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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 document 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 [[RFC1521](#)]. However, the format in this memo is equally applicable for use outside of a MIME message content type.

[Editor NOTE: This form will be changed to reflect the new MIME memos in the next draft.]

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

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or using HTTP. In addition, the content type is useful as an object for interactions between desktop applications using the operating system clipboard, drag/drop or file systems capabilities.

This document 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 document is to be known as the iCalendar specification.

This document also includes the format for defining content type profiles. A content type profile is a document that defines a set of usage constraints for the iCalendar Object. For example, a profile might be defined to specify how the iCalendar Object can be used to provide for a set of interpersonal scheduling messages. Such a profile 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 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 calendaring and scheduling, is currently limited by the lack of Internet standards for the message content types that are central to these groupware applications. This specification is intended to progress the level of interoperability possible between dissimilar calendaring and scheduling applications. This specification defines a MIME content type for exchanging electronic calendaring and scheduling information. The Internet Calendaring and Scheduling Core Object Specification, or iCalendar Object, allows for the capture and exchange of information normally stored within a calendaring and scheduling application; such as a Personal Information Manager or a Group Scheduling product.

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 specification also provides for the definition of usage profiles that will map this content type to a set of messages for supporting calendaring and scheduling operations such as requesting, replying to, modifying, and canceling meetings or appointments and to-dos. The

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usage profiles can be used to define other calendaring and scheduling operations such a requesting for and replying with free/busy time data.

The specification 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 specification.

1.1 Definitions

Date and time terminology is used in every day conversations. However, there are precise definitions of many of these terms that are used by this memo.

1.1.1 Calendar Scale

The particular type of calendar in general use. For example, Gregorian, Buddhist Era, Japanese Emperor Era, Chinese Lunar, Islamic, and Jewish Calendars.

1.1.2 Coordinate Universal Time (UTC)

The time scale maintained by the Bureau International de l'Heure (International Time Bureau) that forms the basis of a coordinated dissemination of standard frequencies and time signals. UTC is often incorrectly referred to as GMT.

1.1.3 Daylight Saving Time (DST)

An adjustment to local to accommodate annual changes in the number of daylight hours. DST is also known as Advanced Time, Summer Time, or Legal Time. Daylight saving time adjustments in the southern hemisphere are opposite to those in the northern hemisphere.

1.1.4 Gregorian Calendar

A calendar scale in general use beginning in 1582. It was introduced to correct an error in the Julian Calendar scale. The Gregorian Calendar scale is based on a solar calendar consisting of common years made up of 365 days and leap years made up of 366 days; both divided into 12 sequential months.

Initially, this memo addresses specification of calendar information in terms of the Gregorian calendar scale.

1.1.5 Local Time

The clock time in public use in a locale. Local time is often referenced by the customary name for the time zone in which it is located. The relationship between local time and UTC is based on the offset(s) that are in use for a particular time zone. In general, the formula is as follows:

local time = UTC + (offset)

1.1.6 Standard Time

Introduced by Sir Sanford Fleming and others around 1870, standard time is a scheme for dividing the world into zones where the same time would be kept. The original proposal was to divide the world into 24 zones, each zone having a width of 15 degrees of longitude. The center zone was originally the meridian passing through Greenwich, England, called Greenwich Mean Time (GMT). The time in the zones was decremented by one hour per zone going westwards and was incremented by one hour per zone going eastwards from GMT. Changes have been made to the original proposal to accommodate political boundaries. In addition, some countries and regions specify 30 or 45 minute offsets, rather than the full 60 minute offset. Standard time is also known as Winter Time in some regions.

GMT and UTC are generally equivalent. However, by international agreement, the GMT term is discouraged in favor of the term UTC for all general time keeping.

1.1.7 Time Zone

The particular time zone that a location's time is expressed in. A time zone is unambiguously defined by the set of time measurement rules determined by the governing body for the given location. These rules describe at a minimum the base offset from UTC, often referred to as the Standard Time offset. Optionally, if Daylight time is observed, the rules will specify the Daylight time offset and either a set of rules describing the transition to and from Daylight time or absolute dates describing the movement in and out of Daylight time. It is important to note that these rules are not static. Time zones may also have a local customary name. However, not all time zones have a special name for their time. The customary names for time zones are often abbreviated. However, not all time zone abbreviations are unique. For example, AST may mean Atlantic Standard Time, Alaska Standard Time, and even Aleutian Standard Time. Each of these are different offsets from UTC. Nevertheless, customary names for time zones are in use in various parts of the world.

2. TEXT/CALENDAR Registration Information

[Editor NOTE: This form will be changed to reflect the revision to the MIME memos when the respective RFC becomes available.]

To: ietf-types@uninett.no

Subject: Registration of MIME content type text/calendar.

MIME media type name: text

MIME subtype name: calendar

Required parameters: PROFILE

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Optional parameters: CHARSET

Additional required content header fields: CONTENT-ID, MESSAGE-ID

Optional content header fields: CONTENT-LANGUAGE, TRANSFER-ENCODING

Encoding considerations: This MIME content type does not introduce any new encoding considerations beyond those defined in [[RFC 2045](#)].

Security considerations: The calendaring and scheduling information based on this MIME content type may include references to Uniform Resource Locators that may be programmed resources. In addition, this information may contain direct references to executable programs intended to be used as program-based alarms for an event or to-do. Implementers and users of this specification should be aware of the network security implications of accepting and parsing such information.

Interoperability considerations: This MIME content type is intended to provide interoperability between calendaring and scheduling products. It is heavily based on the earlier [[VCAL](#)] industry specification.

Intended Usage: COMMON

Published specification: This document.

Person & email address to contact for further information:

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3. Intended Use

[Editor NOTE: The reference to [[RFC 1521](#)] and [[MIME-REG](#)] will be changed to reflect the revision to the MIME memos when the respective RFC becomes available.]

This memo is meant to serve as the basis for registration of a MIME content type per [[RFC1521](#)]. It is defined using the MIME content type registration from [[MIME-REG](#)]. The proposed content type value is "TEXT/CALENDAR". This string would label a media type containing

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calendar and scheduling information encoded primarily as text characters formatted in a manner outlined below. The media type is useful for conveying inter-personal calendar and scheduling information between systems and applications.

A subtype of the standard MIME `_TEXT_` media type was chosen as the form for this content type because it provides a known and reasonable fallback for legacy systems that are required in an enterprise that also includes MIME based user agents that support this content type. Legacy systems that do not understand the `_TEXT/CALENDAR_` content type will render these MIME entities as they would `_TEXT/PLAIN_` content type. This will provide a minimal level of support for calendar and scheduling information in legacy systems (i.e., the ability to display the text tagged calendar and scheduling content information). This is a vital requirement for any mail enabled, enterprise application; as there are still over 7 million existing legacy electronic mail user agents at this time.

The calendar and scheduling media type is specified as an independent content type in order that it can be conveyed either as a single MIME message entity or as one MIME entity in a multi-part MIME message. Additionally, the calendar and scheduling information may be defined in a multi-part message containing references to other MIME body parts holding additional data related to the event, to-do, or free/busy time information.

3.1 Published specification

The following characteristics are specific to this MIME content type.

3.1.1 Existing Message Header Fields

The MIME Calendar Content Type may utilize any of the message header fields defined by [\[RFC 822\]](#), [\[RFC 2045\]](#), and [\[RFC 1766\]](#). A number of these message header fields are especially useful to the iCalendar Object. These include the following header fields defined in either [\[RFC 822\]](#), [\[RFC 2045\]](#), and [\[RFC 1766\]](#).

3.1.1.1 Content-Type Header Field

The [\[RFC 2045\]](#) Content-Type header field is used to identify the iCalendar Object. The value of this property must be `_text/calendar_` in order to correspond to the media type defined by this document. This header field is required for MIME entities conforming to this content type.

3.1.1.1.1 CHARSET Header Field Parameter

The [\[RFC 2045\]](#) CHARSET Content-Type header field parameter is used to identify an alternate character set to the default US-ASCII used by the iCalendar Object. This header field parameter is optional for MIME entities conforming to this content type.

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3.1.1.2 Content-ID Header Field

The [\[RFC 2045\]](#) Content-ID header field is used by the iCalendar Object to provide a persistent, globally unique identifier for a MIME Calendar Object within a MIME message entity. This header field is required for multi-part MIME entities containing an iCalendar Object that conforms to this content type. In the event that the iCalendar Object is transported in a MIME message containing a single body, then the Message-ID header field is required.

3.1.1.3 Content-Language

The [\[RFC 1766\]](#) Content-Language header field is used to provide an alternate default language for the MIME Calendar Object. The default language is `_en-US_`. This header field is optional for MIME entities conforming to this content type.

3.1.1.4 Message-ID Header Field

The [RFC 2045] Message-ID header field is used by the iCalendar Object to provide a persistent, globally unique identifier for a MIME message containing a single body part consisting of a iCalendar Object. This header field is required for a single body part MIME message conforming to this content type. In the event that the iCalendar Object is transported as a body part within a multi-part MIME message, the Content-ID header field must be specified. The Message-ID header field is used to unambiguously refer to the iCalendar Object within a MIME entity.

3.1.1.5 Transfer-Encoding Header Field

The [RFC 2045] Transfer-Encoding header field is used to provide an alternate transfer encoding for the iCalendar Object. The default transfer encoding is _7BIT_. This header field is required for a MIME entity conforming to this content type when any other encoding is used in the iCalendar Object.

3.1.2 Additional Content Type Parameter

In addition to the existing content type parameters defined by [RFC 2045] and [RFC 1766], this document defines an additional content type parameter to be used by the iCalendar Object.

3.1.2.1 Profile

The MIME Calendar Object defines the Profile content type parameter. This parameter is used to specify a usage profile for the iCalendar Object. The value of this parameter consists of a type and a subtype value pair. The type value is used to specify either a EVENT, TODO, or FREE-BUSY type of MIME Calendar Object profile. The subtype value is used to specify the scheduling operation being conveyed by the profile type. For example, the EVENT and TODO type values might have a subtype value of REQUEST, to convey an event or to-do request message, REPLY, to convey an event or to-do reply message, MODIFY, to

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convey an event or to-do modification message, CANCEL, to convey an event or to-do cancellation message, DELEGATE, to convey an event or to-do delegation message; or the BUSYFREE type value might have a subtype value of REQUEST, to convey a free-busy time request message, or REPLY, to convey a free-busy time data message. The parameter value is defined by the following BNF:

```
profile := ((_EVENT_ / _
                                     TODO  _- type1) / (_FREEBUSY_ _- type2)
```

type1 := <any IANA values defined by an iCalendar Object usage profile or an _X-_ type of non-standard value>

type2 := <any IANA value defined by an iCalendar Object usage profile or an _X-_ type of non-standard value>

The following is an example of this content type parameter for a profile that specifies an event request message, such as in a request for a meeting or appointment:

CONTENT-TYPE:TEXT/CALENDAR;PROFILE=EVENT-REQUEST

The following is an example of this content type parameter for a profile that specifies a to-do delegation message, such as delegating a task to another individual:

CONTENT-TYPE:TEXT/CALENDAR;PROFILE=TODO-DELEGATE

The following is an example of this content type parameter for a profile that specifies a free-busy time request, such as when searching for a free time for a meeting:

CONTENT-TYPE:TEXT/CALENDAR;PROFILE=FREEBUSY-REQUEST

This content type parameter is required for MIME entities conforming to this content type. Other memos are expected to address specific usage profiles and define values for this property.

3.1.3 Content Syntax Considerations

The following general considerations are specific to the syntax used to format the text of the body information for this content type.

3.1.3.1 Property

A property is the definition of an individual attribute describing an event or a to-do associated with the MIME Calendar Object. A property takes the following form:

property := propname *(_;_ propparm) _:_ propvalue

as shown in the following example:

DTSTART:19960415T083000-05:00

A property takes the form of one or more lines of text. The specification of property names and property parameters is case insensitive. The property name can be one of a set of pre-defined or non-standard strings. The property name must appear as the first characters on a line. In the previous example, `_DTSTART_` is the name of the Start Date/Time property. Property values are specified as strings. In the previous example, `_19960415T083000-05:00_` is the formatted value for the Start Date/Time property.

The property parameter expressions are specified as either a `name=value` or a value string. The parameter value string can be specified alone in those cases where the value is unambiguous. For example a complete property parameter specification might be:

```
DESCRIPTION;ENCODING=QUOTED-PRINTABLE:Don't forget to order Girl=
  Scout cookies from Stacey today!
```

A valid short version of the same property parameter specification might be:

```
DESCRIPTION;QUOTED-PRINTABLE:Don't forget to order Girl=
  Scout cookies from Stacey today!
```

3.1.3.2 Delimiters

Individual lines within the iCalendar Object body are delimited by the [\[RFC 822\]](#) line break, which is a CRLF sequence (ASCII decimal 13, followed by ASCII decimal 10). Long lines of text can be split into a multiple-line representation using the [RFC 822](#) `_folding_` technique. That is, wherever there may be linear white space (NOT simply LWSP-chars), a CRLF immediately followed by at least one LWSP-char may instead be inserted. 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 of a property definition to its single line representation is called `_unfolding_`. Unfolding is accomplished by regarding CRLF immediately followed by a LWSP-char as equivalent to the LWSP-char.

It is recommended that folding be limited to higher-level syntactic breaks in structured components of the property definition.

A formatted text line break in a property value, must also be specified by a ([RFC 822](#)) line break, which is a CRLF sequence. However, since the CRLF sequence is used to delimit a line, property

values with formatted line breaks (i.e., multiple lines) must be encoded using an alternate encoding of either Quoted-Printable or Base64, as defined in [[RFC 2045](#)].

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For example, in the Quoted-Printable encoding the multiple lines of formatted text are separated with a Quoted-Printable CRLF sequence of `_=0D_` followed by `_=0A_` followed by a Quoted-Printable soft line break sequence of `_=_`. Quoted-Printable lines of text must also be limited to less than 76 characters. The 76 characters does not include the CRLF [[RFC 822](#)] line break sequence. For example a multiple line DESCRIPTION value of:

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

Would be represented in a Quoted-Printable encoding as:

```
DESCRIPTION; QUOTED-PRINTABLE:Project XYZ Final Review=0D=0A=
Conference Room - 3B=0D=0A=
Come Prepared.
```

Property parameter sub-strings are delimited by a field delimiter, specified by the Semi-colon character (ASCII decimal 59). A Semi-colon character in a property parameter value must be escaped with a Backslash character (ASCII decimal 92).

Compound property values are delimited by a field delimiter, specified by the Semi-colon character (ASCII decimal 59). A Semi-colon character in a component of a compound property value must be escaped with a Backslash character (ASCII decimal 92).

[3.1.3.3](#) Property Value Transfer Encoding

The default transfer encoding for the iCalendar Object is `_7BIT_`. The default transfer encoding can be overridden for an individual property value by using the `_ENCODING_` property parameter. This parameter value can be either `_7BIT_`, `_BASE64_`, `_QUOTED-PRINTABLE_`, or `_8BIT_`. This parameter may be used on any property.

The MIME TRANSFER-ENCODING header field can be used to specify a default transfer encoding other than 7BIT (e.g., 8BIT).

[3.1.3.4](#) Property Value Character Set

The default character set for a iCalendar Object is ASCII. The default character set can be overridden for an individual property value by using the `_CHARSET_` property parameter. This property parameter may be used on any property. However, the use of this parameter on some properties may not make sense.

Any character set registered with the Internet Assigned Numbers Authority (IANA) can be specified by this property parameter. For example, ISO 8859-8 or the Latin/Hebrew character set is specified by:

```
DESCRIPTION;CHARSET=ISO-8859-8:...
```

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The MIME CHARSET parameter on the CONTENT-TYPE header field can be used to specify a default character set other than ASCII (e.g., UTF-8).

3.1.3.5 Property Value Language

The default language for a iCalendar Object is `_en-US_` (US English). The default language can be overridden for an individual property value by using the `_LANGUAGE_` property parameter. The values for this property are a string consistent with [RFC 1766](#), Tags for the Identification of Languages. This property parameter may be used on any property. However, the use of this parameter on some properties, such as PHOTO, LOGO, SOUND, TEL, may not make sense. Canadian French would be specified by this property parameter by the following:

```
SUMMARY;LANGUAGE=fr-CA:...
```

The MIME LANGUAGE parameter on the CONTENT-TYPE header field can be used to specify a default language other than US English (e.g., fr-CA).

3.1.3.6 Property Value Data Type

In order to more fully specify the semantics of this content type and to facilitate its automated processing, the specification of each property defined by the iCalendar Object identifies the valid data types and the default data type for the property value. In addition, within an instance of this content type a property may explicitly convey the data type information through the DATATYPE property parameter. The STRING data type for the DESCRIPTION property would be specified by the following:

DESCRIPTION;DATATYPE=STRING:Weekly Staff Meeting

If the DATATYPE property parameter is not specified on a property, then the default data type for that property is assumed. Usage profiles for this content type that introduce new properties must specify the default data type for each newly defined property. The data types used within this content type definition include the following:

Property Data Type		Description
AALARM		Indicates an audio alarm value, as specified by this document.
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BOOLEAN		Indicates a Boolean value string of either TRUE or FALSE.
CID		Indicates a string identifier value for the content identifier of another MIME entity within the current message.
DALARM		Indicates a display alarm value, as

specified by
this
document.

DATE-TIME Indicates an
 ISO 8601
 formatted
 date/time
 string value.

DST-RULE Indicates a
 daylight
 saving time
 rule value as
 specified in
 this
 document.

D-T-LIST Indicates a
 list of ISO
 8601
 formatted
 date/time
 string
 values.

DURATION Indicates an
 ISO 8601
 formatted
 duration or
 period of
 time value.

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FLOAT Indicates a
 string
 representatio
 n of a
 floating
 point value.

FLOAT-LIST Indicates a
 list of
 string

representations of floating point values.

INTEGER Indicates a numeric string representation of an integer value.

INTEGER-LIST Indicates a list of numeric string representations of an integer value.

MALARM Indicates a mail alarm value, as specified by this document.

MID Indicates a string identifier value for an external message.

PALARM Indicates a procedure alarm value, as specified by this document.

RFC822 - ADDRESS	Indicates a RFC 822 formatted address specification string value.
RRULE	Indicates a recurrence rule grammar string value as specified in this document.
STRING	Indicates a text string value in the current character set.
STRING-LIST	Indicates a list of text string values in the current character set.
TIME-OFFSET	Indicates an ISO 8601 formatted time offset value
URL	Indicates a RFC 1738 formatted Uniform Resource Locator string.

The property values consisting of lists of a particular data type (i.e., STRING-LIST) are semi-colon separated string of list items.

[3.1.3.7](#) Date and Time

The date and time values for all iCalendar Object properties are

formatted as a string consistent with the ISO 8601 representation for

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combinations of dates and times. Either the basic or extended format is allowed. The use of UTC, rather than local time, should be used when ever possible in order to avoid time zone ambiguities. Where local time is specified, the inclusion of the UTC offset should also be included to avoid time zone ambiguities. The format for the complete, representation of a date and time value is represented by the following ABNF:

```
date-time =      (date / time / (date _T_ time))

date =          year month day
year =          <four digits representing the century and year>
month =         [_-_] <digits representing the month in the year>
day =           [_-_] <digits representing the day of the month>

time =          hour minute second [fraction](utc-sign / utc-offset)
hour =          <digits representing a period of time of 60 minutes>
minute =        [_:_] <digits representing a period of time of 60
seconds>
second =        [_:_] <digits representing a basic measurement unit
of time in the International System of Units as defined
in ISO 31-1>
fraction =      _,_ <digits representing fraction of a second>
utc-sign =      _Z_
utc-offset =    [_+_ / _-_] hour [_:_] minute
                ;+_ if offset is after UTC and _- if offset is before UTC
```

The basic complete representation does not include the _- date separator nor the _:_ time separator. The extended complete representation does include the separators.

For example, 8:30 AM on April 15, 1996 local time EST would be written as:

```
19960415T083000-05:00
```

And the same time in UTC based time would be written as:

```
19960415T133000Z
```

The same date and time represented in the extended completed representation would be written as:

1996-04-15T08:30:00-05:00

And the same time in UTC based time would be written as:

1996-04-15T13:30:00Z

Where a value needs to specify a sequence of date and time values, then the property value is a string made up of a list of date and time values, separated by the field separator, a Semi-Colon (ASCII decimal 59). For example:

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19960101T090000Z;19960201T090000Z;19960301T090000Z;...

3.1.3.8 Time Duration

The values for time duration or periods of time for all iCalendar Object properties are formatted as a string consistent with the ISO 8601 representation for duration of time. A given duration of a period of time is represented by a character string consisting of the designator `_P_`, optionally including the number of years followed by the designator `_Y_`, optionally including the number of months followed by the designator `_M_`, optionally including the number of weeks followed by the designator `_W_`, optionally including the number of days followed by the designator `_D_`. The sequence can also contain a time component preceded by the designator `_T_`, optionally including the number of hours followed by the designator `_H_`, optionally including the number of minutes followed by the designator `_M_`, optionally including the number of seconds followed by the designator `_S_`. The following ABNF describes the representation of ISO 8601 periods of time:

```
duration = _P_ (yr-period / tm-period / (yr-period tm-period))
          ;Duration needs to include at least one component of year or
          ;time periods
```

```
yr-period =      [yr-param] [mo-param] / wk-param
yr-param  =      _Y_ <digits representing the number of years>
mo-param  =      _M_ <digits representing the number of months>
wk-param  =      _W_ <digits representing the number of weeks>
```

```
tm-period =      _T_ [hr-param] [mn-param] [sc-param]
hr-param  =      _H_ <digits representing the number of hours>
mn-param  =      _M_ <digits representing the number of minutes>
sc-param  =      _S_ <digits representing the number of seconds>
```

For example:

P6W

represents a period of six weeks;

PT15M

represents a period of 15 minutes;

PT1H30M

represents a period of 1 hour and thirty minutes; or

P2Y10M15DT10H30M20S

represents a period of 2 years, 10 months, 15 days, 10 hours, 30 minutes, and 20 seconds.

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3.1.3.9 Value Location

The default location of the property values is inline with the property. However, for some properties, such as those that specify multimedia values, it is more efficient in a MIME message to organize the property value as a separate MIME entity. The property parameter `_VALUE_` can be specified to override the `_INLINE_` location of the property value. In the case of the iCalendar Object being transported within a MIME email message, the property value can be specified as being located in a separate MIME entity with the `_CONTENT-ID_` value; or `_CID_` for shorthand. In this case, the property value is the Content-ID for the MIME entity within the multi-part message that contains the property value. The value can also be specified as being contained within another, external message using the `_MESSAGE-ID_` value, or `_MID_` for shorthand. In addition, the property value can be specified as being located out on the Internet using the `_URL_` value. In this case, the property value is the Uniform Resource Locator for the Internet resource containing the property value. This property parameter may be used on any property. However, the use of this parameter on some properties may not make sense; for example the Version, Time Zone, Status, Priority, Mail Reminder, etc. properties.

The following specifies a value located out on the Internet:

ATTACH;VALUE=URL:http://www.abc.com/dir_photos/my_photo.gif

The following specifies a value located out in the content of another message:

ATTACH;VALUE=MID:<960120.aaCB@host1.com>

3.1.3.10 Binary Property Values

The iCalendar Object supports inclusion of binary information, such as computer graphic images (e.g., IMAGE/JPEG), digital audio (e.g., AUDIO/BASIC), or video graphic images (e.g., VIDEO/MPEG). As specified above the binary information can be referenced with a Uniform Reference Locator (URL), referenced within an external MIME message, referenced within a particular MIME message body part, or placed inline. Inline binary information is included as a property value after being binary encoded using Base 64 (default) or Quoted-Printable transfer encoding.

3.1.3.11 Recurrence Rule Grammar

Recurring events within the iCalendar Object may be specified as either a list of discrete date and time values or as a recurrence rule using a grammar. The basic recurrence rule grammar used by this specification is defined in a separate section of this specification. The grammar defines a recurrence rule that is based on the prior work of the X.400 API Association's Calendaring and Scheduling Subcommittee. It is also based on prior work of the IETF Chronos Working Group. Refer to [section 3.3](#).

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3.1.4 Body Delimiter Properties

The body information of a iCalendar Object is defined by a series of body fields or properties. This section defines the properties that can be used in MIME entities conforming to this content type.

3.1.4.1 Calendar Object

The body of the iCalendar Object is identified within the body of a MIME entity by the appearance of the Begin Calendar Object Delimiter:

BEGIN:VCALENDAR

The sentinel string must appear as the first characters in the body of the MIME entity and as the first characters on a line.

The body information of the iCalendar Object is terminated by the appearance of the End Calendar Object Delimiter as the first characters on a line:

END:VCALENDAR

The iCalendar Object is a container for calendar components. These can include either event or to-do components. The body of a iCalendar Object will generally contain a single calendar event or to-do component. However, the body may include multiple event or to-do components. This is the case for free-busy time reply messages that contain multiple free time intervals in individual calendar components.

The Begin and End Calendar Object Delimiter properties are required in a MIME entity conforming to this content type. The data type for these properties is a STRING.

3.1.4.2 Event Component

An Event Component is a grouping of calendaring and scheduling properties that defines a component that represents a scheduled amount of time on a calendar. For example, it may be an activity; such as a one-hour, department meeting from 8 AM to 9 AM, tomorrow or a free/busy time interval.

An individual Event Component is identified within a MIME Calendaring and Scheduling Content Type by the appearance of the delimiter:

BEGIN:VEVENT

The sentinel string must appear as the first characters on a line.

The Event Component is terminated with the appearance of the following delimiter string as the first characters on a line

END:VEVENT

The Event Component can not be nested within another Event or To-do Component. If Event components need to be related to each other or to a To-do Component, they can specify a relationship with the RELATED-

TO property.

The Begin and End Event Component Delimiter properties are required for a MIME entity containing an event component and conforming to this content type. The data type for these properties is a STRING.

3.1.4.3 To-do Component

A To-do Component is a grouping of calendaring and scheduling properties that define a component that represents 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_`.

An individual To-do Component is identified within a MIME Calendaring and Scheduling Content Type by the appearance of the delimiter:

```
BEGIN:VTODO
```

The sentinel string must appear as the first characters on a line.

The To-do Component is terminated with the appearance of the following delimiter string as the first characters on a line

```
END:VTODO
```

The To-do Component can not be nested within another To-do or Event Component. If To-do components need to be related to each other or to an Event Component, they can specify a relationship with the RELATED-TO property.

The Begin and End To-do Component Delimiter properties are required for a MIME entity containing a to-do component and conforming to this content type. The data type for these properties is a STRING.

3.1.5 Calendar Object Properties

The following properties may appear between the Begin Calendar Object Delimiter and either the Begin Event Component Delimiter or the Begin To-do Component Delimiter. These properties define body field values that apply to the complete calendar object.

3.1.5.1 Calendar Content Profile

This property is identified by the property name PROFILE. This property defines the usage profile associated with the calendar object. When used in a MIME message entity, the value of this property MUST be the same as the Content-Type profile parameter value. This property can only appear once within the iCalendar Object.

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The calendar property value might include the following usage profile values:

Profile Parameter Type/Subtype Value	Description
EVENT-REQUEST	Make a request for an event
EVENT-REPLY	Reply to an event request
EVENT-COUNTER	Make a counter proposal to the event request
EVENT-DECLINECOUNTER	Decline the counter proposal to the event request
EVENT-MODIFY	Modify a subset of the details of an existing event request
EVENT-REPLACE	Replace the current event request with a complete set of information
EVENT-CANCEL	Cancel an existing event request
EVENT-DELEGATE	Delegate an existing event request

EVENT-RESEND	Request a duplicate of the current event request information
--------------	--

TODO-REQUEST	Assign a to-do
--------------	----------------

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TODO-REPLY	Reply to a to-do assignment
------------	-----------------------------

TODO-COUNTER	Make a counter proposal for the to-do request
--------------	---

TODO-DECLINECOUNTER	Decline a counter proposal for the to-do request
---------------------	--

TODO-MODIFY	Modify a subset of the details of an existing to-do assignment
-------------	--

TODO-REPLACE	Replace the current to-do request with a complete set of information
--------------	--

TODO-CANCEL	Cancel an existing to-do
-------------	--------------------------

TODO-DELEGATE	Delegate an existing to-do
---------------	----------------------------

TODO-RESEND	Request a duplicate of the current to-do request information
-------------	--

FREEBUSY-REQUEST	Free/busy time request
------------------	------------------------

FREEBUSY-REPLY	Reply to an existing free/busy time request with free/busy time data
----------------	---

Other values may be defined by other usage profiles of this content type.

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This property is optional for MIME entities conforming to this content type. In the event that this property is not specified, the recipient of a MIME Calendaring and Scheduling Content Type should assume the calendar object is for an `_event/request_`. The data type for this property is `STRING`.

3.1.5.2 Calendar Scale

This property is identified by the property name `CALENDAR`. This property defines the calendar scale used for the calendar information specified in the iCalendar Object. This specification is based on the Gregorian calendar scale. The Gregorian calendar scale is assumed if this property is not specified in the iCalendar Object. It is expected that other calendar scales will be defined in other specifications or by future versions of this specification.

The following is an example of this property:

```
CALENDAR:GREGORIAN
```

The data type for this property is `STRING`.

3.1.5.3 Daylight Savings Rule

This property is identified by the property name `DAYLIGHT`. This property defines the effective daylight savings time rule for calendar information specified in the iCalendar Object. More than one `DAYLIGHT` properties can be specified for a series of future DST rules

for the time zone.

Many locations adjust their standard time forward or backward by one hour, in order to accommodate seasonal changes in number of daylight hours. Some locations adjust their time by a fraction of an hour. Standard time is also known as Winter Time. Daylight savings time is also known as Advanced Time, Summer Time, or Legal Time in certain countries.

The property value consists of a sequence of components that define a rule for the observance of daylight savings time. The value consists of effective start date for the DST rule, followed by the daylight savings time flag, followed by the daylight savings time offset from UTC, followed by the date and time of the transition from standard time to daylight savings time, followed by the date and time of the transition from daylight savings time to standard time, followed by the customary standard time designation, followed by the customary daylight savings time designation. The effective start date for the DST rule allows for the specification of a series of future DST rules for a given time zone. The daylight savings time flag is TRUE if daylight savings time is observed, otherwise it is FALSE and no other components are specified. The daylight savings time offset value is specified in a manner consistent with ISO 8601. The property value is a signed numeric indicating the number of hours and possibly minutes from UTC. The date and time that the daylight savings time begins and ends is specified in a manner consistent with ISO 8601 date and time

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format. The standard time and daylight savings time designations correspond to the customary character designations.

The following are examples of this property:

DAYLIGHT:19960407;TRUE;-06;19960407T025959;19961027T010000;EST;EDT

DAYLIGHT:FALSE

DAYLIGHT:19960407;TRUE;-09;19960407T115959;19961027T100000;PST;PDT

This property is optional for MIME entities conforming to this content type. In the event that this property is not specified, the recipient of a MIME Calendaring and Scheduling Content Type should assume the same daylight savings time rule as the recipient location. The data type for this property is DST-RULE.

3.1.5.4 Geographic Position

This property is identified by the property name GEO. This property specifies information related to the global position of the _home_ system that created the MIME calendar object. The property value specifies longitude and latitude. The 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 following is an example of this property:

GEO:37.24,-17.87

This property is optional for MIME entities conforming to this content type. The default data type for this property is FLOAT-LIST. Optionally, the data type for this property may be URL. The URL is the resource location for the geographical position value.

3.1.5.5 Product Identifier

This property is identified by the property name PROPID. This property specifies the identifier for the product that created the MIME calendar 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. The following is an example of this property:

PROPID:-//ABC Corporation//NONSGML My Product//EN

This property is required for MIME entities conforming to this content type. The default data type for this property is STRING. Optionally, the data type may be URL. The URL is the resource location for the product identifier value.

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3.1.5.6 Time Zone

This property is identified by the property name TZ. This property specifies the standard time zone of the _home_ system that created the MIME calendar object. The property value is specified in a manner consistent with ISO 8601. The property value is a signed numeric indicating the number of hours and possibly minutes from UTC. Time zones east of UTC are positive numbers. Time zones west of UTC are

negative numbers. The following are examples of this property:

TZ:-0500

TZ:+05:30

This property is optional for MIME entities conforming to this content type. If this property is missing, the recipient should assume all local times are relative to the recipients time zone. The data type for this property is TIME-OFFSET. Optionally, the data type for this property may be STRING.

3.1.5.7 Version

This property specifies the identifier corresponding to the highest version number of the MIME Calendaring and Scheduling Content Type specification supported by the implementation that created the MIME calendar object. The value of this property must be 2.0 to correspond to this specification..

This property is identified by the property name VERSION. The following is an example of this property:

VERSION:2.0

This property is required for MIME entities conforming to this content type. This property must appear within the MIME calendar object. The data type for this property is FLOAT.

3.1.6 Event and To-do Component Properties

The following properties apply to either an event or to-do calendar object component.

3.1.6.1 Attachment

This property is identified by the property name ATTACH. The property defines an attached object to the MIME calendar object. For example, a document to be reviewed at a scheduled event or the process steps for a to-do. The property value can be a text string, a reference to another message body part or a reference to a URL corresponding to a document.

Multiple attachments may be specified by including multiple ATTACH properties within the MIME calendaring entity.

The following are examples of this property:

```
ATTACH;VALUE=CONTENT-ID:<jsmith.part3.960817T083000.  
xyzMail@host1.com>
```

```
ATTACH;VALUE=URL:file://xyzCorp.com/pub/reports/r-960812.ps
```

This property is optional for MIME entities conforming to this content type. The default data type for this property is MID. The data type may alternatively be specified to be CID, URL, or STRING value.

3.1.6.2 Attendee

This property is identified by the property name ATTENDEE. The property defines an attendee to a group event or to-do. The default property value is an ([RFC 822](#)) address. The property may include property parameters TYPE, for the type of attendee, ROLE, for the role of the attendee in the event or to-do; STATUS, for the status of the attendee's participation in the event or to-do, RSVP, for indicating whether the favor of a reply is requested, EXPECT, to indicate the expectation of the attendee's participation by the originator, and MEMBER, to indicate the group that the attendee belongs to.

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

The property value may reference a vCard object. This provides a useful mechanism to allow more than just the address of the attendee to be referenced.

The TYPE property parameter for each attendee can have the following values:

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Property Value	Description
INDIVIDUAL	Indicates attendee is an individual.
GROUP	Indicates attendee is a group of individuals.
RESOURCE	Indicates attendee is a resource.
UNKNOWN	Indicates attendee type is unknown.

The ROLE property parameter for each attendee can have the following values:

Property Value	Description
ATTENDEE	Indicates an attendee at the event or to-do

ORGANIZER	Indicates organizer of the event, but not owner
-----------	---

OWNER	Indicates owner of the event or to-do.
-------	--

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DELEGATE	Indicates a delegate of another attendee.
----------	---

The default value for this property parameter is ATTENDEE.

The STATUS property parameter for each attendee can have the following values:

Property Value	Description
ACCEPTED	Indicates to-do was accepted by attendee
NEEDS ACTION	Indicates event or to-do requires action by attendee

SENT	Indicates event or to- do was sent out to attendee
TENTATIVE	Indicates event is tentatively accepted by attendee
CONFIRMED	Indicates attendee has confirmed their attendance at the event
DECLINED	Indicates event or to-

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	do has been rejected by attendee
COMPLETED	Indicates to- do has been completed by attendee
DELEGATED	Indicates event or to- do has been delegated by the attendee to another
CANCELED	Indicates the event or to- do has been canceled and/or this attendee has been removed

from the list
of attendees.

The default value for this property parameter is NEEDS ACTION.

The RSVP property parameter for each attendee can have the following values:

Property Value	Description
YES	Indicates a reply is requested
NO	Indicates a reply is not requested.

The default value for this property parameter is NO.

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The EXPECT property parameter for each attendee can have the following values:

Property Value	Description
FYI	Indicates request is for your information.

REQUIRE	Indicates presence is definitely required.
REQUEST	Indicates presence is being requested
IMMEDIATE	Indicates an immediate response needed.

The default value for this property parameter is FYI.

The MEMBER property parameter value is an ([RFC 822](#)) address that represents the group or distribution list.

The following is an example of this property's use for a to-do:

```
ATTENDEE;ROLE=OWNER;STATUS=COMPLETED:jsmith@host1.com
```

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

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

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

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

This property is optional for MIME entities conforming to this content type. The default data type for this property is [RFC822](#)-

ADDRESS. Optionally, the data type for this property may be URL, MID, or CID; in which case the value is a location or message that contains information that is to be used to specify the attendee.

3.1.6.3 Audio Reminder

This property is identified by the property name AALARM. The property defines an audio reminder for the MIME calendar object. An audio reminder is an alarm that is sounded for a calendar component..

The value for the audio reminder consists of the Run Time, or the date and time that the reminder is to be executed; Snooze Time, or the duration of time after the Run Time that the reminder is to be dormant prior to being repeated; Repeat Count, or the number of times that the reminder is to be repeated; and the Audio Content, or the digital sound to be played when the reminder is executed.

The following are some examples of this property:

```
AALARM;TYPE=WAVE;VALUE=URL:19960415T235959; ; ;  
file:///mmedia/taps.wav
```

```
AALARM;TYPE=WAVE;VALUE=CONTENT-  
ID:19960903T060000;PT15M;4;<jsmith.part2.=  
960901T083000.xyzMail@host1.com>
```

The property has the following additional property parameters:

Property Parameter Values	Description
TYPE	
- - Any IANA registered audio content type value - -	Indicates a MIME audio content type.
WAVE	Indicates the WAVE format for audio content.

AIFF	Indicates the AIFF format for audio content.
------	--

The Reminder properties are primarily provided as a means for allowing the capture of alarm information when accessing a calendar system. It may not be an appropriate property to send in an event or to-do request.

This property is optional for MIME entities conforming to this content type. The default data type for this property is AALARM. Optionally, the data type may be specified to be CID, MID, or URL.

3.1.6.4 Categories

This property is identified by the property name CATEGORIES. This property defines the categories for the MIME calendar component. More than one category may be specified as a list of categories separated by the Semi-Colon character (ASCII decimal 59).

The following are some examples of this property:

CATEGORIES:APPOINTMENT;EDUCATION

CATEGORIES:MEETING

Some of the possible values for this property might include the following:

Some Possible

Property Values

APPOINTMENT

BUSINESS

EDUCATION

HOLIDAY

MEETING

MISCELLANEOUS

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NON-WORKING-HOURS

NOT-IN-OFFICE

PERSONAL

PHONE CALL

SICK DAY

SPECIAL OCCASION

TRAVEL

VACATION

This property is optional for MIME entities conforming to this content type. The data type for this property is STRING-LIST.

3.1.6.5 Classification

This property is identified by the property name CLASS. This property defines the access classification for the MIME calendar component.

A calendar event/to-do 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 MIME calendaring entity is useful when measured along with the other security components of a calendar system (e.g., user authorization, access rights, access role, etc.). Hence, the semantics of the individual access classifications can not be completely defined by this specification. Additionally, due to the _blind_ nature of most exchange processes using this specification, these entity classifications can not serve

as an enforcement statement for a system receiving a MIME calendar object . Rather, they provide a method for capturing the intention of the calendar owner for the access to the MIME calendar object component.

The following is an example of this property:

CLASS:PUBLIC

The property can have the following values:

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Property Value	Description
PUBLIC	Indicates general, public access.
PRIVATE	Indicates restricted, private access.
CONFIDENTIAL	Indicates very restricted, confidential access.

The default value for this property is PUBLIC.

This property is optional for MIME entities conforming to this content type. The data type for this property is STRING.

3.1.6.6 Date/Time Created

This property is identified by the property name DCREATED. This property specifies the date and time that the MIME calendar component was created within the originating calendar system. This is not necessarily the same date and time that the MIME calendar object was created. The date and time value is the local or UTC based time expressed in the complete representation, basic or extended format as specified in ISO 8601. The following is an example of this property:

```
DCREATED:19960329T083000-0500
```

This property is optional for MIME entities conforming to this content type. The data type for this property is DATE-TIME.

3.1.6.7 Date/Time Completed

This property is identified by the property name COMPLETED. This property defines the date and time that the to-do was actually completed. The date and time value is expressed in the complete representation, basic or extended format as specified in ISO 8601. The time can either be in local or UTC based time. The following is an example of this property:

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```
COMPLETED:19960401T235959Z
```

This property is optional for MIME entities conforming to this content type. The data type for this property is DATE-TIME.

3.1.6.8 Description

This property is identified by the property name DESCRIPTION. This property provides a more complete description of the MIME calendar component, than that provided by the SUMMARY property. The following is an examples of the property with formatted line breaks in the property value:

```
DESCRIPTION;ENCODING=QUOTED-PRINTABLE:Meeting to provide technical=
review for _Phoenix_ design.=0D=0A=
Happy Face Conference Room. Phoenix design team=
must attend this meeting. RSVP to team leader.
```

The following is an examples 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.

This property is required for MIME entities conforming to this content type. The data type for this property is STRING. Optionally, the data type may be URL, MID, or CID.

3.1.6.9 Display Reminder

This property is identified by the property name DALARM. The property defines a display reminder for the MIME calendar component. A display reminder is an alarm that is popped up into the user interface or otherwise visually displayed for a calendar component.

The value for the display reminder consists of the Run Time, or the date and time that the reminder is to be executed; Snooze Time, or the duration of time after the Run Time that the reminder is to be dormant prior to being repeated; Repeat Count, or the number of times that the reminder is to be repeated; and the Display String, or the text to be displayed when the reminder is executed.

The following is an example of this property:

DALARM:19960415T235000-0800;PT5M;2;Your Taxes Are Due !!!

The Reminder properties are primarily provided as a means for allowing the capture of alarm information when accessing a calendar system. It may not be an appropriate property to send in an event or to-do request.

This property is optional for MIME entities conforming to this content type. The default data type for this property is DALARM. Optionally, the data type may be specified to be CID, MID, or URL.

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3.1.6.10 Due Date/Time

This property is identified by the property name DUE. This property defines the date and time that the to-do is due to be completed. The date and time value is expressed in the complete representation, basic or extended format as specified in ISO 8601. The time can either be in local or UTC based time. Alternatively, the value may be a duration of time, expressed in the ISO 8601 format as specified in [section 3.1.3.8](#). In this case, the end is relative to the start of the MIME calendar component. The following is an example of this

property:

DUE:19960401T235959Z

This property is required for MIME entities consisting of a to-do calendar component that conforms to this content type. The default data type for this property is DATE-TIME. Optionally, the data type may be specified as a DURATION.

3.1.6.11 Duration

This property is identified by the property name DURATION. The property specifies an interval or duration of time. This property can be used with the DTSTART property to specify a relative duration for an event (e.g., event starts at 8:00 am and lasts for one hour). The property can also be used in constructing a free-busy time request (e.g., find free time periods of 15 minute duration, or longer). 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

This property is optional for MIME entities conforming to this content type. The data type for this property is DURATION.

3.1.6.12 End Date/Time

This property is identified by the property name DTEND. This property defines the date and time that the event component will end. The date and time value is expressed in the complete representation, basic or extended format as specified in ISO 8601. The time can either be in local or UTC based time. Alternatively, the value may be a duration of time, expressed in the ISO 8601 format as specified in [section 3.1.3.8](#). In this case, the end is relative to the start of the MIME calendar component. Events may have an end date/time but no start date/time. In that case, the event does not take up any time. The following is an example of this property:

DTEND:19960401T235959Z

This property is required for MIME entities conforming to this content type. The default data type for this property is DATE-TIME. The data type may alternatively be specified as a DURATION.

3.1.6.13 **Exception Date/Times**

This property is identified by the property name EXDATE. This property defines the list of date/time exceptions for a recurring MIME calendar component. The date and time values is expressed in the complete representation, basic format as specified in ISO 8601. The times can either be in local or UTC based time. The following is an example of this property:

```
EXDATE:19960402T010000Z;19960403T010000Z;19960404T010000Z
```

This property is optional for MIME entities conforming to this content type. The data type for this property is D-T-LIST. Optionally, the data type may be URL; in which case the value is the location where a list of exception dates can be found. This latter case is a useful method for conveying dynamic exceptions dates, such as holidays, for a recurring event or to-do.

3.1.6.14 **Exception Rule**

This property is identified by the property name EXRULE. This property defines a rule or repeating pattern for an exception to a recurring MIME calendaring entity, based on the Basic Recurrence Rule Grammar of the [\[XAPIA\]](#). The value for the property is a pattern specification for the recurrence exception. The following are some examples of this property:

```
EXRULE:W2 TU TH #2           // Except every other week, on Tuesday
                                // and Thursday for 4 occurrences

EXRULE:D1 #10                 // Except daily for 10 occurrences

EXRULE:YM1 6 7 #8             // Except yearly in June and July for 8
                                // occurrences
```

This property is optional for MIME entities conforming to this content type. The data type for this property is RRULE.

3.1.6.15 **Last Modified**

This property is identified by the property name LAST-MODIFIED. The property specifies the date and time that the MIME calendar component was last revised. The following is an example of this property:

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

This property is optional for MIME entities conforming to this content type. The data type for this property is DATE-TIME.

3.1.6.16 **Location**

This property is identified by the property name LOCATION. The property defines the intended location for the MIME calendar component.

The property value may reference a vCard object. This provides a useful mechanism to specify a location in terms of its electronic business card.

The following are some examples of this property:

LOCATION:Conference Room - F123, Bldg. 002 // or

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

This property is optional for MIME entities conforming to this content type. The default data type for this property is STRING. Optionally the data type may URL, MID, or CID.

3.1.6.17 **Mail Reminder**

This property is identified by the property name MALARM. The property defines an email address that is to be sent a reminder for the MIME calendar component. A mail reminder is an electronic mail address that will be sent a display string as an alarm for a calendar component.

The value for the procedure reminder consists of the Run Time, or the date and time that the reminder is to be executed; Snooze Time, or the duration of time after the Run Time that the reminder is to be dormant prior to being repeated; Repeat Count, or the number of times that the reminder is to be repeated; Email Address, or the ([RFC 822](#)) email address that is to be sent the reminder, Subject, or the textual subject of the note, and the Note, or the textual reminder string that is to be sent to the email address.

The following is an example of this property:

MALARM:19960416T000000-0500;PT1H;24;IRS@us.gov;My Payment;
The Check Is In The Mail!

The Reminder properties are primarily provided as a means for allowing the capture of alarm information when accessing a calendar system. It may not be an appropriate property to send in an event or to-do request.

This property is optional for MIME entities conforming to this content type. The default data type for this property is MALARM. Optionally, the data type may be URL, MID, or CID.

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[3.1.6.18](#) **Number Recurrences**

This property is identified by the property name RNUM. The property defines the number of times the calendar entry will reoccur. The value is equal to the number of recurrences that are specified by the union of the Recurrence Dates, Recurrence Rule, Exception Dates, and Exception Rule property values. The following is an example of this property:

RNUM:3

In the event that this value does not match the computed number of recurrences, it will be ignored and the computed number of recurrences will be used.

This property is optional for MIME entities conforming to this content type. The data type for this property is INTEGER.

[3.1.6.19](#) **Priority**

This property is identified by the property name PRIORITY. The property defines the priority for the MIME calendar component. The value is an alphanumeric. 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. The following is an example of this property:

PRIORITY:2

This property is optional for MIME entities conforming to this content type. The default data type for this property is STRING.

Optionally the data type may be specified to be INTEGER.

3.1.6.20 Procedure Reminder

This property is identified by the property name PALARM. The property defines a procedure reminder for the MIME calendar component. A procedure reminder is a procedure, or application executable that will be run as an alarm for a calendar component.

While this property has many useful purposes, implementers should be aware of the security implications of sending a MIME calendaring entity containing this property. The security implications are similar to those associated with active messages within electronic mail.

The value for the procedure reminder consists of the Run Time, or the date and time that the reminder is to be executed; Snooze Time, or the duration of time after the Run Time that the reminder is to be dormant prior to being repeated; Repeat Count, or the number of times that the reminder is to be repeated; and the Procedure Name, or the path to the procedure to be run when the reminder is executed. Parameters are passed to the procedure by concatenating to the

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Procedure Name value a Question-Mark (ASCII decimal 63) followed by a string representation of the parameters.

The following is an example of this property:

```
PALARM;VALUE=URL:19960415T235000-0500;PT5M;2;file:///myapps/  
shockme.exe?HARD
```

The Reminder properties are primarily provided as a means for allowing the capture of alarm information when accessing a calendar system. It may not be an appropriate property to send in an event or to-do request.

This property is optional for MIME entities conforming to this content type. The default data type for this property is PALARM. Optionally, the data type may be URL, MID, or CID.

3.1.6.21 Related To

This property is identified by the property name RELATED-TO. The property is used to represent relationships or references between this MIME calendar component and another. The property value consists

of the persistent, globally unique identifier of another MIME calendar component. This value would be represented in a MIME calendar component by the UID property.

A linked relationship can be specified by a series of components that each, in turn, refer to their parent component. A group relationship can be specified by a number of components that all refer to one common parent component.

Changes to a calendar component referenced by this property may impact 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 this relationship.

The following is an example of this property:

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

```
RELATED-TO:19960401-080045-4000F192713-0052
```

This property is optional for MIME entities conforming to this content type. The default data type for this property is STRING. Optionally, the data type may be URL, MID, or CID.

3.1.6.22 Recurrence Date/Times

This property is identified by the property name RDATE. This property defines the list of date/times for a recurring MIME calendar component. This property may appear along with the RRULE property to

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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 date and time values is expressed in the complete representation, basic format as specified in ISO 8601. The times can either be in local or UTC based time. The number of recurring date/times is specified by the Number Recurrences property. The following is an example of this property:

```
RDATE:19960402T010000Z;19960403T010000Z;19960404T010000Z
```

This property is optional for MIME entities conforming to this

content type. The default data type for this property is D-T-LIST. Optionally, the data type may be URL; in which case the value is the location where a list of recurring dates can be found. This latter case is a useful method for conveying dynamic recurring dates, such as schedules, for a recurring event or to-do.

3.1.6.23 **Recurrence Rule**

This property is identified by the property name RRULE. This property defines a rule or repeating pattern for a recurring MIME calendar component, based on the Basic Recurrence Rule Grammar of [[XAPIA](#)]. The value for the property is a pattern specification for the recurrence. This property may appear along with the RDATE 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 following are examples of this property:

```
RRULE:W2 TU TH           // Every other week, on Tuesday
                           // and Thursday

RRULE:D1 #10              // Daily for 10 occurrences

RRULE:YM1 6 7 #8          // Yearly in June and July for 8
                           // occurrences
```

This property is optional for MIME entities conforming to this content type. The data type for this property is RRULE.

3.1.6.24 **Resources**

This property is identified by the property name RESOURCES. This property defines the equipment or resources needed in the MIME calendar component.

Some of the values that the property may have include the following:

Some Possible

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Property Values

CATERING
CHAIRS
COMPUTER PROJECTOR
EASEL
OVERHEAD PROJECTOR
SPEAKER PHONE
TABLE
TV
VCR
VIDEO PHONE
VEHICLE

The following is an example of this property:

```
RESOURCES:EASEL;PROJECTOR;VCR
```

This property is optional for MIME entities conforming to this content type. The default data type for this property is STRING-LIST. The data type may alternatively be specified to be STRING.

3.1.6.25 Response Sequence Number

This property is identified by the property name RESPONSE-SEQUENCE. This property defines the instance of the MIME calendar component in a revision sequence of responses. This property is needed to properly handle the receipt and processing of a sequence of MIME calendar components that have been delivered out of order. Such is the case for store-and-forward based transports. When a response to an original MIME calendaring entity is created its sequence number is zero (ASCII decimal 48). It is incremented each time it is revised. The following is an example of this property:

```
RESPONSE-SEQUENCE:1
```

This property is optional for MIME entities conforming to this content type. The data type for this property is INTEGER.

3.1.6.26 **Sequence Number**

This property is identified by the property name SEQUENCE. This property defines the instance of the MIME calendar component in a sequence of revisions. This property is needed to properly handle the receipt and processing of a sequence of MIME calendar components that have been delivered out of order. Such is the case for store-and-forward based transports. When a MIME calendaring entity is created its sequence number is zero (ASCII decimal 48). It is incremented each time it is revised by the OWNER and/or ORGANIZER. The following is an example of this property:

SEQUENCE:1

This property is optional for MIME entities conforming to this content type. The data type for this property is INTEGER.

3.1.6.27 **Start Date/Time**

This property is identified by the property name DTSTART. This property defines the date and time that the calendar component will start. The date and time value is expressed in the complete representation, basic format as specified in ISO 8601. The time can either be in local or UTC based time. Alternatively, the value may be a duration of time, expressed in the ISO 8601 format as specified in [section 3.1.3.8](#). In this case, the start is relative to another MIME calendar component specified by the RELATED-TO property. Events may have a start date/time but no end date/time. In that case, the event does not take up any time. The following is an example of this property:

DTSTART:19960401T235959-0600

This property is optional for MIME entities conforming to this content type. The default data type for this property is DATE-TIME. Optionally, the data type may be DURATION.

3.1.6.28 **Status**

This property is identified by the property name STATUS. This property defines the status associated with the MIME calendar component. This property can only be used when the ATTENDEE property is either not supported or not needed. The following is an example of this property:

STATUS:TENTATIVE

The property can have the following values:

Description		Property
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		Value
Indicates to-do was accepted		ACCEPTED
Indicates event or to-do requires action		NEEDS ACTION
Indicates event or to-do was sent out.		SENT
Indicates event is tentatively accepted		TENTATIVE
Indicates event is confirmed		CONFIRMED
Indicates event or to-do has been declined		DECLINED
Indicates to-do has been completed		COMPLETED
Indicates event or to-do has been delegated		DELEGATED
Indicates the event or to-do has been		CANCELED

canceled and/or
this attendee
has been
removed from
the list of
attendees.

The default value for this property is NEEDS ACTION.

This property is required for MIME entities containing a to-do calendar component conforming to this content type. This property is optional for MIME entities containing an event calendar component conforming to this content type. The data type for this property is STRING.

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[3.1.6.29](#) **Summary**

This property is identified by the property name SUMMARY. This property defines a short summary or subject of the MIME calendar component. The following is an example of this property:

SUMMARY:Department Party

This property is required for MIME entities conforming to this content type. The data type for this property is STRING.

[3.1.6.30](#) **Time Transparency**

This property is identified by the property name TRANSP. This property defines whether the event is transparent to free time searches. The value of this property is a number. A value of zero (ASCII decimal 48) guarantees that the entry will block time and will be factored into a free time search. A value of one (ASCII decimal 49) specifies that the entry will not block time and will not be factored into a free time search. Any values greater than `_1_` will provide implementation specific transparency semantics. Some implementations may treat values greater than one as non-blocking or transparent events. Other implementations may use the numeric value to provide a layering of levels of transparency. The default value is zero (ASCII decimal 48), the event is not transparent and will block free time searches. The following is an example of this property:

TRANSP:0

This property is optional for MIME entities conforming to this content type. The data type for this property is INTEGER.

3.1.6.31 Uniform Resource Locator

This property is identified by the property name URL. This property defines a Uniform Resource Locator for an Internet location that can be used to obtain real-time information associated with the MIME calendar component. Valid values for this property are a string conforming to [[RFC 1738](#)]. The following is an example of this property:

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

This property is optional for MIME entities conforming to this content type. The data type for this property is URL.

3.1.6.32 Unique Identifier

This property is identified by the property name UID. This property defines a persistent, globally unique identifier associated with the MIME calendar component. Some examples of forms of unique identifiers would include ISO 9070 formal public identifiers (FPI), X.500 distinguished names, machine-generated `_random_` numbers with a statistically high likelihood of being globally unique and Uniform

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Resource Locators (URL). If an URL is specified, it is suggested that the URL reference a service which can provide an updated version of the MIME calendar component. The following is an example of this property:

UID:19960401-080045-4000F192713-0052

This property is an important method for group scheduling applications to match calendar entities with later modification or deletion requests. Calendaring and scheduling applications that do not generate this property in MIME calendar components may be limiting their interoperability with other group scheduling applications.

This property is optional for MIME entities conforming to this content type. The default data type for this property is STRING. Optionally, the data type may be URL, MID, or CID.

3.1.6.33

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 specification. Extension properties are specified by property and/or property parameter names that have the initial sub-string of X- (the two character sequence: Capital X character followed by the Dash character). It is recommended that vendors concatenate onto this sentinel an added short sub-string 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 following might be the ABC vendor's extension for an audio-clip form of subject property:

X-ABC-MMSUBJ;TYPE=WAVE; VALUE=URL: <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 STRING. Optionally, the data type may be any of the other valid data types.

3.2

Formal Definition

The following modified Backus-Naur Notation (BNF) is provided to assist developers in building parsers for the properties of this MIME content type..

This syntax is written according to the form described in [RFC 822](#), but it references just this small subset of [RFC 822](#) literals:

CR = <ASCII CR, carriage return> ; (15, 13.)

LF = <ASCII LF, linefeed> ; (12, 10.)

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CRLF = CR LF

SPACE = <ASCII SP, space> ; (40, 32.)

HTAB = <ASCII HT, horizontal-tab> ; (11, 9.)

All literal property names are valid as upper, lower, or mixed


```

case.

ws          = 1*(SPACE / HTAB)

; _whitespace,_ one or more spaces or tabs

wsls        = 1*(SPACE / HTAB / CRLF)

; whitespace with line separators

value       = 7bit / 8bit / quoted-printable / base64

; The value must be in the encoding type specified for the
; property value.

7bit        = <7bit us-ascii printable chars, excluding CR LF>

8bit        = <MIME RFC 2045 8-bit text>

quoted-printable = <MIME RFC 2045 quoted-printable text>

base64      = <MIME RFC 2045 base64 text>

; the end of the text is marked with two CRLF sequences

; this results in one blank line before the start of the next

; property

word        = <any printable 7bit us-ascii except []=:., >

vcal_file   = [wsls] vcal [wsls]

vcal        = _BEGIN_ [ws] _:_ [ws] _VCALENDAR_ [ws]
1*CRLF

calprop calentities [ws] *CRLF

_END_ [ws] _:_ [ws] _VCALENDAR_ [ws] 1*CRLF

calentities = calentities *CRLF calentity

/ calentity

calentity   = evententity

/ todoentity

```

```

evententity = _BEGIN_ [ws] _:_ [ws] _VEVENT_ [ws] 1*CRLF
               entprops [ws] *CRLF
               _END_ [ws] _:_ [ws] _VEVENT_ [ws] 1*CRLF

todoentity = _
              BEGIN_ [ws] _:_ [ws] _VTODO_ [ws] 1*CRLF
              entprops [ws] *CRLF
              _END_ [ws] _:_ [ws] _VTODO_ [ws] 1*CRLF

calprops      = calprops *CRLF calprop
               / calprop

calprop       = _PROFILE_
               [params] _:_ value CRLF
               / _DAYLIGHT_
               [params] _:_ value CRLF
               / _CALENDAR_
               [params] _:_ _GREGORIAN_ CRLF
               / _GEO_
               [params] _:_ value CRLF
               / _PRODID_
               [params] _:_ value CRLF
               / _TZ_
               [params] _:_ value CRLF
               / _VERSION_ _:_ _1.0_ CRLF

; The VERSION calendar property MUST appear in the MIME Calendar
; Object.

entprops      = entprops *CRLF entprop
               / entprop

entprop       = [ws] simprop

```

[params] _:_ value CRLF
/ [ws] _AALARM_

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[params] _:_ aalarmparts CRLF
/ [ws] _CATEGORIES_
[params] _:_ 1*catvals CRLF
/ [ws] _CLASS_
[params] _:_ classvals CRLF
/ [ws] _DALARM_
[params] _:_ dalarmparts CRLF
/ [ws] _EXDATE_
[params] _:_ xdatevals CRLF
/ [ws] _MALARM_
[params] _:_ malarmparts CRLF
/ [ws] _PALARM_
[params] _:_ palarmparts CRLF
/ [ws] _RDATE_
[params] _:_ rdatevals CRLF
/ [ws] _RESOURCES_
[params] _:_ 1*resvals CRLF
/ [ws] _STATUS_
[params] _:_ statvals CRLF

simprop = _ATTACH_ / _ATTENDEE_ / _DCREATED_ / _COMPLETED_
/ _DESCRIPTION /


```

resvals    = _CATERING_ / _CHAIRS_ / _EASEL_ / _PROJECTOR_ / _VCR_
           / _VEHICLE_ / _X-_ word / value

statvals   = _ACCEPTED_ / _NEEDS ACTION_ / _SENT_ / _TENTATIVE_
           / _CONFIRMED_ / _DECLINED_ / _COMPLETED_ / _DELEGATED_
           / _X-_ word / value

params     = _;_ [ws] paramlist

paramlist  = paramlist [ws] _;_ [ws] param
           / param

param      = _TYPE_ [ws] _=_ [ws] ptypeval
           / [_VALUE_ [ws] _=_ [ws]] pvalueval
           / [_ENCODING_ [ws] _=_ [ws]] pencodingval
           / _CHARSET_ [ws] _=_ [ws] charsetval

```

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```

/ _DATATYPE_ [ws] _=_ [ws] dtypeval

/ _LANGUAGE_ [ws] _=_ [ws] langval

/ _MEMBER_ [ws] _=_ [ws] <RFC 822 address specification>

/ _ROLE_ [ws] _=_ [ws] roleval

/ _STATUS_ [ws] _=_ [ws] statual

/ _X-_ word [ws] _=_ [ws] word

/ knowntype

ptypeval   = knowntype / attendtype / _X-_ word

knowntype  = _
           BASIC / _WAVE_ / _X-_ word / value

attendtype = _INDIVIDUAL_ / _GROUP_ / _RESOURCE_ / _UNKNOWN_

pvalueval  = _INLINE_ / _URL_ / _CONTENT-ID_ / _CID_ /

```

```

        / _MESSAGE-ID_ / _MID_ / _X-_ word

pencodingval = _7BIT_ / 8BIT
               _ / _QUOTED-PRINTABLE_ / _BASE64_

        / _X-_ word

charsetval = <a character set string as defined in RFC 2046>

dtypeval   = _AALARM_ / _BOOLEAN_ / _CID_ / _DALARM_ / _DATE-TIME_
             / _DST-RULE_ / _D-T-LIST_ / _DURATION_ / _FLOAT_
             / _FLOAT-LIST_ _
             / _INTEGER_ / _INTEGER-LIST_ / _MALARM_

             / _MID_ / _
             _ PALARM_ / RFC822-ADDRESS
             _ / _RRULE_

             / _STRING_ / _STRING-LIST_ / _TIME-OFFSET_ / _URL_

             / _X-_ word

langval     = <a language string as defined in RFC 1766>

roleval     = _ATTENDEE_ / _ORGANIZER_ / _OWNER_ / _X-_ word

statusval   = _ACCEPTED_ / _
              _ NEEDS ACTION _ / _SENT_ / _TENTATIVE_
              / _CONFIRMED_ / _DECLINED_ / _COMPLETED_ / _DELEGATED_
              / _X-_ word

strnosemi   = *(*nonsemi (_\;_ / _\_ CRLF)) *nonsemi

```

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; To include a semicolon in this string, it must be escaped

; with a __ character.

nonsemi = <any non-control ASCII except _;>

[3.3](#) Basic Recurrence Rule Grammar

The specification of recurring events can be simplified by the use of a grammar or rule notation. This specification makes use of the Base Recurrence Rule Grammar from the [\[XAPIA\]](#).

A recurrence rule is a string or clear-text encoding of a recurrence specification. A recurrence rule is composed of several components. A rule begins with a frequency which describes the type of repeating event (e.g., daily, weekly, etc.). This is followed by an interval which indicates how often the frequency repeats (i.e., daily, every third day, etc.). This can be followed by optional frequency modifier information and either an end date or a duration.

Below is the form of a typical rule. This example causes events to be generated every other week on Tuesday and Thursday, for 8 occurrences:

```
W2 TU TH #4
```

Where, W is the Frequency, 2 is the Interval, TU and TH are the optional Frequency Modifiers, and #4 is the Duration.

The basic recurrence rule grammar supports six types of repetition. The six types follow the same form with only the frequency name and optional modifier information changing from one type of frequency to the next.

[3.3.1](#) Daily Rule

The daily rule is used for specifying repeating events based on an interval of a day or more. These can range from every day to every 200th day and beyond. The daily rule begins with the letter D followed by an interval (representing days) and an optional duration or end date.

Some examples follow:

Daily for 10 occurrences:

```
D1 #10
```

Daily until 12/24/94:

```
D1 19941224T000000Z
```

Every other day - forever:

```
D2 #0
```

Every 10 days, 5 occurrences:

D10 #5

3.3.2 Weekly Rule

The weekly rule is used for specifying repeating events based on an interval of a week or more. The basic weekly rule has the same form as the daily rule except that the rule begins with a W and can contain an optional list of weekdays the events are generated on. For weekly rules, the interval represents weeks. Some examples follow:

Weekly for 10 occurrences:

W1 #10

Weekly until 12/24/94:

W1 19941224T000000Z

Every other week - forever:

W2 #0

Weekly on Tuesday and

Thursday for 5 weeks:

W1 TU TH #5

Every other week on Monday Wednesday and Friday until 12/24/94:

W2 MO WE FR 19941224T000000Z

3.3.3 Monthly Rule

The monthly rule is used for specifying repeating events base on an interval of a month or more. There are two types of monthly recurrence rules. One for by-position and one for by-day. The by-position rule allows weekdays in the month to be specified in relation to their occurrence in the month. An example would be to specify the third Sunday of the month or the last Friday of the month. An occurrence specifier may be used in monthly by-position rules. The occurrence specifiers control which occurrence of a weekday in a month an event occurs on:

1+, 2+, ... 5+ for the first occurrence, second, ...fifth occurrence of the month.

1-, 2-, ... 5- for the last occurrence, second to last occurrence, etc.

A 2+ FR SA would indicate the second occurrence of Friday and Saturday in the month. A 1- MO would indicate the first occurrence of Monday working from the end of the month backwards (i.e., the last occurrence). A 2- MO would be the second to the last Monday of the

month.

A by-day rule allows actual day numbers to be specified such as the 12th day or 29th day.

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The by-position rule begins with a MP and the by-day rule begins with a MD. The interval in monthly rules represents months. Some examples follow:

Monthly on the 1st Friday for ten occurrences:

MP1 1+ FR #10

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

MP1 1+ FR 19941224T000000Z

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

MP2 1+ SU 1- SU #10

Every six months on the 2nd Monday
through Friday for 10 occurrences:

MP6 2+ MO TU WE TH FR #10

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

MP1 2- MO #6

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

MD1 3- #0

Monthly on the 2nd and 15th of the month for 10 occurrences:

MD1 2 15 #10

In the next example LD refers to _LastDay_ in a monthly recurrence rule. Monthly on the 1st and last day of the month for 10 occurrences:

MD1 1 LD #10 or MD1 1 1- #10

Every 18 months on the 10th through 15th of the month for 10 occurrences:

MD18 10 11 12 13 14 15 #10

Monthly on the second to the last day for 5 months. So, if the

start date is August 1996, the event would repeat on 8/30/96,
9/29/96, 10/30/96, 11/29/96, and 12/30/96:
MD1 2- #5

3.3.4 Yearly Rule

The yearly rule is used for specifying repeating events based on an interval of a year or more. There are two types of yearly recurrence rules. One for by-month and one for by-day. The by-month rule allows specific months out of the year to be specified. The by-day allows specific days to be specified. In the by-month rule, the day in the month the rule is to occur on is determined from the initial appointment.

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The by-month rule begins with a YM and the by-day rule begins with a YD. The interval in yearly rules represents years. Some examples follow:

Yearly in June and July for 10 occurrences:

YM1 6 7 #10

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

YM2 1 2 3 #10

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

YD3 1 100 200 #10

3.3.5 Grammar

[Editor's Note: The format of this BNF will be changed to the [RFC 822](#) ABNF in the next version of the draft.]

{ } 0 or more

[] 0 or 1

start ::= <daily> [<enddate>] |
 <weekly> [<enddate>] |
 <monthlybypos> [<enddate>] |
 <monthlybyday> [<enddate>] |

```

        <yearlybymonth> [<enddate>] |
        <yearlybyday> [<enddate>]

digit ::= <0|1|2|3|4|5|6|7|8|9>

digits ::= <digit> {<digits>}

enddate    ::= ISO 8601_date_time value(e.g., 19940712T101530Z)

interval    ::= <digits>

duration    ::= #<digits>

lastday     ::= LD

plus        ::= +

minus       ::= -

daynumber   ::= <1-31> [<plus>|<minus>]| <lastday>

daynumberlist ::= daynumber {<daynumberlist>}

```

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```

month       ::= <1-12>

monthlist   ::= <month> {<monthlist>}

day         ::= <1-366>

daylist     ::= <day> {<daylist>}

occurrence  ::= <1-5><plus> | <1-5><minus>

weekday     ::= <SU|MO|TU|WE|TH|FR|SA>

weekdaylist ::= <weekday> {<weekdaylist>}

occurrenceweekday ::= [<occurrence>] <weekday>

occurrenceweekdaylist ::= <occurrenceweekday>
    {<occurrenceweekdaylist>}

daily       ::= D<interval> [<duration>]

```

weekly ::= W<interval> [<weekdaylist>] [<duration>]
 monthlybypos ::= MP<interval> [<occurrenceweekdaylist>]
 [<duration>]
 monthlybyday ::= MD<interval> [<daynumberlist>] [<duration>]
 yearlybymonth ::= YM<interval> [<monthlist>] [<duration>]
 yearlybyday ::= YD<interval> [<daylist>] [<duration>]

3.3.6 Grammar Glossary

enddate Controls when a repeating event terminates. The enddate is the last time an event can occur.
 Interval Defines the frequency in which a rule repeats.
 duration Controls the number of events a rule generates.
 Lastday Can be used as a replacement to daynumber to indicate the last day of the month.
 daynumber A number representing a day of the month.
 month A number representing a month of the year.
 day A number representing a day of the year.
 occurrence Controls which week of the month a particular weekday event occurs.

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weekday A symbol representing a day of the week.
 daily Defines a rule that repeats on a daily basis.
 weekly Defines a rule that repeats on a weekly basis.
 monthlybypos Defines a rule that repeats on a monthly basis on a relative day and week.
 monthlybyday Defines a rule that repeats on a monthly basis on an absolute day.

yearlybymonth Defines a rule that repeats on specific months of the year.

yearlybyday Defines a rule that repeats on specific days of the year.

3.3.7 Policies

1.
The duration portion of a rule defines the total number of events the rule generates, including the first event.
2.
Information, not contained in the rule, necessary to determine the next event time and date is derived from the Start Time entry attribute.
3.
If an end date and a duration is specified in the rule, the recurring event ceases when the end date is reached or the number of events indicated in the duration occur; whichever comes first.
4.
If the duration or an end date is not established in the rule (e.g., D4) the event occurs twice. That is D4 is equivalent to D4 #2.
5.
A duration of #0 means repeat this event forever.
6.
Using the occurrence specifier 5+ (e.g. 5th Friday) or 5- (e.g. 5th from last Friday) in a month that does not contain 5 weeks does not generate an event and thus does not count against the duration. The same applies to providing a day of the month that does not occur in the month. For example the 30th or 31st .
7.
The start time and date of an entry must be synchronized with one of the repeating events defined by its recurrence rule. The following is not allowed:

Initial Appointment Date:	7/1/94 (Friday)
Recurrence Rule:	W1 MO TH #5

The following is acceptable:

Initial Appt Date:	7/1/94 (Friday)
Recurrence Rule:	W1 MO FR #5 or W1 #5

8.

If the optional <occurrencelist> and <weekdaylist> information is missing from a <monthlybypos> occurrence the information is derived from the entry attributes. The <occurrence> used in the recurring event is a count from the beginning of the month to the entry date and the <weekday> used is the day of the week the entry is scheduled to occur on.

9.

If the <monthlybypos> occurrence or <monthlybyday> occurrence does not list a week day (e.g., SU or day 10) in the rule, the week day is established from the entry attribute information. As an example the rule MP1 #3 used in an entry with a start date of 7/20/94 (which is the third Wednesday of the month) repeats on 8/17/94 which is the third Wednesday of the month.

4. Registration of Content Type Profiles

This section defines procedures by which usage profiles for the MIME Calendaring and Scheduling Content Type are registered with the IANA and made available to the Internet community. Note that non-IANA profiles may be used by bilateral agreement, provided the associated profile names follow the "X-" convention defined above in [section 3.1.6.33](#).

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

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

4.1 Define the profile

A profile is defined by completing the following template.

To: ietf-calendar@imc.org

Subject: Registration of text/calendar MIME profile XXX

Profile name:

Profile purpose:

Profile type-subtype:

Profile special notes (optional):

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

The explanation of what goes in each field in the template follows.

Profile name: The name of the profile as it will be generally referred to in public. This name is required in the profile.

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Profile purpose: The purpose of the profile (e.g., to schedule document management updates, etc.). Give a short but clear description. This description is required in the profile.

Profile type-subtype: The type-subtypes of the profile as they will appear in the text/calendar MIME Content-Type Profile parameter. This list of type-subtype values is required in the profile.

Profile properties: The list of MIME Calendaring and Scheduling Content Type properties associated with the profile. This list of properties that are included in the profile. If a property is required by the profile, it should be noted in this section. Other types not mentioned in the profile definition may also be present. Note that any new properties referenced by the profile must be defined separately as described in section .

Profile special notes: Any special notes about the profile, how it is to be used, etc. This section is not required in the profile.

4.2 Post the profile definition

The profile description must be posted to the IETF Calendaring and Scheduling Working Group discussion list, ietf-calendar@imc.org.

4.3 Allow a comment period

Discussion on the new profile must be allowed to take place on the list for a minimum of two weeks. Consensus must be reached on the profile before submitting the profile for approval.

4.4 Submit the profile for approval

Once the two-week comment period has elapsed, and the proposer is convinced consensus has been reached on the profile, the registration application should be submitted to the Profile Reviewer for approval.

The Profile Reviewer is appointed to the Application Area Directors and may either accept or reject the profile registration. An accepted registration should be passed on by the Profile Reviewer to the IANA for inclusion in the official IANA profile registry. The registration may be rejected for any of the following reasons. 1) Insufficient comment period; 2) Consensus not reached; 3) Technical deficiencies raised on the list or elsewhere have not been addressed. The Profile Reviewer's decision to reject a profile may be appealed by the proposer to the IESG, or the objections raised can be addressed by the proposer and the profile resubmitted.

4.5 Profile Change Control

Existing profiles may be changed using the same process by which they were registered.

1.
 Define the change

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2.
 Post the change
3.
 Allow a comment period
4.
 Submit the profile for approval

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

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

4.6 Registration of New Content Type Properties

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

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 encoding: The encodings permitted for the property value. This description must be precise and must not violate the general encoding rules defined in this document.

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

4.6.2 Post the Property definition

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

4.6.3 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.

4.6.4 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 Profile Reviewer for approval. The Profile 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 Profile Reviewer to the IANA for inclusion in the official IANA profile registry. The registration may be rejected for any of the following reasons. 1) Insufficient comment period; 2) Consensus not reached; 3) Technical deficiencies raised on the list or elsewhere have not been addressed. The Profile 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.

4.7 Content Type Property Change Control

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

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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 specification. The Profile 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.

5. 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.

6. 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.

7. Bibliography

The following document are referred to within this document.

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[ISO 9070] ISO/IEC 9070, Information Technology_SGML Support Facilities_Registration Procedures for Public Text Owner Identifiers, Second Edition, International Organization for Standardization, April, 1991.

[MIME-REG] Freed, N., Postel, J., "Multipurpose Internet Mail Extensions (MIME) - Part Four: Registration Procedures", Internet-Draft <draft-ietf-822ext-mime-reg-02.txt>, December 1995.

[RFC 1738] T. Berners-Lee and L. Masinter , _Universal Resource Locator_, [RFC 1738](#), Xerox Corporation, University of Minnesota, December 1994.

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[RFC 2045] Borenstein, N., and N. Freed, "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", [RFC 2045](#), November 1996.

[RFC 2046] Borenstein N., and N. Freed, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", [RFC 2046](#), November 1996.

[US-ASCII] Coded Character Set--7-bit American Standard Code for Information Interchange, ANSI X3.4-1986.

[VCAL] MIME calendaring entity - Calendaring and Scheduling Exchange Format, Versit Consortium, September 18, 1996.

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

8. Acknowledgments

A hearty thanks to the IETF Calendaring and Scheduling Working Group and also the following individuals who have participated in the drafting, review and discussion of this memo:

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9. 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:fdawson@earthlink.net
URL:http://home.earthlink.net/~fdawson
END:VCARD
```

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```
BEGIN:VCARD
FN:Derik Stenerson
ORG:Microsoft Corporation
ADR;WORK;POSTAL;PARCEL;;;One Microsoft Way;
  Redmond;WA;98052-6399;USA
TEL;WORK;MSG:+1-206-936-5522
TEL;WORK;FAX:+1-206-936-7329
EMAIL;INTERNET:deriks@Exchange.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:+1-810-559-5955
TEL;WORK;FAX:+1-810-559-5034
EMAIL;INTERNET:anik@ontime.com
END:VCARD
```

10. Examples

The following examples are provided as an informational source of illustrative MIME entities containing data consistent with this MIME content type.

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:2.0
MESSAGE-ID:<19960704 08:30:00 EDT xyz@host1.com>
CONTENT-TYPE:text/calendar;PROFILE=request,event

BEGIN:VCALENDAR
PROFILE:event-request
VERSION:2.0
BEGIN:VEVENT
DTSTART:19960918T143000Z
DTEND:19960920T220000Z
CATEGORIES:CONFERENCE;PROJECT
SUMMARY:Networld+Interop Conference
DESCRIPTION;ENCODING=QUOTED-PRINTABLE:Networld+Interop Conference=
and Exhibit=0D=0A=
Atlanta World Congress Center=0D=0A=
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: 2.0
Message-ID: <id1@host1.com>
Content-Type: text/calendar;Profile=event,request

BEGIN:VCALENDAR
PROFILE:event-request
DAYLIGHT:TRUE;-06:00;19960407T025959;19961027T010000;EST;EDT
PRODID:-//RDU Software//NONSGML HandCal//EN
TZ:-05:00
VERSION:2.0
BEGIN:VEVENT
```

ATTENDEE;EXPECT=REQUEST:ietf-calendar@imc.org
DESCRIPTION:First IETF-Calendaring and Scheduling Working Group
Meeting
CATEGORIES:MEETING
CLASS:PUBLIC
DCREATED:19961022T083000
SUMMARY:IETF Calendaring Working Group Meeting
DTSTART:19961210T210000Z
DTEND:19961210T220000Z
LOCATION:San Jose, CA - Fairmont Hotel
UID:guid-1.host1.com
END:VEVENT
END:VCALENDAR