Links

* Links are used to refer single file by multiple names.
* They are used to make file more accessible , to give commands multiple names, to enable programs that look for the same files in different locations to access the same file
* Links in Linux have similar purpose as shortcuts in windows
* **How to create Link in Linux?**
* ln (we can create using ln command)

* **Two types of links exist in Linux**

1. Hard Links -: point to data on the hard disk and share the same inode number
2. Soft (symbolic) Links -: Special types of files that point to data on other hard drive. Unlike hard links, they don’t share the same inode number.

Hard Links (Can be created on only same partition

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* A hard links in Linux is duplicate directory entry .
* Both directories entries point to the same file (to same inode number).
* Neither entry holds any sort of priority over the other and both are equally valid.
* To delete the file , you must delete both files.
* How to create hard link?
* using ln command without any option. Need to specify file name and the name of the link.
* Ex.
* [root@yogesh7 ~]# ll

total 4554768

-rw-r--r--. 1 root root 11 Jun 23 10:19 123

-rwxrwxrwx. 2 root root 2485 Jun 20 15:50 123.link

-rwxrwxrwx. 2 root root 2485 Jun 20 15:50 anaconda-ks.cfg

-rwxrwxrwx. 1 root root 4664066048 Feb 25 15:57 CentOS-7-x86\_64-DVD-1908.iso

-rwxrwxrwx. 1 root root 2502 Jun 20 18:03 initial-setup-ks.cfg

[root@yogesh7 **~]# ln 123 111**

[root@yogesh7 ~]# ls -il

total 4554772

**18936766** -rw-r--r--. 2 root root 11 Jun 23 10:19 111

**18936766** -rw-r--r--. 2 root root 11 Jun 23 10:19 123

18936767 -rwxrwxrwx. 2 root root 2485 Jun 20 15:50 123.link

18936767 -rwxrwxrwx. 2 root root 2485 Jun 20 15:50 anaconda-ks.cfg

18494188 -rwxrwxrwx. 1 root root 4664066048 Feb 25 15:57 CentOS-7-x86\_64-DVD-1908.iso

18494186 -rwxrwxrwx. 1 root root 2502 Jun 20 18:03 initial-setup-ks.cfg

In above example we have created a hard link call as 111 to the 123 file, inode number’s of both files are same.

* Now we will change the content of the file and display the content using different (linked ) file name.

[root@yogesh7 ~]# echo Its new > 123

[root@yogesh7 ~]# cat 111

Its new

Content has been changes because entry point to the same file, both file name can be used to access the same content

* To delete the files , you must delete both directory entries

[root@yogesh7 ~]# rm 123

rm: remove regular file ‘123’? y

[root@yogesh7 ~]# ls -il

total 4554764

18936766 -rw-r--r--. 1 root root 8 Jun 23 10:22 111

18936767 -rwxrwxrwx. 1 root root 2485 Jun 20 15:50 anaconda-ks.cfg

18494188 -rwxrwxrwx. 1 root root 4664066048 Feb 25 15:57 CentOS-7-x86\_64-DVD-1908.iso

18494186 -rwxrwxrwx. 1 root root 2502 Jun 20 18:03 initial-setup-ks.cfg

[root@yogesh7 ~]# rm 111

rm: remove regular file ‘111’? y

In above example you can see that although we have deleted original file, the linked file still exists and its not useless.

Symbolic (soft) Links

* A symbolic link in Linux is special type of file that points to other files, instead of pointing to data on the hard drive.
* Unlike Hard links symbolic link don’t share the same inode number
* A symbolic link is second file that exists independently of its target
* Symbolic link is more common than hard link
* **Biggest advantage of is that they can work over different partitions.**
* **How to create symbolic link?**
* **Use -s option with ln ( ln -s )**

[root@yogesh7 ~]# **ln -s link softlink**

[root@yogesh7 ~]# ls -il

total 4554764

18936767 -rwxrwxrwx. 1 root root 2485 Jun 20 15:50 anaconda-ks.cfg

18494188 -rwxrwxrwx. 1 root root 4664066048 Feb 25 15:57 CentOS-7-x86\_64-DVD-1908.iso

18494186 -rwxrwxrwx. 1 root root 2502 Jun 20 18:03 initial-setup-ks.cfg

**18936766** -rw-r--r--. 1 root root 18 Jun 23 11:02 link

**18494199** lrwxrwxrwx. 1 root root 4 Jun 23 11:03 **softlink -> link**

* In above example you can show there is no same inode number.
* Now will change content of the file

[root@yogesh7 ~]# echo soft link is more common>link

[root@yogesh7 ~]# cat softlink

soft link is more common

* Content is updated in linked file
* Now we delete the original file

[root@yogesh7 ~]# rm link

rm: remove regular file ‘link’? y

[root@yogesh7 ~]# ls -il

total 4554760

18936767 -rwxrwxrwx. 1 root root 2485 Jun 20 15:50 anaconda-ks.cfg

18494188 -rwxrwxrwx. 1 root root 4664066048 Feb 25 15:57 CentOS-7-x86\_64-DVD-1908.iso

18494186 -rwxrwxrwx. 1 root root 2502 Jun 20 18:03 initial-setup-ks.cfg

18494199 lrwxrwxrwx. 1 root root 4 Jun 23 11:03 softlink -> link

[root@yogesh7 ~]# **cat softlink**

cat: softlink: **No such file or directory**

* **Linked file becomes useless**

Difference between Hard link and soft(symbolic link)

|  |  |
| --- | --- |
| Hard Link | Soft Link |
| Created using ln command | **Created using ln -s command** |
| Inode number for both files are same | **Inode number for both files are different** |
| Linked file is still existing after deleted original file and its become useful | **Linked file is still existing after deleted original file and it’s become useless** |
| Less common than symbolic link | **More common than hard link** |
| Point to data on same hard disk | **Point to data on other file on other drive** |