EGG

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This specification of EGG format is available on the following link.

* Download at: http://www.altools.co.kr/Product/ALZip Egg.aspx

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2

Update History

Version	Change Description	Date
1.0	First Edition	09/28/2009
1.0	Added comment to algorithm, and corrected type-o	02/16/2011
1.0	License Updated	03/15/2011
1.0	Encrypt Header Table Updated	03/31/2011
1.0	Encrypt Header Table Updated – Added LEA	09/19/2016

Content

Copyri	ght	2
License	2	2
Update	e History	3
Conten	ıt	4
Section	1: Concept	6
	Considerations for Design	6
	Format Features	7
	Header Features	7
Section	2: Specification	8
	Overall	8
	EGG Header	8
	File Header	9
	Block Header	9
	Extra Field	9
	Encrypt Header	10
	Windows File Information	10
	Posix File Information	11
	Dummy Header	13
	Filename Header	13
	Comment Header	14
	Split Compression	14
	Solid Compression	14
Section	3: Examples	15
	Simple Archive	15
	General File Archive	16

Section 4: Binary Samples25					
	Split Archive	21			
	Big File Archive	19			
	Die Eile Anabire	10			
	Solid Archive	1 /			

Section 1: Concept

Considerations for Design

Flexibility in Extensions

Modifying existing or adding new functions should be easy.

Compatibility to Previous Versions

Basic functions such as viewing and extracting of compressed files created by later version should be executed by previous versions.

Support Different Environments

It should support other operating systems besides Windows operating systems.

It should also apply on Stream, Embedded and other environments, not only on files.

Saving Specific Information on Each File

Have to save specific information on each file of the compressed file.

Random Access

Each compressed file should be extracted without extracting the entire compressed file.

Complete Support for Unicode

Saving data should be possible in both Unicode supported environment and Unicode unsupported environment.

Compressing Massive Capacity

There should be no error in compressing files with large capacity.

Support for Advanced Encryption

It should support verified encryption method such as AES in addition to the previous simple encryption method, and should also support for digital signature and DRM.

Reinforce Split Compressing Function

It should support split compressing function that restoration and extension is considered not just dividing files, and should maintain the same format.

Support for Solid Compression

It should support compressing function for Solid type.

Format Features

Compress Massive Capacity

Should support compression for large size more than 2GB or 4GB

Save String

Multi-byte, Unicode, utf-8 and other forms should be available when saving file names or comments.

Relative Path

Support for relative path of superior and sub relations.

Support for Encryption

Support Zip 2.0 Compatible, AES-128, AES-256 encryption methods.

Split Compression

Support 2*32–1 numbers of splits.

Forward Compatibility

Ensure basic forward compatibility.

Basic extracting should be available with v1.0 specification.

Data Block

Available to compress a single file into multi split blocks.

Byte Order

Little Endian

Header Features

Basic Header

Basic header has static capacity.

Extended Header

Iterate signature, length, data structure.

Each iteration continue until a stop-iterate signature appears.

Implement by handling only currently recognized signatures and skipping the rest.

Section 2: Specification

Overall

EGG Header	1		
Extra Field1: Split Compression Solid Compression Global Encryption Header			0~N
File Header	1		
Extra Field 2: Filename Header Comment Header Windows File Information Posix File Information Encrypt Header	0~n	1~N	0~N
Block Header	1		
Extra Field 3	0~N	0~N	
Compressed Data	1		
Extra Field 4: Global Comment Header	0~N		

EGG Header

Magic	4	0x41474745
Version	2	0x0100
Header ID	4	Random number of the program (Cannot be 0)
Reserved	4	0x0000000

File Header

Magic	4	0x0A8590E3
File ID	4	Unique value for each header (Includes 0)
File Length	8	Total size of the file

Block Header

Magic	4	0x02B50C13		
Compress Method	2	0	Algorithm Number 0-Store, 1-Deflate, 2-Bzip2, 3-AZO, 4-LZMA	
		1	Hint	
Uncompress Size	4	Size of the block before compressed		
Compress Size	4	Size of the block after compressed		
CRC32	4	CRC value of the block		

Split block of files exceeding 4G

Extra Field

Magic	4	Unique v	alue for each field
General Purpose	1	1	0: Size of 2Byte 1: Size of 4Byte
Bit flag		2	Always Unset
		3~8	Field Custom Bit
Size	2 or 4		ata size of the field excluding Magic, and Size area.

Encrypt Header

Magic (ENCRYP)	4	0x08D1470F	
Bit flag	1	0	
Size	17		
		0 Key base XOR (Low security)	
		1 AES128	
Encrypt Method	1	2 AES256	
		5 LEA128	
		6 LEA256	
verify Data(Key Base)	12	Encryption Verification Data	
CRC32(Key Base)	4	Partial Block CRC	
AES Header(AES/LEA)	(128-10, 256-18)	AES/LEA Header	
AES Footer (AES/LEA)	10	AES/LEA Footer	

^{*} Inserted in Extra Field 2(optional depending on KeyBase, AES or LEA)

Windows File Information

Magic	4	0x2C86950B		
Bit flag	1	0		
Size	2	2 9		
Last Modified DataTime	8	100-nanosecond Time since the Epoch (00:00:00 UTC, January 1, 1601)		
Attribute	1	bit	Description	
	1	1	ReadOnly	

	2	Hidden
	3	System File
	4	Link File (Junction File)
	5~7	Always Unset
	8	Directory

Posix File Information

Magic	4	0x1EE922E5			
Bit flag	1	0			
Size	2	20			
Size	4	0170000 bitmask for the file type bitfields 0140000 socket 0120000 symbolic link 0100000 regular file 0060000 block device 0040000 directory 0020000 character device 0010000 FIFO 0004000 set UID bit 0002000 set-group-ID bit (see below) 0001000 sticky bit (see below) 00700 mask for file owner permissions 00400 owner has read permission 00200 owner has write permission 00100 owner has execute permission 00070 mask for group permissions 00040 group has read permission 00000 group has write permission 00010 group has execute permission 00010 group has execute permission			
		00004 others have read permission 00002 others have write permission 00001 others have execute permission			
UID	4	user ID			

GID	4	group ID
Last Modified Time	8	Second Time since the Epoch (00:00:00 UTC, January 1, 1970)

Dummy Header

Magic	4	0x07463307
Bit flag	1	0
Size	2	Size of Dummy Data
Dummy Data	size	Dummy Data. Ignore.

No need to consider if the size is too small to fit the dummy header because it can be distinguished by size calculation.

Filename Header

Magic	4	0x0A8	0x0A8591AC		
		bit	Unset	Set	
Bit flag	1	3	No encryption	Encrypt	
Dic iiag	±	4	Use UTF-8	Use area code	
		5	Absolute Path	Relative Path	
Size	2				
Locale	0 or 2	Can specify locale when Unicode is not in use. 0: Depend on system locale 932: Japanese (Shift-JIS) 949: Korean * Refence(IBM, MSDN)			
Parent Path ID	0 or 4	Exists only when the fifth Bit flag is set, and it is the ID of the file which possess parent path.			
Name	N	Exclu	de NULL character		

Comment Header

Magic	4	0x04C63672				
		bit	Unset	Set		
Bit flag	1	3	No Encryption	Encrypt		
		4	Use UTF-8	Use area code		
Size	2	,				
Comment	N	Exclude NULL character				

Split Compression

Magic	4	0x24F5A262
Bit flag	1	0
Size	2	8
Prev File ID	4	ID of previous file If 0, it is the first file.
Next File ID	4	ID of next file If 0, it is the last file.

It is the first file if previous file's ID is 0, and is the last file if next file's ID is 0.

Header and Extra Field shouldn't be cut when split compressing.

Compressed Block Data can be saved cut.

If header is excluded from the split size, insert Dummy Extra Field.

If file compression ratio not applied when split compressing, modify Magic of the header into Dummy Header or Skip Header (0xFFFF0000) so it can be skipped.

Solid Compression

Magic	4	0x24E5A060
Bit flag	1	0
Size	2	0

Section 3: Examples

Simple Archive

For Compressing String "hello"

For Compressi	ng String "nello"		
	Magic	4	45 47 47 41
EGG Header	Version	2	00 01
lee nedder	File ID	4	01 00 00 00
	Reserved2	4	00 00 00 00
EOFARC	End of Egg Header	4	22 82 E2 08
	Magic	4	E3 90 85 0A
File Header	Uniq ID	4	00 00 00 00
	File Length	8	05 00 00 00 00 00 00 00
EOFARC	End of File Header	4	22 82 E2 08
	Magic	4	13 0C B5 02
	Compress Method(M)	1	00
Block Header	Compress Method(H)	1	00
Drook neader	Uncompress Size	4	05 00 00 00
	Compress Size	4	05 00 00 00
	CRC32	4	86 A6 10 36
EOFARC	End of Block Header	22 82 E2 08	
Со	mpressed Data	5	'h' 'e' 'l' 'l' 'o'
EOFARC	End of Archive	4	22 82 E2 08

General File Archive

Compressing File hello.txt

Compressing r	ne neno.txt		
	Magic	4	45 47 47 41
EGG Header	Version	2	00 01
Egg Headel	File ID	4	01 00 00 00
	Reserved2	4	00 00 00 00
EOFARC	End of Egg Header	4	22 82 E2 08
	Magic	4	E3 90 85 0A
File Header	Uniq ID	4	00 00 00 00
	File Length	8	05 00 00 00 00 00 00
	Magic	4	AC 91 85 0A
	Bit flag	1	00
File Name	Size	2	09 00
	Name	9	'h' 'e' 'l' 'l' 'o' '.' 't' 'x' 't'
	Magic	4	OB 95 86 2C
	Bit flag	1	00
Windows File	Size	2	09 00
Information	Last Modified DataTime	8	23 C9 A3 4F 63 FB C7 01
	Attribute	1	00
EOFARC	End of File Header	4	22 82 E2 08
	Magic	4	13 OC B5 02
	Compress Method(M)	1	00
Block Header	Compress Method(H)	1	00
2100% Moddol	Uncompress Size	4	05 00 00 00
	Compress Size	4	05 00 00 00
	CRC32	4	86 A6 10 36
EOFARC	End of Block Header	4	22 82 E2 08
Comp	pressed Data	5	'h' 'e' 'l' 'l' 'o'
EOFARC	End of Archive	4	22 82 E2 08

Solid Archive

Compressing a.txt(1byte, "a"), b.txt(2byte, "bc")

	xt(1byte, "a"), b.txt(2byte	, DC)
	Magic	4	45 47 47 41
EGG Header	Version	2	00 01
EGG Headel	File ID	4	01 00 00 00
	Reserved2	4	00 00 00 00
	Magic	4	60 A0 E5 24
Solid Header	Bit flag	1	00
	Size	2	00 00
EOFARC	End of EGG Header	4	22 82 E2 08
	Magic	4	E3 90 85 0A
File Header	Uniq ID	4	00 00 00 00
	File Length	8	01 00 00 00 00 00 00 00
	Magic	4	AC 91 85 0A
File Name	Bit flag	1	00
TITE Walle	Size	2	05 00
	Name	5	'a' '.' 't' 'x' 't'
	Magic	4	0B 95 86 2C
	Bit flag	1	00
Windows File Information	Size	2	09 00
	Last Modified DataTime	8	23 C9 A3 4F 63 FB C7 01
	Attribute	1	00
EOFARC	End of File Header	4	22 82 E2 08
File Header	Magic	4	E3 90 85 0A

		<i>a</i>	01 00 00 00
	Uniq ID	4	01 00 00 00
	File Length	8	02 00 00 00 00 00 00 00
	Magic	4	AC 91 85 0A
File Name	Bit flag	1	00
	Size	2	05 00
	Name	5	'b' '.' 't' 'x' 't'
	Signature	4	0B 95 86 2C
	Bit flag	1	00
Windows File Information	Size	2	09 00
	Last Modified DataTime	8	67 FA A3 4F 63 FB C7 01
	Attribute	1	00
EOFARC	End of File Header	4	22 82 E2 08
	Magic	4	13 0C B5 02
	Compress Method(M)	1	00
Block Header	Compress Method(H)	1	00
	Uncompress Size	4	03 00 00 00
	Compress Size	4	03 00 00 00
	CRC32	4	6D 48 83 9E
EOFARC	End of Block Header	4	22 82 E2 08
Con	mpressed Data	3	'a' 'b' 'c'
EOFARC	End of Archive	4	22 82 E2 08

Big File Archive

		_	T
	Magic	4	45 47 47 41
EGG Header	Version	2	00 01
200 1100001	File ID	4	01 00 00 00
	Reserved2	4	00 00 00 00
EOFARC	End of Archive	4	22 82 E2 08
	Magic	4	E3 90 85 0A
File Header	Uniq ID	4	00 00 00 00
	File Length	8	00 00 00 00 00 00 00 18
	Magic	4	AC 91 85 0A
	Bit flag	1	00
File Name	Size	2	08 00
	Name	8	't' 'e' 's' 't' '.' 'd' 'a' 't'
	Magic	4	OB 95 86 2C
	Bit flag	1	00
Windows File	Size	2	09 00
Information	Last Modified DataTime	8	23 C9 A3 4F 63 FB C7 01
	Attribute	1	00
EOFARC	End of File Header	4	22 82 E2 08
	Magic	4	13 OC B5 02
	Compress Method(M)	1	00
Block Header	Compress Method(H)	1	00
block neadel	Uncompress Size	4	C0 00 00 00
	Compress Size	4	CO 00 00 00
-	CRC32	4	B2 A6 34 25
EOFARC	End of Block Header	4	22 82 E2 08
Co	ompressed Data	3G	
	Magic	4	22 82 E2 08
Block Header	Compress Method(M)	1	00
	Compress Method(H)	1	00

	Uncompress Size	4	CO 00 00 00
Compress Size		4	CO 00 00 00
	CRC32	4	86 A8 13 36
EOFARC	End of Block Header	4	22 82 E2 08
Compressed Data		3G	
EOFARC	End of Block Header	4	22 82 E2 08

Split Archive

Split Compressing Hello.txt into 64Bytes

spire compressi	ing menotixi mto 04 dytes	1	I
	Magic	4	45 47 47 41
700 W 1	Version	2	00 01
EGG Header	File ID	4	01 00 00 00
	Reserved2	4	00 00 00 00
	Magic	4	62 A2 F5 24
	Bit flag	1	00
Split Header	Size	2	08 00
	Prev File ID	4	00 00 00 00
	Next File ID	4	02 00 00 00
EOFARC	End of Archive	4	22 82 E2 08
	Magic	4	E3 90 85 0A
File Header	Uniq ID	4	00 00 00 00
	File Length	8	04 00 00 00 00 00 00 00
	Magic	4	07 33 46 07
Dummy	Bit flag	1	00
Danuty	Size	2	08 00
	Dummy Data	8	00 00 00 00 00 00 00 00

total

64 Byte

EGG Header	Magic	4	45 47 47 41
	Version	2	00 01
	File ID	4	02 00 00 00
	Reserved2	4	00 00 00 00

	Magic 4 62 A2 F5 24							
	Bit flag	1	00					
Split Header	Size	2	08 00					
	Prev File ID	4	01 00 00 00					
	Next File ID	4	03 00 00 00					
EOFARC	End of Archive	4	0 8 00 1 00 00 00 00 3 00 00 00 00 2 82 E2 08 C 91 85 0A 0 9 00 h' 'e' 'l' 'l' 'o' '.' t' 'x' 't' 7 33 46 07 0					
	Magic	4	AC 91 85 0A					
Dila Mana	Bit flag	1	00					
File Name	Size	2	09 00					
	Name	9	'h' 'e' 'l' 'l' 'o' '.' 't' 'x' 't'					
	Magic	4	07 33 46 07					
Dummy	Bit flag	1	00					
	Size	2	08 00					
	Dummy Data	8	00 00 00 00 00 00 00					

total

64 byte

EGG Header	Magic	4	45 47 47 41	
	Version		00 01	
	File ID	4	03 00 00 00	
	Reserved2	4	00 00 00 00	
Split Header	Magic	4	62 A2 F5 24	
	Bit flag	1	03 00 00 00 00 00 00 00 52 A2 F5 24 00	
	Size	2	08 00	
	Prev File ID	4	02 00 00 00	

	Next File ID	4	04 00 00 00
EOFARC	End of Archive	4	22 82 E2 08
	Magic	4	0B 95 86 2C
	Bit flag	1	00
Windows File Information	Size	2	09 00
	Last Modified DataTime	8	23 C9 A3 4F 63 FB C7 01
	Attribute	1	00
	Magic	4	07 33 46 07
Dummy	Bit flag	1	00
	Size	2	08 00
	Dummy Data	8	00 00 00 00 00 00 00

total

64 byte

EGG Header	Magic	4	45 47 47 41
	Version		00 01
	File ID	4	04 00 00 00
	Reserved2	4	00 00 00 00
	Magic	4	62 A2 F5 24
	Bit flag	1	00
Split Header	Size	2	08
	Prev File ID	4	03 00 00 00
	Next File ID	4	00 00 00 00
EOFARC	End of Archive	4	22 82 E2 08
Block Header	Magic	4	13 OC B5 02
	Compress Method(M)	1	00

	Compress Method(H)	1	00		
	Uncompress Size	4	14 00 00 00 14 00 00 00 16 A6 10 36		
	Compress Size	4	04 00 00 00		
	CRC32	4	86 A6 10 36		
EOFARC	End of Archive	4	22 82 E2 08		
C	ompressed Data	4	'e' 'x' 'i' 't'		
EOFARC	End of Archive	22 82 E2 08			

total

63 byte

Section 4: Binary Samples

Hello.txt – **5Bytes string** ('h', 'e', 'l', 'l', 'o')

45	47	47	41	00	01	01	00	00	00	00	00	00	00	22	82	
E	gg Siq	gnature Version			ID			Reserved				End				
E2	08	E3	90	85	0A	00	00	00	00	05	00	00	00	00	00	
_	atur	Fi	le Si	gnatu	re		I	D				File I	Length	l		
00	00	AC	91	85	0A	00	09	00	'h'	'e'	'1'	'1'	·o'	.,	't'	
		File	ename	Signa [.]	ture	BF	BF Size			File Name						
'x'	't'	0В	95	86	2C	00	09	00	80	95	7F	15	43	DD	С9	
		File Attribute(Win)			Win)	BF	Si	ze	e D				ateTime			
01	00	22	82	E2	08	13	0C	В5	02	00	00	05	00	00	00	
	Att r	E	ng Si	gnatur	îe	Bl	ock Si	gnatu	ıre	СМ	Hin t	Un	compre	ess Si	ze	
05	00	00	00	86	A6	10	35	22	82	E2	08	'h'	'e'	'1'	'1'	
C	ompres	ss Siz	:e		CRC32			E:	End Signature Data					ta		
·°,	22	82	E2	08												
End Signature																

Section 5: Signatures

EGG Header	0x41474745
File Header	0x0A8590E3
Block Header	0x02B50C13
Encrypt Header	0x08D1470F
Filename Header	0x0A8591AC
Windows File Information	0x2C86950B
Posix File Information	0x1EE922E5
Comment Header	0x04C63672
Split Compression	0x24F5A262
Dummy Header	0x07463307
Skip Header	0xFFFF0000
Global Encrypt Header	0x08D144A8