Hard Links and Junctions

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There are three types of file links supported in the NTFS file system: hard links, junctions, and symbolic links. This topic is an overview of hard links and junctions. For information about symbolic links, see Creating Symbolic Links.

Hard Links

A *hard link* is the file system representation of a file by which more than one path references a single file in the same volume. To create a hard link, use the **CreateHardLink** function. Any changes to that file are instantly visible to applications that access it through the hard links that reference it. However, the directory entry size and attribute information is updated only for the link through which the change was made. Note that the attributes on the file are reflected in every hard link to that file, and changes to that file's attributes propagate to all the hard links. For example if you reset the READONLY attribute on a hard link to delete that particular hard link, and there are multiple hard links to the actual file, then you will need to reset the READONLY bit on the file from one of the remaining hard links to bring the file and all remaining hard links back to the READONLY state.

For example, in a system where C: and D: are local drives and Z: is a network drive mapped to \\fred\share, the following references are permitted as a hard link:

- C:\dira\ethel.txt linked to C:\dirb\dirc\lucy.txt
- D:\dir1\tinker.txt to D:\dir2\dirx\bell.txt
- C:\diry\bob.bak linked to C:\dir2\mina.txt

The following are not:

- C:\dira linked to C:\dirb
- C:\dira\ethel.txt linked to D:\dirb\lucy.txt
- C:\dira\ethel.txt linked to Z:\dirb\lucy.txt

To delete a hard link, use the **DeleteFile** function. You can delete hard links in any order regardless of the order in which they are created.

Junctions

A *junction* (also called a *soft link*) differs from a hard link in that the storage objects it references are separate directories, and a junction can link directories located on different local volumes on the same computer. Otherwise, junctions operate identically to hard links. Junctions are implemented through reparse points.

Assuming the same conditions in the Hard Links section, the following references are permitted as junctions:

- C:\dira linked to C:\dirb\dirc
- C:\dirx linked to D:\diry

The following are not:

- C:\dira\one.txt linked to C:\dirb\two.txt
- C:\dir1 linked to Z:\dir2

Related topics

Creating Symbolic Links

Community Additions

To overcome the problem with the 'ς' character

To overcome the problem with the 'ς' character, it can be substituted with the 's' character. This can be done easily for all files in one-line command in powershell:

get-child-item "*ς*" -recurse | rename-item -newname {$_.name -creplace 'ς', 's'} -whatif

To actually execute the batch rename remove -whatif parameter

alexglts
1/8/2013

Support for Unicode characters

I've created a directory junction in the root folder of primary HDD to a folder on my second HDD. All works normally, except the case that a file or folder name contains the character "ς" (Greek small letter final sigma U+03C2) in the filename. In this case i can see the file in explorer but i cannot open/rename/edit it.Is there a sollution?

kmagkanas
8/8/2012

Behaviour of File Management APIs?

Like SymbolicLinks, there needs to be a list of how the various File Management APIs behave when encountering HardLinks. Finding out the hard way I can confirm that the behaviour is *not* similar to SymbolicLinks after a call to CopyFile with a hardlink as destination overwrote the hardlink target and not the hardlink itself (contrast this to SymbolicLnks which state that the symlink itself will be overwritten).

edit: it seems that the SymbolicLink content contains incorrect information: CopyFile does behave similarly for both hardlinks and symlinks: if the destination is a link it's target is overwritten.

Anthony_P
11/28/2009

vista mklink

http://www.howtogeek.com/howto/windows-vista/using-symlinks-in-windows-vista/

GreenCat
8/9/2009

Hard links and directories

Hard links cannot be made to directories.

mbudiu
9/11/2008

Junction and reparse point tools

Junction.exe from Microsoft Technet / SysInternals: http://www.microsoft.com/technet/sysinternals/FileAndDisk/Junction.mspx

Linkd.exe, Mountvol.exe, and Delrp.exe from Microsoft Support: http://support.microsoft.com/kb/205524

neopath_seitz
8/27/2008

Hard link tools

"fsutil hardlink": http://technet.microsoft.com/en-us/library/cc788097.aspx

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