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Binding Extensions to Web Distributed Authoring and Versioning (WebDAV) draft-ietf-webdav-bind-25

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Abstract

This specification defines bindings, and the BIND method for creating multiple bindings to the same resource. Creating a new binding to a resource causes at least one new URI to be mapped to that resource. Servers are required to ensure the integrity of any bindings that they allow to be created.

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/>. <http://www.webdav.org/bind/draft-ietf-webdav-bind-issues.html> lists all registered issues since draft 02.

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1. Introduction

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This specification extends the WebDAV Distributed Authoring Protocol ([RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.)) to enable clients to create new access paths to existing resources. This capability is useful for several reasons:

URIs of WebDAV-compliant resources are hierarchical and correspond to a hierarchy of collections in resource space. The WebDAV Distributed Authoring Protocol makes it possible to organize these resources into hierarchies, placing them into groupings, known as collections, which are more easily browsed and manipulated than a single flat collection. However, hierarchies require categorization decisions that locate resources at a single location in the hierarchy, a drawback when a resource has multiple valid categories. For example, in a hierarchy of vehicle descriptions containing collections for cars and boats, a description of a combination car/boat vehicle could belong in either collection. Ideally, the description should be accessible from both. Allowing clients to create new URIs that access the existing resource lets them put that resource into multiple collections.

Hierarchies also make resource sharing more difficult, since resources that have utility across many collections are still forced into a single collection. For example, the mathematics department at one university might create a collection of information on fractals that contains bindings to some local resources, but also provides access to some resources at other universities. For many reasons, it may be

undesirable to make physical copies of the shared resources on the local server: to conserve disk space, to respect copyright constraints, or to make any changes in the shared resources visible automatically. Being able to create new access paths to existing resources in other collections or even on other servers is useful for this sort of case. The BIND method defined here provides a mechanism for allowing clients to create alternative access paths to existing WebDAV resources. 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.) and WebDAV [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.) methods are able to work because there are mappings between URIs and resources. A method is addressed to a URI, and the server follows the mapping from that URI to a resource, applying the method to that resource. Multiple URIs may be mapped to the same resource, but until now there has been no way for clients to create additional URIs mapped to existing resources.

BIND lets clients associate a new URI with an existing WebDAV resource, and this URI can then be used to submit requests to the resource. Since URIs of WebDAV resources are hierarchical, and correspond to a hierarchy of collections in resource space, the BIND method also has the effect of adding the resource to a collection. As new URIs are associated with the resource, it appears in additional collections. A BIND request does not create a new resource, but simply makes available a new URI for submitting requests to an existing resource. The new URI is indistinguishable from any other URI when submitting a request to a resource. Only one round trip is needed to submit a request to the intended target. Servers are required to enforce the integrity of the relationships between the new URIs and the resources associated with them. Consequently, it may be very costly for servers to support BIND requests that cross server boundaries.

This specification is organized as follows. [Section 1.1 \(Terminology\)](#) defines terminology used in the rest of the specification, while [Section 2 \(Overview of Bindings\)](#) overviews bindings. [Section 3 \(Properties\)](#) defines the new properties needed to support multiple bindings to the same resource. [Section 4 \(BIND Method\)](#) specifies the BIND method, used to create multiple bindings to the same resource. [Section 5 \(UNBIND Method\)](#) specifies the UNBIND method, used to remove a binding to a resource. [Section 6 \(REBIND Method\)](#) specifies the REBIND method, used to move a binding to another collection.

1.1. Terminology

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The terminology used here follows and extends that in the WebDAV Distributed Authoring Protocol 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 notational convention, using the rules defined in Section 17 of [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#).

URI Mapping

A relation between an absolute URI and a resource. For an absolute URI U and the resource it identifies R, the URI mapping can be thought of as (U => R). Since a resource can represent items that are not network retrievable, as well as those that are, it is possible for a resource to have zero, one, or many URI mappings. Mapping a resource to an "http" scheme URI makes it possible to submit HTTP protocol requests to the resource using the URI.

Path Segment

Informally, the characters found between slashes ("/") in a URI. Formally, as defined in Section 3.3 of [\[RFC3986\] \(Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier \(URI\): Generic Syntax," January 2005.\)](#).

Binding

A relation between a single path segment (in a collection) and a resource. A binding is part of the state of a collection. If two different collections contain a binding between the same path segment and the same resource, these are two distinct bindings. So for a collection C, a path segment S, and a resource R, the binding can be thought of as C:(S -> R). Bindings create URI mappings, and hence allow requests to be sent to a single resource from multiple locations in a URI namespace. For example, given a collection C (accessible through the URI <http://www.example.com/CollX>), a path segment S (equal to "foo.html"), and a resource R, then creating the binding C: (S -> R) makes it possible to use the URI <http://www.example.com/CollX/foo.html> to access R.

Collection

A resource that contains, as part of its state, a set of bindings that identify internal member resources.

Internal Member URI

The URI that identifies an internal member of a collection, and that consists of the URI for the collection, followed by a slash character ('/'), followed by the path segment of the binding for that internal member.

Binding Integrity

The property of a binding that says that:

- *the binding continues to exist, and
- *the identity of the resource identified by that binding does not change

unless an explicit request is executed that is defined to delete that binding (examples of requests that delete a binding are DELETE, MOVE, and - defined later on - UNBIND, and REBIND).

1.2. Method Preconditions and Postconditions

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See Section 16 of [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#) for the definitions of "precondition" and "postcondition".

2. Overview of Bindings

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Bindings are part of the state of a collection. They define the internal members of the collection, and the names of those internal members.

Bindings are added and removed by a variety of existing HTTP methods. A method that creates a new resource, such as PUT, COPY, and MKCOL, adds a binding. A method that deletes a resource, such as DELETE, removes a binding. A method that moves a resource (e.g. MOVE) both adds a binding (in the destination collection) and removes a binding (in the source collection). The BIND method introduced here provides a mechanism for adding a second binding to an existing resource. There is no difference between an initial binding added by PUT, COPY, or MKCOL, and additional bindings added with BIND.

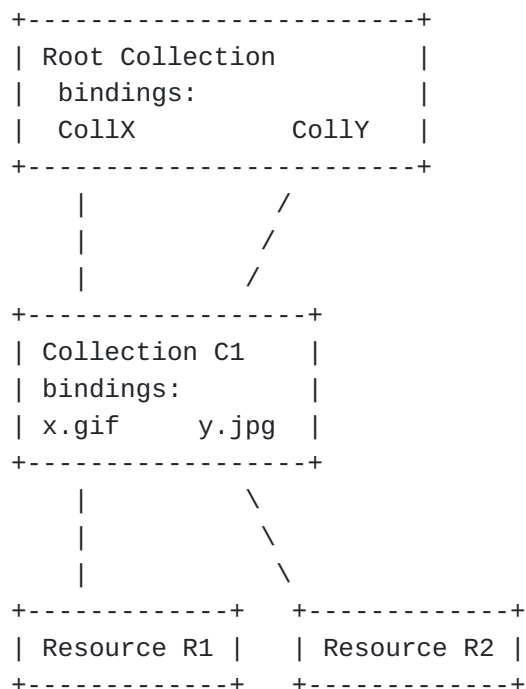
It would be very undesirable if one binding could be destroyed as a side effect of operating on the resource through a different binding. In particular, the removal of one binding to a resource (e.g. with a

DELETE or a MOVE) MUST NOT disrupt another binding to that resource, e.g. by turning that binding into a dangling path segment. The server MUST NOT reclaim system resources after removing one binding, while other bindings to the resource remain. In other words, the server MUST maintain the integrity of a binding. It is permissible, however, for future method definitions (e.g., a DESTROY method) to have semantics that explicitly remove all bindings and/or immediately reclaim system resources.

2.1. Bindings to Collections

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Creating a new binding to a collection makes each resource associated with a binding in that collection accessible via a new URI, and thus creates new URI mappings to those resources but no new bindings. For example, suppose a new binding CollY is created for collection C1 in the figure below. It immediately becomes possible to access resource R1 using the URI /CollY/x.gif and to access resource R2 using the URI /CollY/CollY/y.jpg, but no new bindings for these child resources were created. This is because bindings are part of the state of a collection, and associate a URI that is relative to that collection with its target resource. No change to the bindings in Collection C1 is needed to make its children accessible using /CollY/x.gif and /CollY/y.jpg.



2.1.1. Bind Loops

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Bindings to collections can result in loops ("cycles"), which servers MUST detect when processing "Depth: infinity" requests. It is sometimes possible to complete an operation in spite of the presence of a loop. For instance, a PROPFIND can still succeed if the server uses the new status code 208 (Already Reported) defined in [Section 7.1 \(208 Already Reported\)](#).

However, the 506 (Loop Detected) status code is defined in [Section 7.2 \(506 Loop Detected\)](#) for use in contexts where an operation is terminated because a loop was encountered.

Support for loops is OPTIONAL: servers MAY reject requests that would lead to the creation of a bind loop (see DAV:cycle-allowed precondition defined in [Section 4 \(BIND Method\)](#)).

2.2. URI Mappings Created by a new Binding

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Suppose a binding from "Binding-Name" to resource R is to be added to a collection, C. Then if C-MAP is the set of URIs that were mapped to C before the BIND request, then for each URI "C-URI" in C-MAP, the URI "C-URI/Binding-Name" is mapped to resource R following the BIND request.

For example, if a binding from "foo.html" to R is added to a collection C, and if the following URIs are mapped to C:

```
http://www.example.com/A/1/  
http://example.com/A/one/
```

then the following new mappings to R are introduced:

```
http://www.example.com/A/1/foo.html  
http://example.com/A/one/foo.html
```

Note that if R is a collection, additional URI mappings are created to the descendents of R. Also, note that if a binding is made in collection C to C itself (or to a parent of C), an infinite number of mappings are introduced.

For example, if a binding from "myself" to C is then added to C, the following infinite number of additional mappings to C are introduced:

```
http://www.example.com/A/1/myself  
http://www.example.com/A/1/myself/myself  
...
```

and the following infinite number of additional mappings to R are introduced:

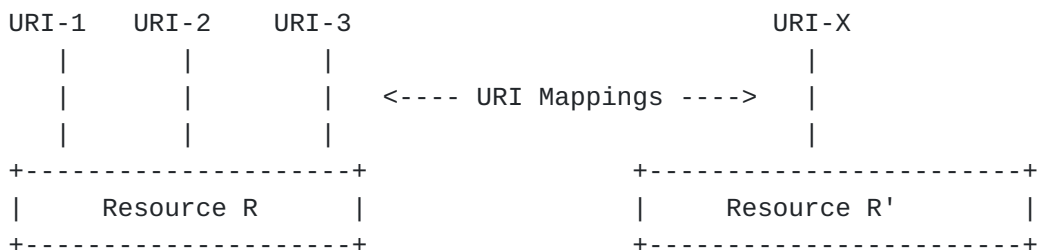
http://www.example.com/A/1/myself/foo.html
http://www.example.com/A/1/myself/myself/foo.html
...

2.3. COPY and Bindings

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As defined in Section 9.8 of [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#), COPY causes the resource identified by the Request-URI to be duplicated, and makes the new resource accessible using the URI specified in the Destination header. Upon successful completion of a COPY, a new binding is created between the last path segment of the Destination header, and the destination resource. The new binding is added to its parent collection, identified by the Destination header minus its final segment.

The following figure shows an example: Suppose that a COPY is issued to URI-3 for resource R (which is also mapped to URI-1 and URI-2), with the Destination header set to URI-X. After successful completion of the COPY operation, resource R is duplicated to create resource R', and a new binding has been created which creates at least the URI mapping between URI-X and the new resource (although other URI mappings may also have been created).



It might be thought that a COPY request with "Depth: 0" on a collection would duplicate its bindings, since bindings are part of the collection's state. This is not the case, however. The definition of Depth in [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#) makes it clear that a "Depth: 0" request does not apply to a collection's members. Consequently, a COPY with "Depth: 0" does not duplicate the bindings contained by the collection.

If a COPY request causes an existing resource to be updated, the bindings to that resource MUST be unaffected by the COPY request. Using the preceding example, suppose that a COPY request is issued to URI-X for resource R', with the Destination header set to URI-2. The content and dead properties of resource R would be updated to be a copy of those of resource R', but the mappings from URI-1, URI-2, and URI-3 to

resource R remain unaffected. If because of multiple bindings to a resource, more than one source resource updates a single destination resource, the order of the updates is server defined (see [Section 2.3.2 \(Example: COPY updating multiple Bindings\)](#) for an example).

If a COPY request would cause a new resource to be created as a copy of an existing resource, and that COPY request has already created a copy of that existing resource, the COPY request instead creates another binding to the previous copy, instead of creating a new resource (see [Section 2.3.3 \(Example: COPY with 'Depth: infinity' with Multiple Bindings to a Leaf Resource\)](#) for an example).

2.3.1. Example: COPY with 'Depth: infinity' in Presence of Bind Loops

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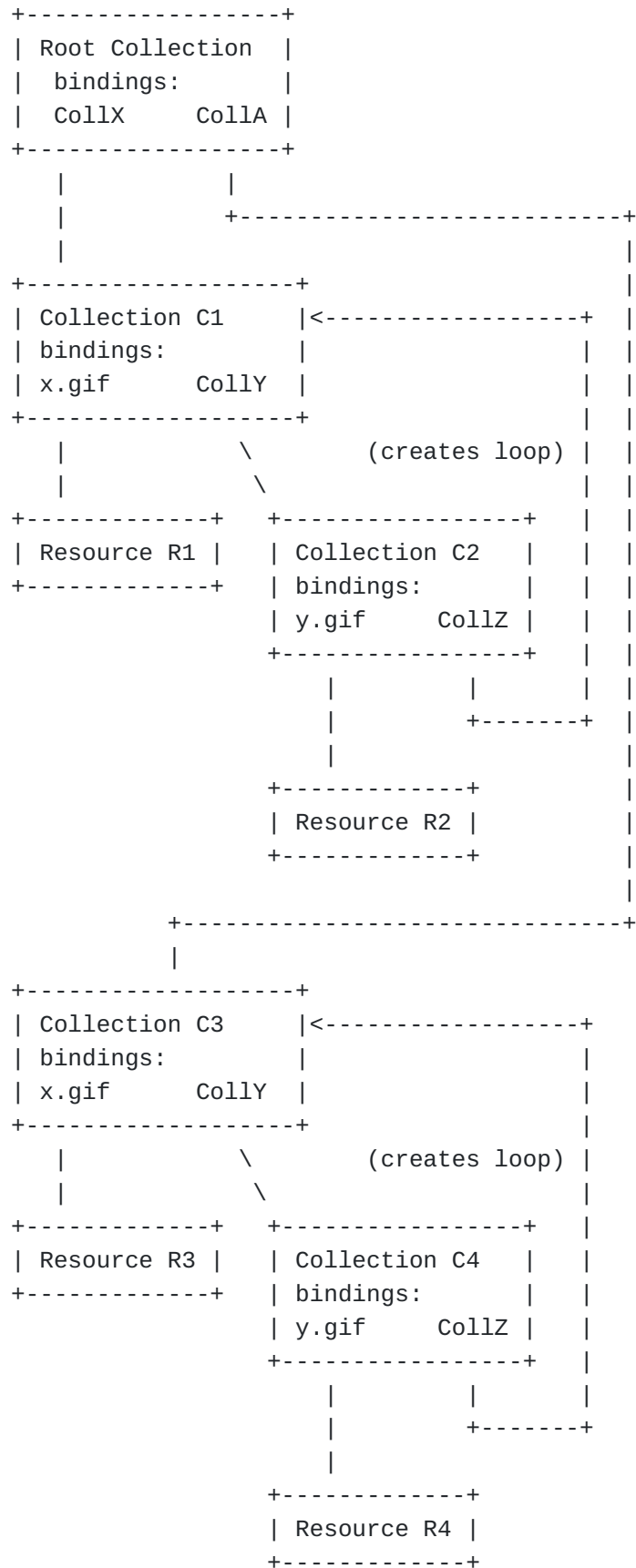
As an example of how COPY with Depth infinity would work in the presence of bindings, consider the following collection:

```

+-----+
| Root Collection |
| bindings:      |
| CollX          |
+-----+
|
|
+-----+
| Collection C1   |<-----+
| bindings:      |         |
| x.gif          | CollY    |
+-----+         |
|                | \       | (creates loop) |
|                | \       |         |
+-----+         +-----+         |
| Resource R1 |   | Collection C2 |   |
+-----+         | bindings:    |   |
                  | y.gif      | CollZ |   |
                  +-----+         |
                  |              |         |
                  |              | +-----+
                  |              |         |
                  +-----+         |
                  | Resource R2 |         |
                  +-----+

```

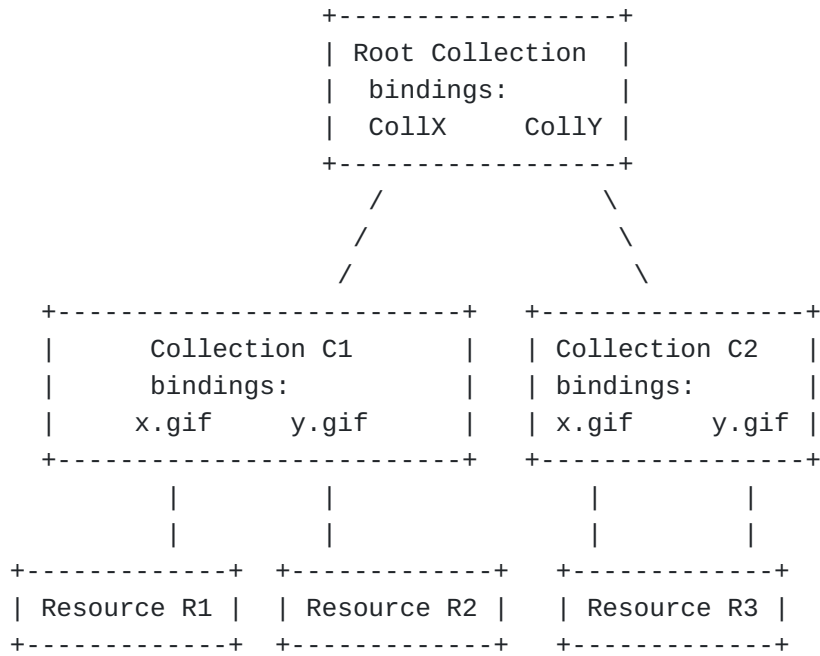
If a COPY with Depth infinity is submitted to /CollX, with destination of /CollA, the outcome of the copy operation is:



2.3.2. Example: COPY updating multiple Bindings

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Given the following collection hierarchy:



A COPY of /CollX with Depth infinity to /CollY will not result in a changed hierarchy, and Resource R3 will be updated with the content of either Resource R1 or Resource R2.

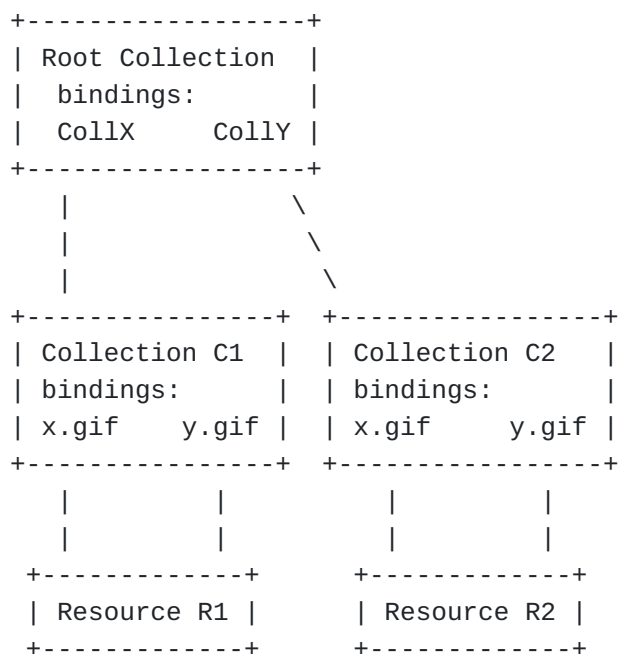
2.3.3. Example: COPY with 'Depth: infinity' with Multiple Bindings to a Leaf Resource

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Given the following collection hierarchy:



A COPY of /CollX with Depth infinity to /CollY results in the following collection hierarchy:



2.4. DELETE and Bindings

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When there are multiple bindings to a resource, a DELETE applied to that resource MUST NOT remove any bindings to that resource other than

the one identified by the Request-URI. For example, suppose the collection identified by the URI `"/a"` has a binding named `"x"` to a resource `R`, and another collection identified by `"/b"` has a binding named `"y"` to the same resource `R`. Then a DELETE applied to `"/a/x"` removes the binding named `"x"` from `"/a"` but MUST NOT remove the binding named `"y"` from `"/b"` (i.e. after the DELETE, `"/y/b"` continues to identify the resource `R`).

When DELETE is applied to a collection, it MUST NOT modify the membership of any other collection that is not itself a member of the collection being deleted. For example, if both `"/a/.../x"` and `"/b/.../y"` identify the same collection, `C`, then applying DELETE to `"/a"` must not delete an internal member from `C` or from any other collection that is a member of `C`, because that would modify the membership of `"/b"`. If a collection supports the UNBIND method (see [Section 5 \(UNBIND Method\)](#)), a DELETE of an internal member of a collection MAY be implemented as an UNBIND request. In this case, applying DELETE to a Request-URI has the effect of removing the binding identified by the final segment of the Request-URI from the collection identified by the Request-URI minus its final segment. Although [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#) allows a DELETE to be a non-atomic operation, when the DELETE operation is implemented as an UNBIND, the operation is atomic. In particular, a DELETE on a hierarchy of resources is simply the removal of a binding to the collection identified by the Request-URI.

2.5. MOVE and Bindings

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When MOVE is applied to a resource, the other bindings to that resource MUST be unaffected, and if the resource being moved is a collection, the bindings to any members of that collection MUST be unaffected. Also, if MOVE is used with `Overwrite:T` to delete an existing resource, the constraints specified for DELETE apply.

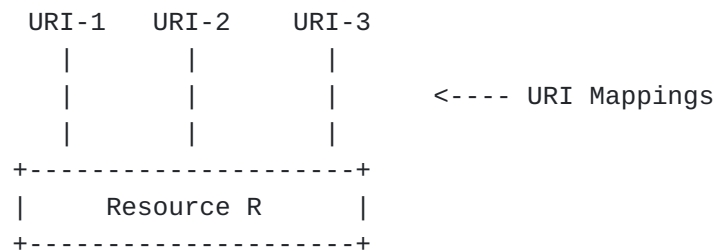
If the destination collection of a MOVE request supports the REBIND method (see [Section 6 \(REBIND Method\)](#)), a MOVE of a resource into that collection MAY be implemented as a REBIND request. Although [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#) allows a MOVE to be a non-atomic operation, when the MOVE operation is implemented as a REBIND, the operation is atomic. In particular, applying a MOVE to a Request-URI and a Destination URI has the effect of removing a binding to a resource (at the Request-URI), and creating a new binding to that resource (at the Destination URI). Even when the Request-URI identifies a collection, the MOVE operation involves only removing one binding to that collection and adding another.

2.5.1. Example: Simple MOVE

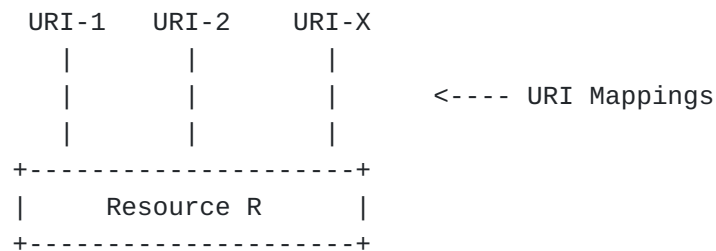
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As an example, suppose that a MOVE is issued to URI-3 for resource R below (which is also mapped to URI-1 and URI-2), with the Destination header set to URI-X. After successful completion of the MOVE operation, a new binding has been created which creates the URI mapping between URI-X and resource R. The binding corresponding to the final segment of URI-3 has been removed, which also causes the URI mapping between URI-3 and R to be removed. If resource R were a collection, old URI-3 based mappings to members of R would have been removed, and new URI-X based mappings to members of R would have been created.

>> Before Request:



>> After Request:

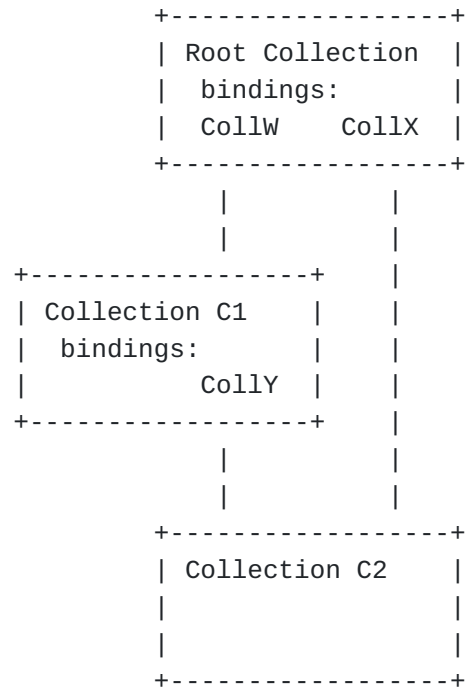


2.5.2. Example: MOVE Request causing a Bind Loop

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Note that in the presence of collection bindings, a MOVE request can cause the creating of a bind loop.

Consider a the top level collections C1 and C2 with URIs "/CollW/" and "/CollX/". C1 also contains an additional binding named "CollY" to C2:



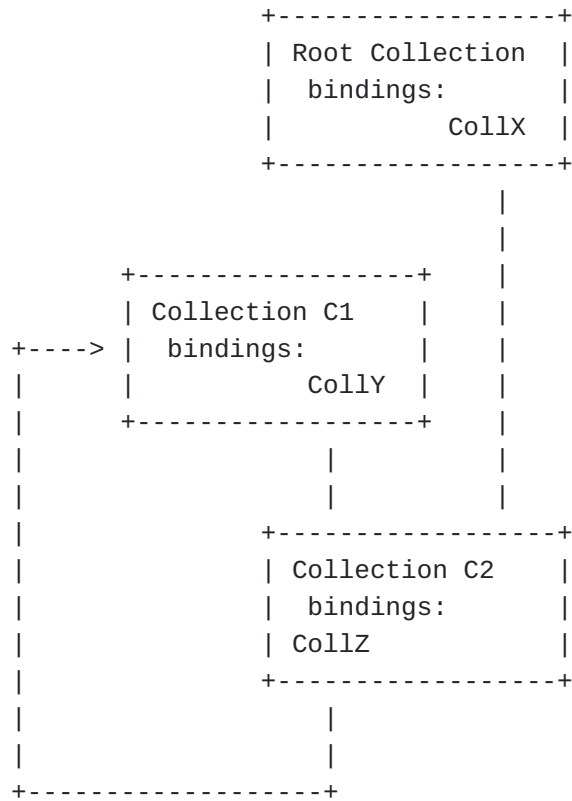
In this case, the MOVE request below would cause a bind loop:
 >> Request:

```

MOVE /CollW HTTP/1.1
Host: example.com
Destination: /CollX/CollZ

```

If the request succeeded, the resulting state would be:



2.6. PROPFIND and Bindings

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Consistent with [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), the value of a dead property MUST be independent of the number of bindings to its host resource or of the path submitted to PROPFIND. On the other hand, the behaviour for each live property depends on its individual definition (for example, see [\[RFC3744\]](#) (Clemm, G., Reschke, J., Sedlar, E., and J. Whitehead, "Web Distributed Authoring and Versioning (WebDAV) Access Control Protocol," May 2004.), Section 5, paragraph 2 for a case where the value is independent of path and bindings, and [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 8.8 for a discussion about the live properties DAV:getetag and DAV:getlastmodified, which may behave differently).

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2.7. Determining Whether Two Bindings Are to the Same Resource

It is useful to have some way of determining whether two bindings are to the same resource. Two resources might have identical contents and properties, but not be the same resource (e.g. an update to one resource does not affect the other resource).

The REQUIRED DAV:resource-id property defined in [Section 3.1 \(DAV:resource-id Property\)](#) is a resource identifier, which MUST be unique across all resources for all time. If the values of DAV:resource-id returned by PROPFIND requests through two bindings are identical character by character, the client can be assured that the two bindings are to the same resource.

The DAV:resource-id property is created, and its value assigned, when the resource is created. The value of DAV:resource-id MUST NOT be changed. Even after the resource is no longer accessible through any URI, that value MUST NOT be reassigned to another resource's DAV:resource-id property.

Any method that creates a new resource MUST assign a new, unique value to its DAV:resource-id property. For example, a PUT applied to a null resource, COPY (when not overwriting an existing target) and CHECKIN (see [\[RFC3253\] \(Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV \(Web Distributed Authoring and Versioning\)," March 2002.\)](#), Section 4.4) must assign a new, unique value to the DAV:resource-id property of the new resource they create. On the other hand, any method that affects an existing resource must not change the value of its DAV:resource-id property. Specifically, a PUT or a COPY that updates an existing resource must not change the value of its DAV:resource-id property. A REBIND, since it does not create a new resource, but only changes the location of an existing resource, must not change the value of the DAV:resource-id property.

2.8. Discovering the Bindings to a Resource

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An OPTIONAL DAV:parent-set property on a resource provides a list of the bindings that associate a collection and a URI segment with that resource. If the DAV:parent-set property exists on a given resource, it MUST contain a complete list of all bindings to that resource that the client is authorized to see. When deciding whether to support the DAV:parent-set property, server implementers / administrators should balance the benefits it provides against the cost of maintaining the property and the security risks enumerated in [Sections 11.4 \(Private Locations May Be Revealed\)](#) and [11.5 \(DAV:parent-set and Denial of Service\)](#).

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3. Properties

The bind feature introduces the properties defined below.

A DAV:allprop PROPFIND request SHOULD NOT return any of the properties defined by this document. This allows a binding server to perform efficiently when a naive client, which does not understand the cost of asking a server to compute all possible live properties, issues a DAV:allprop PROPFIND request.

3.1. DAV:resource-id Property

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The DAV:resource-id property is a REQUIRED property that enables clients to determine whether two bindings are to the same resource. The value of DAV:resource-id is a URI, and may use any registered URI scheme that guarantees the uniqueness of the value across all resources for all time (e.g. the urn:uuid: URN namespace defined in [\[RFC4122\]](#) (Leach, P., Mealling, M., and R. Salz, "A Universally Unique Identifier (UUID) URN Namespace," July 2005.) or the opaque: URI scheme defined in [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.).

```
<!ELEMENT resource-id (href)>
```

3.2. DAV:parent-set Property

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The DAV:parent-set property is an OPTIONAL property that enables clients to discover what collections contain a binding to this resource (i.e. what collections have that resource as an internal member). It contains an href/segment pair for each collection that has a binding to the resource. The href identifies the collection, and the segment identifies the binding name of that resource in that collection. A given collection MUST appear only once in the DAV:parent-set for any given binding, even if there are multiple URI mappings to that collection.

```
<!ELEMENT parent-set (parent)*>
<!ELEMENT parent (href, segment)>
<!ELEMENT segment (#PCDATA)>
<!-- PCDATA value: segment, as defined in Section 3.3 of
[RFC3986] -->
```

3.2.1. Example for DAV:parent-set Property

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For example, if collection C1 is mapped to both /CollX and /CollY, and C1 contains a binding named "x.gif" to a resource R1, then either [/CollX, x.gif] or [/CollY, x.gif] can appear in the DAV:parent-set of R1, but not both. But if C1 also had a binding named "y.gif" to R1, then there would be two entries for C1 in the DAV:parent-set of R1 (i.e. both [/CollX, x.gif] and [/CollX, y.gif] or, alternatively, both [/CollY, x.gif] and [/CollY, y.gif]).

```
+-----+
| Root Collection |
| bindings:      |
| CollX          CollY |
+-----+
|               /    |
|               /    |
|               /    |
+-----+
| Collection C1   |
| bindings:      |
| x.gif    y.gif |
+-----+
|               |
|               |
|               |
+-----+
| Resource R1    |
+-----+
```

In this case, one possible value for DAV:parent-set property on "/CollX/x.gif" would be:

```
<parent-set xmlns="DAV:">
  <parent>
    <href>/CollX</href>
    <segment>x.gif</segment>
  </parent>
  <parent>
    <href>/CollX</href>
    <segment>y.gif</segment>
  </parent>
</parent-set>
```

4. BIND Method

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The BIND method modifies the collection identified by the Request-URI, by adding a new binding from the segment specified in the BIND body to the resource identified in the BIND body.

If a server cannot guarantee the integrity of the binding, the BIND request MUST fail. Note that it is especially difficult to maintain the integrity of cross-server bindings. Unless the server where the resource resides knows about all bindings on all servers to that resource, it may unwittingly destroy the resource or make it inaccessible without notifying another server that manages a binding to the resource. For example, if server A permits creation of a binding to a resource on server B, server A must notify server B about its binding and must have an agreement with B that B will not destroy the resource while A's binding exists. Otherwise server B may receive a DELETE request that it thinks removes the last binding to the resource and destroy the resource while A's binding still exists. The precondition DAV:cross-server-binding is defined below for cases where servers fail cross-server BIND requests because they cannot guarantee the integrity of cross-server bindings.

By default, if there already is a binding for the specified segment in the collection, the new binding replaces the existing binding. This default binding replacement behavior can be overridden using the Overwrite header defined in Section 10.6 of [\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#).

If a BIND request fails, the server state preceding the request MUST be restored. This method is unsafe and idempotent (see [\[RFC2616\] \(Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1," June 1999.\)](#), Section 9.1).

Marshalling:

The request MAY include an Overwrite header.

The request body MUST be a DAV:bind XML element.

```
<!ELEMENT bind (segment, href)>
```

If the request succeeds, the server MUST return 201 (Created) when a new binding was created and 200 (OK) or 204 (No Content) when an existing binding was replaced.

If a response body for a successful request is included, it MUST be a DAV:bind-response XML element. Note that this document does not define any elements for the BIND response body, but the DAV:bind-response element is defined to ensure interoperability between

future extensions that do define elements for the BIND response body.

<!ELEMENT bind-response ANY>

Preconditions:

(DAV:bind-into-collection): The Request-URI MUST identify a collection.

(DAV:bind-source-exists): The DAV:href element MUST identify a resource.

(DAV:binding-allowed): The resource identified by the DAV:href supports multiple bindings to it.

(DAV:cross-server-binding): If the resource identified by the DAV:href element in the request body is on another server from the collection identified by the Request-URI, the server MUST support cross-server bindings (servers that do not support cross-server bindings can use this condition code to signal the client exactly why the request failed).

(DAV:name-allowed): The name specified by the DAV:segment is available for use as a new binding name.

(DAV:can-overwrite): If the collection already contains a binding with the specified path segment, and if an Overwrite header is included, the value of the Overwrite header MUST be "T".

(DAV:cycle-allowed): If the DAV:href element identifies a collection, and if the Request-URI identifies a collection that is a member of that collection, the server MUST support cycles in the URI namespace (servers that do not support cycles can use this condition code to signal the client exactly why the request failed).

(DAV:locked-update-allowed): If the collection identified by the Request-URI is write-locked, then the appropriate token MUST be specified in an If request header.

(DAV:locked-overwrite-allowed): If the collection already contains a binding with the specified path segment, and if that binding is protected by a write-lock, then the appropriate token MUST be specified in an If request header.

Postconditions:

(DAV:new-binding): The collection MUST have a binding that maps the segment specified in the DAV:segment element in the request body, to the resource identified by the DAV:href element in the request body.

4.1. Example: BIND

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>> Request:

```

BIND /CollY HTTP/1.1
Host: www.example.com
Content-Type: application/xml; charset="utf-8"
Content-Length: 172

<?xml version="1.0" encoding="utf-8" ?>
<D:bind xmlns:D="DAV:">
  <D:segment>bar.html</D:segment>
  <D:href>http://www.example.com/CollX/foo.html</D:href>
</D:bind>
```

>> Response:

```

HTTP/1.1 201 Created
Location: http://www.example.com/CollY/bar.html
```

The server added a new binding to the collection, "http://www.example.com/CollY", associating "bar.html" with the resource identified by the URI "http://www.example.com/CollX/foo.html". Clients can now use the URI "http://www.example.com/CollY/bar.html" to submit requests to that resource.

5. UNBIND Method

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The UNBIND method modifies the collection identified by the Request-URI, by removing the binding identified by the segment specified in the UNBIND body.

Once a resource is unreachable by any URI mapping, the server MAY reclaim system resources associated with that resource. If UNBIND removes a binding to a resource, but there remain URI mappings to that resource, the server MUST NOT reclaim system resources associated with the resource.

If an UNBIND request fails, the server state preceding the request MUST be restored. This method is unsafe and idempotent (see [\[RFC2616\]](#) (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 9.1).

Marshalling:

The request body MUST be a DAV:unbind XML element.

```
<!ELEMENT unbind (segment)>
```

If the request succeeds, the server MUST return 200 (OK) or 204 (No Content) when the binding was successfully deleted.

If a response body for a successful request is included, it MUST be a DAV:unbind-response XML element. Note that this document does not define any elements for the UNBIND response body, but the DAV:unbind-response element is defined to ensure interoperability between future extensions that do define elements for the UNBIND response body.

```
<!ELEMENT unbind-response ANY>
```

Preconditions:

(DAV:unbind-from-collection): The Request-URI MUST identify a collection.

(DAV:unbind-source-exists): The DAV:segment element MUST identify a binding in the collection identified by the Request-URI.

(DAV:locked-update-allowed): If the collection identified by the Request-URI is write-locked, then the appropriate token MUST be specified in the request.

(DAV:protected-url-deletion-allowed): If the binding identified by the segment is protected by a write-lock, then the appropriate token MUST be specified in the request.

Postconditions:

(DAV:binding-deleted): The collection MUST NOT have a binding for the segment specified in the DAV:segment element in the request body.

(DAV:lock-deleted): If the internal member URI of the binding specified by the Request-URI and the DAV:segment element in the request body was protected by a write-lock at the time of the request, that write-lock must have been deleted by the request.

5.1. Example: UNBIND

[TOC](#)

>> Request:

```
UNBIND /CollX HTTP/1.1
Host: www.example.com
Content-Type: application/xml; charset="utf-8"
Content-Length: 117

<?xml version="1.0" encoding="utf-8" ?>
<D:unbind xmlns:D="DAV:">
  <D:segment>foo.html</D:segment>
</D:unbind>
```

>> Response:

```
HTTP/1.1 200 OK
```

The server removed the binding named "foo.html" from the collection, "http://www.example.com/CollX". A request to the resource named "http://www.example.com/CollX/foo.html" will return a 404 (Not Found) response.

6. REBIND Method

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The REBIND method removes a binding to a resource from a collection, and adds a binding to that resource into the collection identified by the Request-URI. The request body specifies the binding to be added (segment) and the old binding to be removed (href). It is effectively an atomic form of a MOVE request, and MUST be treated the same way as MOVE for the purpose of determining access permissions. If a REBIND request fails, the server state preceding the request MUST be restored. This method is unsafe and idempotent (see [\[RFC2616\]](#) (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 9.1).

Marshalling:

The request MAY include an Overwrite header.

The request body MUST be a DAV:rebind XML element.

```
<!ELEMENT rebind (segment, href)>
```

If the request succeeds, the server MUST return 201 (Created) when a new binding was created and 200 (OK) or 204 (No Content) when an existing binding was replaced.

If a response body for a successful request is included, it MUST be a DAV:rebind-response XML element. Note that this document does not define any elements for the REBIND response body, but the DAV:rebind-response element is defined to ensure interoperability between future extensions that do define elements for the REBIND response body.

<!ELEMENT rebind-response ANY>

Preconditions:

(DAV:rebind-into-collection): The Request-URI MUST identify a collection.

(DAV:rebind-source-exists): The DAV:href element MUST identify a resource.

(DAV:cross-server-binding): If the resource identified by the DAV:href element in the request body is on another server from the collection identified by the Request-URI, the server MUST support cross-server bindings (servers that do not support cross-server bindings can use this condition code to signal the client exactly why the request failed).

(DAV:name-allowed): The name specified by the DAV:segment is available for use as a new binding name.

(DAV:can-overwrite): If the collection already contains a binding with the specified path segment, and if an Overwrite header is included, the value of the Overwrite header MUST be "T".

(DAV:cycle-allowed): If the DAV:href element identifies a collection, and if the Request-URI identifies a collection that is a member of that collection, the server MUST support cycles in the URI namespace (servers that do not support cycles can use this condition code to signal the client exactly why the request failed).

(DAV:locked-update-allowed): If the collection identified by the Request-URI is write-locked, then the appropriate token MUST be specified in the request.

(DAV:protected-url-modification-allowed): If the collection identified by the Request-URI already contains a binding with the specified path segment, and if that binding is protected by a write-lock, then the appropriate token MUST be specified in the request.

(DAV:locked-source-collection-update-allowed): If the collection identified by the parent collection prefix of the DAV:href URI is write-locked, then the appropriate token MUST be specified in the request.

(DAV:protected-source-url-deletion-allowed): If the DAV:href URI is protected by a write lock, then the appropriate token MUST be specified in the request.

Postconditions:

(DAV:new-binding): The collection MUST have a binding that maps the segment specified in the DAV:segment element in the request body, to the resource that was identified by the DAV:href element in the request body.

(DAV:binding-deleted): The URL specified in the DAV:href element in the request body MUST NOT be mapped to a resource.

(DAV:lock-deleted): If the URL specified in the DAV:href element in the request body was protected by a write-lock at the time of the request, that write-lock must have been deleted by the request.

6.1. Example: REBIND

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>> Request:

```
REBIND /CollX HTTP/1.1
Host: www.example.com
Content-Type: application/xml; charset="utf-8"
Content-Length: 176

<?xml version="1.0" encoding="utf-8" ?>
<D:rebind xmlns:D="DAV:">
  <D:segment>foo.html</D:segment>
  <D:href>http://www.example.com/CollY/bar.html</D:href>
</D:rebind>
```

>> Response:

```
HTTP/1.1 200 OK
```

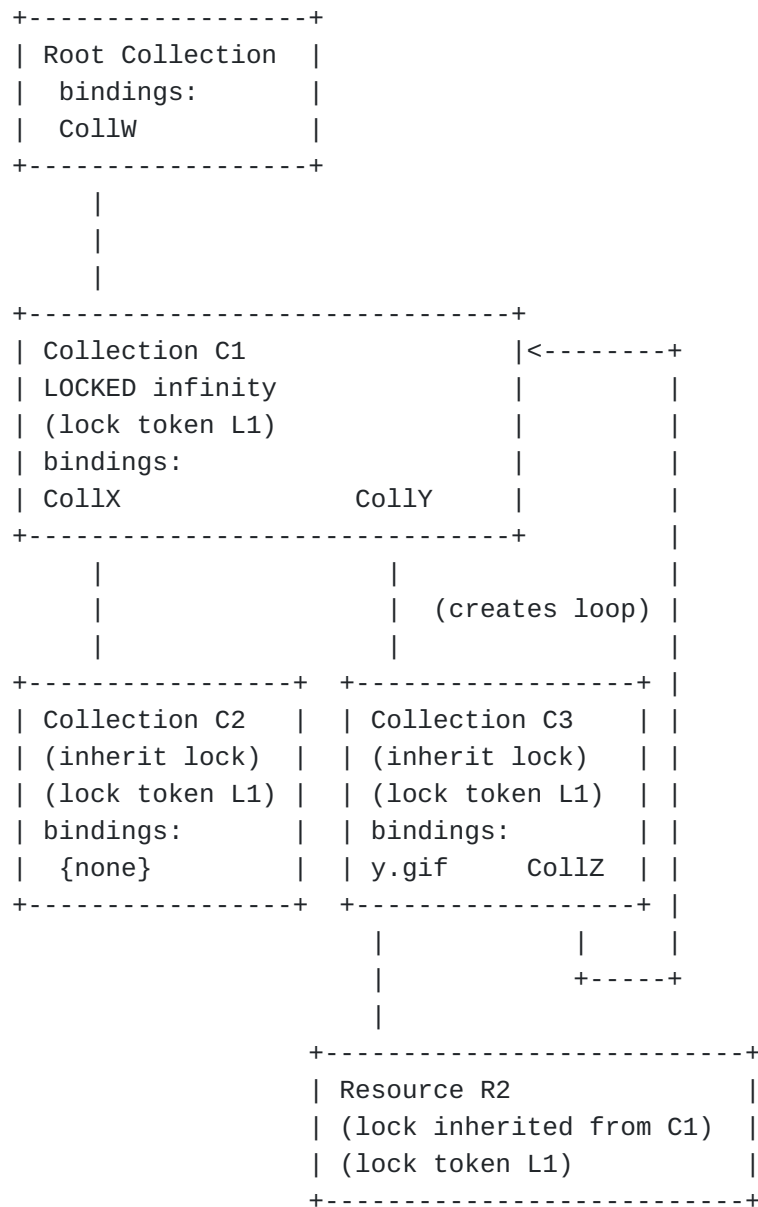
The server added a new binding to the collection, "http://www.example.com/CollX", associating "foo.html" with the resource identified by the URI "http://www.example.com/CollY/bar.html", and removes the binding named "bar.html" from the collection identified by

the URI "http://www.example.com/CollY". Clients can now use the URI "http://www.example.com/CollX/foo.html" to submit requests to that resource, and requests on the URI "http://www.example.com/CollY/bar.html" will fail with a 404 (Not Found) response.

6.2. Example: REBIND in Presence of Locks and Bind Loops

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To illustrate the effects of locks and bind loops on a REBIND operation, consider the following collection:



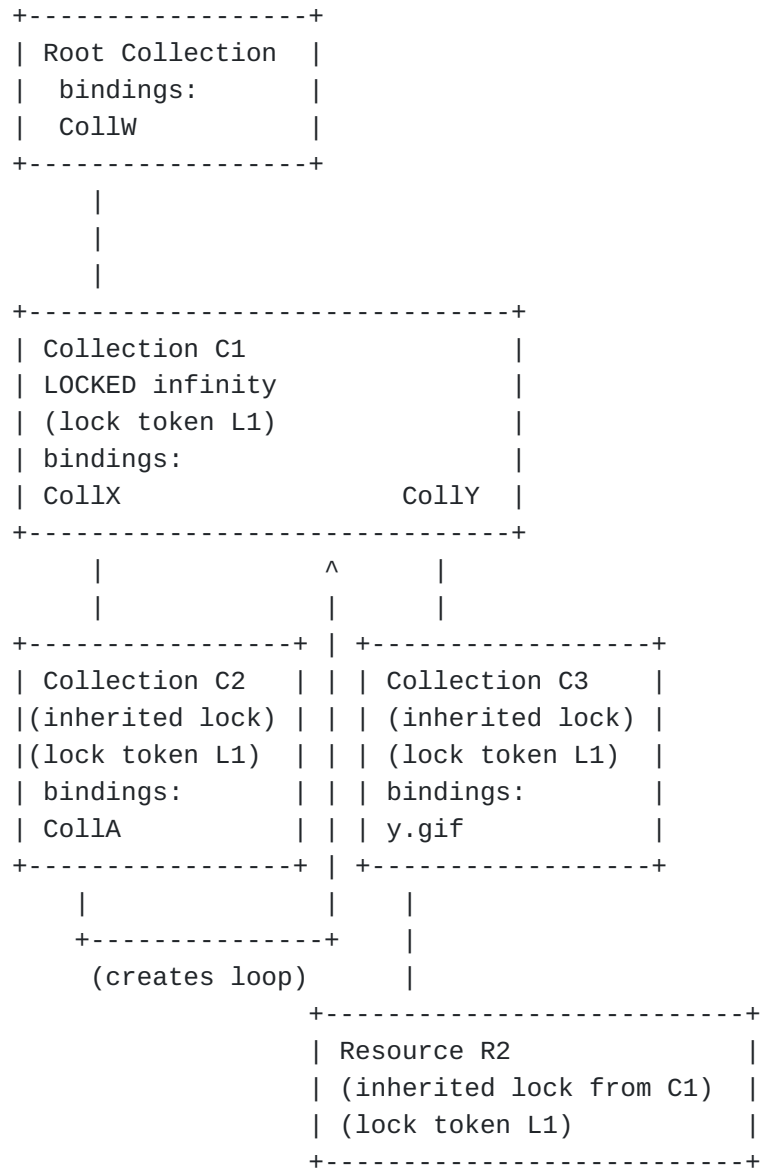
(where L1 is "urn:uuid:f92d4fae-7012-11ab-a765-00c0ca1f6bf9").

Note that the binding between CollZ and C1 creates a loop in the containment hierarchy. Servers are not required to support such loops, though the server in this example does.
The REBIND request below will remove the segment "CollZ" from C3 and add a new binding from "CollA" to the collection C2.

```
REBIND /CollW/CollX HTTP/1.1
Host: www.example.com
If: (<urn:uuid:f92d4fae-7012-11ab-a765-00c0ca1f6bf9>)
Content-Type: application/xml; charset="utf-8"
Content-Length: 152

<?xml version="1.0" encoding="utf-8" ?>
<D:rebind xmlns:D="DAV:">
  <D:segment>CollA</D:segment>
  <D:href>/CollW/CollY/CollZ</D:href>
</D:rebind>
```

The outcome of the REBIND operation is:



7. Additional Status Codes

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7.1. 208 Already Reported

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The 208 (Already Reported) status code can be used inside a DAV:propstat response element to avoid enumerating the internal members of multiple bindings to the same collection repeatedly. For each binding to a collection inside the request's scope, only one will be

reported with a 200 status, while subsequent DAV:response elements for all other bindings will use the 208 status, and no DAV:response elements for their descendants are included.

Note that the 208 status will only occur for "Depth: infinity" requests, and that it is of particular importance when the multiple collection bindings cause a bind loop as discussed in [Section 2.2 \(URI Mappings Created by a new Binding\)](#).

A client can request the DAV:resource-id property in a PROPFIND request to guarantee that they can accurately reconstruct the binding structure of a collection with multiple bindings to a single resource.

For backward compatibility with clients not aware of the 208 status code appearing in multistatus response bodies, it SHOULD NOT be used unless the client has signalled support for this specification using the "DAV" request header (see [Section 8.2 \('DAV' Request Header\)](#)).

Instead, a 506 status should be returned when a binding loop is discovered. This allows the server to return the 506 as the top level return status, if it discovers it before it started the response, or in the middle of a multistatus, if it discovers it in the middle of streaming out a multistatus response.

7.1.1. Example: PROPFIND by Bind-Aware Client

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For example, consider a PROPFIND request on /Coll (bound to collection C), where the members of /Coll are /Coll/Foo (bound to resource R) and /Coll/Bar (bound to collection C).

>> Request:

```
PROPFIND /Coll/ HTTP/1.1
Host: www.example.com
Depth: infinity
DAV: bind
Content-Type: application/xml; charset="utf-8"
Content-Length: 152
```

```
<?xml version="1.0" encoding="utf-8" ?>
<D:propfind xmlns:D="DAV:">
  <D:prop>
    <D:displayname/>
    <D:resource-id/>
  </D:prop>
</D:propfind>
```

>> Response:

HTTP/1.1 207 Multi-Status
Content-Type: application/xml; charset="utf-8"
Content-Length: 1241

```
<?xml version="1.0" encoding="utf-8" ?>
<D:multistatus xmlns:D="DAV:">
  <D:response>
    <D:href>http://www.example.com/Coll/</D:href>
    <D:propstat>
      <D:prop>
        <D:displayname>Loop Demo</D:displayname>
        <D:resource-id>
          <D:href>
            >urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf8</D:href>
          </D:resource-id>
        </D:prop>
        <D:status>HTTP/1.1 200 OK</D:status>
      </D:propstat>
    </D:response>
    <D:response>
      <D:href>http://www.example.com/Coll/Foo</D:href>
      <D:propstat>
        <D:prop>
          <D:displayname>Bird Inventory</D:displayname>
          <D:resource-id>
            <D:href>
              >urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf9</D:href>
            </D:resource-id>
          </D:prop>
          <D:status>HTTP/1.1 200 OK</D:status>
        </D:propstat>
      </D:response>
      <D:response>
        <D:href>http://www.example.com/Coll/Bar</D:href>
        <D:propstat>
          <D:prop>
            <D:displayname>Loop Demo</D:displayname>
            <D:resource-id>
              <D:href>
                >urn:uuid:f81d4fae-7dec-11d0-a765-00a0c91e6bf8</D:href>
              </D:resource-id>
            </D:prop>
            <D:status>HTTP/1.1 208 Already Reported</D:status>
          </D:propstat>
        </D:response>
      </D:multistatus>
```

7.1.2. Example: PROPFIND by Non-Bind-Aware Client

[TOC](#)

In this example, the client isn't aware of the 208 status code introduced by this specification. As the "Depth: infinity" PROPFIND request would cause a loop condition, the whole request is rejected with a 506 status.

>> Request:

```
PROPFIND /Coll/ HTTP/1.1
Host: www.example.com
Depth: infinity
Content-Type: application/xml; charset="utf-8"
Content-Length: 125
```

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

>> Response:

```
HTTP/1.1 506 Loop Detected
```

7.2. 506 Loop Detected

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The 506 (Loop Detected) status code indicates that the server terminated an operation because it encountered an infinite loop while processing a request with "Depth: infinity". This status indicates that the entire operation failed.

8. Capability Discovery

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8.1. OPTIONS Method

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If the server supports bindings, it MUST return the compliance class name "bind" as a field in the "DAV" response header (see [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 10.1) from an OPTIONS

request on any resource implemented by that server. A value of "bind" in the "DAV" header MUST indicate that the server supports all MUST level requirements and REQUIRED features specified in this document.

8.2. 'DAV' Request Header

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Clients SHOULD signal support for all MUST level requirements and REQUIRED features by submitting a "DAV" request header containing the compliance class name "bind". In particular, the client MUST understand the 208 status code defined in [Section 7.1 \(208 Already Reported\)](#).

9. Relationship to WebDAV Access Control Protocol

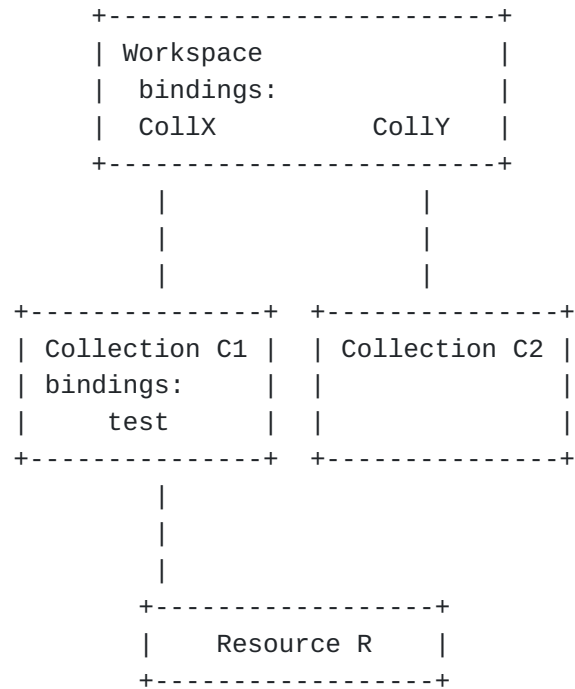
[TOC](#)

BIND and REBIND behave the same as MOVE with respect to the DAV:acl property (see [\[RFC3744\] \(Clemm, G., Reschke, J., Sedlar, E., and J. Whitehead, "Web Distributed Authoring and Versioning \(WebDAV\) Access Control Protocol," May 2004.\)](#), Section 7.3).

10. Relationship to Versioning Extensions to WebDAV

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Servers that implement Workspaces ([\[RFC3253\] \(Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV \(Web Distributed Authoring and Versioning\)," March 2002.\)](#), Section 6) and Version Controlled Collections ([\[RFC3253\] \(Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV \(Web Distributed Authoring and Versioning\)," March 2002.\)](#), Section 14) already need to implement BIND-like behaviour in order to handle UPDATE and UNCHECKOUT semantics. Consider a workspace "/ws1/", containing the version-controlled, checked-out collections C1 and C2, named "/ws1/CollX" and "/ws1/CollY", and a version-controlled resource R, bound to C1 as "/ws1/CollX/test":



Moving "/ws1/CollX/test" into "/ws1/CollY", checking in C2, but undoing the checkout on C1 will undo part of the MOVE request, thus restoring the binding from C1 to R, but keeping the new binding from C2 to R:

>> Request:

```

MOVE /ws1/CollX/test HTTP/1.1
Host: www.example.com
Destination: /ws1/CollY/test

```

>> Response:

```

HTTP/1.1 204 No Content

```

>> Request:

```

CHECKIN /ws1/CollY/ HTTP/1.1
Host: www.example.com

```

>> Response:

```

HTTP/1.1 201 Created
Cache-Control: no-cache
Location: http://repo.example.com/his/17/ver/42

```

>> Request:

```

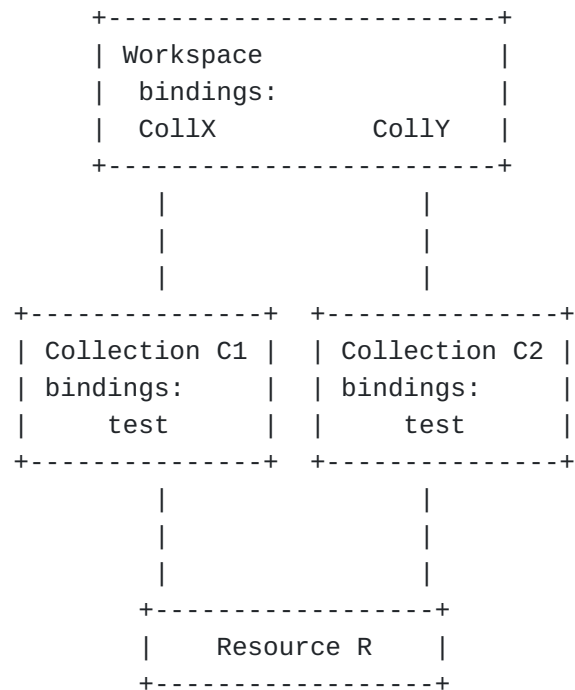
UNCHECKOUT /ws1/CollX/ HTTP/1.1
Host: www.example.com

```

>> Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
```

As a result, both C1 and C2 would have a binding to R:



The MOVE semantics defined in Section 3.15 of [\[RFC3253\] \(Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV \(Web Distributed Authoring and Versioning\)," March 2002.\)](#) already require that `/ws1/CollX/test` and `/ws1/CollY/test` will have the same version history (as exposed in the `DAV:version-history` property). Furthermore, the UNCHECKOUT semantics (which in this case is similar to UPDATE, see Section 14.11 of [\[RFC3253\] \(Clemm, G., Amsden, J., Ellison, T., Kaler, C., and J. Whitehead, "Versioning Extensions to WebDAV \(Web Distributed Authoring and Versioning\)," March 2002.\)](#)) require:

```
...If a new version-controlled member is in a workspace that already
has a version-controlled resource for that version history, then the
new version-controlled member MUST be just a binding (i.e., another
name for) that existing version-controlled resource...
```

Thus, `/ws1/CollX/test` and `/ws1/CollY/test` will be bindings to the same resource R, and have identical `DAV:resource-id` properties.

11. Security Considerations

This section is provided to make WebDAV implementors aware of the security implications of this protocol.

All of the security considerations of HTTP/1.1 ([\[RFC2616\] \(Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1," June 1999.\)](#), Section 15) and the WebDAV Distributed Authoring Protocol specification ([\[RFC4918\] \(Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning \(WebDAV\)," June 2007.\)](#), Section 20) also apply to this protocol specification. In addition, bindings introduce several new security concerns and increase the risk of some existing threats. These issues are detailed below.

11.1. Privacy Concerns

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In a context where cross-server bindings are supported, creating bindings on a trusted server may make it possible for a hostile agent to induce users to send private information to a target on a different server.

11.2. Bind Loops

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Although bind loops were already possible in HTTP 1.1, the introduction of the BIND method creates a new avenue for clients to create loops accidentally or maliciously. If the binding and its target are on the same server, the server may be able to detect BIND requests that would create loops. Servers are required to detect loops that are caused by bindings to collections during the processing of any requests with "Depth: infinity".

11.3. Bindings, and Denial of Service

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Denial of service attacks were already possible by posting URIs that were intended for limited use at heavily used Web sites. The introduction of BIND creates a new avenue for similar denial of service attacks. If cross-server bindings are supported, clients can now create bindings at heavily used sites to target locations that were not designed for heavy usage.

11.4. Private Locations May Be Revealed

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If the DAV:parent-set property is maintained on a resource, the owners of the bindings risk revealing private locations. The directory structures where bindings are located are available to anyone who has access to the DAV:parent-set property on the resource. Moving a binding may reveal its new location to anyone with access to DAV:parent-set on its resource.

11.5. DAV:parent-set and Denial of Service

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If the server maintains the DAV:parent-set property in response to bindings created in other administrative domains, it is exposed to hostile attempts to make it devote resources to adding bindings to the list.

12. Internationalization Considerations

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All internationalization considerations mentioned in Section 19 of [\[RFC4918\]](#) (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.) also apply to this document.

13. IANA Considerations

[TOC](#)

[Section 7 \(Additional Status Codes\)](#) defines the HTTP status codes 208 (Already Reported) and 506 (Loop Detected), to be added to the registry at <http://www.iana.org/assignments/http-status-codes>.

14. Acknowledgements

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15. References

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15.1. Normative References

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[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.
[RFC3986]	Berners-Lee, T. , Fielding, R. , and L. Masinter , " Uniform Resource Identifier (URI): Generic Syntax ," STD 66, RFC 3986, January 2005.
[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.

15.2. Informative References

[TOC](#)

[RFC3253]	Clemm, G. , Amsden, J. , Ellison, T. , Kaler, C. , and J. Whitehead , " Versioning Extensions to WebDAV (Web Distributed Authoring and Versioning) ," 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.
[RFC4122]	Leach, P. , Mealling, M. , and R. Salz , " A Universally Unique Identifier (UUID) URN Namespace ," RFC 4122, July 2005.

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Appendix A. Clarification to RFC2518bis' Usage of the term 'lock root'

[RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 9.10.1 claims:

A LOCK request to an existing resource will create a lock on the resource identified by the Request-URI, provided the resource is not already locked with a conflicting lock. The resource identified in the Request-URI becomes the root of the lock.

This is misleading in that it implies that the "lock root" is the directly locked resource, not the URI through which the lock was requested (see http://www.rfc-editor.org/errata_search.php?eid=1207). As a matter of fact, other parts of the specification use the term "lock-root" to talk about that URI (see [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.), Section 6.1, Item 2, and Section 14.12). With that definition, it becomes clear that a lock affects the resource identified by the Request-URI (plus optionally its descendants), plus the URI through which the lock was requested, but not URIs mapped to that resource due to the existence of additional bindings. A clearer description would be:

A LOCK request to an existing resource will create a lock on the resource identified by the Request-URI, provided the resource is not already locked with a conflicting lock. The Request-URI becomes the "lock-root" of the lock.

Note that this change makes the description consistent with the definition of the DAV:lockroot XML element in Section 14.12 of [RFC4918] (Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)," June 2007.).

Appendix B. Change Log (to be removed by RFC Editor before publication)

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B.1. Since draft-ietf-webdav-bind-02

[TOC](#)

Add and resolve issues "2.3_COPY_SHARED_BINDINGS" and "2.3_MULTIPLE_COPY". Add issue "5.1_LOOP_STATUS" and proposed resolution, but keep it open. Add issues "ED_references" and "4_507_status". Started work on index. Rename document to "Binding

Extensions to Web Distributed Authoring and Versioning (WebDAV)".
Rename "References" to "Normative References". Close issue
"ED_references". Close issue "4_507_status".

B.2. Since draft-ietf-webdav-bind-03

[TOC](#)

Add and close issues "9.2_redirect_loops", "ED_authors" and
"ED_updates". Add section about capability discovery (DAV header).
Close issues "5.1_LOOP_STATUS". Add and resolve new issue
"5.1_506_STATUS_STREAMING". Update XML spec reference. Add issue
"locking" and resolve as invalid.

B.3. Since draft-ietf-webdav-bind-04

[TOC](#)

Add and close issues "6_precondition_binding_allowed" and
"6_lock_behaviour". Add mailing list and issues list pointers to front.

B.4. Since draft-ietf-webdav-bind-05

[TOC](#)

Editorial fixes. Add and resolve issues "1.3_error_negotiation",
"2.5_language" and "7.1.1_add_resource_id". Add historical issue
"4_LOCK_BEHAVIOR" and it's resolution for better tracking.

B.5. Since draft-ietf-webdav-bind-06

[TOC](#)

Rewrite Editorial Note. Open and resolve issues "2.6_identical",
"specify_safeness_and_idempotence" and "ED_rfc2026_ref".

B.6. Since draft-ietf-webdav-bind-07

[TOC](#)

Add more index items (no change tracking). Add and resolve issues
"2.3_copy_to_same", "bind_properties", "bind_vs_ACL", "6_rebind_intro"
and "rfc2396bis" (actually an action item). Fix XML DTD fragment in
section 3.3. Make spelling of "Request-URI" consistent.

B.7. Since draft-ietf-webdav-bind-08

[TOC](#)

Resolved editorial issues raised by Jim Whitehead in <http://lists.w3.org/Archives/Public/w3c-dist-auth/2004OctDec/0129.html>. Add and resolve issues "atomicity", "2_allow_destroy", "2.1_separate_loop_discussion", "2.1.1_bind_loops_vs_locks", "2.3_copy_depth_infinity", "2.3_copy_example", "2.3_copy_vs_loops", "2.6_resource-id_vs_versions", "3.2_example" and "6_rebind_premissions". Add issue "2.6_when_do_ids_change". Re-open and resolve "6_rebind_intro".

B.8. Since draft-ietf-webdav-bind-09

[TOC](#)

Add and resolve issue "6.1_rebind_vs_locks", adding proposed example text. Add action item "3.1_uuids". Close issue "2.6_when_do_ids_change". Add and resolve issues "2.6_bindings_vs_properties" and "uri_draft_ref".

B.9. Since draft-ietf-webdav-bind-10

[TOC](#)

Resolve action item "3.1_uuids". Add and resolve issue "2.7_unlock_vs_bindings". Revisit issue "2.6_bindings_vs_properties", and remove the part of the sentence that speaks about live properties. Update "rfc2396bis" references to "RFC3986". Add issue "9_ns_op_and_acl" and add potential resolution. Align artwork where applicable (new xml2rfc1.29rc2 feature).

B.10. Since draft-ietf-webdav-bind-11

[TOC](#)

Updated [draft-mealling-uuid-urn] to [RFC4122]. Add statement about live properties in Section 2.6.

B.11. Since draft-ietf-webdav-bind-12

[TOC](#)

Updated Author's address. Uppercase "Section" when referring to other documents.

Updating from RFC2518 to RFC2518bis:

- *Remove own explanation of DTD syntax.
- *Remove own definition of precondition/postcondition.
- *Remove reference to broken RFC2518 language about DELETE and UNLOCK.
- *Remove own definition of DAV: request header.
- *Updated "Rationale for Distinguishing Bindings from URI Mappings" to reflect the changes in [draft-ietf-webdav-rfc2518bis], making proposals for more changes so that the issue can be closed (see also http://ietf.cse.ucsc.edu:8080/bugzilla/show_bug.cgi?id=227 and <http://greenbytes.de/tech/webdav/draft-ietf-webdav-rfc2518bis-12.html#rfc.section.5.2>).

B.12. Since draft-ietf-webdav-bind-13

[TOC](#)

Update [draft-ietf-webdav-rfc2518-bis] to draft 14. Update one incorrect section reference. Remove Section "Rationale for Distinguishing Bindings from URI Mappings" as [draft-ietf-webdav-rfc2518-bis] now uses the proper definition of collection state. Examples use application/xml instead of text/xml MIME type. Fix IANA section (there are no IANA considerations).

B.13. Since draft-ietf-webdav-bind-14

[TOC](#)

Update [draft-ietf-webdav-rfc2518-bis] to draft 15. Update [XML] to 4th edition. Markup ASCII art for box recognition (doesn't affect ASCII version). Identify Julian Reschke as Editor.

B.14. Since draft-ietf-webdav-bind-15

[TOC](#)

Fix typo in RFC2119 keywords section (sorry!). Update [draft-ietf-webdav-rfc2518-bis] to draft 17. Add and resolve issue "rfc2518bis-lock-root".

B.15. Since draft-ietf-webdav-bind-16

[TOC](#)

Add and resolve issue "iana-vs-http-status".

B.16. Since draft-ietf-webdav-bind-17

[TOC](#)

Update rfc2518bis reference to draft 18 (note that the bug reported in http://ietf.osafoundation.org:8080/bugzilla/show_bug.cgi?id=251 is still present).

B.17. Since draft-ietf-webdav-bind-18

[TOC](#)

Update: draft-ietf-webdav-rfc2518bis replaced by RFC4918.

B.18. Since draft-ietf-webdav-bind-19

[TOC](#)

Add and resolve issues "2.1.1-bind-loops", "2.1.1-cycles", "2.5-move-creating-cycles", "3.1-clarify-resource-id" and "4-precondition-language".

B.19. Since draft-ietf-webdav-bind-20

[TOC](#)

Use "urn:uuid:" instead of "opaquelocktoken:" scheme in examples.
Replace RFC2518bis issue link by pointer to RFC Errata Page.
Add issues "relation-to-deltav" and "status-codes".

B.20. Since draft-ietf-webdav-bind-21

[TOC](#)

Resolve issues "relation-to-deltav" and "status-codes".
Add correct content length values to examples (no change bars).

[TOC](#)

B.21. Since draft-ietf-webdav-bind-22

Set "Intended Status" to "Experimental".
Update XML reference to "Extensible Markup Language (XML) 1.0 (Fifth Edition)".

B.22. Since draft-ietf-webdav-bind-23

[TOC](#)

Remove surplus white space from one example.
Fix typo: "DAV:binding-set" -> "DAV:parent-set".
Add and resolve issues "clarify-alternate-uri", "def-integrity", "ex-copy-multiple-update", "ex-copy-graph", and "ex-live-property".

B.23. Since draft-ietf-webdav-bind-24

[TOC](#)

Add and resolve issues "clarify-clarify", "sec-cons-references", "should-not-update-4918", "should-update-2616", and "webdav-wg-gone".

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

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

C.1. edit

[TOC](#)

Type: edit
julian.reschke@greenbytes.de (2004-05-30): Umbrella issue for editorial fixes/enhancements.

C.2. should-not-update-4918

[TOC](#)

Type: change
julian.reschke@greenbytes.de (2009-06-04): Based on IESG feedback: should not state that we update a Standards Track document unless we have to.

Resolution (2009-06-04): Boilerplate updated.

C.3. sec-cons-references

[TOC](#)

In Section 11:

Type: edit

kivinen@iki.fi (2009-06-02): Security considerations section refers to the "HTTP/1.1 and the WebDAV Distributed Authoring Protocol specification" and says that all security considerations of them also applies to this document, but it does not give explicit references to the documents containing those security considerations.

Resolution (2009-06-02): Add the references.

C.4. should-update-2616

[TOC](#)

In Section 13:

Type: change

adrian.farrel@huawei.com (2009-06-03):

The referenced IANA registry states:

Values to be added to this name space SHOULD be subject to review in the form of a standards track document within the IETF Applications Area. Any such document SHOULD be traceable through statuses of either 'Obsoletes' or 'Updates' to the Draft Standard for HTTP/1.1.

...I only see "updates 4918". Following the trail... 4918 obsoletes 2518 2518 doesn't update or obsolete anything. So I think you need to add "Updates 2616"

Resolution (2009-06-10): First resolution was: add the clause; but subsequent discussion with the IESG led to the conclusion it doesn't need to. HTTPbis is going to take over the status code registry procedure, and is already working on this issue, see <http://trac.tools.ietf.org/wg/httpbis/trac/ticket/170> (as of this writing, the plan was to remove the requirement for "updates" -- <http://trac.tools.ietf.org/wg/httpbis/trac/changeset/591>, and to issue an erratum to RFC 2817).

C.5. webdav-wg-gone

[TOC](#)

In Section 14:

Type: edit

adrian.farrel@huawei.com (2009-06-03): There is no WebDAV WG (anymore).

Resolution (2009-06-03): Add "concluded".

C.6. clarify-clarify

[TOC](#)

In Section A:

Type: change

julian.reschke@greenbytes.de (2009-06-08): Rephrase this so it becomes clear this is really a clarification making RFC 4918 consistent internally.

Resolution (2009-06-09): Done. Expand the explanation, rephrase the clarification. See also <http://lists.w3.org/Archives/Public/w3c-dist-auth/2009AprJun/0020.html>.

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