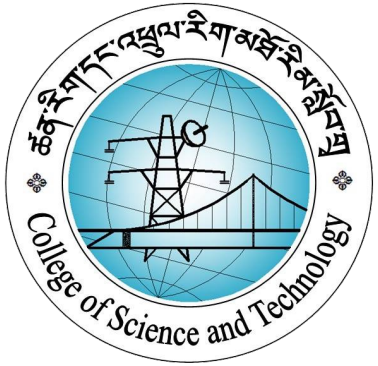


Royal University of Bhutan

LESSON – 7

WORKING WITH FILES AND DIRECTORIES

Learning Outcomes

- Differentiate between absolute and relative path in the BASH Shell.
- Use command with different options to list files and directory
- Identify types of file
- Create link files

MANAGING FILES

- When working in a Linux system, navigating through files and directories is a common task. To access a file or directory, you need to specify its path.

  - Absolute Filename/Pathname -> Complete path reference to the file or directory you want to work with.
    - Always start with root directory (/). Eg.: **/home/cst/**

  - Relative filename -> relative to the current directory.
    - Eg.: **documents/example.txt**

MANAGING FILES

- Listing files and Directories:
  - **Command**: ls
  - **Option**: -1, –l , -a, -d, -t, -r, -R

- Example Explanation:
  - $ls -> (List all files in a present working directory)
  - ls –a -> (List all files including hidden files)
  - ls –l -> (List all files with permission
  - ls –1 -> (Single column listing)
  - ls –t -> (List files in order of last modified time)
  - ls –r -> (Reverses the listing)

MANAGING FILES

- **Copy, move and delete files**:
  - Copy (cp) -> cp Source Destination
  - Move (mv) -> mv Source Destination
  - Delete (rm) -> rm Filename
    - Remove Directory Recursively **rm –r**
    - Be cautious to use **rm -f**

MANAGING FILES

- **File Types**:
  - Normal/Regular file
  - Directory file
  - Special file: block devices (hard disk), character devices (modem), Named pipes
  - Link file
    - Hard link
    - SoftLink

FILE TYPES

- Special Files
  - Block device
    - cst@cst:~$ ls -l /dev/sda
    - brw-rw---- 1 root disk 8, 0 Sep 16 13:40 /dev/sda
  - Character devices(modem)-access devices through the file system
    - cst@cst:~$ ls -l /dev/ttyS0
    - crw-rw---- 1 root dialout 4, 64 Sep 16 13:40 /dev/ttyS0
  - Named pipes – allows for inter-process communication

    mknod: is used to create a named pipe file.
    - cst@cst:~$ls –l mypipefile
    - prw-rw---- 1 root root 0 Mar 7 14:45 mypipefile

LINK FILES

- **Link:**
  - are file system objects that provide a way to establish connections between files or directories.
  - allow multiple names to refer to the same file or directory, creating alternate access points.
- **Inode**:
  - Each file or directory has an inode number that uniquely identifies it.
  - also contains info about the owner, the rights, the file size and modification time of the file it points to.
  - **Syntax: ls -i**

LINK FILES

- **How to create hard link:**
- **Syntax:**

  $ln OriginalFile HardLinkFile

  $ln File1 File1_hardlink

- Hard link share the same inode. Check with the following command.
- You cannot create hard links to directories

  - $ls –li File* [Long listing of all files with “File” & inode number]

- If original file is removed, the file will obtain from another linked file

LINK FILES

- **Symbolic Links:**
- **Syntax:**

  $ln –s OriginalFile ShortcutFile

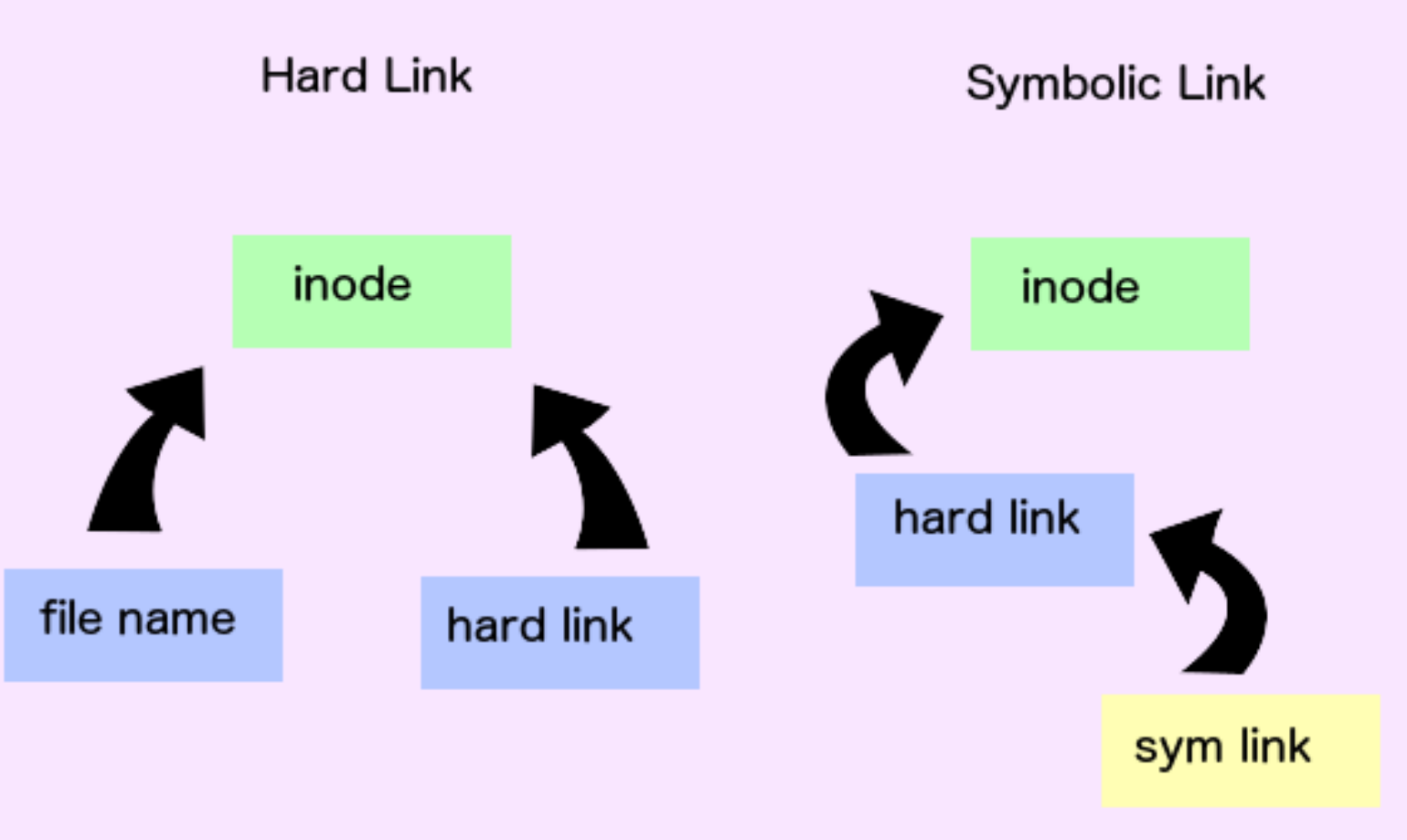
  $ln –s File1 File1_shortcut

- Soft link has different inode number. Check with the following command.
- A symbolic link does not link directly to inode but to the name of the file

  - $ls –li File* [Long listing of all files with “File” & inode number]

- If original file is removed, the file become useless.

LINKS AND INODES



ACTIVITY I

1. Open a shell as a regular user
2. From your home directory, create a regular file **my-first-link-file.txt** and add a little content to it.
3. Now create a symbolic link of **my-first-link-file.txt** to it as **my-first-soft-link-file.txt**
4. Is soft link created? How did you check it?
5. Type **ls –li**. What did you see on the screen? Check the inode number as well.
6. Create a hard link to **my-first-link-file.txt** file as **my-first-hard-linkfile.txt**.
7. Type **ls –li** and notice the link counters are set to 2. Check the inode number as well.
8. Now delete the file **my-first-link-file.txt.**
9. Try accessing the file **my-first-hard-linkfile.txt** and **my-first-soft-link-file.txt**. What do you notice?