# 2.10.3 Link Facts

The Linux file system supports a special file type called a link file. Link files don't actually contain any content. Instead, they are redirectors that point you to a different file or directory in the file system.

This lesson covers the following topics:

- Link file types
- Create links

## Link File Types

Links are files that point to another file. Linux uses two types of links:

| Type | Description |
|---|---|
| Hard link | A hard link is a duplicate entry in the file system that points to a specific piece of data on the disk drive. With a hard link:<br>▪ Duplicate file inodes are used. The inode specifies where a file's data physically exists on a disk. With a hard link, the link file and the original file both share the same inode.<br>The **ls -i** command displays the inodes for the files and directories in a directory.<br>▪ The data stored in the link file is exactly the same as the data in the original file.<br>▪ The data is preserved within the link file, even if the original file is deleted.<br>▪ In the output from the **ls -a** command, a hyphen is used as the first character in the permission string, which is the same character used for normal files (for exmaple, -rwxr-xr-x). |
| Symbolic link | A symbolic link (also known as a soft link) is a file that points to another file in the file system. A symbolic link is similar to shortcuts in the Windows OS. With a symbolic link:<br>▪ Separate inodes are used. The link file has an inode that is distinct from the inode of the file being pointed to.<br>▪ In the output from the **ls -a** command:<br>  ▪ A lower-case L (l) is used as the first character in the permission string (for example, lrwxrwxrwx indicates a symbolic link).<br>  ▪ The -> character sequence follows the file name, which is followed by the file that the link point to. |

## Create Links

The following commands are used to create hard links and symbolic links:

| Command | Function | Examples |
|---|---|---|
| **ln** ***[source] [link_name]*** | Creates links.<br>▪ **ln -s** creates a symbolic link to a file.<br>▪ **ln** (with no options) creates a hard link between files. | ▪ **ln /home/jsmith/project1 /home/edunford/project1** creates a hard link to /home/jsmith/project1 in /home/edunford/.<br>▪ **ln -s /home/jsmith/project1 /home/edunford/project1_ln** creates a symbolic link named /home/edunford/project1_ln that points to /home/jsmith/project1.<br>▪ **ln -s /home/jsmith/project1 /home/edunford/project1_ln** creates a symbolic link named /home/edunford/project1_ln that points to /home/jsmith/project1. |
| **cp** ***[source] [link_name]*** | Copies files and creates links.<br>▪ **cp -l** creates hard links rather than copying the files.<br>▪ **cp -s** creates symbolic links rather than copying the files. | ▪ **cp -l /home/jed/fil1 /home/esam/proj1** creates an exact copy of /home/jed/fil1 in /home/esam/.<br>▪ **cp -s /home/mkon/text /home/ytew/text_ln** creates a symbolic link named /home/ytew/text_ln that points to /home/mkon/text. |
| **unlink** ***[link_name]*** | Removes both symbolic links and hard links. | ▪ **unlink project1_ln** removes the project1_ln link that point to /home/jsmith/project1. |