[MS-SHLLINK-Diff]:

Shell Link (.LNK) Binary File Format

Revision Summary

Date	Revision History	Revision Class	Comments
7/16/2010	1.0	New	First Release.
8/27/2010	1.1	Minor	Clarified the meaning of the technical content.
10/8/2010	1.1	None	No changes to the meaning, language, or formatting of the technical content.
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6/17/2011	1.2	Minor	Clarified the meaning of the technical content.
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7/14/2016	3.0	None	No changes to the meaning, language, or formatting of the

Date	Revision History	Revision Class	Comments
			technical content.
6/1/2017	3.0	None	No changes to the meaning, language, or formatting of the technical content.
9/15/2017	4.0	Major	Significantly changed the technical content.

Table of Contents

1 Introduction

This is a specification of the Shell Link Binary File Format. In this format a structure is called a shell link, or shortcut, and is a data object that contains information that can be used to access another data object. The Shell Link Binary File Format is the format of Windows files with the extension "LNK".

Shell links are commonly used to support application launching and linking scenarios, such as Object Linking and Embedding (OLE), but they also can be used by applications that need the ability to store a reference to a target file.

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

1.1 Glossary

This document uses the following terms:

American National Standards Institute (ANSI) character set: A character set defined by a code page approved by the American National Standards Institute (ANSI). The term "ANSI" as used to signify Windows code pages is a historical reference and a misnomer that persists in the Windows community. The source of this misnomer stems from the fact that the Windows code page 1252 was originally based on an ANSI draft, which became International Organization for Standardization (ISO) Standard 8859-1 [ISO/IEC-8859-1]. In Windows, the ANSI character set can be any of the following code pages: 1252, 1250, 1251, 1253, 1254, 1255, 1256, 1257, 1258, 874, 932, 936, 949, or 950. For example, "ANSI application" is usually a reference to a non-Unicode or code-page-based application. Therefore, "ANSI character set" is often misused to refer to one of the character sets defined by a Windows code page that can be used as an active system code page; for example, character sets defined by code page 1252 or character sets defined by code page 950. Windows is now based on Unicode, so the use of ANSI character sets is strongly discouraged unless they are used to interoperate with legacy applications or legacy data.

Augmented Backus-Naur Form (ABNF): A modified version of Backus-Naur Form (BNF), commonly used by Internet specifications. ABNF notation balances compactness and simplicity with reasonable representational power. ABNF differs from standard BNF in its definitions and uses of naming rules, repetition, alternatives, order-independence, and value ranges. For more information, see [RFC5234].

class identifier (CLSID): A GUID that identifies a software component; for instance, a DCOM object class or a COM class.

code page: An ordered set of characters of a specific script in which a numerical index (code-point value) is associated with each character. Code pages are a means of providing support for character sets and keyboard layouts used in different countries. Devices such as the display and keyboard can be configured to use a specific code page and to switch from one code page (such as the United States) to another (such as Portugal) at the user's request.

extra data section: A data structure appended to the basic Shell Link Binary File Format data that contains additional information about the link target.

folder GUID ID: A GUID value that identifies a known folder. Some folder GUID ID values correspond to folder integer ID values.

folder integer ID: An integer value that identifies a known folder.

globally unique identifier (GUID): A term used interchangeably with universally unique identifier (UUID) in Microsoft protocol technical documents (TDs). Interchanging the usage of these terms does not imply or require a specific algorithm or mechanism to generate the value.

Specifically, the use of this term does not imply or require that the algorithms described in [RFC4122] or [C706] must be used for generating the GUID. See also universally unique identifier (UUID).

item ID (ItemID): A structure that represents an item in the context of a shell data source.

item ID list (IDList): A data structure that refers to a location. An item ID list is a multi-segment data structure where each segment's content is defined by a data source that is responsible for the location in the namespace referred to by the preceding segments.

link: An object that refers to another item.

link target: The item that a link references. In the case of a shell link, the referenced item is identified by its location in the link target namespace using an item ID list (IDList).

link target namespace: A hierarchical namespace. In Windows, the link target namespace is the Windows Explorer namespace, as described in [MSDN-ShellNamespace].

little-endian: Multiple-byte values that are byte-ordered with the least significant byte stored in the memory location with the lowest address.

namespace: An abstract container that provides context for the items (names, technical terms, or words) that it holds and allows disambiguation of items that have the same name (residing in different namespaces).

NetBIOS name: A 16-byte address that is used to identify a NetBIOS resource on the network. For more information, see [RFC1001] and [RFC1002].

object: In COM, a software entity that implements the IUnknown interface and zero or more additional interfaces that may be obtained from each other using the IUnknown interface. A COM object can be exposed to remote clients via the DCOM protocol, in which case it is also a DCOM object.

Object Linking and Embedding (OLE): A technology for transferring and sharing information between applications by inserting a file or part of a file into a compound document. The inserted file can be either embedded or linked. See also embedded object and linked object.

red-green-blue (RGB): A color model that describes color information in terms of the red (R), green (G), and blue (B) intensities in a color.

relative path: A path that is implied by the active working directory or is calculated based on a specified directory. If users enter a command that refers to a file and the full path is not entered, the active working directory is the relative path of the referenced file.

reparse point: An attribute that can be added to a file to store a collection of user-defined data that is opaque to NTFS or ReFS. If a file that has a reparse point is opened, the open will normally fail with STATUS_REPARSE, so that the relevant file system filter driver can detect the open of a file associated with (owned by) this reparse point. At that point, each installed filter driver can check to see if it is the owner of the reparse point, and, if so, perform any special processing required for a file with that reparse point. The format of this data is understood by the application that stores the data and the file system filter that interprets the data and processes the file. For example, an encryption filter that is marked as the owner of a file's reparse point could look up the encryption key for that file. A file can have (at most) 1 reparse point associated with it. For more information, see [MS-FSCC].

resolve a link: The act of finding a specific link target, confirming that it exists, and finding whether it has moved.

shell data source: An object that is responsible for a specific location in the namespace and for enumerating and binding IDLists to handlers.

shell link: A structure in Shell Link Binary File Format.

shim: A mechanism used to provide custom behavior to applications that do not work on newer versions of the operating system.

shortcut: A term that is used synonymously with shell link.

sparse file: A file containing large sections of data composed only of zeros~~, which~~. This file is marked as ~~such~~a sparse file in the ~~NTFS. The~~ file system, which saves disk space by only allocating as many ranges on disk as are required to completely reconstruct the non-zero data. When an attempt is made to read in the nonallocated portions of the file (also known as holes), the file system automatically returns zeros to the caller.

Unicode: A character encoding standard developed by the Unicode Consortium that represents almost all of the written languages of the world. The Unicode standard [UNICODE5.0.0/2007] provides three forms (UTF-8, UTF-16, and UTF-32) and seven schemes (UTF-8, UTF-16, UTF-16 BE, UTF-16 LE, UTF-32, UTF-32 LE, and UTF-32 BE).

Universal Naming Convention (UNC): A string format that specifies the location of a resource. For more information, see [MS-DTYP] section 2.2.57.

UTC (Coordinated Universal Time): A high-precision atomic time standard that approximately tracks Universal Time (UT). It is the basis for legal, civil time all over the Earth. Time zones around the world are expressed as positive and negative offsets from UTC. In this role, it is also referred to as Zulu time (Z) and Greenwich Mean Time (GMT). In these specifications, all references to UTC refer to the time at UTC–0 (or GMT).

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

1.2 References

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

1.2.1 Normative References

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

[MS-DFSNM] Microsoft Corporation, "Distributed File System (DFS): Namespace Management Protocol".

[MS-DTYP] Microsoft Corporation, "Windows Data Types".

[MS-LCID] Microsoft Corporation, "Windows Language Code Identifier (LCID) Reference".

[MS-PROPSTORE] Microsoft Corporation, "Property Store Binary File Format".

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

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, http://www.rfc-editor.org/rfc/rfc5234.txt

1.2.2 Informative References

[MS-CFB] Microsoft Corporation, "Compound File Binary File Format".

[MS-DLTW] Microsoft Corporation, "Distributed Link Tracking: Workstation Protocol".

[MSCHARSET] Microsoft Corporation, "INFO: Windows, Code Pages, and Character Sets", February 2005, http://support.microsoft.com/kb/75435

[MSDN-CODEPAGE] Microsoft Corporation, "Common Pages", http://msdn.microsoft.com/en-us/goglobal/bb964653.aspx

[MSDN-ISHELLLINK] Microsoft Corporation, "IShellLink Interface", http://msdn.microsoft.com/en-us/library/bb774950.aspx

[MSDN-MSISHORTCUTS] Microsoft Corporation, "How Windows Installer Shortcuts Work", https://support.microsoft.com/en-us/help/243630/info-how-windows-installer-shortcuts-work

1.3 Overview

The Shell Link Binary File Format specifies a structure called a shell link. That structure is used to store a reference to a location in a link target namespace, which is referred to as a link target. The most important component of a link target namespace is a link target in the form of an item ID list (IDList).

The shell link structure stores various information that is useful to end users, including:

- A keyboard shortcut that can be used to launch an application.
- A descriptive comment.
- Settings that control application behavior.
- Optional data stored in extra data sections.

Optional data can include a property store that contains an extensible set of properties in the format that is described in [MS-PROPSTORE].

The Shell Link Binary File Format can be managed using a COM object, programmed using the **IShellLink** interface, and saved into its persistence format using the **IPersistStream** or **IPersistFile** interface. It is most common for shell links to be stored in a file with the .LNK file extension. By using the **IPersistStream** interface, a shell link can be saved into another storage system, for example a database or the registry, or embedded in another file format. For more information, see [MSDN-ISHELLLINK].

Multi-byte data values in the Shell Link Binary File Format are stored in little-endian format.

1.4 Relationship to Protocols and Other Structures

The Shell Link Binary File Format is used by the Compound File Binary File Format [MS-CFB].

The Shell Link Binary File Format uses the Property Store Binary File Format [MS-PROPSTORE].

1.5 Applicability Statement

This document specifies a persistence format for links to files in a file system or to applications that are available for installation. This persistence format is applicable for use as a stand-alone file and for containment within other structures.

1.6 Versioning and Localization

This specification covers versioning issues in the following areas:

Localization: The Shell Link Binary File Format defines the ConsoleFEDataBlock structure (section 2.5.2), which specifies a code page for displaying text. That value can be used to specify a set of characters for a particular language or locale.

1.7 Vendor-Extensible Fields

A shell data source can extend the persistence format by storing custom data inside ItemID structure.

The ItemIDs embedded in an IDList are in a format specified by the shell data sources that manage the ItemIDs. The ItemIDs are free to store whatever data is needed in this structure to uniquely identify the items in their namespace.

The property store embedded in a link can be used to store property values in the shell link.

2 Structures

The Shell Link Binary File Format consists of a sequence of structures that conform to the following ABNF rules [RFC5234].

```
SHELL_LINK = SHELL_LINK_HEADER [LINKTARGET_IDLIST] [LINKINFO]
             [STRING_DATA] *EXTRA_DATA
```

SHELL_LINK_HEADER: A ShellLinkHeader structure (section 2.1), which contains identification information, timestamps, and flags that specify the presence of optional structures.

LINKTARGET_IDLIST: An optional LinkTargetIDList structure (section 2.2), which specifies the target of the link. The presence of this structure is specified by the **HasLinkTargetIDList** bit (LinkFlags section 2.1.1) in the ShellLinkHeader.

LINKINFO: An optional LinkInfo structure (section 2.3), which specifies information necessary to resolve the link target. The presence of this structure is specified by the **HasLinkInfo** bit (LinkFlags section 2.1.1) in the ShellLinkHeader.

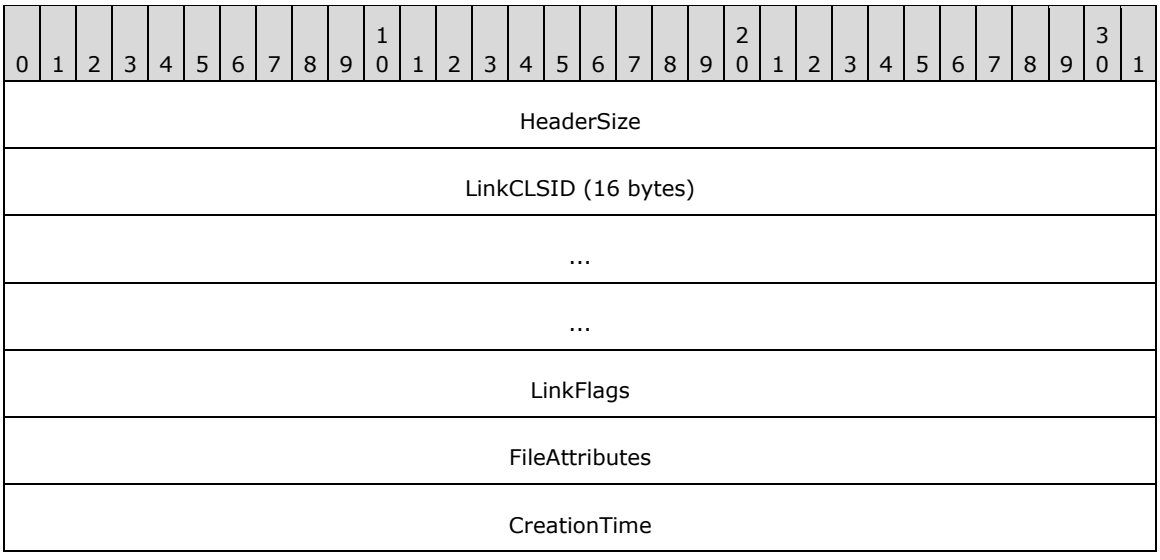
STRING_DATA: Zero or more optional StringData structures (section 2.4), which are used to convey user interface and path identification information. The presence of these structures is specified by bits (LinkFlags section 2.1.1) in the ShellLinkHeader.

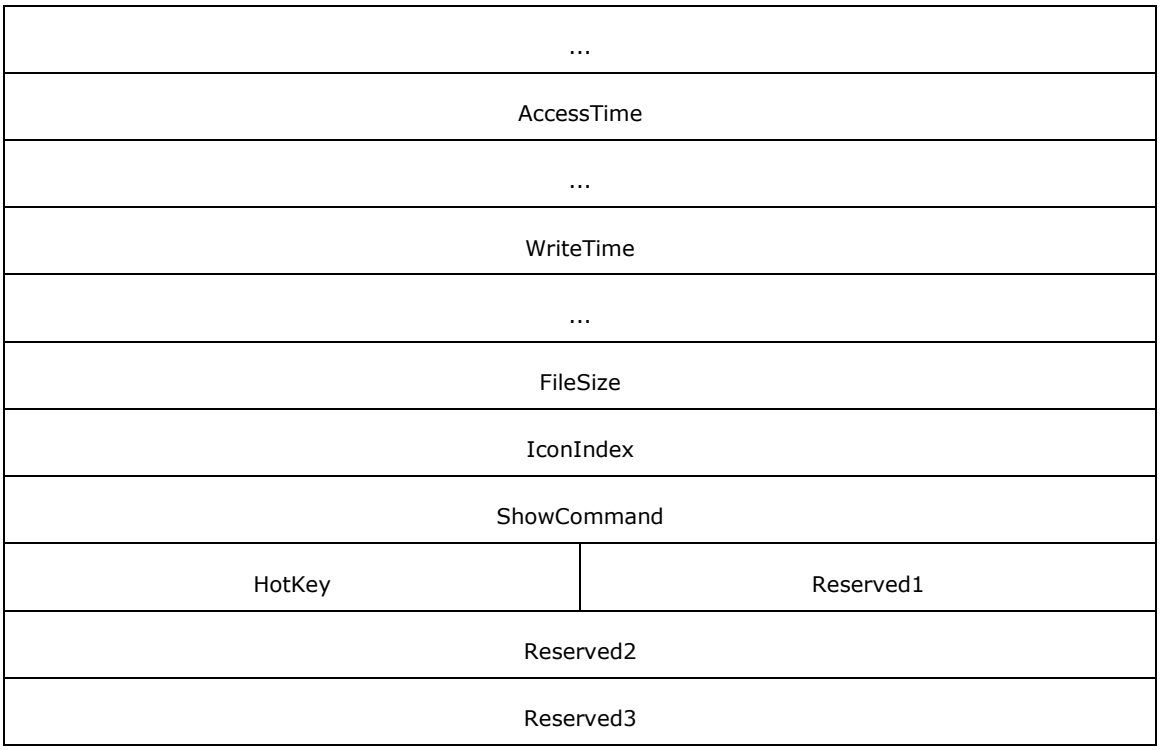
EXTRA_DATA: Zero or more ExtraData structures (section 2.5).

Note Structures of the Shell Link Binary File Format can define strings in fixed-length fields. In fixed-length fields, strings MUST be null-terminated. If a string is smaller than the size of the field that contains it, the bytes in the field following the terminating null character are undefined and can have any value. The undefined bytes MUST NOT be used.

2.1 ShellLinkHeader

The ShellLinkHeader structure contains identification information, timestamps, and flags that specify the presence of optional structures, including LinkTargetIDList (section 2.2), LinkInfo (section 2.3), and StringData (section 2.4).





HeaderSize (4 bytes): The size, in bytes, of this structure. This value MUST be 0x0000004C.

LinkCLSID (16 bytes): A class identifier (CLSID). This value MUST be 00021401-0000-0000-C000-000000000046.

LinkFlags (4 bytes): A LinkFlags structure (section 2.1.1) that specifies information about the shell link and the presence of optional portions of the structure.

FileAttributes (4 bytes): A FileAttributesFlags structure (section 2.1.2) that specifies information about the link target.

CreationTime (8 bytes): A FILETIME structure ([MS-DTYP] section 2.3.3) that specifies the creation time of the link target in UTC (Coordinated Universal Time). If the value is zero, there is no creation time set on the link target.

AccessTime (8 bytes): A FILETIME structure ([MS-DTYP] section 2.3.3) that specifies the access time of the link target in UTC (Coordinated Universal Time). If the value is zero, there is no access time set on the link target.

WriteTime (8 bytes): A FILETIME structure ([MS-DTYP] section 2.3.3) that specifies the write time of the link target in UTC (Coordinated Universal Time). If the value is zero, there is no write time set on the link target.

FileSize (4 bytes): A 32-bit unsigned integer that specifies the size, in bytes, of the link target. If the link target file is larger than 0xFFFFFFFF, this value specifies the least significant 32 bits of the link target file size.

IconIndex (4 bytes): A 32-bit signed integer that specifies the index of an icon within a given icon location.

ShowCommand (4 bytes): A 32-bit unsigned integer that specifies the expected window state of an application launched by the link. This value SHOULD be one of the following.

Value	Meaning
SW_SHOWNORMAL 0x00000001	The application is open and its window is open in a normal fashion.
SW_SHOWMAXIMIZED 0x00000003	The application is open, and keyboard focus is given to the application, but its window is not shown.
SW_SHOWMINNOACTIVE 0x00000007	The application is open, but its window is not shown. It is not given the keyboard focus.

All other values MUST be treated as **SW_SHOWNORMAL**.

HotKey (2 bytes): A HotKeyFlags structure (section 2.1.3) that specifies the keystrokes used to launch the application referenced by the shortcut key. This value is assigned to the application after it is launched, so that pressing the key activates that application.

Reserved1 (2 bytes): A value that MUST be zero.

Reserved2 (4 bytes): A value that MUST be zero.

Reserved3 (4 bytes): A value that MUST be zero.

2.1.1 LinkFlags

The LinkFlags structure defines bits that specify which shell link structures are present in the file format after the ShellLinkHeader structure (section 2.1).

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	0	0	0	0	0

Where the bits are defined as:

Value	Description
A HasLinkTargetIDList	The shell link is saved with an item ID list (IDList). If this bit is set, a LinkTargetIDList structure (section 2.2) MUST follow the ShellLinkHeader. If this bit is not set, this structure MUST NOT be present.
B HasLinkInfo	The shell link is saved with link information. If this bit is set, a LinkInfo structure (section 2.3) MUST be present. If this bit is not set, this structure MUST NOT be present.
C HasName	The shell link is saved with a name string. If this bit is set, a **NAME_STRING** StringData structure (section 2.4) MUST be present. If this bit is not set, this structure MUST NOT be present.
D HasRelativePath	The shell link is saved with a relative path string. If this bit is set, a **RELATIVE_PATH** StringData structure (section 2.4) MUST be present. If this bit is not set, this structure MUST NOT be present.
E HasWorkingDir	The shell link is saved with a working directory string. If this bit is set, a **WORKING_DIR** StringData structure (section 2.4) MUST be present. If this bit is not set, this structure MUST NOT be present.
F	The shell link is saved with command line arguments. If this bit is set, a

Value	Description
HasArguments	**COMMAND_LINE_ARGUMENTS** StringData structure (section 2.4) MUST be present. If this bit is not set, this structure MUST NOT be present.
G HasIconLocation	The shell link is saved with an icon location string. If this bit is set, an **ICON_LOCATION** StringData structure (section 2.4) MUST be present. If this bit is not set, this structure MUST NOT be present.
H IsUnicode	The shell link contains Unicode encoded strings. This bit SHOULD be set. If this bit is set, the StringData section contains Unicode-encoded strings; otherwise, it contains strings that are encoded using the system default code page.
I ForceNoLinkInfo	The LinkInfo structure (section 2.3) is ignored.
J HasExpString	The shell link is saved with an EnvironmentVariableDataBlock (section 2.5.4).
K RunInSeparateProcess	The target is run in a separate virtual machine when launching a link target that is a 16-bit application.
L Unused1	A bit that is undefined and MUST be ignored.
M HasDarwinID	The shell link is saved with a DarwinDataBlock (section 2.5.3).
N RunAsUser	The application is run as a different user when the target of the shell link is activated.
O HasExpIcon	The shell link is saved with an IconEnvironmentDataBlock (section 2.5.5).
P NoPidlAlias	The file system location is represented in the shell namespace when the path to an item is parsed into an IDList.
Q Unused2	A bit that is undefined and MUST be ignored.
R RunWithShimLayer	The shell link is saved with a ShimDataBlock (section 2.5.8).
S ForceNoLinkTrack	The TrackerDataBlock (section 2.5.10) is ignored.
T EnableTargetMetadata	The shell link attempts to collect target properties and store them in the PropertyStoreDataBlock (section 2.5.7) when the link target is set.
U DisableLinkPathTracking	The EnvironmentVariableDataBlock is ignored.
V DisableKnownFolderTracking	The SpecialFolderDataBlock (section 2.5.9) and the KnownFolderDataBlock (section 2.5.6) are ignored when loading the shell link. If this bit is set, these extra data blocks SHOULD NOT be saved when saving the shell link.
W DisableKnownFolderAlias	If the link has a KnownFolderDataBlock (section 2.5.6), the unaliased form of the known folder IDList SHOULD be used when translating the target IDList at the time that the link is loaded.

Value	Description
X AllowLinkToLink	Creating a link that references another link is enabled. Otherwise, specifying a link as the target IDList SHOULD NOT be allowed.
Y UnaliasOnSave	When saving a link for which the target IDList is under a known folder, either the unaliased form of that known folder or the target IDList SHOULD be used.
Z PreferEnvironmentPath	The target IDList SHOULD NOT be stored; instead, the path specified in the EnvironmentVariableDataBlock (section 2.5.4) SHOULD be used to refer to the target.
AA KeepLocalIDListForUNCTarget	When the target is a UNC name that refers to a location on a local machine, the local path IDList in the PropertyStoreDataBlock (section 2.5.7) SHOULD be stored, so it can be used when the link is loaded on the local machine.

2.1.2 FileAttributesFlags

The FileAttributesFlags structure defines bits that specify the file attributes of the link target, if the target is a file system item. File attributes can be used if the link target is not available, or if accessing the target would be inefficient. It is possible for the target items attributes to be out of sync with this value.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

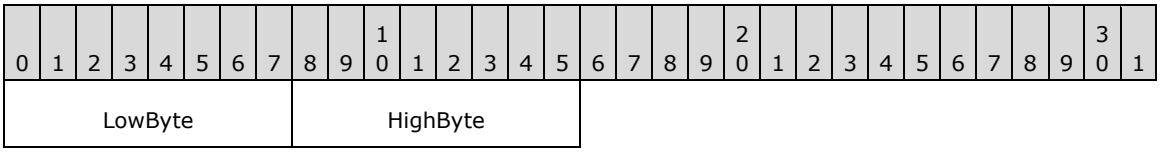
Where the bits are defined as:

Value	Description
A FILE_ATTRIBUTE_READONLY	The file or directory is read-only. For a file, if this bit is set, applications can read the file but cannot write to it or delete it. For a directory, if this bit is set, applications cannot delete the directory.
B FILE_ATTRIBUTE_HIDDEN	The file or directory is hidden. If this bit is set, the file or folder is not included in an ordinary directory listing.
C FILE_ATTRIBUTE_SYSTEM	The file or directory is part of the operating system or is used exclusively by the operating system.
D Reserved1	A bit that MUST be zero.
E FILE_ATTRIBUTE_DIRECTORY	The link target is a directory instead of a file.
F FILE_ATTRIBUTE_ARCHIVE	The file or directory is an archive file. Applications use this flag to mark files for backup or removal.
G Reserved2	A bit that MUST be zero.

Value	Description
H FILE_ATTRIBUTE_NORMAL	The file or directory has no other flags set. If this bit is 1, all other bits in this structure MUST be clear.
I FILE_ATTRIBUTE_TEMPORARY	The file is being used for temporary storage.
J FILE_ATTRIBUTE_SPARSE_FILE	The file is a sparse file.
K FILE_ATTRIBUTE_REPARSE_POINT	The file or directory has an associated reparse point.
L FILE_ATTRIBUTE_COMPRESSED	The file or directory is compressed. For a file, this means that all data in the file is compressed. For a directory, this means that compression is the default for newly created files and subdirectories.
M FILE_ATTRIBUTE_OFFLINE	The data of the file is not immediately available.
N FILE_ATTRIBUTE_NOT_CONTENT_INDEXED	The contents of the file need to be indexed.
O FILE_ATTRIBUTE_ENCRYPTED	The file or directory is encrypted. For a file, this means that all data in the file is encrypted. For a directory, this means that encryption is the default for newly created files and subdirectories.

2.1.3 HotKeyFlags

The HotKeyFlags structure specifies input generated by a combination of keyboard keys being pressed.



LowByte (1 byte): An 8-bit unsigned integer that specifies a virtual key code that corresponds to a key on the keyboard. This value MUST be one of the following:

Value	Meaning
0x30	"0" key
0x31	"1" key
0x32	"2" key
0x33	"3" key
0x34	"4" key
0x35	"5" key

Value	Meaning
0x36	"6" key
0x37	"7" key
0x38	"8" key
0x39	"9" key
0x41	"A" key
0x42	"B" key
0x43	"C" key
0x44	"D" key
0x45	"E" key
0x46	"F" key
0x47	"G" key
0x48	"H" key
0x49	"I" key
0x4A	"J" key
0x4B	"K" key
0x4C	"L" key
0x4D	"M" key
0x4E	"N" key
0x4F	"O" key
0x50	"P" key
0x51	"Q" key
0x52	"R" key
0x53	"S" key
0x54	"T" key
0x55	"U" key
0x56	"V" key
0x57	"W" key
0x58	"X" key
0x59	"Y" key
0x5A	"Z" key
VK_F1 0x70	"F1" key

Value	Meaning
VK_F2 0x71	"F2" key
VK_F3 0x72	"F3" key
VK_F4 0x73	"F4" key
VK_F5 0x74	"F5" key
VK_F6 0x75	"F6" key
VK_F7 0x76	"F7" key
VK_F8 0x77	"F8" key
VK_F9 0x78	"F9" key
VK_F10 0x79	"F10" key
VK_F11 0x7A	"F11" key
VK_F12 0x7B	"F12" key
VK_F13 0x7C	"F13" key
VK_F14 0x7D	"F14" key
VK_F15 0x7E	"F15" key
VK_F16 0x7F	"F16" key
VK_F17 0x80	"F17" key
VK_F18 0x81	"F18" key
VK_F19 0x82	"F19" key
VK_F20 0x83	"F20" key

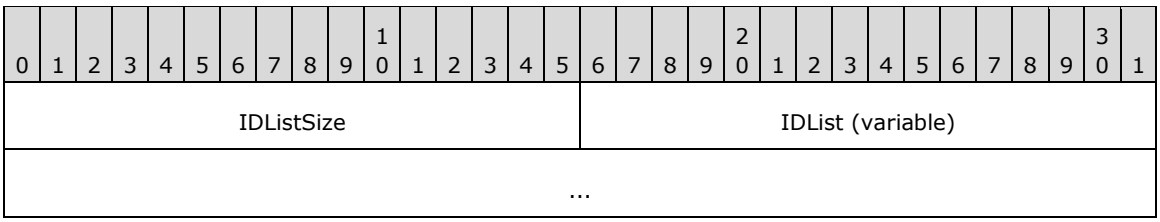
Value	Meaning
VK_F21 0x84	"F21" key
VK_F22 0x85	"F22" key
VK_F23 0x86	"F23" key
VK_F24 0x87	"F24" key
VK_NUMLOCK 0x90	"NUM LOCK" key
VK_SCROLL 0x91	"SCROLL LOCK" key

HighByte (1 byte): An 8-bit unsigned integer that specifies bits that correspond to modifier keys on the keyboard. This value MUST be one or a combination of the following:

Value	Meaning
HOTKEYF_SHIFT 0x01	The "SHIFT" key on the keyboard.
HOTKEYF_CONTROL 0x02	The "CTRL" key on the keyboard.
HOTKEYF_ALT 0x04	The "ALT" key on the keyboard.

2.2 LinkTargetIDList

The LinkTargetIDList structure specifies the target of the link. The presence of this optional structure is specified by the **HasLinkTargetIDList** bit (LinkFlags section 2.1.1) in the ShellLinkHeader (section 2.1).



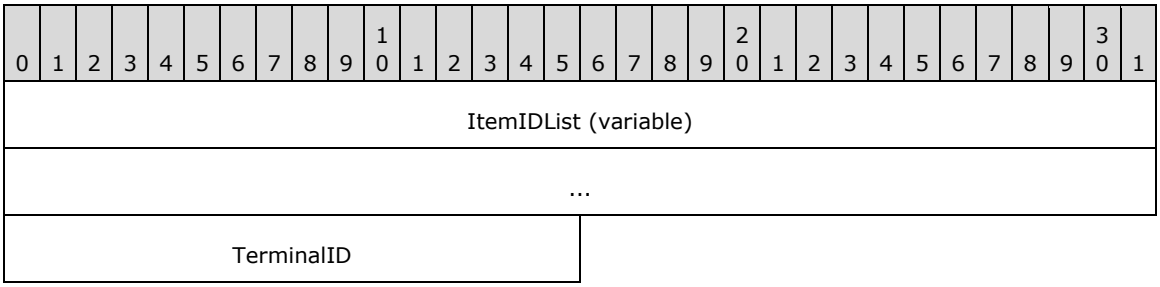
IDListSize (2 bytes): The size, in bytes, of the **IDList** field.

IDList (variable): A stored IDList structure (section 2.2.1), which contains the item ID list. An IDList structure conforms to the following ABNF [RFC5234]:

```
IDLIST = *ITEMID TERMINALID
```

2.2.1 IDList

The stored IDList structure specifies the format of a persisted item ID list.

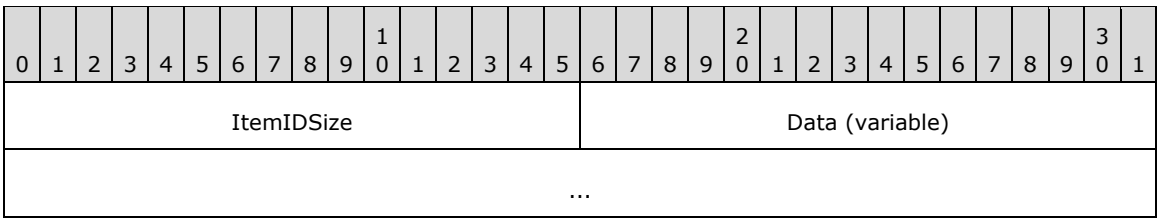


ItemIDList (variable): An array of zero or more ItemID structures (section 2.2.2).

TerminalID (2 bytes): A 16-bit, unsigned integer that indicates the end of the item IDs. This value MUST be zero.

2.2.2 ItemID

An ItemID is an element in an IDList structure (section 2.2.1). The data stored in a given ItemID is defined by the source that corresponds to the location in the target namespace of the preceding ItemIDs. This data uniquely identifies the items in that part of the namespace.

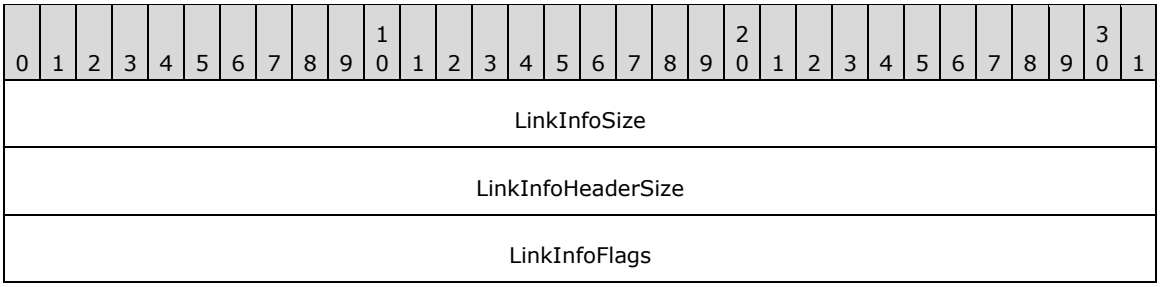


ItemIDSize (2 bytes): A 16-bit, unsigned integer that specifies the size, in bytes, of the ItemID structure, including the **ItemIDSize** field.

Data (variable): The shell data source-defined data that specifies an item.

2.3 LinkInfo

The LinkInfo structure specifies information necessary to resolve a link target if it is not found in its original location. This includes information about the volume that the target was stored on, the mapped drive letter, and a Universal Naming Convention (UNC) form of the path if one existed when the link was created. For more details about UNC paths, see [MS-DFSNM] section 2.2.1.4.



VolumeIDOffset
LocalBasePathOffset
CommonNetworkRelativeLinkOffset
CommonPathSuffixOffset
LocalBasePathOffsetUnicode (optional)
CommonPathSuffixOffsetUnicode (optional)
VolumeID (variable)
...
LocalBasePath (variable)
...
CommonNetworkRelativeLink (variable)
...
CommonPathSuffix (variable)
...
LocalBasePathUnicode (variable)
...
CommonPathSuffixUnicode (variable)
...

LinkInfoSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in bytes, of the LinkInfo structure. All offsets specified in this structure MUST be less than this value, and all strings contained in this structure MUST fit within the extent defined by this size.

LinkInfoHeaderSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in bytes, of the **LinkInfo** header section, which is composed of the **LinkInfoSize**, **LinkInfoHeaderSize**, **LinkInfoFlags**, **VolumeIDOffset**, **LocalBasePathOffset**, **CommonNetworkRelativeLinkOffset**, **CommonPathSuffixOffset** fields, and, if included, the **LocalBasePathOffsetUnicode** and **CommonPathSuffixOffsetUnicode** fields.<1>

Value	Meaning
0x0000001C	Offsets to the optional fields are not specified.
0x00000024 ≤ *value*	Offsets to the optional fields are specified.

LinkInfoFlags (4 bytes): Flags that specify whether the **VolumeID**, **LocalBasePath**, **LocalBasePathUnicode**, and **CommonNetworkRelativeLink** fields are present in this structure.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
A	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Where the bits are defined as:

Value	Description
A VolumeIDAndLocalBasePath	If set, the **VolumeID** and **LocalBasePath** fields are present, and their locations are specified by the values of the **VolumeIDOffset** and **LocalBasePathOffset** fields, respectively. If the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024, the **LocalBasePathUnicode** field is present, and its location is specified by the value of the **LocalBasePathOffsetUnicode** field. If not set, the **VolumeID**, **LocalBasePath**, and **LocalBasePathUnicode** fields are not present, and the values of the **VolumeIDOffset** and **LocalBasePathOffset** fields are zero. If the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024, the value of the **LocalBasePathOffsetUnicode** field is zero.
B CommonNetworkRelativeLinkAndPathSuffix	If set, the **CommonNetworkRelativeLink** field is present, and its location is specified by the value of the **CommonNetworkRelativeLinkOffset** field. If not set, the **CommonNetworkRelativeLink** field is not present, and the value of the **CommonNetworkRelativeLinkOffset** field is zero.

VolumeIDOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **VolumeID** field. If the **VolumeIDAndLocalBasePath** flag is set, this value is an offset, in bytes, from the start of the LinkInfo structure; otherwise, this value MUST be zero.

LocalBasePathOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **LocalBasePath** field. If the **VolumeIDAndLocalBasePath** flag is set, this value is an offset, in bytes, from the start of the LinkInfo structure; otherwise, this value MUST be zero.

CommonNetworkRelativeLinkOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **CommonNetworkRelativeLink** field. If the **CommonNetworkRelativeLinkAndPathSuffix** flag is set, this value is an offset, in bytes, from the start of the LinkInfo structure; otherwise, this value MUST be zero.

CommonPathSuffixOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **CommonPathSuffix** field. This value is an offset, in bytes, from the start of the LinkInfo structure.

LocalBasePathOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer that specifies the location of the **LocalBasePathUnicode** field. If the **VolumeIDAndLocalBasePath** flag is set, this value is an offset, in bytes, from the start of the LinkInfo structure; otherwise, this value MUST be zero. This field can be present only if the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024.

CommonPathSuffixOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer that specifies the location of the **CommonPathSuffixUnicode** field. This value is an offset, in bytes, from the

start of the LinkInfo structure. This field can be present only if the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024.

VolumeID (variable): An optional VolumeID structure (section 2.3.1) that specifies information about the volume that the link target was on when the link was created. This field is present if the **VolumeIDAndLocalBasePath** flag is set.

LocalBasePath (variable): An optional, NULL–terminated string, defined by the system default code page, which is used to construct the full path to the link item or link target by appending the string in the **CommonPathSuffix** field. This field is present if the **VolumeIDAndLocalBasePath** flag is set.

CommonNetworkRelativeLink (variable): An optional CommonNetworkRelativeLink structure (section 2.3.2) that specifies information about the network location where the link target is stored.

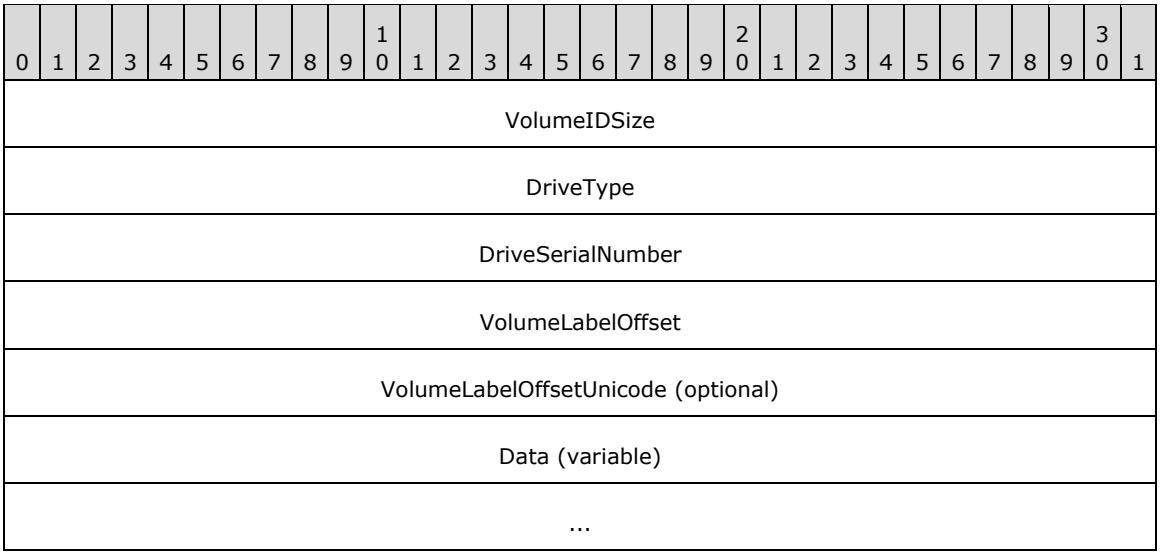
CommonPathSuffix (variable): A NULL–terminated string, defined by the system default code page, which is used to construct the full path to the link item or link target by being appended to the string in the **LocalBasePath** field.

LocalBasePathUnicode (variable): An optional, NULL–terminated, Unicode string that is used to construct the full path to the link item or link target by appending the string in the **CommonPathSuffixUnicode** field. This field can be present only if the **VolumeIDAndLocalBasePath** flag is set and the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024.

CommonPathSuffixUnicode (variable): An optional, NULL–terminated, Unicode string that is used to construct the full path to the link item or link target by being appended to the string in the **LocalBasePathUnicode** field. This field can be present only if the value of the **LinkInfoHeaderSize** field is greater than or equal to 0x00000024.

2.3.1 VolumeID

The VolumeID structure specifies information about the volume that a link target was on when the link was created. This information is useful for resolving the link if the file is not found in its original location.



VolumeIDSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in bytes, of this structure. This value MUST be greater than 0x00000010. All offsets specified in this structure

MUST be less than this value, and all strings contained in this structure MUST fit within the extent defined by this size.

DriveType (4 bytes): A 32-bit, unsigned integer that specifies the type of drive the link target is stored on. This value MUST be one of the following:

Value	Meaning
DRIVE_UNKNOWN 0x00000000	The drive type cannot be determined.
DRIVE_NO_ROOT_DIR 0x00000001	The root path is invalid; for example, there is no volume mounted at the path.
DRIVE_REMOVABLE 0x00000002	The drive has removable media, such as a floppy drive, thumb drive, or flash card reader.
DRIVE_FIXED 0x00000003	The drive has fixed media, such as a hard drive or flash drive.
DRIVE_REMOTE 0x00000004	The drive is a remote (network) drive.
DRIVE_CDROM 0x00000005	The drive is a CD-ROM drive.
DRIVE_RAMDISK 0x00000006	The drive is a RAM disk.

DriveSerialNumber (4 bytes): A 32-bit, unsigned integer that specifies the drive serial number of the volume the link target is stored on.

VolumeLabelOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of a string that contains the volume label of the drive that the link target is stored on. This value is an offset, in bytes, from the start of the VolumeID structure to a NULL-terminated string of characters, defined by the system default code page. The volume label string is located in the **Data** field of this structure.

If the value of this field is 0x00000014, it MUST be ignored, and the value of the **VolumeLabelOffsetUnicode** field MUST be used to locate the volume label string.

VolumeLabelOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer that specifies the location of a string that contains the volume label of the drive that the link target is stored on. This value is an offset, in bytes, from the start of the VolumeID structure to a NULL-terminated string of Unicode characters. The volume label string is located in the **Data** field of this structure.

If the value of the **VolumeLabelOffset** field is not 0x00000014, this field MUST be ignored, and the value of the **VolumeLabelOffset** field MUST be used to locate the volume label string.

Data (variable): A buffer of data that contains the volume label of the drive as a string defined by the system default code page or Unicode characters, as specified by preceding fields.

2.3.2 CommonNetworkRelativeLink

The CommonNetworkRelativeLink structure specifies information about the network location where a link target is stored, including the mapped drive letter and the UNC path prefix. For details on UNC paths, see [MS-DFSNM] section 2.2.1.4.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
CommonNetworkRelativeLinkSize																															
CommonNetworkRelativeLinkFlags																															
NetNameOffset																															
DeviceNameOffset																															
NetworkProviderType																															
NetNameOffsetUnicode (optional)																															
DeviceNameOffsetUnicode (optional)																															
NetName (variable)																															
...																															
DeviceName (variable)																															
...																															
NetNameUnicode (variable)																															
...																															
DeviceNameUnicode (variable)																															
...																															

CommonNetworkRelativeLinkSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in bytes, of the CommonNetworkRelativeLink structure. This value MUST be greater than or equal to 0x00000014. All offsets specified in this structure MUST be less than this value, and all strings contained in this structure MUST fit within the extent defined by this size.

CommonNetworkRelativeLinkFlags (4 bytes): Flags that specify the contents of the **DeviceNameOffset** and **NetProviderType** fields.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
A	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Where the bits are defined as:

Value	Description
A	If set, the **DeviceNameOffset** field contains an offset to the device name.

Value	Description
ValidDevice	If not set, the **DeviceNameOffset** field does not contain an offset to the device name, and its value MUST be zero.
B ValidNetType	If set, the **NetProviderType** field contains the network provider type. If not set, the **NetProviderType** field does not contain the network provider type, and its value MUST be zero.

NetNameOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **NetName** field. This value is an offset, in bytes, from the start of the CommonNetworkRelativeLink structure.

DeviceNameOffset (4 bytes): A 32-bit, unsigned integer that specifies the location of the **DeviceName** field. If the **ValidDevice** flag is set, this value is an offset, in bytes, from the start of the CommonNetworkRelativeLink structure; otherwise, this value MUST be zero.

NetworkProviderType (4 bytes): A 32-bit, unsigned integer that specifies the type of network provider. If the **ValidNetType** flag is set, this value MUST be one of the following; otherwise, this value MUST be ignored.

Vendor name	Value
WNNC_NET_AVID	0x001A0000
WNNC_NET_DOCUSPACE	0x001B0000
WNNC_NET_MANGOSOFT	0x001C0000
WNNC_NET_SERNET	0x001D0000
WNNC_NET_RIVERFRONT1	0X001E0000
WNNC_NET_RIVERFRONT2	0x001F0000
WNNC_NET_DECORB	0x00200000
WNNC_NET_PROTSTOR	0x00210000
WNNC_NET_FJ_REDIR	0x00220000
WNNC_NET_DISTINCT	0x00230000
WNNC_NET_TWINS	0x00240000
WNNC_NET_RDR2SAMPLE	0x00250000
WNNC_NET_CSC	0x00260000
WNNC_NET_3IN1	0x00270000
WNNC_NET_EXTENDNET	0x00290000
WNNC_NET_STAC	0x002A0000
WNNC_NET_FOXBAT	0x002B0000
WNNC_NET_YAHOO	0x002C0000
WNNC_NET_EXIFS	0x002D0000
WNNC_NET_DAV	0x002E0000
WNNC_NET_KNOWARE	0x002F0000

Vendor name	Value
WNNC_NET_OBJECT_DIRE	0x00300000
WNNC_NET_MASFAX	0x00310000
WNNC_NET_HOB_NFS	0x00320000
WNNC_NET_SHIVA	0x00330000
WNNC_NET_IBMAL	0x00340000
WNNC_NET_LOCK	0x00350000
WNNC_NET_TERMSRV	0x00360000
WNNC_NET_SRT	0x00370000
WNNC_NET_QUINCY	0x00380000
WNNC_NET_OPENAFS	0x00390000
WNNC_NET_AVID1	0X003A0000
WNNC_NET_DFS	0x003B0000
WNNC_NET_KWNP	0x003C0000
WNNC_NET_ZENWORKS	0x003D0000
WNNC_NET_DRIVEONWEB	0x003E0000
WNNC_NET_VMWARE	0x003F0000
WNNC_NET_RSFX	0x00400000
WNNC_NET_MFILES	0x00410000
WNNC_NET_MS_NFS	0x00420000
WNNC_NET_GOOGLE	0x00430000

NetNameOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer that specifies the location of the **NetNameUnicode** field. This value is an offset, in bytes, from the start of the CommonNetworkRelativeLink structure. This field MUST be present if the value of the **NetNameOffset** field is greater than 0x00000014; otherwise, this field MUST NOT be present.

DeviceNameOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer that specifies the location of the **DeviceNameUnicode** field. This value is an offset, in bytes, from the start of the CommonNetworkRelativeLink structure. This field MUST be present if the value of the **NetNameOffset** field is greater than 0x00000014; otherwise, this field MUST NOT be present.

NetName (variable): A NULL–terminated string, as defined by the system default code page, which specifies a server share path; for example, "\\server\share".

DeviceName (variable): A NULL–terminated string, as defined by the system default code page, which specifies a device; for example, the drive letter "D:".

NetNameUnicode (variable): An optional, NULL–terminated, Unicode string that is the Unicode version of the **NetName** string. This field MUST be present if the value of the **NetNameOffset** field is greater than 0x00000014; otherwise, this field MUST NOT be present.

DeviceNameUnicode (variable): An optional, NULL–terminated, Unicode string that is the Unicode version of the **DeviceName** string. This field MUST be present if the value of the **NetNameOffset** field is greater than 0x00000014; otherwise, this field MUST NOT be present.

2.4 StringData

StringData refers to a set of structures that convey user interface and path identification information. The presence of these optional structures is controlled by LinkFlags (section 2.1.1) in the ShellLinkHeader (section 2.1).

The StringData structures conform to the following ABNF rules [RFC5234].

```
STRING_DATA = [NAME_STRING] [RELATIVE_PATH] [WORKING_DIR]
              [COMMAND_LINE_ARGUMENTS] [ICON_LOCATION]
```

NAME_STRING: An optional structure that specifies a description of the shortcut that is displayed to end users to identify the purpose of the shell link. This structure MUST be present if the **HasName** flag is set.

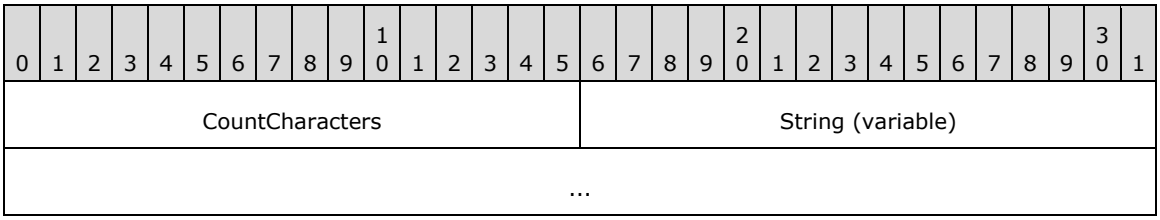
RELATIVE_PATH: An optional structure that specifies the location of the link target relative to the file that contains the shell link. When specified, this string SHOULD be used when resolving the link. This structure MUST be present if the **HasRelativePath** flag is set.

WORKING_DIR: An optional structure that specifies the file system path of the working directory to be used when activating the link target. This structure MUST be present if the **HasWorkingDir** flag is set.

COMMAND_LINE_ARGUMENTS: An optional structure that stores the command-line arguments that are specified when activating the link target. This structure MUST be present if the **HasArguments** flag is set.

ICON_LOCATION: An optional structure that specifies the location of the icon to be used when displaying a shell link item in an icon view. This structure MUST be present if the **HasIconLocation** flag is set.

All StringData structures have the following structure.



CountCharacters (2 bytes): A 16-bit, unsigned integer that specifies either the number of characters, defined by the system default code page, or the number of Unicode characters found in the **String** field. A value of zero specifies an empty string.

String (variable): An optional set of characters, defined by the system default code page, or a Unicode string with a length specified by the **CountCharacters** field. This string MUST NOT be NULL-terminated.

2.5 ExtraData

ExtraData refers to a set of structures that convey additional information about a link target. These optional structures can be present in an extra data section that is appended to the basic Shell Link Binary File Format.

The ExtraData structures conform to the following ABNF rules [RFC5234]:

```
EXTRA_DATA       = *EXTRA_DATA_BLOCK TERMINAL_BLOCK

EXTRA_DATA_BLOCK = CONSOLE_PROPS / CONSOLE_FE_PROPS / DARWIN_PROPS /
                   ENVIRONMENT_PROPS / ICON_ENVIRONMENT_PROPS /
                   KNOWN_FOLDER_PROPS / PROPERTY_STORE_PROPS /
                   SHIM_PROPS / SPECIAL_FOLDER_PROPS /
                   TRACKER_PROPS / VISTA_AND_ABOVE_IDLIST_PROPS
```

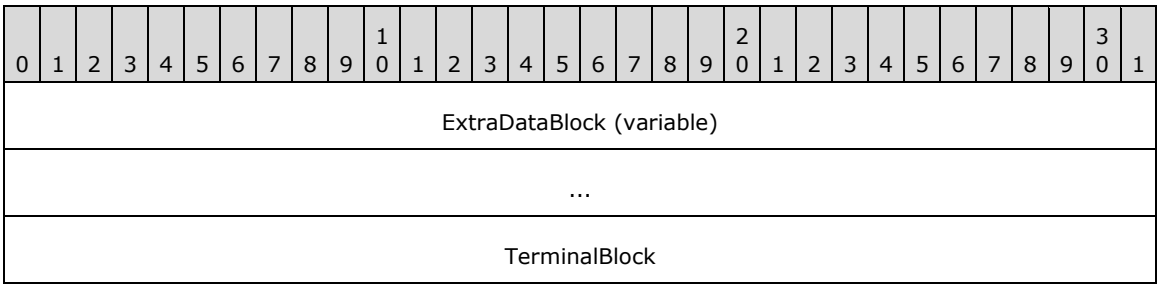
EXTRA_DATA: A structure consisting of zero or more property data blocks followed by a terminal block.

EXTRA_DATA_BLOCK: A structure consisting of any one of the following property data blocks.

- **CONSOLE_PROPS**: A ConsoleDataBlock structure (section 2.5.1).
- **CONSOLE_FE_PROPS**: A ConsoleFEDataBlock structure (section 2.5.2).
- **DARWIN_PROPS**: A DarwinDataBlock structure (section 2.5.3).
- **ENVIRONMENT_PROPS**: An EnvironmentVariableDataBlock structure (section 2.5.4).
- **ICON_ENVIRONMENT_PROPS**: An IconEnvironmentDataBlock structure (section 2.5.5).
- **KNOWN_FOLDER_PROPS**: A KnownFolderDataBlock structure (section 2.5.6).
- **PROPERTY_STORE_PROPS**: A PropertyStoreDataBlock structure (section 2.5.7).
- **SHIM_PROPS**: A ShimDataBlock structure (section 2.5.8).
- **SPECIAL_FOLDER_PROPS**: A SpecialFolderDataBlock structure (section 2.5.9).
- **TRACKER_PROPS**: A TrackerDataBlock structure (section 2.5.10).
- **VISTA_AND_ABOVE_IDLIST_PROPS**: A VistaAndAboveIDListDataBlock structure (section 2.5.11).

TERMINAL_BLOCK A structure that indicates the end of the extra data section.

The general structure of an extra data section is shown in the following diagram.



ExtraDataBlock (variable): An optional array of bytes that contains zero or more property data blocks listed in the **EXTRA_DATA_BLOCK** syntax rule.

TerminalBlock (4 bytes): A 32-bit, unsigned integer that indicates the end of the extra data section. This value MUST be less than 0x00000004.

2.5.1 ConsoleDataBlock

The ConsoleDataBlock structure specifies the display settings to use when a link target specifies an application that is run in a console window.<2>

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
BlockSize																															
BlockSignature																															
FillAttributes																PopupFillAttributes															
ScreenBufferSizeX																ScreenBufferSizeY															
WindowSizeX																WindowSizeY															
WindowOriginX																WindowOriginY															
Unused1																															
Unused2																															
FontSize																															
FontFamily																															
FontWeight																															
Face Name (64 bytes)																															
...																															
...																															
CursorSize																															
FullScreen																															
QuickEdit																															
InsertMode																															
AutoPosition																															

HistoryBufferSize
NumberOfHistoryBuffers
HistoryNoDup
ColorTable (64 bytes)
...
...

BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the ConsoleDataBlock structure. This value MUST be 0x000000CC.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the ConsoleDataBlock extra data section. This value MUST be 0xA0000002.

FillAttributes (2 bytes): A 16-bit, unsigned integer that specifies the fill attributes that control the foreground and background text colors in the console window. The following bit definitions can be combined to specify 16 different values each for the foreground and background colors:

Value	Meaning
FOREGROUND_BLUE 0x0001	The foreground text color contains blue.
FOREGROUND_GREEN 0x0002	The foreground text color contains green.
FOREGROUND_RED 0x0004	The foreground text color contains red.
FOREGROUND_INTENSITY 0x0008	The foreground text color is intensified.
BACKGROUND_BLUE 0x0010	The background text color contains blue.
BACKGROUND_GREEN 0x0020	The background text color contains green.
BACKGROUND_RED 0x0040	The background text color contains red.
BACKGROUND_INTENSITY 0x0080	The background text color is intensified.

PopupFillAttributes (2 bytes): A 16-bit, unsigned integer that specifies the fill attributes that control the foreground and background text color in the console window popup. The values are the same as for the **FillAttributes** field.

ScreenBufferSizeX (2 bytes): A 16-bit, signed integer that specifies the horizontal size (X axis), in characters, of the console window buffer.

ScreenBufferSizeY (2 bytes): A 16-bit, signed integer that specifies the vertical size (Y axis), in characters, of the console window buffer.

WindowSizeX (2 bytes): A 16-bit, signed integer that specifies the horizontal size (X axis), in characters, of the console window.

WindowSizeY (2 bytes): A 16-bit, signed integer that specifies the vertical size (Y axis), in characters, of the console window.

WindowOriginX (2 bytes): A 16-bit, signed integer that specifies the horizontal coordinate (X axis), in pixels, of the console window origin.

WindowOriginY (2 bytes): A 16-bit, signed integer that specifies the vertical coordinate (Y axis), in pixels, of the console window origin.

Unused1 (4 bytes): A value that is undefined and MUST be ignored.

Unused2 (4 bytes): A value that is undefined and MUST be ignored.

FontSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in pixels, of the font used in the console window.

FontFamily (4 bytes): A 32-bit, unsigned integer that specifies the family of the font used in the console window. This value MUST be one of the following:

Value	Meaning
FF_DONTCARE 0x0000	The font family is unknown.
FF_ROMAN 0x0010	The font is variable-width with serifs; for example, "Times New Roman".
FF_SWISS 0x0020	The font is variable-width without serifs; for example, "Arial".
FF_MODERN 0x0030	The font is fixed-width, with or without serifs; for example, "Courier New".
FF_SCRIPT 0x0040	The font is designed to look like handwriting; for example, "Cursive".
FF_DECORATIVE 0x0050	The font is a novelty font; for example, "Old English".

FontWeight (4 bytes): A 16-bit, unsigned integer that specifies the stroke weight of the font used in the console window.

Value	Meaning
700 ≤ *value*	A bold font.
value < 700	A regular-weight font.

Face Name (64 bytes): A 32-character Unicode string that specifies the face name of the font used in the console window.

CursorSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the cursor, in pixels, used in the console window.

Value	Meaning
value ≤ 25	A small cursor.
26 — 50	A medium cursor.
51 — 100	A large cursor.

FullScreen (4 bytes): A 32-bit, unsigned integer that specifies whether to open the console window in full-screen mode.

Value	Meaning
0x00000000	Full-screen mode is off.
0x00000000 < *value*	Full-screen mode is on.

QuickEdit (4 bytes): A 32-bit, unsigned integer that specifies whether to open the console window in QuikEdit mode. In QuickEdit mode, the mouse can be used to cut, copy, and paste text in the console window.

Value	Meaning
0x00000000	QuikEdit mode is off.
0x00000000 < *value*	QuikEdit mode is on.

InsertMode (4 bytes): A 32-bit, unsigned integer that specifies insert mode in the console window.

Value	Meaning
0x00000000	Insert mode is disabled.
0x00000000 < *value*	Insert mode is enabled.

AutoPosition (4 bytes): A 32-bit, unsigned integer that specifies auto-position mode of the console window.

Value	Meaning
0x00000000	The values of the **WindowOriginX** and **WindowOriginY** fields are used to position the console window.
0x00000000 < *value*	The console window is positioned automatically.

HistoryBufferSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in characters, of the buffer that is used to store a history of user input into the console window.

NumberOfHistoryBuffers (4 bytes): A 32-bit, unsigned integer that specifies the number of history buffers to use.

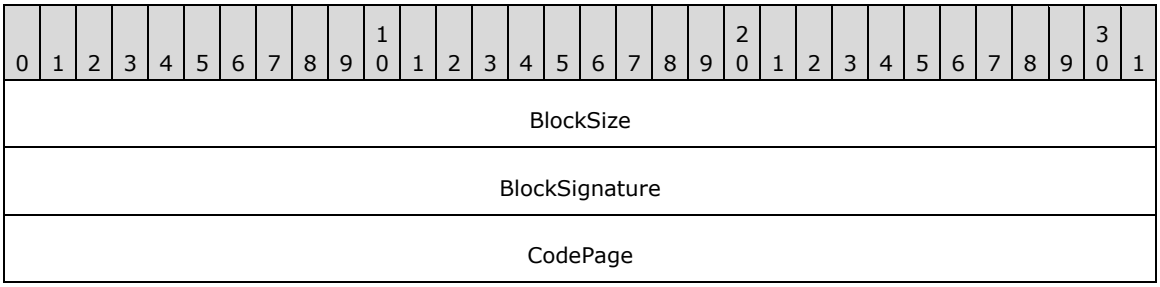
HistoryNoDup (4 bytes): A 32-bit, unsigned integer that specifies whether to remove duplicates in the history buffer.

Value	Meaning
0x00000000	Duplicates are not allowed.
0x00000000 < *value*	Duplicates are allowed.

ColorTable (64 bytes): A table of 16 32-bit, unsigned integers specifying the RGB colors that are used for text in the console window. The values of the fill attribute fields **FillAttributes** and **PopupFillAttributes** are used as indexes into this table to specify the final foreground and background color for a character.

2.5.2 ConsoleFEDataBlock

The ConsoleFEDataBlock structure specifies the code page to use for displaying text when a link target specifies an application that is run in a console window.<3>



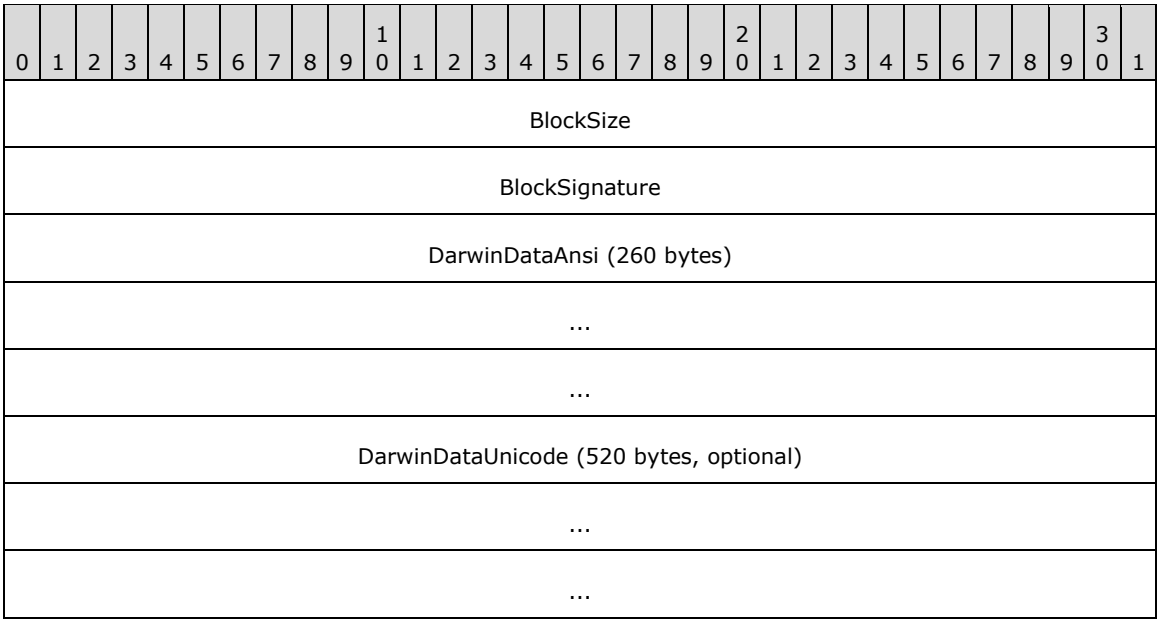
BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the ConsoleFEDataBlock structure. This value MUST be 0x0000000C.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the ConsoleFEDataBlock extra data section. This value MUST be 0xA0000004.

CodePage (4 bytes): A 32-bit, unsigned integer that specifies a code page language code identifier. For details concerning the structure and meaning of language code identifiers, see [MS-LCID]. For additional background information, see [MSCHARSET] and [MSDN-CODEPAGE].

2.5.3 DarwinDataBlock

The DarwinDataBlock structure specifies an application identifier that can be used instead of a link target IDList to install an application when a shell link is activated.



BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the DarwinDataBlock structure. This value MUST be 0x00000314.

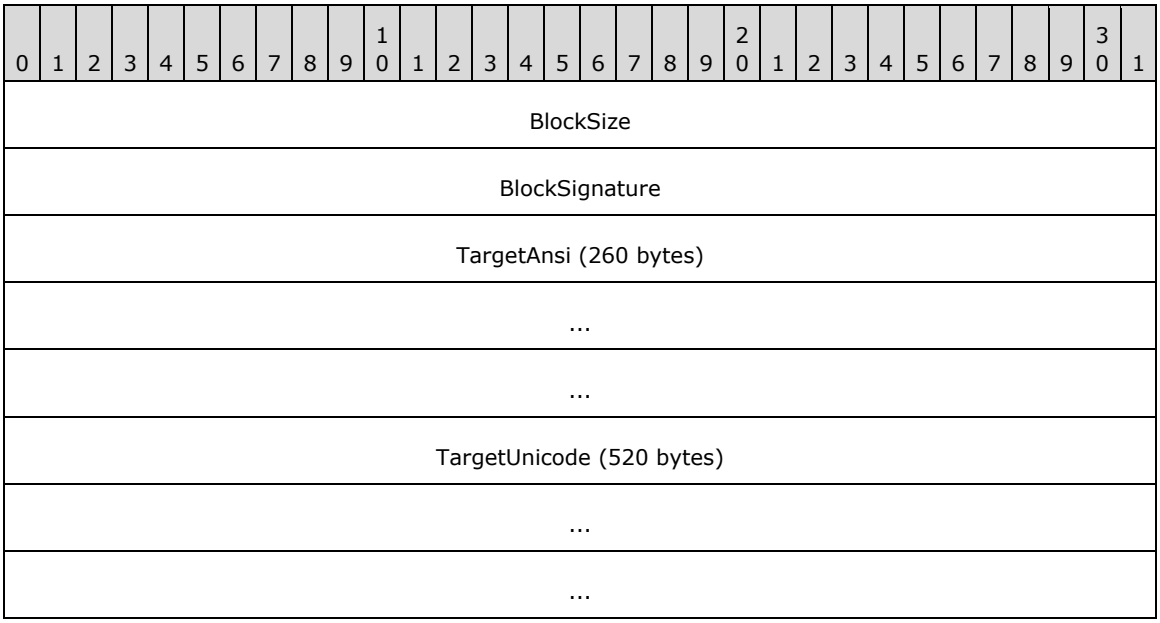
BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the DarwinDataBlock extra data section. This value MUST be 0xA0000006.

DarwinDataAnsi (260 bytes): A NULL–terminated string, defined by the system default code page, which specifies an application identifier. This field SHOULD be ignored.

DarwinDataUnicode (520 bytes): An optional, NULL–terminated, Unicode string that specifies an application identifier.<4>

2.5.4 EnvironmentVariableDataBlock

The EnvironmentVariableDataBlock structure specifies a path to environment variable information when the link target refers to a location that has a corresponding environment variable.



BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the EnvironmentVariableDataBlock structure. This value MUST be 0x00000314.

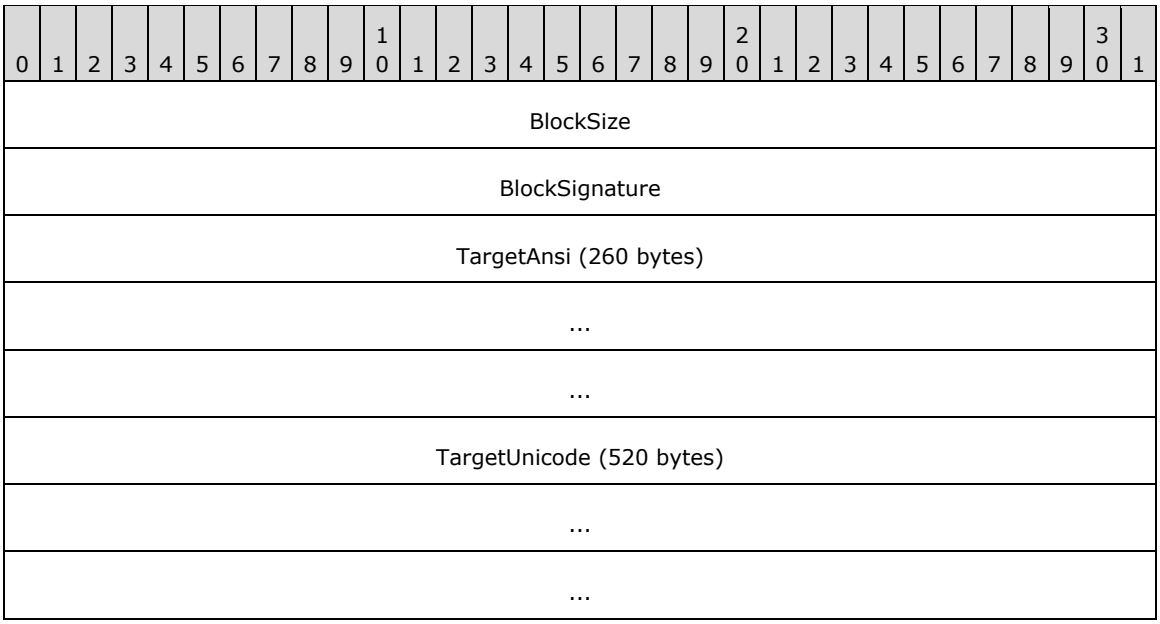
BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the EnvironmentVariableDataBlock extra data section. This value MUST be 0xA0000001.

TargetAnsi (260 bytes): A NULL-terminated string, defined by the system default code page, which specifies a path to environment variable information.

TargetUnicode (520 bytes): An optional, NULL-terminated, Unicode string that specifies a path to environment variable information.

2.5.5 IconEnvironmentDataBlock

The IconEnvironmentDataBlock structure specifies the path to an icon. The path is encoded using environment variables, which makes it possible to find the icon across machines where the locations vary but are expressed using environment variables.



BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the IconEnvironmentDataBlock structure. This value MUST be 0x00000314.

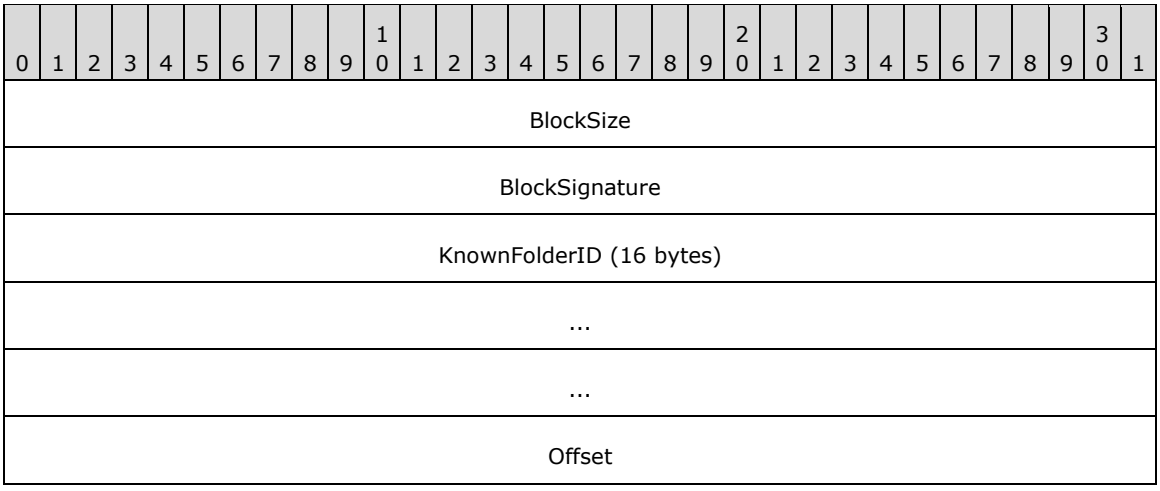
BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the IconEnvironmentDataBlock extra data section. This value MUST be 0xA0000007.

TargetAnsi (260 bytes): A NULL-terminated string, defined by the system default code page, which specifies a path that is constructed with environment variables.

TargetUnicode (520 bytes): An optional, NULL-terminated, Unicode string that specifies a path that is constructed with environment variables.

2.5.6 KnownFolderDataBlock

The KnownFolderDataBlock structure specifies the location of a known folder. This data can be used when a link target is a known folder to keep track of the folder so that the link target IDList can be translated when the link is loaded.



BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the KnownFolderDataBlock structure. This value MUST be 0x0000001C.

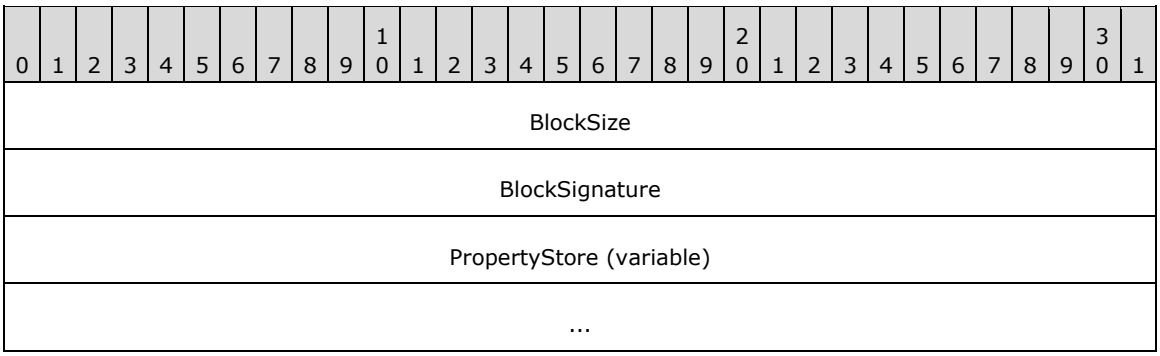
BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the KnownFolderDataBlock extra data section. This value MUST be 0xA000000B.

KnownFolderID (16 bytes): A value in GUID packet representation ([MS-DTYP] section 2.3.2.2) that specifies the folder GUID ID.

Offset (4 bytes): A 32-bit, unsigned integer that specifies the location of the ItemID of the first child segment of the IDList specified by **KnownFolderID**. This value is the offset, in bytes, into the link target IDList.

2.5.7 PropertyStoreDataBlock

A PropertyStoreDataBlock structure specifies a set of properties that can be used by applications to store extra data in the shell link.



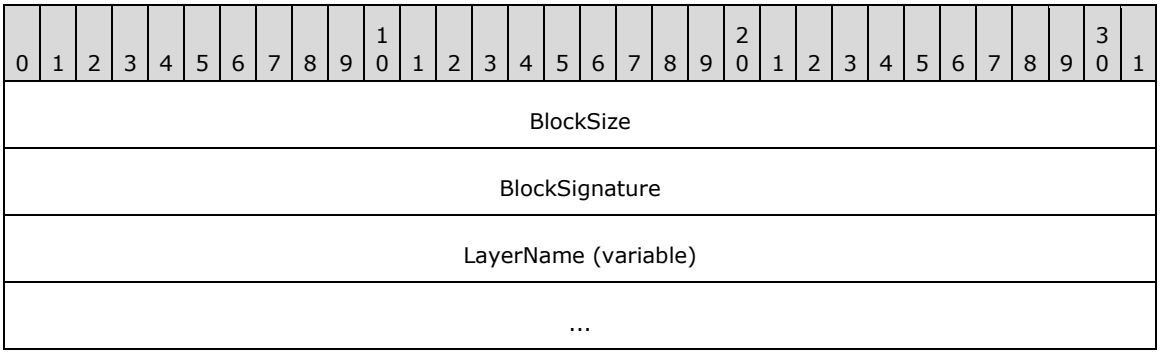
BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the PropertyStoreDataBlock structure. This value MUST be greater than or equal to 0x0000000C.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the PropertyStoreDataBlock extra data section. This value MUST be 0xA0000009.

PropertyStore (variable): A serialized property storage structure ([MS-PROPSTORE] section 2.2).

2.5.8 ShimDataBlock

The ShimDataBlock structure specifies the name of a shim that can be applied when activating a link target.



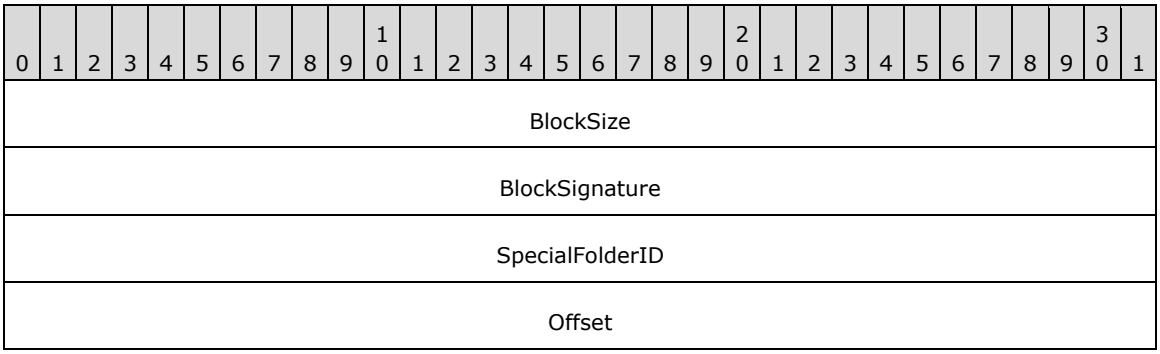
BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the ShimDataBlock structure. This value MUST be greater than or equal to 0x00000088.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the ShimDataBlock extra data section. This value MUST be 0xA0000008.

LayerName (variable): A Unicode string that specifies the name of a shim layer to apply to a link target when it is being activated.

2.5.9 SpecialFolderDataBlock

The SpecialFolderDataBlock structure specifies the location of a special folder. This data can be used when a link target is a special folder to keep track of the folder, so that the link target IDList can be translated when the link is loaded.



BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the SpecialFolderDataBlock structure. This value MUST be 0x00000010.

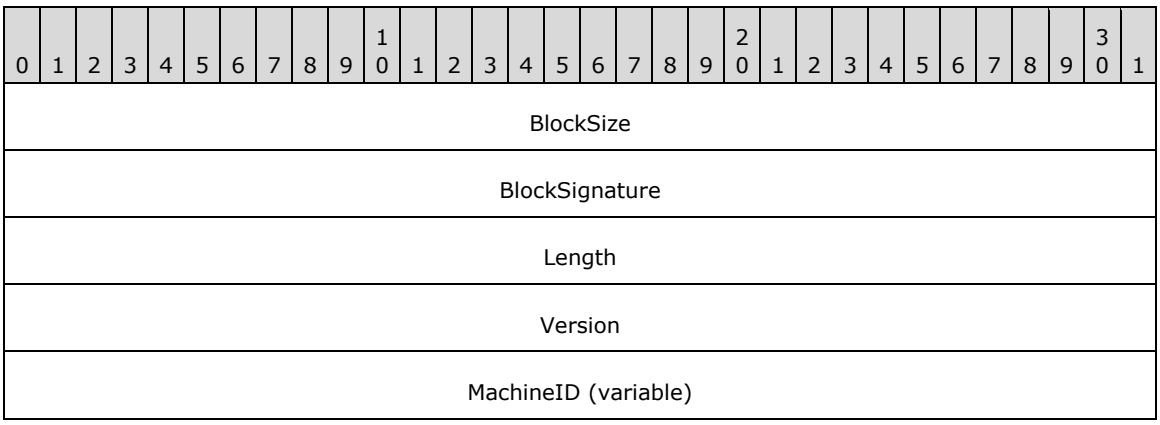
BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the SpecialFolderDataBlock extra data section. This value MUST be 0xA0000005.

SpecialFolderID (4 bytes): A 32-bit, unsigned integer that specifies the folder integer ID.

Offset (4 bytes): A 32-bit, unsigned integer that specifies the location of the ItemID of the first child segment of the IDList specified by **SpecialFolderID**. This value is the offset, in bytes, into the link target IDList.

2.5.10 TrackerDataBlock

The TrackerDataBlock structure specifies data that can be used to resolve a link target if it is not found in its original location when the link is resolved. This data is passed to the Link Tracking service [MS-DLTW] to find the link target.



...
Droid (32 bytes)
...
...
DroidBirth (32 bytes)
...
...

BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the TrackerDataBlock structure. This value MUST be 0x00000060.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the TrackerDataBlock extra data section. This value MUST be 0xA0000003.

Length (4 bytes): A 32-bit, unsigned integer. This value MUST be greater than or equal to 0x0000058.

Version (4 bytes): A 32-bit, unsigned integer. This value MUST be 0x00000000.

MachineID (variable): A character string, as defined by the system default code page, which specifies the NetBIOS name of the machine where the link target was last known to reside.

Droid (32 bytes): Two values in GUID packet representation ([MS-DTYP] section 2.3.2.2) that are used to find the link target with the Link Tracking service, as specified in [MS-DLTW].

DroidBirth (32 bytes): Two values in GUID packet representation that are used to find the link target with the Link Tracking service

2.5.11 VistaAndAboveIDListDataBlock

The VistaAndAboveIDListDataBlock structure specifies an alternate IDList that can be used instead of the LinkTargetIDList structure (section 2.2) on platforms that support it.<5>

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
BlockSize																															
BlockSignature																															
IDList (variable)																															
...																															

BlockSize (4 bytes): A 32-bit, unsigned integer that specifies the size of the VistaAndAboveIDListDataBlock structure. This value MUST be greater than or equal to 0x0000000A.

BlockSignature (4 bytes): A 32-bit, unsigned integer that specifies the signature of the VistaAndAboveIDListDataBlock extra data section. This value MUST be 0xA000000C.

IDList (variable): An IDList structure (section 2.2.1).

3 Structure Examples

3.1 Shortcut to a File

This section presents a sample of the Shell Link Binary File Format, consisting of a shortcut to a file with the path "C:\test\a.txt".

The following is the hexadecimal representation of the contents of the shell link.

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0000	4C	00	00	00	01	14	02	00	00	00	00	00	C0	00	00	00
0010	00	00	00	46	9B	00	08	00	20	00	00	00	D0	E9	EE	F2
0020	15	15	C9	01	D0	E9	EE	F2	15	15	C9	01	D0	E9	EE	F2
0030	15	15	C9	01	00	00	00	00	00	00	00	00	01	00	00	00
0040	00	00	00	00	00	00	00	00	00	00	00	00	BD	00	14	00
0050	1F	50	E0	4F	D0	20	EA	3A	69	10	A2	D8	08	00	2B	30
0060	30	9D	19	00	2F	43	3A	5C	00	00	00	00	00	00	00	00
0070	00	00	00	00	00	00	00	00	00	00	00	46	00	31	00	00
0080	00	00	00	2C	39	69	A3	10	00	74	65	73	74	00	00	32
0090	00	07	00	04	00	EF	BE	2C	39	65	A3	2C	39	69	A3	26
00A0	00	00	00	03	1E	00	00	00	00	F5	1E	00	00	00	00	00
00B0	00	00	00	00	00	74	00	65	00	73	00	74	00	00	00	14
00C0	00	48	00	32	00	00	00	00	00	2C	39	69	A3	20	00	61
00D0	2E	74	78	74	00	34	00	07	00	04	00	EF	BE	2C	39	69
00E0	A3	2C	39	69	A3	26	00	00	00	2D	6E	00	00	00	00	96
00F0	01	00	00	00	00	00	00	00	00	00	00	61	00	2E	00	74
0100	00	78	00	74	00	00	00	14	00	00	00	3C	00	00	00	1C
0110	00	00	00	01	00	00	00	1C	00	00	00	2D	00	00	00	00
0120	00	00	00	3B	00	00	00	11	00	00	00	03	00	00	00	81
0130	8A	7A	30	10	00	00	00	00	43	3A	5C	74	65	73	74	5C
0140	61	2E	74	78	74	00	00	07	00	2E	00	5C	00	61	00	2E
0150	00	74	00	78	00	74	00	07	00	43	00	3A	00	5C	00	74
0160	00	65	00	73	00	74	00	60	00	00	00	03	00	00	A0	58
0170	00	00	00	00	00	00	00	63	68	72	69	73	2D	78	70	73
0180	00	00	00	00	00	00	00	40	78	C7	94	47	FA	C7	46	B3
0190	56	5C	2D	C6	B6	D1	15	EC	46	CD	7B	22	7F	DD	11	94

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
01A0	99	00	13	72	16	87	4A	40	78	C7	94	47	FA	C7	46	B3
01B0	56	5C	2D	C6	B6	D1	15	EC	46	CD	7B	22	7F	DD	11	94
01C0	99	00	13	72	16	87	4A	00	00	00	00					

HeaderSize: (4 bytes, offset 0x0000), 0x0000004C as required.

LinkCLSID: (16 bytes, offset 0x0004), 00021401-0000-0000-C000-000000000046.

LinkFlags: (4 bytes, offset 0x0014), 0x0008009B means the following LinkFlags (section 2.1.1) are set:

- HasLinkTargetIDList
- HasLinkInfo
- HasRelativePath
- HasWorkingDir
- IsUnicode
- EnableTargetMetadata

FileAttributes: (4 bytes, offset 0x0018), 0x00000020, means the following FileAttributesFlags (section 2.1.2) are set:

- FILE_ATTRIBUTE_ARCHIVE

CreationTime: (8 bytes, offset 0x001C) FILETIME 9/12/08, 8:27:17PM.

AccessTime: (8 bytes, offset 0x0024) FILETIME 9/12/08, 8:27:17PM.

WriteTime: (8 bytes, offset 0x002C) FILETIME 9/12/08, 8:27:17PM.

FileSize: (4 bytes, offset 0x0034), 0x00000000.

IconIndex: (4 bytes, offset 0x0038), 0x00000000.

ShowCommand: (4 bytes, offset 0x003C), SW_SHOWNORMAL(1).

Hotkey: (2 bytes, offset 0x0040), 0x0000.

Reserved: (2 bytes, offset 0x0042), 0x0000.

Reserved2: (4 bytes, offset 0x0044), 0 x00000000.

Reserved3: (4 bytes, offset 0x0048), 0 x00000000.

Because **HasLinkTargetIDList** is set, a LinkTargetIDList structure (section 2.2) follows:

- **IDListSize**: (2 bytes, offset 0x004C), 0x00BD, the size of **IDList**.
- **IDList**: (189 bytes, offset 0x004E) an IDList structure (section 2.2.1) follows:
  - **ItemIDList**: (187 bytes, offset 0x004E), ItemID structures (section 2.2.2) follow:
    - **ItemIDSize**: (2 bytes, offset 0x004E), 0x0014
    - **Data**: (12 bytes, offset 0x0050), <18 bytes of data> [computer]

        - **ItemIDSize**: (2 bytes, offset 0x0062), 0x0019
        - **Data**: (23 bytes, offset 0x0064), <23 bytes of data> [c:]
        - **ItemIDSize**: (2 bytes, offset 0x007B), 0x0046
        - **Data**: (68 bytes, offset 0x007D), <68 bytes of data> [test]
        - **ItemIDSize**: (2 bytes, offset 0x00C1), 0x0048
        - **Data**: (68 bytes, offset 0x00C3), <70 bytes of data> [a.txt]
    - **TerminalID**: (2 bytes, offset 0x0109), 0x0000 indicates the end of the **IDList**.

Because **HasLinkInfo** is set, a LinkInfo structure (section 2.3) follows:

- **LinkInfoSize**: (4 bytes, offset 0x010B), 0x0000003C
- **LinkInfoHeaderSize**: (4 bytes, offset 0x010F), 0x0000001C as specified in the LinkInfo structure definition.
- **LinkInfoFlags**: (4 bytes, offset 0x0113), 0x00000001 **VolumeIDAndLocalBasePath** is set.
- **VolumeIDOffset**: (4 bytes, offset 0x0117), 0x0000001C, references offset 0x0127.
- **LocalBasePathOffset**: (4 bytes, offset 0x011B), 0x0000002D, references the character string "C:\test\a.txt".
- **CommonNetworkRelativeLinkOffset**: (4 bytes, offset 0x011F), 0x00000000 indicates **CommonNetworkRelativeLink** is not present.
- **CommonPathSuffixOffset**: (4 bytes, offset 0x0123), 0x0000003B, references offset 0x00000146, the character string "" (empty string).
- **VolumeID**: (17 bytes, offset 0x0127), because **VolumeIDAndLocalBasePath** is set, a VolumeID structure (section 2.3.1) follows:
    - **VolumeIDSize**: (4 bytes, offset 0x0127), 0x00000011 indicates the size of the **VolumeID** structure.
    - **DriveType**: (4 bytes, offset 0x012B), DRIVE_FIXED(3).
    - **DriveSerialNumber**: (4 bytes, offset 0x012F), 0x307A8A81.
    - **VolumeLabelOffset**: (4 bytes, offset 0x0133), 0x00000010, indicates that Volume Label Offset Unicode is not specified and references offset 0x0137 where the Volume Label is stored.
    - **Data**: (1 byte, offset 0x0137), "" an empty character string.
- **LocalBasePath**: (14 bytes, offset 0x0138), because **VolumeIDAndLocalBasePath** is set, the character string "c:\test\a.txt" is present.
- **CommonPathSuffix**: (1 byte, offset 0x0146), "" an empty character string.

Because **HasRelativePath** is set, the **RELATIVE_PATH** StringData structure (section 2.4) follows:

- **CountCharacters**: (2 bytes, offset 0x0147), 0x0007 Unicode characters.
- **String** (14 bytes, offset 0x0149), the Unicode string: ".\a.txt".

Because **HasWorkingDir** is set, the **WORKING_DIR** StringData structure (section 2.4) follows:

- **CountCharacters**: (2 bytes, offset 0x0157), 0x0007 Unicode characters.

- **String** (14 bytes, offset 0x0159), the Unicode string: "c:\test".

Extra data section: (100 bytes, offset 0x0167), an ExtraData structure (section 2.5) follows:

- **ExtraDataBlock** (96 bytes, offset 0x0167), the TrackerDataBlock structure (section 2.5.10) follows:
  - **BlockSize**: (4 bytes, offset 0x0167), 0x00000060
  - **BlockSignature**: (4 bytes, offset 0x016B), 0xA000003, which identifies the TrackerDataBlock structure (section 2.5.10).
  - **Length**: (4 bytes, offset 0x016F), 0x00000058, the required minimum size of this extra data block.
  - **Version**: (4 bytes, offset 0x0173), 0x00000000, the required version.
  - **MachineID**: (16 bytes, offset 0x0177), the character string "chris-xps", with zero fill.
  - **Droid**: (32 bytes, offset 0x0187), 2 GUID values.
  - **DroidBirth**: (32 bytes, offset 0x01A7), 2 GUID values.
- **TerminalBlock**: (4 bytes, offset 0x01C7), 0x00000000 indicates the end of the extra data section.

4 Security

None.

5 Appendix A: Product Behavior

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

- Windows NT 3.1 operating system
- Windows NT 3.5 operating system
- Windows NT 3.51 operating system
- Windows NT 4.0 operating system
- Windows 2000 operating system
- Windows XP operating system
- Windows Server 2003 operating system
- Windows Vista operating system
- Windows Server 2008 operating system
- Windows 7 operating system
- Windows Server 2008 R2 operating system
- Windows 8 operating system
- Windows Server 2012 operating system
- Windows 8.1 operating system
- Windows Server 2012 R2 operating system
- Windows 10 operating system
- Windows Server 2016 operating system
- Windows Server operating system

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

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

<1> Section 2.3: In Windows, Unicode characters are stored in this structure if the data cannot be represented as ANSI characters due to truncation of the values. In this case, the value of the **LinkInfoHeaderSize** field is greater than or equal to 36.

<2> Section 2.5.1: In Windows environments, this is commonly known as a "command prompt" window.

<3> Section 2.5.2: In Windows environments, this is commonly known as a "command prompt" window.

<4> Section 2.5.3: In Windows, this is a Windows Installer (MSI) application descriptor. For more information, see [MSDN-MSISHORTCUTS].

<5> Section 2.5.11: The VistaAndAboveIDListDataBlock structure is not supported on Windows NT operating system, Windows 2000, Windows XP, or Windows Server 2003.

6 Change Tracking

~~No table of~~ This section identifies changes ~~is available. The~~ that were made to this document ~~is either new or has had no changes~~ since ~~its~~the last release. Changes are classified as Major, Minor, or None.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements.
- A document revision that captures changes to protocol functionality.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **None** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the relevant technical content is identical to the last released version.

The changes made to this document are listed in the following table. For more information, please contact dochelp@microsoft.com.

Section	Description	Revision class
5 Appendix A: Product Behavior	Added Windows Server operating system to the list of applicable products.	Major

7 Index