

Folder data object specification

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1. Scope

The **folder** data object is presented in this document. The content-specific aspects of synchronization (filtering keywords, etc...) are listed and clarified.

2. References

2.1 Normative References

[DSDEVDTD] "OMA DS Device Information DTD", Open Mobile AllianceTM, "OMA-SUP-DS-DevInf-DTD-V1 2",

URL:http://www.openmobilealliance.org

[DSREPU] "SyncML Representation Protocol, Data Synchronization Usage", Open Mobile AllianceTM, "OMA-TS-

DS_DataSyncRep-V1_2", URL:http://www.openmobilealliance.org

[ISO 8601] ISO 8601, "Data elements and interchange formats- Information interchange--Representation of dates and

times", International Organization for Standardization, June, 1988.

[RFC2045] "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", N. Freed

& N. Borenstein, November 1966, URL:http://www.ietf.org/rfc/rfc2045.txt

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997.

URL:http://www.ietf.org/rfc/rfc2119.txt

[RFC2234] "Augmented BNF for Syntax Specifications: ABNF", D. Crocker, Ed., P. Overell,

November 1997, URL:http://www.ietf.org/rfc/rfc2234.txt

[WBXML] "WAP Binary XML Content Format Specification." WAP Forum.

URL:http://www1.wapforum.org/tech/terms.asp?doc=WAP-192-WBXML-20010725-a.pdf

[XML] "Extensible Markup Language (XML) 1.0", World Wide Web Consortium Recommendation,

URL:http://www.w3.org/TR/REC-xml

2.2 Informative References

none

3. Terminology and Conventions

3.1 Conventions

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].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Data type

The schema used to represent a data object (e.g., text/calendar MIME content type for an iCalendar representation of calendar information or text/directory MIME content type for a vCard representation of contact information).

3.3 Abbreviations

OMA Open Mobile Alliance

4. Introduction

The folder data objects can be used to organize objects such as email, file, other folder objects, etc. in a hierarchical manner.

5. XML Usage

The **folder** objects are represented in a mark-up language defined by [XML]. The **folder** is an XML application. The **folder** DTD (Document Type Definition) defines the XML document type used to represent a **folder** object. The **folder** DTD can be found in Section 8.7, but it is not necessary to read the DTD in order to understand it.

Folder objects are specified using well-formed XML. However, the **folder** need not be valid XML. That is, the **folder** objects do not need to specify the XML declaration or prolog. They only need to specify the body of the XML document. This restriction allows for the **folder** objects to be specified with greater terseness than well-formed, valid XML documents.

5.1 Including folder object in other XML documents

When using the **folder** object as content of another XML document element the mark-up characters MUST be properly escaped or the CDATA sections MUST be used. See [XML]specification for details on character escaping and usage of CDATA sections. See section 10.3 of this document for an example.

5.2 XML Namespaces

Folder objects to date have no elements that may include elements of the other namespaces.

5.3 XML Attributes

In order to simplify the implementation of the **folder** objects in small devices, the **folder** objects have been intentionally designed to use the XML elements only. Currently no XML attributes are being defined for **folder** objects.

5.4 WBXML

XML can be viewed as more verbose than alternative binary representations. This is often cited as a reason why it may not be appropriate for low bandwidth network protocols. In most cases, **folder** uses shortened element type. This provides a minor reduction in verbosity.

Additionally, the **folder** objects can be encoded in a tokenized, binary format defined by [WBXML]. The use of [WBXML] format is external to specification of the **folder** and should be transparent to any application. The combination of the use of shortened element type names and an alternative binary format makes **folder** object competitive, from a compressed format perspective, with alternative, but private, binary representations.

6. MIME Usage

The [RFC2045] Internet standard provides an industry-accepted mechanism for identifying different content types. The **folder** object is identified by a MIME media type. The application/vnd.omads-folder+xml MIME content type MUST be used to indicate the **folder** object wherever such indication is required.

7. Data types

The following basic data type definitions are provided for referencing from other parts of this document.

7.1 datetime

Usage: This value type is used to identify values that specify a precise calendar date and time of day.

Description:

The *datetime* data type is used to identify values that contain a precise calendar date and time of day. The format is based on the [ISO 8601] complete representation, basic format for a calendar date and time of day. The text format is a concatenation of the "date", followed by the LATIN CAPITAL LETTER T character (US-ASCII decimal 84) time designator, followed by the "time" format.

The *datetime* data type expresses time values in two forms:

The form of date and time with UTC offset MUST NOT be used. For example, the following is not valid for a date-time value:

```
... <datefield>19980119T230000-0800</datefield> <!-- Invalid time format --> ...
```

FORM #1: DATE WITH LOCAL TIME

The date with local time form is simply a date-time value that does not contain the UTC designator nor does it reference a time zone. For example, the following represents January 18, 1998, at 11 PM:

```
... <datefield>19980118T230000</datefield> <!-- January 18, 1998, 11 PM --> ...
```

This notation of *datetime* type is to be used by devices that have no knowledge of the time zone in which they operate. In this case, the *datetime* value that is being transferred is usually the same as the value that is being stored and shown to the user in the application UI.

FORM #2: DATE WITH UTC TIME

The date with UTC time, or absolute time, is identified by a LATIN CAPITAL LETTER Z suffix character (US-ASCII decimal 90), the UTC designator, appended to the time value. For example, the following represents January 19, 1998, at 0700 UTC:

```
... <datefield>19980119T070000Z</datefield> <!-- January 19,1998,07:00 UTC -->
```

7.2 bool

Usage: To be used for Boolean type fields

Restrictions: A text value that MUST be either "true" to indicate Boolean "true" or "false" to indicate "false". If the field is not present its value is assumed to be "false".

Example:

```
...
<booleanfield>true</booleanfield> <!-- the field is set to "true" -->
...
```

7.3 text

Usage: To be used for textual fields

Restrictions: If the field is not present its value is assumed to be an empty string.

Example:

```
...
<textfield>Hello World!</textfield>
...
```

7.4 int

Usage: To be used for integer numeric fields.

Restrictions: The format for the integer values is defined here in an ABNF notation [RFC2234].

```
nonzero-digit = "1"/ "2"/ "3"/ "4"/ "5"/ "6"/ "7"/ "8"/ "9"

octal-digit = "0"/ "1"/ "2"/ "3"/ "4"/ "5"/ "6"/ "7"

hexadecimal-digit = "0"/ "1"/ "2"/ "3"/ "4"/ "5"/ "6"/ "7"/ "8"/ "9"

/ "a"/ "b" / "c"/ "d"/ "e"/ "f"

/ "A"/ "B"/ "C"/ "D"/ "E"/ "F"

decimal-constant = nonzero-digit *("0" / nonzero-digit)
hexadecimal-constant = ("0x" / "0X") 1*hexadecimal-digit
```

```
octal-constant = "0" 1*octal-digit
integer-value = *1("+" / "-") (decimal-constant / hexadecimal-constant / octal-constant)
```

Example:

```
...
<negativevalue>-1234</negativevalue>
<positivevalue>1234</positivevalue>
<anotherpositivevalue>+0xfffabc5</anotherpositivevalue>
<octal>010</octal> <!-- octal value equivalent to decimal 8 -->
...
```

8. Mark-up Language Description

8.1 Folder

Usage: Indicates the beginning of the object

Parent elements: None

Content model:

Folder (name, created?, modified?, accessed?, attributes?, role?, Ext*)

8.2 name

Usage: Specifies name of the folder.

Parent elements: Folder

Restrictions: This element is mandatory and its value MUST NOT be an empty string. The name SHOULD NOT include any location information (URL, path, etc.).

Content model:

name (#PCDATA)

8.3 created

Usage: Specifies the date and time when the folder was created

Parent elements: Folder

Restrictions: *datetime* type field as specified in section 7.1.

Content model:

created (#PCDATA)

8.4 modified

Usage: Specifies the date and time when the folder object was last changed.

Parent elements: Folder

Restrictions: *datetime* type field as specified in section 7.1.

Content model:

modified (#PCDATA)

8.5 accessed

Usage: Specifies the date and time when folder object was last accessed.

Parent elements: Folder

Restrictions: datetime type field as specified in section 7.1.

Content model:

accessed (#PCDATA)

8.6 attributes

Usage: Specifies the state of the file system attributes of the folder.

Parent elements: Folder

Restrictions:

Content model:

```
attributes (h?, s?, a?, d?, w?, r?, x?)
```

8.6.1 h

Usage: Specifies "hidden" attribute state.

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

```
h (#PCDATA)
```

8.6.2 s

Usage: Specifies "system" attribute state.

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

```
s (#PCDATA)
```

8.6.3 a

Usage: Specifies "archived" attribute state.

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

```
a (#PCDATA)
```

8.6.4 d

Usage: Specifies "delete" attribute state. When the "delete" attribute is set, the folder can be deleted.

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

d (#PCDATA)

8.6.5 w

Usage: Specifies "writable" attribute state. If the "writable" attribute is set, it is possible to add or delete objects in the folder.

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

w (#PCDATA)

8.6.6 r

Usage: Specifies "readable" attribute state. If the "readable" attribute is set, it is possible to read the list of objects that are contained in the folder...

Parent elements: attributes

Restrictions: *bool* type field as specified in section 7.2.

Content model:

r (#PCDATA)

8.6.7 x

Usage: Specifies "executable" attribute state. If the "executable" attribute is set, it is possible to access to the objects that are contained in the folder.

Parent elements: attributes

Restrictions: bool type field as specified in section 7.2.

Content model:

x (#PCDATA)

8.7 role

Usage: Identifies the role of the folder within the store. Applications are expected to use this field when it is required to establish mapping between folders of different data stores (e.g. when two stores are being synchronized).

Parent elements: Folder

Restrictions: The following standard folder role identifiers can be used:

Role **Description** Message folder roles Inbox The default folder for the delivered inbound messages Outbox The default folder for the messages that are pending the delivery **Drafts** The default folder in for the messages that are being edited by the user. Sent The default folder for delivered outbound messages. File folder roles **Documents** The default location for documents **Pictures** The default location for still pictures Movies The default location for movies The default location for music files Music

Table 1 Standard folder role identifiers

In addition to standard identifiers, vendor-specific identifiers can be used. Refer to section 8.8.1 for guidelines on identifier naming.

The default location of application files

8.8 Extension fields

8.8.1 Unique naming

Applications

If an extension field is required, the following naming convention MUST be followed in order to prevent undesirable field name collisions.

```
x-name = "x-" vendorid "-" 1*(ALPHA / DIGIT / "-") ; field name vendorid = 3*(ALPHA / DIGIT) ; Vendor identification ALPHA = <math>x41-5A / x61-7A ; x4-Z / a-Z DIGIT = x30-39 ; x4-Z / a-Z
```

8.8.2 Ext

Usage: Specifies the non-standard, experimental extensions supported by the device. The extensions are specified in terms of the XML element type name and the value.

Parent Elements: Folder

Restrictions: The Ext element type MUST specify the extension element name. It may also specify one or more enumerated values. Multiple non-standard extensions can be specified by specifying the Ext element type multiple times. This element type is optional.

Content Model:

```
Ext (XNam, XVal*)
```

Attributes: None.

Example: The following example specifies a non-standard extension, named "CliVer" for a fictitious company, Foo, which takes values of "5.0", "5.01" or "5.02".

8.8.3 XNam

Usage: Specifies the name of one of the extension element types.

Parent Elements: Ext

Restrictions: The element type is required whenever an Ext element is present.

Content Model:

```
XNam (#PCDATA)
```

Attributes: None.

Example:

```
<Ext>
  <XNam>x-Foo-CliVer</XNam>
  <XVal>5.0</XVal>
  <XVal>5.01</XVal>
  <XVal>5.02</XVal>
  </Ext>
```

8.8.4 XVal

Usage: Specifies one of the valid values for an extension element type.

Parent Elements: Ext

Restrictions:

Content Model:

```
XVal (#PCDATA)
```

Attributes: None.

Example:

9. DTD

```
<!--
application/vnd.omads-folder+xml V1.2 Document Type Definition
http://www.openmobilealliance.org/tech/DTD/OMA-DS-DataObjFolder-DTD-
V1 2.dtd
Copyright Open Mobile Alliance Ltd., 2002-2003
          All rights reserved
Terms and conditions of use are available from the
Open Mobile Alliance Ltd. web site at
http://www.openmobilealliance.org/useterms.html -->
<?xml version="1.0" encoding="UTF-8"?>
<!-- Root Element -->
<!ELEMENT Folder (name, created?, modified?, accessed?, attributes?,
role?, Ext*)>
<!-: The supporters of the folder object MUST support this property. The
name does not include any location information (URL, path, etc.). -->
<!ELEMENT name (#PCDATA)>
<!ELEMENT created (#PCDATA)>
<!ELEMENT modified (#PCDATA)>
<!ELEMENT accessed (#PCDATA)>
<!ELEMENT attributes (h?, s?, a?, d?, w?, r?, x?)>
<!ELEMENT h (#PCDATA)>
<!ELEMENT s (#PCDATA)>
<!ELEMENT a (#PCDATA)>
<!ELEMENT d (#PCDATA)>
<!ELEMENT w (#PCDATA)>
<!ELEMENT r (#PCDATA)>
<!ELEMENT x (#PCDATA)>
```

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

<!ELEMENT Ext (XNam, XVal*)>

<!ELEMENT XNam (#PCDATA)>

<!ELEMENT XVal (#PCDATA)>

<!-- End of DTD Definition -->
```

10.SyncML Data Synchronization Usage

The following sections describe the content-specific recommendations for using the data synchronization [DSREPU] protocol with **folder** data objects.

10.1 CTCap

Refer to [DSDEVDTD] for further details on the specification of the Device Information DTD.

10.2 Data Sync Record and Field Level Filtering

10.2.1 Folder Media Object Filter

Filtering for folder objects can be specified using both Record and Field elements. The set of recommended keywords to support is as follows:

```
ct-filter-keyword = <Any field that is defined for the
application/vnd.omads-folder+xml content type in this document>
```

10.3 Folder object replace example

```
<Sync>
```

```
<Replace>
      <CmdID>6</CmdID>
      <Meta>
         <Type xmlns='syncml:metinf'>application/vnd.omads-
folder+xml</Type>
      </Meta>
      <Item>
         <Source>
            <Locuri>123</Locuri>
         </Source>
         <SourceParent>
            <Locuri>345</Locuri>
         </SourceParent>
         . . .
         <Data><![CDATA[
            <Folder>
               <name>OMAFiles</name>
               <created>20030807T231830</created>
            </Folder>]]>
         </Data>
      </Item>
  </Replace>
</Sync>
. . .
```

Appendix A Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-DS_DataObjFolder-V1_2-20060710-A	10 Jul 2006	Approved by TP ref#OMA-TP-2006-0239R03-INP_DS_V1_2_for_final_approval
OMA-TS-DS_DataObjFolder-V1_2_1- 20070122-A	22 Jan 2007	Incorporated CR:
20070122-A		OMA-DS-DS_1_2-2006-0007
OMA-TS-DS_DataObjFolder-V1_2_1-	10 Aug 2007	Prepared for TP notification TP ref # OMA-TP-2007-0326-
20070810-A		INP_DS_V1_2_1_ERP_for_Notification