iCalendar Message-Based Interoperability Protocol
(iMIP)

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Abstract

This document specifies a binding from the iCalendar Transport-
independent Interoperability Protocol [ITIP] to Internet email-based
transports. Calendaring entries defined by the iCalendar Object Model
[ICAL] are composed using constructs from [RFC-822], [RFC-2045],
[RFC-2046], [RFC-2047], [RFC-2048] and [RFC-2049].

This document is based on the calendaring and scheduling model
defined by [ICMS].

This document is based on discussions within the Internet Engineering
Task Force (IETF) Calendaring and Scheduling (CALSCH) working group.
More information about the IETF CALSCH working group activities can
be found on the IMC website at http://www.imc.org, the IETF website
at http://www.ietf.org/html.charters/calsch-charter.html. Refer to
the references within this document for further information on how to
access these various documents.

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for improvement should be sent to the authors.
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September 12, 1997

1 Introduction

This binding document provides the transport specific information necessary to convey iCalendar Transport-independent Interoperability Protocol [ITIP] over MIME as defined in [RFC-822] and [RFC-2045].

1.1 Related Memos

Implementors will need to be familiar with several other memos that, along with this memo, form a framework for Internet calendaring and scheduling standards.

This document - specifies an Internet email binding for [ITIP].

[ICMS] - specifies a common terminology and abstract;

[ICAL] - specifies a core specification of objects, data types, properties and property parameters;

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

[IRIP] - specifies an Internet real time protocol binding for [ITIP].

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

1.2 Formatting Conventions

The mechanisms defined in this memo are defined in propose. In order to refer to elements of the calendaring and scheduling model, core object or interoperability protocol defined in [ICMS], [ICAL] and [ITIP] some formatting conventions have been used.

Calendar roll and scheduling roles defined by [ICMS] are referred to in quoted-strings of text with the first character of each word in upper case. For example, "Organizer" refers to a role of a "Calendar User" within the scheduling protocol defined by [ITIP].

Calendar components defined by [ICAL] are referred to with capitalized, quoted-strings of text. All calendar components start with the letter "V". For example, "VEVENT" refers to the event calendar component, "VTODD" refers to the to-do calendar component and "VJOURNAL" refers to the daily journal calendar component.

Scheduling methods defined by [ITIP] are referred to with capitalized, quoted-strings of text. For example, "REQUEST" refers to the method for requesting a scheduling calendar component be created.
or modified, "REPLY" refers to the method a recipient of a request uses to update their status with the "Organizer" of the calendar component.

Properties defined by [ICAL] are referred to with capitalized, quoted-strings of text, followed by the word "property". For example, "ATTENDEE" property refers to the iCalendar property used to convey the calendar address of a calendar user.

Property parameters defined by [ICAL] are referred to with lower case, quoted-strings of text, followed by the word "parameter". For example, "VALUE" parameter refers to the iCalendar property parameter used to override the default data type for a property value.

1.3 Terminology

The email terms used in this memo are defined in [RFC-822] and [RFC-2045]. The calendaring and scheduling terms used in this memo are defined in [ICMS], [ICAL] and [ITIP]

2 MIME Message Format Binding

This section defines the message binding to the MIME electronic mail transport.

The sections below refer to the "originator" and the "respondent" of an iMIP message. Typically, the originator is the owner or organizer of an event. The respondent is an attendee of the event.

In a well-organized email message the Reply-To header contains the email address of the originator or respondent of an event. However, this cannot be guaranteed as Mail User Agents (MUA) are not required to enforce iMIP semantics.

2.1 MIME Media Type

A MIME entity containing content information formatted according to this design document will be referenced as a "text/calendar" content type. It is assumed that this content type will be transported through a MIME electronic mail transport.

2.2 Security

This section addresses several aspects of security including Authentication, Authorization and Confidentiality. Authentication and confidentiality can be achieved using RFC 1847 which specifies the Security Multipart for MIME. This framework defines new content types and subtypes of multipart: signed and encrypted. Each contains
two body parts: one for the protected data and another for the control information necessary to remove the protection.

2.2.1 Authorization

Per the [ICSM], only the organizer has authorization to modify or cancel calendar entries they organize. That is, spoof@xyz.com should not be able to modify or cancel a meeting that was organized by a@xyz.com. Furthermore, only the respondent has the authorization to indicate their status to the organizer. That is, spoof@xyz.com should not be able to tell the organizer that b@xyz.com declines a meeting invitation.

[Editors note: this does not address issues around a calendar user assigning someone else as a delegate to accept or decline meetings on their behalf. For example, suppose an event invitation is sent to Joe (joe@x.com). Mary (mary@x.com), Joe's administrative assistant, accepts the meeting on Joe's behalf. How is this handled in the iTIP realm? Should the "From:" and/or "Reply-To" fields contain joe@x.com or mary@x.com? How is the organizer of the meeting to know that Mary can accept meetings on Joe's behalf?]

Hence, iMIP implementations must verify the authenticity of the sender of an iCalendar object before taking any action. This could be done by utilizing a Multipart/signed implementation of either PGP/MIME or S/MIME.

[Editors note: this needs further clarification. How do you do this? The certificate owner must be somehow correlated to the organizer or the respondent. How is this done?]

2.2.2 Authentication

Authentication can be performed using an implementation of RFC 1847 Multipart/signed that supports public/private key certificates. However, since most MUAs provide for the forwarding of messages, the organizer of an event and the sender of the message may be different. Therefore authentication may not be possible.

2.2.3 Confidentiality

To ensure confidentiality using iMIP implementations should utilize RFC 1847 compliant encryption. The protocol does not restrict a CUA from forwarding Requests or Responses to other users or agents.

2.3 RFC 822 Addresses
The calendar address specified within the "ATTENDEE" property in an iCalendar object MUST be a fully qualified, RFC 822 address for the corresponding "Owner", "Organizer" or "Attendee" of the "VEVENT" or "VTODO". The address MUST be the RFC 822 address for the calendaring and scheduling mailbox for the attendee.

For purposes of authentication and authorization the RFC 822 "Sender" and "Reply-to" value MUST be the same as the address value for the "Organizer". Because [ITIP] does not preclude "Attendees" from forwarding "VEVENTS" or "VTODOS" to others, the RFC-822 "Sender" value may not equal that of the organizer. In these cases, authentication cannot be verified. Additionally, the "Organizer" cannot be inferred by the RFC-822 "Sender" or "Reply-to" values.

Instead, it MUST be derived by opening the proper text/calendar MIME body part.

2.4 Content Type

A MIME body part containing content information that conforms to this design document MUST have a Content-Type value of "text/calendar". The content type header field MUST also include the type parameter "method". The parameter value MUST be one of the message types defined by this method. The value MUST also be the same as the value of the METHOD calendar property within the iCalendar object. This means that if a MIME message containing multiple iCalendar objects with different method values, then they must be further encapsulated with a "multipart/mixed" MIME entity. This will allow each of the iCalendar objects to be encapsulated within their own "text/calendar" MIME entity.

The Content-Type CHARSET parameter MUST appear in any MIME entity encapsulating an iCalendar object conforming to this design document. The CHARSET parameter value MUST be "UTF-8" or some other valid character set. The reason for this is that in [iCal] the default character set is UTF-8.

The optional Content-Type COMPONENT parameter defines the iCalendar component type contained within the iCalendar object.

The following is an example of this header field with a value that indicates an event request message.

```
Content-Type:text/calendar; method=request; charset=UTF-8; component=vevent
```

The "text/calendar" content type allows for the scheduling message type to be included in a MIME message with other content information (i.e., multipart/mixed) or included in a MIME message with a clear-text, human-readable form of the scheduling message (i.e.,
multipart/alternative).

In order to permit the information in the scheduling message to be understood by MIME user agents (UA) that do not support the text/calendar content type, scheduling messages should be sent with an alternative, human-readable form of the information.

2.5 Content-Transfer-Encoding

Note that the default character set for iCalendar objects is UTF-8 and a transfer encoding may be required.

Content-Transfer-Encoding: quoted-printable

2.6 Content-Description

The Content-Description header is optional.

3 Examples

In the examples below, the iCalendar object does not specify a character set, it is assumed to be UTF-8. Quoted-printable has been used to keep the message human readable.

3.1 Single Component With An ATTACH Property

This minimal message shows how an iCalendar object references an attachment. The attachment is accessible by anyone via its URL.

From: sman@netscape.com
To: stevesil@microsoft.com
Subject: Phone Conference
Mime-Version: 1.0
Content-Type: text/calendar; method=REQUEST; charset=UTF-8
Content-Transfer-Encoding: quoted-printable

BEGIN:VCALENDAR
PRODID:-//ACME/DesktopCalendar//EN
METHOD:REQUEST
VERSION:2.0
BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:sman@netscape.com
ATTENDEE;RSVP=YES;EXPECT=REQUEST:stevesil@microsoft.com
DTSTAMP:19970611T190000Z
DTSTART:19970701T100000-0700
DTEND:19970701T103000-0700
SUMMARY:Phone Conference
DESCRIPTION:Please review the attached document.
UID:www.acme.com-873970198738777
SEQUENCE:0
STATUS:CONFIRMED
END:VEVENT
END:VCALENDAR

3.2 Single Component With An ATTACH Property and Inline Attachment

This example shows how a message containing an iCalendar object references an attached document. The reference is made using a Content-id (CID). Thus, the iCalendar object and the document are packaged in a multipart/related encapsulation.

From: foo1@bar.net
To: foo2@bar.net
Subject: Phone Conference
Mime-Version: 1.0
Content-Type: multipart/related; boundary="boundary-example-1";

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type=text/calendar

--boundary-example-1

Content-Type:text/calendar; method=REQUEST; charset=UTF-8
Content-Transfer-Encoding: quoted-printable
Content-Disposition: attachment; filename="event.vcs"

BEGIN:VCALENDAR
PRODID:-//ACME/DesktopCalendar//EN
METHOD:REQUEST
VERSION:2.0
BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:foo1@bar.net
ATTENDEE;RSVP=YES;EXPECT=REQUEST;
  TYPE=INDIVIDUAL:foo2@bar.net
DTSTAMP:19970611T190000Z
DTSTART:19970701T100000-0700
DTEND:19970701T103000-0700
SUMMARY:Phone Conference
UID:www.acme.com-873970198738777
ATTACH:cid:www.acme.com-12345aaa
SEQUENCE:0
STATUS:CONFIRMED
END:VEVENT
END:VCALENDAR
Multiple Similar Components

Multiple iCalendar components can be included in the iCalendar object when the METHOD is the same for each component.

From: foo1@bar.net
To: foo2@bar.net
Subject: Phone Conference
Mime-Version: 1.0
Content-Type: text/calendar; method=REQUEST; charset=UTF-8
Content-Transfer-Encoding: quoted-printable
Content-Disposition: attachment; filename="event.vcs"

BEGIN:VCALENDAR

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PRODID://ACME/DesktopCalendar//EN
METHOD:REQUEST
VERSION:2.0
BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:foo1@bar.net
ATTENDEE;RSVP=YES;EXPECT=REQUEST;TYPE=INDIVIDUAL:foo2@bar.net
DTSTAMP:19970611T190000Z
DTSTART:19970701T100000-0700
DTEND:19970701T103000-0700
SUMMARY:Phone Conference
DESCRIPTION:Discuss the contents of the attached document
UID:www.acme.com-873970198738777
SEQUENCE:0
STATUS:CONFIRMED
END:VEVENT

BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:foo1@bar.net
ATTENDEE;RSVP=YES;EXPECT=REQUEST;TYPE=INDIVIDUAL:foo2@bar.net
DTSTAMP:19970611T190000Z
DTSTART:19970801T100000-0700
DTEND:19970801T103000-0700
SUMMARY:Phone Conference
DESCRIPTION:Discuss the contents of the attached document
UID:www.acme.com-873970198738777

END:VCALENDAR
3.4 Multiple Mixed Components

Different component types must be encapsulated in separate iCalendar objects.

From: foo1@bar.net
To: foo2@bar.net
Subject: Phone Conference
Mime-Version: 1.0
Content-Type:multipart/mixed;boundary="--FEE3790DC7E35189CA67CE2C"

This is a multi-part message in MIME format.

---FEE3790DC7E35189CA67CE2C
Content-Type:text/calendar; method=REQUEST; charset=UTF-8
Content-Transfer-Encoding: quoted-printable
Content-Disposition: attachment; filename="event.vcs"

BEGIN:VCALENDAR
PRODID:-//ACME/DesktopCalendar//EN
METHOD:REQUEST
VERSION:2.0
BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:foo1@bar.net
DTSTAMP:19970611T190000Z
DTSTART:19970701T100000-0700
DTEND:19970701T103000-0700
SUMMARY:Phone Conference
DESCRIPTION:Discuss the contents of the attached document
UID:www.acme.com-873970198738777
SEQUENCE:0
STATUS:CONFIRMED
END:VEVENT
END:VCALENDAR

----FEE3790DC7E35189CA67CE2C
Content-Type:text/calendar; method=REQUEST; charset=UTF-8
Content-Transfer-Encoding:8bit
Content-Disposition: attachment; filename="event.vcs"

BEGIN:VCALENDAR
PRODID:-//ACME/DesktopCalendar//EN
METHOD:REQUEST
VERSION:2.0
3.5 Detailed Components With An ATTACH Property

This example shows the format of a message containing a group meeting between three individuals. The multipart/related encapsulation is used because the iCalendar object contains an ATTACH property that uses a CID to reference the attachment.

From: Steve Mansour <sman@netscape.com>
MIME-Version: 1.0
To: Steve Silverberg <stevesil@exchange.microsoft.com>,
   Frank Dawson <fdawson@earthlink.net>
Subject: REQUEST - Phone Conference
Content-Type:multipart/mixed;boundary="--FEE3790DC7E35189CA67CE2C"

This is a multi-part message in MIME format.

---FEE3790DC7E35189CA67CE2C
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Event REQUEST

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Description:
Let's discuss the attached document

Begin: July 1, 1997 10:00 PDT
End: July 1, 1997 10:30 PDT

---FEE3790DC7E35189CA67CE2C
Content-Type: multipart/related; boundary="boundary-example-2"
    type=text/calendar

--boundary-example-2
Content-Type: text/calendar; method=REQUEST; charset=UTF-8;
    Component=vevent
Content-Transfer-Encoding: quoted-printable
Content-Dispostion: attachment; filename="event.vcs"

BEGIN:VCALENDAR
PRODID:-//ACME/DesktopCalendar//EN
BEGIN:VEVENT
ATTENDEE;ROLE=OWNER;STATUS=ACCEPTED:foo1@bar.net
ATTENDEE;RSVP=YES;EXPECT=REQUEST;TYPE=INDIVIDUAL:foo2@bar.net
DTSTAMP:19970611T190000Z
DTSTART:19970701T100000-0700
DTEND:19970701T103000-0700
SUMMARY:Let’s discuss the attached document
UID:www.acme.com-873970198738777
ATTACH:cid:www.acme.com-12345aaa
SEQUENCE:0
STATUS:CONFIRMED
END:VEVENT
END:VCALENDAR

--boundary-example-2
Content-Type: application/msword; name="FieldReport.doc"
Content-Transfer-Encoding: base64
Content-Disposition: inline; filename="FieldReport.doc"
Content-ID: <www.acme.com-12345aaa>

0M8R4KGxGuEAAAAAAAAAAAAAAAAAAAAPgADAP7/CQAGAAAAAAAAABAAAAARAAAAAAA
AAAAAQAQAAAAAAD+/AAAAAEUAAAD/-------------------------------------------------
etc...

--boundary-example-2--
----FEE3790DC7E35189CA67CE2C--

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4 Bibliography


[iTIP] This currently includes the following three documents that are being merged into a single iTIP document.

1. "iCalendar Transport-Independent Interoperability Protocol (iTIP) - Part 1: Scheduling Events and Busytime", Internet-


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5 Author's Address

The following address information is provided in a vCard v2.1, Electronic Business Card, format.
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

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TEL;WORK;MSG:+1-810-559-5955
TEL;WORK;FAX:+1-810-559-5034
EMAIL;INTERNET:anik@ontime.com
END:VCARD