- Dropped the CLASS property.
- Property and parameter names SHOULD be upper-case.
- Use ABNF for cardinality notation.

### B.9. Changes in -14

- DQUOTE is US-ASCII decimal 34, not 22.
- Removed unused reference to RFC 2046.
- Updated reference to draft-ietf-vcarddav-vcardxml.
- Small fixes to the IANA registration text.
- Added notes on the usage of TEL and IMPP properties.
- Clarified "country name" component of ADR property.
- Removed usage of undefined type value "msg" in TEL example.
- Fixed parameter value quoting rules and ABNF.
- Added example to LANGUAGE property.
- Fixed synchronization example regarding the cardinality of FN.
- Added implementation note for float value type.

- Removed advice for always including VALUE parameter.
- FMTTYPE MUST include the full MIME type.
- Made ADR's ABNF more verbose.
- Organized TEL TYPE values in a table.
- Replaced TOP-SECRET example with NOINDEX.

### B.10. Changes in -13

- Changed global ABNF to make explicit that VERSION comes first.
- Reworked example for LANGUAGE property.
- s/TYPE/FMTTYPE/ in two examples.
- Allow LANGUAGE parameter for text-valued BDAY, DDAY, and RELATED.
- Tightened language on LANGUAGE parameter regarding cardinality.
- Removed the NAME property.
- Adjusted semi-colon escaping rules.
- Added the ALTID parameter.

### B.11. Changes in -12

- Fixed example of LANGUAGE cardinality.
- Added note about YYYY-MM date format.
- Fixed appendix A.
- VERSION property must come first.
- Fixed mistake in PID example.
- Removed two changes from Appendix A which were probably intended to go into this change log section.
- Explicitly state that the value for the BEGIN and END properties is case-insensitive.
- Removed the SORT-STRING property. Created the SORT-AS parameter.

- "T" and "Z" in dates and times are now mandatory uppercase.
- Added the "version" MIME parameter.
- More consistent capitalization.
- Added missing "ANNIVERSARY" in name production rule.
- Added missing calscale-param in param production rule.
- Moved definition of GEO and TZ parameters to section 5.
- Simplified discussion of encoding.
- Removed restriction for "work" and "home" values of TYPE parameter w.r.t. the KIND property.
- XML value may now be binary.
- Created VERSION parameter for XML.
- BIRTH and DEATH can now have URI values.
- Created the FMTTYPE parameter.
- KEY can now take a text value.
- Added references to RFC 5545 (iCalendar).
- Added namespace column in parameters registry.

### B.12. Changes in -11

- Change "XML chunk" to "XML fragment".
- Cite W3C document containing definition of "fragment".
- Added "XML" to property name ABNF.
- Clarified newline escaping rule.
- Replaced one remaining "type" with "property".
- Removed case insensitivity of parameter values.
- XML property can now only contain one element that is not in the vCard 4 namespace.

- Clarified interrelationship between LANGUAGE, cardinality, and PID.
- Added "textphone" TEL type.
- Fixed quoting of comma in ORG examples.

### B.13. Changes in -10

- Added component in SORT-STRING for sorting by given name. Fixed and expanded the examples.
- Fixed KIND-value ABNF.
- Fixed deprecated media type.
- Created the CALSCALE parameter.
- Strenghtened the stance on character set.
- Defined the Language-Tag ABNF.
- Made explicit the fact that IANA does not register templates.
- Created the XML property.
- Added social networking examples to URL property.

### B.14. Changes in -09

- Removed special meaning for groups. Removed the "work" and "home" groups. Removed the group registry. Re-introduced the "work" and "home" TYPE parameter values. Applied the TYPE parameter to properties which supported the "work" and "home" groups.
- Vendor namespace now uses private enterprise number in prefix.
- Added "thing" value for KIND property.

### B.15. Changes in -08

- Allow 1985 (year only) in date ABNF.
- Fixed missing country in ADR example.
- Added the DATE-AND-OR-TIME value.

- Made BDAY and DDAY use DATE-AND-OR-TIME.
- Prefixed "param" and "value" production rules specific to properties with the property name.
- Replaced the GENDER property with the SEX property.
- Added the ANNIVERSARY property.
- Added the "friend" and "spouse" types of RELATED.
- TZ property now has text / uri value.
- Refined the definitions of TITLE and ROLE.

### B.16. Changes in -07

- PREF is now bounded. 100 is the maximum value.
- Added the "emergency" RELATED type.
- Made GEO a URI.
- Added GEO and TZ parameters to ADR.
- Changed wording of "default" use of SOUND property.
- Completely reworked the date, time, and date-time grammars.
- Added the timestamp value type.
- REV now has the timestamp value type.
- Rewrote ABNF.
- ORG can now have a single level.

### B.17. Changes in -06

- Corrected omission of resetability to text value for RELATED.
- Let KEY value type be reset to a URI value.
- ABNF fixes.
- Made gender values extensible.

- Gave the PREF parameter a positive integer value.
- Removed usage of the undefined "word" ABNF production rule.
- Defined property cardinalities.
- Defined properties allowable in WORK and HOME groups.
- Simplified the LANG property to use the vCard preference mechanism.
- Created the "language-tag" value type.
- Added PID to ABNF of SOURCE allowed parameters.
- Clarified escaping rules.
- Changed ABNF definition of non-standard X- properties.
- Removed TYPE parameter from EMAIL properties in examples.
- Created the CLIENTPIDMAP property.
- Changed PID value to a pair of small integers.
- Completely reworked synchronization mechanisms.
- Created brand new synchronization example.

### B.18. Changes in -05

- Added multi PID value proposal.

### B.19. Changes in -04

- Added "location" value for KIND property.
- Some fixes to ABNF.
- Moved "pref" from being a TYPE value to a parameter in its own right.
- Removed the "work" and "home" TYPE values.
- Reintroduced the group construct.
- Assigned meaning to WORK and HOME groups.

- Restricted the TEL TYPE parameter value set.
- In N property, removed additional names, and replaced with multiple given names.
- Removed TYPE parameter from EMAIL and IMPP properties.
- Replaced AGENT with a type of RELATED.
- Use example.org domain in URL example.
- Created initial IANA table of values.
- Defined meaning of PUBLIC, PRIVATE, CONFIDENTIAL.

### B.20. Changes in -03

- Various changes to the synchronization mechanisms.
- Allowed truncated format for dated. See issue #236.

### B.21. Changes in -02

- Removed useless text in IMPP description.
- Added CalDAV-SCHED example to CALADRURI.
- Removed CAPURI property.
- Dashes in dates and colons in times are now mandatory.
- Allow for dates such as 2008 and 2008-05 and times such as 07 and 07:54.
- Removed inline vCard value.
- Made AGENT only accept URI references instead of inline vCards.
- Added the MEMBER property.
- Renamed the UID parameter to PID.
- Changed the value type of the PID parameter to "a small integer."
- Changed the presence of UID and PID when synchronization is to be used from MUST to SHOULD.

- Added the RELATED (Section 6.6.6) property.
- Fixed many ABNF typos (issue #252).
- Changed formatting of ABNF comments to make them easier to read (issue #226).

### B.22. Changes in -01

- Merged [RFC2739] in.
- Converted all foobar.com, abc.com, etc. to example.com.
- Fixed bugs in ABNF.
- Made explicit that coordinates in the GEO property are expressed in the WGS 84 reference system.
- Clarified folding issues with multi-byte characters.
- Made the value of TEL a URI.
- Added the UID parameter.
- Made the UID property's value type a URI.
- Added Section 7.
- Created IANA process for registering new parameters, value types, and properties.
- Created the initial IANA registries.
- Created vendor namespace based on text from RFC 4288.

### B.23. Changes in -00

- Name change because draft has been accepted as WG item. Otherwise, same as draft-resnick-vcarddav-vcardrev-01.
- Removed reference to RFC 2234.
- Fixed errata from http://www.rfc-editor.org/errata_search.php?rfc=2426.
- Removed passage referring to RFC 2425 profiles.

- Renamed Section 6.4 from "Telecommunications Adressing Properties" to "Communications Properties.
- Added Appendix A and Appendix B.
- Added reference to [RFC4770].
- Removed the group construct.
- Made the N property no longer mandatory.
- Added the KIND property.
- Clarified meaning of TYPE parameter value for PHOTO, LOGO, KEY, and SOUND.
- Removed the CONTEXT parameter.
- Removed the MAILER property.
- Made reference to [ISO9070] informative.
- Removed "intl", "dom", "postal", and "parcel" TYPE parameter values for the ADR and LABEL properties.
- Clarified meaning of "extended address" ADR field.
- Mentioned [RFC3406] as another method of generating PRODID values.
- Updated obsolete references.
- Allowed BDAY and DDAY value types to be text values for fuzzy dates.
- Removed the CHARSET property. Now the encoding is always UTF-8, except when overridden by the Content-Type (which is considered a compatibility feature).

Author's Address

Simon Perreault
Viagenie
2875 Laurier, suite D2-630
Quebec, QC G1V 2M2
Canada

Phone: +1 418 656 9254
EMail: simon.perreault@viagenie.ca
URI: http://www.viagenie.ca

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S. Perreault
Viagenie

May 26, 2011

# xCard: vCard XML Representation
# draft-ietf-vcarddav-vcardxml-11

## Abstract

This document defines the XML schema of the vCard data format.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on November 27, 2011.

## Copyright Notice

Table of Contents

## 1. Introduction

vCard [I-D.ietf-vcarddav-vcardrev] is a data format for representing and exchanging information about individuals and other entities. It is a text-based format (as opposed to a binary format). This document defines xCard, an XML [W3C.REC-xml-20081126] representation for vCard. The underlying data structure is exactly the same, enabling a 1-to-1 mapping between the original vCard format and the XML representation. The XML formatting may be preferred in some contexts where an XML engine is readily available and may be reused instead of writing a stand-alone vCard parser.

Earlier work on an XML format for vCard was started in 1998 by Frank Dawson [I-D.dawson-vcard-xml-dtd]. Sadly it did not take over the world.

## 2. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

## 3. The Schema

The schema is expressed in the RELAX NG language [ISO.19757-2.2008] and is found in Appendix A.

## 4. Example: Author's XML vCard

```
<?xml version="1.0" encoding="UTF-8"?>
<vcards xmlns="urn:ietf:params:xml:ns:vcard-4.0">
  <vcard>
    <fn><text>Simon Perreault</text></fn>
    <n>
      <surname>Perreault</surname>
      <given>Simon</given>
      <additional/>
      <prefix/>
      <suffix>ing. jr</suffix>
      <suffix>M.Sc.</suffix>
    </n>
    <bday><date>--0203</date></bday>
    <anniversary>
      <date-time>20090808T1430-0500</date-time>
    </anniversary>
    <gender><sex>M</sex></gender>
    <lang>
      <parameters><pref><integer>1</integer></pref></parameters>
```

```
        <language-tag>fr</language-tag>
      </lang>
      <lang>
        <parameters><pref><integer>2</integer></pref></parameters>
        <language-tag>en</language-tag>
      </lang>
      <org>
        <parameters><type><text>work</text></type></parameters>
        <text>Viagenie</text>
      </org>
      <adr>
        <parameters>
          <type><text>work</text></type>
          <label><text>Simon Perreault
  2875 boul. Laurier, suite D2-630
  Quebec, QC, Canada
  G1V 2M2</text></label>
        </parameters>
        <pobox/>
        <ext/>
        <street>2875 boul. Laurier, suite D2-630</street>
        <locality>Quebec</locality>
        <region>QC</region>
        <code>G1V 2M2</code>
        <country>Canada</country>
      </adr>
      <tel>
        <parameters>
          <type>
            <text>work</text>
            <text>voice</text>
          </type>
        </parameters>
        <uri>tel:+1-418-656-9254;ext=102</uri>
      </tel>
      <tel>
        <parameters>
          <type>
            <text>work</text>
            <text>text</text>
            <text>voice</text>
            <text>cell</text>
            <text>video</text>
          </type>
        </parameters>
        <uri>tel:+1-418-262-6501</uri>
      </tel>
      <email>
```

```
        <parameters><type><text>work</text></type></parameters>
        <text>simon.perreault@viagenie.ca</text>
      </email>
      <geo>
        <parameters><type><text>work</text></type></parameters>
        <uri>geo:46.766336,-71.28955</uri>
      </geo>
      <key>
        <parameters><type><text>work</text></type></parameters>
        <uri>http://www.viagenie.ca/simon.perreault/simon.asc</uri>
      </key>
      <tz><text>America/Montreal</text></tz>
      <url>
        <parameters><type><text>home</text></type></parameters>
        <uri>http://nomis80.org</uri>
      </url>
    </vcard>
  </vcards>
```

## 5. Design Considerations

The general idea is to map vCard parameters, properties, and value types to XML elements. For example, the "FN" property is mapped to the "fn" element. That element in turn contains a text element whose content corresponds to the vCard property's value.

vCard parameters are also mapped to XML elements. They are contained in the <parameters> element, which is contained in property elements. For example, the "TYPE" parameter applied to the "TEL" property would look like the following in XML:

```
  <tel>
    <parameters>
      <type>
        <text>voice</text>
        <text>video</text>
      </type>
    </parameters>
    <uri>tel:+1-555-555-555</uri>
  </tel>
```

Parameters taking a list of values are simply repeated multiple times, once for each value in the list.

Properties having structured values (e.g. the "N" property) are expressed by XML element trees. Element names in that tree (e.g. "surname", "given", etc.) do not have a vCard equivalent since they

are identified by position in plain vCard.

Line folding is a non-issue in XML. Therefore, the mapping from vCard to XML is done after the unfolding procedure is carried out. Conversely, the mapping from XML to vCard is done before the folding procedure is carried out.

A top-level <vcards> element is used as root. It contains one or more <vcard> element, each representing a complete vCard. The <vcards> element MUST be present even when only a single vCard is present in an XML document.

The group construct (Section 3.2 in [I-D.ietf-vcarddav-vcardrev]) is represented with the <group> element. The "name" attribute contains the group's name. For example:

```
<vcards>
  <vcard>
    <group name="contact">
      <fn>...</fn>
      <email>...</email>
    </group>
    <group name="media">
      <photo>...</photo>
    </group>
    <categories>...</categories>
  </vcard>
</vcards>
```

is equivalent to:

```
BEGIN:VCARD
VERSION:4.0
contact.FN=...
contact.EMAIL=...
media.PHOTO=...
CATEGORIES=...
END:VCARD
```

## 5.1. Extensibility

The original vCard format is extensible. New properties, parameters, data types and values (collectively known as vCard elements, not to be confused with XML elements) can be registered with IANA (see [I-D.ietf-vcarddav-vcardrev] section 10.2). It is expected that these vCard extensions will also specify extensions to the XML format described in this document.

New XML vCard property and parameter element names MUST be lower-case. This is necessary to ensure that round-tripping between XML and plain-text vCard works correctly.

Unregistered extensions (i.e. those starting with "X-" and "VND-...-") are expressed in XML by using elements starting with "x-" and "vnd-...-". Usage of XML namespaces [W3C.REC-xml-names-20091208] for extensibility is RECOMMENDED for extensions that have no equivalent in plain text vCard. Refer to Section 6 for the implications when converting between plain-text vCard and XML.

Examples:

```
<x-my-prop>
  <parameters>
    <pref><integer>1</integer></pref>
  </parameters>
  <text>value goes here</text>
<x-my-prop>

<ext:my-prop
    ext:xmlns="http://example.com/extensions/my-vcard">
  <parameters>
    <pref><integer>1</integer></pref>
  </parameters>                 <!-- Core vCard elements  -->
  <text>value goes here</text>  <!-- are still accessible -->
</ext:my-prop>
```

Note that extension elements do not need the "X- or "VND-" prefix in XML. The XML namespace mechanism is sufficient.

A vCard XML parser MUST ignore XML elements and attributes for which it doesn't recognize the expanded name. The normal behaviour of ignoring XML processing instructions whose target is not recognized MUST also be followed.

In the original vCard format, the "VERSION" property was mandatory and played a role in extensibility. In XML, this property is absent. Its role is played by the vCard core namespace identifier, which includes the version number. vCard revisions will use a different namespace.

Parameters containing a list of values are expressed using a list of elements in XML (e.g. the <type> element).

### 5.2. Limitations

The schema does not validate the cardinality of properties. This is a limitation of the schema definition language. Cardinalities of the original vCard format [I-D.ietf-vcarddav-vcardrev] MUST still be respected.

Some constructs (e.g. value enumerations in type parameters) have additional ordering constraints in XML. This is a result of limitations of the schema definition language and the order is arbitrary. The order MUST be respected in XML for the vCard to be valid. However, reordering as part of conversion to or from plain vCard MAY happen.

## 6. Format Conversions

When new properties or "X-" proeprties used, a vCard<->xCard converter might not recognize them, and know what the appropriate default value types are, yet they need to be able to preserve the values. A similar issue arises for unrecognized property parameters. As a result, the following rules are applied when dealing with unrecognized properties and property parameters:

- When converting from vCard to xCard:
  - Any property that does not include a "VALUE" parameter and whose default value type is not known MUST be converted using the value type XML element <unknown>. The content of that element is the unprocessed value text.
  - Any unrecognized property parameter MUST be converted using the value type XML element <unknown>, with its content set to the parameter value text, treated as if it were a text value, or list of text values.
  - The content of "XML" properties is copied as-is to XML.
  - Property and parameter XML element names are converted to lower-case.
  - Property value escaping is undone. For example, "\n" becomes a NEWLINE character (ASCII decimal 10).
  - Double-quoting of parameter values, as well as backslash escaping in parameter values, is undone. For example, PARAM="\"foo\",\"bar\"" becomes <param>"foo","bar"</param>.

- When converting xCard to vCard:
  - Properties in the vCard 4 namespace:
    - If the converter knows of a specific plain-text representation for this property, it uses it. For example, the <adr> element corresponds to the "ADR" property, which is encoded using comma-separated lists separated by semi-colons.
    - Otherwise, the property name is taken from the element name, property parameters are taken from the <parameters> element, and the content of the property is taken from the content of the value element. If the property element has attributes or contains other XML elements, they are dropped.
    - If a standard property's XML element contains XML elements and attributes for which the converter doesn't recognize the expanded name, they are dropped. Therefore, it is RECOMMENDED to limit extensions to the property level to ensure that all data is preserved intact in round-trip conversions.
  - Properties in other namespaces are wrapped as-is inside an "XML" property.
  - Any <unknown> property value XML elements are converted directly into vCard values. The containing property MUST NOT have a "VALUE" parameter.
  - Any <unknown> parameter value XML elements are converted as if they were <text> value type XML elements.
  - Property and parameter names are converted to upper-case.
  - Property value escaping (Section 3.3 of [I-D.ietf-vcarddav-vcardrev]) is carried out. For example, a NEWLINE character (ASCII decimal 10) becomes "\n".
  - Double-quoting of parameter values, as well as backslash escaping in parameter values, is carried out. For example, <param>"foo","bar"</param> becomes PARAM="\"foo\",\"bar\"".

For example, these two vCards are equivalent:

```
<?xml version="1.0"?>
<vcards xmlns="urn:ietf:params:xml:ns:vcard-4.0">
  <vcard>
    <fn><text>J. Doe</text></fn>
    <n>
      <surname>Doe</surname>
      <given>J.</given>
      <additional/>
      <prefix/>
      <suffix/>
    </n>
    <x-file>
      <parameters>
        <mediatype><text>image/jpeg</text></mediatype>
      </parameters>
      <unknown>alien.jpg</unknown>
    </x-file>
    <a xmlns="http://www.w3.org/1999/xhtml"
       href="http://www.example.com">My web page!</a>
  </vcard>
</vcards>
```

```
BEGIN:VCARD
VERSION:4.0
FN:J. Doe
N:Doe;J.;;
X-FILE;MEDIATYPE=image/jpeg:alien.jpg
XML:<a xmlns="http://www.w3.org/1999/xhtml"\n
    href="http://www.example.com">My web page!</a>
END:VCARD
```

## 7. Security Considerations

All the security considerations applicable to plain vCard [I-D.ietf-vcarddav-vcardrev] are applicable to this document as well.

XML Signature [W3C.CR-xmldsig-core1-20110303] and XML Encryption [W3C.CR-xmlenc-core1-20110303] can be used with xCard to provide authentication and confidentiality.

## 8. IANA Considerations

### 8.1. Registration of the XML Namespace

URI: urn:ietf:params:xml:ns:vcard-4.0

Registrant Contact: Simon Perreault <simon.perreault@viagenie.ca>

XML: None. Namespace URIs do not represent an XML specification.

### 8.2. Media Type

This section defines the MIME media type [RFC4288] for use with vCard-in-XML data.

To: ietf-types@iana.org

Subject: Registration of media type application/vcard+xml

Type name: application

Subtype name: vcard+xml

Required parameters: none

Optional parameters: charset as defined for application/xml in [RFC3023]; per [RFC3023], use of the charset parameter with the value "utf-8" is "STRONGLY RECOMMENDED"

Encoding considerations: Same as encoding considerations of application/xml as specified in [RFC3023]

Security considerations: This media type has all of the security considerations described in [RFC3023], plus those listed in Section 7.

Interoperability considerations: This media type provides an alternative syntax to vCard data [I-D.ietf-vcarddav-vcardrev] based on XML.

Published specification: This specification.

Applications which use this media type: Applications that currently make use of the text/vcard media type can use this as an alternative. In general, applications that maintain or process contact information can use this media type.

Additional information:

Magic number(s): none

File extension(s): XML data should use ".xml" as the file extension.

Macintosh file type code(s): none

Person & email address to contact for further information: Simon Perreault <simon.perreault@viagenie.ca>

Intended usage: COMMON

Restrictions on usage: none

Author: Simon Perreault

Change controller: IETF

## 9. Acknowledgements

Thanks to the following people for their input:

Alexey Melnikov, Barry Leiba, Bjorn Hoehrmann, Cyrus Daboo, Joe Hildebrand, Joseph Smarr, Marc Blanchet, Mike Douglas, Peter Saint-Andre, Robins George, Zahhar Kirillov, Zoltan Ordogh.

## 10. References

### 10.1. Normative References

[I-D.ietf-vcarddav-vcardrev] Perreault, S., "vCard Format Specification", draft-ietf-vcarddav-vcardrev-20 (work in progress), May 2011.

[ISO.19757-2.2008] International Organization for Standardization, "Information technology -- Document Schema Definition Language (DSDL) -- Part 2: Regular-grammar-based validation -- RELAX NG", ISO International Standard 19757-2, October 2008.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3023] Murata, M., St. Laurent, S., and D. Kohn, "XML Media Types", RFC 3023, January 2001.

[W3C.REC-xml-20081126] Yergeau, F., Maler, E., Paoli, J., Sperberg-McQueen, C., and T. Bray, "Extensible Markup Language (XML) 1.0 (Fifth Edition)", World Wide Web Consortium Recommendation REC-xml-20081126, November 2008, <http://www.w3.org/TR/2008/REC-xml-20081126>.

[W3C.REC-xml-names-20091208] Tobin, R., Hollander, D., Thompson, H., Bray, T., and A. Layman, "Namespaces in XML 1.0 (Third Edition)", World Wide Web Consortium Recommendation REC-xml-names-20091208, December 2009, <http://www.w3.org/TR/2009/REC-xml-names-20091208>.

## 10.2. Informative References

[I-D.dawson-vcard-xml-dtd] Dawson, F., "The vCard v3.0 XML DTD", draft-dawson-vcard-xml-dtd-03 (work in progress), June 1998.

[RFC4288] Freed, N. and J. Klensin, "Media Type Specifications and Registration Procedures", BCP 13, RFC 4288, December 2005.

[W3C.CR-xmldsig-core1-20110303] Reagle, J., Roessler, T., Solo, D., Yiu, K., Eastlake, D., Nystroem, M., and F. Hirsch, "XML Signature Syntax and Processing Version 1.1", World Wide Web Consortium CR CR-xmldsig-core1-20110303, March 2011, <http://www.w3.org/TR/2011/CR-xmldsig-core1-20110303>.

[W3C.CR-xmlenc-core1-20110303] Eastlake, D., Reagle, J., Hirsch, F., and T. Roessler, "XML Encryption Syntax and Processing Version 1.1", World Wide Web Consortium CR CR-xmlenc-core1-20110303, March 2011, <http://www.w3.org/TR/2011/

CR-xmlenc-core1-20110303>.

## Appendix A. Relax NG Schema

```
default namespace = "urn:ietf:params:xml:ns:vcard-4.0"

### Section 3.3: vCard Format Specification
#
# 3.3
iana-token = xsd:string { pattern = "[a-zA-Z0-9-]+" }
x-name = xsd:string { pattern = "x-[a-zA-Z0-9-]+" }

### Section 4: Value types
#
# 4.1
value-text = element text { text }
value-text-list = value-text+

# 4.2
value-uri = element uri { xsd:anyURI }

# 4.3.1
value-date = element date {
    xsd:string { pattern = "\d{8}|\d{4}-\d\d|--\d\d(\d\d)?|---\d\d" }
  }

# 4.3.2
value-time = element time {
    xsd:string { pattern = "(\d\d(\d\d(\d\d)?)?|-\d\d(\d\d?)|--\d\d)"
                         ~ "(Z|[+\-]\d\d(\d\d)?)?" }
  }

# 4.3.3
value-date-time = element date-time {
    xsd:string { pattern = "(\d{8}|--\d{4}|---\d\d)T\d\d(\d\d(\d\d)?)?"
                         ~ "(Z|[+\-]\d\d(\d\d)?)?" }
  }

# 4.3.4
value-date-and-or-time = value-date | value-date-time | value-time

# 4.3.5
value-timestamp = element timestamp {
    xsd:string { pattern = "\d{8}T\d{6}(Z|[+\-]\d\d(\d\d)?)?" }
  }

# 4.4
value-boolean = element boolean { xsd:boolean }
```

```
# 4.5
value-integer = element integer { xsd:integer }

# 4.6
value-float = element float { xsd:float }

# 4.7
value-utc-offset = element utc-offset {
    xsd:string { pattern = "[+\-]\d\d(\d\d)?" }
  }

# 4.8
value-language-tag = element language-tag {
    xsd:string { pattern = "([a-z]{2,3}((-[a-z]{3}){0,3})?|[a-z]{4,8})"
                         ~ "(-[a-z]{4})?(-([a-z]{2}|\d{3}))?"
                         ~ "(-([0-9a-z]{5,8}|\d[0-9a-z]{3}))*"
                         ~ "(-[0-9a-wyz](-[0-9a-z]{2,8})+)*"
                         ~ "(-x(-[0-9a-z]{1,8})+)?|x(-[0-9a-z]{1,8})+|"
                         ~ "[a-z]{1,3}(-[0-9a-z]{2,8}){1,2}" }
  }

### Section 5: Parameters
#
# 5.1
param-language = element language { value-language-tag }?

# 5.2
param-pref = element pref {
    element integer {
      xsd:integer { minInclusive = "1" maxInclusive = "100" }
    }
  }?

# 5.4
param-altid = element altid { value-text }?

# 5.5
param-pid = element pid {
    element text { xsd:string { pattern = "\d+(\.\d+)?" } }+
  }?

# 5.6
param-type = element type { element text { "work" | "home" }+ }?

# 5.7
param-mediatype = element mediatype { value-text }?

# 5.8
```

```
param-calscale = element calscale { element text { "gregorian" } }?

# 5.9
param-sort-as = element sort-as { value-text+ }?

# 5.10
param-geo = element geo { value-uri }?

# 5.11
param-tz = element tz { value-text | value-uri }?

### Section 6: Properties
#
# 6.1.3
property-source = element source {
    element parameters { param-altid, param-pid, param-pref,
                         param-mediatype },
    value-uri
  }

# 6.1.4
property-kind = element kind {
    element text { "individual" | "group" | "org" | "location" |
                   x-name | iana-token }*
  }

# 6.2.1
property-fn = element fn {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type }?,
    value-text
  }

# 6.2.2
property-n = element n {
    element parameters { param-language, param-sort-as, param-altid }?,
    element surname { text }+,
    element given { text }+,
    element additional { text }+,
    element prefix { text }+,
    element suffix { text }+
  }

# 6.2.3
property-nickname = element nickname {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type }?,
    value-text-list
```

```
  }

# 6.2.4
property-photo = element photo {
    element parameters { param-altid, param-pid, param-pref, param-type,
                         param-mediatype }?,
    value-uri
  }

# 6.2.5
property-bday = element bday {
    element parameters { param-altid, param-calscale }?,
    (value-date-and-or-time | value-text)
  }

# 6.2.6
property-anniversary = element anniversary {
    element parameters { param-altid, param-calscale }?,
    (value-date-and-or-time | value-text)
  }

# 6.2.7
property-gender = element gender {
    element sex { "" | "M" | "F" | "O" | "N" | "U" },
    element identity { text }?
  }

# 6.3.1
param-label = element label { value-text }?
property-adr = element adr {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type, param-geo, param-tz,
                         param-label }?,
    element pobox { text }+,
    element ext { text }+,
    element street { text }+,
    element locality { text }+,
    element region { text }+,
    element code { text }+,
    element country { text }+
  }

# 6.4.1
property-tel = element tel {
    element parameters {
      param-altid,
      param-pid,
      param-pref,
```

```
      element type {
        element text { "work" | "home" | "text" | "voice"
                     | "fax" | "cell" | "video" | "pager"
                     | "textphone" }+
      }?,
      param-mediatype
    }?,
    (value-text | value-uri)
  }

# 6.4.2
property-email = element email {
    element parameters { param-altid, param-pid, param-pref,
                         param-type }?,
    value-text
  }

# 6.4.3
property-impp = element impp {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# 6.4.4
property-lang = element lang {
    element parameters { param-altid, param-pid, param-pref,
                         param-type }?,
    value-language-tag
  }

# 6.5.1
property-tz = element tz {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    (value-text | value-uri | value-utc-offset)
  }

# 6.5.2
property-geo = element geo {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# 6.6.1
property-title = element title {
    element parameters { param-language, param-altid, param-pid,
```

```
                          param-pref, param-type }?,
    value-text
  }

# 6.6.2
property-role = element role {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type }?,
    value-text
  }

# 6.6.3
property-logo = element logo {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type, param-mediatype }?,
    value-uri
  }

# 6.6.4
property-org = element org {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type, param-sort-as }?,
    value-text-list
  }

# 6.6.5
property-member = element member {
    element parameters { param-altid, param-pid, param-pref,
                         param-mediatype }?,
    value-uri
  }

# 6.6.6
property-related = element related {
    element parameters {
      param-altid,
      param-pid,
      param-pref,
      element type {
        element text {
          "work" | "home" | "contact" | "acquaintance" |
          "friend" | "met" | "co-worker" | "colleague" | "co-resident" |
          "neighbor" | "child" | "parent" | "sibling" | "spouse" |
          "kin" | "muse" | "crush" | "date" | "sweetheart" | "me" |
          "agent" | "emergency"
        }+
      }?,
      param-mediatype
```

```
    }?,
    (value-uri | value-text)
  }

# 6.7.1
property-categories = element categories {
    element parameters { param-altid, param-pid, param-pref,
                         param-type }?,
    value-text-list
  }

# 6.7.2
property-note = element note {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type }?,
    value-text
  }

# 6.7.3
property-prodid = element prodid { value-text }

# 6.7.4
property-rev = element rev { value-timestamp }

# 6.7.5
property-sound = element sound {
    element parameters { param-language, param-altid, param-pid,
                         param-pref, param-type, param-mediatype }?,
    value-uri
  }

# 6.7.6
property-uid = element uid { value-uri }

# 6.7.7
property-clientpidmap = element clientpidmap {
    element sourceid { xsd:positiveInteger },
    value-uri
  }

# 6.7.8
property-url = element url {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# 6.8.1
```

```
property-key = element key {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    (value-uri | value-text)
  }

# 6.9.1
property-fburl = element fburl {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# 6.9.2
property-caladruri = element caladruri {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# 6.9.3
property-caluri = element caluri {
    element parameters { param-altid, param-pid, param-pref,
                         param-type, param-mediatype }?,
    value-uri
  }

# Top-level grammar
property = property-adr | property-anniversary | property-bday
         | property-caladruri | property-caluri | property-categories
         | property-clientpidmap | property-email | property-fburl
         | property-fn | property-geo | property-impp | property-key
         | property-kind | property-lang | property-logo
         | property-member | property-n | property-nickname
         | property-note | property-org | property-photo
         | property-prodid | property-related | property-rev
         | property-role | property-gender | property-sound
         | property-source | property-tel | property-title
         | property-tz | property-uid | property-url
start = element vcards {
    element vcard {
      (property
       | element group {
           attribute name { text },
           property*
         })+
    }+
  }
```

## Appendix B. Change Log (to be removed by RFC Editor prior to publication)

### B.1. Changes in -11

- Refer to ISO standard for Relax NG.
- Adjust text on vCard extensibility through IANA.
- Add missing case conversion rules.
- Refer to XML Signature and XML Encryption in security considerations section.

### B.2. Changes in -10

- Fixed bugs in examples.
- New XML elements MUST be lower-case.
- Adjusted case conversion rules for unknown parameters.
- Added utc-offset as possible value type to tz property.
- Added "agent" and "emergency" related values.
- Added x-name and iana-token in kind values.
- Added cross-references to vcardrev sections.
- Add <unknown> element for round-tripping.
- Tweak sex grammar.
- "Structured" properties don't need <text> elements.
- Fixed wrong example.

### B.3. Changes in -09

- Added "Conventions" section with reference to RFC2119.
- Fixed bad XML in example.
- Updated MIME type registration following feedback from ietf-types@iana.org.

### B.4. Changes in -08

- Synchronized with draft-ietf-vcarddav-vcardrev-17.
- Added some references.
- Fixed bad XML in example.
- Added <text> element around pid param value.

### B.5. Changes in -07

- Synchronized with draft-ietf-vcarddav-vcardrev-16.
- Fixed bad XML in example.
- Fixed <categories> which now takes a value-text-list.
- All parameters now use value elements. This affects type, calscale, and pref.

### B.6. Changes in -06

- Synchronized with draft-ietf-vcarddav-vcardrev-15.

### B.7. Changes in -05

- Synchronized with draft-ietf-vcarddav-vcardrev-13.

### B.8. Changes in -04

- Synchronized with draft-ietf-vcarddav-vcardrev-12.
- Added application/vcard+xml media type.
- Added rules for backslash escaping and quoting when converting.
- Added description of <vcards> element.
- Described group construct in XML.

### B.9. Changes in -03

- Created "Format Conversions" section.
- Turned more <type> parameter values into plain text.

- Removed need for empty value elements in components.
- Wrapped value of <sex>, <class>, and <kind> in value elements.

### B.10. Changes in -02

- Synchronized with draft-ietf-vcarddav-vcardrev-10.
- Turned <type> parameter values into plain text.
- Moved the "XML" property to vCard base.
- Changed title to avoid confusion with XML Schema.
- Added prefixes "value-", "param-", and "property-" in schema.
- Better language for specifying what a parser must ignore.

### B.11. Changes in -01

- Synchronized with draft-ietf-vcarddav-vcardrev-09.
- Added the <vcards> element to allow multiple vCards in a single XML file.
- Created the <parameters> container element.
- Use text value for enumeration in <class> element.
- Created the "XML" vCard property.
- Added IANA considerations section.
- Added security considerations section.

### B.12. Changes in -00

- Same as draft-perreault-vcarddav-vcardxml-02.

Author's Address

Simon Perreault
Viagenie
2600 boul. Laurier, suite 625
Quebec, QC G1V 4W1
Canada

Phone: +1 418 656 9254
EMail: simon.perreault@viagenie.ca
URI: http://www.viagenie.ca