[MS-XWDSTRUCTDOC]:
Web Distributed Authoring and Versioning (WebDAV) Extensions for Structured Documents

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Revision Summary

Date	Revision History	Revision Class	Comments
12/03/2008	1.0		Initial Release.
04/10/2009	2.0		Deprecated for Exchange 2010.
07/15/2009	3.0	Major	Changes made for template compliance.
11/04/2009	3.1.0	Minor	Updated the technical content.
02/10/2010	4.0.0	Major	Updated and revised the technical content.
05/05/2010	4.0.1	Editorial	Revised and edited the technical content.
08/04/2010	4.0.1	No change	No changes to the meaning, language, or formatting of the technical content.
11/03/2010	4.0.1	No change	No changes to the meaning, language, or formatting of the technical content.

Contents

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1   Introduction

This document specifies extensions to the Web Distributed Authoring and Versioning (WebDAV) protocol [RFC2518] to allow for creation and manipulation of **structured documents**. This protocol allows clients to retrieve, insert, change, and remove individual pieces of structured documents on the server.

1.1   Glossary

The following terms are defined in [MS-OXGLOS]:

> **folder**
> **Uniform Resource Identifier (URI)**

The following terms are specific to this document:

> **entity tag:** Used to compare two or more entities from the same requested resource, as described in [RFC2616].

> **structured document:** A document that is internally composed of multiple streams that specify data for individual pieces of the document, such as style information, images, or embedded objects. Allows the pieces to be individually addressed and manipulated.

> **MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as described in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2   References

1.2.1   Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.

[MS-OXCDATA] Microsoft Corporation, "Data Structures", April 2008.

[MS-OXPROPS] Microsoft Corporation, "Exchange Server Protocols Master Property List", April 2008.

[MS-WDVSE] Microsoft Corporation, "Web Distributed Authoring and Versioning (WebDAV) Protocol: Server Extensions", September 2007, http://msdn.microsoft.com/en-us/library/cc250200.aspx

[MS-XWDEXT] Microsoft Corporation, "Web Distributed Authoring and Versioning (WebDAV) Core Extensions", April 2009.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, http://www.ietf.org/rfc/rfc2119.txt

[RFC2518] Goland Y., Whitehead, E., Faizi, A., et al., "HTTP Extensions for Distributed Authoring -- WEBDAV", RFC 2518, February 1999, http://www.ietf.org/rfc/rfc2518.txt

[RFC2616] Fielding, R., Gettys, J., Mogul, J., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999, http://www.ietf.org/rfc/rfc2616.txt

[RFC2818] Rescorla, E., "HTTP Over TLS", RFC 2818, May 2000, http://www.ietf.org/rfc/rfc2818.txt

1.2.2   Informative References

[MS-OXGLOS] Microsoft Corporation, "Exchange Server Protocols Master Glossary", April 2008.

[MSDN-STS] Microsoft Corporation, "About Structured Storage", http://msdn.microsoft.com/en-us/library/aa378734.aspx

1.3   Overview

This protocol allows servers to implement structured storage and make structured documents available to WebDAV clients. This protocol also allows clients to create and manipulate structured documents. For more information about structured storage, see [MSDN-STS].

This protocol specifies the following extensions to [RFC2518]:

- A property to indicate the default document within a structured document.

- A new value for PidNameDavResourceType that indicates that a resource is a structured document.

- A new value for PidNameContentClass that indicates that a resource is a structured document.

- Extensions to the **PROPFIND**, **SEARCH**, **GET**, **PUT**, **MKCOL** and **MOVE** methods to work with structured documents.

1.4   Relationship to Other Protocols

This protocol relies on [MS-XWDEXT], [RFC2518] and [RFC2616]. It also relies on [RFC2818] for data protection services.

All properties are listed in [MS-OXPROPS] and are formatted as specified in [MS-OXCDATA] for use with WebDAV.

1.5   Prerequisites/Preconditions

This specification requires a WebDAV server as specified in [RFC2518]. This specification also requires that WebDAV clients have a **URL** that points to the WebDAV server.

1.6   Applicability Statement

This protocol can be used to create and manipulate structured documents on a WebDAV server. It can also be used to retrieve and manipulate individual pieces of a structured document without transferring and processing the entire document.

1.7   Versioning and Capability Negotiation

None.

1.8   Vendor-Extensible Fields

None.

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1.9   Standards Assignments

None.

2   Messages

2.1   Transport

This protocol specifies extensions to, and uses the same transport mechanisms as, [RFC2518].

2.2   Message Syntax

2.2.1   Properties

2.2.1.1   PidTagTemporaryDefaultDocument

DAV Property name: DAV:defaultdocument

Data type: **PtypString**

This property indicates the relative **URI** of the default document contained in the structured document. The URI MUST be relative to the structured document. Clients can use this property to retrieve or set the default document URI. For more information, see [MS-OXPROPS] section 2.1165.

2.2.1.2   PidNameDavResourceType

This protocol specifies a new value for PidNameDavResourceType ([MS-OXPROPS] section 2.447). This value is "<DAV:structureddocument/>". If this value is present in the PidNameDavResourceType property on a **resource**, then that resource is a structured document.

2.2.1.3   PidNameContentClass

This protocol specifies a new value for PidNameContentClass ([MS-OXPROPS] section 2.432). This value is "urn:content-classes:structureddocument". If PidNameContentClass is set to this value on a resource, then that resource is a structured document.

3   Protocol Details

3.1   Client Details

3.1.1   Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

3.1.2   Timers

None.

3.1.3   Initialization

None.

3.1.4   Higher-Layer Triggered Events

None.

3.1.5   Message Processing Events and Sequencing Rules

The following sections specify extensions to the existing WebDAV methods specified in [RFC2518]. These methods MUST be processed as specified in [RFC2518] except for the cases specified below.

3.1.5.1   PidTagTemporaryDefaultDocument

Clients SHOULD set this property when sending a **MKCOL** request to the server to create a structured document. Clients MUST set this property when sending a **PROPPATCH** request to the server to change the default document of a structured document.

3.1.5.2   PidNameDavResourceType

Clients MUST set this property to "<DAV:structureddocument/>" when sending a **MKCOL** request to the server to create a structured document.

3.1.5.3   PidNameContentClass

Clients SHOULD set this property to "urn:content-classes:structureddocument" when sending a **MKCOL** request to the server to create a structured document.

3.1.5.4   MKCOL Method

Clients MUST include an XML body with a **propertyupdate** element, as specified in [RFC2518]. The **propertyupdate** element MUST contain a value for PidNameDavResourceType, and SHOULD contain values for PidTagTemporaryDefaultDocument and PidNameContentClass as specified above.

3.1.5.5 GET Method

Clients MUST use an URI consisting of the URI of the structured document appended with the relative URI of a contained resourc to request the contents of the contained resource using the **GET** method.

3.1.5.6 PUT Method

The client MUST use an URI consisting of the URI of the structured document appended with the relative URI of a contained resource with the **PUT** method to add resources to the structured document.

3.1.5.7 MOVE Method

If the client attempts to use the **MOVE** method to move the default document of a structured document, the server will respond with the error specified in 3.2.5.9.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

3.2.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

None.

3.2.5 Message Processing Events and Sequencing Rules

The following sections specify extensions to the existing WebDAV methods specified in [RFC2518]. These methods MUST be processed as specified in [RFC2518] except for the cases specified below.

3.2.5.1 PidTagTemporaryDefaultDocument

Servers MUST return the relative URI of the default document in response to a **PROPFIND** request for this property. If the server receives a **MKCOL** request with PidTagTemporaryDefaultDocument set, then it MUST create a structured document and set the default document to the value of PidTagTemporaryDefaultDocument. Note that the request MUST also have the proper value of PidNameDavResourceType, as specified in sections 3.2.5.2.

If the server receives a **PROPPATCH** or **PUT** request with PidTagTemporaryDefaultDocument set, then it MUST update the default document to the value of PidTagTemporaryDefaultDocument.

3.2.5.2 PidNameDavResourceType

If the server receives a **MKCOL** request with PidNameDavResourceType containing "<DAV:structureddocument/>" then it MUST create a structured document.

The server MUST ensure that the value "<DAV:collection/>" is added to the value of PidNameDavResourceType on structured documents. This value is optional in the **MKCOL** request.

3.2.5.3 PidNameContentClass

If the server receives a **MKCOL** request with PidNameContentClass set to "urn:content-classes:structureddocument", then it MUST create a structured document. Note that the request MUST also have the proper value of PidNameDavResourceType as specified in section 3.2.5.2.

3.2.5.4 MKCOL Method

If the server receives a **MKCOL** request to create a structured document, then PidNameDavResourceType MUST be set as specified in section 3.2.5.2, and PidTagTemporaryDefaultDocument and PidNameContentClass SHOULD be set as specified in sections 3.2.5.1 and 3.2.5.3.

3.2.5.5 PROPFIND Method

If the server receives a **PROPFIND** request for the URI of a structured document with a **Depth** header ([RFC2518] section 9.2) specified with a valid value, then the server MUST ignore the value of the **Depth** header and treat the request as if the **Depth** header is set to 0. Only properties of the structured document are returned, and properties of the contained resources are omitted.

3.2.5.6 SEARCH Method

If the server receives a **SEARCH** request for the URI of a structured document, then the server MUST return a 400 Bad Request response.

If the server receives a **SEARCH** request for the URI of a **folder** on the server that contains a structured document, then the server MUST NOT include resources contained inside the structured document. The server MUST return the structured document itself if appropriate.

3.2.5.7 GET Method

If the server receives a **GET** request for the URI of a resource contained within a structured document, then the server MUST return the contents of the contained resource.

3.2.5.8 PUT Method

If the server receives a **PUT** request for the URI of a resource contained within a structured document, then the server MUST update the **entity tag** of the parent structured document.

3.2.5.9 MOVE Method

If the server receives a **MOVE** request for the URI of the default document of a structured document, then it MUST NOT perform the MOVE and MUST return a 501 Not Implemented response.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

4 Protocol Examples

4.1 Creating a Structured Document

A user is using a WebDAV client to access the server. The user wishes to create a structured document called MyDocCol and add two resources, default.txt and other.txt, to the structured document.

The client begins by creating a **MKCOL** request to create the structured document.

```
MKCOL /public/Testing/MyDocCol HTTP/1.1
Content-Type: text/xml

<?xml version="1.0"?>
<a:propertyupdate xmlns:a="DAV:">
  <a:set>
  <a:prop>
    <a:resourcetype><a:structureddocument/></a:resourcetype>
    <a:defaultdocument>default.txt</a:defaultdocument>
    <a:contentclass>urn:content-classes:structureddocument</a:contentclass>
  </a:prop>
  </a:set>
</a:propertyupdate>
```

The server processes the request and successfully creates the structured document.

```
HTTP/1.1 207 Multi-Status
Date: Tue, 04 Nov 2008 16:33:36 GMT
Content-Type: text/xml
Content-Length: 300

<?xml version="1.0" ?>
<a:multistatus xmlns:a="DAV:">
  <a:response>
    <a:href>http://ex01/public/Testing/MyDocCol</a:href>
    <a:status>HTTP/1.1 201 Created</a:status>
    <a:propstat>
      <a:status>HTTP/1.1 200 OK</a:status>
      <a:prop>
        <a:defaultdocument />
        <a:contentclass />
      </a:prop>
    </a:propstat>
  </a:response>
</a:multistatus>
```

Next, the client creates a **PUT** request to insert the contents of default.txt.

```
PUT /public/Testing/MyDocCol/default.txt HTTP/1.1
Content-Type: text/plain

This is the contents of default.txt.
```

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The server processes the request and successfully adds the content.

```
HTTP/1.1 201 Created
Date: Tue, 04 Nov 2008 16:34:14 GMT
Content-Type: text/html
Content-Length: 85
Allow: OPTIONS, TRACE, GET, HEAD, DELETE, PUT, COPY, MOVE, PROPFIND, PROPPATCH, SEARCH,
SUBSCRIBE, UNSUBSCRIBE, POLL, BDELETE, BCOPY, BMOVE, BPROPPATCH, BPROPFIND, LOCK, UNLOCK
GetETag: "4089bc4932289941ad27bacc5f89e8a90021a560f30e"

<body><h1>/public/Testing/MyDocCol/default.txt was created successfully</h1></body>
```

Next the client creates a **PUT** request to insert the contents of other.txt.

```
PUT /public/Testing/MyDocCol/other.txt HTTP/1.1
Content-Type: text/plain

This is the contents of other.txt.
```

The server processes the request and successfully adds the content.

```
HTTP/1.1 201 Created
Date: Tue, 04 Nov 2008 16:34:55 GMT
Content-Type: text/html
Content-Length: 83
Allow: OPTIONS, TRACE, GET, HEAD, DELETE, PUT, COPY, MOVE, PROPFIND, PROPPATCH, SEARCH,
SUBSCRIBE, UNSUBSCRIBE, POLL, BDELETE, BCOPY, BMOVE, BPROPPATCH, BPROPFIND, LOCK, UNLOCK
GetETag: "4089bc4932289941ad27bacc5f89e8a90021a560f310"

<body><h1>/public/Testing/MyDocCol/other.txt was created successfully</h1></body>
```

4.2   Retrieving Content of a Contained Resource

The user wishes to retrieve the content of default.txt from MyDocCol.

The client creates a **GET** request with the URI of default.txt.

```
GET /public/Testing/MyDocCol/default.txt HTTP/1.1
Translate: f
```

The server processes the request and returns the contents of other.txt.

```
HTTP/1.1 200 OK
Date: Tue, 04 Nov 2008 16:35:51 GMT
Content-Type: text/plain; charset="iso-8859-1"
Content-Length: 36
ETag: "4089bc4932289941ad27bacc5f89e8a90021a560f311"
Last-Modified: Tue, 04 Nov 2008 16:34:55 GMT
Accept-Ranges: bytes
This is the contents of default.txt.
```

5   Security

5.1   Security Considerations for Implementers

There are no special security concerns specific to the WebDAV Extensions for Structured Documents protocol. General security considerations pertaining to the underlying transport apply, as specified in [RFC2518] and [MS-WDVSE].

5.2   Index of Security Parameters

None.

6   Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products:

- Microsoft® Exchange Server 2003

- Microsoft® Exchange Server 2007

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that product does not follow the prescription.

7 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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