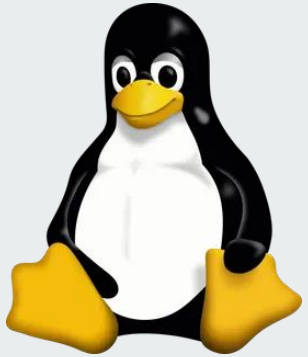
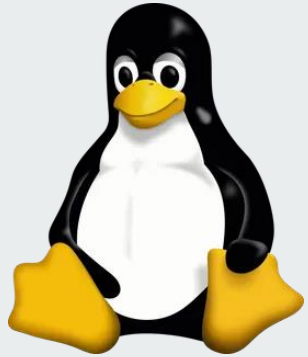
Introduction to Linux

Day 2/10



Prepared by:
Gaurav Pokhrel
Rohan Raj Poudel

Agenda



- Installation of Linux - Ubuntu
- Familiarization with GNOME
- Terminal and Shell
- Basic commands – Part 1
- ManPages in Linux

Jan, 2024

Gaurav P. | Rohan Raj P.

2.1 Installation

Disable Secure Boot

Enable Virtualization

Install Oracle VM VirtualBox

Install Ubuntu in your Virtual environment

SubTopic – Kernel Space vs User Space

Privileged vs Less-Privileged mode: Unrestricted Access vs Restricted Access

System Critical Operations vs User Applications

Direct Access To Hardware vs Interaction with Kernal using SystemCall

2.2 GNU and Open Source Licensing

- GNU (GNU's not UNIX): Project (1983) that aimed to create UNIX like OS
- Promotes the idea of Open source project / free software.
- GNU's license: General-Public-License(GPL), widely used open source license
- GNU lacked kernel (initially)
- Linux developed in 1991, combined with GNU to create complete OS – GNU/Linux system
- GNOME (defaults for most Linux distros) made for desktop environment on 1997

2.2 GUI

- Linux GUI refers to the graphical user interface provided by the desktop environment running on top of the Linux kernel.
- Various desktop environments are available for Linux including GNOME, KDE, Cinnamon, etc.
- GUI typically includes a graphical shell, window manager, file manager, system settings, and other graphical elements to provide a user-friendly interface.
- GUI allows users to interact with the operating system, launch applications, manage files, customize settings, and perform other tasks using a mouse or touchpad.

2.2 GNOME

Popular Desktop Environment

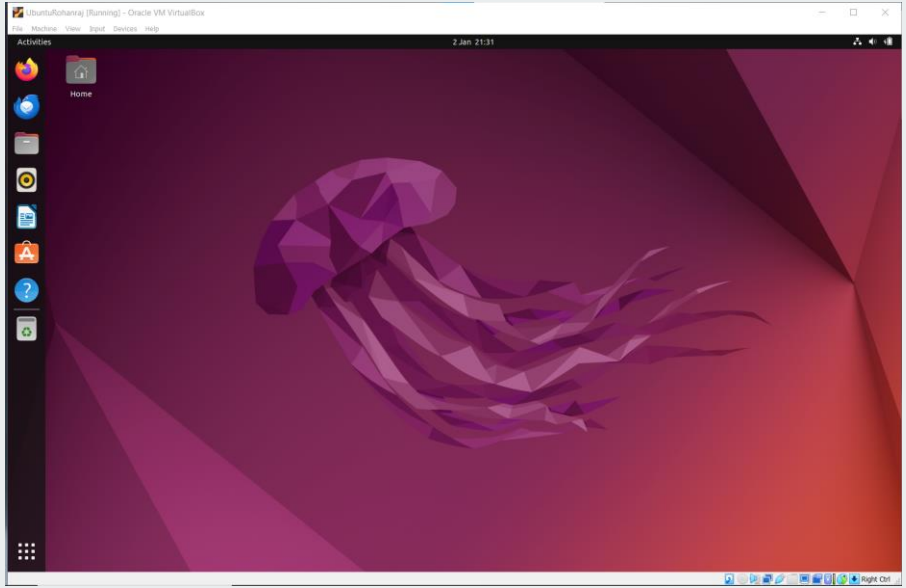
Clean, Simple and Easy to use

Extensions and theming options available

Provides a complete desktop experience

System-Menu, App-Launcher, Notification-Area

2.2 GNOME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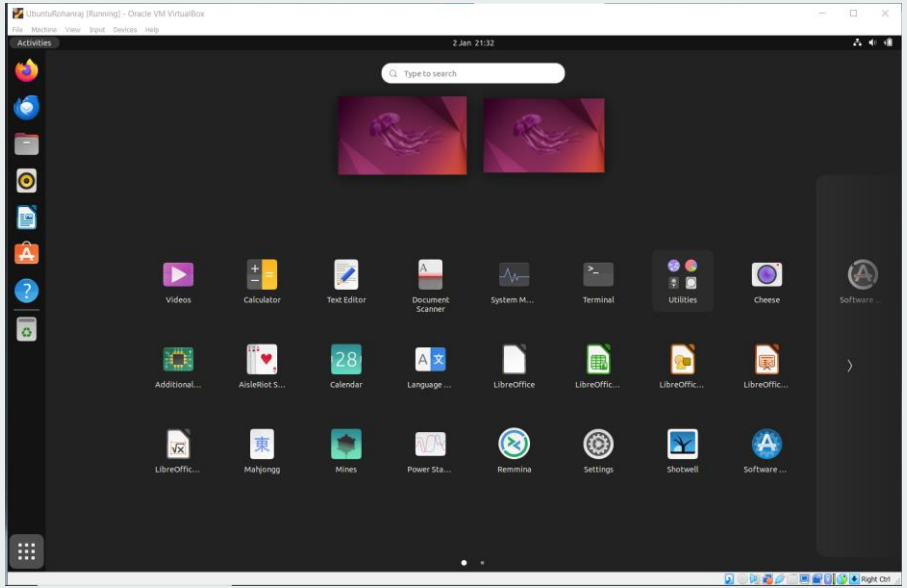
Home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Text Editor
Document Scanner
System M...
Terminal
Utilities
Cheese
Software ...
Additional...
AisleRiot S...
Calendar
Language ...
LibreOffice
LibreOffic...
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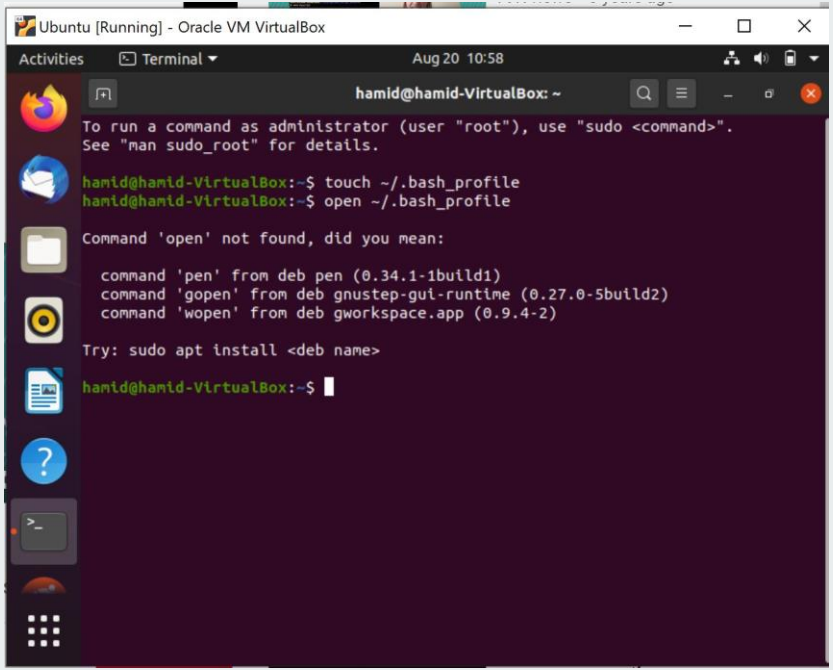
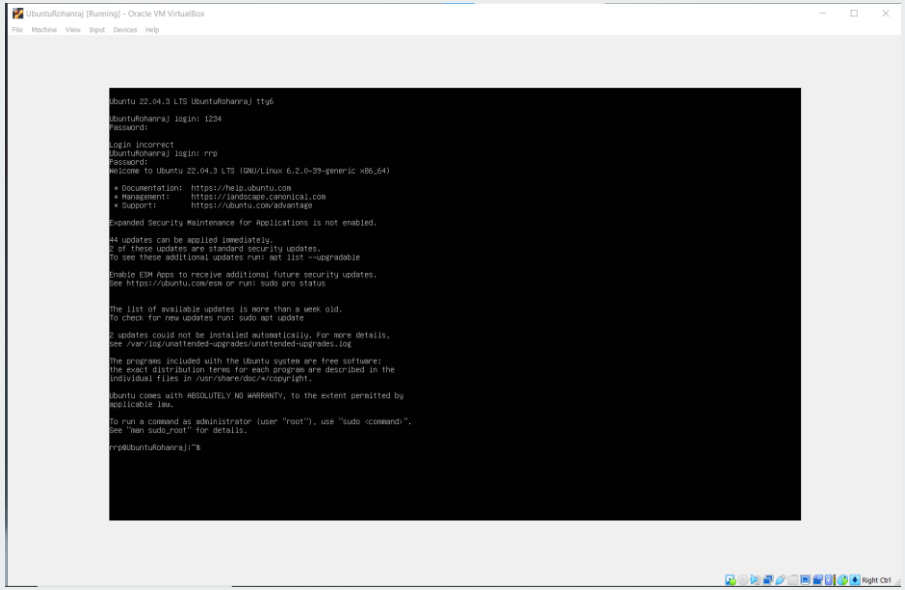
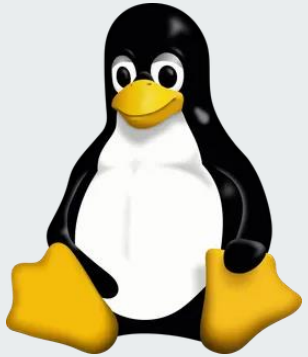
Mahjongg
Mines
Power Sta...
Remmina
Settings
Shotwell
Software ...

2.3 Terminal and Shell



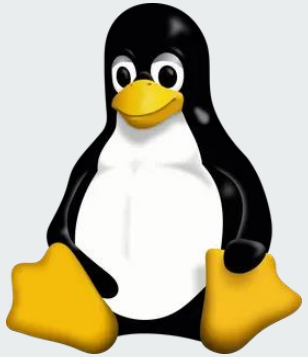


Basic Linux Commands



1. ls
2. cd
3. pwd
4. mkdir
5. rmdir
6. cp
7. rm
8. touch
9. mv

Basic Linux Commands



1. **ls**

   Command: ls

   Purpose: Lists files and directories in the current directory.

   Eg: ls , ls -l, ls -a, ls - - almost-all, ls -l *.pdf

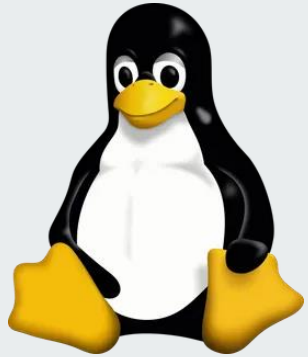
1. **cd**

   Command: cd

   Purpose: Changes the current working directory.

   Eg: (cd ..), (cd./Pictures/), (cd../Pictures/)

Basic Linux Commands



3. **pwd**

   Command: pwd

   Purpose: Displays the current working directory.

   Eg: pwd

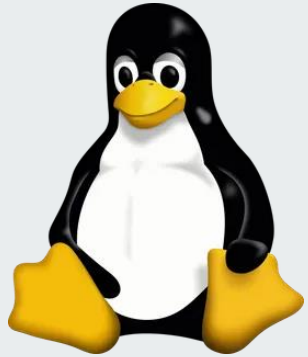
4. **mkdir**

   Command: mkdir

   Purpose: Creates a new directory.

   Eg: mkdir folder_name

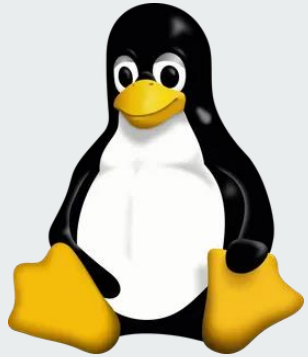
Basic Linux Commands



5. **rmdir**
   Command: rmdir
   Purpose: Removes an empty directory.
   Example: rmdir Empty_folder_name

6. **cp**
   Command: cp
   Purpose: Copies files or directories.
   Example: cp file.txt /home/destination

Basic Linux Commands



7. **rm**

   Command: rm

   Purpose: Removes files or directories

   Example: rm file_name , rm * , rm -r dir_name

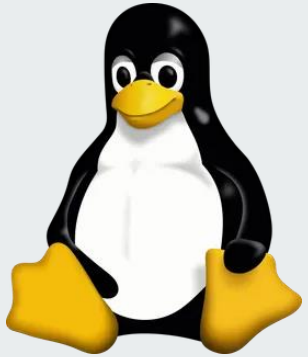
8. **touch**

   Command: touch

   Purpose: Create file/ files.

   Example: touch file or touch file1 file2....

Basic Linux Commands



9 mv

Command: mv

Purpose: move or rename files

Example: mv oldname newname , mv source destination

File Permissions

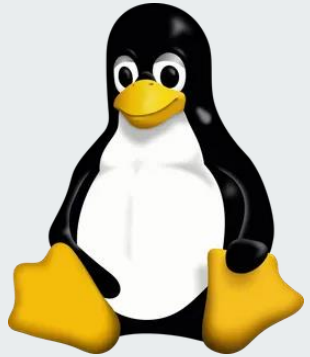
Permission Characters:

- Each set of three characters consists of r (read), w (write), and x (execute) permissions.
- If the permission is granted, the corresponding character is present; if not, a "-" is used.

File Type and Permissions:

- The first character indicates the file type. Common types include - for a regular file, d for a directory, and l for a symbolic link.
- The next nine characters represent the file permissions. They are divided into three sets of three:
    - The first set represents the owner's (user's) permissions.
    - The second set represents the group's permissions.
    - The third set represents others' (everyone else's) permissions.

File Permissions

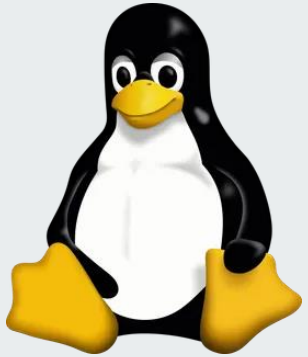


Concept of Owner , group and world:

Owner:

- The owner of a file or directory is the user who created or owns it.
- The owner has the most control over the file, with the ability to read, write, and execute it.
- The owner can also change the file's permissions, change its owner, and modify its group.

File Permissions



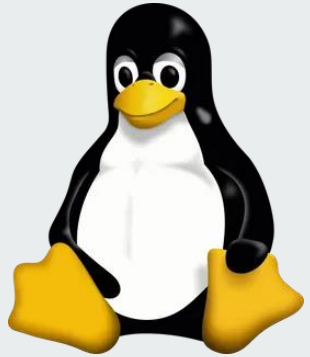
Concept of Owner , group and world:

Group:

- A file or directory can be assigned a group, and members of that group are granted certain permissions based on the group settings.
- Every user in Linux belongs to one or more groups.

Create group : sudo groupadd group_name
Add user to group: sudo usermod -aG group_name username
Check which groups a user belongs to : groups username

File Permissions



Concept of Owner , group and world:

World(others):

- In Linux, the term "world" is often used in the context of file permissions to refer to everyone else who is not the owner of a file or a member of the group associated with that file.
- The "world" permissions are the permissions that apply to all users who are not the owner or part of the group.

2.5 ManPages in Linux (Manuals)

- Manual pages provide documentation and information about various commands, utilities, system calls, libraries, and other aspects of the operating system and software.

- man [command_name] eg. man ls

- Key navigation commands within the "man" pager include:
  Arrow Keys or "j" and "k": Scroll up and down.
  "q": Quit the manpager and return to the command prompt.
  "/": Search for a specific term. Enter the term and press "Enter" to search forward. Press "n" to go to the next occurrence.

- Use the "apropos" command to search for manpages related to a specific keyword.
  eg. apropos copy

Conclusion

- Mastering these commands is fundamental for Linux navigation and file manipulation.
- Understanding the file and directory structure is crucial for effective system administration.
- Practice using these commands to build confidence and efficiency.