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iCalendar in XML Format (xCal)
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Abstract

The mailing list for discussion of this memo is "ietf-calendar@imc.org". This is a rerelease of an expire draft with updates and a much more simplivied approach. This approach uses an exact 1 to 1 mapping between iCalendar and xml object.

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 [RFC 2119].

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1. Introduction

The Extended Markup Language (XML) as defined in [XML] is gaining widespread attention as a "web friendly" syntax for representing and exchanging documents and data on the Internet. This interest includes requests for and discussion of possible document type definitions (DTD) and name-space for IETF standard formats such as that defined by [RFC 2445]. This memo defines how XML can be used to represent iCalendar objects and does not specify a DTD as iCalendar can be extended.

NOTE: The [RFC 2445] is the definitive reference for the definition of iCalendar semantics. This memo only provides an alternative, XML representation for the standard syntax defined in [RFC 2445]. This memo does not introduce any semantics not already defined by [RFC 2445].

An attempt has been made to leverage the standard features of the XML syntax in order to represent the component iCalendar semantics. For example, strong data typing is specified using the XML notation declaration. The element type attributes are used to represent many of the calendar properties that provide a "global attribute" capability in an iCalendar object. Binary content in the ATTACH component property may either be specified through an external entity reference to a non-XML binary content or may be included in the XML document's content information, after first being encoding using the BASE64 scheme of [RFC 2146].

The publication of XML version 1.0 was followed by the publication of a World-wide Web Consortium (W3C) recommendation on "Namespaces in XML". A XML name-space is a collection of names, identified by a URI. In anticipation of the broader use of XML namespaces. Within this memo the term "xCal" will mean the XML namespace usage as described in this memo.

2. Using XML For Representating iCalendar

XML is a simplified version of the text markup syntax defined by ISO 8879, Standard Generalized Markup Language (SGML). XML was published as a proposed recommendation [XML] by the World-wide Web Consortium (W3C) on February 10, 1998.

In iCalendar names can be in upper case, lower case, or mixed case. In xCal the predefined iCaledars names will be represented in lower case only as XML element and attribute names are case sensitive.. Values to properties and parameters that are user specified may be in upper, lower, or mixed case.

All iCalendar component names will be represented in xCal as XML element names in lower case. The "BEGIN" iCalendar component will be represented in xCal as: <begin>.

All iCalendar property names will be represented in xCal as XML element names in lower case.

All iCalendar parameter names will be represented in xCal as XML attribute names in lower case.

All iCalendar predefined names that are used as values will be represented in xCal in lower case.

This example:

```
BEGIN:VCALENDAR
VERSION:2.0
PRODID:-//hacksw/handcal//NONSGML v1.0//EN
BEGIN:VEVENT
DTSTART;TZID=US/Pacific:19970714T170000Z
DTEND;TZID=US/Pacific:19970715T035959Z
SUMMARY:Bastille Day Party
END:VEVENT
END:VCALENDAR
```

Is represented in xCal as:

```
<?xml version="1.0" TODO_NAMESPACE="foo"?>
<iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
<version>2.0</version>
<prodid>-//hacksw/handcal//NONSGML v1.0//EN</prodid>
<vevent>
<dtstart tzid="US/Pacific">19970714T170000Z</dtstart>
<dtend tzid="US/Pacific">19970715T035959Z</dtend>
<summary>Bastille Day Party</summary>
</vevent>
</vcaledar>
</iCalendar>
```

2.1 XML Dependencies

This memo specifies the XML representation for the standard iCalendar format defined by [RFC 2445]. There are no XML dependencies other than the [XML] and the [XMLNS] recommendations.

2.2 Working With Standard and XML iCalendar Representations

This memo defines an alternative, XML representation for the standard iCalendar format defined in [RFC 2445]. This alternative representation provides the same semantics as that defined in the standard format. It is the goal of this memo to allow all [RFC 2445] extensions and modifications to be translated into and from this XML format.

2.2.1 Conversion

The standard format can be converted to and from this XML format without loss of any calendaring information. When the XML representation was defined, every attempt was made to use existing component, property and parameter naming conventions. This greatly facilitates transformations between the two representations.

2.2.2 Mixed Use of Both Representations

As previously indicated, conversion between the standard and XML representations of iCalendar is a straightforward process. In addition, mixed use of both representations is also possible using MIME objects.

With the use of the MIME multipart content-types, compound MIME entities containing a mix of the standard and XML representations can be specified. This capability is useful in applications where both

representations might be encountered. In addition, this capability demonstrates the isomeric nature of the two representations. XML applications conforming to this specification MUST be able to properly parse and process a MIME multipart entity containing the MIME type associated with this iCalendar XML document type.

Internet applications conforming to this memo MUST only send the iCalendar XML document in a "multipart/alternative" MIME entity that also contains an equivalent iCalendar object in the standard format defined by [RFC2445]. This restriction will guarantee that the iCalendar object can also be processed by Internet applications that only support the standard iCalendar representation.

2.3 Using Data Types

Strong "data typing" is an integral design principle to the iCalendar format. Strong data typing in iCalendar means that the format type for each property value is well known. Within [RFC 2445], the data type is called the "value type". The standard format defined by [RFC 2445] specifies a default value type for each calendar and component property. In addition, many of the property definitions allow for the specification of alternate value types. This XML representation continues this design principle.

Explicit value/data typing in the XML representation is specified with the "value" attribute on each element type. XML documents conforming to this memo need only specify the "value" attribute on element types when the value needs to override the default value/data type defined in the iCalendar specifications. The formal public identifier for standard value types all have the common string format of:

2.4 Including Binary Content

Binary content can be included in an iCalendar object with the "ATTACH" component property. In the standard iCalendar format this content may either be specified through an external entity reference, using a URI value type, or maybe specified within the iCalendar object, after first BASE64 encoding the content.

The XML representation for iCalendar also supports including binary content in an iCalendar object with the "attach" element type. It also supports either an external reference to the non-XML binary content or inclusion of the binary content after first encoding the binary information using the BASE64 encoding of [RFC 2045].

```
<attach>http://host.com/bin/foo.exe</attach>
```

```
<attach fmttype="APPLICATION/OCTET-STRING">MIICajCC
AdOgAwIBAgICBEUwDQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05l
dHNjYXBlIENvbW11bmljYXR5z...and so on...IENvcnBvc==</attach>
```

2.5 Including Multiple iCalendar Objects

The iCalendar format has the capability for including multiple, individual iCalendar objects in a single data stream. The XML representation can support this also. Individual iCalendar objects are specified by the "vcalendar" element type. One or more "vcalendar" element types are permitted within the parent element type, called "iCalendar". For example:

```
<iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
   <vcalendar>
   <version>2.0</version>
        <!-- remainder of the first vcalendar object -->
   </begin>
   <begin>
   <version>2.0</version>
        <!-- remainder of the second vcalendar object -->
   </vcalendar>>
</iCalendar>
```

2.6 Mapping Property Parameters to XML

The property parameters defined in the standard iCalendar format are represented in the XML representation as an attribute on element types. The following table specifies some of the attribute name corresponding to each property parameter. This is true for all iCalendar object parameters defined in any iCalendar specification. The property and paramater names will be all lower case as shown below in the example:

Property Parameter Name	Attribute Name
ALTREP	altrep
CN	cn
CUTYPE	cutype
DELEGATED-FROM	delegated-from
DELEGATED-TO	delegated-to
DIR	dir
FMTTYPE	fmttype
FBTYPE	fbtype
LANGUAGE	language
MEMBER	member
PARTSTAT	partstat
RANGE	range
RELATED	related
RELTYPE	reltype
ROLE	role
RSVP	rsvp
SENT-BY	sent-by
TZID	tzid
VALUE	value
.....	.....

2.7 Mapping VCALENDAR object Properties to XML

Calendar properties defined in the standard iCalendar format provide information about an iCalendar object, as a whole. The calendar properties are represented in the XML representation as element types as shown in this example:

Calendar Property Name	Tag Name	Example Usage
CALSCALE	calscale	<calscale>
METHOD	method	<method>
VERSION	version	<version>
PRODID	prodid	<prodid>
...	...	<...>

The semantics for these are as specified for the corresponding calendar property in [RFC 2445].

In addition to these attributes, the "iCalendar" element type can also have the following attributes:

Attribute Name	Attribute Type	Default Value	Description
xmlns	CDATA	FIXED	Used to specify the default iCalendar XML name space.
xmlns: + <namespace prefix>	CDATA	FIXED	Used to specify the name space.

The semantics of the "xmlns" attribute, and any attribute with "xmlns:" as a prefix, is as specified in [XMLNS]. It is used to declare a namespace in XML. It can be used to declare the xCal XML namespace in a XML document with a document type other than the iCalendar XML document type. The iCalendar XML document type MUST only use element types from the iCalendar namespace. To specify the iCalendar namespace, the attribute value for the "xmlns" and any attribute with the prefix "xmlns:" MUST be:

"http://www.ietf.org/rfc/rfcXXXX.txt"

NOTE: This attribute value will be replaced with the URL "http://www.ietf.org/rfc/rfcxxxx.txt", where "xxxx" is the RFC number, when this memo is published as a RFC.

For example:

```
  <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<!-- the "iCalendar" prefix is bound to
'http://www.ietf.org/rfc/rfcXXXX.txt'
for the "iCalendar" element and contents-->
</iCalendar>
```

2.8 Mapping All Component Properties to XML

Component properties in the standard iCalendar format provide calendar information about the calendar component. The component properties defined in the standard iCalendar format are represented in the XML representation as element types. The following tables specify the element types corresponding to each of the properties in the specified property category in lower case. Example:

Descriptive Component Properties

Component Property Name	Element Name	Example Usage
ATTACH	attach	<attach>
CATEGORIES	categories	<categories>
CLASS	class	<class>
COMMENT	comment	<comment>
DESCRIPTION	description	<description>
GEO	geo	<geo>
LOCATION	location	<location>
PERCENT	percent	<percent>
PRIORITY	priority	<priority>
RESOURCES	resources	<resources>
STATUS	status	<status>
SUMMARY	summary	<summary>

Date and Time Component Properties

Component Property Name	Element Name
COMPLETED	completed
DTEND	dtend
DUE	due
DTSTART	dtstart
DURATION	duration
FREEBUSY	freebusy
TRANSP	transp

Time Zone Component Properties

Component Property Name	Element Name
TZID	tzid
TZNAME	tzname
TZOFFSETFROM	tzoffsetfrom
TZOFFSETTO	tzoffsetto
TZURL	tzurl

Relationship Component Properties

Component Property Name	Element Name
ATTENDEE	attendee
CONTACT	contact
ORGANIZER	organizer
RECURRENCE-ID	recurrence-id
RELATED-TO	related-to
URL	url
UID	uid

Recurrence Component Properties

Component Property Name	Element Name
EXDATE	exdate
EXRULE	exrule
RDATE	rdate
RRULE	rrule

Alarm Component Properties

Component Property Name	Element Name
ACTION	action
REPEAT	repeat
TRIGGER	trigger

Change Management Component Properties

Component Property Name	Element Name
CREATED	created
DTSTAMP	dtstamp
LAST-MODIFIED	last-modified
SEQUENCE	sequence

```
Miscellaneous Component Properties
+----------------+----------------+
| Component      | Element        |
| Property Name  | Name           |
+----------------+----------------+
| REQUEST-STATUS | request-status |
+----------------+----------------+

...
...
```

The [RFC 2445] specification specifies that the equivalent component properties to the "comment", "description", "location", "summary" and "contact" element types can contain formatted content, such as is specified by multiple lines of text. In such cases, the formatted text should be specified in as CDATA Section content. The CDATA section specifies arbitrary character data that is not meant to be interpretted. It is not scanned for markup by the XML parser. The CDATA Section in these element types MUST NOT contain markup or other such alternate representation of the property value. The "altrep" attribute is used to reference any such alternate representation for the textual content of these element types.

2.9 Namespace

[XMLNS] defines "Namespaces in XML" to be a collection of names, identified by a URI, which are used in XML documents as element types and attribute names. The [XML] specification does not include a definition for namespaces, but does set down some guidelines for experimental naming of namespaces.

XML namespaces allow multiple markup vocabulary in a single document. Considering the utility of the iCalendar properties in other applications.

This memo defines the value that MUST be used in non-iCalendar XML documents that reference element types or attribute lists from the iCalendar namespace.

The following is an example of a well-formed but invalid "xdoc" document type that includes elements and attribute lists from the iCalendar namespace:

```
<?xml version="1.0" encoding="UTF-8"?>
<xdoc>
<xCal:xCal xmlns:xCal="http://www.ietf.org/rfc/rfcXXXX.txt">

<!-- Remainder of the XML document, each element from the -->
<!-- iCalendar namespace with the "xCal:" prefix. -->

</xCal:xCal>
</xdoc>
```

2.10 Emailing the iCalendar XML Representation

It is expected that iCalendar XML documents will need to be sent over SMTP/MIME email. The "text/xml" and "application/xml" content-types have been registered for XML documents. However, use of these content-type definitions present some problems for XML applications such as calendaring and scheduling.

The "text/xml" and "application/xml" content-type definitions do not provide for any header field parameters to identify the type of XML document contained in the MIME entity. This means that a recipient mail user agent must (MUA) open up each "text/xml" or "application/xml" content in order to determine what object handler is needed to process the information. To a MUA, all XML documents look like just plain "text/xml" or "application/xml" content.

Additionally, it is accepted practice for a MUA to provide iconic feedback to the user for individual content-types that are supported by the MUA. For example, not only would feedback be provided for a calendaring and scheduling content. Some further unique identification would also be provided for each different scheduling message; such as a meeting invitation, response to an invitation, reschedule notice, cancellation notice, etc. In such cases, acceptable performance by the MUA is dependent on the existence of header field information, such as it provided in the definition of the "text/calendar" content-type by [RFC 2445].

Internet application conforming to this memo MUST identify iCalendar XML documents with the experimental content-type "application/calendar+xml". The content-type header field SHOULD also contain a "component" and "method" parameter to clearly identify a comma-separated list of components and the singular method used in the iCalendar XML document. For example, an iCalendar XML document specifying a REQUEST for a VEVENT and VTODO would be specified with the following content-type header field:

```
content-type:application/
calendar+xml;method=REQUEST;component=VEVENT,VTODO
```

The content-type can also include the "optinfo" parameter to specify any other optional iCalendar information. The semantics of these content-type parameters is as defined in [RFC 2445].

Internet applications conforming to this memo MUST only send the iCalendar XML document in a "multipart/alternative" MIME entity that also contains an equivalent iCalendar object in the standard format defined by [RFC 2445]. This restrict will guarantee that the iCalendar object can also be processed by internet applications that only support the standard iCalendar format.

An XML application supporting the iCalendar XML document type MUST be able to receive and properly process the "application/calendar+xml" document contained within a "multipart" message content-type.

2.11 iCalendar XML Representation and File Systems

The iCalendar XML documents will be stored in file systems. The accepted practice for file extensions for XML documents is the text "XML". However, in order to uniquely identify iCalendar XML documents for file association with applications that can directly process this document type, it is RECOMMENDED that the file extension be the text "XCS".

3. Example Usage

The following sections provide various examples of iCalendar XML documents.

3.1 A well-formed and valid iCalendar XML document

The following is a simple example of a iCalendar XML document. This document is both a well-formed and valid XML document. The iCalendar object specifies an appointment.

```
<?xml version="1.0" encoding="UTF-8"?>
  <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
 <method>PUBLISH</method>
 <version>2.0</version>
 <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
 <vevent>
  <uid>19981116T150000@cal10.host.com</uid>
  <dtstamp>19981116T145958Z</dtstamp>
  <summary>Project XYZ Review</summary>
  <location>Conference Room 23A</location>
  <dtstart>19981116T163000Z</dtstart>
  <dtend>19981116T190000Z</dtend>
  <x-foo-cust-code>1998-ABC Corp-1234</x-foo-cust-code>
  <categories>Appointment,Work</categories>
 </vevent>
</vcalendar>
</iCalendar>
```

3.2 Including binary content in attachments

The following is an example of a valid iCalendar XML document that also includes an external reference to an attachment. The iCalendar object specifies a meeting invitation with an attachment.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE iCalendar PUBLIC "-//IETF//DTD XCAL/iCalendar XML//EN"
"http://www.ietf.org/internet-drafts/draft-ietf-calsch-many-xcal-03.txt"

  <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
 <vcalendar>
  <method>REQUEST</method>
  <version>2.0</version>
  <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
  <vevent>
   <uid>19981211T133000@cal1.host.com</uid>
   <dtstamp>19981211T132928Z</dtstamp>
   <organizer>cap://host.com/jim</organizer>
   <dtstart>19981212T150000Z</dtstart>
   <dtend>19981212T160000Z</dtend>
   <summary>Department Meeting</summary>
   <location>Conference Room 23A</location>
   <attendee role="CHAIR">jim@host.com</attendee>
   <attendee role="REQ-PART"
             rsvp="TRUE">MAILTO:joe@host.com</attendee>
   <attendee role="REQ-PART"
             rsvp="TRUE">MAILTO:steve@host.com</attendee>
   <attach>http://host.com/pub/photos/holiday.jpg</attach>
  </vevent>
 </vcalendar>
</iCalendar>
```

The following is an example of a well-formed and valid iCalendar XML document that includes an attachment as inline binary content. The iCalendar object specifies a meeting invitation with an attachment.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE iCalendar PUBLIC "-//IETF//DTD XCAL/iCalendar XML//EN"
"http://www.ietf.org/internet-drafts/draft-ietf-calsch-many-xcal-01.txt">

  <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
 <method>REQUEST</method>
 <version>2.0</version>
 <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
 <vevent>
  <uid>19981211T133000@cal1.host.com</uid>
  <dtstamp>19981211T132928Z</dtstamp>
  <organizer>MAILTO:jim@host.com</organizer>
  <dtstart>19981212T150000Z</dtstart>
  <dtend>19981212T160000Z</dtend>
  <summary>Department Meeting</summary>
  <location>Conference Room 23A</location>
  <attendee role="CHAIR">MAILTO:jim@host.com</attendee>
  <attendee role="REQ-PART"
            rsvp="TRUE">MAILTO:joe@host.com</attendee>
  <attendee role="REQ-PART"
            rsvp="TRUE">MAILTO:steve@host.com</attendee>
  <attach fmttype="IMAGE/JPEG">MIICajCCAdOgAwIBAgI
  CBEUwDQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05ldHNjYXB
  lIEjYXRpb25z...and so on...IENvcnBvc==</attach>
 </vevent>
 </vevent>
</iCalendar>
```

3.3 iCalendar XML document with multiple iCalendar objects

The following is an example of a well-formed and valid iCalendar XML document that includes more than one iCalendar object.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE iCalendar PUBLIC "-//IETF//DTD XCAL/iCalendar XML//EN"
"http://www.ietf.org/rfc/rfcXXXX.txt">

  <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
 <method>PUBLISH</method>
 <version>2.0</version>
 <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
 <vtodo>
  <uid>19981009T233000@cal1.host.com</uid>
  <dtstamp>19981009T232928Z</dtstamp>
  <dtstart>19981010T000000Z</dtstart>
  <due>19981010T235959Z</due>
  <summary>Register for conference</summary>
  <priority>2</priority>
 </vtodo>
</vcalendar>
<vcalendar>
 <version>2.0</version>
 <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
 <method>PUBLISH</method>
 <vevent>
  <uid>19981009T233010@cal1.host.com</uid>
  <dtstamp>19981009T233000Z</dtstamp>
  <dtstart>19981120T133000Z</dtstart>
  <dtend>19981122T183000Z</dtend>
  <summary>IT Conference</summary>
  <location>Downtowner Hotel</location>
 </vevent>
</vcalendar>
</iCalendar>
```

3.4 Using the iCalendar namespace

The following is an example of a snippet of a XML document that includes elements from the iCalendar name-space.

```
<x xmlns:xcal="http://www.ietf.org/rfc/rfcXXXX.txt"
  xmlns:pdi="http://pdi.org/schema">
<xcal:dtstart>19981123T133000Z</xcal:dtstart>
<xcal:dtend>19981123T203000Z</xcal:dtend>
<pdi:idnum>1234567</pdi:idnum>
<pdi:usage>999.99</pdi:usage>
</x>
```

3.5 Publish meeting information

The following is a snippet of an iCalendar XML document that publishes information about a meeting.

```
     <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
    <vcalendar>
     <version>2.0</version>
     <prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
     <method>PUBLISH</method>
     <vevent>
      <uid>19970901T130000Z-123401@host.com</uid>
      <dtstamp>19970901T130000Z</dtstamp>
      <dtstart>19970903T163000Z</dtstart>
      <dtend>19970903T190000Z</dtend>
      <summary>Annual Employee Review</summary>
      <class>PRIVATE</class>
      <categories>Business,Human Resources</categories>
     </vevent>
    </vcalendar>
   </iCalendar>
```

3.6 Publish transparent annual event

The following is a snippet of an iCalendar XML document that publishes information about an annually repeating event that is transparent to busy time searches.

```
     <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
    <vcalendar>
     <version>2.0</version>
     <prodid-//hacksw/handcal//NONSGML 1.0//EN</prodid>
     <method>PUBLISH</publish>
     <vevent>
      <uid>19990101T125957Z-123403@host.com</uid>
      <dtstamp>19990101T130000Z</dtstamp>
      <dtstart value="DATE">19991102</dtstart>
      <summary>Our Blissful Anniversary</summary>
      <class>CONFIDENTIAL</class>
      <transp>TRANSPARENT</transp>
      <categories>Anniversary,Personal,Special Occasion</categories>
      <rrule>FREQ=YEARLY</rrule>
     </vevent>
    </vcalendar>
   </iCalendar>
```

3.7 Meeting invitation

The following is a snippet of an iCalendar XML document that specifies an invitation for a meeting. The meeting occurs on the first Monday of each year for five years.

```
 <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
<method>REQUEST</method>
<version>2.0</version>
<prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
<vevent>
 <uid>19981220T130000Z-123403@host.com</uid>
 <dtstamp>19981220T130050Z</dtstamp>
 <organizer>MAILTO:corprel@host.com</organizer>
 <dtstart>19990104T140000Z</dtstart>
 <dtend>19990104T220000Z</dtend>
 <summary>Annual Stockholders Meeting</summary>
 <location>One Corporate Drive, Wilmington, DL</location>
 <attendee role="CHAIR">MAILTO:mrbig@host.com</attendee>
 <attendee cutype="GROUP"
           rsvp="TRUE">CAP:host.com/stockholders</attendee>
 <categories>Business,Meeting,Special Occasion</categories>
 <rrule>FREQ=YEARLY;COUNT=5;BYDAY=1MO</rrule>
 </vevent>
</vcalendar>
</iCalendar>
```

3.8 Assign a to-do

The following is a snippet of an iCalendar XML document for a to-do.

```
<iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
 <vcalendar>
  <method>REQUEST</method>
  <version>2.0</version>
  <prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
  <vtodo>
   <uid>19990104T133402@ical1.host.com</uid>
   <dtstamp>19990104T133410Z</dtstamp>
   <dtstart value="DATE">19990104</dtstart>
   <due value="DATE">19990129</due>
   <organizer>MAILTO:dboss@host.com</organizer>
   <summary>Periodic Self Review</summary>
   <description>Complete your self review.
   Contact me if you questions.</description>
   <priority>1</priority>
   <class>CONFIDENTIAL</class>
   <attendee>CAP:dilbert@host.com</attendee>
  </vtodo>
 </vcalendar>
</iCalendar>
```

3.9 Publish busy time

The following is an iCalendar XML document that publishes busy time information. The default value for the "method" attribute is "PUBLISH" and does not need to be specified in this example.

```
<iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
 <vcalendar>
  <version>2.0</version>
  <prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
  <vfreebusy>
   <uid>19980313T133000@ical1.host.com</uid>
   <dtstamp>19990104T133010Z</dtstamp>
   <organizer>CAP:host.com/jsmith</organizer>
   <dtstart>19980313T141711Z</dtstart>
   <dtend>19980410T141711Z</dtend>
   <url>jsmith.ifb</url>
   <freebusy>19980314T233000Z/19980315T003000Z</freebusy>
   <freebusy>19980316T153000Z/19980316T163000Z</freebusy>
   <freebusy>19980318T030000Z/19980318T040000Z</freebusy>
  </vfreebusy>
 </vcalendar>
</iCalendar>
```

3.10 Request busy time

The following is a snippet of an iCalendar XML document that requests a calendar user's busy time information.

```
 <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
 <method>REQUEST</method>
 <version>2.0</version>
 <prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
 <vfreebusy>
  <uid>19970901T083000@ical1.host.com</uid>
  <dtstamp>19970901T083000Z</dtstamp>
  <organizer>MAILTO:jane_doe@host1.com</organizer>
  <dtstart>19971015T050000Z</dtstart>
  <dtend>19971016T050000Z</dtend>
  <attendee>MAILTO:john_public@host2.com</attendee>
 </vfreebusy>
</vcalendar>
</iCalendar>
```

3.11 Issue a CAP command

The following is a snippet of an iCalendar XML document that issues a CAP command to delete a UID.

```
 <iCalendar xmlns:xCal="http://ietf.org/rfc/rfcXXXX.txt">
<vcalendar>
 <version>2.0</version>
 <prodid>-//hacksw/handcal//NONSGML 1.0//EN</prodid>
 <target>relcalid-22</target>
 <cmd id="random but unique per CUA">DELETE</cmd>
 <vquery>
  <query>SELECT VEVENT FROM VAGENDA WHERE UID = 'abcd12345'</query>
 </vquery>
 </vcalendar>
</iCalendar>
```

4. Acknowledgments

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Greg FitzPatrick, Charles Goldfarb, Paul Hoffman, Lisa Lippert, Thomas Rowe.

5. IANA Considerations

TODO - registration if application/calendar+xml

6. Security Considerations

CDATA Sections - - A XML iCalendar document may contain CDATA sections to represent content for specific element types. The CDATA section specifies arbitrary character data that is not meant to be interpretted. It is not scanned by the XML parser for markup. While this memo restricts that any CDATA section MUST NOT contain markup or other such alternate representation for the property value, in general, CDATA section from a non-conformant implementation can contain content such as HTML markup. HTML text can be used to invoke programs. Implementors should be aware that this may leave an implementation open to malicious attack that might occur as a result of executing the markup in the CDATA section.

PROCEDURAL ALARMS - - A XML iCalendar document can be created that contains a "VEVENT" and "VTODO" calendar component with "VALARM" calendar components. The "VALARM" calendar component can be of type PROCEDURE and can have an attachment containing some sort of executable program. Implementations that incorporate these types of alarms are subject to any virus or malicious attack that might occur as a result of executing the attachment.

ATTACHMENTS - - A XML iCalendar document can include references to Uniform Resource Locators that can be programmed resources. Implementers and users of this memo should be aware of the network security implications of accepting and parsing such information.

In addition, the security considerations observed by implementations of electronic mail systems should be followed for this memo.

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