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IntelliCal  
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iCalendar in XML Format (xCal-Basic)  
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Abstract

The mailing list for discussion of this memo is "xCal@INET-Consulting.com" and signup page at "http://INET-Conusulting.com/mailman/listinfo/xcal. This is a rerelease of an expired draft with updates and a much more simplified approach. This approach uses an exact 1 to 1 mapping between iCalendar and xml objects.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY" and "OPTIONAL" in this

Internet-Draft

xCal-Basic-RSS

October 2005

document are to be interpreted as described in [[KEYWORDS](#)].

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">3</a>
<a href="#">2.</a>	Using XML For Representating iCalendar . . . . .	<a href="#">4</a>
<a href="#">2.1</a>	XML Dependencies . . . . .	<a href="#">5</a>
2.2	Working With Standard and XML iCalendar Representations .	5
<a href="#">2.2.1</a>	Conversion . . . . .	<a href="#">5</a>
<a href="#">2.2.2</a>	Mixed Use of Both Representations . . . . .	<a href="#">5</a>
<a href="#">2.3</a>	Including Multiple iCalendar Objects . . . . .	<a href="#">5</a>
<a href="#">2.4</a>	Mapping Property Parameters to XML . . . . .	<a href="#">6</a>
<a href="#">2.5</a>	Mapping VCALENDAR object Properties to XML . . . . .	<a href="#">7</a>
<a href="#">2.6</a>	Mapping All Components to XML . . . . .	<a href="#">8</a>
<a href="#">2.7</a>	Mapping All Values to XML . . . . .	<a href="#">9</a>
<a href="#">2.8</a>	Emailing the iCalendar XML Representation . . . . .	<a href="#">10</a>
<a href="#">2.9</a>	iCalendar XML Representation and File Systems . . . . .	<a href="#">11</a>
<a href="#">3.</a>	Example Usage . . . . .	<a href="#">12</a>
<a href="#">3.1</a>	A well-formed and valid iCalendar XML document . . . . .	<a href="#">12</a>
<a href="#">3.2</a>	Including binary content in attachments . . . . .	<a href="#">12</a>
<a href="#">3.3</a>	iCalendar XML document with multiple iCalendar objects . .	<a href="#">14</a>
<a href="#">3.4</a>	Using the iCalendar namespace . . . . .	<a href="#">15</a>
<a href="#">3.5</a>	Publish meeting information . . . . .	<a href="#">15</a>
<a href="#">3.6</a>	Publish transparent annual event . . . . .	<a href="#">16</a>
<a href="#">3.7</a>	Meeting invitation . . . . .	<a href="#">16</a>
<a href="#">3.8</a>	Publish busy time . . . . .	<a href="#">17</a>
<a href="#">3.9</a>	Request busy time . . . . .	<a href="#">18</a>
<a href="#">3.10</a>	Issue a CAP command . . . . .	<a href="#">18</a>
<a href="#">4.</a>	Acknowledgments . . . . .	<a href="#">19</a>
<a href="#">5.</a>	IANA Considerations . . . . .	<a href="#">20</a>
<a href="#">6.</a>	Security Considerations . . . . .	<a href="#">21</a>
<a href="#">7.</a>	Bibliography . . . . .	<a href="#">22</a>
	Author's Address . . . . .	<a href="#">22</a>
	Intellectual Property and Copyright Statements . . . . .	<a href="#">23</a>

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Internet-Draft

xCal-Basic-RSS

October 2005

## 1. Introduction

xCal is a representation of iCalendar objects in XML. xCal is not an alternative or next generation of iCalendar. This memo defines how to use XML to represent iCalendar objects in XML. These XML object can be embedded into other XML documents using the XML syntax here. xCal does represent iCalendar componnts, properties, and parameters as defined in iCalendar. As iCalendar evolves the one to one mapping of iCalendar objects into xCal will continue to work as this memo describes the mapping of iCalendar objects.. Within this memo the term "xCal" will mean the XML namespace usage as described in this memo.

This format was selected to ease its translation back to the iCalendar format using an XSLT transform. (See project iCalendar on SourceForge.com - <http://sourceforge.net/projects/icalendar/> )

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

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Internet-Draft

xCal-Basic-RSS

October 2005

## [2.](#) Using XML For Representating iCalendar

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 are represen in xCal as the component name it self in lower case. (BEGIN:VEVENT becomes <vevent>).

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 property and parameter values will be represented in xCal unchanged.

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

END:VEVENT  
END:VCALENDAR

Is represented in xCal as:

```
<?xml version="1.0" TODO_NAMESPACE="foo"?>
<iCalendar xmlns:xCal="urn:ietf:params:xml:ns:xcal">
  <vcalendar>
    <version>2.0</version>
    <prodid>-//hacksw/handcal//NONSGML v1.0//EN</prodid>
    <vevent>
      <dtstart>19970714T170000Z</dtstart>
      <dtend>19970715T035959Z</dtend>
      <summary xml:lang="en_US">Bastille Day Party</summary>
    </vevent>
  </vcalendar>
</iCalendar>
```

Royer

Expires April 25, 2006

[Page 4]

---

Internet-Draft

xCal-Basic-RSS

October 2005

## [2.1](#) XML Dependencies

This memo specifies the XML representation for the standard iCalendar format defined by [[iCAL](#)]. 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 [[iCAL](#)]. This alternative representation provides the same semantics as that defined in the standard format. It is the goal of this memo to allow all [[iCAL](#)] 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 [[iCAL](#)]. This restriction will guarantee that the iCalendar object can also be processed by Internet applications that only support the standard iCalendar representation.

### [2.3](#) Including Multiple iCalendar Objects

The iCalendar format has the capability for including multiple,

individual iCalendar objects in a single data stream, as can be needed by [[iTIP](#)]. 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="urn:ietf:params:xml:ns:xcal">
  <vcalendar>
    <version>2.0</version>
    <!-- remainder of the first vcalendar object -->
  </vcalendar>
  <vcalendar>
    <version>2.0</version>
    <!-- remainder of the second vcalendar object -->
  </vcalendar>>
```

</iCalendar>

## 2.4 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 parameter names will be all lower case. Here are some iCalendar parameter names and how they are mapped to their lower case xCal names.

NOTE: that the iCalendar "language" parameter is converted to the "xml:lang" attribute as an exception to the one to one mapping.

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	xml:lang
MEMBER	member
PARTSTAT	partstat
RANGE	range
RELATED	related
RELTYPE	reltype
ROLE	role
RSVP	rsvp
SENT-BY	sent-by
TZID	tzid
VALUE	value
X-...	x-...
.....	.....

## 2.5 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 lower case. Here is a list of some iCalendar properties and them mapped to xCal lower case names:

Calendar Property Name	Tag Name
ACTION	action
ATTACH	attach
ATTENDEE	attendee
CALSCALE	calscale
CATEGORIES	categories
CLASS	class
COMMENT	comment
COMPLETED	completed

CONTACT	contact
---------	---------



CREATED	created
DESCRIPTION	description
DTEND	dtend
DTSTART	dtstart
DTSTAMP	dtstamp
DUE	due
DURATION	duration
EXDATE	exdate
EXRULE	exrule
FREEBUSY	freebusy
GEO	geo
LAST-MODIFIED	last-modified
LOCATION	location
METHOD	method
ORGANIZER	organizer
PERCENT-COMPLETE	percent-complete
PRIORITY	priority
PROID	proid
RECURRENCE-ID	recurrence-id
RDATE	rdate
RELATED-TO	related-to
REPEAT	repeat
RESOURCES	resources
RRULE	rrule
SEQUENCE	sequence
STATUS	status
SUMMARY	summary
TRANSP	transp
TRIGGER	trigger
TZID	tzid
TZNAME	tzname
TZOFFSETTO	tzoffsetto
TZOFFSETFROM	tzoffsetfrom
TZURL	tzurl
URL	url
UID	uid
VERSION	version
X-...	x-...
...	...

The semantics for these are as specified for the corresponding calendar property in [\[iCAL\]](#).

## 2.6 Mapping All Components to XML

All components in xCal are mapped to their component name without the

BEGIN tag. This example show how many component names are mapped to xCal lower case names:

Component	Element	Example
VEVENT	vevent	<vevent> ... </vevent>
VTODO	vtodo	<vtoto> ... </vtodo>
VJOURNAL	vjournal	<vjournal> ... </vjournal>
VTIMEZONE	vtimezone	<vtimezone> ... </vtimezone>
STANDARD	standard	<standard> ... </standard>
DAYLIGHT	daylight	<daylight> ... </daylight>
X-...	x-...	<x-...> ... </x-...>
...	...	...

## [2.7](#) Mapping All Values to XML

The [[iCAL](#)] 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 using standard XML escaping.

Values MUST NOT be mapped to lower case. iCalendar property values and iCalendar parameter values are used without lower case conversion.

Vaues that have characters forbidden by XML MUST be encoded using standard XML escaping mechanisms.

Values that containe XML tags like in this example:

```
DESCRIPTION:How to map xml DESCRIPTION into
an XML <description> element.
```

Would be encoded using standard XML encoding as shown here:

```
<description>How to map xml DESCRIPTION into
an XML &lt;description&gt; element.</description>
```

Internet-Draft

xCal-Basic-RSS

October 2005

## [2.8](#) 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 [[iCAL](#)].

Internet application conforming to this memo MUST identify iCalendar XML documents with the experimental content-type "application/calendar+xml".

```
content-type:application/calendar+xml
```

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 [[iCAL](#)].

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 [[iCAL](#)]. 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.

Royer

Expires April 25, 2006

[Page 10]

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Internet-Draft

xCal-Basic-RSS

October 2005

## [2.9](#) 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="urn:ietf:params:xml:ns:xcal">
<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-royer-calsch-xcal-02.txt"

  <iCalendar xmlns:xCal="urn:ietf:params:xml:ns:xcal">
<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-royer-calsch-xcal-02.txt">

  <iCalendar xmlns:xCal="urn:ietf:params:xml:ns:xcal">
<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="urn:ietf:params:xml:ns:xcal">
<vcalendar>
  <method>PUBLISH</method>
  <version>2.0</version>
  <prodid>-//HandGen//NONSGML vGen v1.0//EN</prodid>
</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>Downtown 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="urn:ietf:params:xml:ns:xcal"
  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="urn:ietf:params:xml:ns:xcal">
<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="urn:ietf:params:xml:ns:xcal">
<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="urn:ietf:params:xml:ns:xcal">
<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=1M0</rrule>
</vevent>
</vcalendar>
</iCalendar>
```

### [3.8](#) 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="urn:ietf:params:xml:ns:xcal">
<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>
```

Royer

Expires April 25, 2006

[Page 17]

---

Internet-Draft

xCal-Basic-RSS

October 2005

### [3.9](#) 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="urn:ietf:params:xml:ns:xcal">
<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>
```

### [3.10](#) 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="urn:ietf:params:xml:ns:xcal">
<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>
```

Royer

Expires April 25, 2006

[Page 18]

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Internet-Draft

xCal-Basic-RSS

October 2005

#### [4.](#) Acknowledgments

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Royer

Expires April 25, 2006

[Page 19]

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Internet-Draft

xCal-Basic-RSS

October 2005

## [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 interpreted. 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" 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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