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Internet Calendaring and Scheduling Core Object Specification (iCalendar)

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Abstract

There is a clear need to provide and deploy interoperable calendaring and scheduling services for the Internet. Current group scheduling and Personal Information Management (PIM) products are being extended for use across the Internet, today, in proprietary ways. This memo has been defined to provide the a definition of a common format for openly exchanging calendaring and scheduling information across the Internet.

This memo is formatted as a registration for a MIME media type per [[RFC 2048](#)]. However, the format in this memo is equally applicable for use outside of a MIME message content type.

The proposed media type value is `'TEXT/CALENDAR'`. This string would label a media type containing calendaring and scheduling information encoded as text characters formatted in a manner outlined below.

This MIME media type provides a standard content type for capturing calendar event and to-do information. It also can be used to convey free/busy time information. The content type is suitable as a MIME message entity that can be transferred over MIME based email systems or using HTTP. In addition, the content type is useful as an object

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for interactions between desktop applications using the operating system clipboard, drag/drop or file systems capabilities.

This memo is based on the earlier work of the vCalendar specification for the exchange of personal calendaring and scheduling information. In order to avoid confusion with this referenced work, this memo is to be known as the iCalendar specification. This memo is based on the calendaring and scheduling model defined in []. The document is also the basis for the calendaring and scheduling interoperability protocol defined in [[ITIP](#)].

This memo also includes the format for defining iCalendar object methods. An iCalendar object method is a set of usage constraints for the iCalendar object. For example, these methods might define scheduling messages that request an event be scheduled, reply to an event request, send a cancellation notice for an event, modify or replace the definition of an event, provide a counter proposal for an original event request, delegate an event request to another individual, request free or busy time, reply to a free or busy time request, or provide similar scheduling messages for a to-do or journal entry calendar component.

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1. Introduction

The use of calendaring and scheduling has grown considerably in the last decade. Enterprise and inter-enterprise business has become dependent on rapid scheduling of events and actions using this information technology. However, the longer term growth of

calendar and scheduling, is currently limited by the lack of Internet standards for the message content types that are central to these groupware applications. This memo is intended to progress the level of interoperability possible between dissimilar calendar and scheduling applications. This memo defines a MIME content type for exchanging electronic calendar and scheduling information. The Internet Calendar and Scheduling Core Object Specification, or iCalendar, allows for the capture and exchange of information normally stored within a calendar and scheduling application; such as a Personal Information Manager or a Group Scheduling product.

The calendar and scheduling model implemented by this memo is defined in the [[ICMS](#)].

The format is suitable as an exchange format between applications or systems. The format is defined in terms of a MIME content type. This will enable the object to be exchanged using several transports, including but not limited to SMTP, HTTP, a file system, desktop interactive protocols such as the use of a memory-based clipboard or drag/drop interactions, point-to-point asynchronous communication, wired-network transport, or some form of unwired transport such as infrared might also be used.

The definition of a calendar and scheduling interoperability protocol is the subject of another memo [[ITIP](#)].

The memo also provides for the definition of iCalendar object methods that will map this content type to a set of messages for supporting calendar and scheduling operations such as requesting, replying to, modifying, and canceling meetings or appointments, to-dos and journal entries. The iCalendar object methods can be used to define other calendar and scheduling operations such as requesting for and replying with free/busy time data.

The memo also includes a formal grammar for the content type to aid in the implementation of parsers and to serve as the definitive reference when ambiguities or questions arise in interpreting the descriptive prose definition of the memo.

2. Basic Grammar and 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 [[RFC 2119](#)].

This memo makes use of both a descriptive prose and a more formal notation for defining the calendar and scheduling format.

The notation used in this memo is the augmented BNF notation of [RFC 822]. Readers intending on implementing this format defined in this memo should be familiar with this notation in order to properly interpret the specifications of this memo.

All numeric and hexadecimal values used in this memo are given in decimal notation. All names of properties, property parameters, enumerated property values and property parameter values are case-insensitive. However, all other property values are case-sensitive, unless otherwise stated.

Note: All indented editorial notes, such as this one, are intended to provide the reader with additional information that is not essential to the building of a conformant implementation of the specifications of this memo. The information is provided to highlight a particular feature or characteristic of the specifications.

The format for the iCalendar object is based on the syntax of the [MIME DIR] content type. While the iCalendar object is not a profile of the [MIME DIR] content type, it does reuse a number of the elements from the [MIME DIR] specification.

2.1 Formatting Conventions

The mechanisms defined in this memo are defined in propose. In order to refer to elements of the calendaring and scheduling model [[ICMS](#)], core object (this memo) or interoperability protocol [[ITIP](#)] in this memo some formatting conventions have been used. Calendaring and scheduling roles defined by [[ICMS](#)] are referred to in quoted-strings of text with the first character of each word in upper case. For example, "Organizer" refers to a role of a "Calendar User" within the scheduling protocol defined by [[ITIP](#)] Calendar components defined by this memo are referred to with capitalized, quoted-strings of text. All calendar components start with the letter "V". For example, "VEVENT" refers to the event calendar component, "VTODO" refers to the to-do calendar component and "VJOURNAL" refers to the daily journal calendar component. Scheduling methods defined by [[ITIP](#)] are referred to with capitalized, quoted-strings of text. For example, "REQUEST" refers to the method for requesting a scheduling calendar component be created or modified, "REPLY" refers to the method a recipient of a request uses to update their status with the "Organizer" of the calendar component.

The properties defined by this memo are referred to with capitalized, quoted-strings of text, followed by the word "property". For example, "ATTENDEE" property refers to the iCalendar property used to convey

the calendar address of a calendar user. Property parameters defined by this memo are referred to with lower case, quoted-strings of text, followed by the word "parameter". For example, "value" parameter refers to the iCalendar property parameter used to override the default data type for a property value. Enumerated values defined by this memo are referred to with capitalized text, either alone or followed by the word "value". For example, the "MINUTELY" value can

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be used with the "FREQ" component of the "RECUR" data type to specify repeating components based on an interval of one minute or more.

2.2 Related Memos

Implementers will need to be familiar with several other memos that, along with this memo, form a framework for Internet calendaring and scheduling standards. This memo, [ICAL], specifies a core specification of objects, data types, properties and property parameters.

[ICMS] - specifies a common terminology and abstract;

[ITIP] - specifies an interoperability protocol for scheduling between different implementations;

[IMIP] specifies an Internet email binding for [\[ITIP\]](#);

[IRIP] - specifies an Internet real time protocol binding for [\[ITIP\]](#).

This memo does not attempt to repeat the specification of concepts or definitions from these other memos. Where possible, references are made to the memo that provides for the specification of these concepts or definitions.

3. TEXT/CALENDAR Registration Information

The Calendaring and Scheduling Core Object Specification is intended for use as a MIME content type. However, the implementation of the memo is in no way limited solely as a MIME content type.

The following text is intended to register this memo as the MIME content type "text/calendar".

To: ietf-types@uninett.no

Subject: Registration of MIME content type text/calendar.

MIME media type name: text

MIME subtype name: calendar

Required parameters: method

The "method" parameter is used to convey the iCalendar object method to which the calendaring and scheduling information pertains. It also is an identifier for the set of properties that the iCalendar object will consist of. The parameter is to be used as a guide for applications interpreting the information contained within the body part. It should NOT be used to exclude or require particular pieces of information unless the identified method definition specifically calls for this behavior. Unless specifically forbidden by a particular method definition, a text/calendar content type MAY contain any set of properties

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permitted by the Calendaring and Scheduling Core Object Specification.

The value for the "method" parameter is defined as follows:

```
method      = 1*(ALPHA / DIGIT / "-")
              ; IANA registered iCalendar object method
```

Optional parameters: charset, component

The "charset" parameter is defined in [[RFC 2046](#)] for other body parts. It is used to identify the default character set used within the body part.

The "component" parameter conveys the type of iCalendar calendar component within the body part. If the iCalendar object contains more than one calendar component, then the components are specified as a comma-separated list of values.

The value for the "component" parameter is defined as follows:

```
component    = "VEVENT" / "VTODO" / "VJOURNAL" / "VFREEBUSY"
              / x-name / iana-token
```

Optional content header fields: Any header fields defined by [RFC

2045].

Encoding considerations: This MIME content type can contain 8bit characters, so the use of quoted-printable or base64 MIME content-transfer-encodings MAY be necessary when iCalendar objects are transferred across protocols restricted to the 7bit repertoire. Note that each property in the content entity MAY also have special characters encoded using a BACKSLASH character (ASCII decimal 92) escapement technique. This means that content values MAY end up encoded twice.

Security considerations: SPOOFING - - In this memo, the "Organizer" is the only person authorized to make changes to an existing "VEVENT", "VTODO", "VJOURNAL" calendar component and redistribute the updates to the "Attendees". An iCalendar object that maliciously changes or cancels an existing "VEVENT", "VTODO" or "VJOURNAL" or "VFREEBUSY" calendar component MAY be constructed by someone other than the "Organizer" and sent to the "Attendees". In addition in this memo, an "Attendee" of a "VEVENT", "VTODO", "VJOURNAL" calendar component is the only person authorized to update any parameter associated with their "ATTENDEE" property and send it to the "Organizer". An iCalendar object that maliciously changes the "ATTENDEE" parameters MAY be constructed by someone other than the real "Attendee" and sent to the "Organizer".

PROCEDURAL ALARMS - - An iCalendar object can be created that contains a "VEVENT" and "VTODO" calendar component with an "VALARM" calendar components. The "VALARM" calendar component MAY be of type PROCEDURE and MAY have an attachment containing some sort of

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executable program. Implementations that incorporate these types of alarms are subject to any virus or malicious attack that MAY occur as a result of executing the attachment.

ATTACHMENTS - - An iCalendar object MAY include references to Uniform Resource Locators that MAY 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.

Interoperability considerations: This MIME content type is intended to define a common format for conveying calendaring and scheduling

information between different systems. It is heavily based on the earlier [[VCAL](#)] industry specification.

Intended Usage: COMMON

Published specification: This memo.

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4. iCalendar Object Specification

The following sections define the details of a Calendaring and Scheduling Core Object Specification. This information is intended to be an integral part of the MIME content type registration. In addition, this information MAY be used independent of such content registration. In particular, this memo has direct applicability for use as a calendaring and scheduling exchange format in file-, memory- or network-based transport mechanisms.

4.1 Content Considerations

The iCalendar object consists of lines of text. This section defines how the content lines MUST be formatted.

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4.1.1 Content Lines

The iCalendar object consists of individual lines of text, delimited

by a line break, which is a CRLF sequence (ASCII decimal 13, followed by ASCII decimal 10). Lines of text should not be longer than 76 characters, excluding the line break.

Long lines of text can be split into a multiple line representations using a line "folding" technique. That is, a long line MAY be split at any point by inserting a CRLF immediately followed by a single linear white space character (i.e., SPACE, ASCII decimal 32 or HTAB, ASCII decimal 9). Any sequence of CRLF followed immediately by a single linear white space character is ignored (i.e., removed) when processing the content type.

For example the line:

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

Can be represented as:

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

The process of moving from this folded multiple line representation to its single line representation is called "unfolding". Unfolding is accomplished by removing the CRLF character and the linear white space character that immediately follows.

An intentional formatted text line break MAY only be included in a property value by representing the line break with the character sequence of BACKSLASH (ASCII decimal 92), followed by a LATIN SMALL LETTER N (ASCII decimal 110) or a LATIN CAPITAL LETTER N (ASCII decimal 78), that is "\n" or "\N".

For example a multiple line "DESCRIPTION" property value of:

```
Project XYZ Final Review  
Conference Room - 3B  
Come Prepared.
```

Could be represented as:

```
DESCRIPTION:Project_XYZ Final_Review\n  
Conference Room - 3B\nCome_Prepared.
```

The content information associated with an iCalendar object is formatted using a syntax similar to that defined by [MIME DIR]. That is, the content information consists of one or more CRLF-separated content lines as defined by the following notation:

```
contentline = name *(;" [WSP] param ) ":" [WSP] value-list CRLF  
; Lines longer than 75 characters should be folded
```

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```
name      = iana-token / x-name

x-name    = "X-" 1*(ALPHA / DIGIT / "-")
           ;Reserved for experimental use.

param     = param-name "=" param-value *(", " param-value)

param-name = iana-token

param-value = quoted-string / text

value-list = value-struct *([FOLD] ", " value-struct)
           ; permitted values are restricted by valuetype

value-struct = value-elem *([FOLD] ";" value-elem)

value-elem = folded-text / folded-b
           ; encoding determined by encoding parameter

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

text      = *SAFE-CHAR

quoted-string = DQUOTE *(QSAFE-CHAR / QUOTED-CHAR) DQUOTE

folded-text = *([FOLD] (SAFE-CHAR / ":" / DQUOTE / ESCAPED-CHAR))

folded-base64 = *([FOLD] 4B-CHAR) [[FOLD] b-end]

base64-end = (2B-CHAR "==") / (3B-CHAR "=")

ESCAPED-CHAR = "\" ("\" / DQUOTE / ";" / ", " / "N" / "n")
             ; \\ encodes \, \" encodes ", \N or \n encodes newline
             ; \; encodes ;, \, encodes ,

B-CHAR = ALPHA / DIGIT / "+" / "/"

FOLD     = CRLF WSP
           ; not considered part of the value

NON-ASCII = %x80-FF
           ; use restricted by charset parameter
           ; on outer MIME object
```

QSAFE-CHAR = %x20-21 / %x23-5B / %x5D-7E / NON-ASCII
; Any character except CTLs, DQUOTE, or "\"

QUOTED-CHAR = "\" (\" / DQUOTE)
; \\ encodes \, \" encodes "

SAFE-CHAR = %x20-21 / %x23-2B / %x2D-39 / %x3C-5B
%x5D-7E / NON-ASCII
; Any character except CTLs, DQUOTE, ";", ":", "\", ", "

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ALPHA = %x41-5A / %x61-7A ; A-Z / a-z

BIT = "0" / "1"

CHAR = %x01-7F
; any 7-bit US-ASCII character, excluding NUL

CR = %x0D
; carriage return

CRLF = CR LF
; Internet standard newline

CTL = %x00-1F / %x7F
; controls

DIGIT = %x30-39
; 0-9DQUOTE = %x22

WSP = SPACE / HTAB

SPACE = %x20

HTAB = %x09

[4.1.2](#) List and Field Separators

List of values MAY be specified for property values or property parameter values. Each value in a list of values MUST be separated by a COMMA character (ASCII decimal 44).

Some property values are defined in terms of multiple components. These structured property values MUST have their components separated by a SEMICOLON character (ASCII decimal 59).

requirements that necessitate conveying the complete calendaring and scheduling information within a single iCalendar object. A property containing inline binary content information MUST specify the "ENCODING" property parameter. Binary content information placed external to the iCalendar object MUST be referenced by a uniform resource identifier (URI).

The following example specifies an "ATTACH" property that references an attachment external to the iCalendar object with a URI reference:

```
ATTACH:http://xyz.com/public/quarterly-report.doc
```

The following example specifies an "ATTACH" property with inline binary encoded content information:

```
ATTACH;ENCODING=b;VALUE=text:MIICajCCAdOgAwIBAgICBEUwDQYJKoZI
hvcNAQEEBQAwdzELMAkGA1UEBhMCVVMxLDAqBgNVBAoTI05ldHNjYXBliENV
bW11bmljYXRpb25zIENvcnBvcnF0aw9uMRwwGgYDVQQLExNJbmZvcmlhdGlv
biBTeXN0 <...remainder of "B" encoded binary data...>
```

4.1.5 Property Parameters

A property MAY have additional attributes associated with it. These "property parameters" contain meta information about the property or the property value. Property parameters MAY be used to specify the location of an alternate text representation for a property value, the language of a text property value or the data type of the property value.

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Property parameter values that contain the COLON, SEMICOLON, COMMA or BACKSLASH character separators MUST be specified as quoted-string text values. For example:

```
DESCRIPTION;ALTREP="http://www.wiz.org":The Fall'98 Wild Wizards
Conference - - Las Vegas, NV, USA
```

The general property parameters defined by this memo are specified the following notation:

```
parameter = altrepparm           ;Alternate text representation
           / encodingparm         ;Inline encoding
           / languageparm         ;Text language
```

/ valuetypeparm ;Property value data type

4.1.6 Alternate Text Representation

The "ALTREP" property parameter is an OPTIONAL property parameter. It specifies the URI that points to an alternate representation for a textual property value. The property MUST include a value that reflects the default representation. This property parameter MAY include multiple values, separated by the COMMA character (ASCII decimal 44). The property parameter MAY only be specified in the "COMMENT", "CONTACT", "DESCRIPTION", "LOCATION" and "SUMMARY" properties.

For example:

```
DESCRIPTION;ALTREP="CID:<part3.msg.970415T083000@host.com>":Project
  XYZ Review Meeting will include the following agenda items: (a)
  Market Overview, (b) Finances, (c) Project Management
```

The "ALTREP" property parameter value might point to a "text/html" content portion.

```
Content-Type:text/html
Content-Id:<part3.msg.970415T083000@host.com>

<p><b>Project XYZ Review Meeting</b> will include the following
agenda items:<li>Market
Overview</li><li>Finances</li><li>Project Management</li></p>
```

The "ALTREP" property parameter is defined by the following notation:

```
altrepparm = "altrep" "=" uri
```

4.1.7 Character Set

There is not a property parameter to declare the character set used in a property value. The default character set for an iCalendar object is [[UTF-8](#)].

The "charset" Content-Type parameter MAY be used in MIME transports to specify any other IANA registered character set.

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4.1.8 Inline Encoding

The "ENCODING" property parameter is an OPTIONAL property parameter. It identifies the inline encoding used in a property value. The default encoding type is "8bit", corresponding to a property value consisting of text. The "b" encoding type corresponds to a property value encoded using the "B" encoding defined in [\[RFC 2047\]](#).

The "ENCODING" property parameter is defined by the following notation:

```
encodingparam      = "encoding" "=" "8bit" / "b" / iana-token
                    / x-name
; "8bit" text encoding is defined in \[RFC 2045\]
; "b" binary encoding format is defined in \[RFC 2047\]
; Some other IANA registered iCalendar encoding type
; A non-standard, experimental encoding type
```

[4.1.9](#) Language

The "LANGUAGE" property parameter is an OPTIONAL property parameter. It identifies the language used in text values. The value of the "language" property parameter is that defined in [\[RFC 1766\]](#).

Note: For transport in a MIME entity, the Content-Language header field MAY be used to set the default language for the entire body part.

The "LANGUAGE" property parameter is defined by the following notation:

```
languageparm =      "language" "=" language
language = <Text identifying a language, as defined in \[RFC 1766\]>
```

[4.1.10](#) Value Data Types

The "VALUE" property parameter is an OPTIONAL property parameter. It is used to identify the data type and format of the property value. The values of a property MUST be of a single data type. For example, a "RDATE" property cannot have a combination of DATE-TIME and TIME values.

The "VALUE" property parameter is defined by the following notation:

```
valuetypeparm = "value" "=" valuetype
valuetype      = "boolean"
                / "cal-address"
                / "date"
                / "date-time"
                / "duration"
                / "float"
                / "integer"
```

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```

    / "period"
    / "recur"
    / "text"
    / "time"
    / "uri"
    / "utc-offset"
    / x-name
        ;Some experimental iCalendar data type.
    / iana-token
        ;Some other IANA registered iCalendar data type.

```

The following data types are defined by this memo.

[4.1.10.1](#) **Boolean**

The "BOOLEAN" data type is used to identify properties that contain either a "true" or a "false" boolean value. These values are case insensitive. The data type is defined by the following notation:

```
boolean = "TRUE" / "FALSE"
```

For example, any of the following are equivalent:

```
TRUE
true
TrUe
```

[4.1.10.2](#) **Calendar User Address**

The "CAL-ADDRESS" data type is used to identify properties that contain an address of a calendar user. The value is a URI as defined by [[RFC 1738](#)] or any other IANA registered form for a URI. When used to address an Internet email transport address for a calendar user, the value MUST be a MAILTO URI, as defined by [[RFC 1738](#)]. The data type is as defined by the following notation:

```
cal-address = uri
```

[4.1.10.3](#) **Date**

The "DATE" data type is used to identify values that contain a calendar date. The format is expressed as the [ISO 8601] complete representation, basic format for a calendar date. The text format

specifies a four-digit year, two-digit month, and two-digit day of the month. There are no separator characters between the year, month and day component text. The data type is defined by the following notation:

```
date-fullyear      = 4DIGIT
date-month         = 2DIGIT          ;01-12
date-mday          = 2DIGIT          ;01-28, 01-29, 01-30, 01-31
                                   ;based on month/year

date               = date-fullyear date-month date-mday
```

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For example, the following represents July 14, 1997:

```
19970714
```

[4.1.10.4](#) Date-Time

The "DATE-TIME" data type is used to identify values that contain a precise calendar date and time of day. The format is expressed as the [ISO 8601] complete representation, basic format for a calendar date and time of day. The text format is a concatenation of the "date", followed by the LATIN CAPITAL LETTER T character (ASCII decimal 84) time designator, followed by the "time" format defined below. The data type is defined by the following notation:

```
date-time = date "T" time ;As specified above in date and time
```

The following represents July 14, 1997, at 1:30 PM in UTC and the equivalent time in New York (four hours behind UTC in DST), expressed as a local time and local time with UTC offset:

```
19970714T133000Z
19970714T083000
19970714T083000-0400
```

[4.1.10.5](#) Duration

The "DURATION" data type is used to identify properties that contain a duration of time. The format is expressed as the [ISO 8601] basic format for the duration of time. The format can represent durations in terms of years, months, days, hours, minutes, and seconds. The data type is defined by the following notation:

```

dur-second = 1*DIGIT "S"
dur-minute = 1*DIGIT "M" [dur-second]
dur-hour   = 1*DIGIT "H" [dur-minute]
dur-time   = "T" (dur-hour / dur-minute / dur-second)

dur-week   = 1*DIGIT "W"
dur-day    = 1*DIGIT "D"
dur-month  = 1*DIGIT "M" [dur-day]
dur-year   = 1*DIGIT "Y" [dur-month]
dur-date   = (dur-day / dur-month / dur-year) [dur-time]

duration   = ([ "+" ] / "-" ) "P" (dur-date / dur-time / dur-week)

```

For example, a duration of 10 years, 3 months, 15 days, 5 hours, 30 minutes and 20 seconds would be:

```
P10Y3M15DT5H30M20S
```

[4.1.10.6](#) **Float**

The "FLOAT" data type is used to identify properties that contain a real value number value. If the property permits, multiple "float"

```
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```

```
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```

values MAY be specified using a COMMA character (ASCII decimal 44) separator character. The data type is defined by the following notation:

```
float = ([ "+" ] / "-" ) 1*DIGIT [ "." 1*DIGIT ]
```

For example:

```
1000000.0000001
1.333
-3.14
```

[4.1.10.7](#) **Integer**

The "INTEGER" data type is used to identify properties that contain a signed integer value. The valid range for "integer" is -2147483648 to 2147483647. If the sign is not specified, then the value is assumed to be positive. If the property permits, multiple "integer" values MAY be specified using a COMMA character (ASCII decimal 44) separator character. The data type is defined by the following notation:

integer = (["+"] / ["-"]) *DIGIT

For example:

1234567890
-1234567890
+1234567890
432109876

4.1.10.8 Period of Time

The "PERIOD" data type is used to identify values that contain a precise period of time. There are two forms of a period of time.

A period of time MAY be identified by it's start and it's end. This format is expressed as the [ISO 8601] complete representation, basic format for "DATE-TIME" start of the period, followed by a SOLIDUS character (ASCII decimal 47), followed by the "DATE-TIME" of the end of the period. For example, the period starting at 10 AM in Seattle (eight hours behind UTC) on January 1, 1997 and ending at 11 PM in Seattle on January 1, 1997 would be:

19970101T100000-0800/19970101T230000-0800

A period of time MAY also be defined by a start and a duration of time. The format is expressed as the [ISO 8601] complete representation, basic format for the "DATE-TIME" start of the period, followed by a SOLIDUS character (ASCII decimal 47), followed by the [ISO 8601] basic format for "DURATION" of the period. For example, the period start at 10 AM in Seattle (eight hours behind UTC) on January 1, 1997 and lasting 5 hours and 30 minutes would be:

19970101T100000-0800/PT5H30M

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The data type is defined by the following notation:

period-explicit = date-time "/" date-time
;ISO 8601 complete representation basic format for a period of time
;consisting of a start and end. The start MUST be before the end.

period-start = date-time "/" duration
;ISO 8601 complete representation basic format for a period of time
;consisting of a start and duration of time.

period = period-explicit / period-start

4.1.10.9 Recurrence Rule

The "RECUR" data type is used to identify properties that contain a recurrence rule specification. The data type is a structured value consisting of a list of one or more recurrence grammar components. Each component is defined by a NAME=VALUE pair. The components are separated from each other by the SEMICOLON character (ASCII decimal 59). The components are not ordered in any particular sequence. Individual components MAY only be specified once.

The FREQ component identifies the type of recurrence rule. This component MUST be specified in the recurrence rule. Valid values include SECONDLY, to specify repeating events based on an interval of a second or more; MINUTELY, to specify repeating events based on an interval of a minute or more; HOURLY, to specify repeating events based on an interval of an hour or more; DAILY, to specify repeating events based on an interval of a day or more; WEEKLY, to specify repeating events based on an interval of a week or more; MONTHLY, to specify repeating events based on an interval of a month or more; and YEARLY, to specify repeating events based on an interval of a year or more.

The INTERVAL component contains a positive integer representing how often the recurrence rule repeats. The default value is "1" or every minute for a MINUTELY rule, every hour for a HOURLY rule, every day for a DAILY rule, every week for a WEEKLY rule, every month for a MONTHLY rule and every year for a YEARLY rule.

The UNTIL component defines a date-time value which bounds the recurrence rule in an inclusive manner. If the value specified by UNTIL is synchronized with the specified recurrence, this date-time becomes the last instance of the recurrence. If not present, and the COUNT component is also not present, the RRULE is considered to repeat forever.

The COUNT component defines the number of occurrences at which to range-bound the recurrence. This component is ignored if the "UNTIL" component is also present.

The BYSECOND component specifies a COMMA character (ASCII decimal 44) separated list of seconds within a minute. Valid values are 0 to 60.

Zero is the beginning of the minute and 60 is the beginning of the next minute.

The BYMINUTE component specifies a COMMA character (ASCII decimal 44) separated list of minutes within an hour. Valid values are 0 to 60. Zero is the beginning of the hour and 60 is the beginning of the next hour.

The BYHOUR component specifies a COMMA character (ASCII decimal 44) separated list of hours of the day. Valid values are 0 to 24. Zero is the start of the day and 24 is the start of the next day.

The BYDAY component specifies a COMMA character (ASCII decimal 44) separated list of days of the week; MO, indicates Monday; TU, indicates Tuesday; WE, indicates Wednesday; TH, indicates Thursday; FR, indicates Friday; SA, indicates Saturday; SU, indicates Sunday.

Each BYDAY value MAY also be preceded by a positive (+n) or negative (-n) integer. If present, this indicates the nth occurrence of the specific day within the MONTHLY or YEARLY RRULE. For example, within a MONTHLY rule, +1MO (or simply 1MO) represents the first Monday within the month, whereas -1MO represents the last Monday of the month. If an integer modifier is not present, it means all days of this type within the specified frequency. For example, within a MONTHLY rule, MO represents all Mondays within the month.

The BYMONTHDAY component specifies a COMMA character (ASCII decimal 44) separated list of days of the month. Valid values are 1 to 31 or -31 to -1.

Each BYMONTHDAY value MAY include a positive (+n) or negative (-n) integer. If present, this indicates the nth occurrence of the specific day of the month within the MONTHLY rule. If an integer modifier is not present, it means all days of this type within the specified frequency. For example, within a MONTHLY rule, -10 represents the tenth to the last day of the month.

The BYYEARDAY component specifies a COMMA character (ASCII decimal 44) separated list of days of the year. Valid values are 1 to 366 or -366 to -1. For example, -1 represents the last day of the year (December 31st).

The BYWEEKNO component specifies a comma-separated list of weeks of the year. Valid values are 1 to 53. This corresponds to weeks according to week numbering as defined in [ISO 8601]. That is, a week as "A seven day period within a calendar year, starting on a Monday and identified by its ordinal number within the year; the first calendar week of the year is the one that includes the first Thursday of that year." This component is only valid for YEARLY rules.

Each BYWEEKNO value MAY include a positive (+n) or negative (-n)

integer. If present, this indicates the nth occurrence of the specific week of the year within the YEARLY rule. If an integer modifier is not present, it means all days of this type within the

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specified frequency. For example, within a YEARLY rule, 3 represents the third week of the year.

The BYMONTH component specifies a comma separated list of months of the year. Valid values are 1 to 12.

The WKST component specifies the day on which the workweek starts. Valid values are MO, TU, WE, TH, FR, SA and SU. This is significant when a WEEKLY RRULE has an interval greater than 1, and a BYDAY component is specified. The default value is MO.

The BYSETPOS component specifies a COMMA character (ASCII decimal 44) separated list of values which corresponds to the nth occurrence within the set of events specified by the rule. Valid values are 1 to 366 or -366 to -1. It MUST only be used in conjunction with another Byxxx component. For example "the last work day of the month" could be represented as:

```
RRULE:FREQ=MONTHLY;BYDAY=MO,TU,WE,TH,FR;BYSETPOS=-1
```

Each BYSETPOS value MAY include a positive (+n) or negative (-n) integer. If present, this indicates the nth occurrence of the specific occurrence within the set of events specified by the rule.

If BYxxx component values are found which are beyond the available scope (ie, BYMONTHDAY=30 in February), they are simply ignored.

Information, not contained in the rule, necessary to determine the various recurrence instance start time and dates are derived from the Start Time (DTSTART) entry attribute. For example, "FREQ=YEARLY;BYMONTH=1" doesn't specify a specific day within the month or a time. This information would be the same as what is specified for DTSTART.

BYxxx components modify the recurrence in some manner. BYxxx components for a period of time which is the same or greater than the frequency generally reduce or limit the number of occurrences of the recurrence generated. For example, "FREQ=DAILY;BYMONTH=1" reduces the number of recurrence instances from all days (if BYMONTH tag is not present) to all days in January. BYxxx components for a period of

time less than the frequency generally increase or expand the number of occurrences of the recurrence. For example, "FREQ=YEARLY;BYMONTH=1,2" increases the number of days within the yearly recurrence set from 1 (if BYMONTH tag is not present) to 2.

If only one BYxxx component is specified in the recurrence rule, the list of "n" unique values would cause "n" occurrences of the recurrence within each specified frequency interval, where each unique list value is substituted in the appropriate date position within DTSTART for each such occurrence.

If multiple BYxxx components are specified, then the list of "n" unique values for each lower frequency BYxxx components is applied to the list of "n" unique values for higher frequency BYxxx components.

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This process will not always increase the set of occurrences. If a higher component is inconsistent with what was generated for lower components, it would reduce the set. The ordering of BYxxx components from lower frequency to higher frequency is as follows: BYMINUTE, BYHOUR, BYDAY, BYMONTHDAY, BYYEARDAY, BYWEEKNO, BYMONTH, BYSETPOS.

Here is an example of evaluating multiple BYxxx components.

```
"FREQ=YEARLY;INTERVAL=2;BYMONTH=1;BYDAY=SU;BYHOUR=8,9;BYMINUTE=30"
```

would first apply the "BYMINUTE=30" To "BYHOUR=8,9" to arrive at "every 8:30AM and 9:30AM". This in turn would be applied to "BYDAY=SU" to arrive at "every Sunday at 8:30AM and 9:30AM". This would be applied to "BYMONTH=1" to arrive at "every Sunday in January at 8:30AM and 9:30AM". Considering the FREQUENCY and INTERVAL, this would become "Every Sunday in January at 8:30AM and 9:30AM, every other year". If the BYMINUTE, BYDAY, BYMONTHDAY, BYYEARDAY, BYHOUR or BYMONTH component was missing, the appropriate minutes, hour, day or month would have been retrieved from DTSTART.

The data type is defined by the following notation:

```
recur      = "FREQ"=freq ";"
           [ ("UNTIL" "=" enddate ";") / ("COUNT" "=" 1*DIGIT ";") ]
           ["INTERVAL" "=" 1*DIGIT ";"]
           ["BYSECOND" "=" byseclist ";"]
           ["BYMINUTE" "=" byminlist ";"]
           ["BYHOUR" "=" byhrlist ";"]
           ["BYDAY" "=" byweekdaylist ";"]
```

```

["BYMONTHDAY" "=" bymodaylist ";"]
["BYYEARDAY" "=" byyrdaylist ";"]
["BYWEEKNO" "=" bywknolist ";"]
["BYMONTH" "=" bymolist ";"]
["BYSETPOS" "=" bysplist ";"]
["WKST" "=" weekday ";"]
*("X-" word "=" word) ";

```

;Individual components MAY only be specified once.

;Rule components need not be specified in particular any order.

```

freq      = "SECONDLY" / "MINUTELY" / "HOURLY" / "DAILY"
          / "WEEKLY" / "MONTHLY" / "YEARLY"

```

```

enddate   = date           ;A UTC value

```

```

byseclist = seconds / ( seconds *(", " seconds) )

```

```

seconds   = 1DIGIT / 2DIGIT      ;0 to 60

```

```

byminlist = minutes / ( minutes *(", " minutes) )

```

```

minutes   = 1DIGIT / 2DIGIT      ;0 to 60

```

```

byhrlist  = hour / ( hour *(", " hour) )

```

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```

hour      = 1DIGIT / 2DIGIT      ;0 to 24

```

```

byweekdaylist = weekdaynum / ( weekdaynum *(", " weekdaynum) )

```

```

weekdaynum = [[plus] ordwk / minus ordwk] weekday

```

```

plus      = "+"

```

```

minus     = "-"

```

```

ordwk     = 1DIGIT / 2DIGIT      ;1 to 53

```

```

weekday   = "SU" / "MO" / "TU" / "WE" / "TH" / "FR" / "SA"
;Corresponding to SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY,
;FRIDAY, SATURDAY and SUNDAY days of the week.

```

```

bymodaylist = monthdaynum / ( monthdaynum *(", " monthdaynum) )

```

```

monthdaynum = ([plus] ordmoday) / (minus ordmoday)

```


specified for the seconds component. Fractions of an hour, minute or second are not supported by this format. This format is used to represent local time, local time with UTC offset and UTC time. UTC time is identified by a LATIN CAPITAL LETTER Z suffix character (ASCII decimal 90), the UTC designator, appended to the time. The local time with UTC offset is expressed as a local time, suffixed with the signed offset from UTC. The UTC offset is expressed as the 2-digit hours and 2-digit minutes difference from UTC. It is expressed as positive, with a leading PLUS SIGN character (ASCII decimal 43), if the local time is ahead of UTC. It is expressed as a negative, with a leading HYPHEN-MINUS character (ASCII decimal 45), if the local time is behind UTC. Local time has neither the UTC designator nor the UTC offset suffix text. The data type is defined by the following notation:

```
time-hour          = 2DIGIT          ;00-23
time-minute        = 2DIGIT          ;00-59
time-second        = 2DIGIT          ;00-60
;The "60" value is used to account for years with "leap" seconds.
time-numzone       = ("+" / "-") time-hour time-minute
time-zone          = "Z" / time-numzone

time               = time-hour time-minute time-second [time-zone]
```

For example, the following represents 8:30 AM in New York, five hours behind UTC, in local time and local time with UTC offset. In addition, 1:30 PM in UTC is illustrated:

```
083000
083000-0500
133000Z
```

There are cases when a floating time is intended within a property value. For example, an event MAY be defined that indicates that an individual will be busy from 11:00 AM to 1:00 PM every day. In these cases, a local time MAY be specified. The recipient of an iCalendar object with a property value consisting of a local time, without any relative time zone information, should interpret the value as being fixed to the recipient's locale and time zone. In most cases, a fixed time is desired. To properly communicate a fixed time in a property value, either UTC, local time with UTC offset, or local time with a "VTIMEZONE" calendar component MUST be specified.

[4.1.10.12](#) **URI**

The "URI" data type is used to identify values that contain a uniform resource identifier (URI) type of reference to the property value. This data type might be used to reference binary information, for values that are large, or otherwise undesirable to include directly in the iCalendar object.

The URI value formats in [RFC 1738](#), [RFC 2111](#) and any other IETF registered value format MAY be specified.

The data type is defined by the following notation:

```
uri            = <As defined by any IETF RFC>
```

Any IANA registered URI format MAY be used. These include, but are not limited to, those defined in [RFC 1738](#) and [RFC 2111](#).

For example, the following is a URI for a network file:

```
http://host1.com/my-report.txt
```

[4.1.10.13](#) **UTC Offset**

The "UTC-OFFSET" data type is used to identify properties that contain an offset from UTC to local time. The data type is defined by the following notation:

```
utc-offset = time-numzone ;As defined above in time data type
```

The PLUS SIGN character MUST be specified for positive UTC offsets.

For example, the following are UTC offsets are given for standard time for New York (five hours behind UTC) and Geneva (one hour ahead of UTC):

```
-0500
```

```
+0100
```

[4.2](#) **iCalendar object**

The Calendaring and Scheduling Core Object is a collection of calendaring and scheduling information. Typically, this information will consist of a single iCalendar object. However, multiple iCalendar objects MAY be sequentially, grouped together. The first line and last line of the iCalendar object MUST contain a pair of iCalendar object delimiter strings. The syntax for an iCalendar object is as follows:

The body of the iCalendar Object is defined by the following notation:

```
icalbody    = calprops 1*component

calprops    = [calscale] prodid method [source] [name] version

component   = 1*(eventc / todoc / journalc / freebusyc /
              / timezonec)
```

4.4.1 Event Component

A "VEVENT" calendar component is a grouping of component properties and an OPTIONAL "VALARM" calendar component that represent a scheduled amount of time on a calendar. For example, it MAY be an activity; such as a one-hour, department meeting from 8:00 AM to 9:00

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AM, tomorrow. Generally, these events will take up time on an individual calendar. Hence, the event will appear as an opaque interval in a search for busy time. Alternately, the event MAY have its Time Transparency set to "TRANSPARENT" in order to prevent blocking of the event in searches for busy time.

The "VEVENT" is also the calendar component used to specify an anniversary or daily reminder within a calendar. These events have a DATE value type for the "DTSTART" and "DTEND" properties instead of the default data type of DATE-TIME. If such a "VEVENT" has an end time, it MUST be specified as a DATE value also. The anniversary type of "VEVENT" MAY span more than one date (i.e, "DTEND" property value is set to a calendar date after the "DTSTART" property value).

The "DTSTART" property for a "VEVENT" specifies the inclusive start of the event. For recurring events, it also specifies the very first instance in the recurrence set. The "DTEND" property for a "VEVENT" calendar component specifies the non-inclusive end of the event. For cases where a "VEVENT" calendar component specifies a "DTSTART" property with a DATE data type but no "DTEND" property, the events non-inclusive end is the end of the calendar date specified by the "DTSTART" property. For cases where a "VEVENT" calendar component specifies a "DTSTART" property with a DATE-TIME data type but no "DTEND" property, the event ends on the same calendar date and time of day specified by the "DTSTART" property.

A "VEVENT" calendar component is defined by the following notation:

```

eventc      = "BEGIN" ":" [WSP] "VEVENT" CRLF
              eventprop *alarmc
              "END" ":" [WSP] "VEVENT" CRLF

eventprop   = *attach *attendee *categories [class] *comment
              *contact [created] [description] [dtend / duration]
              dtstart *exdate *exrule [geo] [last-mod] [location]
              [priority] [rstatus] [related] *resources *rdate
              *rrule dtstamp [seq] [status] summary [transp] uid
              [url] [recurid]

```

The "VEVENT" calendar component cannot be nested within another calendar component. The "VEVENT" calendar components MAY be related to each other or to a "VTODO" or "VJOURNAL" calendar component with the "RELATED-TO" property.

The following is an example of the "VEVENT" calendar component used to represent a meeting that will also be opaque to searches for busy time:

```

BEGIN:VEVENT
UID:19970901T130000Z-123401@host.com
DTSTAMP:19970901T1300Z
DTSTART:19970903T083000-0800
DTEND:19970903T110000-0800
SUMMARY:Annual Employee Review

```

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```

CLASS:PRIVATE
CATEGORIES:BUSINESS,HUMAN RESOURCES
END:VEVENT

```

The following is an example of the "VEVENT" calendar component used to represent a reminder that will not be opaque, but rather transparent, to searches for busy time:

```

BEGIN:VEVENT
UID:19970901T130000Z-123402@host.com
DTSTAMP:19970901T1300Z DTSTART:19970401T083000-0800
DTEND:19970401T170000-0800
SUMMARY:Laurel is in sensitivity awareness class.
CLASS:PUBLIC
CATEGORIES:BUSINESS,HUMAN RESOURCES
TRANSP:TRANSPARENT
END:VEVENT

```

The following is an example of the "VEVENT" calendar component used to represent an anniversary that will occur annually. Since it takes up no time, it will not appear as opaque in a search for busy time; no matter what the value of the "TRANSP" property indicates:

```
BEGIN:VEVENT
UID:19970901T130000Z-123403@host.com
DTSTAMP:19970901T1300Z
DTSTART:19971102
SUMMARY:Our Blissful Anniversary
CLASS:CONFIDENTIAL
CATEGORIES:ANNIVERSARY,PERSONAL,SPECIAL OCCASION
RRULE:FREQ=YEARLY
END:VEVENT
```

4.4.2 To-do Component

A "VTODO" calendar component is a grouping of component properties and an OPTIONAL "VALARM" calendar component that represent an action-item or assignment. For example, it MAY be an item of work assigned to an individual; such as "turn in travel expense today".

A "VTODO" calendar component is defined by the following notation:

```
todoctoc = "BEGIN" ":" [WSP] "VTODO" CRLF
          todoprop *alarmc
          "END" ":" [WSP] "VTODO" CRLF

todoprop = *attach *attendee *categories [class] *comment
          [completed] *contact [created] [description] dtstamp
          dtstart [due / duration] *exdate *exrule [geo]
          [last-mod] [location] [percent] priority [rstatus]
          [related] *resources *rdate *rrule [recurid] [seq]
          [status] summary uid [url]
```

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The "VTODO" calendar component cannot be nested within another calendar component. If "VTODO" calendar components need to be related to each other or to a "VTODO" or "VJOURNAL" calendar component, they can specify a relationship with the "RELATED-TO" property.

The following is an example of a "VTODO" calendar component:

```

BEGIN:VTODO
UID:19970901T130000Z-123404@host.com
DTSTAMP:19970901T1300Z
DTSTART:19970415T083000-0500
DUE:19970415T235959-0500
SUMMARY:1996 Income Tax Preparation
CLASS:CONFIDENTIAL
CATEGORIES:FAMILY,FINANCE
PRIORITY:1
STATUS:NEEDS-ACTION
END:VEVENT

```

4.4.3 Journal Component

A "VJOURNAL" calendar component is a grouping of component properties that represent one or more descriptive text notes on a particular calendar date. The "DTSTART" property is used to specify the calendar date that the journal entry is associated with. Generally, it will have a DATE value data type, but it MAY also be used to specify a DATE-TIME value data type. Examples of a journal entry include a daily record of a legislative body or a journal entry of individual telephone contacts for the day or an ordered list of accomplishments for the day. The calendar component can also be used to associate a document with a calendar date.

The "VJOURNAL" calendar component does not take up time on a calendar. Hence, it does not play a role in free or busy time searches - - it is as though it has a time transparency value of TRANSPARENT. It is transparent to any such searches.

A "VJOURNAL" calendar component is defined by the following notation:

```

journalc  = "BEGIN" ":" [WSP] "VJOURNAL" CRLF
           jourprop
           "END" ":" [WSP] "VJOURNAL" CRLF

jourprop  = *attach *attende *categories [class] *comment
           *contact [created] [description] dtstart dtstamp
           *exdate *exrule [last-mod] [related] *rdate *rrule
           [rstatus] [seq] summary uid [url] [recurid]

```

The "VJOURNAL" calendar component cannot be nested within another calendar component. If "VJOURNAL" calendar components need to be related to each other or to a "VEVENT" or "VTODO" calendar component, they can specify a relationship with the "RELATED-TO" property.

The following is an example of the "VJOURNAL" calendar component:

```

BEGIN:VJOURNAL
UID:19970901T130000Z-123405@host.com
DTSTAMP:19970901T1300Z
DTSTART;VALUE=DATE:19970317
SUMMARY:Staff meeting minutes
DESCRIPTION:1. Staff meeting: Participants include Joe\, Lisa
and Bob. Aurora project plans were reviewed. There is currently
no budget reserves for this project. Lisa will escalate to
management. Next meeting on Tuesday.
2. Telephone Conference: ABC Corp. sales representative called
to discuss new printer. Promised to get us a demo by Friday.
3. Henry Miller (Handsoff Insurance): Car was totaled by tree.
Is looking into a loaner car. 654-2323 (tel).
END:VJOURNAL

```

[4.4.4](#) Free/Busy Component

A "VFREEBUSY" calendar component is a grouping of component properties that represents either a request for, or a reply with, free or busy time information. Typically, this component exists in an iCalendar object that is being used to either request or return free or busy time information.

A "VFREEBUSY" calendar component is defined by the following notation:

```

freebusyc = "BEGIN" ":" [WSP] "VFREEBUSY" CRLF
           fbprop
           "END" ":" [WSP] "VFREEBUSY" CRLF

fbprop    = fbrequest / fbreply

fbrequest = 1*attendee dtstart dtend [duration] *comment dtstamp
           [last-mod] *related [seq] uid
;This set of properties is used for free/busy time request.

fbreply   = 1*attendee [created] *comment [dtstart dtend] dtstamp
           *freebusy [last-mod] [related] [rstatus] [seq] uid
           [url]
;This set of properties is used for free/busy time reply.

```

The "VFREEBUSY" calendar component cannot be nested within another calendar component. The "VFREEBUSY" calendar components MAY be related to each other with the "RELATED-TO" property. Multiple "VFREEBUSY" calendar components MAY be specified within a iCalendar object. This permits the grouping of Free/Busy information into logical collections, such as monthly groups of busy time information.

The "VFREEBUSY" calendar component is intended for use in iCalendar object methods involving requests for free time, requests for busy time, requests for both free and busy, and the associated replies.

Free/Busy information can be expressed using the "FREEBUSY" property. This property provides a terse representation of time

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periods. One or more "FREEBUSY" properties MAY be specified in the "VFREEBUSY" calendar component to describe the Free/Busy information.

Optionally, the "DTSTART" and "DTEND" properties MAY be specified to express the start and end date and time for all of the Free/Busy information in the "VFREEBUSY" calendar component. When present in a "VFREEBUSY" calendar component, they should be specified prior to any "FREEBUSY" properties. In a free time request, these properties MAY be used in combination with the "DURATION" property to express a request for a duration of free time within a given window of time.

The recurrence properties ("RRULE", "EXRULE", "RDATE", "EXDATE") are not permitted within a "VFREEBUSY" calendar component. Any recurring events are resolved into their individual busy time periods using the "FREEBUSY" property.

The following is an example of a "VFREEBUSY" calendar component used to request free or busy time information:

```
BEGIN:VFREEBUSY
ATTENDEE;ROLE=ORGANIZER:MAILTO:jane_doe@host1.com
ATTENDEE:MAILTO:john_public@host2.com
DTSTART:19971015T050000Z
DTEND:19971016T050000Z
DTSTAMP:19970901T083000Z
SEQUENCE:0
UID:19970901T0830000-uid1@host1.com
END:VFREEBUSY
```

The following is an example of a "VFREEBUSY" calendar component used to reply to the request with busy time information:

```
BEGIN:VFREEBUSY
ATTENDEE:MAILTO:john_public@host2.com
DTSTAMP:19970901T100000Z
SEQUENCE:0
```

```
UID:19970901T0830000-uid1@host1.com
FREEBUSY;VALUE=PERIOD:19971015T050000Z/PT8H30M,
  19971015T160000Z/PT5H30M,19971015T223000Z/PT6H30M
URL:http://host2.com/pub/busy/jpublic-01.vcs
COMMENT:This iCalendar file contains busy time information for
  the next three months.
END:VFREEBUSY
```

4.4.5 Alarm Component

A "VALARM" calendar component is a grouping of component properties that is a reminder or alarm for an event or a to-do. The "VALARM" calendar component MAY only be specified in a "VEVENT" or "VTODO" calendar component. For example, it MAY define a reminder for a pending event or an overdue to-do.

The "DTSTART" property specifies the calendar date and time of day that the alarm will be triggered. The value MAY alternately be set to

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a DURATION, before or after the event or to-do, that the alarm will be triggered.

A "VALARM" calendar component is defined by the following notation:

```
alarmc      = "BEGIN" ":" [WSP] "VALARM" CRLF
              alarmprop
              "END" ":" [WSP] "VALARM" CRLF

alarmprop   = *attendee *attach 1*categories *comment [description]
              dtstart duration *related repeat [summary]
```

The "VALARM" calendar component can only appear within either a "VEVENT" or "VTODO" calendar component. The "VALARM" calendar components cannot be nested.

The "CATEGORIES" property within the "VALARM" calendar component specifies the type or combination of types of the alarm. The "CATEGORIES" property value of AUDIO specifies an alarm that triggers with an audio sound; a value of DISPLAY specifies an alarm that triggers with the "Calendar User Agent" displaying text; the value of EMAIL specifies an alarm that triggers the posting of an electronic email message to one or more email addresses; and the value of PROCEDURE specifies an alarm that triggers the execution of a procedure.

In an AUDIO category of alarm, the first "ATTACH" property in the "VALARM" calendar component that specifies an audio sound file is intended to be rendered as the alarm effect. If an "ATTACH" property is specified that does not refer to an audio sound file, then it is not used by this category of alarm. In addition, any "ATTENDEE", "DESCRIPTION" or "SUMMARY" properties are not used by this category of alarm.

In a DISPLAY category of alarm, the "SUMMARY" property in the "VALARM" calendar component is intended to be displayed as the alarm effect. Any "ATTACH", "ATTENDEE" or "DESCRIPTION" properties in the "VALARM" calendar component are not used by this category of alarm.

In an EMAIL category of alarm, the intended alarm effect is to use the "DESCRIPTION" property in the "VALARM" calendar component as the body text of an email message that is to be sent to the addresses specified by any "ATTENDEE" properties present in the "VALARM" calendar component. The "SUMMARY" property in the "VALARM" calendar component is intended to be used as the subject text for the email. Any "ATTACH" properties are not used by this category of alarm.

In a PROCEDURE category of alarm, the first "ATTACH" property in the "VALARM" calendar component that specifies a procedure or program is intended to be invoked as the alarm effect. Any "ATTACH" properties that do not refer to a procedure or program, then it is not used by this category of alarm. In addition, the "ATTENDEE", "DESCRIPTION" and "SUMMARY" properties are not used by this category of alarm. "Calendar User Agents" that receive an iCalendar object with this

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category of alarm, should allow the "Calendar User" to disable or otherwise ignore this category of alarm. While a very useful alarm capability, the PROCEDURE category of alarm should be treated by the "Calendar User Agent" as a potential security risk.

The following is an example of the "VALARM" calendar component:

```
BEGIN:VALARM
DTSTART:19970317T133000Z
REPEAT:4
DURATION:PT15M
CATEGORIES:DISPLAY,AUDIO
ATTACH:ftp://host.com/pub/sounds/bell-01.wav
SUMMARY:Breakfast meeting with executive team at 8:30 AM
```

END:VALARM

4.4.6 Timezone Component

The "VTIMEZONE" calendar component is used to define a time zone.

A time zone is unambiguously defined by the set of time measurement rules determined by the governing body for a given geographic area. These rules describe at a minimum the base offset from UTC for the time zone, often referred to as the Standard Time offset. Many locations adjust their Standard Time forward or backward by one hour, in order to accommodate seasonal changes in number of daylight hours, often referred to as Daylight Saving Time. Some locations adjust their time by a fraction of an hour. Standard Time is also known as Winter Time. Daylight Saving Time is also known as Advanced Time, Summer Time, or Legal Time in certain countries. The following table shows the changes in time zone rules for the eastern United States.

Effective Date	Transition Rule (Date/Time)	Offset	Abbreviation
1920-1920	last Sun in Mar, 02:00	_0400	EDT
1920-1920	last Sun in Oct, 02:00	_0500	EST
1921-1966	last Sun in Apr, 02:00	_0400	EDT
1921-1954	last Sun in Sep, 02:00	_0500	EST
1955-1966	last Sun in Oct, 02:00	_0500	EST
1967-*	last Sun in Oct, 02:00	_0500	EST
1967-1973	last Sun in Apr, 02:00	_0400	EDT
1974-1974	Jan 6, 02:00	-0400	EDT
1975-1975	Feb 23, 02:00	-0400	EDT
1976-1986	last Sun in Apr, 02:00	_0400	EDT

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1987-* first Sun in Apr, 02:00 _0400 EDT

Interoperability between two calendaring and scheduling applications, especially for recurring events, to-dos or journal entries, is

dependent on the ability to capture and convey date and time information in an unambiguous format. The specification of current time zone information is integral to this behavior.

The "VTIMEZONE" calendar component is a grouping of component properties that define a time zone description. The time zone description specifies the effective Standard Time or Daylight Savings Time rules for a particular time zone. The "VTIMEZONE" calendar component cannot be nested within other calendar components. The "VTIMEZONE" calendar component MAY be specified multiple times. If the "VTIMEZONE" calendar component is missing, the recipient should assume all local times are relative to the recipient's time zone. The "VTIMEZONE" calendar component should be specified in the iCalendar object before any other calendar components.

A "VTIMEZONE" calendar component is defined by the following notation:

```
timezonec = "BEGIN" ":" [WSP] "VTIMEZONE" CRLF
           tzprop
           "END" ":" [WSP] "VTIMEZONE" CRLF

tzprop    = *comment [daylight] dtstart [rdate / rrule]
           [tzname] tzoffset
```

The "VTIMEZONE" calendar component is important for correct interpretation of individual as well as recurring calendar components that span a time zone transition. For example, from EST to EDT. The exception to this are calendar components that are considered floating (i.e., occurs at a particular local time no matter what time zone you are in). If the iCalendar object contains a non-floating calendar component that has a recurring date pattern (i.e., includes the "RRULE" property) or a list of date and local time values (i.e., includes the "RDATE" property), one or more "VTIMEZONE" calendar components MUST be specified, such that for the given range of the recurrence (i.e., the earliest instance to latest instance), there is valid time zone information for all instances. In other words, if all of the instances of the pattern is entirely within one offset observance, (e.g., all are in Standard Time), only one "VTIMEZONE" calendar component need be present. If a time zone transition is crossed, then other "VTIMEZONE" calendar components are needed. Further, if there are known changes to the rules for the time zone, even more "VTIMEZONE" calendar components are needed.

Each "VTIMEZONE" calendar component consists of several properties:

The "DAYLIGHT" property is a BOOLEAN value indicating Standard Time (FALSE) or Daylight Savings Time (TRUE). The default for DAYLIGHT is FALSE or Standard Time.

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The "DTSTART" property in this usage is a fully specified DATE-TIME value, including the UTC offset, indicating the effective start date and time for the time zone information. For example, 19671029T020000-0400 represents the time at which the transition to Standard Time took effect in 1967 for the eastern United States.

The "TZOFFSET" property is a UTC-OFFSET value indicating the UTC offset for the time zone (Standard Time or Daylight Savings Time).

The "TZNAME" property is the customary name for the time zone.

The "RRULE" property indicates the recurrence rule for the transition to this time zone. For example, in the United States, the transition from Standard Time to Daylight Saving Time occurs on the first Sunday in April at 02:00. If a recurrence rule describing the transition is known to have an effective end date, the UNTIL recurrence rule parameter is used to specify that end date and time. If the recurrence rule for a particular observance (Daylight Saving Time) is changing, then the UNTIL of the first rule will be equal to the last valid instance (the last date-time) of this particular rule. See example below.

Alternatively, the "RDATE" property can be used. The "RDATE" property is a property that indicates the individual dates and/or times that the transition takes effect. The values supplied for "RDATE" property for each "VTIMEZONE" calendar component MUST provide valid time zone information of all instances of the recurrence specified for the calendar component to which this time zone information is to be applied.

The following are examples of the "VTIMEZONE" calendar component:

This is a simple example showing time zone information for the Eastern United States using "RDATE" property. Note that this is only suitable for a recurring event that starts on or later than 1997, April 6, at 02:00:00 EST (i.e., the earliest effective transition date and time) and ends no later than 1998, April 7, 02:00:00 EST (i.e., latest valid date and time for EST in this scenario). For example, this can be used for a recurring event that occurs every Friday, 8am-9am, starting June 1, 1997, ending Dec 31, 1997.

```
BEGIN:VTIMEZONE
DAYLIGHT:FALSE
RDATE:19971026T020000-0400
TZOFFSET:-0500
```

TZNAME:EST
END:VTIMEZONE

BEGIN:VTIMEZONE
DAYLIGHT:TRUE
RDATE:19970406T020000-0500
TZOFFSET:-0400
TZNAME:EDT
END:VTIMEZONE

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This is a simple example showing the current time zone rules for the Eastern United States using a RRULE recurrence pattern. Note that there is no effective end date to either of the Standard Time or Daylight Time rules. This information would be valid for a recurring event starting today and continuing on into the known future.

BEGIN:VTIMEZONE
DAYLIGHT:FALSE
DTSTART:19671029T020000-0400
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=10
TZOFFSET:-0500
TZNAME:EST
END:VTIMEZONE

BEGIN:VTIMEZONE
DAYLIGHT:TRUE
DTSTART:19870405T020000-0500
RRULE:FREQ=YEARLY;BYDAY=1SU;BYMONTH=4
TZOFFSET:-0400
TZNAME:EDT
END:VTIMEZONE

This is an example showing a fictitious set of rules for the Eastern United States, where the Daylight Time rule has an effective end date (i.e., after that date, Daylight Time is no longer observed).

BEGIN:VTIMEZONE
DAYLIGHT:FALSE
DTSTART:19671029T020000-0400
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=10
TZOFFSET:-0500
TZNAME:EST
END:VTIMEZONE

```
BEGIN:VTIMEZONE
DAYLIGHT:TRUE
DTSTART:19870405T020000-0500
RRULE:FREQ=YEARLY;BYDAY=1SU;BYMONTH=4;UNTIL=19980404T020000-0500
TZOFFSET:-0400
TZNAME:EDT
END:VTIMEZONE
```

This is an example showing a fictitious set of rules for the Eastern United States, where the first Daylight Time rule has an effective end date. There is a second Daylight Time rule that picks up where the other left off.

```
BEGIN:VTIMEZONE
DAYLIGHT:FALSE
DTSTART:19671029T020000-0400
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=10
TZOFFSET:-0500
```

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```
TZNAME:EST
END:VTIMEZONE
```

```
BEGIN:VTIMEZONE
DAYLIGHT:TRUE
DTSTART:19870405T020000-0500
RRULE:FREQ=YEARLY;BYDAY=1SU;BYMONTH=4;UNTIL=19980404T020000-0500
TZOFFSET:-0400
TZNAME:EDT
END:VTIMEZONE
```

```
BEGIN:VTIMEZONE
DAYLIGHT:TRUE
DTSTART:19990327T020000-0500
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=3
TZOFFSET:-0400
TZNAME:EDT
END:VTIMEZONE
```

4.5 Calendar Properties

The Calendar Properties are attributes that apply to the iCalendar object, as a whole. These properties do not appear within a calendar

The data type for this property is TEXT.

4.5.3 Product Identifier

This property is identified by the property name PRODID. This property specifies the identifier for the product that created the iCalendar object. The vendor of the implementation should assure that this is a globally unique identifier; using some technique such as an ISO 9070 FPI value. This calendar property MUST be specified in the iCalendar object but can only appear once.

This property should not be used to alter the interpretation of an iCalendar object beyond the semantics specified in this memo. For example, it is not to be used to further the understanding of non-standard properties.

The property is defined by the following notation:

```
prodid      = "PRODID" ":" [WSP] pidvalue CRLF
pidvalue    = text
;Any text that describes the product and version
;and that is generally assured of being unique.
```

The following is an example of this property:

```
PRODID:-//ABC Corporation//NONSGML My Product//EN
```

The data type for this property is TEXT.

4.5.4 Source

This property is identified by the property name SOURCE. This property is defined by the [MIME DIR] memo. In this memo, the property identifies the URI for the source of the iCalendar object. The URI is useful for accessing the iCalendar object using a calendar access protocol.

The property is defined by the following notation:

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```
source      = "SOURCE" ":" [WSP] uri CRLF
```

The following are examples of this property:

SOURCE:http://xyz.corp.com/corp-cals/1997-events.or4

SOURCE:http://xyz.corp.com/calendars/~jdoe

The data type for this property is URI.

4.5.5 Source Name

This property is identified by the property name NAME. This property is defined by the [MIME DIR] memo. The property identifies the displayable, presentation name for the source of the iCalendar object. The source name is a useful text to associate in the user-interface of an application with the value in the SOURCE property.

The property is defined by the following notation:

```
name      = "NAME" ":" [WSP] text CRLF
```

The following is an example of this property:

```
NAME:1997 Events Calendar for XYZ Corporation
```

The data type for this property is TEXT.

4.5.6 Version

This property is identified by the property name VERSION. This property specifies the identifier corresponding to the highest version number or the minimum and maximum range of the MIME Calendaring and Scheduling Content Type specification supported by the implementation that created the iCalendar object. A value of "2.0" corresponds to this memo. This calendar property MUST appear within the iCalendar object but can only appear once.

The property is defined by the following notation:

```
version   = "VERSION" ":" [WSP] vvalue CRLF
```

```
vvalue    = "2.0"           ;This memo  
          / maxver  
          / (minver ";" [WSP] maxver)
```

```
minver    = <A IANA registered iCalendar version identifier>  
          ;Minimum iCalendar version used to create the iCalendar object
```

```
maxver    = <A IANA registered iCalendar version identifier>  
          ;Maximum iCalendar version used to create the iCalendar object
```

The following is an example of this property:

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VERSION:2.0

The data type for this property is TEXT.

4.6 Component Properties

The following properties MAY appear within calendar components, as specified by each component property definition.

4.6.1 Attachment

This property is identified by the property name ATTACH. The property provides the capability to associate an external object with a calendar component. For example, a document to be reviewed at a scheduled event or the description of the process steps for a to-do. The property MAY only be specified within "VEVENT", "VTODO", "VJOURNAL", or "VALARM" calendar components. This property MAY be specified multiple times within an iCalendar object.

The property is defined by the following notation:

```
attach      = ("ATTACH" ":" [WSP] uri CRLF) /  
              ("ATTACH" ";" [WSP] "ENCODING" "=" "b" ";" [WSP]  
              "VALUE" "=" "text" ":" [WSP] folded-b
```

The following are examples of this property:

```
ATTACH:CID:jsmith.part3.960817T083000.xyzMail@host1.com
```

```
ATTACH:FTP://xyzCorp.com/pub/reports/r-960812.ps
```

The default data type for this property is URI. The data type MAY also be reset to TEXT in order to include inline binary encoded content information.

4.6.2 Attendee

This property is identified by the property name ATTENDEE. The property defines an attendee within a calendar component. The property MAY only be specified within the "VEVENT", "VTODO", "VJOURNAL", "VFREEBUSY" and "VALARM" calendar components.

The property has the property parameters TYPE, for the type of attendee, ROLE, for the intended role of the attendee; STATUS, for the status of the attendee's participation; RSVP, for indicating

whether the favor of a reply is requested; EXPECT, to indicate the expectation of the attendee's participation by the originator; MEMBER, to indicate the groups that the attendee belongs to; DELEGATED-TO, to indicate the people that the original request was delegated to; and DELEGATED-FROM, to indicated whom the request was delegated from.

A recipient delegated a request MUST inherit the RSVP and EXPECT values from the attendee that delegated the request to them.

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Multiple attendees MAY be specified by including multiple "ATTENDEE" properties within the MIME calendaring entity.

The property data type default is CAL-ADDRESS. The property data type MAY also be set to URI. This provides a useful mechanism to allow more than just the address of the attendee to be referenced. If the value is a URI, then it MUST be able to be resolved to a calendar address.

The property is defined by the following notation:

```
attendee = "ATTENDEE" *(";" [WSP] parameter)
          *(";" [WSP] attparam) ":" [WSP]
          (cal-address / uri) CRLF
;Value MUST match default or explicit data type
```

```
attparam = typeparam / roleparam / statusparam / rsvpparm
          / expectparam / memberparam / deletoparm / delefromparam
```

```
typeparam = "TYPE" "="
           ("INDIVIDUAL" ; An individual
            / "GROUP"     ; A group of individuals
            / "RESOURCE"  ; A physical resource
            / "ROOM"     ; A room resource
            / "UNKNOWN") ; Otherwise not known
;Default value is INDIVIDUAL
```

```
roleparam = "ROLE" "="
           ("ATTENDEE" ; Indicates a regular attendee
            / "OWNER"   ; Indicates owner of event or to-do
            / "ORGANIZER" ; Indicates organizer of event or to-do
            / "DELEGATE") ; Indicates delegate to event or to-do
;Default is ATTENDEE
```

```

statusparm = "STATUS" "="
    ("NEEDS-ACTION" ; Indicates event or to-do needs action
    / "ACCEPTED"    ; Indicates event or to-do accepted
    / "DECLINED"   ; Indicates event or to-do not accepted
    / "TENTATIVE"  ; Indicates event or to-do tentatively
    ; accepted. Status MAY change in the future.
    / "COMPLETED" ; Indicates to-do was completed.
    ; COMPLETED property has date/time completed.
    / "IN-PROCESS" ;Indicates to-do is in the process of
    ; being completed.
    / "DELEGATED"  ; Indicates event or to-do delegated
    ; to another ATTENDEE
    / "CANCELLED") ; Indicates event or to-do cancelled for
                    ; ATTENDEE
;Default is NEEDS-ACTION

rsvpparm   = "RSVP" "="
    ("TRUE"          ; Indicates response requested
    / "FALSE")       ; Indicates no response needed
;Default is FALSE

```

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```

expectparm = "EXPECT" "="
    ("FYI"          ; Indicates request is for your info
    / "REQUIRE"    ; Indicates presence is required
    / "REQUEST")   ; Indicates presence is requested
;Default is FYI

memberparm = "MEMBER" "=" cal-address *(", " [WSP] cal-address)
; Indicates a group or mailing list

deletoparm = "DELEGATED-TO" "=" cal-address *(", " [WSP]
    cal-address)
; Indicates who the request is delegated to

delefromparm = "DELEGATED-FROM" "=" cal-address *(", " [WSP]
    cal-address)
;Indicates who the request is delegated from

```

The following are examples of this property's use for a to-do:

```

ATTENDEE;ROLE=OWNER;STATUS=COMPLETED:MAILTO:jsmith@host1.com
ATTENDEE;MEMBER="MAILTO:DEV-GROUP@host2.com":
    MAILTO:joecool@host2.com
ATTENDEE;DELEGATED-FROM="MAILTO:immud@host3.com":

```

MAILTO:ildoit@host1.com

The following is an example of this property used for specifying multiple attendees to an event:

```
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:MAILTO:John Smith
<jsmith@host1.com>
ATTENDEE;ROLE=ATTENDEE;STATUS=TENTATIVE:MAILTO:Henry Cabot
<hcabot@host2.com>
ATTENDEE;ROLE=DELEGATE;STATUS=ACCEPTED:MAILTO:Jane Doe
<jdoe@host1.com>
```

The following is an example of this property with the value specified as an URI reference to a vCard that contains the information about the attendee:

```
ATTENDEE;ROLE=ATTENDEE;STATUS=ACCEPTED;VALUE=URI:
http://www.xyz.com/~myvcard.vcf
```

The following is an example of this property with "delegatee" and "delegator" information for an event:

```
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:MAILTO:John Smith
<jsmith@host1.com>

ATTENDEE;ROLE=DELEGATE;STATUS=TENTATIVE;DELEGATED-FROM=
"MAILTO:iamboss@host2.com":MAILTO:Henry Cabot<hcabot@host2.com>

ATTENDEE;ROLE=ATTENDEE;STATUS=DELEGATED;DELEGATED-TO=
"MAILTO:hcabot@host2.com:MAILTO:iamboss(The Big Cheese)@host2.com"
```

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```
ATTENDEE;ROLE=DELEGATE;STATUS=ACCEPTED:MAILTO:Jane Doe
<jdoe@host1.com>
```

The default data type for this property is CAL-ADDRESS. The data type MAY be reset to URI; in which case the value is a location or message that contains the information that is to be used to specify the attendee address.

[4.6.3](#) Categories

This property is identified by the property name CATEGORIES. This

property defines the categories for a calendar component. The property MAY be specified within the "VEVENT", "VTOD0" or "VJOURNAL" calendar component with an arbitrary text value. In the "VALARM" calendar component the property MUST be specified to declare the alarm category. More than one category MAY be specified as a list of categories separated by the COMMA character (ASCII decimal 44).

The properties is defined by the following notation:

```
categories = "CATEGORIES" *(";" [WSP] parameter) ":" [WSP]
             catvalue CRLF
```

```
catvalue    = cat1value *["," [WSP] cat1value]
             / cat2value *["," [WSP] cat2value]
```

```
cat1value   = "ANNIVERSARY" / "APPOINTMENT" / "BUSINESS"
             / "EDUCATION" / "HOLIDAY" / "MEETING" / "MISCELLANEOUS"
             / "NON-WORKING HOURS" / "NOT IN OFFICE" / "PERSONAL"
             / "PHONE CALL" / "SICK DAY" / "SPECIAL OCCASION"
             / "TRAVEL" / "VACATION" / word
```

;Used only in "VEVENT", "VTOD0" and "VJOURNAL" calendar components.

```
cat2value   = "AUDIO" / "DISPLAY" / "EMAIL" / "PROCEDURE"
             / iana-token / x-name
```

;Used only in "VALARM" calendar component.

The following are examples of this property in a "VEVENT", "VTOD0" or "VJOURNAL" calendar component:

```
CATEGORIES:APPOINTMENT,EDUCATION
```

```
CATEGORIES:MEETING
```

The following are examples of this property in a "VALARM" calendar component:

```
CATEGORIES:AUDIO,DISPLAY
```

```
CATEGORIES:PROCEDURE
```

The data type for this property is TEXT.

This property is identified by the property name CLASS. This property defines the access classification for a calendar component. The property MAY only be specified in a "VEVENT", "VTODO" or "VJOURNAL" calendar component. The property MAY only be specified once.

An access classification is only one component of the general security system within a calendar application. It provides a method of capturing the scope of the access the calendar owner intends for information within an individual calendar entry. The access classification of an individual iCalendar component is useful when measured along with the other security components of a calendar system (e.g., calendar user authentication, authorization, access rights, access role, etc.). Hence, the semantics of the individual access classifications cannot be completely defined by this memo alone. Additionally, due to the "blind" nature of most exchange processes using this memo, these access classifications cannot serve as an enforcement statement for a system receiving an iCalendar object. Rather, they provide a method for capturing the intention of the calendar owner for the access to the calendar component. The [\[ICMS\]](#) provides a broader description of the security system within a calendar application.

The property is defined by the following notation:

```
class      = "CLASS" ":" [WSP] classvalue CRLF
classvalue = "PUBLIC" / "PRIVATE" / "CONFIDENTIAL" / iana-token
           / x-name
;Default is PUBLIC
```

The following is an example of this property:

```
CLASS:PUBLIC
```

The data type for this property is TEXT.

[4.6.5](#) Comment

This property is identified by the property name COMMENT. This property specifies non-processing information intended to provide a comment to the calendar user. The property MAY be specified in any of the calendar components. The property MAY be specified multiple times.

The property is defined by the following notation:

```
comment    = "COMMENT" ":" [WSP] text CRLF
```

The following is an example of this property:

```
COMMENT:The meeting really needs to include both ourselves
and the customer. We can't hold this meeting without them
```

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As a matter of fact\, the venue for the meeting ought to be at their site. - - John

The data type for this property is TEXT.

4.6.6 Contact

This property is defined by the property name CONTACT. The property is used to represent contact information or alternately a reference to contact information associated with the calendar component. The property MAY only be specified in the "VEVENT", "VTODO" and "VJOURNAL" calendar components. The property value consists of textual contact information. Alternately, the value type for the property can be reset such that the property references the URI to the contact information.

The property is defined by the following notation:

```
contact        = "CONTACT" *(";" [WSP] parameter) ":" [WSP]
                 text / uri CRLF
```

The following is an example of this property referencing textual contact information:

```
CONTACT:Jim Dolittle\, ABC Industries\, +1-919-555-1234
```

The following is an example of this property referencing a LDAP URI to a directory entry containing the contact information:

```
CONTACT;VALUE=URI:ldap://host.com:6666/o=3DABC%20Industries\,
                 c=3DUS??(cn=3DBJim%20Dolittle)
```

The following is an example of this property referencing a MIME body part containing the contact information, such as a vCard embedded in a [MIME-DIR] content-type:

```
CONTACT;VALUE=URI:<part3.msg970930T083000SILVER@host.com>
```

The default data type for this property is TEXT. The data type MAY be reset to URI in order to specify a reference to the contact information.

4.6.7 Date/Time Completed

This property is identified by the property name COMPLETED. This property defines the date and time that a to-do was actually completed. The property MAY be specified once in a "VTODO" component. The date and time is an UTC value.

The property is defined by the following notation:

```
completed = "COMPLETED" ":" [WSP] date-time CRLF
```

The following is an example of this property:

```
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```

```
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```

```
COMPLETED:19960401T235959Z
```

The data type for this property is DATE-TIME.

[4.6.8](#) **Date/Time Created**

This property is identified by the property name CREATED. This property specifies the date and time that the calendar information was created by the Organizer. The property MAY be specified in any of the calendar components. The property MAY only be specified once. The date and time is an UTC value.

The property is defined by the following notation:

```
created = "CREATED" ":" [WSP] date-time CRLF
```

The following is an example of this property:

```
CREATED:19960329T133000Z
```

The data type for this property is DATE-TIME.

[4.6.9](#) **Date/Time Due**

This property is identified by the property name DUE. This property defines the date and time that a to-do is expected to be completed. The time can either be in local time, local time with UTC offset or UTC time. The property MAY only be specified in a "VTODO" calendar component and only once. The value MUST be a date/time after the DTSTART value, if specified.

The property is defined by the following notation:

```
due = "DUE" ":" [WSP] date-time CRLF
```

The following is an example of this property:

```
DUE:19960401T235959Z
```

The type for this property is DATE-TIME.

4.6.10 Date/Time End

This property is identified by the property name DTEND. This property MAY be specified within the "VEVENT", "VFREEBUSY", and "VTIMEZONE" calendar components.

Within the "VEVENT" calendar component, this property defines the end date and time for the event. The property is REQUIRED in "VEVENT" calendar components. The time can either be in local time, local time with UTC offset or UTC time. The local time is only to be used to specify date and time values that do not need to be fixed. A recipient MUST assume their own time zone for data and time values

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that do not include time zone information. The value MUST be later in time than the value of the "DTSTART" property.

Within the "VFREEBUSY" calendar component, this property defines the end date and time for the free or busy time information. The time MUST be specified in local time with UTC offset or UTC time. The value MUST be later in time than the value of the "DTSTART" property.

The property is defined by the following notation:

```
dtend      = "DTEND" ":" [WSP] date-time CRLF
```

The following is an example of this property:

```
DTEND:19960401T235959Z
```

The data type for this property is DATE-TIME.

4.6.11 Date/Time Stamp

This property is identified by the property name DTSTAMP. This property specifies an UTC date/time stamp. The property indicates the date/time that the iCalendar object instance was created. This property MUST be included in "VEVENT", "VTODO", "VJOURNAL" and

"VFREEBUSY" calendar components to permit the recipient to know when the iCalendar object was created.

This property is also useful to protocols such as [\[IMIP\]](#) that have inherent latency issues with the delivery of content. This property will assist in the proper sequencing of messages containing iCalendar objects.

This property is different than the "CREATED" and "LAST-MODIFIED" properties. These two properties are used to specify when the calendar service information was created and last modified. This is different than when the iCalendar object representation of the calendar service information was created or last modified.

The property is defined by the following notation:

```
dtstamp    = "DTSTAMP" ":" [WSP] date-time CRLF
```

The value type for this property is DATE-TIME. The value MUST be a UTC date/time value.

[4.6.12](#) Date/Time Start

This property is identified by the property name DTSTART. This property MAY be specified within the "VEVENT", "VTODO", "VFREEBUSY", and "VTIMEZONE" calendar components.

Within the "VEVENT" calendar component, this property defines the start date and time for the event. The property is REQUIRED in "VEVENT" calendar components. The time can either be in local time,

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local time with UTC offset or UTC time. The local time is only to be used to specify date and time values that do not need to be fixed. A recipient MUST assume their own time zone for data and time values that do not include time zone information. Events MAY have a start date/time but no end date/time. In that case, the event does not take up any time.

Within the "VFREEBUSY" calendar component, this property defines the start date and time for the free or busy time information. The time MUST be specified in local time with UTC offset or UTC time.

Within the "VTIMEZONE" calendar component, this property defines the effective start date and time for a time zone specification. This

property is REQUIRED within "VTIMEZONE" calendar components. The time MUST be specified as a UTC time.

The property is defined by the following notation:

```
dtstart    = "DTSTART" *(";" [WSP] parameter) ":" [WSP] (date-time
              / date) CRLF
```

The following is an example of this property:

```
DTSTART:19960401T235959-0600
```

The default data type for this property is DATE-TIME. The data type MAY be overridden to be DATE.

4.6.13 Daylight

This property is identified by the property name DAYLIGHT. This property MAY only be specified in a "VTIMEZONE" calendar component. This property specifies whether Daylight Saving Time (i.e., value is TRUE) or Standard Time (i.e., value is FALSE) is in effect for the time zone. The default value is FALSE or Standard Time.

The property is defined by the following notation:

```
daylight   = "DAYLIGHT" ":" [WSP] boolean CRLF
              ;Default value is FALSE
```

The following is an example of this property:

```
DAYLIGHT:TRUE           ;Specifies DST in effect in time zone
```

The data type for this property is BOOLEAN.

4.6.14 Description

This property is identified by the property name DESCRIPTION. This property provides a more complete description of the calendar component, than that provided by the "SUMMARY" property. The property MAY be specified in the "VEVENT", "VTODO" and "VJOURNAL" calendar

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components. The property MAY be specified multiple times only within a "VJOURNAL" calendar component.

The property is defined by the following notation:

```
description      = "DESCRIPTION" *("; " [WSP] parameter) ":" [WSP]
                  text CRLF
```

The following is an example of the property with formatted line breaks in the property value:

```
DESCRIPTION:Meeting to provide technical review for "Phoenix"
             design.\n Happy Face Conference Room. Phoenix design team
             MUST attend this meeting.\n RSVP to team leader.
```

The following is an example of the property with folding of long lines:

```
DESCRIPTION:Last draft of the new novel is to be completed
             for the editor's proof today.
```

The data type for this property is TEXT.

4.6.15 Duration

This property is identified by the property name DURATION. The property specifies a duration of time. The property MAY be specified in a "VEVENT" calendar component in order to specify a duration of the event, instead of an explicit end date/time. The property MAY be specified in a "VTODO" calendar component in order to specify a duration for the to-do. The property MAY be specified in a "VFREEBUSY" calendar component in order to specify the amount of free time being requested. The property MAY be specified in an "VALARM" calendar component in order to specify the period between repeating alarms.

The property is defined by the following notation:

```
duration      = "DURATION" ":" [WSP] duration CRLF
```

The following is an example of this property that specifies an interval of time of 1 hour and zero minutes and zero seconds:

```
DURATION:PT1H0M0S
```

The following is an example of this property that specifies an interval of time of 15 minutes.

```
DURATION:PT15M
```

The data type for this property is DURATION.

4.6.16 Exception Date/Times

This property is identified by the property name EXDATE. This property defines the list of date/time exceptions for a recurring "VEVENT", "VTODO" or "VJOURNAL" calendar component. The times can either be in local time, local time with UTC offset or UTC time.

The exception dates, if specified, is used in computing the recurrence set. The recurrence set is the complete set of recurrence instances for a calendar component. The recurrence set is generated by considering the initial "DTSTART" property along with the "RRULE", "RDATE", "EXDATE" and "EXRULE" properties contained within the iCalendar object. The "DTSTART" property defines the first instance in the recurrence set. Multiple instances of the "RRULE" and "EXRULE" properties MAY also be specified to define more sophisticated recurrence sets. The final recurrence set is generated by gathering all of the start date-times generated by any of the specified "RRULE" and "RDATE" properties, and excluding any start date and times which fall within the union of start date and times generated by any specified "EXRULE" and "EXDATE" properties. This implies that start date and times within exclusion related properties (i.e., "EXDATE" and "EXRULE") take precedence over those specified by inclusion properties (i.e., "RDATE" and "RRULE"). Where duplicate instances are generated by the "RRULE" and "RDATE" properties, only one recurrence is considered. Duplicate instances are ignored.

The "EXDATE" property MAY be used to exclude the value specified in "DTSTART". However, in such cases the original "DTSTART" date MUST still be maintained by the calendaring and scheduling system because the original "DTSTART" value has inherent usage dependencies by other properties such as the "RECURRENCE-ID".

The property is defined by the following notation:

```
exdate      = "EXDATE" *(";" [WSP] parameter) ":" [WSP] [date-time /
                date] *("," [WSP] date-time/date) CRLF
;Values MUST match the specified value type.
```

The following is an example of this property:

```
EXDATE:19960402T010000Z,19960403T010000Z,19960404T010000Z
```

The data type for this property is DATE-TIME. The data type MAY be reset to DATE.

[4.6.17](#) Exception Rule

This property is identified by the property name EXRULE. This property defines a rule or repeating pattern for an exception to a recurrence set. This property MAY only be specified in the "VEVENT", "VTODO" or "VJOURNAL" calendar components.

The exception rule, if specified, is used in computing the recurrence set. The recurrence set is the complete set of recurrence instances

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for a calendar component. The recurrence set is generated by considering the initial "DTSTART" property along with the "RRULE", "RDATE", "EXDATE" and "EXRULE" properties contained within the iCalendar object. The "DTSTART" defines the first instance in the recurrence set. Multiple instances of the "RRULE" and "EXRULE" properties MAY also be specified to define more sophisticated recurrence sets. The final recurrence set is generated by gathering all of the start date-times generated by any of the specified "RRULE" and "RDATE" properties, and excluding any start date and times which fall within the union of start date and times generated by any specified "EXRULE" and "EXDATE" properties. This implies that start date and times within exclusion related properties (i.e., "EXDATE" and "EXRULE") take precedence over those specified by inclusion properties (i.e., "RDATE" and "RRULE"). Where duplicate instances are generated by the "RRULE" and "RDATE" properties, only one recurrence is considered. Duplicate instances are ignored.

The "EXRULE" property MAY be used to exclude the value specified in "DTSTART". However, in such cases the original "DTSTART" date MUST still be maintained by the calendaring and scheduling system because the original "DTSTART" value has inherent usage dependencies by other properties such as the "RECURRENCE-ID".

The property is defined by the following notation:

```
exrule    = "EXRULE" ":" [WSP] recur CRLF
```

The following are examples of this property. Except every other week, on Tuesday and Thursday for 4 occurrences:

```
EXRULE:FREQ=WEEKLY;COUNT=4;INTERVAL=2;BYDAY=TU,TH
```

Except daily for 10 occurrences:

EXRULE:FREQ=DAILY;COUNT=10

Except yearly in June and July for 8 occurrences:

EXRULE:FREQ=YEARLY;COUNT=8;BYMONTH=6,7

The data type for this property is RECUR.

4.6.18 Free/Busy Time

This property is identified by the property name FREEBUSY. The property defines one or more free or busy time intervals. These time periods MAY be specified as either a start and end date-time or a start date-time and duration.

The date and time is either local time with UTC offset or a UTC value.

The "FREEBUSY" property MAY include the "TYPE" property parameter to specify whether the information defines a free or busy time interval.

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The default "TYPE" property parameter value is BUSY. The property MAY also include the "STATUS" property parameter to provide added information about the busy time. For example, if the busy time is associated with a time interval that would be unavailable for scheduling - - in any case - - or busy time that has been tentatively scheduled. The default "STATUS" property parameter value is BUSY. The property is defined by the following notation:

```
freebusy = "FREEBUSY" *(";" [WSP] parameter) [;" [WSP]
          fbparmlist] ":" [WSP] fbvalue CRLF
```

```
fbparmlist = fbparam *(";" [WSP] fbparam)
```

```
fbparam = fbtype / fbstatus
```

```
fbtype = "TYPE" "=" ("FREE" or "BUSY")
;Default is BUSY
```

```
fbstatus = "STATUS" "="
          "BUSY" ;Represents busy time interval.
          / "UNAVAILABLE" ;Represents busy, but unavailable
          ;interval for cheduling; such as
```

```

;out-of-office or non-working hours.
/ "TENTATIVE" ;Represents busy, but tentatively
;scheduled interval.
;Default is BUSY

fbvalue = period *["," [WSP] period]
;Value MUST match default or explicit data type

```

The following are some examples of this property:

```
FREEBUSY;STATUS=UNAVAILABLE:19970308T160000Z/PT8H30M
```

```
FREEBUSY;TYPE=FREE:19970308T160000Z/PT3H,19970308T200000Z/PT1H
```

"FREEBUSY" properties within the "VFREEBUSY" calendar component should be sorted in ascending order, based on start time and then end time, with the earliest periods first.

The "FREEBUSY" property MAY specify more than one value, separated by the COMMA character (ASCII decimal 44). In such cases, the "FREEBUSY" property values should all be of the same "STATUS" property parameter type (e.g., all values of a particular "STATUS" listed together in a single property).

The data type for this property is PERIOD.

4.6.19 Geographic Position

This property is identified by the property name GEO. This property specifies information related to the global position for a "VEVENT" or "VTODO" calendar component. The property value specifies latitude and longitude, in that order (i.e., "LAT LON" ordering). The

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longitude represents the location east and west of the prime meridian as a positive or negative real number, respectively. The latitude represents the location north and south of the equator as a positive or negative real number, respectively. The longitude and latitude values MUST be specified as decimal degrees and should be specified to six decimal places. This will allow for granularity within a meter of the geographical position. The simple formula for converting degrees-minutes-seconds into decimal degrees is:

decimal = degrees + minutes/60 + seconds/3600.

The property is defined by the following notation:

```
geo          = "GEO" ":" [WSP] geovalue CRLF
geovalue    = float ";" [WSP] float
              ;Latitude and Longitude components
```

The following is an example of this property:

```
GEO:37.386013;-122.082932
```

The default data type for this property is FLOAT.

[4.6.20](#) Last Modified

This property is identified by the property name LAST-MODIFIED. The property specifies the date and time that the calendar information was last revised. This property MAY be specified in the "VEVENT", "VTODO", "VJOURNAL" or "VFREEBUSY" calendar components. The data and time MUST be a UTC value.

The property is defined by the following notation:

```
last-mod    = "LAST-MODIFIED" ":" [WSP] date-time CRLF
```

The following is are examples of this property:

```
LAST-MODIFIED:19960817T133000Z
```

The data type for this property is DATE-TIME.

[4.6.21](#) Location

This property is identified by the property name LOCATION. The property defines the intended location for the "VEVENT" or "VTODO" calendar component. The property MAY only be specified within a "VEVENT" or "VTODO" calendar component.

The property is defined by the following notation:

```
location    = "LOCATION *(;" [WSP] parameter) ":" [WSP] locavalue
              CRLF
```

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```
locavalue   = text / uri      ;The value MUST be the same type as the
```

;default or explicit data type.

The following are some examples of this property:

```
LOCATION:Conference Room - F123, Bldg. 002
```

```
LOCATION;VALUE=URI:http://www.xyzcorp.com/~jsmith.vcf
```

The default data type for this property is TEXT. The data type MAY be reset to URI. In the case of the data type being URI, the property value MAY reference a vCard object. This provides a useful mechanism to specify a location in terms of its electronic business card.

4.6.22 Percent Complete

This property is identified by the property name PERCENT-COMPLETE. This property is used by an assignee or delegatee of a to-do to convey the percent completion of a to-do to the Organizer. The property MAY only be specified once and within a "VTODO" calendar component. The property value is an integer between zero and one hundred. A value of "0" indicates the to-do has not yet been started. A value of "100" indicates that the to-do has been completed. Integer values in between indicate the percent partially complete.

When a to-do is assigned to multiple individuals, the property value indicates the percent complete for that portion of the to-do assigned to the assignee or delegatee. For example, if a to-do is assigned to both individuals "A" and "B". A reply from "A" with a percent complete of "70" indicates that "A" has completed 70% of the to-do assigned to them. A reply from "B" with a percent complete of "50" indicates "B" has completed 50% of the to-do assigned to them.

The property is defined by the following notation:

```
percent = "PERCENT-COMPLETE" ":" [WSP] integer CRLF
```

The following is an example of this property to show 39% completion:

```
PERCENT-COMPLETE:39
```

The data type for this property is INTEGER.

4.6.23 Priority

This property is identified by the property name PRIORITY. The property defines the priority for event or to-do. The property MAY only be specified within a "VEVENT" or "VTODO" calendar component. The value is an integer. A value of zero (ASCII decimal 48) specifies an undefined priority. A value of one (ASCII decimal 49) is the highest priority. A value of two (ASCII decimal 50) is the second highest priority. Subsequent numbers specify a decreasing ordinal priority.

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The property is specified by the following notation:

```
priority = "PRIORITY" ":" [WSP] integer CRLF
;Default is zero
```

The following is an example of this property:

```
PRIORITY:2
```

The data type for this property is INTEGER.

[4.6.24](#) Recurrence Date/Times

This property is identified by the property name RDATE. This property defines the list of date/times for a recurrence set. The property MAY only appear within the "VEVENT", "VTODO", "VJOURNAL" or "VTIMEZONE" calendar components. This property MAY appear along with the "RRULE" property to define an aggregate set of repeating occurrences. When they both appear in an iCalendar object, the recurring events are defined by the union of occurrences defined by both the "RDATE" and "RRULE". The times can either be in local time, local time with UTC offset or UTC based time. If local time is used, the "VTIMEZONE" calendar component MUST be included in the iCalendar object, otherwise the local time value will be interpreted relative to the time zone of the recipient. The period values for "RDATE" property are specified using a specific start and a specific end basic format (period-explicit) or the period with a specific start and a specific duration basic format (period-start).

The recurrence dates, if specified, is used in computing the recurrence set. The recurrence set is the complete set of recurrence instances for a calendar component. The recurrence set is generated by considering the initial "DTSTART" property along with the "RRULE", "RDATE", "EXDATE" and "EXRULE" properties contained within the iCalendar object. The "DTSTART" property defines the first instance in the recurrence set. Multiple instances of the "RRULE" and "EXRULE" properties MAY also be specified to define more sophisticated recurrence sets. The final recurrence set is generated by gathering all of the start date-times generated by any of the specified "RRULE" and "RDATE" properties, and excluding any start date and times which fall within the union of start date and times generated by any specified "EXRULE" and "EXDATE" properties. This implies that start

date and times within exclusion related properties (i.e., "EXDATE" and "EXRULE") take precedence over those specified by inclusion properties (i.e., "RDATE" and "RRULE"). Where duplicate instances are generated by the "RRULE" and "RDATE" properties, only one recurrence is considered. Duplicate instances are ignored.

The property is defined by the following notation:

```
rdate      = "RDATE" *(";" [WSP] parameter) ":" [WSP] rdvalue
            *(", " [WSP] rdvalue) CRLF
```

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```
rdvalue    = date-time / date / period
;Value MUST match the specified data type
```

The following are examples of this property:

```
RDATE:19970714T083000-0400
```

```
RDATE;VALUE=PERIOD:19960403T020000Z/19960403T040000Z,
19960404T010000Z/PT3H
```

```
RDATE;VALUE=DATE:19970101,19970120,19970217,19970421
19970526,19970704,19970901,19971014,19971128,19971129,19971225
```

The default data type for this property is DATE-TIME. The data type MAY be reset to DATE or PERIOD.

4.6.25 Recurrence ID

This property is identified by the property name RECURRENCE-ID. This property is used in conjunction with the "UID" property to identify a specific instance of a recurring "VEVENT", "VTOD" or "VJOURNAL" calendar component. The property value is the effective value of the "DTSTART" property of the recurrence instance.

The full range of calendar components specified by a recurrence set is referenced by referring to just the "UID" property value corresponding to the calendar component. The "RECURRENCE-ID" property allows the reference to an individual instance within the recurrence set.

The time of day component for the value MUST be either an UTC or a

local time with UTC offset time format, unless the original calendar object was expressed as a "floating" calendar object; that is in local time with no time zone calendar component specified. If the value of the "DTSTART" property is a DATE type value, then the value MUST be the calendar date for the recurrence instance.

The date/time value is set to the time when the original recurrence instance would occur - - meaning that if the intent is to change a Friday meeting to Thursday, the date/time is still set to the original Friday meeting.

The "RECURRENCE-ID" property is used in conjunction with the "UID" property to identify a particular instance of a recurring event, to-do or journal.

The property is defined by the following notation:

```
recurid    = "RECURRENCE-ID" *(";" [WSP] parameter)
              [";" [WSP] rangeparm] ":" [WSP] [date-time / date]
              ;Value must match value type.

rangeparm  = "RANGE" "=" ("THISANDPRIOR" / "THISANDFUTURE")
```

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The default value for the range parameter is the single recurrence instance only.

The following are examples of this property:

```
RECURRENCE-ID:19960401T235959Z
```

```
RECURRENCE-ID;RANGE=THISANDFUTURE:19960120T120000Z
```

This default data type for this property is DATE-TIME. The data type MAY be reset to DATE.

4.6.26 Recurrence Rule

This property is identified by the property name RRULE. This property defines a rule or repeating pattern for a recurring events, to-dos, or time zone definitions. The property MAY be specified in the "VEVENT", "VTODO", "VJOURNAL" or "VTIMEZONE" calendar components. The data type for this property is RECUR.

==> (1997 9AM EDT)September 2-11

Daily until 12/24/97:

DTSTART:19970902T090000-0400
RRULE:FREQ=DAILY;UNTIL=19971224T000000Z

==> (1997 9AM EDT)September 2-30;October 1-25
(1997 9AM EST)October 26-31;November 1-30;December 1-23

Every other day - forever:

DTSTART:19970902T090000-0400
RRULE:FREQ=DAILY;INTERVAL=2
==> (1997 9AM EDT)September 2, 4, 6, 8...24, 26, 28, 30;
October 2, 4, 6...20, 22, 24
(1997 9AM EST)October 26, 28, 30;November 1, 3, 5, 7...25, 27, 29;
Dec 1, 3, ...

Every 10 days, 5 occurrences:

DTSTART:19970902T090000-0400
RRULE:FREQ=DAILY;INTERVAL=10;COUNT=5
==> (1997 9AM EDT)September 2, 12, 22;October 2, 12

Everyday in January, for 3 years:

DTSTART:19980101T090000-0400
RRULE:FREQ=YEARLY;UNTIL:20000131T090000-0400;BYMONTH=1;BYDAY=SU,
MO, TU, WE, TH, FR, SA
or
RRULE:FREQ=DAILY;UNTIL:20000131T090000-0400;BYMONTH=1

==> (1998 9AM EDT)January 1-31
(1999 9AM EDT)January 1-31
(2000 9AM EDT)January 1-31

Weekly for 10 occurrences

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;COUNT=10
==> (1997 9AM EDT)September 2, 9, 16, 23, 30;October 7, 14, 21

(1997 9AM EST)October 28;November 4

Weekly until 12/24/94

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;UNTIL=19971224T000000Z

==> (1997 9AM EDT)September 2,9,16,23,30;October 7,14,21
(1997 9AM EST)October 28;November 4,11,18,25;
December 2,9,16,23

Every other week - forever:

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;INTERVAL=2;WKST=SU

==> (1997 9AM EDT)September 2,16,30;October 14
(1997 9AM EST)October 28;November 11,25;December 9,23
(1998 9AM EST)January 6,20;February

...

Weekly on Tuesday and Thursday for 5 weeks:

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;UNTIL=19971007T000000-0400;WKST=SU;BYDAY=TU,TH
or
RRULE:FREQ=WEEKLY;COUNT=10;WKST=SU;BYDAY=TU,TH

==> (1997 9AM EDT)September 2,4,9,11,16,18,23,25,30;October 2

Every other week on Monday, Wednesday and Friday until 12/24/97, but starting on Tuesday, 9/2/97:

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;INTERVAL=2;UNTIL=19971224T000000-0400;WKST=SU;
BYDAY=MO,WE,FR
==> (1997 9AM EDT)September 2,3,5,15,17,19,29;October 1,3,13,15,17
(1997 9AM EST)October 27,29,31;November 10,12,14,24,26,28;
December 8,10,12,22

Every other week on Tuesday and Thursday, for 8 occurrences:

DTSTART:19970902T090000-0400
RRULE:FREQ=WEEKLY;INTERVAL=2;COUNT=8;WKST=SU;BYDAY=TU,TH

==> (1997 9AM EDT)September 2,4,16,18,30;October 2,14,16

Monthly on the 1st Friday for ten occurrences:

DTSTART:19970905T090000-0400

RRULE:FREQ=MONTHLY;COUNT=10;BYDAY=1FR

==> (1997 9AM EDT)September 5;October 3

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(1997 9AM EST)November 7;Dec 5

(1998 9AM EST)January 2;February 6;March 6;April 3

(1998 9AM EDT)MAY 1;June 5

Monthly on the 1st Friday until 12/24/94:

DTSTART:19970905T090000-0400

RRULE:FREQ=MONTHLY;UNTIL=19971224T000000Z;BYDAY=1FR

==> (1997 9AM EDT)September 5;October 3

(1997 9AM EST)November 7;December 5

Every other month on the 1st and last Sunday of the month for 10 occurrences:

DTSTART:19970907T090000-0400

RRULE:FREQ=MONTHLY;INTERVAL=2;COUNT=10;BYDAY=1SU, -1SU

==> (1997 9AM EDT)September 7, 28

(1997 9AM EST)November 2, 30

(1998 9AM EST)January 4, 25;March 1, 29

(1998 9AM EDT)MAY 3, 31

Monthly on the second to last Monday of the month for 6 months:

DTSTART:19970922T090000-0400

RRULE:FREQ=MONTHLY;COUNT=6;BYDAY=-2MO

==> (1997 9AM EDT)September 22;October 20

(1997 9AM EST)November 17;December 22

(1998 9AM EST)January 19;February 16

Monthly on the third to the last day of the month, forever:

DTSTART:19970928T090000-0400

RRULE:FREQ=MONTHLY;BYMONTHDAY=-3

==> (1997 9AM EDT)September 28

(1997 9AM EST)October 29;November 28;December 29

(1998 9AM EST)January 29;February 26

==> (1997 9AM EDT)June 10;July 10
(1998 9AM EDT)June 10;July 10
(1999 9AM EDT)June 10;July 10
(2000 9AM EDT)June 10;July 10
(2001 9AM EDT)June 10;July 10

Note: Since none of the BYDAY, BYMONTHDAY or BYYEARDAY components are specified, the day is gotten from DTSTART

Every other year on January, February, and March for 10 occurrences:

DTSTART:19970310T090000-0400
RRULE:FREQ=YEARLY;INTERVAL=2;COUNT=10;BYMONTH=1,2,3

==> (1997 9AM EST)March 10
(1999 9AM EST)January 10;February 10;March 10
(2001 9AM EST)January 10;February 10;March 10
(2003 9AM EST)January 10;February 10;March 10

Every 3rd year on the 1st, 100th and 200th day for 10 occurrences:

DTSTART:19970101T090000-0400
RRULE:FREQ=YEARLY;INTERVAL=3;COUNT=10;BYYEARDAY=1,100,200

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==> (1997 9AM EST)January 1
(1997 9AM EDT)April 10;July 19
(2000 9AM EST)January 1
(2000 9AM EDT)April 9;July 18
(2003 9AM EST)January 1
(2003 9AM EDT)April 10;July 19
(2006 9AM EST)January 1

Every 20th Monday of the year, forever:

DTSTART:19970519T090000-0400
RRULE:FREQ=YEARLY;BYDAY=20MO

==> (1997 9AM EDT)MAY 19
(1998 9AM EDT)MAY 18
(1999 9AM EDT)MAY 17

...

Monday of Week No. 20, forever:

DTSTART:19970512T090000-0400
RRULE:FREQ=YEARLY;BYWEEKNO=20;BYDAY=MO

==> (1997 9AM EDT)MAY 12
(1998 9AM EDT)MAY 11
(1999 9AM EDT)MAY 17

...

Every Thursday in March, forever:

DTSTART:19970313T090000-0400
RRULE:FREQ=YEARLY;BYMONTH=3;BYDAY=TH

==> (1997 9AM EST)March 13,20,27
(1998 9AM EST)March 5,12,19,26
(1999 9AM EST)March 4,11,18,25

...

Every Thursday, but only during summer months, forever:

DTSTART:19970605T090000-0400
RRULE:FREQ=YEARLY;BYDAY=TH;BYMONTH=6,7,8

==> (1997 9AM EDT)June 5,12,19,26;July 3,10,17,24,31;
August 7,14,21,28
(1998 9AM EDT)June 4,11,18,25;July 2,9,16,23,30;
August 6,13,20,27
(1999 9AM EDT)June 3,10,17,24;July 1,8,15,22,29;
August 5,12,19,26

...

Every Friday the 13th, forever:

DTSTART:19970902T090000-0400

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EXDATE:19970902T090000-0400
RRULE:FREQ=MONTHLY;BYDAY=FR;BYMONTHDAY=13

==> (1998 9AM EST)February 13;March 13;November 13
(1999 9AM EDT)August 13
(2000 9AM EDT)October 13

...

The first Saturday that follows the first Sunday of the month,
forever:

```
DTSTART:19970913T090000-0400
RRULE:FREQ=MONTHLY;BYDAY=SA;BYMONTHDAY=7,8,9,10,11,12,13
```

```
==> (1997 9AM EDT)September 13;October 11
      (1997 9AM EST)November 8;December 13
      (1998 9AM EST)January 10;February 7;March 7
      (1998 9AM EDT)April 11;MAY 9;June 13...
```

...

Every four years, the first Tuesday after a Monday in November,
forever (U.S. Presidential Election day):

```
DTSTART:19961105T090000-0400
RRULE:FREQ=YEARLY;INTERVAL=4;BYMONTH=11;BYDAY=TU;BYMONTHDAY=2,3,4,
      5,6,7,8
```

```
==> (1996 9AM EST)November 5
      (2000 9AM EST)November 7
      (2004 9AM EST)November 2
```

...

The 3rd instance into the month of one of Tuesday, Wednesday or
Thursday, for the next 3 months:

```
DTSTART:19970904T090000-0400
RRULE:FREQ=MONTHLY;COUNT=3;BYDAY=TU,WE,TH;BYSETPOS=3
```

```
==> (1997 9AM EDT)September 4;October 7
      (1997 9AM EST)November 6
```

The 2nd to last weekday of the month:

```
DTSTART:19970929T090000-0400
RRULE:FREQ=MONTHLY;BYDAY=MO,TU,WE,TH,FR;BYSETPOS=-2
```

```
==> (1997 9AM EDT)September 29
      (1997 9AM EST)October 30;November 27;December 30
      (1998 9AM EST)January 29;February 26;March 30
```

...

Every 3 hours from 9AM to 5PM on a specific day:

```
DTSTART:19970902T090000-0400
```

RRULE:FREQ=HOURLY;INTERVAL=3;UNTIL=19970902T170000-0400

==> (September 2, 1997 EDT)09:00,12:00,15:00

Every 15 minutes for 6 occurrences:

DTSTART:19970902T090000-0400

RRULE:FREQ=MINUTELY;INTERVAL=15;COUNT=6

==> (September 2, 1997 EDT)09:00,09:15,09:30,09:45,10:00,10:15

Every hour and a half for 4 occurrences:

DTSTART:19970902T090000-0400

RRULE:FREQ=MINUTELY;INTERVAL=90;COUNT=4

==> (September 2, 1997 EDT)09:00,10:30;12:00;13:30

Every 20 minutes from 9AM to 4:40PM every day:

DTSTART:19970902T090000-0400

RRULE:FREQ=DAILY;BYHOUR=9,10,11,12,13,14,15,16;BYMINUTE=0,20,40
or

RRULE:FREQ=MINUTELY;INTERVAL=20;BYHOUR=9,10,11,12,13,14,15,16

==> (September 2, 1997 EDT)9:00,9:20,9:40,10:00,10:20,
... 16:00,16:20,16:40

(September 3 1997 EDT)9:00,9:20,9:40,10:00,10:20,
...16:00,16:20,16:40

...

An example where the days generated makes a difference because of WKST:

DTSTART:19970805T090000-0400

RRULE:FREQ=WEEKLY;INTERVAL=2;COUNT=4;BYDAY=TU,SU;WKST=MO

==> (1997 EDT)Aug 5,10,19,24

changing only WKST from MO to SU, yields different results...

DTSTART:19970805T090000-0400

RRULE:FREQ=WEEKLY;INTERVAL=2;COUNT=4;BYDAY=TU,SU;WKST=SU

==> (1997 EDT)August 5,17,19,31

[4.6.27](#) Related To

This property is identified by the property name RELATED-TO. The property is used to represent a relationship or reference between one

calendar component and another. The property MAY only be specified once in the "VEVENT", "VTODO", "VJOURNAL" or "VFREEBUSY" calendar components. The property value consists of the persistent, globally unique identifier of another calendar component. This value would be represented in a calendar component by the "UID" property.

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By default, the property value points to another calendar component that has a PARENT relationship to the referencing object. The "RELTYPE" property parameter is used to either explicitly state the default PARENT relationship type to the referenced calendar component or to override the default PARENT relationship type and specify either a CHILD or SIBLING relationship. The PARENT relationship indicates that the calendar component is a subordinate of the referenced calendar component. The CHILD relationship indicates that the calendar component is a superior of the referenced calendar component. The SIBLING relationship indicates that the calendar component is a peer of the referenced calendar component.

Changes to a calendar component referenced by this property MAY have an implied impact to the related calendar component. For example, if a group event changes its start or end date or time, then the related, dependent events will need to have their start and end dates changed in a corresponding way. This property is intended only to provide information on the relationship of calendar components. It is up to the target calendar system to maintain any property implications of this relationship.

The property is defined by the following notation:

```
related    = "RELATED-TO" [";" [WSP] relparam) ":" [WSP] uid CRLF

relparam   = "RELTYPE" "="
             "PARENT"      ; Parent relationship. Default.
             / "CHILD"     ; Child relationship.
             / "SIBLING"   ; Sibling relationship.
```

The following is an example of this property:

```
RELATED-TO:<jsmith.part7.19960817T083000.xyzMail@host3.com>

RELATED-TO:<19960401-080045-4000F192713-0052@host1.com>
```

The data type for this property is UID.

4.6.28 Repeat Count

This property is identified by the property name REPEAT. This property defines the number of time the alarm should be repeated, after the initial trigger.

The property is defined by the following notation:

```
repeatcnt = "REPEAT" ":" [WSP] integer CRLF
;Default is "0", zero.
```

The following is an example of this property:

```
REPEAT:4
```

The data type for the property is INTEGER.

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4.6.29 Request Status

This property is identified by the property name REQUEST-STATUS. This property defines the status code returned for a scheduling request. This property is used to return status code information related to the processing of an associated iCalendar object. The data type for this property is TEXT.

The value consists of a short return status, a longer return status description, and optionally the offending data. The components of the value are separated by the SEMICOLON character (ASCII decimal 59).

The short return status is a PERIOD character (ASCII decimal xx) separated set of integers. For example, "3.1.1". The successive levels of integers provide for a successive level of status code granularity.

The property is defined by the following notation:

```
rstatus = "REQUEST-STATUS" *(";" [WSP] parameter) ":" [WSP]
statcode ";" [WSP] statdesc [";" [WSP] extdata]
```

```
statcode = 1*DIGIT *("." 1*DIGIT)
;Hierarchical, numeric return status code
```

```
statdesc = text
;Textual status description
```

```

extdata    = text
;Textual exception data. For example, the offending property
;name and value or complete property line.

```

The following are some possible examples of this property (Note: The BACKSLASH character escapement of separator characters in a property value):

```

REQUEST-STATUS:2.0;Success

REQUEST-STATUS:3.1;Invalid property value;DTSTART:96-Apr-01

REQUEST-STATUS:2.8; Success\, repeating event ignored. Scheduled
as a single event.;RRULE\FREQ=WEEKLY\;INTERVAL=2

REQUEST-STATUS:4.1;Event conflict. Date/time is busy.

REQUEST-STATUS:3.7;Invalid calendar user;ATTENDEE:
MAILTO:jsmith@host.com

```

The following are valid classes for the return status code. Individual iCalendar object methods will define specific return status codes for these classes.

```

|=====+=====|
| Short Return | Longer Return Status Description |

```

```

| Status Code |
|=====+=====|
| 1.xx       | Preliminary success. This class of status
|            | of status code indicates that the request has
|            | request has been initially processed but that
|            | completion is pending.
|=====+=====|
| 2.xx       | Successful. This class of status code
|            | indicates that the request was completed
|            | successfully. However, the exact status code
|            | MAY indicate that a fallback has been taken.
|=====+=====|
| 3.xx       | Client Error. This class of status code
|            | indicates that the request was not successful.
|            | The error is the result of either a syntax or
|            | a semantic error in the client formatted
|            | request. Request should not be retried until

```

```

|           | the condition in the request is corrected. |
|=====+=====|
| 4.xx     | Scheduling Error. This class of status code |
|         | indicates that the request was not successful. |
|         | Some sort of error occurred within the      |
|         | calendaring and scheduling service, not     |
|         | directly related to the request itself.     |
|=====+=====|

```

4.6.30 Resources

This property is identified by the property name RESOURCES. This property defines the equipment or resources needed for the event or to-do. The property value is an arbitrary text. The property MAY only be specified in the "VEVENT" or "VTODO" calendar component. More than one resource MAY be specified as a list of resources separated by the COMMA character (ASCII decimal 44).

The property is defined by the following notation:

```

resource   = "RESOURCES" *(";" [WSP] parameter) ":" [WSP]
            resvalist CRLF

resvalist  = resvalue / resvalue "," [WSP] resvalist

resvalue   = "CATERING" / "CHAIRS" / "COMPUTER PROJECTOR"
            / "EASEL" / "OVERHEAD PROJECTOR" / "SPEAKER PHONE"
            / "TABLE" / "TV" / "VCR" / "VIDEO PHONE" / "VEHICLE"
            / word

```

The following is an example of this property:

```
RESOURCES:EASEL,PROJECTOR,VCR
```

The data type for this property is TEXT.

4.6.31 Sequence Number

This property is identified by the property name SEQUENCE. This property defines the revision sequence of the calendar component used in a request. The property MAY only be specified in a "VEVENT", "VTODO", "VJOURNAL" or "VFREEBUSY" calendar component. This property

is needed to properly handle the receipt and processing of a sequence of calendar components that have been delivered out of order. Such is the case for store-and-forward based transports. The first request is created with a sequence number of "0" (ASCII decimal 48). It is incremented each time the ORGANIZER or OWNER issues a revision to the request. The sequence number MUST be monotonically incremented when one of the following properties in a calendar component is changed:

- . "DTSTART"
- . "DTEND"
- . "DUE"
- . "RDATE"
- . "RRULE"
- . "EXDATE"
- . "EXRULE"

The property is defined by the following notation:

```
sequence = "SEQUENCE" ":" [WSP] integer CRLF
;Default is "0".
```

The following is an example of this property:

```
SEQUENCE:1
```

The data type for this property is INTEGER.

4.6.32 Status

This property is identified by the property name STATUS. This property defines the originator's view of the overall status for the calendar component. This property MAY only be specified in the "VEVENT", "VTODO", "VJOURNAL" calendar components. The property is used to specify the originator's view of the general consensus for the event or the to-do. In addition, when specified in a group scheduled to-do the property is used to specify the originator's view of the completion status for the to-do. The property MAY also specify whether the event or to-do has been cancelled.

The property is defined by the following notation:

```
status = "STATUS" ":" [WSP] statvalue CRLF

statvalue = "NEEDS-ACTION" ;Indicates to-do needs action.
/ "COMPLETED" ;Indicates to-do completed.
/ "IN-PROCESS" ;Indicates to-do in process of
;being completed.
/ "TENTATIVE" ;Indicates event or to-do is
```

```

                                ;tentative.
/ "CONFIRMED"                   ;Indicates event or to-do is
                                ;definite.
/ "CANCELLED"                   ;Indicates event or to-do was
                                ;cancelled.

```

The following is an example of this property:

```
STATUS:TENTATIVE
```

The data type for this property is TEXT.

4.6.33 Summary

This property is identified by the property name SUMMARY. This property defines a short summary or subject for the calendar component. The property MUST be specified in the "VEVENT", "VTODO" and "VJOURNAL" calendar components. In addition, it MAY appear in the "VALARM" calendar component.

The property is defined by the following notation:

```
summary    = "SUMMARY" *(";" [WSP] parameter) ":" [WSP] text CRLF
```

The following is an example of this property:

```
SUMMARY:Department Party
```

The data type for this property is TEXT.

4.6.34 Time Transparency

This property is identified by the property name TRANSP. This property defines whether an event is transparent or not to busy time searches. This property MAY only be specified in a "VEVENT" calendar component.

The property is specified by the following notation:

```
transp     = "TRANSP" ":" [WSP] transvalue CRLF
```

```
transvalue = "OPAQUE"           ;Blocks or opaque on busy time searches.
/ "TRANSPARENT" ;Transparent on busy time searches.
```

```
           ;Default value is OPAQUE
```

The following is an example of this property for an event that is

The following are examples of this property:

```
TZOFFSET:-0500
```

```
TZOFFSET:+0530
```

The data type for this property is UTC-OFFSET.

4.6.37 Uniform Resource Locator

This property is identified by the property name URL. This property defines a Uniform Resource Locator (URL) associated with the iCalendar object. This property MAY be specified once in the "VEVENT", "VTODO", "VJOURNAL" and "VFREEBUSY" calendar components.

The property is defined by the following notation:

```
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```

```
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```

```
url          = "URL" ":" [WSP] uri CRLF
```

The following is an example of this property:

```
URL:http://abc.com/pub/calendars/jsmith/mytime.or3
```

The data type for this property is URI.

4.6.38 Unique Identifier

This property is identified by the property name UID. This property defines the persistent, globally unique identifier for the calendar component. The property MUST be specified in the "VEVENT", "VTODO", "VJOURNAL" and "VFREEBUSY" calendar components.

The UID itself MUST be a globally unique identifier. The generator of the identifier MUST guarantee that the identifier is unique. There are several algorithms that can be used to accomplish this. The identifier is RECOMMENDED to be the identical syntax to the [\[RFC 822\]](#) addr-spec. A good method to assure uniqueness is to put the domain name or a domain literal IP address of the host on which the identifier was created on the right hand side of the "@", and on the left hand side, put a combination of the current calendar date and time of day (i.e., formatted in as a DATE-TIME value) along with some other currently unique (perhaps sequential) identifier available on the system (for example, a process id number). Using a date/time value on the left hand side and a domain name or domain literal on

the right hand side makes it possible to guarantee uniqueness since no two hosts should be using the same domain name or IP address at the same time. Though other algorithms will work, it is RECOMMENDED that the right hand side contain some domain identifier (either of the host itself or otherwise) such that the generator of the message identifier can guarantee the uniqueness of the left hand side within the scope of that domain.

This is the method for correlating scheduling messages with the referenced "VEVENT", "VTODO", or "VJOURNAL" calendar component.

The full range of calendar components specified by a recurrence set is referenced by referring to just the "UID" property value corresponding to the calendar component. The "RECURRENCE-ID" property allows the reference to an individual instance within the recurrence set.

The property is defined by the following notation:

```
uid          = "UID" ":" [WSP] text CRLF
```

The following is an example of this property:

```
UID:19960401T080045Z-4000F192713-0052@host1.com
```

This property is an important method for group scheduling applications to match requests with later replies, modifications or

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deletion requests. Calendaring and scheduling applications MUST generate this property in "VEVENT", "VTODO" and "VJOURNAL" calendar components to assure interoperability with other group scheduling applications. This identifier is created by the calendar system that generates an iCalendar object.

Implementations MUST be able to receive and persist values of at least 255 characters for this property.

The data type for this property is TEXT.

4.6.39 Non-standard Properties

The MIME Calendaring and Scheduling Content Type provides a "standard mechanism for doing non-standard things". This extension support is provided for implementers to "push the envelope" on the existing

version of the memo. Extension properties are specified by property and/or property parameter names that have the prefix text of "X-" (the two character sequence: LATIN CAPITAL LETTER X character followed by the HYPHEN-MINUS character). It is RECOMMENDED that vendors concatenate onto this sentinel another short prefix text to identify the vendor. This will facilitate readability of the extensions and minimize possible collision of names between different vendors. User agents that support this content type are expected to be able to parse the extension properties and property parameters but MAY ignore them.

The property is defined by the following notation:

```
extension = "X-" [vendorid] "-" word *("; " [WSP] param) ":"
           [WSP] value-list CRLF
           ; Lines longer than 75 characters should be folded
```

```
vendorid  = 3*char           ;Vendor identification prefix text
```

The following might be the ABC vendor's extension for an audio-clip form of subject property:

```
X-ABC-MMSUBJ;TYPE=wave; VALUE=URI: http://load.noise.org/mysubj.wav
```

At present, there is no registration authority for names of extension properties and property parameters. The data type for this property is TEXT. Optionally, the data type MAY be any of the other valid data types.

5. Recommended Practices

These recommended practices should be followed in order to assure consistent handling of the following cases for an iCalendar object.

1.

A calendar entry with a "DTSTART" property but no "DTEND" property - The event does not take up any time. It is intended to represent an event that is associated with a given calendar date and time of day, such as an anniversary. Since the event does not take up any

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time, it MUST NOT be used to record busy time no matter what the value for the "TRANSP" property.

2.

When the "DTSTART" and "DTEND", for "VEVENT", "VJOURNAL" and "VFREEBUSY" calendar components, and "DTSTART" and "DUE", for "VTODO" calendar components, have the same value data type (e.g., DATE-TIME), they should specify values in the same time format (e.g., local time with UTC offset).

3.

A combination of "RRULE" and "RDATE" properties that produces more than one instance for a given date/time - Only one recurrence can occur on a given date/time interval. Just one instance for the date/time is recorded.

4.

A particular iCalendar object method that specifies "ATTENDEE" properties with the "MEMBER" property parameter, for which the recipient has multiple memberships - Recipient should reply to only the first "MEMBER" property parameter value that it can match.

6. Registration of Content Type Elements

This section provide the process for registration of MIME Calendaring and Scheduling Content Type iCalendar object methods and new or modified properties.

6.1 Registration of New and Modified iCalendar object Methods

New MIME Calendaring and Scheduling Content Type iCalendar object methods are registered by the publication of an IETF Request for Comment (RFC). Changes to an iCalendar object method are registered by the publication of a revision of the RFC defining the method.

6.2 Registration of New Properties

This section defines procedures by which new properties or enumerated property values for the MIME Calendaring and Scheduling Content Type can be registered with the IANA. Note that non-IANA properties MAY be used by bilateral agreement, provided the associated properties names follow the "X-" convention.

The procedures defined here are designed to allow public comment and review of new properties, while posing only a small impediment to the definition of new properties.

Registration of a new property is accomplished by the following steps.

6.2.1 Define the property

A property is defined by completing the following template.

To: ietf-calendar@imc.org

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Subject: Registration of text/calendar MIME property XXX

Property name:

Property purpose:

Property data type(s):

Property encoding:

Property special notes (optional):

Intended usage: (one of COMMON, LIMITED USE or OBSOLETE)

The meaning of each field in the template is as follows.

Property name: The name of the property, as it will appear in the body of an text/calendar MIME Content-Type "property: value" line to the left of the colon ":".

Property purpose: The purpose of the property (e.g., to indicate a delegate for the event or to-do, etc.). Give a short but clear description.

Property data type(s): Any of the valid data types for the property value needs to be specified. The default data type also needs to be specified. If a new data type is specified, it needs to be declared in this section.

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

6.2.2 Post the Property definition

The property description MUST be posted to the new property discussion list, ietf-calendar@imc.org.

6.2.3 Allow a comment period

Discussion on the new property MUST be allowed to take place on the list for a minimum of two weeks. Consensus MUST be reached on the property before proceeding to the next step.

6.2.4 Submit the property for approval

Once the two-week comment period has elapsed, and the proposer is convinced consensus has been reached on the property, the registration application should be submitted to the Method Reviewer for approval. The Method Reviewer is appointed to the Application Area Directors and MAY either accept or reject the property registration. An accepted registration should be passed on by the Method Reviewer to the IANA for inclusion in the official IANA method registry. The registration MAY be rejected for any of the following reasons. 1) Insufficient comment period; 2) Consensus not reached; 3)

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Technical deficiencies raised on the list or elsewhere have not been addressed. The Method Reviewer's decision to reject a property MAY be appealed by the proposer to the IESG, or the objections raised can be addressed by the proposer and the property resubmitted.

6.3 Property Change Control

Existing properties MAY be changed using the same process by which they were registered.

1.
Define the change
2.
Post the change
3.
Allow a comment period
4.
Submit the property for approval

Note that the original author or any other interested party MAY propose a change to an existing property, but that such changes should only be proposed when there are serious omissions or errors in the published memo. The Method Reviewer MAY object to a change if it is not backwards compatible, but is not required to do so.

Property definitions can never be deleted from the IANA registry, but properties which are no longer believed to be useful can be declared OBSOLETE by a change to their "intended use" field.

7. File extension

The file extension of "vcs" is to be used to designate a file containing calendaring and scheduling information consistent with this MIME content type.

8. Macintosh File Type Code

The file type code of "vcal" is to be used in Apple MacIntosh operating system environments to designate a file containing calendaring and scheduling information consistent with this MIME media type.

9. References

The following document are referred to within this memo.

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[RFC 2111] "Content-ID and Message-ID Uniform Resource Locators", [RFC 2111](#), March 1997.

[RFC 2119] "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), March 1997.

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18, 1996.

[VCAL] Internet Mail Consortium, "vCalendar - The Electronic Calendaring and Scheduling Exchange Format", <http://www.imc.org/pdi/vcal-10.txt>, September 18, 1996.

[XAPIA] "XAPIA CSA, Calendaring and Scheduling Application Programming Interface (CSA) Version 1.0", X.400 API Association, November 15, 1994.

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11. Author's Address

The following address information is provided in a MIME-VCARD, Electronic Business Card, format.

The authors of this draft are:

```
BEGIN:VCARD
FN:Frank Dawson
ORG:Lotus Development Corporation
ADR;WORK;POSTAL;PARCEL:;6544 Battleford Drive;
Raleigh;NC;27613-3502;USA
TEL;WORK;MSG:+1-919-676-9515
TEL;WORK;FAX:+1-919-676-9564
EMAIL;INTERNET;PREF:Frank_Dawson@Lotus.com
EMAIL;INTERNET:fdawson@earthlink.net
URL:http://home.earthlink.net/~fdawson
END:VCARD
```

```
BEGIN:VCARD
FN:Derik Stenerson
ORG:Microsoft Corporation
ADR;WORK;POSTAL;PARCEL:;One Microsoft Way;
  Redmond;WA;98052-6399;USA
TEL;WORK;MSG:+1-425-936-5522
TEL;WORK;FAX:+1-425-936-7329
EMAIL;INTERNET:deriks@Microsoft.com
END:VCARD
```

The iCalendar object is a result of the work of the Internet Engineering Task Force Calendaring and Scheduling Working Group. The chairman of that working group is:

```
BEGIN:VCARD
FN:Anik Ganguly
ORG:OnTime, Inc.
ADR;WORK;POSTAL;PARCEL:10 Floor;21700 Northwestern Highway;
  Southfield;MI;48075;USA
TEL;WORK;MSG:+1-248-559-5955
TEL;WORK;FAX:+1-248-559-5034
EMAIL;INTERNET:anik@ontime.com
END:VCARD
```

12. iCalendar object Examples

The following examples are provided as an informational source of illustrative iCalendar objects consistent with this content type.

The following iCalendar object is specified as the content of a MIME message. The example demonstrates a possible meeting request between the originator and recipient of the message.

```
TO:jsmith@host1.com
FROM:jdoe@host1.com
MIME-VERSION:1.0
MESSAGE-ID:<id1@host1.com>
CONTENT-TYPE:text/calendar;method=request

BEGIN:VCALENDAR
METHOD:REQUEST
PRODID:-//xyz Corp//NONSGML PDA Calendar Verson 1.0//EN
VERSION:2.0
BEGIN:VEVENT
DTSTAMP:19960704T120000Z
```

DTSTART:19960918T143000Z
DTEND:19960920T220000Z
CATEGORIES:CONFERENCE,PROJECT
SUMMARY:Networld+Interop Conference
DESCRIPTION:Networld+Interop Conference
and Exhibit\nAtlanta World Congress Center\
Atlanta, Georgia

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END:VEVENT
END:VCALENDAR

The following example message issues a meeting request that does not require any reply. The message is sent as a singular "text/calendar" content type, body part.

From: jsmith@host1.com
To: ietf-calendar@imc.org
Subject: First IETF-Calendar Working Group Meeting
MIME-Version: 1.0
Message-ID: <id2@host1.com>
Content-Type: text/calendar;method=request

BEGIN:VCALENDAR
METHOD:REQUEST
PRODID:-//RDU Software//NONSGML HandCal//EN
VERSION:2.0
BEGIN:VEVENT
DTSTAMP:19961022T133000Z
ATTENDEE;EXPECT=REQUEST:MAILTO:ietf-calendar@imc.org
DESCRIPTION:First IETF-Calendar and Scheduling Working Group
Meeting
CATEGORIES:MEETING
CLASS:PUBLIC
CREATED:19961022T083000
SUMMARY:IETF Calendar Working Group Meeting
DTSTART:19961210T210000Z
DTEND:19961210T220000Z
LOCATION:San Jose, CA - Fairmont Hotel
UID:guid-1.host1.com
END:VEVENT
END:VCALENDAR

The following is an example of a MIME message with a single body part consisting of a text/calendar content type. The message specifies a

meeting request between the originator and recipient of the message.

TO:jsmith@host1.com
FROM:jdoe@host1.com
MIME-VERSION:1.0
MESSAGE-ID:<id3@host1.com>
CONTENT-TYPE:text/calendar;method=request

BEGIN:VCALENDAR
METHOD:REQUEST
VERSION:2.0
PROID:-//ABC Corporation//NONSGML My Product//EN
BEGIN:VEVENT
DTSTAMP:19970324T1200Z
SEQUENCE:0
UID:19970324T080045Z-4000F192713-0052@host1.com
ATTENDEE;EXPECT=REQUEST:MAILTO:jsmith@host1.com
DTSTART:19970324T123000Z

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DTEND:19970324T210000Z
CATEGORIES:CONFERENCE,PROJECT
CLASS:PUBLIC
SUMMARY:Calendaring Interop Conference
DESCRIPTION:Calendaring Interop Conference and Exhibit\
Atlanta, Georgia
LOCATION:Atlanta World Congress Center
ATTACH;VALUE=URI:file:///xyzCorp.com/conf/bkgrnd.ps
END:VEVENT
END:VCALENDAR

Example of a reply to the above request, accepting the meeting.

TO:jdoe@host1.com
FROM:jsmith@host1.com
MIME-VERSION:1.0
MESSAGE-ID:<id4@host1.com>
CONTENT-TYPE:text/calendar;method=reply

BEGIN:VCALENDAR
METHOD:REPLY
VERSION:2.0
PROID:-//ABC Corporation//NONSGML My Product//EN
BEGIN:VEVENT
DTSTAMP:19970324T120000Z

SEQUENCE:0
UID:19970324T080045Z-4000F192713-0052@host1.com
ATTENDEE;STATUS=ACCEPTED;EXPECT=REQUEST:MAILTO:jsmith@host1.com
END:VEVENT
END:VCALENDAR

An example of a meeting cancelation:

TO:jsmith@host1.com
FROM:jdoe@host1.com
MIME-VERSION:1.0
MESSAGE-ID:<id5@host1.com>
CONTENT-TYPE:text/calendar;method=cancel

BEGIN:VCALENDAR
METHOD:CANCEL
VERSION:2.0
PRODID:-//ABC Corporation//NONSGML My Product//EN
BEGIN:VEVENT
DTSTAMP:19970324T120000Z
UID:19970324T080045Z-4000F192713-0052@host1.com
END:VEVENT
END:VCALENDAR

13. Full Copyright Statement

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