WEBDAV Working Group
INTERNET DRAFT
<draft-ietf-webdav-dublin-core-01>
Expires December, 1999

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June 8, 1999

Use of Dublin Core Metadata in WebDAV

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2 Abstract

This document specifies a mapping for using the metadata vocabulary of Dublin Core ([DUBLIN]) in a WebDAV ([WEBDAV]) server.

3 Introduction

This document specifies a mapping for using the metadata vocabulary of Dublin Core ([DUBLIN]) in a WebDAV ([WEBDAV]) server.

WebDAV defines a protocol for manipulating metadata on a Web resource; in WebDAV, an element of metadata is called a property. Dublin Core defines several metadata elements, with standard names and standard meanings. A server which stores Dublin Core metadata for its content may wish to make the metadata available as WebDAV properties; to forestall the emergence of incompatible ways to provide this functionality, this document defines a mapping from Dublin Core element labels into WebDAV property names.

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

4 Mapping

The approach taken in this mapping is to leverage the RDF encoding

([DC-RDF]) of Dublin Core. An [RDF] document encoding Dublin Core data would look something like this:

```
<?xml version="1.0"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://purl.org/dc/elements/1.0/"
xmlns:dcq="http://purl.org/dc/qualifiers/1.0/">
<rdf:Description about="http://www.ietf.org/rfc/rfc822.txt">
<dc:creator>
<rdf:Description>
<rdf:value>Crocker, David</rdf:value>
<dcq:creatorType
rdf:resource="http://purl.org/dc/schema/LastnameFirstname#"/>
</rdf:Description>
</dc:creator>
</rdf:Description>
</rdf:RDF>
```

The mapping defined here works by identifying each subelement of <rdf:Description> with a single WebDAV property. Since WebDAV properties are expressed as XML elements ([XML]), using XML namespaces ([XMLNS]) allow different groups to define sets of properties without interfering with each other, the mapping is direct and one-to-one. In this case, the namespaces being used are <URI:http://purl.org/dc/elements/1.0/>, <URI:http://purl.org/dc/qualifiers/1.0/>, and <URI:http://www.w3.org/1999/02/22-rdf-syntax-ns#>, as specified in [RDF] and [DC-RDF]. To obtain the Dublin Core creator for the resource <http://www.ietf.org/rfc/rfc822.txt>, a WebDAV client would issue a PROPFIND method to the resource, requesting the dc:creator property:

```
PROPFIND /rfc/rfc822.txt HTTP/1.1
Host: www.ietf.org
Content-type: text/xml; charset="utf-8"
Content-Length: xxxx

<?xml version="1.0" encoding="utf-8" ?>
<D:propfind xmlns:D="DAV:">
<D:prop xmlns:dc="http://purl.org/dc/elements/1.0/">
<dc:creator/>
</D:prop>
</D:propfind>
```

The response to the request would provide the <dc:creator> element, and all its contents, just as in the RDF document above.

4.1 Correspondences

The following table illustrates the relationship between [DUBLIN] element names and [WEBDAV] property names. The dc: prefix is assumed to be mapped to the namespace http://purl.org/dc/elements/1.0/.

Dublin Core element	WebDAV property
DC.Title	dc:title
DC.Creator	dc:creator
DC.Subject	dc:subject
DC.Description	dc:description
DC.Publisher	dc:publisher
DC.Contributor	dc:contributor
DC.Date	dc:date
DC.Type	dc:type
DC.Format	dc:format
DC.Identifier	dc:identifier
DC.Source	dc:source
DC.Language	dc:language
DC.Relation	dc:relation
DC.Coverage	dc:coverage
DC.Rights	dc:rights

4.2 Abbreviated Syntax

The Abbreviated Syntax of [DC-RDF] MUST NOT be used in this encoding, since it requires packing separate properties into a single XML element, which is incompatible with the DAV property model.

4.3 Complications

A previous version of this document had some difficulties with advanced sections of the Dublin Core model. This version addresses these problems, but it may be useful to enumerate them for future reference.

4.3.1 Multivalued Properties

A WebDAV property can occur on a resource only once, while a content item may bear more than one instance of a Dublin Core element. The previous document defined an ad hoc XML syntax for listing multiple values, which drew criticism from people who wanted more general multivalued property support for WebDAV. This document is able to sidestep the problem because Dublin Core now has its own solution, and it is not necessary to create a new one. In the above example, if RFC-822 had multiple authors, the <dc:creator> element might contain an <rdf:Bag> element containing <rdf:li> elements.

4.3.2 Qualification (Subelements)

When the previous document was written, some members of the Dublin Core group had plans to support more structure in their metadata, but had not yet defined a syntax for it. At this time, the debate over subelements is still not fully resolved, but the syntax in the RDF encding has been established: to add extra data on a dc: element, one nests a dcq: element within it, as a qualifier, as in the <dcq:creatorType> element in the RDF example above.

5 Examples

The examples in this section are based on Example 14 of [DC-RDF], showing how [WEBDAV] would be used to set and get the properties presented there. (Note that non-ASCII characters in Example 14 have been elided for the sake of the ASCII Internet-Draft format.)

5.1 Set with PROPPATCH

5.1.1 Request

```
PROPPATCH /metadata/resources/dc/datamodel/WD-dc-rdf/ HTTP/1.1
Host: www.ukoln.ac.uk
Content-type: text/xml
Content-length: xxxx

<?xml version="1.0"?>
<D:propertyupdate
xmlns:D="DAV:"
xmlns:dc="http://purl.org/dc/elements/1.0/"
>
<D:set>
<D:prop>
<rdf:Description
rdf:about="http://www.ukoln.ac.uk/metadata/resources/dc/datamodel/
WD-dc-rdf/">
<dc:title>
<rdf:Alt>
<rdf:li xml:lang="en">Guidance on expressing the Dublin Core
within the Resource Description Framework (RDF)</rdf:li>
<rdf:li xml:lang="no">Veiledning a uttrykke Dublin Core innenfor
rammen av Resource Description Framework (RDF)</rdf:li>
<rdf:li xml:lang="de">Dublin Core in RDF: Eine Anleitung</rdf:li>
</rdf:Alt>
</dc:title>
<dc:creator>
<rdf:Bag>
<rdf:li>Eric Miller</rdf:li>
<rdf:li>Paul Miller</rdf:li>
<rdf:li>Dan Brickley</rdf:li>
</rdf:Bag>
</dc:creator>
<dc:description>
<rdf:Alt>
<rdf:li xml:lang="en">This document describes work carried out by
the Data Model Working Group of the Dublin Core Metadata
Initiative. Specifically, the document discusses means by which
the fifteen elements of the Dublin Core (as defined in RFC 2413)
may be expressed using the Resource Description Framework (RDF)
and encoded with the eXtensible Markup Language (XML). RDF-based
mechanisms by which the 15 elements may be qualified are also
introduced.</rdf:li>
<rdf:li xml:lang="no">Dette dokumentet beskriver arbeide utfort av
```

```
      arbeidsgruppen for datamodellering knyttet til Dublin
      Core-initiativet. Spesifikt diskuterer dokumentet hvordan de
      femten elementene i Dublin Core (slik disse er definert i RFC
      2413) kan uttrykkes ved hjelp av Resource Description Framework
      (RDF) og kodes ved hjelp av eXtensible Markup Language (XML).
      Videre introduseres RDF-baserte mekanismer for a kvalifisere de 15
      elementene.</rdf:li>
      </rdf:Alt>
      </dc:description>
      <dc:subject> Dublin Core; Resource Description Framework; RDF;
      eXtensible
      Markup Language; XML </dc:subject>
      <dc:publisher> Dublin Core Metadata Initiative </dc:publisher>
      <dc:contributor> Dublin Core Data Model Working Group
      </dc:contributor>
      <dc:date>
      <rdf:Description>
      <dcq:dateScheme> WTN8601 </dcq:dateScheme>
      <rdf:value> 1999-05-26 </rdf:value>
      </rdf:Description>
      </dc:date>
      <dc:format>
      <rdf:Description>
      <dcq:formatScheme> IMT </dcq:formatScheme>
      <rdf:value> text/html </rdf:value>
      </rdf:Description>
      </dc:format>
      <dc:language>
      <rdf:Description>
      <dcq:languageScheme> RFC1766 </dcq:languageScheme>
      <rdf:value> en </rdf:value>
      </rdf:Description>
      </dc:language>
      </rdf:Description>
      <D:/prop>
      <D:/set>
      </D:propertyupdate>
```

5.1.2 Response

```
      HTTP/1.1 200 OK
```

5.2 Retrieving a single Dublin Core property with PROPFIND

This example shows how to fetch the DC.Title property.

5.2.1 Request

```
      PROPFIND /metadata/resources/dc/datamodel/WD-dc-rdf/ HTTP/1.1
      Host: www.ukoln.ac.uk Content-type: text/xml; charset="utf-8"
      Content-Length: xxxx

      <?xml version="1.0" encoding="utf-8" ?>
```

```
      <D:propfind xmlns:D="DAV:">
      <D:prop xmlns:dc="http://purl.org/dc/elements/1.0/">
      <dc:title/>
      </D:prop>
      </D:propfind>
```

5.2.2 Response

```
      HTTP/1.0 200 OK
      Content-Type: text/xml
      Content-Length: xxxx

      <?xml version="1.0" ?>
      <D:propstat
      xmlns:D="DAV:"
      xmlns:dc="http://purl.org/dc/elements/1.0/"
      >
      <prop>
      <dc:title>
      <rdf:Alt>
      <rdf:li xml:lang="en">Guidance on expressing the Dublin Core
      within the Resource
      Description Framework (RDF)</rdf:li>
      <rdf:li xml:lang="no">Veiledning a uttrykke Dublin Core
      innenfor rammen av
      Resource Description Framework (RDF)</rdf:li>
      <rdf:li xml:lang="de">Dublin Core in RDF: Eine Anleitung</rdf:li>
      </rdf:Alt>
      </dc:title>
      </prop>
      </propstat>
```

5.3 Retrieving multiple Dublin Core properties with PROPFIND

This example shows how to fetch the DC.Title, DC.Creator, and DC.Publisher properties in a single request.

5.3.1 Request

```
      PROPFIND /metadata/resources/dc/datamodel/WD-dc-rdf/ HTTP/1.1
      Host: www.ukoln.ac.uk Content-type: text/xml; charset="utf-8"
      Content-Length: xxxx

      <?xml version="1.0" encoding="utf-8" ?>
      <D:propfind xmlns:D="DAV:">
      <D:prop xmlns:dc="http://purl.org/dc/elements/1.0/">
      <dc:title/>
      <dc:creator/>
      <dc:publisher/>
      </D:prop>
      </D:propfind>
```

5.3.2 Response

```
HTTP/1.0 200 OK
Content-Type: text/xml
Content-Length: xxxx

<?xml version="1.0" ?>
<D:propstat
xmlns:D="DAV:"
xmlns:dc="http://purl.org/dc/elements/1.0/"
>
<prop>
<dc:title>
<rdf:Alt>
<rdf:li xml:lang="en">Guidance on expressing the Dublin Core
within the Resource
Description Framework (RDF)</rdf:li>
<rdf:li xml:lang="no">Veiledning a uttrykke Dublin Core
innenfor rammen av
Resource Description Framework (RDF)</rdf:li>
<rdf:li xml:lang="de">Dublin Core in RDF: Eine Anleitung</rdf:li>
</rdf:Alt>
</dc:title>

<dc:creator>
<rdf:Bag>
<rdf:li>Eric Miller</rdf:li>
<rdf:li>Paul Miller</rdf:li>
<rdf:li>Dan Brickley</rdf:li>
</rdf:Bag>
</dc:creator>

<dc:publisher> Dublin Core Metadata Initiative </dc:publisher>
</prop>
</propstat>
```

6 Internationalization Considerations

XML is an inherently internationalizable format, able to express any language or character set; as a result, all WebDAV properties, including the Dublin Core properties defined here, are internationalizable.

7 Security Considerations

The security considerations of this mapping are those of [DUBLIN] plus those of [WEBDAV].

8 IANA Considerations

The namespace defined here is isomorphic to the element namespace defined in [DUBLIN], so this document introduces no new IANA considerations beyond those of [DUBLIN].

9 Copyright

10 Intellectual Property

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights which may cover technology that may be required to practice this standard. Please address the information to the IETF Executive Director.

11 Acknowledgements

The triviality of this specification is due to the hard work put into [WEBDAV], [DUBLIN], [XML], and [XMLNS] by their respective authors and working groups.

The need for this specification was pointed out (by Jim Whitehead, I think) during the variants discussion held after a meeting of the versioning design team of the WebDAV working group.

Thanks to Liz Parrot for alerting me to the question of subelements.

Thanks to Paul Miller for clarifying to me how [DC-RDF] handles multivalued properties.

12 References

12.1 Normative References

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12.2 Informational References

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