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CalDAV Managed Attachments
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Abstract

This document defines how CalDAV servers can provide server managed collections to allow attachments associated with iCalendar data, to be stored and managed on the server.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on November 3, 2012.

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1. Introduction

The iCalendar [RFC5545] data format is used to represent calendar data and is used with iTIP [RFC5546] to handle scheduling operations between calendar users.

[RFC4791] defines the CalDAV Calendar Access protocol, based on HTTP [RFC2616], for accessing calendar data stored on a server.

Calendar users often want to include attachments with their calendar data events or tasks (for example a copy of a presentation, or the meeting agenda). iCalendar provides an "ATTACH" property whose value is either the inline Base64 encoded attachment data, or a URL specifying the location of the attachment data.

Use of inline attachment data is not ideal with CalDAV because the data would need to be uploaded to the server each time a change to the calendar data is done - even minor changes such as a change to the summary. Whilst a client could choose to use a URL value instead, the problem then becomes where and how the client discovers an appropriate URL to use and how it ensures that only those attendees listed in the event or task are able to access it.

This specification provides a solution to this problem whereby the client sends the attachment to the server separately from the iCalendar data and the server takes care of adding appropriate "ATTACH" properties in the iCalendar data as well as managing privileges . The server can also provide additional information to the client about each attachment, such as the size and an identifier, so clients can manage their list of attachments directly from the calendar data.

2. Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

The notation used in this memo is the ABNF notation of [RFC5234] as used by iCalendar [RFC5545]. Any syntax elements shown below that are not explicitly defined in this specification come from iCalendar [RFC5545].

3. Open Issues (to be removed prior to publication as a RFC)

1. Do we need a way to allow for multiple attachments to be added, updated or removed in a single POST (batching)?

2. Do we need a way for the server to indicate limits for managed attachments (individual size, total size, total number etc). Also a way for a server to indicate it does not allow inline attachments?

3. Should we say anything about servers automatically stripping inline attachments and making them managed?

4. Do we want to allow reusing of an existing ATTACH (with MTAG/ MANAGED-ID) in multiple calendar object resources (4.6)?

4. Overview

There are four main operations a client needs to do with attachments for calendar data: add, update, remove, and retrieve. The first three operations are carried out by the client issuing an HTTP POST request on the calendar object resource to which the attachment is associated and specifying the appropriate action query parameter. In the case of the remove operation, the client can alternatively directly update the calendar object resource and remove the relevant "ATTACH" properties. The retrieve operation is accomplished by simply issuing an HTTP GET request targeting the attachment URI specified by the calendar resource's ATTACH property.

iCalendar data stored in a CalDAV calendar object resource can contain multiple components when recurrences are involved. In such a situation, the client needs to be able to target a specific recurrence instance or multiple instances when adding or deleting attachments. As a result, the POST request needs to provide a way for the client to specify which recurrence instances should be targeted for the attachment operation. This is accomplished through use of additional query parameters on the POST request-URI.

4.1. Requirements

A server that supports the features described in this document is REQUIRED to support the CalDAV "calendar-access" [RFC4791] features.

In addition, such server MUST honor the "return-representation" Prefer header value [I-D.snell-http-prefer] on both HTTP PUT and POST successful requests targeting existing calendar object resources, by returning the new representation of that calendar resource (including

its new Etag header value) in the response. The same behavior is expected in the case of a successful HTTP PUT request to create a new calendar object resource.

4.2. Discovering Support for Managed Attachments

A server supporting the features described in this document MUST include "calendar-managed-attachments" as a field in the DAV response header from an OPTIONS request on a calendar home collection.

4.3. POST Request for Managing Attachments

An HTTP POST request is used to add, update, or remove attachments. The request-URI will contain various query parameters to specify the behavior.

4.3.1. action= Query Parameter

The "action" query parameter is used to identify which attachment operation the client is requesting. This parameter MUST be present once on each POST request used to manage attachments. One of these three values MUST be used:

attachment-add Indicates an operation that is adding an attachment to a calendar object resource. See Section 4.4 for more details.

attachment-update Indicates an operation that is updating an existing attachment on a calendar object resource. See Section 4.5 for more details.

attachment-remove Indicates an operation that is removing an attachment on a calendar object resource. See Section 4.6 for more details.

Example:
http://calendar.example.com/events/1.ics?action=attachment-add

4.3.2. rid= Query Parameter

The "rid" query parameter is used to identify which recurrence instances are being targeted by the client for the attachment operation. This query parameter MUST contain one or more items, separated by commas (0x2C). The item values can be in one of two forms:

Master instance The value "M" (case-insensitive) refers to the "master" recurrence instance, i.e., the component that does not include a "RECURRENCE-ID" property. This item MUST be present only once.

Specific instance A specific iCalendar instance is targeted by using its "RECURRENCE-ID" value as the item value. That value MUST correspond to the RECURRENCE-ID value as stored in the calendar object resource (i.e. without any conversion to UTC). If multiple items of this form are used, they MUST be unique values.

If the "rid" query parameter is not present, all recurrence instances in the calendar object resource are targeted.

The "rid" query parameter MUST NOT be present in the case of an update operation.

Example:
http://calendar.example.com/events/1.ics?
action=attachment-add&rid=M,20111022T160000

4.3.3. managed-id= Query Parameter

The "managed-id" query parameter is used to identify which "ATTACH" property is being updated or removed. The value of this query parameter MUST match the "MANAGED-ID" property parameter value on the "ATTACH" property in the calendar object resource instance(s) targeted by the request.

The "managed-id" query parameter MUST NOT be present in the case of an add operation.

Example:
http://calendar.example.com/events/1.ics?
action=attachment-update&managed-id=aUNhbGVuZGFy

4.4. Adding attachments

To add an attachment to an existing calendar object resource, the following occurs:

1. The client issues a POST request targeted at the calendar object resource.

   A. The request-URI will include an "action" query parameter with the value "attachment-add" (see Section 4.3.1).

B. If all recurrence instances are having an attachment added, the "rid" query parameter is not present in the request-URI. If one or more specific recurrence instances are targeted, then the request-URI will include a "rid" query parameter containing the list of instances (see Section 4.3.2).

C. The body of the request contains the data for the attachment.

D. The client MUST include a valid Content-Type HTTP header describing the media type of the attachment (as required by HTTP).

E. The client SHOULD include a Content-Disposition HTTP header [RFC6266] with a "type" parameter set to "attachment", and a "filename" parameter that indicates the name of the attachment.

2. When the server receives the POST request it does the following:

A. Validates that any recurrence instances referred to via the "rid" query parameter are valid for the calendar object resource being targeted.

B. Stores the supplied attachment data into a resource and generates an appropriate URI for clients to access the resource.

C. For each affected recurrence instance in the calendar object resource targeted by the request, the server adds an "ATTACH" property, whose value is the URI of the stored attachment. The "ATTACH" property MUST contain a "MANAGED-ID" parameter whose value is a unique identifier (within the context of the server as a whole). The "ATTACH" property MUST contain an "MTAG" parameter whose value represents the initial state of the attachment. The "ATTACH" property SHOULD contain an "FMTTYPE" parameter whose value matches the Content-Type header value from the request. The "ATTACH" property SHOULD contain an "FILENAME" parameter whose value matches the Content-Disposition header "Filename" parameter value from the request, taking into account the restrictions expressed in Section 5.2. The "ATTACH" property SHOULD include a "SIZE" parameter whose value represents the size in octets of the attachment. Note that if a specified recurrence instance does not have a matching component in the calendar object resource, then the server MUST modify the calendar object resource to include the overridden component with the appropriate "RECURRENCE-ID" property included.

D. Upon successful creation of the attachment resource and modification of the targeted calendar object resource, the server MUST return a 201 HTTP status response and include a "Cal-Managed-ID" HTTP header containing the MANAGED-ID parameter value of the newly created "ATTACH" property. The client can use the "Cal-Managed-ID" header value to correlate the attachment with "ATTACH" properties added to the calendar object resource. It is expected that the client will immediately reload the calendar object resource to refresh any local cache.

In the following example, the client adds a new attachment to a non recurring event and asks the server (via the Prefer [I-D.snell-http-prefer] HTTP header) to return the updated version of that event in the response.

>> Request <<

```
POST /events/64.ics?action=attachment-add HTTP/1.1
Host: cal.example.com
Content-Type: text/html; charset="utf-8"
Content-Disposition:attachment;filename=agenda.html
Content-Length: xxxx
Prefer: return-representation

<html>
  <body>
    <h1>Agenda</h1>
  </body>
</html
```

```
>> Response <<


HTTP/1.1 201 Created
Content-Type: text/calendar charset="utf-8"
Content-Length: yyyy
Content-Location: http://cal.example.com/events/64.ics
ETag: "123456789-000-111"
Cal-Managed-ID: 97S

BEGIN:VCALENDAR
VERSION:2.0
PRODID:-//Example Corp.//CalDAV Server//EN
BEGIN:VEVENT
UID:20010712T182145Z-123401@example.com
DTSTAMP:20120201T203412Z
DTSTART:20120714T170000Z
DTEND:20120715T040000Z
SUMMARY:One-off meeting
ATTACH;MANAGED-ID=97S;MTAG=987654321-555-441;FMT-TYPE=text/html;
 SIZE=xxxx;
 FILENAME=agenda.html:https://cal.example.com/attach/64/34X22R
END:VEVENT
END:VCALENDAR
```

4.5. Updating Attachments

To change the data of an existing managed attachment in a calendar object resource, the following occurs:

1. The client issues a POST request targeted at the calendar object resource.

    A. The request-URI will include an "action" query parameter with the value "attachment-update" (see Section 4.3.1).

    B. The request-URI will include an "managed-id" query parameter with the value matching that of the "MANAGED-ID" property parameter for the "ATTACH" property being updated (see Section 4.3.3).

    C. The body of the request contains the updated data for the attachment.

    D. The client MUST include a valid Content-Type header describing the media type of the attachment (as required by HTTP).

E. The client SHOULD include a Content-Disposition header [RFC6266] with a "type" parameter set to "attachment", and a "filename" parameter that indicates the name of the attachment.

2. When the server receives the POST request it does the following:

A. Validates that the "managed-id" query parameter is valid for the calendar object resource.

B. Updates the content of the attachment resource corresponding to that managed-id with the supplied attachment data.

C. For each affected recurrence instance in the calendar object resource targeted by the request, the server updates the "ATTACH" property whose "MANAGED-ID" property parameter value matches the "managed-id" query parameter. The "ATTACH" property value (attachment URI) MUST remain the same. The "ATTACH" property MUST contain an "MTAG" parameter whose value represents the new state of the attachment. The "ATTACH" property SHOULD contain an "FMTTYPE" parameter whose value matches the Content-Type header value from the request - this could differ from the original value if the media type of the updated attachment is different. The "ATTACH" property SHOULD contain an "FILENAME" parameter whose value matches the Content-Disposition header "Filename" parameter value from the request, taking into account the restrictions expressed in Section 5.2. The "ATTACH" property SHOULD include a "SIZE" parameter whose value represents the size in octets of the updated attachment.

D. Upon successful update of the attachment resource and modification of the targeted calendar object resource, the server MUST return a 200 HTTP status response. It is expected that the client will immediately reload the calendar object resource to refresh any local cache.

The update operation does not take an "rid" parameter and does not add, nor remove, any "ATTACH" property in the targetted calendar object resource. To link an existing attachment to a new instance, the client simply does a PUT on the calendar object resource, adding an "ATTACH" property with the correct "MANAGED-ID" and URI value to that instance (see Section 4.7).

In the following example, the client updates an existing attachment and asks the server (via the Prefer [I-D.snell-http-prefer] HTTP header) to return the updated version of that event in the response.

```
   >> Request <<


   POST /events/64.ics?action=attachment-update&managed-id=97S HTTP/1.1
   Host: cal.example.com
   Content-Type: text/html; charset="utf-8"
   Content-Disposition:attachment;filename=agenda.html
   Content-Length: xxxx
   Prefer: return-representation

   <html>
     <body>
       <h1>Agenda</h1>
       <p>Discuss attachment draft</p>
     </body>
   </html



   >> Response <<


   HTTP/1.1 200 OK
   Content-Type: text/calendar charset="utf-8"
   Content-Length: yyyz
   Content-Location: http://cal.example.com/events/64.ics
   ETag: "123456789-000-222"

   BEGIN:VCALENDAR
   VERSION:2.0
   PRODID:-//Example Corp.//CalDAV Server//EN
   BEGIN:VEVENT
   UID:20010712T182145Z-123401@example.com
   DTSTAMP:20120201T203412Z
   DTSTART:20120714T170000Z
   DTEND:20120715T040000Z
   SUMMARY:One-off meeting
   ATTACH;MANAGED-ID=97S;MTAG=987654321-555-666;FMT-TYPE=text/html;
    SIZE=xxxy;
    FILENAME=agenda.html:https://cal.example.com/attach/64/34X22R
   END:VEVENT
   END:VCALENDAR
```

4.6. Removing Attachments via POST

To remove an existing attachment from a calendar object, the following occurs:

1. The client issues a POST request targeted at the calendar object resource.

   A. The request-URI will include an "action" query parameter with the value "attachment-remove" (see Section 4.3.1).

   B. If all recurrence instances are having an attachment removed, the "rid" query parameter is not present in the request-URI. If one or more specific recurrence instances are targeted, then the request-URI will include a "rid" query parameter containing the list of instances (see Section 4.3.2).

   C. The request-URI will include a "managed-id" query parameter with the value matching that of the "MANAGED-ID" property parameter for the "ATTACH" property being removed (see Section 4.3.3).

   D. The body of the request will be empty.

2. When the server receives the POST request it does the following:

   A. Validates that any recurrence instances referred to via the "rid" query parameter are valid for the calendar object resource being targeted.

   B. Validates that the "managed-id" query parameter is valid for the calendar object resource and specific instances being targeted.

   C. For each affected recurrence instance in the calendar object resource targeted by the request, the server removes the matching "ATTACH" property. Note that if a specified recurrence instance does not have a matching component in the calendar object resource, then the server MUST modify the calendar object resource to include the overridden component with the appropriate "RECURRENCE-ID" property included, and the matching "ATTACH" property removed. This later case is actually valid only if the master component does include the referenced "ATTACH" property.

   D. If the attachment resource is no longer referenced by any instance of the calendar object resource, the server MUST delete the attachment resource.

E. Upon successful removal of the attachment resource and modification of the targeted calendar object resource, the server MUST return a 200 HTTP status response. It is expected that the client will immediately reload the calendar object resource to refresh any local cache.

In the following example, the client deletes an existing attachment by passing its managed-id in the request. The Prefer [I-D.snell-http-prefer] HTTP header is not set in the request so the calendar resource is not returned in the response.

```
>> Request <<

POST /events/64.ics?action=attachment-remove&managed-id=97S HTTP/1.1
Host: cal.example.com
Content-Length: 0

>> Response <<

HTTP/1.1 200 No Content
Content-Length: 0
```

4.7. Adding Existing Managed Attachments via PUT

Clients can make use of existing managed attachments by adding the corresponding "ATTACH" property to calendar object resources (subject to the restrictions described in Section 4.11.2).

4.8. Updating Attachments via PUT

Servers MUST NOT allow clients to update attachment data directly via a PUT on the attachment URI (or via any other HTTP method that modifies content).

4.9. Removing Attachments via PUT

Clients can remove attachments by simply re-writing the calendar object resource data to remove the appropriate "ATTACH" properties.

4.10. Retrieving Attachments

Clients retrieve attachments by simply issuing an HTTP GET request using the value of the corresponding "ATTACH" property as the request-URI, taking into account the substitution mechanism associated with the "CALDAV:managed-attachments-server-URL" property (see Section 7.1).

4.11. Additional Considerations

4.11.1. Error Handling

TODO: error codes for each request.

4.11.2. Access Control

TODO: talk about authentication for attachment URIs, access limited to attendees only, or token based, only organizer able to re-use "ATTACH" properties.

4.11.3. Redirects

For POST requests that add or update attachment data, the server MAY issue an HTTP redirect to require the client to re-issue the POST request using a different request-URI. As a result, it is always best for clients to use the "100 Continue" behavior defined in Section 8.2.3 of [RFC2616]. Using this mechanism ensures that, if a redirect does occur, the client does not needlessly send the attachment data.

When servers do redirect clients to a different request-URI, they SHOULD ensure that the authentication/authorization for the redirected URI falls within the same domain realm as that of the original URI, so that the client can re-use credentials without having to prompt the user.

4.11.4. Automatic Clean-up by servers

Servers MAY automatically remove attachment data as appropriate, for example to regain the storage taken by unused attachments, or as the result of a virus scanning. When doing so they SHOULD NOT modify calendar data referencing those attachments. Instead they SHOULD return a 410 HTTP status response to any request on the removed attachment URI.

4.11.5. Sending Scheduling Messages with Attachments

When a managed attachment is added, updated or removed from a calendar object resource, the server MUST ensure that a scheduling message is sent to update any Attendees with the changes, as per [I-D.desruisseaux-caldav-sched].

4.11.6. Attendees managing Attachments

TODO: how do we do this? Organizer adds a property to calendar data to say attendees can add attachments, but how does scheduling happen?

4.11.7. Other Client Considerations

Clients can expect servers to take a while to respond to POST requests that include large attachment bodies. Servers SHOULD use the "100 Continue" behavior defined in Section 8.2.3 of [RFC2616] to keep the client connection alive if the response will take some time.

When exporting calendar data from a CalDAV server supporting managed attachments, clients SHOULD remove all "MANAGED-ID" property parameters from "ATTACH" properties in the calendar data. Similarly when importing calendar data from another source, clients SHOULD remove any "MANAGED-ID" property parameters on "ATTACH" properties (failure to do so will likely result in the server removing those properties automatically).

5. Modifications to iCalendar Syntax

5.1. SIZE Property Parameter

Parameter Name: SIZE

Purpose: To specify the size of an attachment.

Format Definition: This property parameter is defined by the following notation:

```
sizeparam = "SIZE" "=" paramtext
; positive integers
```

Description: This property parameter MAY be specified on "ATTACH" properties. It indicates the size in octets of the corresponding attachment data. Since iCalendar integer values are restricted to a maximum value of 2147483647, the current parameter is defined as text to allow an extended range to be used.

Example:

```
ATTACH;SIZE=1234:http://attachments.example.com/abcd.txt
```

5.2. FILENAME Property Parameter

Parameter Name: FILENAME

Purpose: To specify the file name of a managed attachment.

Format Definition: This property parameter is defined by the following notation:

```
filenameparam = "FILENAME" "=" paramtext
```

Description: This property parameter MAY be specified on "ATTACH" properties corresponding to managed attachments. Its value provides information on how to construct a filename for storing the attachment data. This parameter is very similar in nature to the Content-Disposition HTTP header "filename" parameter and exposes the same security risks. As a consequence, clients MUST follow the guidelines expressed in Section 4.3 of [RFC6266] when consuming this parameter value. Similarly, servers MUST follow those same guidelines before storing a value.

Example:

```
ATTACH;FILENAME=agenda.html:http://attachments.example.c
 om/rt452S
```

5.3. MANAGED-ID Property Parameter

Parameter Name: MANAGED-ID

Purpose: To uniquely identify a managed attachment.

Format Definition: This property parameter is defined by the following notation:

```
managedidparam = "MANAGED-ID" "=" paramtext
```

Description: This property parameter MUST be specified on "ATTACH" properties corresponding to managed attachments. Its value is generated by the server and uniquely identifies a managed attachment. This property parameter MUST NOT be present in the case of non managed attachments.

Example:

```
ATTACH;MANAGED-ID=aUNhbGVuZGFy:http://attachments.example.c
 om/abcd.txt
```

5.4. MTAG Property Parameter

Parameter Name: MTAG

Purpose: To track changes made to a managed attachment.

Format Definition: This property parameter is defined by the following notation:

```
mtagparam = "MTAG" "=" paramtext
```

Description: This property parameter MUST be specified on "ATTACH" properties corresponding to managed attachments. Its value is an opaque token, that represents the state of the attachment resource at a given point in time. It MUST be unique across all versions of a given resource. Servers MUST change the MTAG value whenever an attachment resource content is modified, thus allowing clients to use it as a change token. This property parameter MUST NOT be present in the case of non managed attachments.

Example:

```
ATTACH;MTOKEN=12C:http://attachments.example.c
 om/abcd.txt
```

6. Additional Message Header Fields

6.1. Cal-Managed-ID Response Header

The Cal-Managed-ID response header provides the value of the MANAGED-ID parameter corresponding to a newly added ATTACH property. It MUST be sent only in response to a successful POST request with an action set to attachment-add.

```
    Cal-Managed-ID = "Cal-Managed-ID" ":" paramtext
    ; "paramtext" is defined in Section 3.1 of [RFC5545]
```

Example:

```
Cal-Managed-ID:aUNhbGVuZGFy
```

7. Additional WebDAV properties

7.1. CALDAV:managed-attachments-server-URL property

Name: managed-attachments-server-URL

Namespace: urn:ietf:params:xml:ns:caldav

Purpose: Specifies the server base URI to use when retrieving managed attachments.

Protected: This property MUST be protected as only the server can update the value.

COPY/MOVE behavior: This property is only defined on a calendar home collection which cannot be moved or copied.

Description: This property MAY be defined on a calendar home collection. If present, it contains zero or one DAV:href XML elements.

When one DAV:href element is present, its value MUST be an absolute HTTP URI containing only the scheme (i.e. "https") and authority (i.e. host and port) parts . Whenever a managed attachment is to be retrieved via an HTTP GET, the client MUST construct the actual URL of the attachment by substituting the scheme and authority parts of the attachment URI (as stored in the iCalendar ATTACH property) with the present WebDAV property value.

When no DAV:href element is present, the client MUST substitute the scheme and authority parts of the attachment URI with the scheme and authority part of the calendar home collection absolute URI.

In the absence of this property, the client can consider the attachment URI as its actual URL.

Definition:

```
<!ELEMENT managed-attachments-server-URL (DAV:href?)>
```

Example:

```
<C:managed-attachments-server-URL xmlns:D="DAV:"
    xmlns:C="urn:ietf:params:xml:ns:caldav">
  <D:href>https://attachstore.example.com</D:href>
</C:managed-attachments-server-URL>
```

8. Security Considerations

TODO:servers need to enforce quotas, attachments could contain malicious content (virus checking could be done)

9. IANA Considerations

9.1. Parameter Registrations

This documents defines the following new iCalendar property parameters to be added to the registry defined in Section 8.2.3 of [RFC5545]:

Property Parameter	Status	Reference
FILENAME	Current	RFCXXXX, Section 5.2
MTAG	Current	RFCXXXX, Section 5.4
SIZE	Current	RFCXXXX, Section 5.1
MANAGED-ID	Current	RFCXXXX, Section 5.3

9.2. Message Header Field Registrations

The message header fields below should be added to the Permanent Message Header Field Registry (see [RFC3864]).

9.2.1. Cal-Managed-ID

Header field name: Cal-Managed-ID

Applicable protocol: http

Status: standard

Author/Change controller: IETF

Specification document(s): this specification (Section 6.1)

Related information: none

10. Acknowledgments

This specification came about via discussions at the Calendaring and Scheduling Consortium.

11. References

11.1. Normative References

[I-D.desruisseaux-caldav-sched]
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[I-D.snell-http-prefer]
Snell, J., "Prefer Header for HTTP", draft-snell-http-prefer-12 (work in progress), February 2012.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC2616] Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999.

[RFC3864] Klyne, G., Nottingham, M., and J. Mogul, "Registration Procedures for Message Header Fields", BCP 90, RFC 3864, September 2004.

[RFC4791] Daboo, C., Desruisseaux, B., and L. Dusseault, "Calendaring Extensions to WebDAV (CalDAV)", RFC 4791, March 2007.

[RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008.

[RFC5545] Desruisseaux, B., "Internet Calendaring and Scheduling Core Object Specification (iCalendar)", RFC 5545, September 2009.

[RFC6266] Reschke, J., "Use of the Content-Disposition Header Field in the Hypertext Transfer Protocol (HTTP)", RFC 6266, June 2011.

11.2. Informative References

[RFC5546] Daboo, C., "iCalendar Transport-Independent Interoperability Protocol (iTIP)", RFC 5546, December 2009.

Appendix A. Change History (To be removed by RFC Editor before publication)

Changes in -01:

1. Tweaked OPTIONS capability wording.

2. Added section on clients expecting 100-Continue for delayed response.

3. Added text for clean-up and use of HTTP 410 on orphans.

4. Added text on removing "MANAGED-ID" when exporting/importing calendar data.

5. Added protocol examples.

6. Added MTAG property parameter on ATTACH property

7. Added FILENAME property parameter on ATTACH property

8. "id" query parameter is now "managed-id".

9. Use of Cal-Managed-ID header instead of Location header in responses.

10. rid query param MUST contain RECURRENCE-ID without any conversion to UTC (case of floating events).

11. Introduced CALDAV:managed-attachments-server-URL property

12. Made support for Prefer header a MUST for servers.

Appendix B. Example Involving Recurring Events

In the following example, the organizer of a recurring meeting adds an agenda (HTML attachment) to the corresponding calendar resource. Attendees of the meeting are granted read access to the newly created attachment resource. Their own copy of the meeting is updated to include the new ATTACH property pointing to the attachment resource and they are notified of the change via their scheduling inbox.

>> Request <<

```
POST /events/65.ics?action=attachment-add HTTP/1.1
Host: cal.example.com
Content-Type: text/html; charset="utf-8"
Content-Disposition:attachment;filename=agenda.html
Content-Length: xxxx
Prefer: return-representation

<html>
  <body>
    <h1>Agenda</h1>
    <p>As usual</p>
  </body>
</html
```

>> Response <<

```
HTTP/1.1 201 Created
Content-Type: text/calendar charset="utf-8"
Content-Length: yyyy
Content-Location: http://cal.example.com/events/65.ics
ETag: "123456789-000-111"
Cal-Managed-ID: 97S

BEGIN:VCALENDAR
VERSION:2.0
PRODID:-//Example Corp.//CalDAV Server//EN
BEGIN:VTIMEZONE
LAST-MODIFIED:20040110T032845Z
TZID:US/Eastern
BEGIN:DAYLIGHT
DTSTART:20000404T020000
RRULE:FREQ=YEARLY;BYDAY=1SU;BYMONTH=4
TZNAME:EDT
TZOFFSETFROM:-0500
TZOFFSETTO:-0400
END:DAYLIGHT
BEGIN:STANDARD
DTSTART:20001026T020000
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=10
TZNAME:EST
TZOFFSETFROM:-0400
TZOFFSETTO:-0500
END:STANDARD
END:VTIMEZONE
BEGIN:VEVENT
UID:20010712T182145Z-123401@example.com
DTSTAMP:20120201T203412Z
DTSTART;TZID=US/Eastern:20120206T100000
DURATION:PT1H
RRULE:FREQ=WEEKLY
SUMMARY:Planning Meeting
ORGANIZER:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:arnaudq@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=NEEDS-ACTION:mailto:mike@example.com
ATTACH;MANAGED-ID=97S;MTAG=987654321-555-441;FMT-TYPE=text/html;
 SIZE=xxxx;
 FILENAME=agenda.html:https://cal.example.com/attach/65/34X22R
END:VEVENT
END:VCALENDAR
```

The organizer has a more specific agenda for the 20th of February meeting. It is added to that particular instance of the meeting by specifying the rid parameter.

>> Request <<

```
POST /events/65.ics?action=attachment-add&rid=20120220T100000 HTTP/1.1
Host: cal.example.com
Content-Type: text/html; charset="utf-8"
Content-Disposition:attachment;filename=agenda0220.html
Content-Length: xxxx
Prefer: return-representation

<html>
  <body>
    <h1>Agenda</h1>
    <p>Something different, for a change</p>
  </body>
</html
```

>> Response <<

```
HTTP/1.1 201 Created
Content-Type: text/calendar charset="utf-8"
Content-Length: yyyy
Content-Location: http://cal.example.com/events/65.ics
ETag: "123456789-000-222"
Cal-Managed-ID: 33225

BEGIN:VCALENDAR
VERSION:2.0
PRODID:-//Example Corp.//CalDAV Server//EN
BEGIN:VTIMEZONE
LAST-MODIFIED:20040110T032845Z
TZID:US/Eastern
BEGIN:DAYLIGHT
DTSTART:20000404T020000
RRULE:FREQ=YEARLY;BYDAY=1SU;BYMONTH=4
TZNAME:EDT
TZOFFSETFROM:-0500
TZOFFSETTO:-0400
END:DAYLIGHT
BEGIN:STANDARD
DTSTART:20001026T020000
```

```
RRULE:FREQ=YEARLY;BYDAY=-1SU;BYMONTH=10
TZNAME:EST
TZOFFSETFROM:-0400
TZOFFSETTO:-0500
END:STANDARD
END:VTIMEZONE
BEGIN:VEVENT
UID:20010712T182145Z-123401@example.com
DTSTAMP:20120201T203412Z
DTSTART;TZID=US/Eastern:20120206T100000
DURATION:PT1H
RRULE:FREQ=WEEKLY
SUMMARY:Planning Meeting
ORGANIZER:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:arnaudq@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=NEEDS-ACTION:mailto:mike@example.com
ATTACH;MANAGED-ID=97S;MTAG=987654321-555-441;FMT-TYPE=text/html;
 SIZE=xxxx;
 FILENAME=agenda.html:https://cal.example.com/attach/65/34X22R
END:VEVENT
BEGIN:VEVENT
UID:20010712T182145Z-123401@example.com
RECURRENCE-ID;TZID=US/Eastern:20120220T100000
DTSTAMP:20120201T203412Z
DTSTART;TZID=US/Eastern:20120220T100000
DURATION:PT1H
SUMMARY:Planning Meeting
ORGANIZER:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:cyrus@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=ACCEPTED:mailto:arnaudq@example.com
ATTENDEE;CUTYPE=INDIVIDUAL;PARTSTAT=NEEDS-ACTION:mailto:mike@example.com
ATTACH;MANAGED-ID=33225;MTAG=987654321-555-263;FMT-TYPE=text/html;
 SIZE=xxxx;
 FILENAME=agenda0220.html:https://cal.example.com/attach/65/FGZ225
END:VEVENT
END:VCALENDAR
```

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