[MS-MCI]:
MCI Compression and Decompression

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Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1		Initial Availability.
06/27/2008	1.0		Initial Release.
08/06/2008	1.01		Revised and edited technical content.
09/03/2008	1.02		Revised and edited technical content.
12/03/2008	1.03		Revised and edited technical content.
03/04/2009	1.04		Revised and edited technical content.
04/10/2009	2.0		Updated technical content and applicable product releases.
07/15/2009	3.0	Major	Revised and edited for technical content.
11/04/2009	3.1.0	Minor	Updated the technical content.
02/10/2010	3.1.0	None	Version 3.1.0 release
05/05/2010	4.0.0	Major	Updated and revised the technical content.

Release: Saturday, May 1, 2010

Table of Contents

1 Introduction

This document specifies the format of MSZIP compressed data as used in the MSZIP compression mode of **cabinet files**. The purpose of this specification is to enable anyone to encode or decode MSZIP compressed data.

1.1 Glossary

The following terms are defined in [MS-OXGLOS]:

cabinet file
cabinet folder

The following terms are specific to this document:

RFC 1951 block: A compressed block format as defined in [RFC1951] section 3.2.

MSZIP block: One or more RFC 1951 blocks with an MSZIP signature.

MSZIP signature: The first two bytes of the **MSZIP block** that demarcate a unique MSZIP block.

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

1.2 References

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. We will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.

[MS-CAB] Microsoft Corporation, "Cabinet File Format", April 2008.

[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", RFC 2119, BCP 14, March 1997, http://www.ietf.org/rfc/rfc2119.txt

1.2.2 Informative References

None.

1.3 Overview

MSZIP compression is a derivative of Phil Katz's DEFLATE Compressed Data Format. For more information about the DEFLATE Compressed Data Format, see [RFC1951]. MSZIP uses only the three basic modes of deflate: no compression, compressed with fixed Huffman codes, and compressed with dynamic Huffman codes.

1.4 Relationship to Protocols and Other Structures

None.

1.5 Applicability Statement

None.

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 block**. 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 diagram.
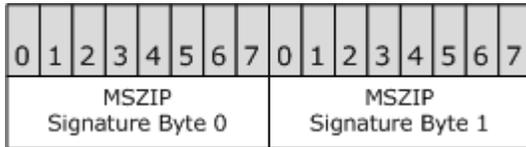

Figure 1: MSZIP signature

MSZIP signature **Byte 0**: The first byte of the MSZIP signature MUST be set to 0x43.

MSZIP signature **Byte 1**: The second byte of the MSZIP signature MUST be set to 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. Each MSZIP block that is not the last MSZIP block in a **cabinet folder** MUST represent 32 KB of uncompressed data. The last block in a cabinet folder can be smaller than 32 KB of uncompressed data.

The maximum compressed size of each MSZIP block is 32 KB + 12 bytes. This allows for the data to be passed as two separate RFC 1951 blocks. Each RFC 1951 block can have a 5-byte overhead. The two separate RFC 1951 blocks with 5 bytes of overhead each, combined with the 2-byte MSZIP signature, constitute the 12 bytes in addition to the 32 KB of data contained in an MSZIP block. MSZIP MUST use a compression window of size 32 KB.

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3   Structure Examples

The following MSZIP block structure contains a single compressed RFC 1951 block.

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

Figure 2: MSZIP block with a single RFC 1951 block

The MSZIP block structure shown in the following figure 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

Figure 3: MSZIP block with two RFC 1951 blocks

4   Security Considerations

None.

5 Appendix A: Product Behavior

The information in this specification is applicable to the following product versions. References to product versions include released service packs.

- Microsoft® Exchange Server 2003

- Microsoft® Exchange Server 2007

- Microsoft® Exchange Server 2010

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified.

Unless otherwise specified, any statement of optional behavior in this specification 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 product does not follow the prescription.

6 Change Tracking

This section identifies changes made to [MS-MCI] protocol documentation between February 2010 and May 2010 releases. Changes are classed as major, minor, or editorial.

Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements or functionality.
- An extensive rewrite, addition, or deletion of major portions of content.
- A protocol is deprecated.
- The removal of a document from the documentation set.
- Changes made for template compliance.

Minor changes do not affect protocol interoperability or implementation. Examples are updates to fix technical accuracy or ambiguity at the sentence, paragraph, or table level.

Editorial changes apply to grammatical, formatting, and style issues.

No changes means that the document is identical to its last release.

Major and minor changes can be described further using the following revision types:

- New content added.
- Content update.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.
- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.

- Content removed for template compliance.

- Obsolete document removed.

Editorial changes always have the revision type "Editorially updated."

Some important terms used in revision type descriptions are defined as follows:

Protocol syntax refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.

Protocol revision refers to changes made to a protocol that affect the bits that are sent over the wire.

Changes are listed in the following table. If you need further information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
1.3 Overview	Updated the section title.	N	Content updated for template compliance.
3 Structure Examples	47813 Updated the structure diagrams.	Y	Content update.

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