Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

ISO/IEC 30114-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information Technology*, Subcommittee SC 34, Document Description and Processing Languages.

— *Part 1: Guidelines*

— *Part 2: Character Repertoire Checking*

— *Part 3: Flat Packaging Format*

Introduction

ISO/IEC 29500-2:2011 specifies a packaging format whereby multiple digital resources can be contained in a single Zip package. To work with packages, implementors are required to use package-aware tools. This requirement can be an overhead which is undesirable.

This Part of ISO/IEC 30114 specifies an XML-based format for representing package content as a single resource. Implementors can process these XML-based resources without the use of package-aware tools.

Extensions of Office Open XML File Formats — Part 3: Flat Packaging Format

1   Scope

This Part of ISO/IEC 30114 specifies an alternative physical representation for digital content stored as specified in ISO/IEC 29500-2:2011. In ISO/IEC 29500-2:2011 content is stored in a package. In this Part of ISO/IEC 30114 content is stored in a single XML document.

2   Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 30114. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 30114 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 19757-2:2008, *Regular-grammar-based validation — RELAX NG*,
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=52348

ISO/IEC 29500-2:2011, *Open Packaging Conventions*,
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=59576

IETF RFC 1951, *DEFLATE Compressed Data Format Specification version 1.3*, Informational Track Specification, May 1996, http://tools.ietf.org/html/rfc1951

IETF RFC 4648, *The Base16, Base32, and Base64 Data Encodings*, Standards Track Specification, October 2006, http://tools.ietf.org/html/rfc4648

3   Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1   OPC package

a package of conformance class OPC as specifed by ISO/IEC 29500-2:2011

4   Overview

Logically, a digital resource conforming to this Part of ISO/IEC 30114 is equivalent to an OPC package.

Physically, a digital resource conforming to this Part of ISO/IEC 30114 shall be an entity which is an XML document, valid to the schema of Annex A.

All elements and attributes defined by Annex A are contained in the Namespace of Name "http://schemas.microsoft.com/office/2006/xmlPackage". For brevity, in this document these elements and attributes are referred to as having the "`pkg`" prefix.

EXAMPLE A reference to the element "`pkg:package`" in this document is a reference to the element having a local name of "`package`" and a Namespace Name of "http://schemas.microsoft.com/office/2006/xmlPackage".

5 Document structure

5.1 `pkg:part` element

For every part of an equivalent OPC package there shall be one `pkg:part` element.

The content of the `pkg:name` attribute shall be the part name of the equivalent part of the OPC package.

The content of the `pkg:contentType` attribute shall be the part content type of the equivalent part of the OPC package.

The content of the `pkg:compression` attribute, if present, shall specify whether the content of the pkg:part element is compressed, as specified below.

What is the pkg:padding attribute for? suspect byte padding for Zip??

5.2 `pkg:xmlData` element

If the part being represented is an XML document, the `pkg:part` element shall contain a single child element, `pkg:xmlData`. The content of this `pkg:xmlData` element shall be the document element of the XML document in the equivalent OPC package part.

N.B. W3C state: "Names beginning with the string "xml", or with any string which would match (('X'|'x') ('M'|'m') ('L'|'l')), are reserved for standardization in this or future versions of this [the XML] specification."

Do we care about representing stuff outside the document element?

We need to prohibit use of the flatpack namespace in OPC packages ... however this is best done in OPC itself

5.3 `pkg:binaryData` element

The content of the `pkg:part` shall represent binary data if the equivalent part of the OPC package is not an XML document. In this case, the `pkg:part` element shall contain a single child element, `pkg:binaryData`. The `pkg:binaryData` shall contain character data which is an IETF RFC 4648 Base64-encoded representation of the equivalent part in the OPC package. The encoded data shall have a line feed character added after every 76 characters.

If the `pkg:compression` attribute has the value "`deflate`" then the resource represented by the Base64-encoded data shall be a compressed representation of the resource as specified by IETF RFC 1951. If the `pkg:compression` attribute has the value "`store`" then the represented resource shall not be compressed.

NOTE   Compressed resources are compressed using RFC 1951 before being Base64 encoded. Thus to recreate a compressed binary resource the data must first be Base64 decoded and the resulting binary resource then deflated.

I assume there is no concept in OPC of plain text data which is serialized as such.

Annex A
(normative)

RELAX NG schema for the Flat Packaging Format

```
namespace pkg = "http://schemas.microsoft.com/office/2006/xmlPackage"

start = package
anyXml =
    element * - pkg:* {
        attribute * - pkg:* { text }*,
        mixed { anyXml }
    }*
package = element pkg:package { part+ }
part =
    element pkg:part {
        (attribute pkg:name { text }
         & attribute pkg:contentType { text }
         & attribute pkg:padding { text }?
         & attribute pkg:compression { "deflate" | "store" }?),
        (xmlData | binaryData)
    }
xmlData = element pkg:xmlData { anyXml }
binaryData = element pkg:binaryData { text }
```

Annex B
(informative)

W3C XML schema for the Flat Packaging Format

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified" targetNamespac
  <xs:complexType name="anyXml">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:any namespace="##other" processContents="skip"/>
      <xs:any namespace="##local" processContents="skip"/>
    </xs:choice>
  </xs:complexType>
  <xs:element name="package">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" ref="pkg:part"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="part">
    <xs:complexType>
      <xs:choice>
        <xs:element ref="pkg:xmlData"/>
        <xs:element ref="pkg:binaryData"/>
      </xs:choice>
      <xs:attribute name="name" use="required" form="qualified"/>
      <xs:attribute name="contentType" use="required" form="qualified"/>
      <xs:attribute name="padding" form="qualified"/>
      <xs:attribute name="compression" form="qualified">
        <xs:simpleType>
          <xs:restriction base="xs:token">
            <xs:enumeration value="deflate"/>
            <xs:enumeration value="store"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
  <xs:element name="xmlData" type="pkg:anyXml"/>
  <xs:element name="binaryData" type="xs:string"/>
</xs:schema>
```

Summary of editorial comments:

[5.1] `pkg:part` element

What is the pkg:padding attribute for? suspect byte padding for Zip??

[5.2] `pkg:xmlData` element

N.B. W3C state: "Names beginning with the string "xml", or with any string which would match (('X'|'x') ('M'|'m') ('L'|'l')), are reserved for standardization in this or future versions of this [the XML] specification."

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