



# **Folder data object specification**

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**Open Mobile Alliance**  
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# Contents

1.	SCOPE.....	5
2.	REFERENCES .....	6
2.1	NORMATIVE REFERENCES.....	6
2.2	INFORMATIVE REFERENCES.....	6
3.	TERMINOLOGY AND CONVENTIONS.....	7
3.1	CONVENTIONS.....	7
3.2	DEFINITIONS.....	7
3.3	ABBREVIATIONS .....	7
4.	INTRODUCTION .....	8
5.	XML USAGE .....	9
5.1	INCLUDING FOLDER OBJECT IN OTHER XML DOCUMENTS.....	9
5.2	XML NAMESPACES.....	9
5.3	XML ATTRIBUTES .....	9
5.4	WBXML .....	9
6.	MIME USAGE.....	9
7.	DATA TYPES .....	10
7.1	DATETIME.....	10
7.2	BOOL .....	10
7.3	TEXT.....	11
7.4	INT.....	11
8.	MARK-UP LANGUAGE DESCRIPTION.....	13
8.1	FOLDER .....	13
8.2	NAME.....	13
8.3	CREATED.....	13
8.4	MODIFIED.....	13
8.5	ACCESSED .....	13
8.6	ATTRIBUTES.....	14
8.6.1	h.....	14
8.6.2	s.....	14
8.6.3	a.....	14
8.6.4	d.....	14
8.6.5	w.....	15
8.6.6	r.....	15
8.6.7	x.....	15
8.7	ROLE .....	15
8.8	EXTENSION FIELDS.....	16
8.8.1	Unique naming.....	16
8.8.2	Ext.....	16
8.8.3	XNam.....	17
8.8.4	XVal.....	17
9.	DTD.....	19
10.	SYNXML DATA SYNCHRONIZATION USAGE .....	21
10.1	CTCAP.....	21
10.2	DATA SYNC RECORD AND FIELD LEVEL FILTERING.....	21
10.2.1	Folder Media Object Filter.....	21
10.3	FOLDER OBJECT REPLACE EXAMPLE .....	21
APPENDIX A	CHANGE HISTORY (INFORMATIVE).....	23
A.1	APPROVED VERSION HISTORY .....	23
A.2	DRAFT/CANDIDATE VERSION 1.2 HISTORY .....	23

# Tables

Table 1 Standard folder role identifiers.....16

# 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

- [DSREPU] “SyncML Representation Protocol, Data Synchronization Usage”, Open Mobile Alliance, “OMA-SyncML-DataSyncRep-V1\_2”, [URL:http://www.openmobilealliance.org](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 1996, [URL:http://www.ietf.org/rfc/rfc2045.txt](http://www.ietf.org/rfc/rfc2045.txt)
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- [SYNCDEVDTD] “SyncML Device Information DTD”, Open Mobile Alliance, “OMA-SyncML-DevInfo-V1\_2”, [URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [WBXML] “WAP Binary XML Content Format Specification.” WAP Forum. [URL:http://www1.wapforum.org/tech/terms.asp?doc=WAP-192-WBXML-20010725-a.pdf](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](http://www.w3.org/TR/REC-xml)

### 2.2 Informative References

## 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 “0”.

**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>+0xffffabc5</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:** The supporters of the **folder** object **MUST** support this property. The name does not include any location information (URL, path, etc.). The name of the folder must not be empty.

**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 file.

**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 file 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, the file can be written.

**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 contents of the file.

**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, the contents of the file can be executed by the operating system.

**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:

Table 1 Standard folder role identifiers

Role	Description
<b>Message folder roles</b>	
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.
<b>File folder roles</b>	
Documents	The default location for documents
Pictures	The default location for still pictures
Movies	The default location for movies
Music	The default location for music files
Applications	The default location of application files

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

## 8.8 Extension fields

### 8.8.1 Unique naming

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           = %x41-5A / %x61-7A                                 ; A-Z / a-z
DIGIT           = %x30-39                                           ; 0-9
```

### 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".

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

### 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:**

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

## 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 [SYNCDEVDTD] for further details on the specification of the Device Information DTD.

```
<CTCap>
  <CTType> application/vnd.omads-folder+xml</CTType>
  <Property>
    <PropName>name</PropName>
    <DataType>text</DataType>
    <MaxSize>260</MaxSize>
    <DisplayName>Folder name</DisplayName>
  </Property>
  <Property>
    <PropName>created</PropName>
    <DataType>datetime</DataType>
    <DisplayName>Date created</DisplayName>
  </Property>
</CTCap>
```

## 10.2 Data Sync Record and Field Level Filtering

### 10.2.1 Folder Media Object Filter

Filtering for file 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
n/a	n/a	No prior version –or- No previous version within OMA

### A.2 Draft/Candidate Version 1.2 History

Document Identifier	Date	Sections	Description
OMA-SyncML-DataObjEmail-V1_2	19 Jan 04	Title page, p.2	Changed dates and copyrights
	26 Jan 04	Last page, All	Removed Appendix B, corrected typos
	01 Mar 04	TP, 2.1	Clerical changes from consistency review
	14 Apr 04	5.1, 6, 9, 10.1, 10.2	Updated XML usage. Updated MIME types.
	05 May 04	TP	Updated date
Candidate Version OMA-SyncML-DataObjEmail-V1_2	01 Jun 2004	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2004-0178-DS-V1_2-for-candidate