

[MS-MCI]:

## Microsoft ZIP (MSZIP) Compression and Decompression Data Structure

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## Revision Summary

Date	Revision History	Revision Class	Comments
4/4/2008	0.1	New	Initial Availability.
6/27/2008	1.0	Major	Initial Release.
8/6/2008	1.01	Minor	Revised and edited technical content.
9/3/2008	1.02	Minor	Revised and edited technical content.
12/3/2008	1.03	Minor	Revised and edited technical content.
3/4/2009	1.04	Minor	Revised and edited technical content.
4/10/2009	2.0	Major	Updated technical content and applicable product releases.
7/15/2009	3.0	Major	Revised and edited for technical content.
11/4/2009	3.1.0	Minor	Updated the technical content.
2/10/2010	3.1.0	None	Version 3.1.0 release
5/5/2010	4.0.0	Major	Updated and revised the technical content.
8/4/2010	4.1	Minor	Clarified the meaning of the technical content.
11/3/2010	4.1	None	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	5.0	Major	Significantly changed the technical content.
8/5/2011	5.0	None	No changes to the meaning, language, or formatting of the technical content.
10/7/2011	5.0	None	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	6.0	Major	Significantly changed the technical content.
4/27/2012	7.0	Major	Significantly changed the technical content.
7/16/2012	7.0	None	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	7.1	Minor	Clarified the meaning of the technical content.
2/11/2013	7.2	Minor	Clarified the meaning of the technical content.
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11/18/2013	7.2	None	No changes to the meaning, language, or formatting of the technical content.
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10/30/2014	7.3	None	No changes to the meaning, language, or formatting of the technical content.
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# 1 Introduction

The Microsoft ZIP (MSZIP) data structure enables a client or server to encode or decode data that is stored in the DEFLATE compressed data format.

Sections 1.7 and 2 of this specification are normative. All other sections and examples in this specification are informative.

## 1.1 Glossary

This document uses the following terms:

**stream:** An element of a compound file, as described in [\[MS-CFB\]](#). A stream contains a sequence of bytes that can be read from or written to by an application, and they can exist only in storages.

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as defined in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the [Errata](#).

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information.

[RFC1951] Deutsch, P., "DEFLATE Compressed Data Format Specification version 1.3", RFC 1951, May 1996, <http://www.ietf.org/rfc/rfc1951.txt>

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <https://www.rfc-editor.org/rfc/rfc2119.html>

### 1.2.2 Informative References

[MS-OXPROTO] Microsoft Corporation, "[Exchange Server Protocols System Overview](#)".

## 1.3 Overview

MSZIP compression is a derivative of the DEFLATE compressed data format described in [\[RFC1951\]](#). MSZIP uses only the three basic methods of compression described in [RFC1951] section 3.2.3: no compression, compression with fixed Huffman codes, and compression with dynamic Huffman codes.

## 1.4 Relationship to Protocols and Other Structures

None.

For conceptual background information and overviews of the relationships and interactions between this and other protocols, see [\[MS-OXPROTO\]](#).

## **1.5 Applicability Statement**

The MSZIP structure is applicable to protocols or structures that are designed to use [\[RFC1951\]](#) to compress or decompress data.

## **1.6 Versioning and Localization**

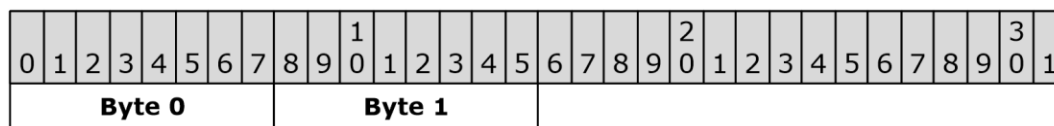
None.

## **1.7 Vendor-Extensible Fields**

None.

## 2 Structures

Each MSZIP block MUST consist of a 2-byte MSZIP signature and one or more RFC 1951 blocks. The 2-byte MSZIP signature MUST consist of the bytes 0x43 and 0x4B. The MSZIP signature MUST be the first 2 bytes in the MSZIP block. The MSZIP signature is shown in the following packet diagram.



**Figure 1: Packet diagram with MSZIP signature**

MSZIP signature **Byte 0 (1 byte)**: The first byte of the MSZIP signature MUST be 0x43.

MSZIP signature **Byte 1 (1 byte)**: The second byte of the MSZIP signature MUST be 0x4B.

Each MSZIP block is the result of a single deflate compression operation, as defined in [\[RFC1951\]](#). The compressor that performs the compression operation MUST generate one or more RFC 1951 blocks, as defined in [RFC1951]. The number, deflation mode, and type of RFC 1951 blocks in each MSZIP block is determined by the compressor, as defined in [RFC1951]. The last RFC 1951 block in each MSZIP block MUST be marked as the "end" of the **stream**, as defined by [RFC1951] section 3.2.3. Decoding trees MUST be discarded after each RFC 1951 block, but the history buffer MUST be maintained. Each MSZIP block MUST represent no more than 32 KB of uncompressed data.

The maximum compressed size of each MSZIP block is 32 KB + 12 bytes. This enables the MSZIP block to contain 32 KB of data split between two noncompressed RFC 1951 blocks, each of which has a value of BTYP=00.

### 3 Structure Examples

The MSZIP block structure shown in the following diagram contains a single RFC 1951 block.

<=(32 KB + 12 bytes)	
0x43   0x4B	Generated by single "deflate" compression operation
2-Byte MSZIP Signature	RFC 1951 Block

The MSZIP block structure shown in the following diagram contains two RFC 1951 blocks.

<=(32 KB + 12 bytes)		
0x43   0x4B	Generated by single "deflate" compression operation	
2-Byte MSZIP Signature	RFC 1951 Block	RFC 1951 Block



## **4 Security**

### **4.1 Security Considerations for Implementers**

None.

### **4.2 Index of Security Fields**

None.

## 5 Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms "SHOULD" or "SHOULD NOT" implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term "MAY" implies that the product does not follow the prescription.

## 6 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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