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Mounting Web Distributed Authoring and Versioning (WebDAV) Servers

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Abstract

In current Web browsers, there is no uniform way to specify that a user clicking on a link will be presented with an editable view of a Web Distinguished Authoring and Versioning (WebDAV) server. For example, it is frequently desirable to be able to click on a link and have this link open a window that can handle drag-and-drop interaction with the resources of a WebDAV server.

This document specifies a mechanism and a document format that enables WebDAV servers to send "mounting" information to a WebDAV client. The mechanism is designed to work on any platform and with any combination of browser and WebDAV client, relying solely on the well-understood dispatch of documents through their MIME type.

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1. Introduction

By definition, a Web Distributed Authoring and Versioning (WebDAV) server ([RFC2518]) is an HTTP server as well ([RFC2616]). Most WebDAV servers can be (at least partly) operated from an HTML-based user interface in a web browser. However, it is frequently desirable to be able to switch from an HTML-based view to a presentation provided by a native WebDAV client, directly supporting the authoring features defined in WebDAV and related specifications.

This document specifies a platform-neutral mechanism based on the dispatch of documents through their MIME type. For completeness, Appendix A lists other approaches that have been implemented in existing clients.

For example, many educational institutions use WebDAV servers as a mechanism for sharing documents among students. Each student owns a separate collection structure on a WebDAV server, often called his/her "locker". Ideally, when users click on a link in an HTML page provided by the university (perhaps by their university Web portal), an editable view of their locker will appear.

2. Terminology

The terminology used here follows that in the WebDAV Distributed Authoring Protocol specification [RFC2518].

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].

This document uses XML DTD fragments ([XML]) as a purely notational convention. In particular:

- o Element names use the namespace "http://purl.org/NET/webdav/mount". When an XML element type in this namespace is referenced in this document outside of the context of an XML fragment, the string "dm:" will be prefixed to the element name.
- o Element ordering is irrelevant.
- o Extension elements/attributes (elements/attributes not already defined as valid child elements) may be added anywhere, except when explicitly stated otherwise.

3. Format

A WebDAV mount request is encoded in a specific XML format ([XML]) with a well-defined MIME type (see Section 6.1). The MIME type allows user agents to dispatch the content to a handler specific to the system's WebDAV client.

The elements defined below use the namespace "http://purl.org/NET/webdav/mount".

```
<!ELEMENT mount (url, open?, username?) >
```

```
<!ELEMENT url (#PCDATA) >
```

```
<!-- PCDATA value: scheme ":" hier-part, as defined in Section 3 of  
[RFC3986] -->
```

```
<!ELEMENT open (#PCDATA) >
```

```
<!-- PCDATA value: path, as defined in Section 3 of  
[RFC3986] -->
```

```
<!ELEMENT username (#PCDATA) >
```

3.1. dm:mount

The `<dm:mount>` element acts as a container for all the remaining elements defined by this protocol.

3.2. dm:url

The mandatory `<dm:url>` element provides the HTTP URL of the WebDAV collection that should be mounted by the client.

3.3. dm:open

The optional `<dm:open>` element instructs the client to display the specified child collection; its URL is computed by concatenating this element's value with the URL obtained from the `<dm:url>` (Section 3.2) element (see Section 7 for a discussion about why this element only supports displaying collections rather than opening arbitrary documents).

3.4. dm:username

The server can use the optional `<dm:username>` element to specify the name of the currently authenticated principal. A client can use this value to select a matching mount point (different users may have mounted the URL with different credentials under different local mount points) or to provide a meaningful default for authentication against the server. It is common that a browser and WebDAV client do not share HTTP connections, so including this information in the mount document increases usability.

Implementation Note: If a `<dm:username>` element is present, public caching of the document should be disallowed. Thus, appropriate 'Vary' or 'Cache-Control' headers are needed in the server response.

4. Example

In the example below, the client first retrieves a representation of a WebDAV collection using a generic Web browser (1). The returned HTML content contains a hyperlink that identifies the "davmount" document in the format defined in Section 3 (2). The user follows this link (3), which causes the server to return the "davmount" document to the user's browser (4). The browser in turn passes the content to the application that was registered to handle the "application/davmount+xml" MIME type, usually the default WebDAV client on the client's system.

(1) Client retrieves representation of WebDAV collection `"/user42/inbox/`.

```
GET /user42/inbox/ HTTP/1.1
Host: www.example.com
```

(2) Server returns representation.

```
HTTP/1.1 200 OK
Content-Type: text/html
Content-Length: xxx
```

```
..
<a href="?action=davmount">View this collection in your
WebDAV client</a>
..
```

(note that the example shows only that part of the HTML page that contains the relevant link)

(3) Client follows link to `"davmount"` document

```
GET /user42/inbox/?action=davmount HTTP/1.1
Host: www.example.com
```

(4) Server returns `"davmount"` document

```
HTTP/1.1 200 OK
Content-Type: application/davmount+xml
Content-Length: xxx
Cache-Control: private
```

```
<dm:mount xmlns:dm="http://purl.org/NET/webdav/mount">
  <dm:url>http://www.example.com/user42/</dm:url>
  <dm:open>inbox/</dm:open>
</dm:mount>
```

5. Internationalization Considerations

This document does not introduce any new internationalization considerations beyond those discussed in [RFC2518], Section 16.

6. IANA Considerations

6.1. MIME Type Registration

Type name:

application

Subtype name:

davmount+xml

Required parameters:

none

Optional parameters:

"charset": This parameter has identical semantics to the charset parameter of the "application/xml" media type as specified in [RFC3023].

Encoding considerations:

Identical to those of "application/xml" as described in [RFC3023], Section 3.2.

Security considerations:

As defined in this specification. In addition, as this media type uses the "+xml" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification:

This specification.

Applications that use this media type:

SAP Netweaver Knowledge Management, Xythos Drive.

Additional information:

Magic number(s):

As specified for "application/xml" in [RFC3023], Section 3.2.

File extension(s):

.davmount

Fragment identifiers:

As specified for "application/xml" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh file type code(s):

TEXT

Person & email address to contact for further information:

Julian Reschke <julian.reschke@greenbytes.de>

Intended usage:

COMMON

Restrictions on usage:

None.

Author:

Julian Reschke

Change controller:

IESG

7. Security Considerations

All security considerations connected to HTTP/WebDAV and XML apply for this specification as well, namely, [RFC2518] (Section 17) and [RFC3470] (Section 7).

In addition, client implementers must be careful when implementing the <dm:open> element (see Section 3.3). It MUST NOT be used to initiate any action beyond displaying the contents of a WebDAV collection (supporting "opening" documents could be abused to trick a user into letting the operating system's shell execute arbitrary content, possibly running it as an executable program).

The OPTIONAL <dm:username> element defined in Section 3.4 allows the inclusion of user names into mount documents. However in some cases, user name information is considered to be security sensitive. Should this be the case, parties generating mount documents are advised to either not to include user names, or to use access control to restrict access to the information as desired.

8. Acknowledgements

This document has benefited from thoughtful discussion by Emile Baizel, Spencer Dawkins, Lisa Dusseault, Stefan Eissing, Joe Gregorio, Michal Gregor, Russ Housley, Jim Luther, Jaroslav Mazanec, and Jim Whitehead.

9. References

9.1. Normative References

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9.2. 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.
- [WEBARCH] Walsh, N. and I. Jacobs, "Architecture of the World Wide Web, Volume One", W3C REC-webarch-20041215, December 2004, <<http://www.w3.org/TR/2004/REC-webarch-20041215/>>.

Appendix A. Alternative Approaches

A.1. ...Through HTML/CSS Extensions

Microsoft Internet Explorer implements a Cascading Style Sheet (CSS) extension that allows switching to its own WebDAV client ("Webfolder", see <<http://msdn.microsoft.com/workshop/author/behaviors/reference/behaviors/anchor.asp>>). However, at the time of this writing, this extension was not implemented by any other user agent.

A.2. ...Through Custom URI Schemes

The "kio" library of the "K Desktop Environment" (<<http://www.kde.org/>>) uses the URI scheme "webdav" to dispatch to the system's WebDAV client. This URI scheme is not registered, nor is it supported on other platforms. Furthermore, the W3C's "Architecture of the World Wide Web, Volume One" explicitly advises against defining new schemes when existing schemes can be used:

A specification SHOULD reuse an existing URI scheme (rather than create a new one) when it provides the desired properties of identifiers and their relation to resources.

(See [WEBARCH], Section 2.4.)

Appendix B. Implementations

B.1. Example Implementation for Webfolder Client

The figure below shows a sample implementation of a dispatcher for the application/davmount+xml datatype, suited for Win32 systems and the Microsoft "Webfolder" client.

```
// sample implementation of application/davmount+xml
// dispatcher for Windows Webfolder client
//
// to install/uninstall:
//      wscript davmount.js
//
// to open the webfolder:
//      wscript davmount.js filename
// (where filename refers to an XML document with MIME type
// application/davmount+xml)

var EXTENSION = ".davmount";
var MIMETYPE = "application/davmount+xml";
var REGKW = "WebDAV.mount";
```

```
var NS = "xmlns:m='http://purl.org/NET/webdav/mount";

// remove keys/entries from the registry

function regdel(shell, key) {
    try {
        var x = shell.RegRead(key);
        try {
            shell.RegDelete(key);
        }
        catch(e) {
            WScript.Echo("Error removing key " + key + ": " + e);
        }
    }
    catch(e) {
        // entry not present
    }
}

// methods for registering/unregistering the handler

function install() {

    var WshShell = new ActiveXObject("WScript.Shell");
    if (WshShell == null) {
        WScript.Echo("Couldn't instantiate WScript.Shell object");
        return 2;
    }

    var fso = new ActiveXObject("Scripting.FileSystemObject");

    var RegExt = "HKCR\\" + EXTENSION + "\\";
    var RegMimeType = "HKCR\\MIME\\DataBase\\Content Type\\"
        + MIMETYPE + "\\";
    var RegKw = "HKCR\\" + REGKW + "\\";

    var extension = null;
    try {
        extension = WshShell.RegRead(RegMimeType + "Extension");
    }
    catch (e) {
    }

    if (extension == null) {
        var but = WshShell.popup("Install the dispatcher for mime type "
            + MIMETYPE + "?", 0, MIMETYPE + " installation", 4);
    }
}
```

```
if (but == 6) {
    try {
        WshShell.RegWrite(RegExt, REGKW);
        WshShell.RegWrite(RegExt + "Content Type", MIMETYPE);
        WshShell.RegWrite(RegMimeType + "Extension", EXTENSION);
        WshShell.RegWrite(RegKw, "WebDAV Mount Request");
        WshShell.RegWrite(RegKw + "DefaultIcon\\",
            "shell32.dll,103");
        var path = fso.getAbsolutePathName("davmount.js");
        WshShell.RegWrite(RegKw + "shell\\open\\command\\",
            "%SystemRoot%\\system32\\wscript.exe /nologo \""
            + path + "\" \"%1\"", "REG_EXPAND_SZ");
    }
    catch (e) {
        WScript.Echo("Error writing to registry");
        return 1;
    }

    return 0;
}
else {
    return 1;
}
}
else {
    var but = WshShell.popup("Remove the dispatcher for mime type "
        + MIMETYPE + "?", 0, MIMETYPE + " installation", 4);

    if (but == 6) {
        regdel(WshShell, RegExt + "Content Type");
        regdel(WshShell, RegExt);
        regdel(WshShell, RegKw + "shell\\open\\command\\");
        regdel(WshShell, RegKw + "DefaultIcon\\");
        regdel(WshShell, RegKw);
        regdel(WshShell, RegMimeType + "Extension");
        regdel(WshShell, RegMimeType);
        return 0;
    }
    else {
        return 1;
    }
}
}

if (WScript.Arguments.length == 0) {
    // install/uninstall
    WScript.Quit(install());
}
```

```
}
else {
    // try to invoke Webfolder

    var inp = new ActiveXObject("MSXML2.DOMDocument");
    var furi = encodeURI(WScript.Arguments(0));
    if (! inp.load(furi)) {
        WScript.Echo("Can't read from '"
            + WScript.Arguments(0) + "'!");
        WScript.Quit(2);
    }

    inp.setProperty("SelectionLanguage", "XPath");
    inp.setProperty("SelectionNamespaces",
        "xmlns:m='http://purl.org/NET/webdav/mount'");

    var n1 = inp.selectSingleNode("/m:mount/m:url");
    var n2 = inp.selectSingleNode("/m:mount/m:open");

    if (n1 == null) {
        WScript.Echo("<url> element missing.");
        WScript.Quit(2);
    }

    var ie = new ActiveXObject("InternetExplorer.Application");

    ie.Navigate("about:blank");
    var doc = ie.Document;

    var folder = doc.createElement("span");
    folder.addBehavior("#default#httpFolder");

    var result = folder.navigate(n1.text +
        (n2 == null ? "" : n2.text));

    // close the window again when there was no <open> element
    if (n2 == null) ie.Quit();

    if (result != "OK") {
        if (result == "PROTOCOL_NOT_SUPPORTED") {
            WScript.Echo("This site doesn't seem to support WebDAV.");
            WScript.Quit(1);
        }
        else {
            WScript.Echo("Unexpected status: " + result);
            WScript.Quit(2);
        }
    }
}
```

}

B.2. Xythos

The "Xythos Drive" WebDAV client for WebDAV supports this specification starting with version 4.4.

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