File System

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1 Some Basic Commands

List of basic commands shown in the lecture

- passwd - change password
- ls - list files
- more - show content of file, page by page
- logout - logout from system
- date - display date and time
- who - display who is on the screen
- clear - clears the terminal
- man - find and display system manual pages

2 RTFM - The man Command

2.1 Overview

shows pages from system manual

Syntax: man [option] [-S section] command-name

- $ man date
- $ man - k date
- $ man crontab
- $ man -S 5 crontab

Caveates:

Some commands are aliases
Some commands are part of shell

2.2 Section info

1. User commands
2. System calls
3. C libray function
4. Special system files
5. File formats
6. Games
7. Misc. features
8. System admin utilities

3 The Unix file system

The UNIX file system has a hierarchical organinzation of files and it is organized as a single tree.

Note:-

The typical Unix file system type is ext4

It also supports FAT, NTFS, UDF, ...

3.1 Directory terminology

- Root Directory: /
  top-most directory in any UNIX file structure
- Home Directory: ~
  directory owned by a user
  default location where user logs in
- Current Directory: .
  default location for working with files
- Parent Directory: ..
  directory immediately above the current directory

4 Paths

a path is simply a list of names seperated by "/". There are two types of paths to refer to a file or directory.

- ***Absolute Path***
  Traces a path from root to a file or a directory
  Always begins with the root (/) directory
  Example: /home/student/Desktop/assign1.txt
- ***Relative Path***
  Traces a path from the current directory
  No initial forward slash (/)
  dot (.) refers to current directory
  two dots (..) refers to one level up in directory hierarchy
  Example: Desktop/assign1.txt

5 Linking Files

Allows one file to be known by a different name
Link is a reference to another file stored elsewhere

There are 2 types of links, we have

- Hard link (default)
- Symbolic link (a.k.a "soft link")

Syntax: ln [-s] target local

5.1 Symbolic Link

- Refers to target file via path
- Created without checking the existence or permissions of target file
- Can be circular linked to another symbolic link
- Can cross physical file systems

5.2 Hard Link

- Refers to target file by its inode number
  inode number of a file is unique only
  within physical device file system
- Checks for the existence of target file
- Other file continues to exist as long as at least one directory contains it
- Cannot link to a file in a different physical file system

6 Locating Files: find

Syntax: find path-list expression(s)

"find" recursively descends through directories in path-list and applies expression to every file

Examples:

- find . -name "*.txt"
- find /tmp -empty -delete