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Parameter Value Encoding in iCalendar and vCard

Abstract

This specification updates the data formats for iCalendar (RFC 5545) and vCard (RFC 6350) to allow parameter values to include certain characters forbidden by the existing specifications.

Status of This Memo

This is an Internet Standards Track document.

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1. Introduction

The iCalendar [RFC5545] specification defines a standard way to describe calendar data. The vCard [RFC6350] specification defines a standard way to describe contact data. Both of these use a similar text-based data format. Each iCalendar and vCard data object can include "properties" that have "parameters" and a "value". The value of a "parameter" is typically a token or URI value, but a "generic" text value is also allowed. However, the syntax rules for both iCalendar and vCard prevent the use of a double-quote character or control characters in such values, though double-quote characters and some subset of control characters are allowed in the actual property values.

As more and more extensions are being developed for these data formats, there is a need to allow at least double-quotes and line feeds to be included in parameter values. The \-escaping mechanism used for property text values is not defined for use with parameter values and cannot be easily used in a backwards-compatible manner. This specification defines a new character escaping mechanism, compatible with existing parsers and chosen to minimize any impact on existing data.

2. Conventions Used in This Document

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. Parameter Value Encoding Scheme

This specification defines the ^ character (U+005E -- Circumflex Accent) as an escape character in parameter values whose value type is defined using the "param-value" syntax element (Section 3.1 of iCalendar [RFC5545] and Section 3.3 of vCard [RFC6350]). The ^-escaping mechanism can be used when the value is either unquoted or quoted (i.e., whether or not the value is surrounded by double-quotes).

When generating iCalendar or vCard parameter values, the following apply:

- o formatted text line breaks are encoded into ^n (U+005E, U+006E)
- o the ^ character (U+005E) is encoded into ^^ (U+005E, U+005E)
- o the " character (U+0022) is encoded into ^' (U+005E, U+0027)

When parsing iCalendar or vCard parameter values, the following apply:

- o the character sequence ^n (U+005E, U+006E) is decoded into an appropriate formatted line break according to the type of system being used
- o the character sequence ^^ (U+005E, U+005E) is decoded into the ^ character (U+005E)
- o the character sequence ^' (U+005E, U+0027) is decoded into the " character (U+0022)
- o if a ^ (U+005E) character is followed by any character other than the ones above, parsers MUST leave both the ^ and the following character in place

When converting between iCalendar and vCard text-based data formats and alternative data-format representations such as XML (as described in [RFC6321] and [RFC6351], respectively), implementations MUST ensure that parameter value escape sequences are generated correctly in the text-based format and are decoded when the parameter values appear in the alternate data formats.

3.1. iCalendar Example

The following example is an "ATTENDEE" property with a "CN" parameter whose value includes two double-quote characters. The parameter value is not quoted, as there are no characters in the value that would trigger quoting as required by iCalendar.

```
ATTENDEE;CN=George Herman ^'Babe^' Ruth:mailto:babe@example.com
```

The unescaped parameter value is

```
George Herman "Babe" Ruth
```

3.2. vCard Example

The following example is a "GEO" property with an "X-ADDRESS" parameter whose value includes several line feed characters. The parameter value is also quoted, since it contains a comma, which triggers quoting as required by vCard.

```
GEO;X-ADDRESS="Pittsburgh Pirates^n115 Federal St^nPittsburgh, PA 15212":geo:40.446816,-80.00566
```

The unescaped parameter value (where each line is terminated by a line break character sequence) is

```
Pittsburgh Pirates
115 Federal St
Pittsburgh, PA 15212
```

4. Security Considerations

There are no additional security issues beyond those of iCalendar [RFC5545] and vCard [RFC6350].

5. Acknowledgments

Thanks to Michael Angstadt, Tim Bray, Mike Douglass, Barry Leiba, Simon Perreault, and Pete Resnick for feedback on this specification.

6. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC5545] Desruisseaux, B., "Internet Calendaring and Scheduling Core Object Specification (iCalendar)", RFC 5545, September 2009.
- [RFC6321] Daboo, C., Douglass, M., and S. Lees, "xCal: The XML Format for iCalendar", RFC 6321, August 2011.
- [RFC6350] Perreault, S., "vCard Format Specification", RFC 6350, August 2011.
- [RFC6351] Perreault, S., "xCard: vCard XML Representation", RFC 6351, August 2011.

Appendix A. Choice of Quoting Mechanism

Having recognized the need for escaping parameter values, the question is what mechanism to use? One obvious choice would be to adopt the \-escaping used for property values. However, that could not be used as-is, because it escapes a double-quote as the sequence of \ followed by double-quote. Consider what the example in Section 3.1 might look like using \-escaping:

```
ATTENDEE;CN="George Herman \"Babe\" Ruth":mailto:babe@example.com
```

Existing iCalendar/vCard parsers know nothing about escape sequences in parameters. So they would parse the parameter value as:

```
George Herman \
```

i.e., the text between the first and second occurrence of a double-quote. However, the text after the second double-quote ought to be either a : or a ; (to delimit the parameter value from the following parameter or property) but is not, so the parser could legitimately throw an error at that point because the data is syntactically invalid. Thus, for backwards-compatibility reasons, a double-quote cannot be escaped using a sequence that itself includes a double-quote, and hence the choice of using a single-quote in this specification.

Another option would be to use a form of \-escaping modified for use in parameter values only. However, some incorrect, non-interoperable use of \ in parameter values has been observed, and thus it is best to steer clear of that to achieve guaranteed, reliable interoperability. Also, given that double-quote gets changed to single-quote in the escape sequence for a parameter, but not for a value, it is better to not give the impression that the same escape mechanism (and thus code) can be used for both (which could lead to other issues, such as an implementation incorrectly escaping a ; as \; as opposed to quoting the parameter value).

The choice of ^ as the escape character was made based on the requirement that an ASCII symbol (non-alphanumeric character) be used, and it ought to be one least likely to be found in existing data.

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