

Changes to section Introduction

ISO/IEC 29500 specifies a family of XML schemas, collectively called *Office Open XML*, which define the XML vocabularies for word-processing, spreadsheet, and presentation documents, as well as the packaging of documents that conform to these schemas.

The goal is to enable the implementation of the Office Open XML formats by the widest set of tools and platforms, fostering interoperability across office productivity applications and line-of-business systems, as well as to support and strengthen document archival and preservation, all in a way that is fully compatible with the existing corpus of ~~Microsoft~~Microsoft[®] Office documents.

The following organizations have participated in the creation of ISO/IEC 29500 and their contributions are gratefully acknowledged:

Apple, Barclays Capital, BP, The British Library, Essilor, Intel, ~~Microsoft~~Microsoft[®], NextPage, Novell, Statoil, Toshiba, and the United States Library of Congress

1.1.1 Changes to section ZIP Package Limitations

The package implementer shall map all ZIP items to parts except ~~MS-DOS~~MS-DOS[®] ZIP items, as defined in the ZIP specification, that are not ~~MS-DOS~~MS-DOS[®] files. [M3.7]

[*Note:* The ZIP specification specifies that ZIP items recognized as ~~MS-DOS~~MS-DOS[®] files are those with a “version made by” field and an “external file attributes” field in the “file header” record in the central directory that have a value of 0. *end note*]

In ZIP archives, the package implementer shall not exceed 65,535 bytes for the combined length of the item name, Extra field, and Comment fields. [M3.8] Accordingly, part names stored in ZIP archives are limited to 65,535 characters, subtracting the size of the Extra and Comment fields.

Package implementers should restrict part naming to accommodate file system limitations when naming parts to be stored as ZIP items. [S3.1]

[*Example:*

Examples of these limitations are:

- On ~~Windows~~Windows[®] file systems, the asterisk (“*”) and colon (“:”) are not supported, so parts named with this character do not unzip successfully.
- On ~~Windows~~Windows[®] file systems, many programs can handle only file names that are less than 256 characters including the full path; parts with longer names might not behave properly once unzipped.

end example]

ZIP-based packages shall not include encryption as described in the ZIP specification. Package implementers shall enforce this restriction. [M3.9]

The compression algorithm supported is DEFLATE, as described in the .ZIP specification. The package implementer shall not use any compression algorithm other than DEFLATE.

A.1 Changes to section Table Key

- “Yes” — During consumption of a package, a “Yes” value for a field in a table in **Error! Reference source not found.** indicates a package implementer shall support reading the ZIP archive containing this record or field, however, support might mean ignoring. [M3.15] During production of a package, a “Yes” value for a field in a table in **Error! Reference source not found.** indicates that the package implementer shall write out this record or field. [M3.16]
- “No” — A “No” value for a field in a table in **Error! Reference source not found.** indicates the package implementer should not use this record or field. [M3.17]
- “Optional” — An “Optional” value for a record in a table in **Error! Reference source not found.** indicates that package implementers might write this record during production. [O3.2]
- “Partially, details below” — A “Partially, details below” value for a record in a table in **Error! Reference source not found.** indicates that the record contains fields that might not be supported by package implementers during production or consumption. See the details in the corresponding table to determine requirements. [M3.18]
- “Only used when needed” — The value “Only used when needed” associated with a record in a table in Annex C indicates that the package implementer shall use the record only when needed to store data in the ZIP archive. [M3.19]

Table **Error! No text of specified style in document.**–1, “Support for records”, specifies the requirements for package production, consumption, and editing in regard to particular top-level records or fields described in the ZIP Appnote.txt. [Note: Editing, in this context, means in-place modification of individual records. A format specification can require editing applications to instead modify content in-memory and re-write all parts and relationships on each save in order to maintain more rigorous control of ZIP record usage. *end note*]

Table **Error! No text of specified style in document.**–1. Support for records

Record name	Supported on Consumption	Supported on Production	Pass through on editing
Local File Header	Yes (partially, details below)	Yes (partially, details below)	Yes
File data	Yes	Yes	Yes
Data descriptor	Yes	Optional	Optional
Archive decryption header	No	No	No
Archive extra data record	No	No	No

Record name	Supported on Consumption	Supported on Production	Pass through on editing
Central directory structure: File header	Yes (partially, details below)	Yes (partially, details below)	Yes
Central directory structure: Digital signature	Yes (ignore the signature data)	Optional	Optional
Zip64 end of central directory record V1 (from spec version 4.5)	Yes (partially, details below)	Yes (partially, details below, used only when needed)	Optional
Zip64 end of central directory record V2 (from spec version 6.2)	No	No	No
Zip64 end of central directory locator	Yes (partially, details below)	Yes (partially, details below, used only when needed)	Optional
End of central directory record	Yes (partially, details below)	Yes (partially, details below, used only when needed)	Yes

Table **Error! No text of specified style in document.–2**, “Support for record components”, specifies the requirements for package production, consumption, and editing in regard to individual record components described in the ZIP Appnote.txt.

Table **Error! No text of specified style in document.–2**. Support for record components

Record	Field	Supported on Consumption	Supported on Production	Pass through on editing
Local File Header	Local file header signature	Yes	Yes	Yes
	Version needed to extract	Yes (partially, see Table Error! No text of specified style in document.–3)	Yes (partially, see Table Error! No text of specified style in document.–3)	Yes (partially, see Table Error! No text of specified style in document.–3)
	General purpose bit flag	Yes (partially, see Table Error! No text of specified style in document.–5)	Yes (partially, see Table Error! No text of specified style in document.–5)	Yes (partially, see Table Error! No text of specified style in document.–5)

Record	Field	Supported on Consumption	Supported on Production	Pass through on editing
	Compression method	Yes (partially, see Table Error! No text of specified style in document. –4)	Yes (partially, see Table Error! No text of specified style in document. –4)	Yes (partially, see Table Error! No text of specified style in document. –4)
	Last mod file time	Yes	Yes	Yes
	Last mod file date	Yes	Yes	Yes
	Crc-32	Yes	Yes	Yes
	Compressed size	Yes	Yes	Yes
	Uncompressed size	Yes	Yes	Yes
	File name length	Yes	Yes	Yes
	Extra field length	Yes	Yes	Yes
	File name (variable size)	Yes	Yes	Yes
	Extra field (variable size)	Yes (partially, see Table Error! No text of specified style in document. –6)	Yes (partially, see Table Error! No text of specified style in document. –6)	Yes (partially, see Table Error! No text of specified style in document. –6)
Central directory structure: File header	Central file header signature	Yes	Yes	Yes
	version made by: high byte	Yes	Yes (0 = MS-DOS ^{MS-DOS} is default publishing value)	Yes
	Version made by: low byte	Yes	Yes	Yes
	Version needed to extract (see Table Error! No text of specified style in document. –3 for details)	Yes (partially, see Table Error! No text of specified style in document. –3)	Yes (1.0, 1.1, 2.0, 4.5)	Yes
	General purpose bit flag	Yes (partially, see Table Error! No text of specified style in document. –5)	Yes (partially, see Table Error! No text of specified style in document. –5)	Yes (partially, see Table Error! No text of specified style in document. –5)

Record	Field	Supported on Consumption	Supported on Production	Pass through on editing
	Compression method	Yes (partially, see Table Error! No text of specified style in document. –4)	Yes (partially, see Table Error! No text of specified style in document. –4)	Yes (partially, see Table Error! No text of specified style in document. –4)
	Last mod file time (Pass through, no interpretation)	Yes	Yes	Yes
	Last mod file date (Pass through, no interpretation)	Yes	Yes	Yes
	Crc-32	Yes	Yes	Yes
	Compressed size	Yes	Yes	Yes
	Uncompressed size	Yes	Yes	Yes
	File name length	Yes	Yes	Yes
	Extra field length	Yes	Yes	Yes
	File comment length	Yes	Yes (always set to 0)	Yes
	Disk number start	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)
	Internal file attributes	Yes	Yes	Yes
	External file attributes (Pass through, no interpretation)	Yes	Yes (MS-DOS [®] MS-DOS default value)	Yes
	Relative offset of local header	Yes	Yes	Yes
	File name (variable size)	Yes	Yes	Yes
	Extra field (variable size)	Yes (partially, see Table Error! No text of specified style in document. –6)	Yes (partially, see Table Error! No text of specified style in document. –6)	Yes (partially, see Table Error! No text of specified style in document. –6)
	File comment (variable size)	Yes	Yes (always set to empty)	Yes
Zip64 end of central directory V1 (from spec version 4.5, only)	Zip64 end of central directory signature	Yes	Yes	Yes
	Size of zip64 end of central directory	Yes	Yes	Yes

Record	Field	Supported on Consumption	Supported on Production	Pass through on editing
used when needed)	Version made by: high byte (Pass through, no interpretation)	Yes	Yes (0 = MS-DOS MS-DOS® is default publishing value)	Yes
	Version made by: low byte	Yes	Yes (always 4.5 or above)	Yes
	Version needed to extract (see Table Error! No text of specified style in document. –3 for details)	Yes (4.5)	Yes (4.5)	Yes (4.5)
	Number of this disk	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)
	Number of the disk with the start of the central directory	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)
	Total number of entries in the central directory on this disk	Yes	Yes	Yes
	Total number of entries in the central directory	Yes	Yes	Yes
	Size of the central directory	Yes	Yes	Yes
	Offset of start of central directory with respect to the starting disk number	Yes	Yes	Yes
	Zip64 extensible data sector	Yes	No	Yes
Zip64 end of central directory locator (only used when needed)	Zip64 end of central dir locator signature	Yes	Yes	Yes
	Number of the disk with the start of the zip64 end of central directory	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)
	Relative offset of the zip64 end of central directory record	Yes	Yes	Yes
	Total number of disks	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)

Record	Field	Supported on Consumption	Supported on Production	Pass through on editing
End of central directory record	End of central dir signature	Yes	Yes	Yes
	Number of this disk	Yes (partial — no multi disk archives)	Yes (always 1 disk)	Yes (partial — no multi disk archives)
	Number of the disk with the start of the central directory	Yes (partial — no multi disk archive)	Yes (always 1 disk)	Yes (partial — no multi disk archive)
	Total number of entries in the central directory on this disk	Yes	Yes	Yes
	Total number of entries in the central directory	Yes	Yes	Yes
	Size of the central directory	Yes	Yes	Yes
	Offset of start of central directory with respect to the starting disk number	Yes	Yes	Yes
	ZIP file comment length	Yes	Yes	Yes
	ZIP file comment	Yes	No	Yes

Table Error! **No text of specified style in document.**–3, “Support for Version Needed to Extract field”, specifies the detailed production, consumption, and editing requirements for the Extract field, which is fully described in the ZIP Appnote.txt.

Table Error! **No text of specified style in document.**–3. Support for Version Needed to Extract field

Version	Feature	Supported on Consumption	Supported on Production	Pass through on editing
1.0	Default value	Yes	Yes	Yes
1.1	File is a volume label	Yes (do not interpret as a part)	No	(rewrite/remove)
2.0	File is a folder (directory)	Yes (do not interpret as a part)	No	(rewrite/remove)
2.0	File is compressed using Deflate compression	Yes	Yes	Yes

Version	Feature	Supported on Consumption	Supported on Production	Pass through on editing
2.0	File is encrypted using traditional PKWARE encryption	No	No	No
2.1	File is compressed using Deflate64(tm)	No	No	No
2.5	File is compressed using PKWARE DCL Implode	No	No	No
2.7	File is a patch data set	No	No	No
4.5	File uses ZIP64 format extensions	Yes	Yes	Yes
4.6	File is compressed using BZIP2 compression	No	No	No
5.0	File is encrypted using DES	No	No	No
5.0	File is encrypted using 3DES	No	No	No
5.0	File is encrypted using original RC2 encryption	No	No	No
5.0	File is encrypted using RC4 encryption	No	No	No
5.1	File is encrypted using AES encryption	No	No	No
5.1	File is encrypted using corrected RC2 encryption	No	No	No
5.2	File is encrypted using corrected RC2-64 encryption	No	No	No
6.1	File is encrypted using non-OAEP key wrapping	No	No	No
6.2	Central directory encryption	No	No	No

Table Error! No text of specified style in document.–4, “Support for Compression Method field”, specifies the detailed production, consumption, and editing requirements for the Compression Method field, which is fully described in the ZIP Appnote.txt.

Table Error! No text of specified style in document.–4. Support for Compression Method field

Code	Method	Supported on Consumption	Supported on Production	Pass through on editing
0	The file is stored (no compression)	Yes	Yes	Yes
1	The file is Shrunk	No	No	No
2	The file is Reduced with compression factor 1	No	No	No
3	The file is Reduced with compression factor 2	No	No	No
4	The file is Reduced with compression factor 3	No	No	No
5	The file is Reduced with compression factor 4	No	No	No
6	The file is Imploded	No	No	No
7	Reserved for Tokenizing compression algorithm	No	No	No
8	The file is Deflated	Yes	Yes	Yes
9	Enhanced Deflating using Deflate64™	No	No	No
10	PKWARE Data Compression Library Imploding	No	No	No
11	Reserved by PKWARE	No	No	No

Table Error! **No text of specified style in document.**–5, “Support for modes/structures defined by general purpose bit flags”, specifies the detailed production, consumption, and editing requirements when utilizing these general-purpose bit flags within records.

Table Error! **No text of specified style in document.**–5. Support for modes/structures defined by general purpose bit flags

Bit	Feature	Supported on Consumption	Supported on Production	Pass through on editing
0	If set, indicates that the file is encrypted.	No	No	No

Bit	Feature			Supported on Consumption	Supported on Production	Pass through on editing
1, 2	Bit 2	Bit 1		Yes	Yes	Yes
	0	0	Normal (-en) compression option was used.			
	0	1	Maximum (-exx/-ex) compression option was used.			
	1	0	Fast (-ef) compression option was used.			
	1	1	Super Fast (-es) compression option was used.			
3	If this bit is set, the fields crc-32, compressed size and uncompressed size are set to zero in the local header. The correct values are put in the data descriptor immediately following the compressed data.			Yes	Yes	Yes
4	Reserved for use with method 8, for enhanced deflating			No	Bits set to 0	Yes
5	If this bit is set, this indicates that the file is compressed patched data. (Requires PKZIP version 2.70 or greater.)			No	Bits set to 0	Yes
6	Strong encryption. If this bit is set, you should set the version needed to extract value to at least 50 and you shall set bit 0. If AES encryption is used, the version needed to extract value shall be at least 51.			No	Bits set to 0	Yes
7	Currently unused			No	Bits set to 0	Yes
8	Currently unused			No	Bits set to 0	Yes
9	Currently unused			No	Bits set to 0	Yes
10	Currently unused			No	Bits set to 0	Yes
11	Currently unused			No	Bits set to 0	Yes
12	Unused			No	Bits set to 0	Yes

Bit	Feature	Supported on Consumption	Supported on Production	Pass through on editing
13	Used when encrypting the Central Directory to indicate selected data values in the Local Header are masked to hide their actual values. See the section describing the Strong Encryption Specification for details.	No	Bits set to 0	Yes
14	Unused	No	Bits set to 0	Yes
15	Unused	No	Bits set to 0	Yes

Table **Error! No text of specified style in document.**–6, “Support for Extra field (variable size), PKWARE-reserved”, specifies the detailed production, consumption, and editing requirements for the Extra field entries reserved by PKWARE and described in the ZIP Appnote.txt.

Table **Error! No text of specified style in document.**–6. Support for Extra field (variable size), PKWARE-reserved

Field ID	Field description	Supported on Consumption	Supported on Production	Pass through on editing
0x0001	ZIP64 extended information extra field	Yes	Yes	Optional
0x0007	AV Info	No	No	Yes
0x0008	Reserved for future Unicode file name data (PFS)	No	No	Yes
0x0009	OS/2	No	No	Yes
0x000a	NTFS	No	No	Yes
0x000c	OpenVMS	No	No	Yes
0x000d	Unix	No	No	Yes
0x000e	Reserved for file stream and fork descriptors	No	No	Yes
0x000f	Patch Descriptor	No	No	Yes
0x0014	PKCS#7 Store for X.509 Certificates	No	No	Yes
0x0015	X.509 Certificate ID and Signature for individual file	No	No	Yes
0x0016	X.509 Certificate ID for Central Directory	No	No	Yes

Field ID	Field description	Supported on Consumption	Supported on Production	Pass through on editing
0x0017	Strong Encryption Header	No	No	Yes
0x0018	Record Management Controls	No	No	Yes
0x0019	PKCS#7 Encryption Recipient Certificate List	No	No	Yes
0x0065	IBM S/390 (Z390), AS/400 (I400) attributes — uncompressed	No	No	Yes
0x0066	Reserved for IBM S/390 (Z390), AS/400 (I400) attributes — compressed	No	No	Yes
0x4690	POSZIP 4690 (reserved)	No	No	Yes

Table **Error! No text of specified style in document.**–7, “Support for Extra field (variable size), third-party extensions”, specifies the detailed production, consumption, and editing requirements for the Extra field entries reserved by third parties and described in the ZIP Appnote.txt.

Table **Error! No text of specified style in document.**–7. Support for Extra field (variable size), third-party extensions

Field ID	Field description	Supported on Consumption	Supported on Production	Pass through on editing
0x07c8	Macintosh	No	No	Yes
0x2605	Ziplt Macintosh	No	No	Yes
0x2705	Ziplt Macintosh 1.3.5+	No	No	Yes
0x2805	Ziplt Macintosh 1.3.5+	No	No	Yes
0x334d	Info-ZIP Macintosh	No	No	Yes
0x4341	Acorn/SparkFS	No	No	Yes
0x4453	Windows Windows® NT security descriptor (binary ACL)	No	No	Yes
0x4704	VM/CMS	No	No	Yes
0x470f	MVS	No	No	Yes
0x4b46	FWKCS MD5 (see below)	No	No	Yes

Field ID	Field description	Supported on Consumption	Supported on Production	Pass through on editing
0x4c41	OS/2 access control list (text ACL)	No	No	Yes
0x4d49	Info-ZIP OpenVMS	No	No	Yes
0x4f4c	Xceed original location extra field	No	No	Yes
0x5356	AOS/VS (ACL)	No	No	Yes
0x5455	extended timestamp	No	No	Yes
0x554e	Xceed unicode extra field	No	No	Yes
0x5855	Info-ZIP Unix (original, also OS/2, NT, etc)	No	No	Yes
0x6542	BeOS/BeBox	No	No	Yes
0x756e	ASi Unix	No	No	Yes
0x7855	Info-ZIP Unix (new)	No	No	Yes
0xa220	Padding, Microsoft <u>Microsoft®</u>	No	Optional	Optional
0xfd4a	SMS/QDOS	No	No	Yes

The package implementer shall ensure that all 64-bit stream record sizes and offsets have the high-order bit = 0. [M3.20]

The package implementer shall ensure that all fields that contain “number of entries” do not exceed 2, 147, 483, 647. [M3.21]

A.2 Changes to section ZIP Physical Mapping

The requirements in Table Error! No text of specified style in document.–8, Table Error! No text of specified style in document.–9, and Table Error! No text of specified style in document.–10 are only relevant when mapping to the ZIP physical package format.

Table Error! No text of specified style in document.–8. ZIP physical mapping conformance requirements

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
M3.1	Error! Reference source not found.	Error! Reference source not found.	×			

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
M3.2	Error! Reference source not found.	Error! Reference source not found.	×			
M3.3	Error! Reference source not found.	Error! Reference source not found.	×			
M3.4	Error! Reference source not found.steps described in §Error! Reference source not found..	Error! Reference source not found.	×			
M3.5	Error! Reference source not found.	Error! Reference source not found.	×			
M3.6	Error! Reference source not found.steps described in §Error! Reference source not found..	Error! Reference source not found.	×			
M3.7	The package implementer shall map all ZIP items to parts except MS-DOS® ZIP items, as defined in the ZIP specification, that are not MS-DOS® files.	1.1.1	×			
M3.8	The package implementer shall map all ZIP items to parts except MS-DOS® ZIP items, as defined in the ZIP specification, that are not MS-DOS® files. [M3.7] [Note: The ZIP specification specifies that ZIP items recognized as MS-DOS® files are those with a “version made by” field and an “external file attributes” field in the “file header” record in the central directory that have a value of 0. <i>end note</i>] In ZIP archives, the package implementer shall not exceed 65,535 bytes for the combined length of the item name, Extra field, and Comment fields.	1.1.1	×			

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
M3.9	ZIP-based packages shall not include encryption as described in the ZIP specification. Package implementers shall enforce this restriction.	1.1.1	×			
M3.10	Error! Reference source not found.	Error! Reference source not found.	×			
M3.11	Error! Reference source not found.	Error! Reference source not found.	×			
M3.13	Error! Reference source not found., described in § Error! Reference source not found.. Error! Reference source not found.	Error! Reference source not found.	×			
M3.14	Error! Reference source not found.	Error! Reference source not found.	×			
M3.15	During consumption of a package, a "Yes" value for a field in a table in Error! Reference source not found. indicates a package implementer shall support reading the ZIP archive containing this record or field, however, support might mean ignoring.	Error! Reference source not found.	×			
M3.16	During production of a package, a "Yes" value for a field in a table in Error! Reference source not found. indicates that the package implementer shall write out this record or field.	Error! Reference source not found.	×			
M3.17	A "No" value for a field in a table in Error! Reference source not found. indicates the package implementer should not use this record or field.	Error! Reference source not found.	×			

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
M3.18	A “Partially, details below” value for a record in a table in Error! Reference source not found. indicates that the record contains fields that might not be supported by package implementers during production or consumption. See the details in the corresponding table to determine requirements.	Error! Reference source not found.	×			
M3.19	The value “Only used when needed” associated with a record in a table in Annex C indicates that the package implementer shall use the record only when needed to store data in the ZIP archive.	Error! Reference source not found.	×			
M3.20	The package implementer shall ensure that all 64-bit stream record sizes and offsets have the high-order bit = 0.	Error! Reference source not found.	×			
M3.21	The package implementer shall ensure that all fields that contain “number of entries” do not exceed 2, 147, 483, 647.	Error! Reference source not found.	×			

Notes:

A: Only relevant if supporting the interleaving strategy specified in the Open Packaging Conventions.

Table **Error! No text of specified style in document.**–9. ZIP physical mapping recommendations

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
S3.1	Package implementers should restrict part naming to accommodate file system limitations when naming parts to be stored as ZIP items.	1.1.1	×			
S3.2	Error! Reference source not found.	Error! Reference source not found.	×			

Table **Error! No text of specified style in document.**–10. ZIP physical mapping optional requirements

ID	Rule	Reference	Package Implementer	Format Designer	Format Producer	Format Consumer
O3.1	Error! Reference source not found.	Error! Reference source not found.	×			
O3.2	An “Optional” value for a record in a table in Error! Reference source not found. indicates that package implementers might write this record during production.	Error! Reference source not found.	×			

A.3