Using POST to add Members to Web Distributed Authoring and Versioning (WebDAV) Collections
draft-reschke-webdav-post-08

Abstract

The Hypertext Transfer Protocol (HTTP) Extensions for the Web Distributed Authoring and Versioning (WebDAV) do not define the behavior for the "POST" method when applied to collections, as the base specification (HTTP) leaves implementers lots of freedom for the semantics of "POST".
This has led to a situation where many WebDAV servers do not implement POST for collections at all, although it is well suited to be used for the purpose of adding new members to a collection, where the server remains in control of the newly assigned URL. In fact, the Atom Publishing Protocol (AtomPub) uses POST exactly for that purpose. On the other hand, WebDAV-based protocols such as the Calendar Extensions to WebDAV (CalDAV) frequently require clients to pick a unique URL, although the server could easily perform that task.
This specification defines a discovery mechanism through which servers can advertise support for POST requests with the aforementioned "add collection member" semantics.

Editorial Note (To be removed by RFC Editor before publication)

Please send comments to the Distributed Authoring and Versioning (WebDAV) working group at mailto:w3c-dist-auth@w3.org, which may be joined by sending a message with subject "subscribe" to mailto:w3c-dist-auth-request@w3.org. Discussions of the WEBDAV working group are archived at http://lists.w3.org/Archives/Public/w3c-dist-auth/.
Note that although discussion takes place on the WebDAV working group's mailing list, this is not a working group document.
XML versions, latest edits and the issues list for this document are available from http://greenbytes.de/tech/webdav/#draft-reschke-webdav-post.

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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1. Introduction   [TOC](#)

The Hypertext Transfer Protocol (HTTP) Extensions for the Web
Distributed Authoring and Versioning (WebDAV) ([[RFC4918] (Dusseault,
L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning
(WebDAV)," June 2007.)](#), Section 9.5) do not define the behavior for the
"POST" method when applied to collections, as the base specification
(HTTP) leaves implementers lots of freedom for the semantics of "POST":

> 9.5 POST for Collections
>
> Since by definition the actual function performed by POST is
> determined by the server and often depends on the particular
> resource, the behavior of POST when applied to collections cannot be
> meaningfully modified because it is largely undefined. Thus, the
> semantics of POST are unmodified when applied to a collection.

This has led to a situation where many WebDAV servers do not implement
POST for collections at all, although it is well suited to be used for
the purpose of adding new members to a collection, where the server
remains in control of the newly assigned URL. In fact, the Atom
Publishing Protocol (AtomPub) uses POST exactly for that purpose
([[RFC5023] (Gregorio, J. and B. de hOra, "The Atom Publishing
Protocol," October 2007.)](#), Section 9.2):

> 9.2 Creating Resources with POST
>
> To add members to a Collection, clients send POST requests to the
> URI of the Collection.

On the other hand, WebDAV-based protocols such as Calendaring
Extensions to WebDAV (CalDAV) frequently require clients to pick a
unique URL, although the server could easily perform that task

([RFC4791] (Daboo, C., Desruisseaux, B., and L. Dusseault, "Calendaring Extensions to WebDAV (CalDAV)," March 2007.), Section 5.3.2):

> 5.3.2 Creating Calendar Object Resources
>
> ...
>
> When servers create new resources, it's not hard for the server to choose an unmapped URI. It's slightly tougher for clients, because a client might not want to examine all resources in the collection and might not want to lock the entire collection to ensure that a new resource isn't created with a name collision. (...)

Letting the server choose the member URI not only is a simplification for certain types of clients, but can also reduce the complexity of the server (in that it doesn't need to persist an additional client-supplied identifier where it already has an internal one like a UUID or a primary key).

> Note: the vCard Extensions to WebDAV (CardDAV) ([draft-ietf-vcarddav-carddav] (Daboo, C., "vCard Extensions to WebDAV (CardDAV)," November 2009.)) suffer from the same issue, and may be able to take advantage of this specification.

This specification defines a discovery mechanism through which servers can advertise support for POST requests with the aforementioned "add collection member" semantics.
This specification deliberately only adresses the use case of creating new non-collection resources, and that it was not a goal to supply the same functionality for creating collection resources (MKCOL), or for other operations that require the client to specify a new URL (LOCK, MOVE, or COPY).

> Note: the author previously proposed a new HTTP method for exactly this purpose ([draft-reschke-http-addmember] (Reschke, J., "The HTTP ADDMEMBER Method," February 2005.)), but quite a few reviewers pointed out that this would duplicate the original semantics of POST. Thus this proposal that avoids adding a new HTTP method is made.

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2. Terminology

The terminology used here follows that in the WebDAV specification ([RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.)).

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119] (Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels," March 1997.).

This document uses XML DTD fragments ([XML] (Bray, T., Paoli, J., Sperberg-McQueen, C., Maler, E., and F. Yergeau, "Extensible Markup Language (XML) 1.0 (Fifth Edition)," November 2008.)) as a purely notational convention. In particular:

   *Element ordering is irrelevant.

   *Extension elements/attributes (elements/attributes not already
    defined as valid child elements) may be added anywhere, except
    when explicitly stated otherwise.

> Note: this specification defines new properties and precondition
> names in the "DAV:" namespace, which the WebDAV specification
> reserves for use by the IETF ([RFC4918] (Dusseault, L., Ed., "HTTP
> Extensions for Web Distributed Authoring and Versioning (WebDAV),"
> June 2007.), Section 21.1). However, there was rough consensus in
> the WebDAV community that the specification is of general
> applicability to other WebDAV related standards efforts, and thus
> deserves inclusion into the base namespace.

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3. Protocol Extension

Due to the reasons stated in Section 1 (Introduction), clients can not rely on a specific server behavior when POST is applied to a collection. This problem is addressed by this specification by allowing servers to advertise a URI that has the desired "add member" semantics. Servers that already use POST for a different purpose can just expose a separate URI. Other servers can just advertise the collection's own URI, thus avoiding minting another URI for a limited purpose.

3.1. Definition of 'Add-Member' URI

The "Add-Member" URI of a WebDAV collection is a URI that will accept HTTP POST requests, and will interpret these as requests to store the enclosed entity as a new internal member of the collection (see Section 3 of [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.) for the definition of "internal member"). It MUST identify a resource on the

same server as the WebDAV collection (the host and port components
([RFC2616] (Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter,
L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol --
HTTP/1.1," June 1999.), Section 3.2.2) of the URIs must match).
If there are pre-conditions related to creating a resource in the
collection using a PUT request, then those same pre-conditions apply to
the new POST request behavior, and the same HTTP response body will be
returned on failure.
The URI of the newly created resource is returned in the HTTP Location
response header field ([RFC2616] (Fielding, R., Gettys, J., Mogul, J.,
Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext
Transfer Protocol -- HTTP/1.1," June 1999.), Section 14.30).

> Note: the fact that a server advertises an "Add-Member" URI does not
> imply any special semantics of the collection itself. For instance,
> member URIs assigned by the server are not necessarily unique over
> time (a member URI may be assigned again to a new resource when it
> previously was removed).
>
> Note: the "Add-Member" URI can be identical to the collection's URI
> (in which case the server just advertises the fact that POST to the
> WebDAV collection's URI is supported as defined within this
> specification). But it can also be different from it, in which case
> it doesn't need to have any relation to the collection's URI.
>
> Given a collection URI of
>
>   /docs/collection/
>
>
> any of the URIs below might occur as "Add-Member" URIs:
>
>   /docs/collection/
>   /docs/collection/;post
>   /docs/collection;post/
>   /docs/collection/&post
>   /post-service?path=/collection/
>
>
> The remainder of the document uses the same format just for reasons
> of consistency; any other HTTP URI on the same server would do as
> well.

3.2. Discovery

3.2.1. DAV:add-member Property (protected)

DAV:add-member is a protected property (see [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 15) defined on WebDAV collections, and contains the "Add-Member" URI for that collection (embedded inside a DAV:href element).

```
<!ELEMENT add-member (href)>
<!-- href: defined in [RFC4918], Section 14.7 -->
```

A PROPFIND/allprop request SHOULD NOT return this property (see [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 9.1). Servers MUST implement the DAV:supported-live-property-set property defined in Section 3.1.4 of [RFC3253] (Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV," March 2002.), and report the property DAV:add-member as a supported live property.

3.2.2. Example

>>Request

```
PROPFIND /collection/ HTTP/1.1
Host: example.com
Content-Type: application/xml; charset="utf-8"
Content-Length: 118

<?xml version="1.0" encoding="utf-8" ?>
<propfind xmlns="DAV:">
  <prop>
    <add-member/>
  </prop>
</propfind>
```

>>Response

```
HTTP/1.1 207 Multi-Status
Content-Type: application/xml; charset="utf-8"
Content-Length: 340

<?xml version="1.0" encoding="utf-8" ?>
<multistatus xmlns="DAV:">
  <response>
    <href>/collection/</href>
    <propstat>
      <prop>
        <add-member>
          <href>/collection;add-member/</href>
        </add-member>
      </prop>
      <status>HTTP/1.1 200 OK</status>
    </propstat>
  </response>
</multistatus>
```

In this case, the server has minted a separate URI for the purpose of
adding new content.

3.3. Relation to AtomPub's 'Slug' Header Field

In the AtomPub protocol, clients can use the entity header field "Slug"
to suggest parts of the URI to be created (see [RFC5023] (Gregorio, J.
and B. de hOra, "The Atom Publishing Protocol," October 2007.), Section
9.7). Note that servers are free to ignore this suggestion, or to use
whatever algorithm that makes sense to generate the new URI.
The same applies to the extension defined here: clients can use the
"Slug" header field, as by definition it is a generic HTTP header
field. Servers should process it exactly in the way defined by AtomPub.

3.4. Example Operation

>>Request

```
    POST /collection;add-member/ HTTP/1.1
    Host: example.com
    Content-Type: text/plain
    Slug: Sample Title
    Content-Length: 12

    Sample text.

>>Response

    HTTP/1.1 201 Created
    Location: http://example.com/collection/sample%20title
```

4. Additional Semantics for existing Methods

One important use case for this specification are collections that act
as WebDAV collections for the purpose of read access (PROPFIND Depth 1/
Infinity), but which only support internal member URIs assigned by the
server. These collections will not allow a client to create a new
member using methods like PUT, MKCOL, LOCK, COPY or MOVE. Therefore,
this specification defines a new precondition name ([RFC4918]
(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and
Versioning (WebDAV)," June 2007.), Section 16) that can be used to
provide the client with additional information about why exactly the
request failed.

> Note: although the precondition defined below can be used for
> methods other than PUT, the "Add-Member" mechanism defined by this
> specification deliberately is restricted to PUT.

4.1. Additional Preconditions

(DAV:allow-client-defined-URI): the server allows clients to specify
the last path segment for newly created resources.
The precondition element MAY contain an add-member-uri XML element
specifying the "Add-Member" URI associated with the collection, on
which the creation of a new child resource was attempted:

```
    <!ELEMENT allow-client-defined-uri (add-member?)>
```

4.2. Example: Failed PUT Request

In this example, the client tries to use PUT to create a new internal member of /collection/.
>>Request

```
    PUT /collection/new.txt HTTP/1.1
    Host: example.com
    Content-Type: text/plain
    Content-Length: 12

    Sample text.
```

>>Response

```
    HTTP/1.1 405 Method Not Allowed
    Allow: GET, HEAD, TRACE, PROPFIND, COPY, MOVE
    Content-Type: application/xml; charset=UTF-8
    Content-Length: 172

    <error xmlns="DAV:">
      <allow-client-defined-uri>
        <add-member>
          <href>/collection;add-member/</href>
        </add-member>
      </allow-client-defined-uri>
    </error>
```

The request fails with a 405 (Method Not Allowed) status, but also provides the reason, and a pointer to the "Add-Member" URI in the response body.

5. Relationship to WebDAV Access Control Protocol

The WebDAV ACL specification requires the DAV:bind privilege to be granted on a collection for the client to be able to add new collection members ([RFC3744] (Clemm, G., Reschke, J., Sedlar, E., and J. Whitehead, "Web Distributed Authoring and Versioning (WebDAV) Access Control Protocol," May 2004.), Section 3.9). Consistent with that, a server MUST reject a POST request to the Add-Member URI of a collection unless the principal executing the request is granted DAV:bind privilege on the associated WebDAV collection resource.

6. Internationalization Considerations

This document does not introduce any new internationalization considerations beyond those discussed in Section 20 of [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.).

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7. IANA Considerations

This specification does not require any actions from IANA.

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8. Security Considerations

Security considerations applicable to HTTP [RFC2616] (Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1," June 1999.), WebDAV [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), and XML [XML] (Bray, T., Paoli, J., Sperberg-McQueen, C., Maler, E., and F. Yergeau, "Extensible Markup Language (XML) 1.0 (Fifth Edition)," November 2008.) apply for this specification as well, namely, Section 20 of [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.) and Section 7 of [RFC3470] (Hollenbeck, S., Rose, M., and L. Masinter, "Guidelines for the Use of Extensible Markup Language (XML) within IETF Protocols," January 2003.).
Furthermore, servers should be aware that deriving the member path from the data being stored in the resource could potentially expose confidential information. This could even be the case when only a hash code of the content is used.
In addition, on servers that do not support this specification, a malevolent user could set the DAV:add-member URI as a custom property, tricking other users to post content to an entirely different URI. Clients can protect themselves against this scenario by

   *not following DAV:add-member URIs to different servers, and/or

   *verifying that the DAV:add-member property is indeed a live
    property (this can be achieved by testing the DAV:supported-live-
    property-set property, or by checking whether DAV:add-member is
    returned upon PROPFIND/allprop)

9. Acknowledgements

This document has benefited from thoughtful discussion by Cyrus Daboo and Bernard Desruisseaux.

10. References

10.1. Normative References

[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.
[RFC3253]	Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV," RFC 3253, March 2002.
[RFC3744]	Clemm, G., Reschke, J., Sedlar, E., and J. Whitehead, "Web Distributed Authoring and Versioning (WebDAV) Access Control Protocol," RFC 3744, May 2004.
[RFC4918]	Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," RFC 4918, June 2007.
[XML]	Bray, T., Paoli, J., Sperberg-McQueen, C., Maler, E., and F. Yergeau, "Extensible Markup Language (XML) 1.0 (Fifth Edition)," W3C REC-xml-20081126, November 2008.

10.2. Informative References

[RFC3470]	Hollenbeck, S., Rose, M., and L. Masinter, "Guidelines for the Use of Extensible Markup Language (XML) within IETF Protocols," RFC 3470, BCP 70, January 2003.
[RFC4791]	Daboo, C., Desruisseaux, B., and L. Dusseault, "Calendaring Extensions to WebDAV (CalDAV)," RFC 4791, March 2007.
[RFC5023]	Gregorio, J. and B. de hOra, "The Atom Publishing Protocol," RFC 5023, October 2007.
[draft-ietf-vcarddav-carddav]	Daboo, C., "vCard Extensions to WebDAV (CardDAV)," draft-ietf-vcarddav-carddav-10 (work in progress), November 2009.

[draft-reschke-http-addmember]	Reschke, J., "The HTTP ADDMEMBER Method," draft-reschke-http-addmember-00 (work in progress), February 2005.

Appendix A. Change Log (to be removed by RFC Editor before publication)   <u>TOC</u>

A.1.   since draft-reschke-webdav-post-00   <u>TOC</u>

Added Acknowledgements.
Added and resolved issues "acl", "forbidden-put", "member-uri-content",
"post-error-semantics", "property-trust", "rational-server-uri",
""remote-uri", "uri-format" and "uri-uniqueness".

A.2.   since draft-reschke-webdav-post-01   <u>TOC</u>

Add and resolve issue "containment".
Update draft-ietf-vcarddav-carddav reference.

A.3.   since draft-reschke-webdav-post-02   <u>TOC</u>

Update XML, draft-ietf-vcarddav-carddav and draft-nottingham-http-link-
header references.
Add and resolve issues "link-header" and "ns".

A.4.   since draft-reschke-webdav-post-03   <u>TOC</u>

Add and resolve issues "put-only" and "protected".

A.5.   since draft-reschke-webdav-post-04   <u>TOC</u>

Update vcarddav reference. In the example, do not use the same content
for Slug header field and request body. Add issue "collection".

A.6. since draft-reschke-webdav-post-05

Close issue "collection" (not making the addition).

A.7. since draft-reschke-webdav-post-06

None yet.

A.8. since draft-reschke-webdav-post-07

Editorial improvements.

Appendix B. Resolved issues (to be removed by RFC Editor before publication)

Issues that were either rejected or resolved in this version of this document.

B.1. edit

Type: edit
julian.reschke@greenbytes.de (2008-09-22): Umbrella issue for editorial fixes/enhancements.

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