Windows Shell Item format specification

Analysis of the Windows Shell Item format

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Summary

The Windows Shell uses Shell Items (Shell item list) to identify items within the Windows Folder Hierarchy. A Shell Item list is much like a path, and is unique to its parent folder. The format of the Shell Item is undocumented and varies between Windows versions. This specification is based on earlier work on the format and was complimented by reverse engineering.

This document is intended as a working document for the Windows Shell Items format specification. Which should allow existing Open Source forensic tooling to be able to process this file type.

Document information

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License

Version

Version	Author	Date	Comments
0.0.1	J.B. Metz	July 2010	Initial version based on earlier work.
0.0.2	J.B. Metz	August 2010	Additional Windows 7 information.
0.0.3	J.B. Metz	August 2010	Additional known folder identifiers
0.0.4	J.B. Metz	August 2010	Additional shell item information, control panel shell item information, folder type and Windows 7 shell library information.
0.0.5	J.B. Metz	August 2010	Additional shell column property information.
0.0.6	J.B. Metz	September 2010	Merged directory name and filename shell items into file entry shell item. Added information about NTFS file reference. Corrected references.
0.0.7	J.B. Metz	January 2011	License version update Additional Windows 2000 and 2003 information.
0.0.8	J.B. Metz	March 2012	Added information about known folder identifiers. Found additional shell items in test files [LOPEZ10].
0.0.9	J.B. Metz	May 2012	Updates for Windows 8 Consumer Preview.
0.0.10	J.B. Metz	August 2012	New findings regarding shell property sheets (formerly indicated as shell column properties) with thanks to Harlan Carvey and Kevin Moore.
0.0.11	J.B. Metz	February 2013	Additional information regarding Windows 95 shell item types.
0.0.12	J.B. Metz	February 2013	Additional information regarding Windows 95 shell item types. Merged file entry name and file entry seem to be the same type.
0.0.13	J.B. Metz	February 2013	Renamed the shell property sheets (formerly indicated as shell column properties) to property store as indicated in the LNK documentation.
0.0.14	J.B. Metz	June 2013	Additional information regarding regarding class type

Version	Author	Date	Comments
			indicators. Additional findings regarding class type indicator flag 0x80.
0.0.15	J.B. Metz	June 2013	New findings regarding shell item type 0x1f, 0x2f and 0x74.
0.0.16	J.B. Metz	June 2013	New findings regarding Windows 98 shell items, shell item class 0x40, extension blocks and delegate items. Special thanks to J. Sánchez López for revisiting his previous findings.
0.0.17	J.B. Metz	June 2013	New findings regarding shell item type 0x00 and 0xff with thanks to Eduardo P.
0.0.18	J.B. Metz	June 2013	New findings regarding shell item types 0x35, 0x4c, 0x61 and FTP sub shell items, and extension blocks.
0.0.19	J.B. Metz	June 2013	New findings regarding shell item type 0x00 and extension blocks. Moved Property store definitions to separate document.
0.0.20	J.B. Metz	July 2013	Renamed folder identifier shell item to root folder shell item and volume name shell item to volume shell item.
0.0.21	J.B. Metz	October 2013	New findings on Windows 8.1 with thanks to E. Zimmerman.
0.0.22	J.B. Metz	July 2014	Textual changes.
0.0.22	J.B. Metz	July 2014	New findings on Control Panel 0x01 shell item with thanks to E. Zimmerman.
0.0.23	J.B. Metz	July 2014	Found new file entry 0x32 shell item – SWN1. Added findings on the Acronis 0x52 shell item with thanks to D. Pullega and findings on MTP and MSC storage device shell items with thanks to N. Ibrahim.
0.0.24	J.B. Metz	July 2014 August 2014	Additional information on file entry 0x32 shell item – SWN1 and property view shell items. New findings on extension block 0xbeef0025 with thanks to E. Zimmerman and findings on file entry 0x36 shell item with thanks to F. Picasso.
0.0.25	J.B. Metz	August 2014	Restructured document, textual changes and additional information on the CD burn, delegate, compressed folder and MTP storage device shell items and extension blocks with thanks to E. Zimmerman.
0.0.26	J.B. Metz	August 2014	Moved property set information to LIBWPS documentation. Updated information regarding control panel CPL file and delegate shell item. Additional information regarding extension blocks 0xbeef0000, 0xbeef0001, 0xbeef0008 and 0xbeef0010 with thanks to E. Zimmerman.

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1. Overview

The Windows Shell uses Shell Items (Shell Item list) to identify items within the Windows Folder Hierarchy. A Shell Item list is much like a path, and is unique to its parent folder. The format of the Shell Item is undocumented and varies between Windows versions.

Characteristics	Description
Byte order	little-endian
Date and time values	in UTC
Character string	ASCII strings are stored in extended ASCII with a codepage. Unicode strings are stored in UTF-16 little-endian without the byte order mark (BOM).

1.1. Test versions

The following version of programs were used to test the information within this document:

- Windows 95
- Windows 98
- TODO: Windows Me
- Windows NT4
- Windows 2000 (SP4)
- Windows XP (SP3)
- Windows 2003
- Windows Vista (SP0)
- Windows 2008
- Windows 7 (SP0)
- Windows 8
- TODO: Windows 2012
- Windows 8.1

2. Shell Item list

The Shell Item list (ITEMIDLIST) is variable of size and consists of:

offset	size	value	description
0	...		The Shell Item
...	2	0	Terminal identifier Signifies the end of the Shell Item list

The shell items identifiers list consists of Shell Item terminated by the terminal identifier (an empty Shell Item).

2.1. Shell Item

The Shell Item (SHITEMID) is variable of size and consists of:

offset	size	value	description
0	2		The size of the shell item

offset	size	value	description
			Includes the 2 bytes of the size itself, 0 if shell item is empty
Shell Item data			
2	1		Class type indicator
3	...		Class type specific data

Related class identifier CLSID_ShellItem?

The class type indicator has proven not to be a foolproof indicator for all shell items, but it appears to be a strong one for others hence (for now) we divide the shell items into two categories:

- type indicator-base shell items
- signature-base shell items

3. Type indicator-based shell items

3.1. Class type indicator

The class type indicator is a combination of a type, sub-type and flags.

Value	Related class identifier (CLSID)	Description
0x00		Unknown
0x01		Unknown
0x17		Unknown
0x1e	CLSID_ShellDesktop	Not seen in wild but reason to believe it exists.
0x1f	CLSID_ShellDesktop Likely IshellFolder interface?	Root folder shell item
0x20 – 0x2f	CLSID_MyComputer	Volume shell item See section: 3.3 Volume shell item
0x30 – 0x3f	CLSID_ShellFSFolder	File entry shell item See section: 3.4 File entry shell item
0x40 – 0x4f	CLSID_NetworkRoot CLSID_NetworkPlaces	Network location shell item See section: 3.5 Network location shell item
0x52		Compressed folder shell item See section: 3.6 Compressed folder shell item
0x61	CLSID_Internet	URI shell item

Value	Related class identifier (CLSID)	Description
0x70	ControlPanel	Not seen in wild but reason to believe it exists. item has no item data at offset 0x04
0x71	ControlPanel ControlPanelTasks	Control Panel shell item
0x72	Printers	Not seen in wild but reason to believe it exists. Printers
0x73	CommonPlacesFolder	Not seen in wild but reason to believe it exists.
0x74	UsersFilesFolder	Unknown Only seen as delegate item
0x76		Unknown
0x80		Unknown – different meaning per class type indicator?
0xff		Unknown

Type 0x08 (with size of 6) is alias ?
Type 0x0c is alias ?

0x3a Name space object? Link blessing? My Computer (CRegFolder)?

0x7b extension?

What is the relationship between the root (first) shell item (0x1f/0x1e?) and the other shell items?

3.2. Root folder shell item

The root folder shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x1f	Class type indicator
3	1		Sort index
4	16		Shell folder identifier Contains a GUID For a list of shell folder identifiers see: [LIBFWSI-WIKI]
Present if shell item size > 20 (seen in Windows 7)			
20	...		Extension block 0xbeef0017 See section: 6.15 Extension block

offset	size	value	description
			0xbeef0017

Shell item from Windows 7 ShellMRU (Search Home)

```
00000000: 1f 80 2e 81 43 93 37 1c  49 4a a1 2e 4b 2d 81 0d   ....C.7. IJ..K-..
00000010: 95 6b 46 00 01 00 17 00  ef be 00 00 00 00 01 00   .kF..... ........
00000020: 00 00 02 00 00 80 01 00  00 00 01 00 00 00 02 00   ........ ........
00000030: 00 00 00 00 00 00 00 00  00 00 02 00 00 00 00 00   ........ ........
00000040: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000050: 00 00 00 00 00 00 14 00                           ........
```

3.2.1. Sort index

Value	Identifier	Description
0x00		Internet Explorer
0x42		Libraries
0x44		Users
0x48		My Documents
0x50		My Computer
0x58		My Network Places/Network
0x60		Recycle Bin
0x68		Internet Explorer
0x70		Unknown
0x80		My Games

Common sort indexes matches info in oleview.exe

3.3. Volume shell item

The volume shell item is identified by a value of 0x20 after applying a bitmask of 0x70. The remaining bits in the class type indicator are presumed to be a sub-type or flags.

Value	Identifier	Description
0x01		Has name
0x02		Unknown (0x23 C:, 0x2f C: or D:, 0x2a J:)
0x04		Unknown (0x23 C:, 0x25 D:)
0x08		Is removable media (0x23 C:, 0x29 A:, 0x2a J:)

Values that have been seen: 0x23, 0x25, 0x29, 0x2a, 0x2e, 0x2f

The volume shell item is variable bytes of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item

offset	size	value	description
			Includes the 2 bytes of the size itself
2	1		Class type indicator 0x20 after applying a bitmask of 0x70
If class type indicator flag 0x01 (has name) is not set			
3	1		Unknown (Flags) Seen 0x00, 0x1e, 0x80
4	16		Volume identifier? Contains a GUID Control Panel and Printers folder identifier seen in windows 95 lnk
If class type indicator flag 0x01 (has name) is set			
3	20		Volume name ASCII string with end-of-string character Remaining bytes are filled with 0 byte values
23	2		Unknown (icon index or file attributes?)
Present if shell item size > 25 (seen in Windows 7) or is this indicated by another value?			
25	16		Shell folder identifier Contains a GUID For a list of shell folder identifiers see: [LIBFWSI-WIKI]
Present if shell item contains more data			
...	...		Extension block Seen extension block 0xbeef0025. See section: 6.18 Extension block 0xbeef0025

Found in Windows 7 BagMRU

```
00000000: 2f 44 3a 5c 00 00 00 00  00 00 00 00 00 00 00 00   /D:\.... ........
00000010: 00 00 00 00 00 01 01 05  8a eb fb ee be 42 44 80   ........ .....BD.
00000020: 4e 40 9d 6c 45 15 e9                               N@.lE..
```

```
00000000  32 00 2e 80 3a cc bf b4  2c db 4c 42 b0 29 7f e9  |2...:...,.LB.)..|
00000010  9a 87 c6 41 1e 00 00 00  25 00 ef be 11 00 00 00  |...A....%.......|
00000020  fa 66 a2 86 36 74 cf 01  2d 81 fe bc ba 9b cf 01  |.f..6t..-.......|
00000030  14 00 00 00                                       |....|
```

```
00000000  32 00 2e 80 90 e2 4d 37  3f 12 65 45 91 64 39 c4  |2.....M7?.eE.d9.|
00000010  92 5e 46 7b 1e 00 00 00  25 00 ef be 11 00 00 00  |.^F{....%.......|
00000020  fa 66 a2 86 36 74 cf 01  33 cb 2c 72 3b 74 cf 01  |.f..6t..3.,r;t..|
00000030  14 00 00 00                                       |....|
```

3.4. File entry shell item

The file entry shell item is identified by a value of 0x30 after applying a bitmask of 0x70. The

remaining bits in the class type indicator are presumed to be a sub-type or flags.

Value	Identifier	Description
0x01		Is directory
0x02		Is file
0x04		Has Unicode strings
0x08		Unknown (common item flag?) Related to the common item dialog?
0x80		Has class identifier (related to junction?)

Values that have been seen: 0x30, 0x31, 0x32, 0x35, 0x36, 0xb1. Possible other values: 0x38.

According to [LOPEZ10] the value in the last two bytes of the shell can be used to find the offset of the extension block version and if this value is sane the file entry shell item contains an extension block (Windows XP or later) or otherwise the secondary name value (pre Windows XP).

3.4.1. File entry shell item – pre Windows XP

This version of the the file entry shell item is used by Windows versions predating Windows XP, e.g. Windows 95, Windows NT4, Windows 2000.

The file entry shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1		Class type indicator 0x30 after applying a bitmask of 0x70
3	1	0	Unknown (Empty value)
4	4		File size What about > 32-bit file sizes?
8	4		Last modification date and time FAT date and time in UTC
12	2		File attribute flags Contains the lower 16-bit part of the file attribute flags. See section: 7.1 File attribute flags What does 0x8000 represent? Seen in windows 98 lnk.
14	...		Primary name Depending on flag 0x04 an ASCII or UTF-16 little-endian string with end-of-string character. Also see below
...	...		Secondary name Depending on flag 0x04 an ASCII or

offset	size	value	description
			UTF-16 little-endian string with end-of-string character. Also see below
If class type indicator flag 0x80 is set			
...	16		Shell folder identifier Contains a GUID For a list of shell folder identifiers see: [LIBFWSI-WIKI]

The primary name contains the long name if available otherwise it contains the short name. If the primary name contains the long name the secondary name contains the short name otherwise it is empty (consist of a single end-of-string character). It is unknown when Unicode string support was added but it is assumed that it also applies to pre Windows XP file entry shell item.

On Windows 95 for type 0x30 (without flags) none of the values in the first 11 bytes after the type indicator are set.

3.4.2. File entry shell item – Windows XP and later

This version of the the file entry shell item is used by Windows XP and later versions.

The file entry shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1		Class type indicator 0x30 after applying a bitmask of 0x70
3	1	0	Unknown (Empty value)
4	4		File size What about > 32-bit file sizes?
8	4		Last modification date and time FAT date and time in UTC
12	2		File attribute flags Contains the lower 16-bit part of the file attribute flags. See section: 7.1 File attribute flags
14	...		Primary name Depending on flag 0x04 an ASCII or UTF-16 little-endian string with end-of-string character. This value is 16-bit aligned, so for ASCII strings it can contain an additional zero byte. Also see below
...	...		Extension block 0xbeef0004

offset	size	value	description
			This value contains the the size of the extension block or 0 if not set See section: 6.5 File entry extension block (0xbeef0004)
Present if shell item contains more data (and flag 0x80 is not set?) (seen in Windows 2003)			
...	...		Extension block Seen extension block 0xbeef0005, 0xbeef0006 and 0xbeef001a.
If class type indicator flag 0x80 is set			
...	...		Extension block 0xbeef0003 See section: 6.4 Extension block 0xbeef0003

The primary name often contains the short name, but can contain the long name as well e.g. when class indicator flag 0x04 is set.

Note date and time values do not always seem to be set.

3.4.3. File entry shell item - SolidWorks

Seen in Windows 7 in LastVisitedPidMRU and LNK files after shell item 0xb1 with extension block 0xbeef0003 which contains the SolidWorks Enterprise PDM CLSID: {0bd8e793-d371-11d1-b0b5-0060972919d7}.

The file entry shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	Seen: 0x32	Class type indicator 0x30 after applying a bitmask of 0x70
3	1	0	Unknown (Empty value)
4	4	Seen: 0	File size What about > 32-bit file sizes?
8	4	Seen: 0	Last modification date and time FAT date and time in UTC
12	2	Seen: 0	File attribute flags Contains the lower 16-bit part of the file attribute flags. See section: 7.1 File attribute flags
14	...		Primary name UTF-16 little-endian string with end-of-string character.
...	2	Seen: 0	Extension block This value contains the the size of the

offset	size	value	description
			extension block or 0 if not set
...	7	“S.W.N.1”	Signature
...	1		The file entry type? 0x01 => directory 0x02= > file Likely part of signature
...	4		Unknown
...	4		Unknown
...	8	Seen: 2	Unknown
...	6	Seen: 0	Unknown (Empty values)

3.4.4. Notes

File date and time values populated from WIN32_FIND_DATA?

Part before the extension block FolderItem typelib interface?

Class identifier (CLSID)	Related interface identifier(s) (IID)	Related class
CLSID_FolderItem	IID_IPersistFolder	

3.5. Network location shell item

The network location shell item is identified by a value of 0x40 after applying a bitmask of 0x70. The remaining bits in the class type indicator are presumed to be a sub-type or flags.

Value	Identifier	Description
0x01		Domain/Workgroup name
0x02		Server UNC path
0x03		Share UNC path
0x06		Microsoft Windows Network
0x07		Entire Network
0x0d	NetworkPlaces	if resource display type is generic or root
0x0e	NetworkPlaces	if resource display type is server
0x80		Unknown

Values that have been seen: 0x41, 0x42, 0x46, 0x47, 0x4c, 0xc3

The Network location shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1		Class type indicator 0x40 after applying a bitmask of 0x70
3	1		Unknown 0x00, 0x01 (in UNC path), 0x03
4	1		Flags 0x01 0x02 0x04 0x40 => has comments 0x80 => has description
5	...		Location Contains the network name or UNC path ASCII string with end-of-string character
If flag 0x80 is set			
...	...		Description ASCII string with end-of-string character
If flag 0x40 is set			
			Comments ASCII string with end-of-string character
If size > ?			
...	...		Unknown 0x0000 0x0002 0x000042

3.6. Compressed folder shell item

The compressed folder shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x52	Class type indicator
3	1	Seen: 0x67	Unknown
4	2	Seen: 0xacb1	Unknown (flags or signature of some kind)
Controlled by one of the flags?			
6	4	Seen: 1, 2, 3	Unknown
10	8		Unknown (empty values)

offset	size	value	description
18	4	Seen: 0x10, 0x11, 0x16	Unknown
22	4		Unknown Possibly used for higher precision timestamps
26	4		Unknown (date and time) Contains a FAT date and time in UTC, or 0 if not set
30	4		Unknown Possibly used for higher precision timestamps
34	4		Unknown (date and time) Contains a FAT date and time in UTC, or 0 if not set
38	8	0	Unknown (empty values)
Common			
46	4		Unknown string size Contains the number of characters which includes the end-of-string character An empty strings is stored with a size of 1
50	...		Unknown string (file entry name?) UTF-16 little-endian string with end-of-string character.
...	4		Unknown string size Contains the number of characters which includes the end-of-string character An empty strings is stored with a size of 1
...	...		Unknown string UTF-16 little-endian string with end-of-string character.
...	4		Full path string size Contains the number of characters which includes the end-of-string character An empty strings is stored with a size of 1
...	...		Full path string UTF-16 little-endian string with end-of-string character.
...	4		Unknown string size Contains the number of characters which includes the end-of-string character An empty strings is stored with a size of 1
...	...		Unknown string UTF-16 little-endian string with end-of-string character.

```
00000000: 67 b1 ac 02 00 00 00 00  00 00 00 00 00 00 00 16   g....... ........
00000010: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000020: 00 00 00 00 00 00 00 00  00 00 00 03 00 00 00 43   ........ .......C
00000030: 00 3a 00 00 00 03 00 00  00 43 00 3a 00 00 00 03   .:...... .C.:....
00000040: 00 00 00 43 00 3a 00 00  00 01 00 00 00 00 00      ...C.:.. .......
```

```
00000000: 67 b1 ac 01 00 00 00 00  00 00 00 00 00 00 00 00   g....... ........
00000010: 00 00 00 00 00 00 00 00  00 00 00 00 00 03 de 3d   ........ .......=
00000020: 27 74 42 00 00 00 00 00  00 00 00 25 00 00 00 30   'tB..... ...%...0
00000030: 00 43 00 32 00 46 00 34  00 45 00 45 00 42 00 2d   .C.2.F.4 .E.E.B.-
00000040: 00 30 00 42 00 30 00 39  00 2d 00 34 00 43 00 39   .0.B.0.9 .-.4.C.9
00000050: 00 32 00 2d 00 39 00 30  00 44 00 31 00 2d 00 34   .2.-.9.0 .D.1.-.4
00000060: 00 31 00 39 00 31 00 30  00 41 00 31 00 41 00 41   .1.9.1.0 .A.1.A.A
00000070: 00 46 00 42 00 33 00 00  00 0d 00 00 00 4d 00 79   .F.B.3.. .....M.y
00000080: 00 20 00 44 00 6f 00 63  00 75 00 6d 00 65 00 6e   . .D.o.c .u.m.e.n
00000090: 00 74 00 73 00 00 00 01  00 00 00 00 00 01 00 00   .t.s.... ........
000000a0: 00 00 00                                          ...
```

```
00000000        67 45 23 01 00 00  36 00 37 00 45 00 46 00  |R.gE#...6.7.E.F.|
00000010  33 00 38 00 38 00 31 00  2d 00 35 00 33 00 35 00  |3.8.8.1.-.5.3.5.|
00000020  36 00 2d 00 34 00 65 00  61 00 35 00 2d 00 38 00  |6.-.4.e.a.5.-.8.|
00000030  43 00 42 00 45 00 2d 00  43 00 43 00 46 00 38 00  |C.B.E.-.C.C.F.8.|
00000040  33 00 42 00 46 00 41 00  36 00 43 00 42 00 34 00  |3.B.F.A.6.C.B.4.|
00000050  00 00                                            |....|
00000054
```

3.7. URI shell item

The URI shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x61	Class type indicator
3	1		Flags 0x01 0x02 0x80 set if URI string in Unicode
4	2		Size of data Includes the 2 bytes of the size itself 0 if no data
If size of data > 0 *Is this controlled by flag 0x01 or 0x02 ?*			
...	4		Unknown
...	4		Unknown
...	8		Unknown timestamp Contains a FILETIME
...	4		Unknown

offset	size	value	description
			0x00000000 0xffffffff
...	12		Unknown (Empty values)
...	4		Unknown
...	4		String1 data size Value in bytes
...	...		String1 data Depending on flag 0x80 an ASCII or UTF-16 little-endian string with end-of-string character. The string is 4-byte aligned unused bytes are filled with 0-byte values. Therefore an empty string is stored as 4x 0-byte values.
...	4		String2 data size Value in bytes
...	4		String2 data Depending on flag 0x80 an ASCII or UTF-16 little-endian string with end-of-string character. The string is 4-byte aligned unused bytes are filled with 0-byte values. Therefore an empty string is stored as 4x 0-byte values.
...	4		String3 data size Value in bytes
...	4		String3 data Depending on flag 0x80 an ASCII or UTF-16 little-endian string with end-of-string character. The string is 4-byte aligned unused bytes are filled with 0-byte values. Therefore an empty string is stored as 4x 0-byte values.
Common			
...	2	0	Unknown (size of data?)
...	...		URI string Depending on flag 0x80 an ASCII or UTF-16 little-endian string with end-of-string character.
Not always present is this controlled by flag 0x01 or 0x02 ?			
...	2		Unknown (Empty values)
Present if shell item contains more data (Seen in Vista in combination with MSIE 7)			
...	4		Extension block 0xbeef0014 See section: 6.14 Extension block 0xbeef0014

3.7.1. FTP sub shell item

Seen after 0x61 shell item type with ftp URI.

The ftp sub shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1		Class type indicator? Seen: 0x17, 0x30, 0x5b, 0xb5, 0xb7, 0xb9, 0xba, 0xc2, 0xc4, 0xe6
3	1		Unknown 0x00 0x06 0x09
4	2		Unknown If 0 no string padding?
6	4		Unknown 0x00000005 0x00000009
10	4		Unknown (flags?) 0x00000080 0x00000090
14	24		Unknown (empty values)
38	...		String ASCII string with end-of-string character Sometimes is 4-byte aligned unused bytes are filled with 0-byte values?
...	...		Unicode string UTF-16 little-endian string with end-of-string character Sometimes is 4-byte aligned unused bytes are filled with 0-byte values?
...	...		Unknown Not always present, but is an ASCII string sometimes without an end-of-string character. Maybe remnant data?

```
00000000: 76 00 6f 00 05 00 00 00  90 00 00 00 00 00 00 00   v.o..... ........
00000010: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000020: 01 00 00 00 74 65 73 74  00 00 00 00 74 00 65 00   ....test ....t.e.
00000030: 73 00 74 00 00 00 73 00                           s.t...s.
```

3.8. Control Panel shell item

The Control Panel shell item is 30 bytes of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x71	Class type indicator
3	1		Unknown (sort order?) 0x80
4	10		Unknown (Empty values)
14	16		Control Panel Item identifier Contains a GUID For a list of control panel identifiers see: [LIBFWSI-WIKI]

4. Signature-based shell items

4.1. CDBurn shell item

Seen in Windows XP after 0x2e shell item type pointing to CDBurn (related) CLSID.

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x00	Class type indicator
3	1		Unknown (Empty value)
4	4	“AugM” 0x4d677541	Signature
8	4		Unknown (number of 16-bit values that follow?) Seen: 2, 4
12	4		Unknown Related to the number of sub shell items in the sub shell item list?
If number of 16-bit values that follow == 4			
18	4		Unknown Seen: 0x00010000
Common			
...	2		Sub shell item list

4.2. Control panel shell items

4.2.1. Control panel CPL file shell item

Seen after 0x2e shell item type pointing to Control Panel CLSID.

The Control panel CPL file shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x00	Class type indicator
3	1		Unknown (Empty value)
4	4	0xffffff38	Signature
8	4		Unknown (Empty values)
12	4		Unknown 0x00006a00
16	4		Unknown (Empty values)
20	2		Name offset Contains the number of characters (16-bit values)
22	2		Comments offset Contains the number of characters (16-bit values)
24	...		.cpl file path UTF-16 little-endian string with end-of-string character
...	...		Name UTF-16 little-endian string with end-of-string character
...	...		Comments UTF-16 little-endian string with end-of-string character

4.2.2. Control panel category 0x01 shell item

Seen in Windows 7 in BagMRU and also seen in LNK after shell item type 0x1f with Control Panel CLSID.

The Control panel category 0x01 shell item is 12 bytes of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x01	Class type indicator
3	1		Unknown (Empty value)
4	4	0x39de2184	Signature
8	4		Control panel category

Control panel categories

Value	Identifier	Description
0		All Control Panel Items
1		Appearance and Personalization
2		Hardware and Sound
3		Network and Internet
4		Sounds, Speech, and Audio Devices No longer used as Windows Vista
5		System and Security
6		Clock, Language, and Region
7		Ease of Access
8		Programs
9		User Accounts
10		Security Center No longer used as Windows Vista, only available in Windows XP, SP2 or later
11		Mobile PC Only available in mobile version of Windows Vista

4.3. Game Folder shell item

Seen after 0x1f shell item type containing a My Games shell folder identifier (ED228FDF-9EA8-4870-83B1-96B02CFE0D52).

The Game Folder Shell Item is 32 bytes of size and consists of:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x00	Class type indicator
3	1		Unknown (Empty value)
4	4	“GFSI” 0x49534647	Signature
8	16		Class identifier Contains a GameExplorer related GUID D1A7F7E0-D4E9-49e8-BF2C-CEAA01D2E670
24	8		Unknown (Empty values)

4.4. MTP storage device shell items

TODO
MTP => Media Transfer Protocol

4.4.1. MTP storage device volume shell item

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x00	Class type indicator
3	1		Unknown (Empty value)
4	2		Data size The size of the following data, the extension block sizes not included
6	4	0x10312005	Data signature
Data			
10	4	Seen: 3	Unknown
14	2		Unknown
16	2		Unknown
18	2		Unknown
20	2		Unknown
22	4		Unknown
26	8		Unknown (Empty values)
34	4		Unknown size
38	4		Name string size Contains the number of characters including the end-of-string character
42	4		Identifier string number of characters Contains the number of characters including the end-of-string character
46	4		File system string number of characters Contains the number of characters including the end-of-string character
50	4		Number of GUID strings
54	...		Name string UTF-16 little-endian with end-of-string character
...	...		Identifier string UTF-16 little-endian with end-of-string character
...	...		File system string UTF-16 little-endian with end-of-string character
...	78 x n		GUID strings

offset	size	value	description
			UTF-16 little-endian with end-of-string character Each GUID string is 78 bytes in size The GUIDs relate to WPD event handler identifiers
...	4	0xd	Unknown
...	16		Class identifier Contains a GUID CLSID: PortableDeviceValues Class
...	4		Number of properties
...	...		Properties array
...	2		Unknown (empty values)

4.4.2. MTP storage device file entry shell item

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x00	Class type indicator
3	1		Unknown (Empty value)
4	2		Data size The size of the following data, the extension block sizes not included
6	4	0x07192006	Data signature
10	4		Unknown
14	2		Unknown
16	2		Unknown
18	2		Unknown
20	2		Unknown
22	4		Unknown
26	8		Last modification time? Contains a FILETIME
34	8		Creation time? Contains a FILETIME
42	16		GUID WPD_CONTENT_TYPE_FOLDER
58	4		Unknown size
62	4		String 1 size
66	4		String 2 size

offset	size	value	description
70	4		String 3 size
74	...		String 1 (Folder name) UTF-16 little-endian with end-of-string character
...	...		String 2 (Folder name) UTF-16 little-endian with end-of-string character
...	...		String 3 (Folder identifier) UTF-16 little-endian with end-of-string character
...	4	0xd	Unknown
...	16		Class identifier Contains a GUID CLSID: PortableDeviceValues Class
...	4		Number of properties
...	...		Properties array
...	2		Unknown (empty values)

4.4.3. Properties array

Property

A property is variable of size and consists of:

offset	size	value	description
0	16		Format class (or property set) identifier Contains a GUID
16	4		Property value identifier
20	4		Property value type Contains an OLE defines property (variant) types. Also see [LIBFOLE]
24	...		Property value

Format class (or property set) identifiers

The following format class (or property set) identifier are known to be used. For more information about the property sets and values see: [LIBFWPS].

Identifier	Description
01a3057a-74d6-4e80-bea7-dc4c212ce50a	WPD_STORAGE_OBJECT_PROPERTIES_V1
4d545058-4fce-4578-95c8-8698a9bc0f49	Unknown
8f052d93-abca-4fc5-a5ac-b01df4dbe598	WPD_FUNCTIONAL_OBJECT_PROPERTIES_V1

Identifier	Description
ef6b490d-5cd8-437a-affc-da8b60ee4a3c	WPD_OBJECT_PROPERTIES_V1

4.5. Delegate shell item

The delegate shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1		Class type indicator Seen: 0x2e, 0x53
3	1		Unknown Seen: 0x00, 0x44
4	2		Data size Does not includes the 2 bytes of the size itself
6	...		Data
...	16		Delegate item identifier Contains a GUID {5E591A74-DF96-48D3-8D67-1733BCEE28BA}
...	16		Shell folder identifier Contains a GUID For a list of shell folder identifiers see: [LIBFWSI-WIKI]

4.5.1. Item (class) identifiers

Identifier	Description
59031a47-3f72-44a7-89c5-5595fe6b30ee	Shared Documents Folder (Users Files)

4.5.2. Shell folder: 59031a47-3f72-44a7-89c5-5595fe6b30ee data

offset	size	value	description
0	4	Seen: 2	Unknown
4	...		Username? UTF-16 little-endian string with end-of-string character
...	8		Unknown (empty values) 4-byte alignment padding?

Seen 12 and 32 bytes in size, where the 12 byte variant appears to be empty.

```
00000000: 00 00 00 00 00 00 00 00  00 00 00 00                  ........ ....
```

4.5.3. Notes

```
Data signature

00000000        53 44 0e 00 d5 df  a3 23 00 00 04 00 00 00  |4.SD.....#......|
00000010  00 00 00 00 74 1a 59 5e  96 df d3 48 8d 67 17 33  |....t.Y^...H.g.3|
00000020  bc ee 28 ba 40 d0 13 e4  88 67 22 4c 95 7e 17 5d  |..(.@....g"L.~.]|
00000030  1c 51 3a 34                                       |.Q:4..|
00000036
```

```
00000000: 2e 00 54 01 06 20 31 08  03 00 00 00 00 00 00 00   ..T.. 1. ........
00000010: 02 00 00 00 74 00 00 00  01 00 00 00 0c 00 00 00   ....t... ........
00000020: 52 00 00 00 00 00 53 00  61 00 6e 00 73 00 61 00   R.....S. a.n.s.a.
00000030: 20 00 6d 00 32 00 34 00  30 00 20 00 00 00 5c 00    .m.2.4. 0. ...\.
00000040: 5c 00 3f 00 5c 00 75 00  73 00 62 00 23 00 76 00   \.?.\.u. s.b.#.v.
00000050: 69 00 64 00 5f 00 30 00  37 00 38 00 31 00 26 00   i.d._.0. 7.8.1.&.
00000060: 70 00 69 00 64 00 5f 00  37 00 34 00 30 00 30 00   p.i.d._. 7.4.0.0.
00000070: 23 00 30 00 37 00 38 00  31 00 30 00 30 00 35 00   #.0.7.8. 1.0.0.5.
00000080: 62 00 33 00 30 00 30 00  33 00 30 00 34 00 63 00   b.3.0.0. 3.0.4.c.
00000090: 37 00 23 00 7b 00 36 00  61 00 63 00 32 00 37 00   7.#.{.6. a.c.2.7.
000000a0: 38 00 37 00 38 00 2d 00  61 00 36 00 66 00 61 00   8.7.8.-. a.6.f.a.
000000b0: 2d 00 34 00 31 00 35 00  35 00 2d 00 62 00 61 00   -.4.1.5. 5.-.b.a.
000000c0: 38 00 35 00 2d 00 66 00  39 00 38 00 66 00 34 00   8.5.-.f. 9.8.f.4.
000000d0: 39 00 31 00 64 00 34 00  66 00 33 00 33 00 7d 00   9.1.d.4. f.3.3.}.
000000e0: 00 00 0d 00 00 00 03 d5  15 0c 17 d0 ce 47 90 16   ........ .....G..
000000f0: 7b 3f 97 87 21 cc 02 00  00 00 9a 97 d4 26 43 e6   {?..!... .....&C.
00000100: 26 46 9e 2b 73 6d c0 c9  2f dc 0c 00 00 00 1f 00   &F.+sm.. /.......
00000110: 00 00 18 00 00 00 53 00  61 00 6e 00 73 00 61 00   ......S. a.n.s.a.
00000120: 20 00 6d 00 32 00 34 00  30 00 20 00 00 00 93 2d    .m.2.4. 0. ....-
00000130: 05 8f ca ab c5 4f a5 ac  b0 1d f4 db e5 98 02 00   .....O.. ........
00000140: 00 00 48 00 00 00 6b 46  ea 08 a4 e3 36 43 a1 f3   ..H...kF ....6C..
00000150: a4 4d 2b 5c 43 8c 00 00  74 1a 59 5e 96 df d3 48   .M+\C... t.Y^...H
00000160: 8d 67 17 33 bc ee 28 ba  3c 6d 78 35 75 b0 b9 49   .g.3..(. <mx5u..I
00000170: 88 dd 02 98 76 e1 1c 01                           ....v...
```

4.5.4. 0x74 delegate shell item

Could this variant be related?

The 0x74 delegate shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x74	Class type indicator Outer or delegating private data?
3	1		Unknown (Empty value)
4	2		Unknown (size?) Size does not Includes the 2 bytes of the size itself, should map up to the start of

offset	size	value	description
			the delegate item identifier Inner or delegated data size?
6	4	“CFSF” 0x46534643	Unknown (signature)
10	2		Sub shell item data size Value does not includes the 2 bytes of the size itself
Sub shell item			
12	1	0x31	Sub class type indicator
13	1		Unknown (empty value)
14	4		File size What about > 32-bit file sizes?
8	4		Last modification date and time FAT date and time in UTC
12	2		File attribute flags Contains the lower 16-bit part of the file attribute flags. See section: 7.1 File attribute flags
14	...		Primary name ASCII string with end-of-string character This value is 16-bit aligned, so it can contain an additional zero byte
...	2		Unknown (Empty values) Empty extension block?
Common			
...	16		Delegate item identifier Contains a GUID {5E591A74-DF96-48D3-8D67-1733BCEE28BA}
...	16		Item (class) identifier Contains a GUID
...	...		Extension block 0xbeef0004 See section: 6.5 File entry extension block (0xbeef0004)

4.6. Users property view

4.6.1. Users property view shell item

Seen after 0x1f shell item type pointing to Users Libraries shell folder identifier (031e4825-7b94-4dc3-b131-e946b44c8dd5) or Users shell folder identifier (59031A47-3F72-44A7-89C5-5595FE6B30EE).

The Users property view shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	Seen: 0x00	Class type indicator
3	1		Unknown (Empty value)
4	2		Data size The size of the following data, the extension block sizes not included
6	4		Data signature
10	2		Property store data size Contains 0 if not present
12	2		Identifier size
If identifier size > 0			
14	...		Identifier data
If size of shell property sheet list size > 0			
...	...		Property store data Contains one or more property stores See: [LIBFWPS]
Common			
...	2		Unknown (Empty values)
Present if shell item contains more data			
...	...		One or more extension blocks Seen extension blocks 0xbeef0000 and 0xbeef0019. See sections: 6.1 Extension block 0xbeef0000 and 6.16 Extension block 0xbeef0019

Data signatures

Data signature	Size	Description
0x10141981	32	Unknown
0x23febbee	16	Know folder identifier Contains a GUID For a list of known folder identifiers see: [LIBFWSI-WIKI]
0x3b93afbb	4	Contains a 32-bit value
0xbeebee00	4	Contains a 32-bit value

Format class (or property set) identifiers

The following format class (or property set) identifiers are known to be used. For more information about the property sets and values see: [LIBFWPS].

Identifier	Description
b725f130-47ef-101a-a5f1-02608c9eebac	Unknown (Windows Search related?)

Notes

Found in Vista BagMRU

```
shell item size                     : 259
shell item data:
00000000: 00 00 fd 00 00 ee eb be   ef 00 04 00 01 00 00 00   ........ ........

00000010: 55 00 00 00 31 53 50 53   30 f1 25 b7 ef 47 1a 10   U...1SPS 0.%..G..
00000020: a5 f1 02 60 8c 9e eb ac   39 00 00 00 0a 00 00 00   ...`.... 9.......
00000030: 00 1f 00 00 00 13 00 00   00 44 00 65 00 73 00 6b   ........ .D.e.s.k
00000040: 00 74 00 6f 00 70 00 20   00 42 00 61 00 63 00 6b   .t.o.p.  .B.a.c.k
00000050: 00 67 00 72 00 6f 00 75   00 6e 00 64 00 00 00 00   .g.r.o.u .n.d....
00000060: 00 00 00 00 00 4d 00 00   00 31 53 50 53 87 27 bf   .....M.. .1SPS.'.
00000070: 5c cf 48 08 42 b9 0e ee   5e 5d 42 02 94 31 00 00   \.H.B... ^]B..1..
00000080: 00 19 00 00 00 00 1f 00   00 00 10 00 00 00 74 00   ........ ......t.
00000090: 68 00 65 00 6d 00 65 00   63 00 70 00 6c 00 2e 00   h.e.m.e. c.p.l...
000000a0: 64 00 6c 00 6c 00 2c 00   2d 00 31 00 00 00 00 00   d.l.l.,. -.1.....
000000b0: 00 00 49 00 00 00 31 53   50 53 53 7d ef 0c 64 fa   ..I...1S PSS}..d.
000000c0: d1 11 a2 03 00 00 f8 1f   ed ee 2d 00 00 00 05 00   ........ ..-.....
000000d0: 00 00 00 1f 00 00 00 0e   00 00 00 70 00 61 00 67   ........ ...p.a.g
000000e0: 00 65 00 57 00 61 00 6c   00 6c 00 70 00 61 00 70   .e.W.a.l .l.p.a.p
000000f0: 00 65 00 72 00 00 00 00   00 00 00 00 00 00 00 00   .e.r.... ........
00000100: 00                                                 .

number of characters

shell item type                     : 0x00
shell item flags                    : 0x00
shell item list size                : 253
```

```
shell item size                     : 251
libfwsi_item_copy_from_byte_stream: shell item data:
00000000: 00 00 f5 00 00 ee eb be   e7 00 04 00 01 00 00 00   ........ ........

00000010: 4d 00 00 00 31 53 50 53   30 f1 25 b7 ef 47 1a 10   M...1SPS 0.%..G..
00000020: a5 f1 02 60 8c 9e eb ac   31 00 00 00 0a 00 00 00   ...`.... 1.......
00000030: 00 1f 00 00 00 10 00 00   00 43 00 68 00 61 00 6e   ........ .C.h.a.n
00000040: 00 67 00 65 00 20 00 73   00 65 00 74 00 74 00 69   .g.e. .s .e.t.t.i
00000050: 00 6e 00 67 00 73 00 00   00 00 00 00 00           .n.g.s.. .....M..

Variant type
Number of characters

00000050:                                           4d 00 00   .n.g.s.. .....M..
00000060: 00 31 53 50 53 87 27 bf   5c cf 48 08 42 b9 0e ee   .1SPS.'. \.H.B...
00000070: 5e 5d 42 02 94 31 00 00   00 19 00 00 00 00 1f 00   ^]B..1.. ........
00000080: 00 00 0f 00 00 00 77 00   75 00 63 00 6c 00 74 00   ......w. u.c.l.t.
00000090: 75 00 78 00 2e 00 64 00   6c 00 6c 00 2c 00 2d 00   u.x...d. l.l.,.-.
000000a0: 31 00 00 00 00 00 00 00   00 00                     1....... ..I...1S
```

```
000000a0:                                        49 00 00 00 31 53   1....... ..I...1S
000000b0: 50 53 53 7d ef 0c 64 fa  d1 11 a2 03 00 00 f8 1f   PSS}..d. ........
000000c0: ed ee 2d 00 00 00 05 00  00 00 00 1f 00 00 00 0d   ..-..... ........
000000d0: 00 00 00 70 00 61 00 67  00 65 00 53 00 65 00 74   ...p.a.g .e.S.e.t
000000e0: 00 74 00 69 00 6e 00 67  00 73 00 00 00 00 00 00   .t.i.n.g .s......
000000f0: 00 00 00 00 00 00 00 00  00                       ........ .

shell item type                    : 0x00
shell item flags                   : 0x00
shell item list size               : 245
```

```
00000000: 00 00 b1 00 bb af 93 3b  a3 00 04 00 00 00 00 00   .......; ........

00000010: 45 00 00 00 31 53 50 53  30 f1 25 b7 ef 47 1a 10   E...1SPS 0.%..G..
00000020: a5 f1 02 60 8c 9e eb ac  29 00 00 00 0a 00 00 00   ...`.... )....... 
00000030: 00 1f 00 00 00 0c 00 00  00 31 00 30 00 2e 00 31   ........ .1.0...1
00000040: 00 30 00 2e 00 31 00 30  00 2e 00 35 00 35 00 00   .0...1.0 ...5.5..
00000050: 00 00 00 00 00 2d 00 00  00 31 53 50 53 3a a4 bd   .....-.. .1SPS:..
00000060: de b3 37 83 43 91 e7 44  98 da 29 95 ab 11 00 00   ..7.C..D ..)..... 
00000070: 00 03 00 00 00 00 13 00  00 00 00 00 00 00 00 00   ........ ........
00000080: 00 00 2d 00 00 00 31 53  50 53 73 43 e5 0a be 43   ..-...1S PSsC...C
00000090: ad 4f 85 e4 69 dc 86 33  98 6e 11 00 00 00 0b 00   .O..i..3 .n......
000000a0: 00 00 00 0b 00 00 00 ff  ff 00 00 00 00 00 00 00   ........ ........
000000b0: 00 00 00 00 00                                     .....
```

Related to details list view?
IColumnProvider?
Shell Column information (SHCOLUMNINFO)
Windows System Property key (PROPERTYKEY) or Shell Column identifier (SHCOLUMNID)

Preceded by shell item item type 0x1f flags 0x44

```
00000000: 00 00 1a 00 ee bb fe 23  00 00 10 00 90 e2 4d 37   .......# ......M7
00000010: 3f 12 65 45 91 64 39 c4  92 5e 46 7b 00 00         ?.eE.d9. .^F{..
```

Found in Win7 BagMRU

```
indicates the type?

00000000: 00 00 1a 00 ee bb fe 23  00 00 10 00 7d b1 0d 7b   .......# ....}..{
00000010: d2 9c 93 4a 97 33 46 cc  89 02 2e 7c 00 00         ...J.3F. ...|..*.

known folder id

Specific to win7 shell library (IShellLibrary), e.g. child folders?
```

```
class type indicator          : 0x00
unknown0                      : 0x00
data size                     : 963
signature                     : 0x10141981
property store size           : 921
identifier size               : 32
identifier data:
00000000: 00 00 48 40 00 00 00 00  00 00 00 00 00 00 00 00   ..H@.... ........
00000010: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
```

4.6.2. Users property view delegate item

The Users property view 0x1f delegate item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	Seen: 0x1f	Class type indicator
3	1		Unknown (Empty value)
4	2		Data size The size of the following data, the extension block sizes not included
6	4		Data signature
10	2		Property store data size Contains 0 if not present
12	2		Identifier size
If identifier size > 0			
14	...		Identifier data
If size of shell property sheet list size > 0			
...	...		Property store data Contains one or more property stores See: [LIBFWPS]
Common			
...	2		Unknown (Empty values)
...	16		Delegate item identifier Contains a GUID {5E591A74-DF96-48D3-8D67-1733BCEE28BA}
...	16		Item (class) identifier Contains a GUID
Present if shell item contains more data			
...	...		Extension block Seen extension block 0xbeef0013. See section: 6.13 Extension block 0xbeef0013

Shell item from Windows 7 ShellMRU root level

```
00000000: 1f 00 31 28 d5 df a3 23  23 28 04 00 00 00 00 00   ..1(...# #(......
00000010: 1f 28 00 00 31 53 50 53  05 d5 cd d5 9c 2e 1b 10   .(..1SPS ........
00000020: 93 97 08 00 2b 2c f9 ae  57 27 00 00 12 00 00 00   ....+,.. W'......
00000030: 00 41 00 75 00 74 00 6f  00 4c 00 69 00 73 00 74   .A.u.t.o .L.i.s.t
...
```

Data signatures

Data signature	Size	Description
0x23a3dfd5	4	Contains a 32-bit value

5. Unknown shell items

5.1. 0x4c shell item

Seen after shell item 0x2e with CLSID Web Folders

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x4c	Class type indicator
3	1		Unknown 0x50
4	4		Unknown
8	16		Unknown (empty values) Reserved for a GUID?
24	4		Unknown

```
00000000: 4c 50 00 11 42 57 00 00  00 00 00 00 00 00 00 00   LP..BW.. ........
00000010: 00 00 00 00 00 00 10 00  00 00                     ........ ....M.y.

00000010:                                 13 00 4d 00 79 00   ........ ....M.y.
00000020: 20 00 57 00 65 00 62 00  20 00 53 00 69 00 74 00    .W.e.b.  .S.i.t.
00000030: 65 00 73 00 20 00 6f 00  6e 00 20 00 4d 00 53 00   e.s. .o. n. .M.S.
00000040: 4e 00

00000040:       00 00

Number of 16-bit characters?
00000040:             17 00 68 00  74 00 74 00 70 00 3a 00   N.....h. t.t.p.:.
00000050: 2f 00 2f 00 77 00 77 00  77 00 2e 00 6d 00 73 00   /./.w.w. w...m.s.
00000060: 6e 00 75 00 73 00 65 00  72 00 73 00 2e 00 63 00   n.u.s.e. r.s...c.
00000070: 6f 00 6d 00

00000070:             00 00 00 00  00 00                     o.m..... ..
```

5.2. 0x76 shell item

The 0x76 shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0x76	Class type indicator
3	1		Unknown (Empty value)

offset	size	value	description
4	2		Unknown
6	4		Unknown
10	...		

```
00000000: 76 00 6f 00 05 00 00 00  90 00 00 00 00 00 00 00   v.o..... ........
00000010: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000020: 01 00 00 00 74 65 73 74  00 00 00 00 74 00 65 00   ....test ....t.e.
00000030: 73 00 74 00 00 00 73 00                           s.t...s.
```

5.3. 0xff shell item

Seen after shell item 0x71 with CLSID Network Connections

The 0xff shell item is variable of size and consists of the following values:

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	1	0xff	Class type indicator
3	1		Unknown
4	4		Unknown
8	4		Unknown 0x30fe5eff
12	4		Unknown (empty values)
16	16		Unknown GUID1
32	16		Unknown GUID2
48	4		Unknown
52	4		Unknown
56	4		Unknown
60	4		Unknown
64	4		Unknown
68	4		Unknown (empty values)
72	4		Unknown
76	4		Unknown
80	4		Unknown
84	4		Unknown
88	4		Unknown
92	4		Unknown
96	...		Unknown (Local Area Connection #) UTF-16 little-endian string with end-of-

offset	size	value	description
			string character
...	...		Unknown (Description of Network Controller) UTF-16 little-endian string with end-of-string character
...	16		Unknown GUID3 Value is the same as that of GUID2
...	4		Unknown (empty values)
...	2		Unknown 0xffff

6. Extension blocks

If the extension block is variable of size but at minimum consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself, 0 if extension block is empty
2	2		Extension version
4	4		Extension signature
8	...		Extension block data
...	2		Extension version offset The offset is relative from the start of the shell item.

The extension signature seems to always consist of 0xbeef followed by a 16-bit value that indicates the block type.

According to [LOPEZ10] the extension version offset value is likely used to determine if the file shell entry item contains the secondary name or not. So likely this value is used for internal validation of the shell item and extension block data.

6.1. Extension block 0xbeef0000

The extension block 0xbeef0000 is 14 or 42 bytes of size and consists of:

offset	size	value	description
0	2		The size of the data Includes the 2 bytes of the size itself
2	2	Seen: 0	Extension version
4	4	0xbeef0000	Extension signature
If size == 14			

offset	size	value	description
8	4		Unknown
If size == 42			
8	16		Folder type GUID
24	16		Unknown GUID (related to TopViews?)
40	2		Extension version offset The offset is relative from the start of the shell item.

6.1.1. Notes

Related to CMergedFolder object

Folder type:
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Explorer\FolderTypes

IShellLibrary data block?

```
Specific to win7 shell library (IShellLibrary), e.g. child folders?

00000010:                                           2a 00    ...J.3F. ...|..*.
00000020: 00 00 00 00 ef be 00 00  00 20 00 00 00 00 00 00   ........ . ......
00000030: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000040: 00 00 01 00 00 00 20 00  2a 00 00 00 00 00 ef be   ...... . *.......
00000050: 7e 47 b3 fb e4 c9 3b 4b  a2 ba d3 f5 d3 cd 46 f9   ~G....;K ......F.
00000060: 82 07 ba 82 7a 5b 69 45  b5 d7 ec 83 08 5f 08 cc   ....z[iE ......_..
82ba0782-5b7a-4569-b5d7-ec83085f08c

00000070: 20 00 2a 00 00 00 00 00  ef be 00 00 00 20 00 00    .*..... ..... ..
00000080: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000090: 00 00 00 00 00 00 01 00  00 00 20 00              ........ .. .

empty folder type?
Empty unknown GUID?
```

6.2. Extension block 0xbeef0001

The extension block 0xbeef0001 is 14 bytes of size and consists of:

offset	size	value	description
0	2	14	The size of the data Includes the 2 bytes of the size itself
2	2	Seen: 0	Extension version
4	4	0xbeef0001	Extension signature
8	4		Unknown

6.2.1. Notes

Related to CFileUrlStub object. Used for display name?

6.3. Extension block 0xbeef0002

Not seen in the wild but indications that the extension block exists.

Related to CFileUrlStub object. Used for display name?

6.4. Extension block 0xbeef0003

The extension block 0xbeef0003 is 26 bytes of size and consists of:

offset	size	value	description
0	2	26	Extension size Includes the 2 bytes of the size itself
2	2	Seen: 0	Extension version
4	4	0xbeef0003	Extension signature
8	16		Shell folder identifier Contains a GUID For a list of shell folder identifiers see: [LIBFWSI-WIKI]
24	2		Extension version offset The offset is relative from the start of the shell item.

The class identifier seems to indicate which class of shell folders will foll the shell item that has the extension block 0xbeef0003.

6.4.1. Notes

Related to CFSFolder and CFileSysItemString object. Used for junction information?

6.5. File entry extension block (0xbeef0004)

The file entry extension block (0xbeef0004) is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version 3 => Windows XP or 2003 7 => Windows Vista (SP0) 8 => Windows 2008, 7, 8.0 9 => Windows 8.1
4	4	0xbeef0004	Extension signature

offset	size	value	description
8	4		Creation date and time FAT date and time in UTC
12	4		Last access date and time FAT date and time in UTC
16	2		Unknown (version or identifier?) 0x14 => Windows XP or 2003 0x26 => Windows Vista (SP0) 0x2a => Windows 2008, 7, 8.0 0x2e => Windows 8.1
Extension version 7 and later			
...	2		Unknown (empty values)
...	8		File reference See section: 6.5.1 The NTFS file reference Not always a file reference value?
...	8		Unknown
Extension version 3 and later			
...	2		Long string size Contains the size of long name and localized name or 0 if no localized name is present. For extension version 8 and later it also includes the size of values after this size and before the long name.
Extension version 9 and later			
...	4		Unknown (empty values)
Extension version 8 and later			
...	4		Unknown
Extension version 3 and later			
...	...		Long name UTF-16 little-endian string with end-of-string character
Extension version 3, if long string size > 0			
...	...		Localized name ASCII string with end-of-string character E.g. @shell32.dll,-21781
Extension version 7 and later, if long string size > 0			
...	...		Localized name UTF-16 little-endian string with end-of-string character E.g. @shell32.dll,-21781
Extension version 3 and later			

offset	size	value	description
...	2		Extension version offset The offset is relative from the start of the shell item.

6.5.1. The NTFS file reference

The NTFS file reference is 8 bytes of size and consists of:

offset	size	value	description
0	6		MFT entry index
6	2		Sequence number

6.5.2. Notes

Related to CFSFolder and CFileSysItem object.

6.6. Extension block 0xbeef0005

The extension block 0xbeef0005 is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version Seen 0x0000
4	4	0xbeef0005	Extension signature
8	16		Unknown (empty values) Could this be reserved for a GUID?
24	...		Embedded shell item list
...	2		Extension version offset The offset is relative from the start of the shell item.

6.6.1. Notes

Related to CFindFolder object.

6.7. Extension block 0xbeef0006

The extension block 0xbeef0006 is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version

offset	size	value	description
			Seen 0x0000, 0x0027
4	4	0xbeef0006	Extension signature
8	...		Username UTF-16 little-endian string with end-of-string character
...	2		Extension version offset The offset is relative from the start of the shell item.

6.7.1. Notes

Related to CFSFolder and CFileSysItem object. Used for personalized name?

6.8. Extension block 0xbeef0008

The extension block 0xbeef0008 is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version Seen 0x0000
4	4	0xbeef0008	Extension signature
8	8		Unknown
16	8		Deletion time? Contains a FILETIME
24	520		Original path? UTF-16 little-endian string with end-of-string character Unused bytes can contain 0-byte values
544	...		Recycle bin path? UTF-16 little-endian string with end-of-string character
...	...		File extension? UTF-16 little-endian string with end-of-string character
...	...		Unknown
...	2		Extension version offset The offset is relative from the start of the shell item.

```
00000050                                        2a 04 00 00 08 00  |G.F.6.....*.....|
```

```
00000060  ef be 9c 65 23 07 00 00  00 00 f0 f5 e1 58 21 a1  |...e#........X!.|
00000070  cf 01 43 00 3a 00 5c 00  55 00 73 00 65 00 72 00  |..C.:.\.U.s.e.r.|
...
000000a0  73 00 54 00 72 00 69 00  61 00 67 00 65 00 32 00  |s.T.r.i.a.g.e.2.|
000000b0  00 00 32 00 2e 00 6a 00  70 00 67 00 00 00 00 00  |..2...j.p.g.....|
000000c0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00000270  00 00 00 00 00 00 00 00  00 00 43 00 3a 00 5c 00  |..........C.:.\.|
00000280  24 00 52 00 45 00 43 00  59 00 43 00 4c 00 45 00  |$.R.E.C.Y.C.L.E.|
00000290  2e 00 42 00 49 00 4e 00  5c 00 53 00 2d 00 31 00  |..B.I.N.\.S.-.1.|
...
000002f0  31 00 30 00 35 00 5c 00  24 00 52 00 56 00 41 00  |1.0.5.\.$.R.V.A.|
00000300  34 00 47 00 46 00 36 00  00 00 6a 00 70 00 67 00  |4.G.F.6...j.p.g.|
00000310  00 00                                            |................|

00000310        00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000320  00 00                                            |................|

Remnant data the 0x7f values could be pointers?
00000320        10 04 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000330  00 00 00 00 00 00 00 00  00 00 41 00 00 00 00 00  |..........A.....|
00000340  00 00 00 00 01 01 00 00  00 00 08 00 00 00 00 00  |................|
00000350  00 00 00 04 00 00 00 00  00 00 b2 b3 54 6b fc 7f  |............Tk..|
00000360  00 00 00 00 fb 00 00 00  00 00 00 00 00 00 fc 7f  |................|
00000370  00 00 00 04 00 00 00 00  00 00 08 00 00 00 00 00  |................|
00000380  00 00 c0 51 a1 05 00 00  00 00 00 00 00 00 00 00  |...Q............|
00000390  00 00 30 00 00 00 00 00  00 00 00 00 00 00 00 00  |..0.............|
000003a0  00 00 00 00 00 00 00 00  00 00 03 00 00 00 00 00  |................|
000003b0  00 00 00 00 01 01 00 00  00 00 08 00 00 00 00 00  |................|
000003c0  00 00 28 00 00 00 00 00  00 00 b2 b3 54 6b fc 7f  |..(.........Tk..|
000003d0  00 00 00 00 fb 00 00 00  00 00 00 00 00 00 fc 7f  |................|
000003e0  00 00 28 00 00 00 00 00  00 00 08 00 00 00 00 00  |..(.............|
000003f0  00 00 10 f3 85 0c 00 00  00 00 60 9a 64 07 00 00  |..........`.d...|
00000400  00 00 00 00 00 00 00 00  00 00 8f 29 c8 69 fc 7f  |...........).i..|
00000410  00 00 00 00 00 00 00 00  00 00 b2 34 7b 69 fc 7f  |...........4{i..|
00000420  00 00 80 16 5b 00 00 00  00 00 40 2d 95 68 fc 7f  |....[.....@-.h..|
00000430  00 00 00 00 00 00 00 00  00 00 00 98 64 07 00 00  |............d...|
00000440  00 00 00 1c 2c 1f 00 00  00 00 20 5b 84 05 00 00  |....,..... [....|
00000450  00 00 20 a6 9b 05 00 00  00 00 80 00 00 00 00 00  |.. .............|
00000460  00 00 f0 a2 9b 05 00 00  00 00 e3 68 c8 69 fc 7f  |...........h.i..|
00000470  00 00 00 00 00 00 00 00  00 00 02 00 00 00 fc 7f  |................|
00000480  00 00                                            |......|

00000480        18 00                                      |......|

Is this remnant data in the sample?
00000480              00 00                                |......|
```

6.8.1. Notes

Related to CBitBucket object.

6.9. Extension block 0xbeef0009

Not seen in the wild but indications that the extension block exists.

Related to CBitBucket object. Used for original path?

6.10. Extension block 0xbeef000a

The extension block 0xbeef000a is 14 bytes of size and consists of:

offset	size	value	description
0	2	14	Extension size Includes the 2 bytes of the size itself
2	2	0	Extension version
4	4	0xbeef000a	Extension signature
8	4		Unknown (empty values)
12	2		Extension version offset The offset is relative from the start of the shell item.

6.10.1. Notes

Related to CMergedFolder object. Used for source count or sub shell item list?

6.11. Extension block 0xbeef000c

Not seen in the wild but indications that the extension block exists.

Related to CControlPanelFolder object. Used for display name/CPL category?

6.12. Extension block 0xbeef0010

The extension block 0xbeef0010 is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version Seen 0x0000
4	4	0xbeef0010	Extension signature
8	4		Unknown
12	4		Data size?
Data			
16	...		Property store data Contains one or more property stores Note only seen one so far See: [LIBFWPS]
Common			
...	4		Unknown
...	12		Unknown (empty values)

offset	size	value	description
...	2		Extension version offset The offset is relative from the start of the shell item.

```
00000000  9b 04 00 00 10 00 ef be  01 00 00 00 89 04 00 00  |................|

00000010  85 04 00 00 31 53 50 53  05 d5 cd d5 9c 2e 1b 10  |....1SPS........|
00000020  93 97 08 00 2b 2c f9 ae  21 00 00 00 10 00 00 00  |....+,..!.......|
00000030  00 4b 00 65 00 79 00 3a  00 50 00 49 00 44 00 00  |.K.e.y.:.P.I.D..|
00000040  00 13 00 00 00 64 00 00  00 79 03 00 00 14 00 00  |.....d...y......|
00000050  00 00 43 00 6f 00 6e 00  64 00 69 00 74 00 69 00  |..C.o.n.d.i.t.i.|
00000060  6f 00 6e 00 00 00 42 00  00 00 1e 00 00 00 70 00  |o.n...B.......p.|
00000070  72 00 6f 00 70 00 34 00  32 00 39 00 34 00 39 00  |r.o.p.4.2.9.4.9.|
00000080  36 00 37 00 32 00 39 00  35 00 00 00 00 00 2f 03  |6.7.2.9.5...../.|
00000090  00 00 13 8d 6f 11 1e 10  a5 4f 84 d4 ff 82 79 38  |....o....O....y8|
000000a0  19 35 00 00 00 00 01 00  00 00 0b 00 00 00 89 5c  |.5.............\|
000000b0  f1 52 17 5a e1 48 bb cd  46 a3 f8 9c 7c c2 00 00  |.R.Z.H..F...|...|
000000c0  00 00 e0 5a cf 41 5a f7  06 48 bd 87 59 c7 d9 24  |...Z.AZ..H..Y..$|
000000d0  8e b9 64 00 00 00 0b 00  00 00 1f 00 06 00 00 00  |..d.............|
000000e0  2a 00 2e 00 6a 00 70 00  67 00 00 00 00 00 01 00  |*...j.p.g.......|
000000f0  00 00 00 00 00 89 5c f1  52 17 5a e1 48 bb cd 46  |......\.R.Z.H..F|
00000100  a3 f8 9c 7c c2 00 00 00  00 e0 5a cf 41 5a f7 06  |...|......Z.AZ..|
00000110  48 bd 87 59 c7 d9 24 8e  b9 64 00 00 00 0b 00 00  |H..Y..$..d......|
00000120  00 1f 00 07 00 00 00 2a  00 2e 00 6a 00 70 00 65  |.......*...j.p.e|
00000130  00 67 00 00 00 00 00 01  00 00 00 00 00 00 89 5c  |.g.............\|
00000140  f1 52 17 5a e1 48 bb cd  46 a3 f8 9c 7c c2 00 00  |.R.Z.H..F...|...|
00000150  00 00 e0 5a cf 41 5a f7  06 48 bd 87 59 c7 d9 24  |...Z.AZ..H..Y..$|
00000160  8e b9 64 00 00 00 0b 00  00 00 1f 00 06 00 00 00  |..d.............|
00000170  2a 00 2e 00 62 00 6d 00  70 00 00 00 00 00 01 00  |*...b.m.p.......|
00000180  00 00 00 00 00 89 5c f1  52 17 5a e1 48 bb cd 46  |......\.R.Z.H..F|
00000190  a3 f8 9c 7c c2 00 00 00  00 e0 5a cf 41 5a f7 06  |...|......Z.AZ..|
000001a0  48 bd 87 59 c7 d9 24 8e  b9 64 00 00 00 0b 00 00  |H..Y..$..d......|
000001b0  00 1f 00 06 00 00 00 2a  00 2e 00 64 00 69 00 62  |.......*...d.i.b|
000001c0  00 00 00 00 00 01 00 00  00 00 00 00 89 5c f1 52  |.............\.R|
000001d0  17 5a e1 48 bb cd 46 a3  f8 9c 7c c2 00 00 00 00  |.Z.H..F...|.....|
000001e0  e0 5a cf 41 5a f7 06 48  bd 87 59 c7 d9 24 8e b9  |.Z.AZ..H..Y..$..|
000001f0  64 00 00 00 0b 00 00 00  1f 00 06 00 00 00 2a 00  |d.............*.|
00000200  2e 00 70 00 6e 00 67 00  00 00 00 00 01 00 00 00  |..p.n.g.........|
00000210  00 00 00 89 5c f1 52 17  5a e1 48 bb cd 46 a3 f8  |....\.R.Z.H..F..|
00000220  9c 7c c2 00 00 00 00 e0  5a cf 41 5a f7 06 48 bd  |.|......Z.AZ..H.|
00000230  87 59 c7 d9 24 8e b9 64  00 00 00 0b 00 00 00 1f  |.Y..$..d........|
00000240  00 06 00 00 00 2a 00 2e  00 67 00 69 00 66 00 00  |.....*...g.i.f..|
00000250  00 00 00 01 00 00 00 00  00 00 89 5c f1 52 17 5a  |...........\.R.Z|
00000260  e1 48 bb cd 46 a3 f8 9c  7c c2 00 00 00 00 e0 5a  |.H..F...|......Z|
00000270  cf 41 5a f7 06 48 bd 87  59 c7 d9 24 8e b9 64 00  |.AZ..H..Y..$..d.|
00000280  00 00 0b 00 00 00 1f 00  07 00 00 00 2a 00 2e 00  |............*...|
00000290  6a 00 66 00 69 00 66 00  00 00 00 00 01 00 00 00  |j.f.i.f.........|
000002a0  00 00 00 89 5c f1 52 17  5a e1 48 bb cd 46 a3 f8  |....\.R.Z.H..F..|
000002b0  9c 7c c2 00 00 00 00 e0  5a cf 41 5a f7 06 48 bd  |.|......Z.AZ..H.|
000002c0  87 59 c7 d9 24 8e b9 64  00 00 00 0b 00 00 00 1f  |.Y..$..d........|
000002d0  00 06 00 00 00 2a 00 2e  00 6a 00 70 00 65 00 00  |.....*...j.p.e..|
000002e0  00 00 00 01 00 00 00 00  00 00 89 5c f1 52 17 5a  |...........\.R.Z|
000002f0  e1 48 bb cd 46 a3 f8 9c  7c c2 00 00 00 00 e0 5a  |.H..F...|......Z|
00000300  cf 41 5a f7 06 48 bd 87  59 c7 d9 24 8e b9 64 00  |.AZ..H..Y..$..d.|
00000310  00 00 0b 00 00 00 1f 00  06 00 00 00 2a 00 2e 00  |............*...|
00000320  74 00 69 00 66 00 00 00  00 00 01 00 00 00 00 00  |t.i.f...........|
00000330  00 89 5c f1 52 17 5a e1  48 bb cd 46 a3 f8 9c 7c  |..\.R.Z.H..F...||
```

```
00000340  c2 00 00 00 00 e0 5a cf  41 5a f7 06 48 bd 87 59  |......Z.AZ..H..Y|
00000350  c7 d9 24 8e b9 64 00 00  00 0b 00 00 00 1f 00 07  |..$..d..........|
00000360  00 00 00 2a 00 2e 00 74  00 69 00 66 00 66 00 00  |...*...t.i.f.f..|
00000370  00 00 00 01 00 00 00 00  00 00 89 5c f1 52 17 5a  |...........\.R.Z|
00000380  e1 48 bb cd 46 a3 f8 9c  7c c2 00 00 00 00 e0 5a  |.H..F...|......Z|
00000390  cf 41 5a f7 06 48 bd 87  59 c7 d9 24 8e b9 64 00  |.AZ..H..Y..$..d.|
000003a0  00 00 0b 00 00 00 1f 00  06 00 00 00 2a 00 2e 00  |............*...|
000003b0  77 00 64 00 70 00 00 00  00 00 01 00 00 00 00 00  |w.d.p...........|
000003c0  00 00 75 00 00 00 14 00  00 00 00 4b 00 65 00 79  |..u........K.e.y|
000003d0  00 3a 00 46 00 4d 00 54  00 49 00 44 00 00 00 08  |.:.F.M.T.I.D....|
000003e0  00 00 00 4e 00 00 00 7b  00 34 00 31 00 43 00 46  |...N...{.4.1.C.F|
000003f0  00 35 00 41 00 45 00 30  00 2d 00 46 00 37 00 35  |.5.A.E.0.-.F.7.5|
00000400  00 41 00 2d 00 34 00 38  00 30 00 36 00 2d 00 42  |.A.-.4.8.0.6.-.B|
00000410  00 44 00 38 00 37 00 2d  00 35 00 39 00 43 00 37  |.D.8.7.-.5.9.C.7|
00000420  00 44 00 39 00 32 00 34  00 38 00 45 00 42 00 39  |.D.9.2.4.8.E.B.9|
00000430  00 7d 00 00 00 00 00 3f  00 00 00 0a 00 00 00 00  |.}.....?........|
00000440  4e 00 61 00 6d 00 65 00  00 00 08 00 00 00 24 00  |N.a.m.e.......$.|
00000450  00 00 44 00 65 00 73 00  6b 00 74 00 6f 00 70 00  |..D.e.s.k.t.o.p.|
00000460  42 00 61 00 63 00 6b 00  67 00 72 00 6f 00 75 00  |B.a.c.k.g.r.o.u.|
00000470  6e 00 64 00 00 00 1b 00  00 00 0a 00 00 00 00 54  |n.d............T|
00000480  00 79 00 70 00 65 00 00  00                       |.y.p.e..........|

00000480                              13 00 00 00 00 00 00  |.y.p.e..........|

00000490  00 00 00 00 00 00 00 00  00 18 00                 |...........|
0000049b
```

6.13. Extension block 0xbeef0013

The extension block 0xbeef0013 is variable of size and consists of:

```
00000020: 2a 00 00 00 13 00 ef be  00 00 00 20 00 00 00 00   *....... ... ....
00000030: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000040: 00 00 00 00 01 00 00 00  4f 28                    ........ O(
```

6.14. Extension block 0xbeef0014

The extension block 0xbeef0014 is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2	0	Extension version
4	4	0xbeef0014	Extension signature
8	16		Class identifier
24	...		Class data
...	2		Extension version offset The offset is relative from the start of the shell item.

Note likely that this extension block can be used for different class identifiers and that the class data is specific to the class.

The extension block has seen to be used with the CUri class identifier which is the GUID “df2fce13-25ec-45bb-9d4c-cecd47c2430c”. The CUri data could be a Vista and/or MSIE 7 specific extension.

6.14.1. CUri class data

offset	size	value	description
0	4		Data size Includes the 2 bytes of the size itself
4	8		Unknown (Empty values)
12	4	0x00002b84	Unknown (signature?)
16	12		Unknown (Empty values)
24	...		Property table

CUri property table

offset	size	value	description
0	4		Number of properties
4	...		Array of property entries

CUri property entry

offset	size	value	description
0	4		Property type
4	4		Property size
8	...		Property data

CUri property types

Value	Identifier	Description
0	Uri_PROPERTY_ABSOLUTE_URI	The entire canonicalized URI.
1	Uri_PROPERTY_AUTHORITY	Combination of user name, password, fully qualified domain name, and port number.
2	Uri_PROPERTY_DISPLAY_URI	Combination of protocol scheme, fully qualified domain name, port number, full path, query string, and (optionally) fragment.
3	Uri_PROPERTY_DOMAIN	The private domain name and public suffix (top-level domain).
4	Uri_PROPERTY_EXTENSION	The file name extension.

Value	Identifier	Description
5	Uri_PROPERTY_FRAGMENT	The fragment (secondary resource, or named anchor identifier).
6	Uri_PROPERTY_HOST	The fully qualified domain name or plain hostname.
7	Uri_PROPERTY_PASSWORD	The password.
8	Uri_PROPERTY_PATH	The path and resource.
9	Uri_PROPERTY_PATH_AND_QUERY	The full path to resource with URI query string.
10	Uri_PROPERTY_QUERY	The query (or search) string.
11	Uri_PROPERTY_RAW_URI	The entire original URI as entered.
12	Uri_PROPERTY_SCHEME_NAME	The protocol scheme name.
13	Uri_PROPERTY_USER_INFO	Combination of the user name and password.
14	Uri_PROPERTY_USER_NAME	The user name.
15	Uri_PROPERTY_HOST_TYPE	The CUri host type.
16	Uri_PROPERTY_PORT	The port number.
17	Uri_PROPERTY_SCHEME	The CUri URL scheme.
18	Uri_PROPERTY_ZONE	The zone. Not implemented according to MSDN.

CUri host type

Value	Identifier	Description
0	Uri_HOST_UNKNOWN	Unrecognized (or future version) format.
1	Uri_HOST_DNS	DNS format.
2	Uri_HOST_IPV4	IPv4 host format.
3	Uri_HOST_IPV6	IPv6 host format.
4	Uri_HOST_IDN	Internationalized Domain Name (IDN) format.

CUri URL schemes

Value	Identifier	Description
-1	URL_SCHEME_INVALID	An invalid scheme.
0	URL_SCHEME_UNKNOWN	An unknown scheme.
1	URL_SCHEME_FTP	ftp: (File Transfer Protocol)
2	URL_SCHEME_HTTP	http: (Hypertext Transfer Protocol)
3	URL_SCHEME_GOPHER	gopher: (Gopher)

Value	Identifier	Description
4	URL_SCHEME_MAILTO	mailto: (Mail-to)
5	URL_SCHEME_NEWS	news: (Usenet news)
6	URL_SCHEME_NNTP	nntp: (Network News Transfer Protocol)
7	URL_SCHEME_TELNET	telnet: (Telnet)
8	URL_SCHEME_WAIS	wais: (Wide Area Information Server)
9	URL_SCHEME_FILE	file: (File)
10	URL_SCHEME_MK	mk: (URL moniker)
11	URL_SCHEME_HTTPS	
12	URL_SCHEME_SHELL	
13	URL_SCHEME_SNEWS	
14	URL_SCHEME_LOCAL	
15	URL_SCHEME_JAVASCRIPT	
16	URL_SCHEME_VBSCRIPT	
17	URL_SCHEME_ABOUT	
18	URL_SCHEME_RES	
19	URL_SCHEME_MSSHELLROOTED	
20	URL_SCHEME_MSSHELLIDLIST	
21	URL_SCHEME_MSHELP	
22	URL_SCHEME_MSSHELLDEVICE	
23	URL_SCHEME_WILDCARD	
24	URL_SCHEME_SEARCH_MS	
25	URL_SCHEME_SEARCH	
26	URL_SCHEME_KNOWNFOLDER	

TODO
URL_SCHEME_HTTPS
URL HTTPS (https:).
URL_SCHEME_SHELL
Shell (shell:).
URL_SCHEME_SNEWS
NNTP news postings with SSL (snews:).
URL_SCHEME_LOCAL
Local (local:).
URL_SCHEME_JAVASCRIPT
JavaScript (javascript:).
URL_SCHEME_VBSCRIPT

VBScript (vbscript:).
URL_SCHEME_ABOUT
About (about:).
URL_SCHEME_RES
Res (res:).
URL_SCHEME_MSSHELLROOTED
Internet Explorer 6 and later only. Shell-rooted (ms-shell-rooted:)
URL_SCHEME_MSSHELLIDLIST
Internet Explorer 6 and later only. Shell ID-list (ms-shell-idlist:).
URL_SCHEME_MSHELP
Internet Explorer 6 and later only. MSHelp (hcp:).
URL_SCHEME_MSSHELLDEVICE
Not supported.
URL_SCHEME_WILDCARD
Internet Explorer 7 and later only. Wildcard (*:).
URL_SCHEME_SEARCH_MS
Windows Vista and later only. Search-MS (search-ms:).
URL_SCHEME_SEARCH
Windows Vista with SP1 and later only. Search (search:).
URL_SCHEME_KNOWNFOLDER
Windows 7 and later. Known folder (knownfolder:).
URL_SCHEME_MAXVALUE
The highest legitimate value in the enumeration, used for validation purposes.

6.15. Extension block 0xbeef0017

The extension block 0xbeef0017 is 74 bytes of size and consists of:

offset	**size**	**value**	**description**
0	2	74	Extension size Includes the 2 bytes of the size itself
2	2	1	Extension version
4	4	0xbeef0017	Extension signature
8	4		Unknown (Empty values)
12	4		Unknown
16	4		Unknown
20	4		Unknown
24	4		Unknown
28	4		Unknown
32	4		Unknown
36	8		Unknown (Empty values)
44	4		Unknown
48	24		Unknown (Empty values)
72	2		Extension version offset The offset is relative from the start of the shell item.

Shell item from Windows 7 BagMRU (Search Home)

```
00000000: 1f 80 2e 81 43 93 37 1c  49 4a a1 2e 4b 2d 81 0d   ....C.7. IJ..K-..
00000010: 95 6b 46 00 01 00 17 00  ef be 00 00 00 00 01 00   .kF..... ........
00000020: 00 00 02 00 00 80 01 00  00 00 01 00 00 00 02 00   ........ ........
00000030: 00 00 00 00 00 00 00 00  00 00 02 00 00 00 00 00   ........ ........
00000040: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00000050: 00 00 00 00 00 00 14 00                           ........
```

6.16. Extension block 0xbeef0019

The extension block 0xbeef0019 is 42 bytes of size and consists of:

offset	size	value	description
0	2	42	The size of the data Includes the 2 bytes of the size itself
2	2	0	Extension version
4	4	0xbeef0019	Extension signature
8	16		Folder type identifier Contains a GUID e.g. Documents Library {fbb3477e-c9e4-4b3b-a2ba-d3f5d3cd46f9}
24	16		Unknown GUID (related to TopViews?)
40	2		Extension version offset The offset is relative from the start of the shell item.

6.16.1. Notes

HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FolderTypes\{0B2BAAEB-0042-4DCA-AA4D-3EE8648D03E5}

HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FolderTypes\{0B2BAAEB-0042-4DCA-AA4D-3EE8648D03E5}\TopViews

HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\FolderTypes\{0B2BAAEB-0042-4DCA-AA4D-3EE8648D03E5}\TopViews\{82BA0782-5B7A-4569-B5D7-EC83085F08CC}

6.17. Extension block 0xbeef001a

The extension block 0xbeef001a is variable of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version

offset	size	value	description
			Seen 0x0000
4	4	0xbeef001a	Extension signature
8	2		Unknown 0x0002
10	16		File/Document type string? UTF-16 little-endian string with end-of-string character Seen: “AcroExch.Document”
24	...		Embedded shell item list
...	2		Extension version offset The offset is relative from the start of the shell item.

6.18. Extension block 0xbeef0025

The extension block 0xbeef025a is 32 bytes of size and consists of:

offset	size	value	description
0	2		Extension size Includes the 2 bytes of the size itself
2	2		Extension version Seen 0x0000
4	4	0xbeef0025	Extension signature
8	4		Unknown 0x00000011
12	8		Unknown Contains a FILETIME
20	8		Unknown Contains a FILETIME
28	4		Extension version offset The offset is relative from the start of the shell item.

7. Windows definitions

7.1. File attribute flags

The file attribute flags consist of the following values:

Value	Identifier	Description
0x00000001	FILE_ATTRIBUTE_READONLY	Is read-Only
0x00000002	FILE_ATTRIBUTE_HIDDEN	Is hidden

Value	Identifier	Description
0x00000004	FILE_ATTRIBUTE_SYSTEM	Is a system file or directory
0x00000008		Is a volume label
0x00000010	FILE_ATTRIBUTE_DIRECTORY	Is a directory
0x00000020	FILE_ATTRIBUTE_ARCHIVE	Should be archived
0x00000040	FILE_ATTRIBUTE_DEVICE	Is a device
0x00000080	FILE_ATTRIBUTE_NORMAL	Is normal None of the other flags should be set
0x00000100	FILE_ATTRIBUTE_TEMPORARY	Is temporary
0x00000200	FILE_ATTRIBUTE_SPARSE_FILE	Is a sparse file
0x00000400	FILE_ATTRIBUTE_REPARSE_POINT	Is a reparse point or symbolic link
0x00000800	FILE_ATTRIBUTE_COMPRESSED	Is compressed
0x00001000	FILE_ATTRIBUTE_OFFLINE	Is offline The data of the file is stored on an offline storage.
0x00002000	FILE_ATTRIBUTE_NOT_CONTENT_INDEXED	Do not index content The content of the file or directory should not be indexed by the indexing service.
0x00004000	FILE_ATTRIBUTE_ENCRYPTED	Is encrypted
0x00008000	FILE_ATTRIBUTE_INTEGRITY_STREAM	The directory or user data stream is configured with integrity (only supported on ReFS volumes).
0x00010000	FILE_ATTRIBUTE_VIRTUAL	Is virtual
0x00020000	FILE_ATTRIBUTE_NO_SCRUB_DATA	The user data stream not to be read by the background data integrity scanner (AKA scrubber).

8. Notes

Related to .libary-ms XML files. These files also contain serialized data.

```
{DF0AD8E0-F91C-4109-AE46-1EAA5CD8AB08} WMEncMonMainPage Class
WMEnc.WMEncMonMainPage.1
{DF0AD8E1-F91C-4109-AE46-1EAA5CD8AB08} WMEncMonStatsPage Class
WMEnc.WMEncMonStatsPage.1
{DF0AD8E3-F91C-4109-AE46-1EAA5CD8AB08} WMEncMonServerPage Class
WMEnc.WMEncMonServerPage.1
{DF0B3D60-548F-101B-8E65-08002B2BD119} PSSupportErrorInfo
{DF0DAEF2-A289-11D1-8697-006008B0E5D2} MDhcp Class Mdhcp.MDhcp.1
```

```
{DF2269F4-F7D4-4E83-9D31-D2D43C26EDF1} CR7OptBtnGroup.General
{DF26FD0F-DCAC-4042-883E-29A2712D5348} PSTNConnectService Class
Msnpcs.PSTNConnectService.1
{DF2EFCB5-917A-11D3-A49E-00C04F6843FB} AnimTargetDHTMLBehavior Class
MsoRun.AnimTargetDHTMLBehavior.1
{DF2FCE13-25EC-45BB-9D4C-CECD47C2430C} CUri
{DF30358B-F480-338E-AC08-92E0ACDA476A} Microsoft.AnalysisServices.MdxScript
Microsoft.AnalysisServices.MdxScript
{DF3C5EDD-029A-31A1-BA90-96B6A118E0F0}
Microsoft.SqlServer.Replication.TracerToken
Microsoft.SqlServer.Replication.TracerToken
{DF5E5E34-AE22-483D-94C3-9DD02FFF231E} Nero Video Controls Property Page
{DF66AFC9-C61D-404A-B535-64FBF91D420F} MessengerNative.UIAutomation.1
{DF712EC6-6ED2-41E2-AE46-A29E9E793485} MixerSource Class uICE.MixerSource.1
{DF7A2782-9F74-4BFE-83AF-C4BCDFE2DD68} CDDBControl2 Class
CDDBControlYahoo.CDDBControl2.1
{DF9A1DA0-23C0-101B-B02E-FDFDFDFDFDFD} Adobe Acrobat Document
{DFA22B8E-E68D-11D0-97E4-00C04FC2AD98} SQLOLEDB Enumerator SQLOLEDB
Enumerator.1
{DFA699C5-B2C4-4CB7-BBAB-0AA56C566965} Microsoft Clip Organizer
MSClipGallery.Application.11
{DFAC1B20-4681-11D1-AA83-00008612DCF1} PureCoverage version of Java VM Event
Monitor. ICoverageJavaEventMonitor
{DFBC8609-D77F-3512-98BC-CF3FBCEF034F}
Microsoft.SqlServer.Management.Smo.Agent.JobCategory
Microsoft.SqlServer.Management.Smo.Agent.JobCategory
{DFC8BDC0-E378-11D0-9B30-0080C7E9FE95} MSDAOSP MSDAOSP.1
{DFCB3BDD-51BE-416D-9E6C-3655EBB2845D}
Microsoft.AnalysisServices.DimensionAttribute
Microsoft.AnalysisServices.DimensionAttribute
{DFD181E0-5E2F-11CE-A449-00AA004A803D} Microsoft Forms 2.0 ScrollBar
Forms.ScrollBar.1
{DFD74844-990B-4410-9DA0-2848EFA85D14} WMPlayer ClipPropPage Class
{DFD888A7-A6B0-3B1B-985E-4CDAB0E4C17D}
System.Diagnostics.SymbolStore.SymLanguageVendor
System.Diagnostics.SymbolStore.SymLanguageVendor
{DFD8B167-5652-4962-A162-9A227825AFAA} PropLockout Class
{DFE49CFE-CD09-11D2-9643-00C04F79ADF0} Cabview Data Object
{DFEF3E96-F1D4-47CE-A429-2CC8C10DFDB6} CddbID3TagManager Class
CDDBControl.CddbID3TagManager.1
{DFEF4B09-1B0A-4529-9775-AC437D6A93B3} HotfixWz Class vmappcfg.HotfixWz.9
{DFF332ED-0C72-416B-B128-5CC5BD888865} Photoshop GalleryThumbnailOptions
Photoshop.GalleryThumbnailOptions.9
{DFF44AEC-2370-469D-8A22-DF82448BFF64} VmdbUpdates Class vmdbCOM.VmdbUpdates.9
```

http://tech.groups.yahoo.com/group/win4n6/message/7623

8.1. Extension blocks/signatures

CPrinterFolder 0xbebadb00

Extension blocks also referred to as hidden id?

Unknown (file entry type indicator?)

Directory:

0x0014
0x0018
0x001a
0x001c

File:
0x001a

8.2. more notes

Related Registry keys
HKLM\Microsoft\Windows\CurrentVersion\Explorer\MyComputer\NameSpace\

HEID_PIDL
ID_PIDL

8.3. Notes

Bit values

offset	size	value	description
0.0	4 bits		Unknown
0.4	2 bits		Related to KF_CATEGORY?
0.6	2 bits		Unknown

```
Syntax
Copy

typedef enum _KF_CATEGORY {
  KF_CATEGORY_VIRTUAL   = 1,
  KF_CATEGORY_FIXED     = 2,
  KF_CATEGORY_COMMON    = 3,
  KF_CATEGORY_PERUSER   = 4
} KF_CATEGORY;


Constants

KF_CATEGORY_VIRTUAL

    Virtual folders are not part of the file system, which is to say that they
have no path. For example, Control Panel and Printers are virtual folders. A
number of features such as folder path and redirection do not apply to this
category.
KF_CATEGORY_FIXED

    Fixed file system folders are not managed by the Shell and are usually
given a permanent path when the system is installed. For example, the Windows
and Program Files folders are fixed folders. A number of features such as
redirection do not apply to this category.
KF_CATEGORY_COMMON

    Common folders are those file system folders used for sharing data and
settings, accessible by all users of a system. For example, all users share a
```

```
common Documents folder as well as their per-user Documents folder.
KF_CATEGORY_PERUSER

    Per-user folders are those stored under each user's profile and accessible
only by that user. For example, %USERPROFILE%\Pictures. This category of
folder usually supports many features including aliasing, redirection and
customization.

    Note  The user profile root folder (FOLDERID_Profile) does not support
redirection.
```

8.4. Sort order index

TODO
Registry Key: HKEY_CLASSES_ROOT\CLSID\%CLSID%
Value: SortOrderIndex

8.5. Known folder identifiers

TODO move to winreg-kb
The known folder identifiers can be found in:

```
HKEY_CLASSES_ROOT\CLSID\{%CLSID%}
```

E.g. on Windows XP the corresponding class identifier{450d8fba-ad25-11d0-98a8-0800361b1103} registry key contains the value:

```
HKEY_CLASSES_ROOT\CLSID\{450d8fba-ad25-11d0-98a8-0800361b1103}\LocalizedString
```

This value contains:

```
@%SystemRoot%\system32\SHELL32.dll,-9227
```

This technique, known as Registry string redirection [MSDN-MUI].

[MSDN-MUI]
Title: Using Registry String Redirection
URL: http://msdn.microsoft.com/library/dd374120(VS.85).aspx

The value refers to the multi-language user interface (MUI) string resource with identifier 9227 stored in SHELL32.dll. Which, for an English version of SHELL32.dll, corresponds to:

```
My Documents
```

```
9227 => 0x0000240b
resource string node with identifier 0x00000240
sub string 0x0b
```

Note that the My Computer folder identifier is unique for an installation of Windows.

8.6. The delegate item

TODO (DELEGATEITEMID)

offset	size	value	description
0	2		The size of the shell item Includes the 2 bytes of the size itself
2	2		Folder class 0x361 not a delegate?
4	2		Delegate item data size
6	...		Delegate item data
...	16		Delegate item identifier Contains a GUID {5E591A74-DF96-48D3-8D67-1733BCEE28BA}
...	16		Item (class) identifier Contains a GUID

CLSID_RegFolder CRegFolder

Related registry key
HKLM\Software\Microsoft\Windows\CurrentVersion\Explorer\MyComputer\NameSpace\Delegate Folders

8.7. Related identifiers

Related view interface IShellView

Class identifier (CLSID)	Related interface identifier(s) (IID)	Related class
CLSID_ControlPanel		CControlPanelFolder
CLSID_Internet		CInternetFolder
CLSID_MyComputer	IID_IShellFolder IID_IShellFolder2	CDrivesFolder
CLSID_MyDocuments		
CLSID_MruLongList		CMruLongList
CLSID_MruPidlList		CMruPidlList
CLSID_NetworkPlaces		CNetRootFolder
CLSID_NetworkRoot		CNetFolder
CLSID_Printers		CPrinterFolder
CLSID_ShellDesktop		CDesktopFolder
CLSID_ShellFSFolder	IID_IFileSystemBindData IID_IFileSystemBindData2	CFSFolder
CLSID_ShellItem	IID_IShellItem IID_IShellItem2	CShellItem

What about SID_ names e.g. SID_SShellDesktop

8.8. Class identifiers

Interface identifier (IID)	**GUID**
CLSID_Briefcase	85bbd920-42a0-1069-a2e4-08002b30309d
CLSID_BriefcaseFolder	86747ac0-42a0-1069-a2e6-08002b30309d
CLSID_CCommonShellExtInit	a2ad3100-3b84-1069-a2df-08002b30309d
CLSID_CDocObjectFolder	e7e4bc40-e76a-11ce-a9bb-00aa004ae837
CLSID_CFonts	bd84b380-8ca2-1069-ab1d-08000948f534
CLSID_Clouds	869dada0-42a0-1069-a2e7-08002b30309d
CLSID_CmdFileIcon	57651662-ce3e-11d0-8d77-00c04fc99d61
CLSID_ControlPanel	21ec2020-3aea-1069-a2dd-08002b30309d
CLSID_CShellFrameAuto	20c46560-8491-11cf-960c-0080c7f4ee85
CLSID_CShellHlinkFrame	2c5a8fc0-8401-11cf-a12b-00aa004ae837
CLSID_CSiteMapNode	a61d5780-ba29-11cf-952e-00c04fd705b4
CLSID_CStubBindStatusCallback	2b4f54b1-3d6d-11d0-8258-00c04fd5ae38
CLSID_CURLFolder	3dc7a020-0acd-11cf-a9bb-00aa004ae837
CLSID_ExeDropTarget	86c86720-42a0-1069-a2e8-08002b30309d
CLSID_Internet	871c5380-42a0-1069-a2ea-08002b30309d
CLSID_InternetShortcut	fbf23b40-e3f0-101b-8488-00aa003e56f8
CLSID_MruLongList	53bd6b4e-3780-4693-afc3-7161c2f3ee9c
CLSID_MruPidlList	42aedc87-2188-41fd-b9a3-0c966feabec1
CLSID_MyComputer	20d04fe0-3aea-1069-a2d8-08002b30309d
CLSID_MyDocuments	450d8fba-ad25-11d0-98a8-0800361b1103
CLSID_NetworkDomain	46e06680-4bf0-11d1-83ee-00a0c90dc849
CLSID_NetworkPlaces	208d2c60-3aea-1069-a2d7-08002b30309d
CLSID_NetworkRoot	953d732d-ab45-11d2-84e0-00c04fa31a86
CLSID_NetworkServer	c0542a90-4bf0-11d1-83ee-00a0c90dc849
CLSID_NetworkShare	54a754c0-4bf1-11d1-83ee-00a0c90dc849
CLSID_PifProperties	86f19a00-42a0-1069-a2e9-08002b30309d
CLSID_Printers	2227a280-3aea-1069-a2de-08002b30309d
CLSID_RecycleBin	645ff040-5081-101b-9f08-00aa002f954e
CLSID_RegFolder	0997898b-0713-11d2-a4aa-00c04f8eeb3e
CLSID_ShellCopyHook	217fc9c0-3aea-1069-a2db-08002b30309d

Interface identifier (IID)	GUID
CLSID_ShellDesktop	00021400-0000-0000-c000-000000000046
CLSID_ShellDrvDefExt	5f5295e0-429f-1069-a2e2-08002b30309d
CLSID_ShellFileDefExt	21b22460-3aea-1069-a2dc-08002b30309d
CLSID_ShellFindExt	61e218e0-65d3-101b-9f08-061ceac3d50d
CLSID_ShellFSFolder	f3364ba0-65b9-11ce-a9ba-00aa004ae837
CLSID_ShellItem	9ac9fbe1-e0a2-4ad6-b4ee-e212013ea917
CLSID_ShellNetDefExt	86422020-42a0-1069-a2e5-08002b30309d
CLSID_ShellSearchExt	169a0691-8df9-11d1-a1c4-00c04fd75d13
CLSID_ShellViewerExt	84f26ea0-42a0-1069-a2e3-08002b30309d
CLSID_WebSearchExt	07798131-af23-11d1-9111-00a0c98ba67d

LSID_FolderMarshalStub = "{bf50b68e-29b8-4386-ae9c-9734d5117cd5}"
CLSID_CDocObjectFolder = "{E7E4BC40-E76A-11CE-A9BB-00AA004AE837}"
CLSID_CBaseBrowser = "{A5E46E3A-8849-11D1-9D8C-00C04FC99D61}"
CLSID_TaskbarList = "{56FDF344-FD6D-11d0-958A-006097C9A090}"
CLSID_ShellUIHelper = "{64AB4BB7-111E-11d1-8F79-00C04FC2FBE1}"
CLSID_CUrlHistory = "{3C374A40-BAE4-11CF-BF7D-00AA006946EE}"
CLSID_CURLSearchHook = "{CFBFAE00-17A6-11D0-99CB-00C04FD64497}"
CLSID_CStubBindStatusCallback = "{2B4F54B1-3D6D-11d0-8258-00C04FD5AE38}"
CLSID_NSCTree = "{43A8F463-4222-11d2-B641-006097DF5BD4}"
CLSID_Mshtml = "{25336920-03F9-11CF-8FD0-00AA00686F13}"
CLSID_Internet = "{871C5380-42A0-1069-A2EA-08002B30309D}"
CLSID_SHDocVwTypeLib = "{EAB22AC0-30C1-11CF-A7EB-0000C05BAE0B}"
CLSID_WebBrowser1 = "{EAB22AC3-30C1-11CF-A7EB-0000C05BAE0B}"
CLSID_WebBrowser2 = "{8856F961-340A-11D0-A96B-00C04FD705A2}"
CLSID_ShellDispatchInproc = "{0A89A860-D7B1-11CE-8350-444553540000}"
CLSID_InternetShortcut = "{FBF23B40-E3F0-101B-8488-00AA003E56F8}"
CLSID_ShellLink = "{00021401-0000-0000-C000-000000000046}"
CLSID_SplashScreen = "{A2B0DD40-CC59-11d0-A3A5-00C04FD706EC}"
CLSID_HIST = "{FF393560-C2A7-11CF-BFF4-444553540000}"
CLSID_CACHE = "{7BD29E00-76C1-11CF-9DD0-00A0C9034933}"
CLSID_CACHE2 = "{7BD29E01-76C1-11CF-9DD0-00A0C9034933}"
CLSID_WinListShellProc = "{ffdc1a80-d527-11d0-a32c-34af06c10000}"
CLSID_PanMap = "{BD84B381-8CA2-1069-AB1D-08000948F534}"
CLSID_CDFCopyHook = "{67EA19A0-CCEF-11d0-8024-00C04FD75D13}"
CLSID_CacheCleaner = "{9B0EFD60-F7B0-11D0-BAEF-00C04FC308C9}"
CLSID_OfflineCleaner = "{8E6E6079-0CB7-11d2-8F10-0000F87ABD16}"
CLSID_DocFileInfoTip = "{83799FE0-1F5A-11d1-95C7-00609797EA4F}"
CLSID_HostProxyISF = "{4F748358-CD6B-11d0-9816-00C04FD91972}"
CLSID_DocHostUIHandler = "{7057e952-bd1b-11d1-8919-00c04fc2c836}"
CLSID_ToolbarExtBand = "{E0DD6CAB-2D10-11d2-8F1A-0000F87ABD16}"
CLSID_ToolbarExtExec = "{1FBA04EE-3024-11d2-8F1F-0000F87ABD16}"
CLSID_HistBand = "{EFA24E62-B078-11d0-89E4-00C04FC9E26E}"
CLSID_FavBand = "{EFA24E61-B078-11d0-89E4-00C04FC9E26E}"
CLSID_ExplorerBand = "{EFA24E64-B078-11d0-89E4-00C04FC9E26E}"
CLSID_NSCOC = "{55136805-B2DE-11D1-B9F2-00A0C98BC547}"

CLSID_SearchAssistantOC = "{B45FF030-4447-11D2-85DE-00C04FA35C89}"
CLSID_TipOfTheDay = "{4D5C8C25-D075-11d0-B416-00C04FB90376}"
CLSID_ISFBandOC = "{131A6951-7F78-11D0-A979-00C04FD705A2}"
CLSID_SearchAssistant = "{9461b922-3c5a-11d2-bf8b-00c04fb93661}"
CLSID_CShellFrameAuto = "{20C46560-8491-11CF-960C-0080C7F4EE85}"
CLSID_CShellDataSource = "{D4903360-44DA-11D0-89E2-00A0C90A90AC}"

8.9. Interface identifiers

Interface identifier (IID)	**GUID**
IID_IAdviseSink	0000010f-0000-0000-c000-000000000046
IID_ICommDlgBrowser	000214f1-0000-0000-c000-000000000046
IID_IContextMenu	000214e4-0000-0000-c000-000000000046
IID_IContextMenu2	000214f4-0000-0000-c000-000000000046
IID_ICopyHookA	000214ef-0000-0000-c000-000000000046
IID_ICopyHookW	000214fc-0000-0000-c000-000000000046
IID_IDataObject	0000010e-0000-0000-c000-000000000046
IID_IEnumIDList	000214f2-0000-0000-c000-000000000046
IID_IExtractIconA	000214eb-0000-0000-c000-000000000046
IID_IExtractIconW	000214fa-0000-0000-c000-000000000046
IID_IFileViewerA	000214f0-0000-0000-c000-000000000046
IID_IFileViewerSite	000214f3-0000-0000-c000-000000000046
IID_IFileViewerW	000214f8-0000-0000-c000-000000000046
IID_INewShortcutHookA	000214e1-0000-0000-c000-000000000046
IID_INewShortcutHookW	000214f7-0000-0000-c000-000000000046
IID_IPersistFolder	000214ea-0000-0000-c000-000000000046
IID_IShellBrowser	000214e2-0000-0000-c000-000000000046
IID_IShellExecuteHookA	000214f5-0000-0000-c000-000000000046
IID_IShellExecuteHookW	000214fb-0000-0000-c000-000000000046
IID_IShellExtInit	000214e8-0000-0000-c000-000000000046
IID_IShellFolder	000214e6-0000-0000-c000-000000000046
IID_IShellFolder2	93f2f68c-1d1b-11d3-a30e-00c04f79abd1
IID_IShellIcon	000214e5-0000-0000-c000-000000000046
IID_IShellItem	43826d1e-e718-42ee-bc55-a1e261c37bfe
IID_IShellItem2	
IID_IShellLinkA	000214ee-0000-0000-c000-000000000046
IID_IShellLinkW	000214f9-0000-0000-c000-000000000046
IID_IShellPropSheetExt	000214e9-0000-0000-c000-000000000046
IID_IShellView	000214e3-0000-0000-c000-000000000046

Interface identifier (IID)	GUID
IID_IShellView2	88e39e80-3578-11cf-ae69-08002b2e1262

8.10. Shell identifiers

Shell Identifier (SID)	GUID
SID_IActiveDesktop	f490eb00-1240-11d1-9888-006097deacf9
SID_ICommDlgBrowser	000214f1-0000-0000-c000-000000000046
SID_IContextMenu	000214e4-0000-0000-c000-000000000046
SID_IContextMenu2	000214f4-0000-0000-c000-000000000046
SID_IContextMenu3	bcfce0a0-ec17-11d0-8d10-00a0c90f2719
SID_IDeskBand	eb0fe172-1a3a-11d0-89b3-00a0c90a90ac
SID_IDockingWindow	012dd920-7b26-11d0-8ca9-00a0c92dbfe8
SID_IDockingWindowFrame	47d2657a-7b27-11d0-8ca9-00a0c92dbfe8
SID_IDockingWindowSite	2a342fc2-7b26-11d0-8ca9-00a0c92dbfe8
SID_IEnumExtraSearch	0e700be1-9db6-11d1-a1ce-00c04fd75d13
SID_IEnumIDList	000214f2-0000-0000-c000-000000000046
SID_IExtractIconA	000214eb-0000-0000-c000-000000000046
SID_IExtractIconW	000214fa-0000-0000-c000-000000000046
SID_IFileViewerA	000214f0-0000-0000-c000-000000000046
SID_IFileViewerSite	000214f3-0000-0000-c000-000000000046
SID_IFileViewerW	000214f8-0000-0000-c000-000000000046
SID_IInputObject	68284faa-6a48-11d0-8c78-00c04fd918b4
SID_IInputObjectSite	f1db8392-7331-11d0-8c99-00a0c92dbfe8
SID_INewShortcutHookA	000214e1-0000-0000-c000-000000000046
SID_INewShortcutHookW	000214f7-0000-0000-c000-000000000046
SID_IPersistFolder	000214ea-0000-0000-c000-000000000046
SID_IPersistFolder2	1ac3d9f0-175c-11d1-95be-00609797ea4f
SID_IPropSheetPage	000214f6-0000-0000-c000-000000000046
SID_IQueryInfo	00021500-0000-0000-c000-000000000046
SID_IShellBrowser	000214e2-0000-0000-c000-000000000046
SID_IShellChangeNotify	00000000-0000-0000-0000-000000000000
SID_IShellCopyHookA	000214ef-0000-0000-c000-000000000046
SID_IShellCopyHookW	000214fc-0000-0000-c000-000000000046
SID_IShellDetails	000214ec-0000-0000-c000-000000000046
SID_IShellExecuteHookA	000214f5-0000-0000-c000-000000000046
SID_IShellExecuteHookW	000214fb-0000-0000-c000-000000000046

Shell Identifier (SID)	GUID
SID_IShellExtInit	000214e8-0000-0000-c000-000000000046
SID_IShellFolder	000214e6-0000-0000-c000-000000000046
SID_IShellFolder2	b82c5aa8-a41b-11d2-be32-00c04fb93661
SID_IShellIcon	000214e5-0000-0000-c000-000000000046
SID_IShellIconOverlay	7d688a70-c613-11d0-999b-00c04fd655e1
SID_IShellIconOverlayIdentifier	0c6c4200-c589-11d0-999a-00c04fd655e1
SID_IShellLinkA	000214ee-0000-0000-c000-000000000046
SID_IShellLinkW	000214f9-0000-0000-c000-000000000046
SID_IShellPropSheetExt	000214e9-0000-0000-c000-000000000046
SID_IShellView	000214e3-0000-0000-c000-000000000046
SID_IShellView2	88e39e80-3578-11cf-ae69-08002b2e1262
SID_IURLSearchHook	ac60f6a0-0fd9-11d0-99cb-00c04fd64497

8.11. Shell versions

Shell32.dll

Version	Distribution Platform
4.0	Windows 95 and Microsoft Windows NT 4.0
4.71	Microsoft Internet Explorer 4.0. See note 1.
4.72	Internet Explorer 4.01 and Windows 98. See note 1.
5.0	Windows 2000 and Windows Millennium Edition (Windows Me). See note 2.
6.0	Windows XP
6.0.1	Windows Vista
6.1	Windows 7

Shlwapi.dll

Version	Distribution Platform
4.0	Windows 95 and Microsoft Windows NT 4.0
4.71	Internet Explorer 4.0. See note 1.
4.72	Internet Explorer 4.01 and Windows 98. See note 1.
4.7	Internet Explorer 3.x
5.0	Microsoft Internet Explorer 5 and Windows 98 SE. See note 2.
5.5	Microsoft Internet Explorer 5.5 and Windows Millennium Edition (Windows Me)
6.0	Windows XP and Windows Vista

8.12. Property Sheet Handler

http://msdn.microsoft.com/en-us/library/windows/desktop/cc144106(v=vs.85).aspx
http://msdn.microsoft.com/en-us/library/windows/desktop/hh127447(v=vs.85).aspx

8.13. Notes

ILRootedBindToRoot

CLSID_MyComputer 20d04fe0-3aea-1069-a2d8-08002b30309d
IShellFolder 000214e6-0000-0000-c000-000000000046
CDesktopFolder

IshellFolder:EnumObjects -> IEnumIDList

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Author(s): Geoff Chappel
Date: August 4, 2009
URL: http://www.geoffchappell.com/studies/windows/shell/shell32/classes/regfolder.htm

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Author(s): Yogesh Khatri
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Author(s): Joachim Metz
Date: September 2009
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[LIBFWPS]
Title: Windows Property Store format
Author(s): Joachim Metz
Date: June 2013
URL: https://googledrive.com/host/0B3fBvzttpiiSc3VuS1J1QmtEYzA/Windows%20Property%20Store%20format.pdf

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Title: Microsoft Developer Network
URL: http://msdn.microsoft.com/

[MSDN-CONTROLPANELCATEGORY]
Title: Assigning Control Panel Categories
URL: http://msdn.microsoft.com/en-us/library/windows/desktop/cc144183(v=vs.85).aspx

[MSDN-DELEGATEITEMID]
Title: DELEGATEITEMID structure
URL: http://msdn.microsoft.com/en-us/library/windows/desktop/bb773254(v=vs.85).aspx

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URL: http://msdn.microsoft.com/en-us/library/ms775038.aspx
URL: http://msdn.microsoft.com/en-us/library/ms775141(v=vs.85).aspx
URL: http://msdn.microsoft.com/en-us/library/ms775140(v=vs.85).aspx
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Title: ITEMIDLIST structure
URL: http://msdn.microsoft.com/en-us/library/windows/desktop/bb773321(v=vs.85).aspx

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[MSDN-SHLNS]
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