



WALCHAND LINUX USERS' GROUP

PRESENTS CLUB SERVICE ON



LINUX AND BEYOND

OPEN
SOURCE

INTRODUCTION
TO LINUX

SHELL AND
TERMINAL

BASIC
COMMANDS

6PM

29TH NOV

CLASSROOM 19



TABLE OF CONTENTS

- Open Source and Linux basics
- Distros and Desktop Environments
- Virtual Machine Fundamentals
- Starting with CLI
- Hands-on Lab

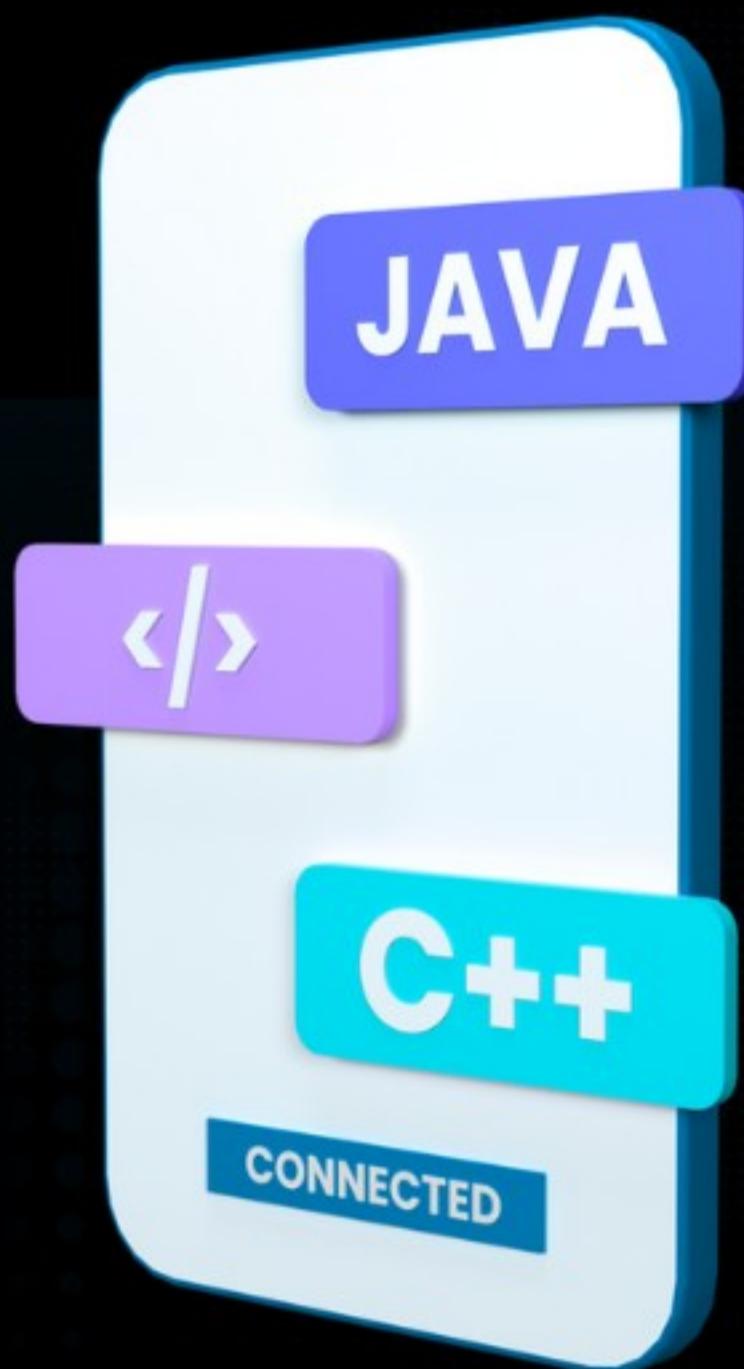


WHAT IS OPEN SOURCE SOFTWARE?



WHAT IS SOURCE CODE ?

- Set of instructions understandable only by machine
- Tells the computer what tasks to perform
- Later compiled or interpreted into machine code



OPEN SOURCE SOFTWARE

- The source code is available to the public
- Anyone can view, use, modify and distribute its source code
- It is often developed collaboratively by a community





OPEN SOURCE SOFTWARE



OPEN SOURCE SOFTWARE



Blender



VLC Media Player



Firefox



VS Code



Git

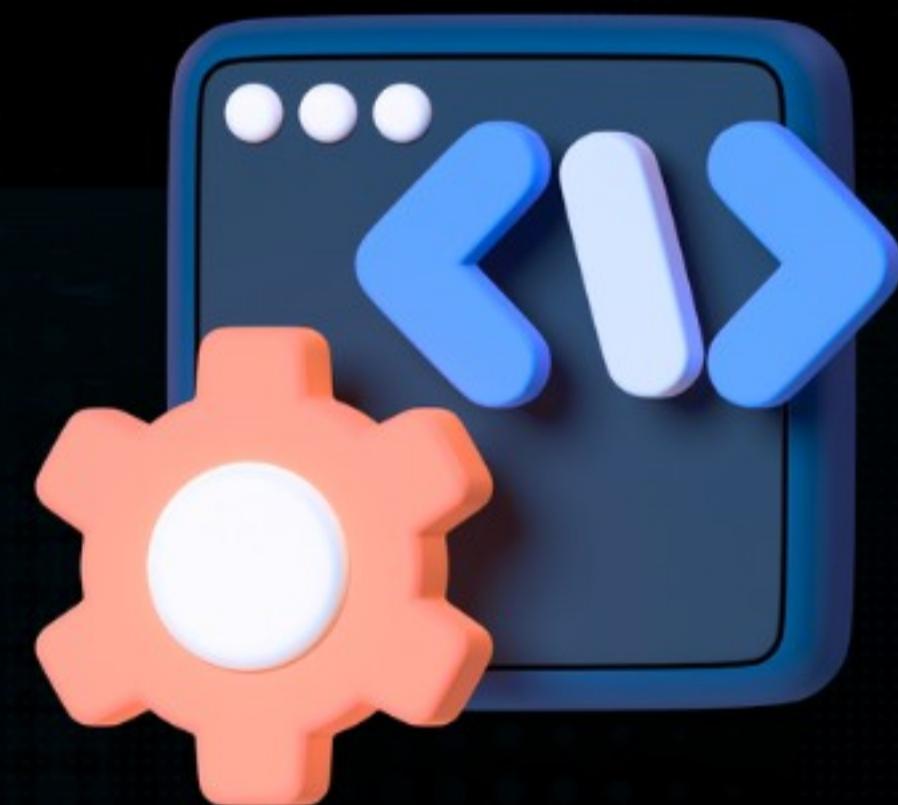
ADVANTAGES OF OSS

- Free
- Customizable
- Secure
- Community Support
- Encourages innovation and collaboration



CLOSED SOURCE SOFTWARE

- The source code is not publicly available
- Paid/Subscription Based
- Organization manages the software



DRAWBACKS

- Lack of flexibility
- Less Customizable
- Costly
- Lack of Transparency
- Restricted Usage Rights



OPEN SOURCE vs CLOSED SOURCE

Source code is publicly available

Source code is not available

More Flexible

Less Flexible

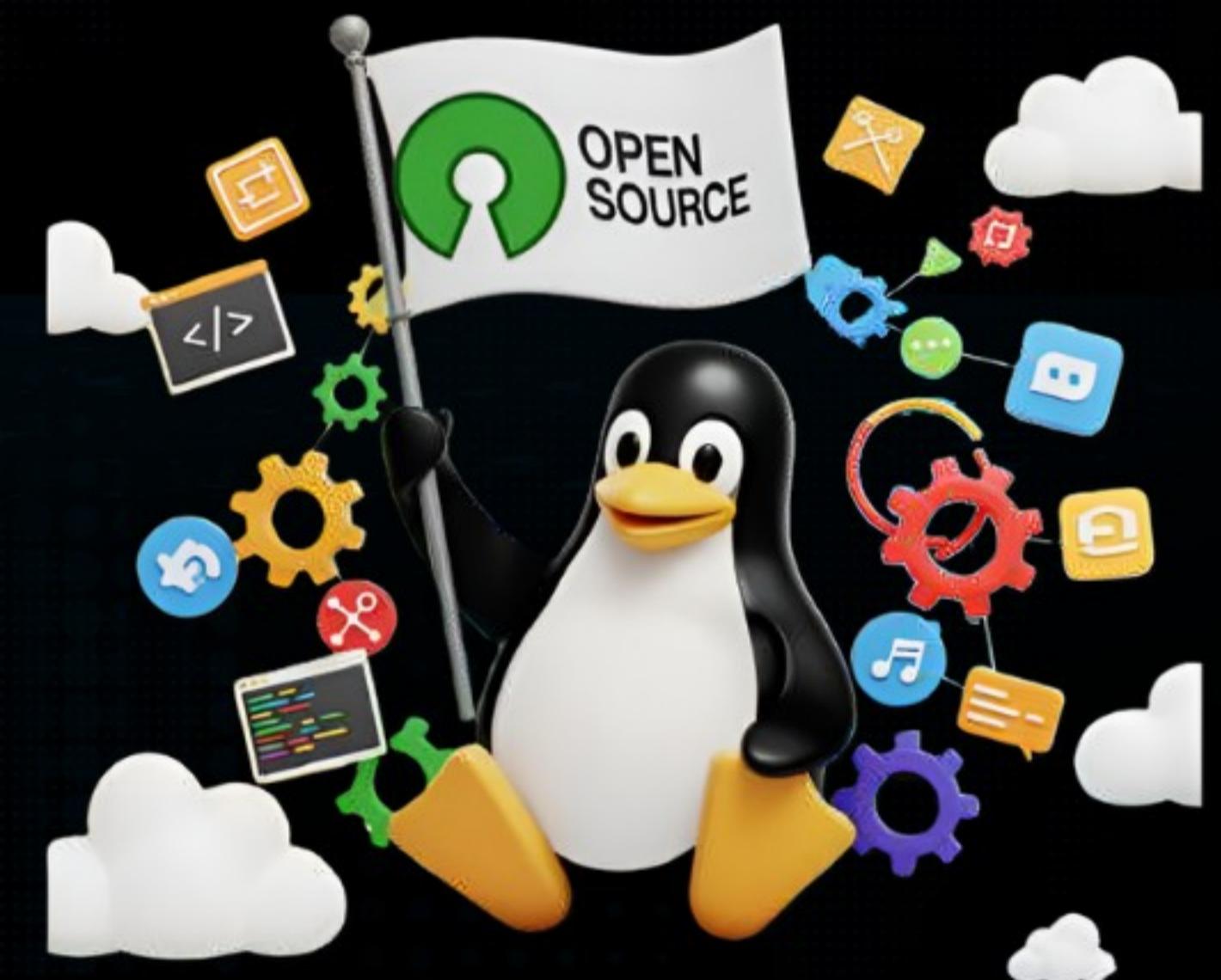
Managed by Community

Managed by Organization



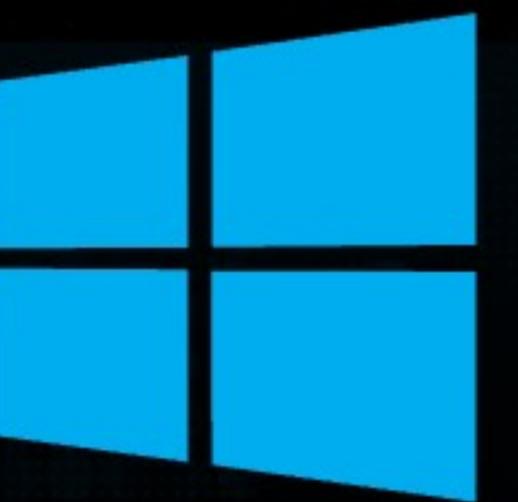
HOW TO CONTRIBUTE

- Start Small
- Collaborate and Communicate



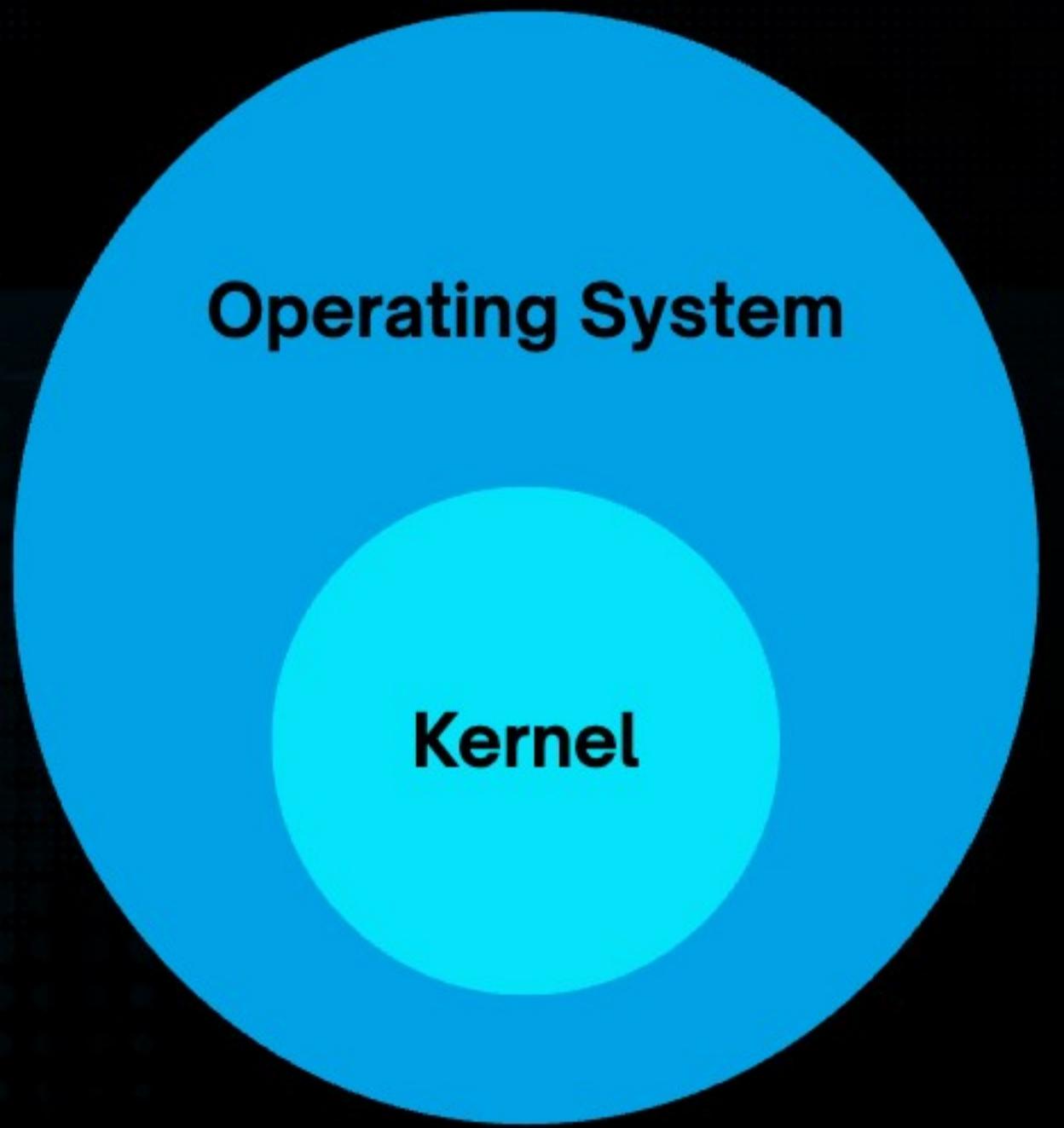
OPERATING SYSTEM

- System Software that enables users to interact with the hardware
- Manages the overall resources and operations of the computer
- Interface between User and Hardware



KERNEL

- Core part of an Operating System
- Handles tasks like managing processes, accessing files, etc.
- Interface between Software and Hardware



The diagram illustrates the relationship between the Kernel and the Operating System. It consists of two concentric circles. The outer circle is light blue and labeled "Operating System". The inner circle is dark blue and labeled "Kernel". This visual representation emphasizes that the Kernel is the central component within the broader context of the Operating System.

Operating System

Kernel

WHAT IS LINUX?



**Linux is
the best OS**

**Linux is not
an OS, it's a
kernel**



fb.me/yuva.krishna.memes

DO YOU KNOW WHO IS HE ?



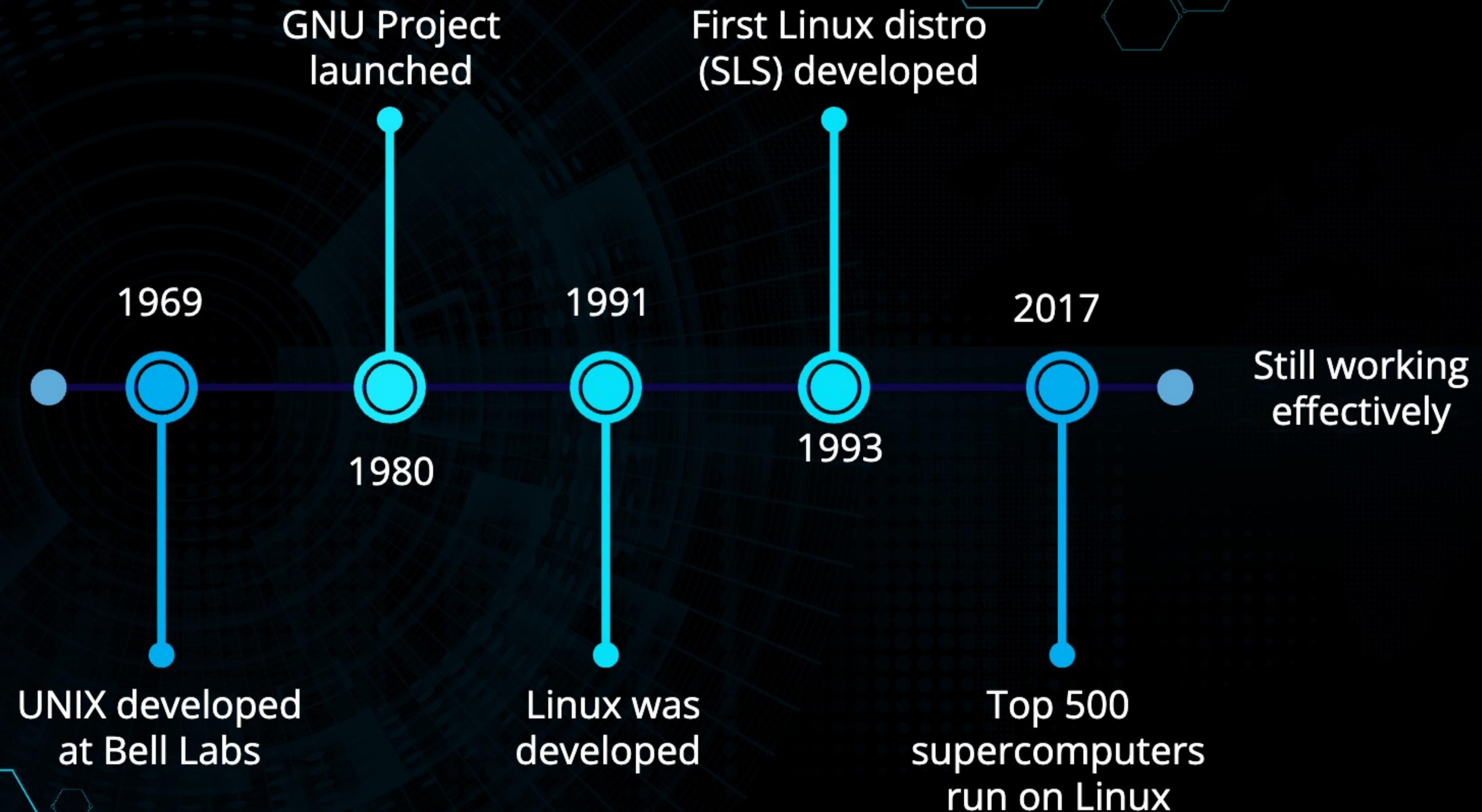
LINUX

- Free and Open Source Kernel
- Created by Linus Torvalds in 1991
- Highly Customizable and Secure
- Widely adopted in industry and everyday use



HISTORY OF LINUX





PACKAGE

- Contains all the essential files needed to install and run software
- Includes executables, libraries, dependencies needed for efficient execution of our program



PACKAGE MANAGER

- Automates the process of installing, upgrading and removing the packages
- Package Manager keeps track of the files in the packages



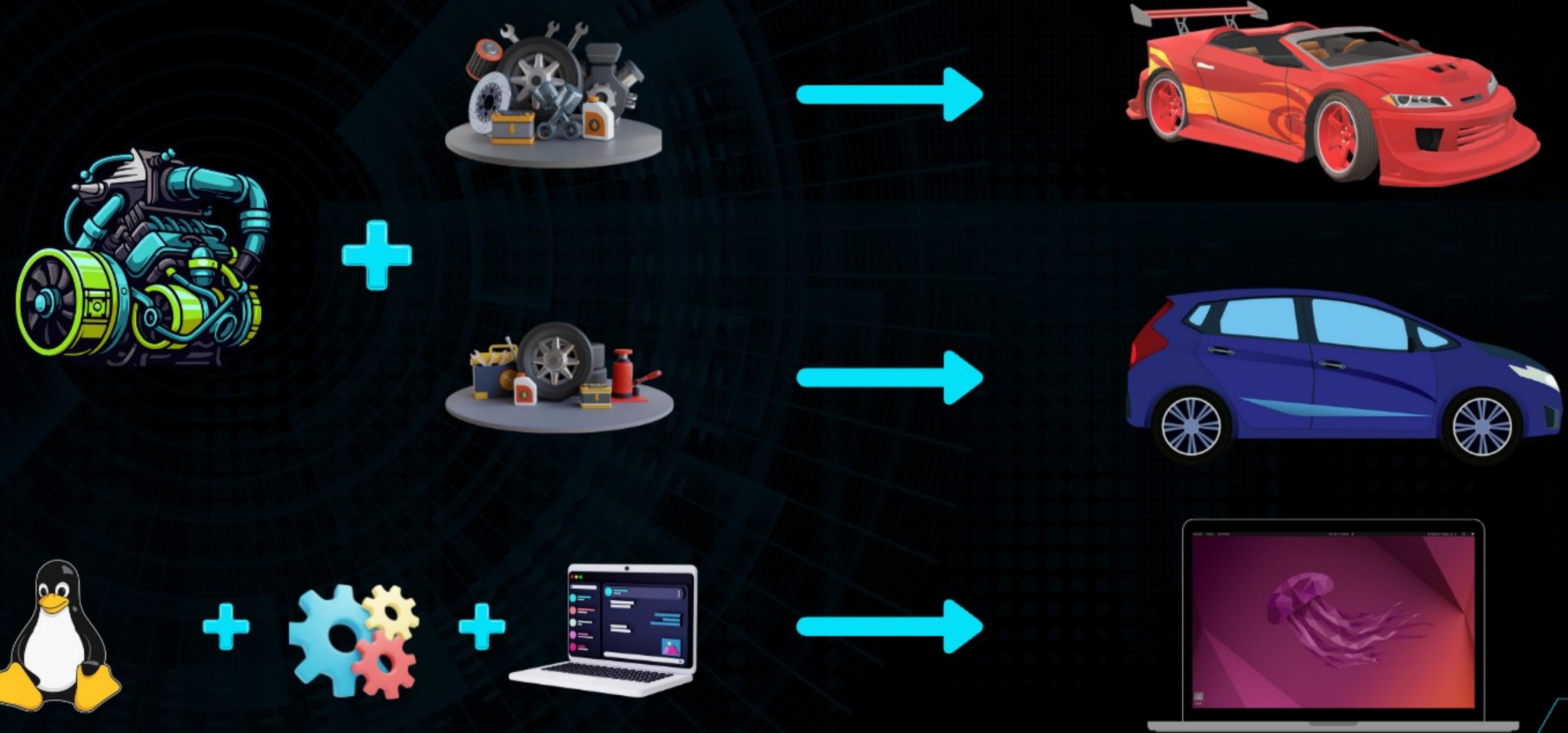
LINUX DISTRIBUTIONS



LINUX DISTRIBUTIONS



MODELS OF LINUX





LINUX FAMILIES



DEBIAN FAMILY

- Based on Debian Linux
- Easy to use and stable
- Popular among beginners and desktop users
- Examples: Ubuntu, Linux Mint



ARCH FAMILY

- Known for its vast repository - AUR
- Designed for advanced users
- User can build their system from scratch
- Examples: Garuda, EndeavourOS



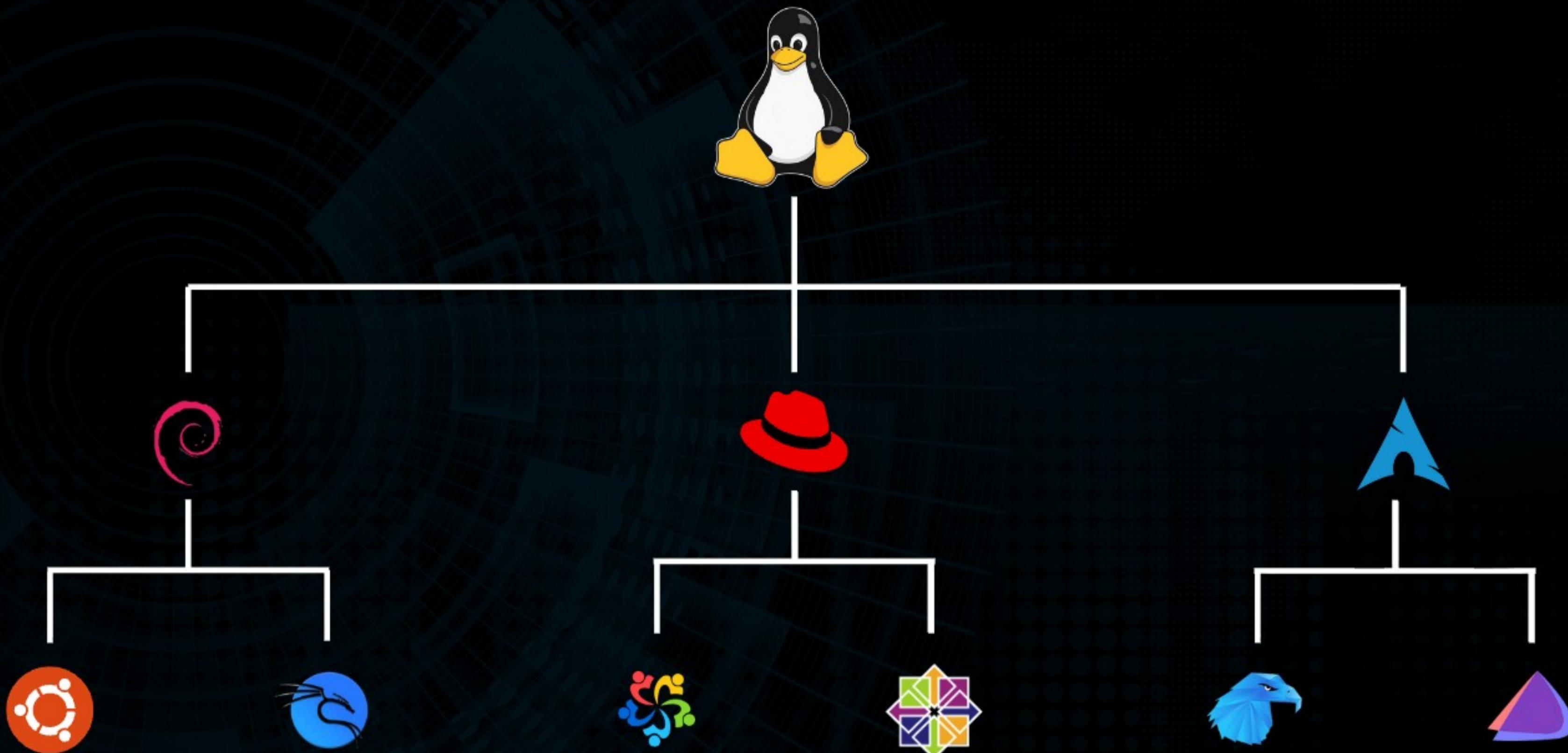


RED HAT FAMILY

- Designed for companies and enterprises
- Used in servers
- Focuses on security and performance
- Examples: Fedora, CentOS



FAMILY TREE





UBUNTU

UBUNTU

- Based: Debian
- User Friendly interface and stable
- Package Manager: APT



Applications Places Activities

Sun Jul 7 13:53:52

Overcast Clouds, 24 °C

80%

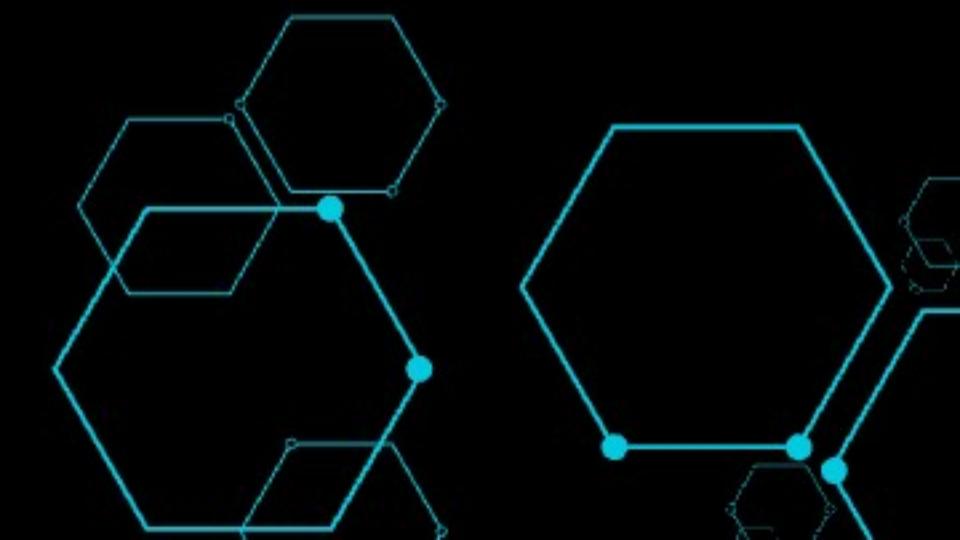


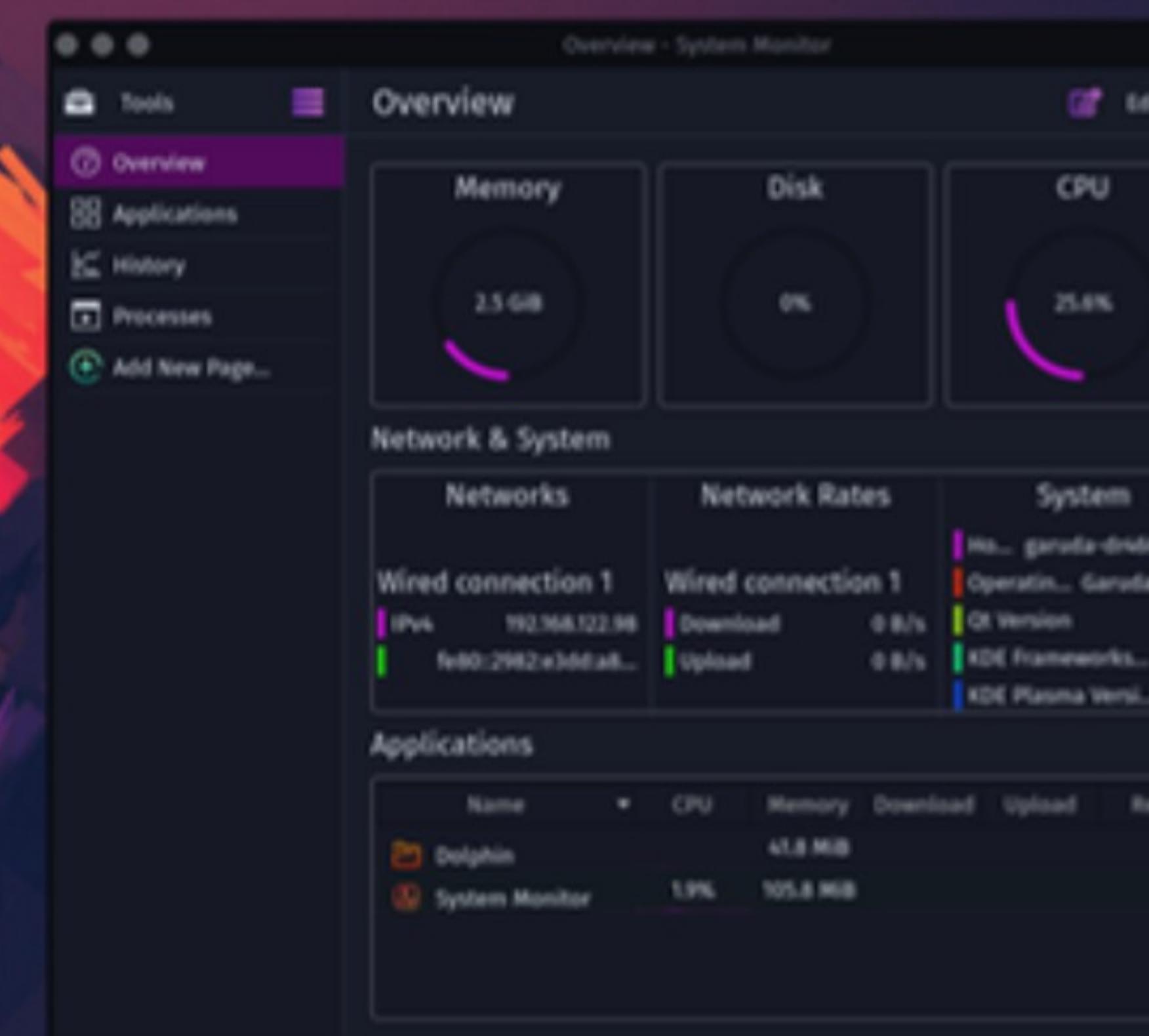
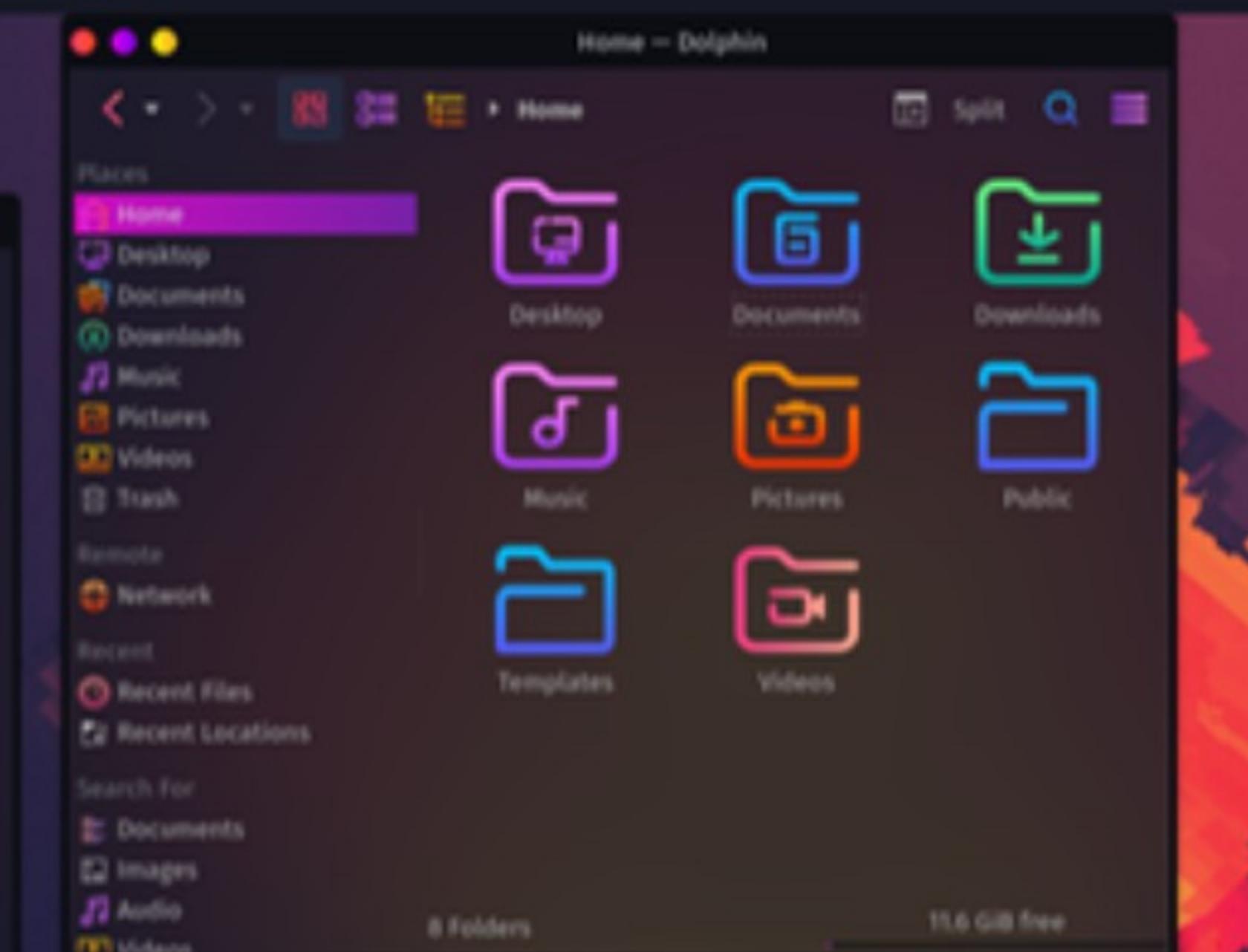
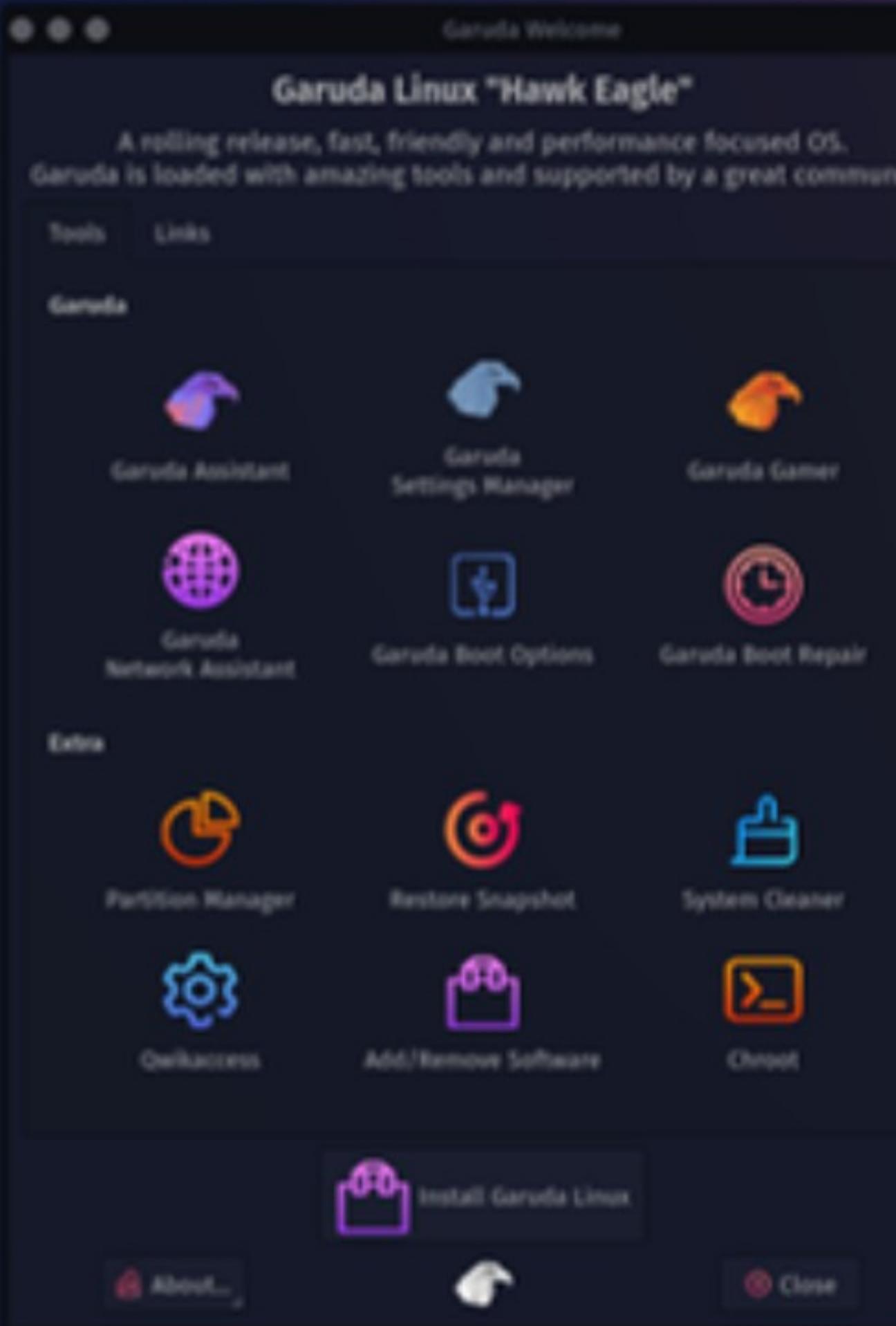
Home

GARUDA

GARUDA

- Based: Arch
- Gaming and performance-focused
- Package Manager: Pacman/Pamac







ALMA

ALMA LINUX

- Based: Red Hat Enterprise Linux
- Focuses on Enterprises and Servers
- Package Manager: DNF



```
[alukoshko@almalinux9-qa ~]$ cat /etc/os-release
NAME="AlmaLinux"
VERSION="9.0 (Emerald Puma)"
ID="almalinux"
ID_LIKE="rhel centos fedora"
VERSION_ID="9.0"
PLATFORM_ID="platform:el9"
PRETTY_NAME="AlmaLinux 9.0 (Emerald Puma)"
ANSI_COLOR="0;34"
LOGO="fedora-logo-icon"
CPE_NAME="cpe:/o:almalinux:almalinux:9::baseos"
HOME_URL="https://almalinux.org/"
DOCUMENTATION_URL="https://wiki.almalinux.org/"
BUG_REPORT_URL="https://bugs.almalinux.org/"

ALMALINUX_MANTISBT_PROJECT="AlmaLinux-9"
ALMALINUX_MANTISBT_PROJECT_VERSION="9.0"
REDHAT_SUPPORT_PRODUCT="AlmaLinux"
REDHAT_SUPPORT_PRODUCT_VERSION="9.0"
[alukoshko@almalinux9-qa ~]$ ]
```

Settings About

Network Bluetooth Background Notifications Search Multitasking

Applications Privacy Online Accounts Sharing Sound Power Displays Mouse & Touchpad Keyboard

 AlmaLinux

Device Name	almalinux9.qa >
Hardware Model	VMware, Inc. VMware7,1
Memory	3.6 GB
Processor	Intel® Core™ i7-7820HQ CPU @ 2.90GHz × 2
Graphics	SVGA3D; build: RELEASE; LLVM:
Disk Capacity	21.5 GB

OS Name	AlmaLinux 9.0 (Emerald Puma)
OS Type	64-bit
GNOME Version	40.4.0
Windowing System	Wayland

KALI

KALI

- Based: Debian
- Pre-installed Hacking tools
- Package Manager: APT



Beginner hackers after installing
Kali Linux for the first time



DESKTOP ENVIRONMENT



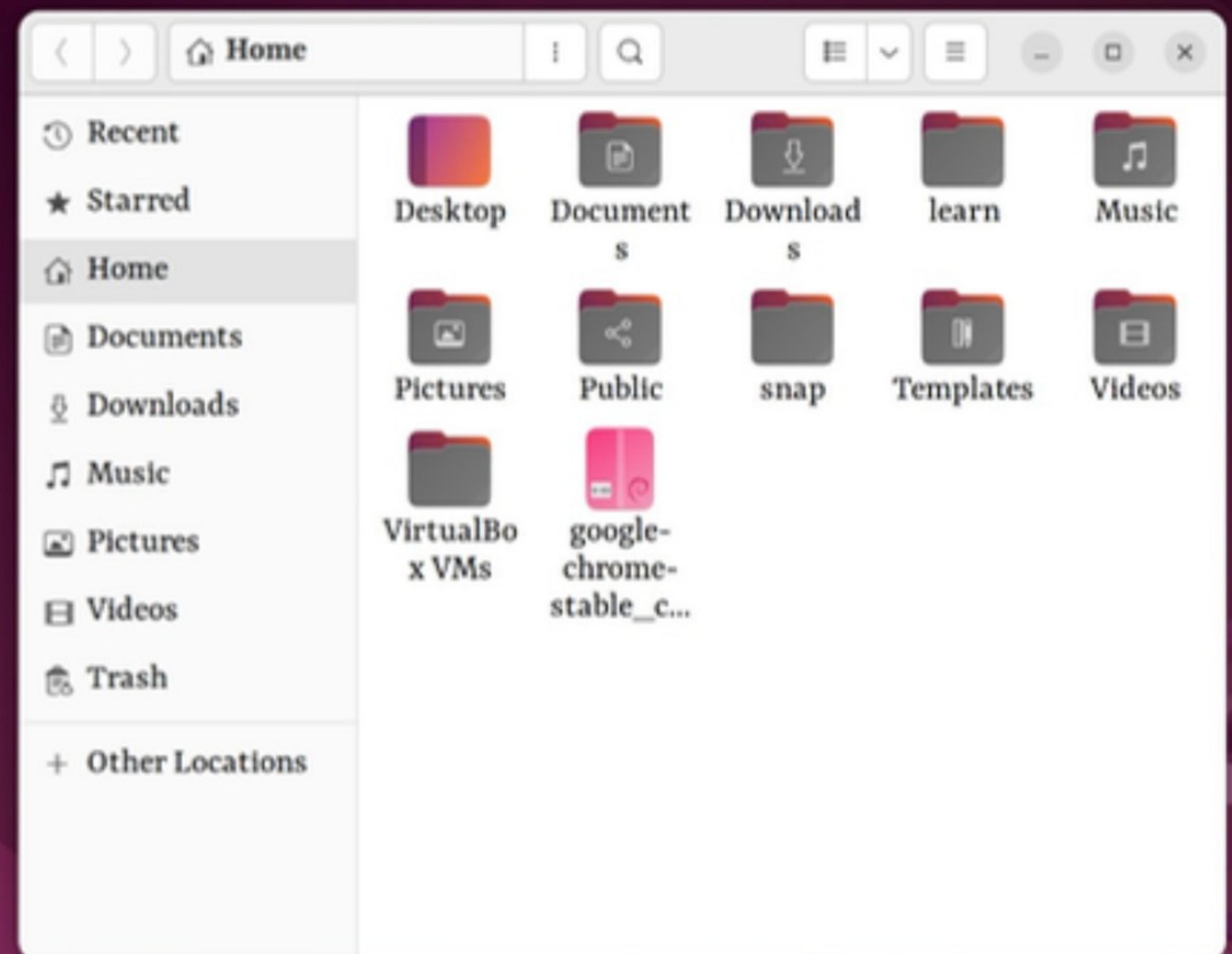
DESKTOP ENVIRONMENT

- Graphical User Interface for interacting with OS
- Examples: GNOME, KDE PLASMA, XFCE

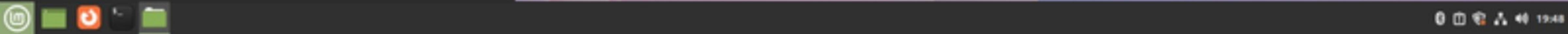
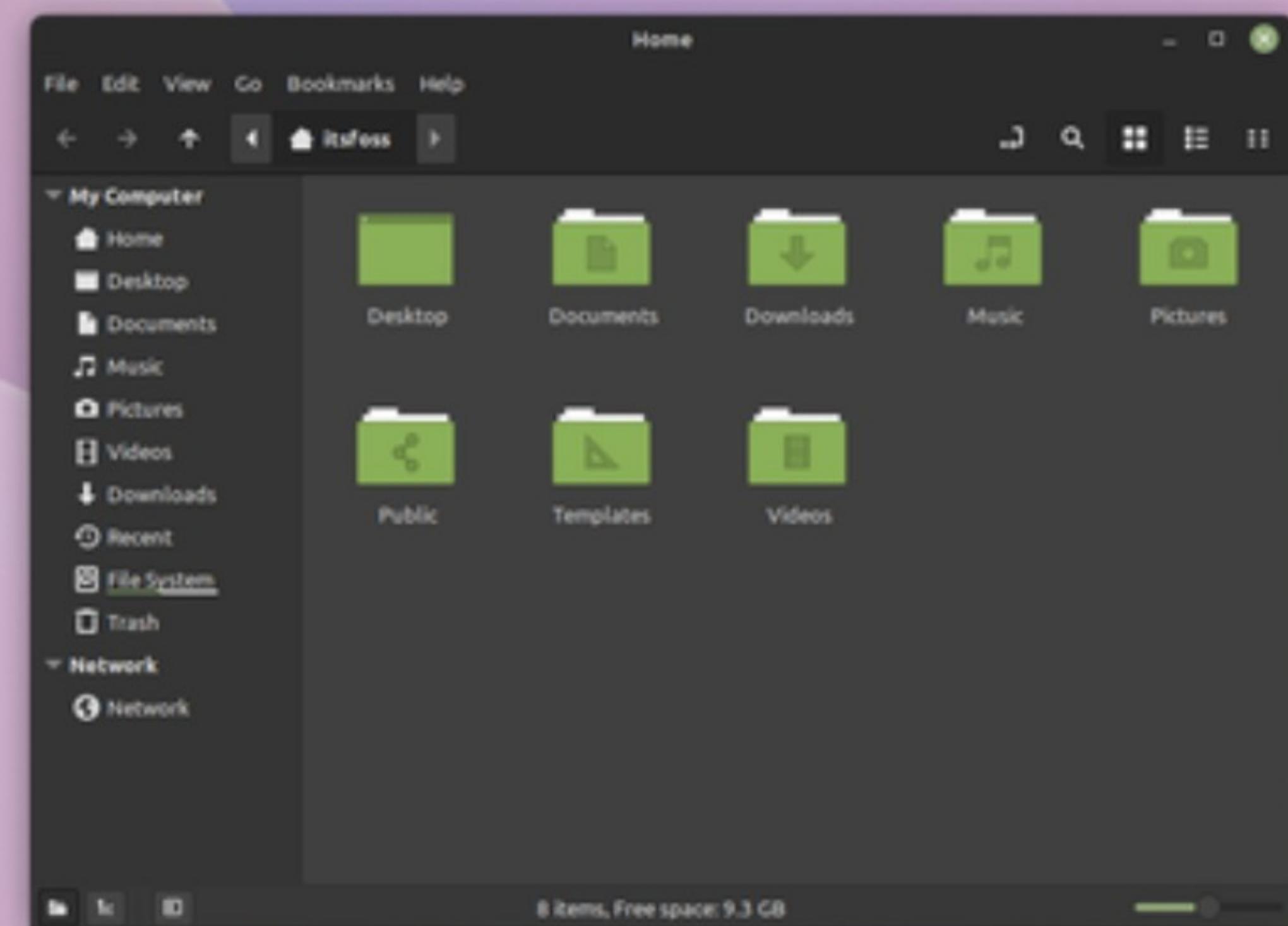
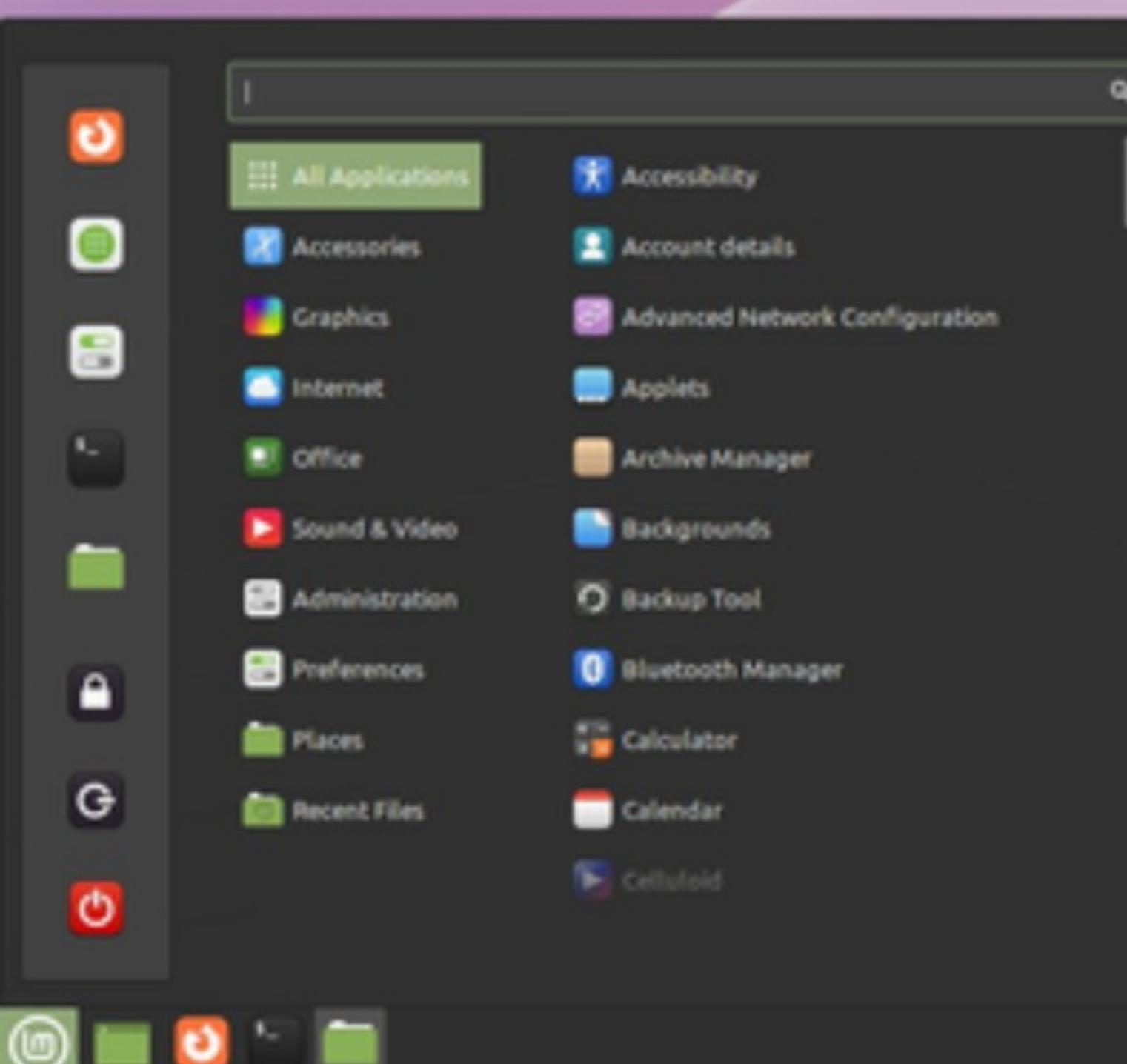
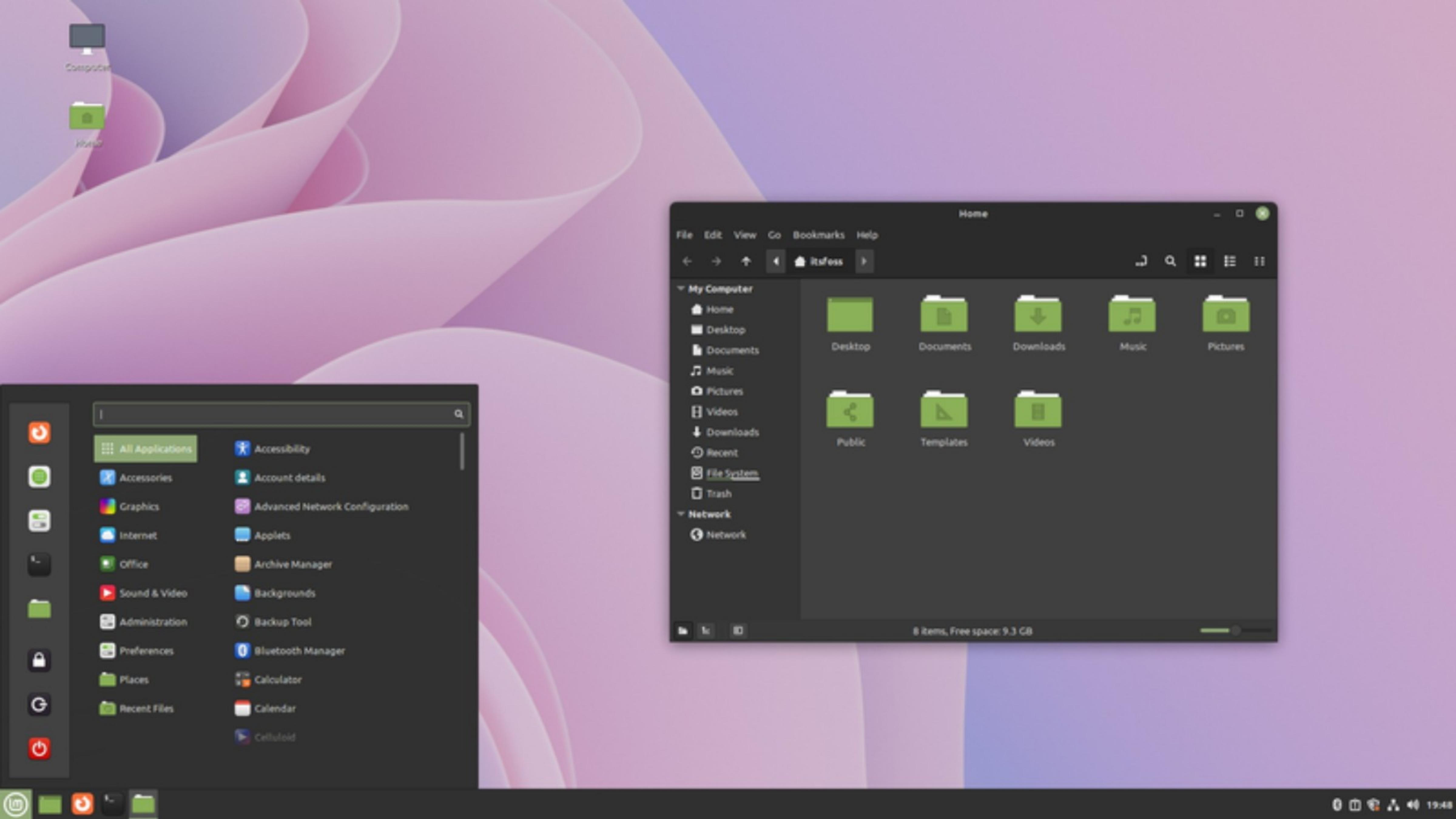




GNOME

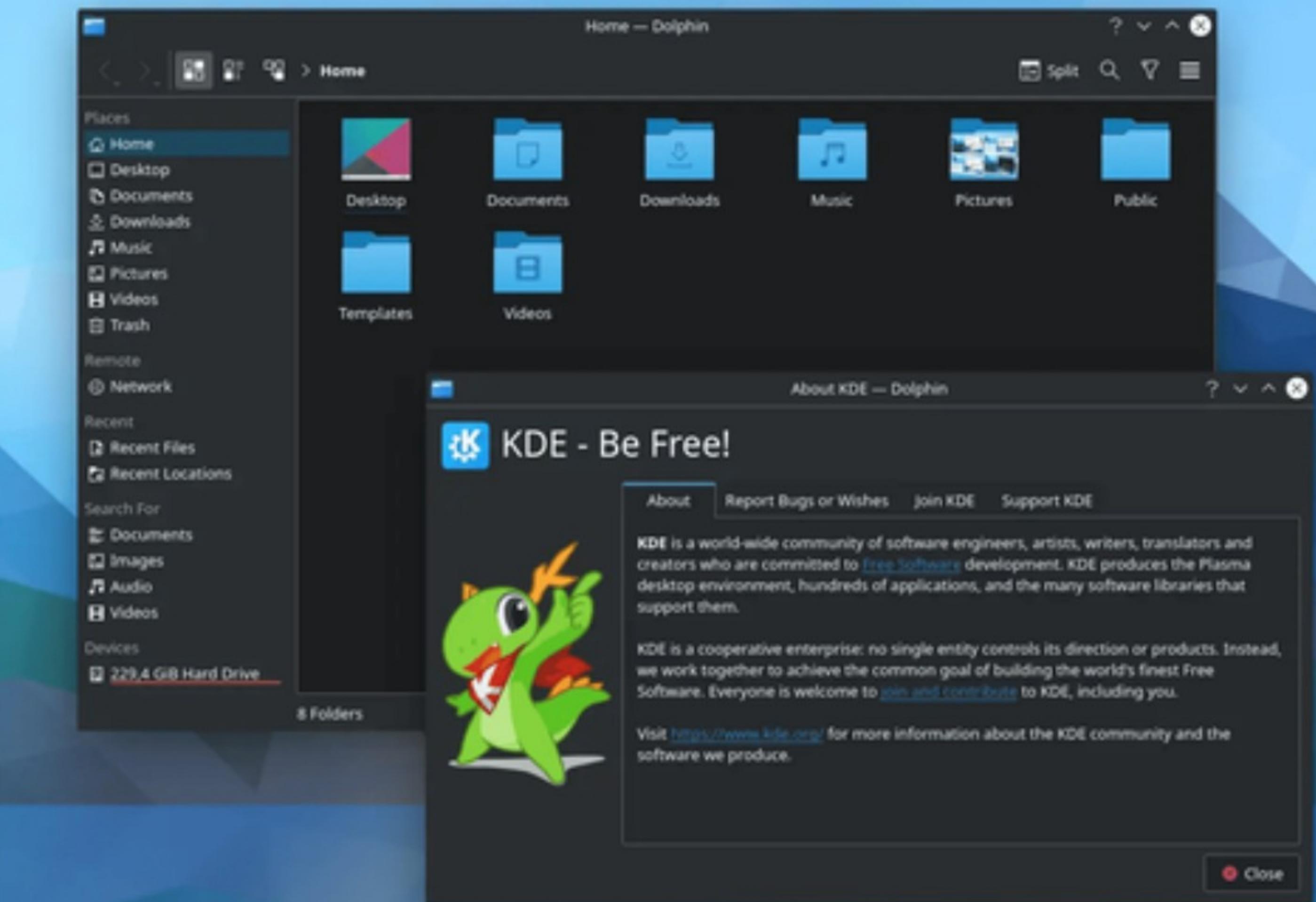
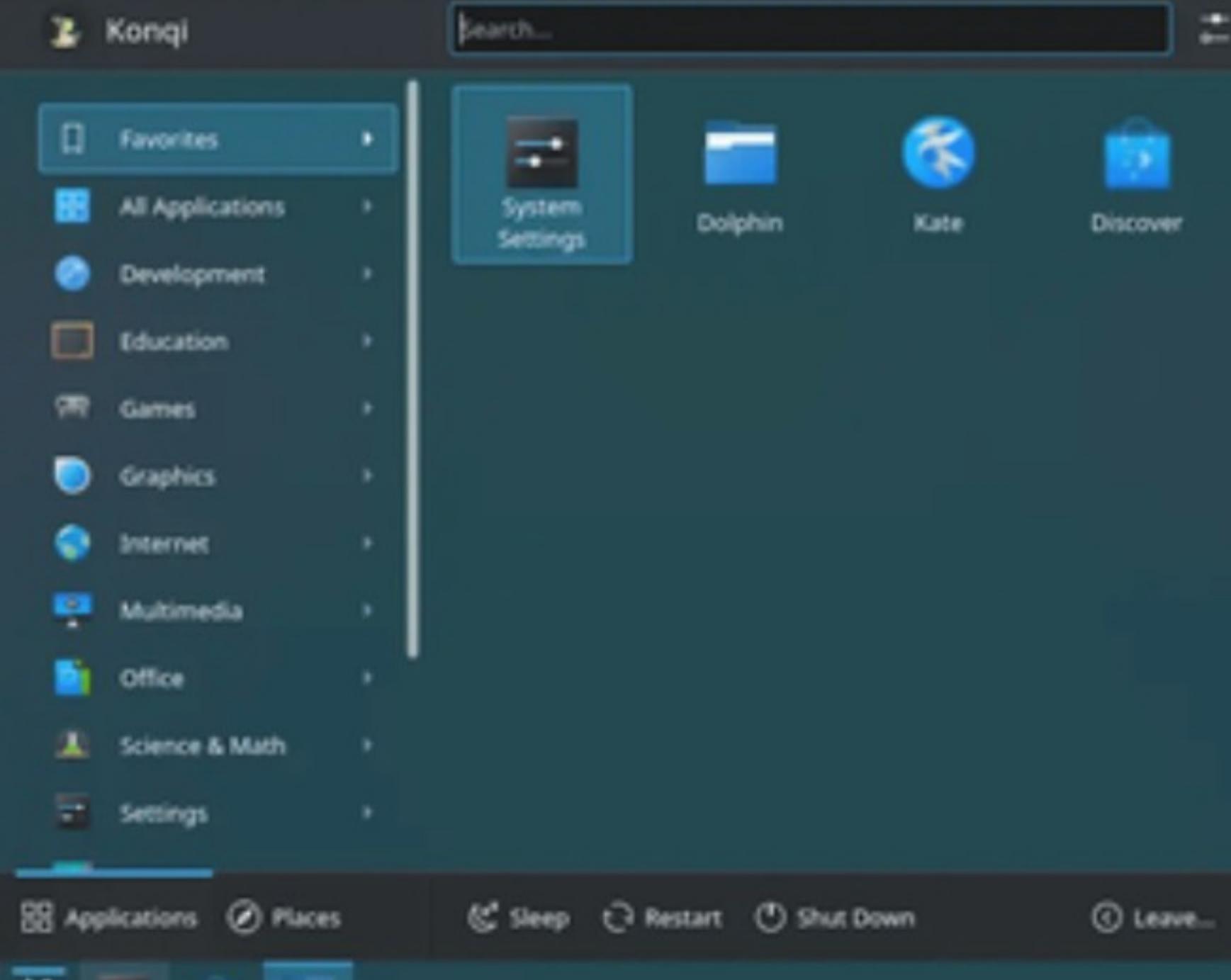




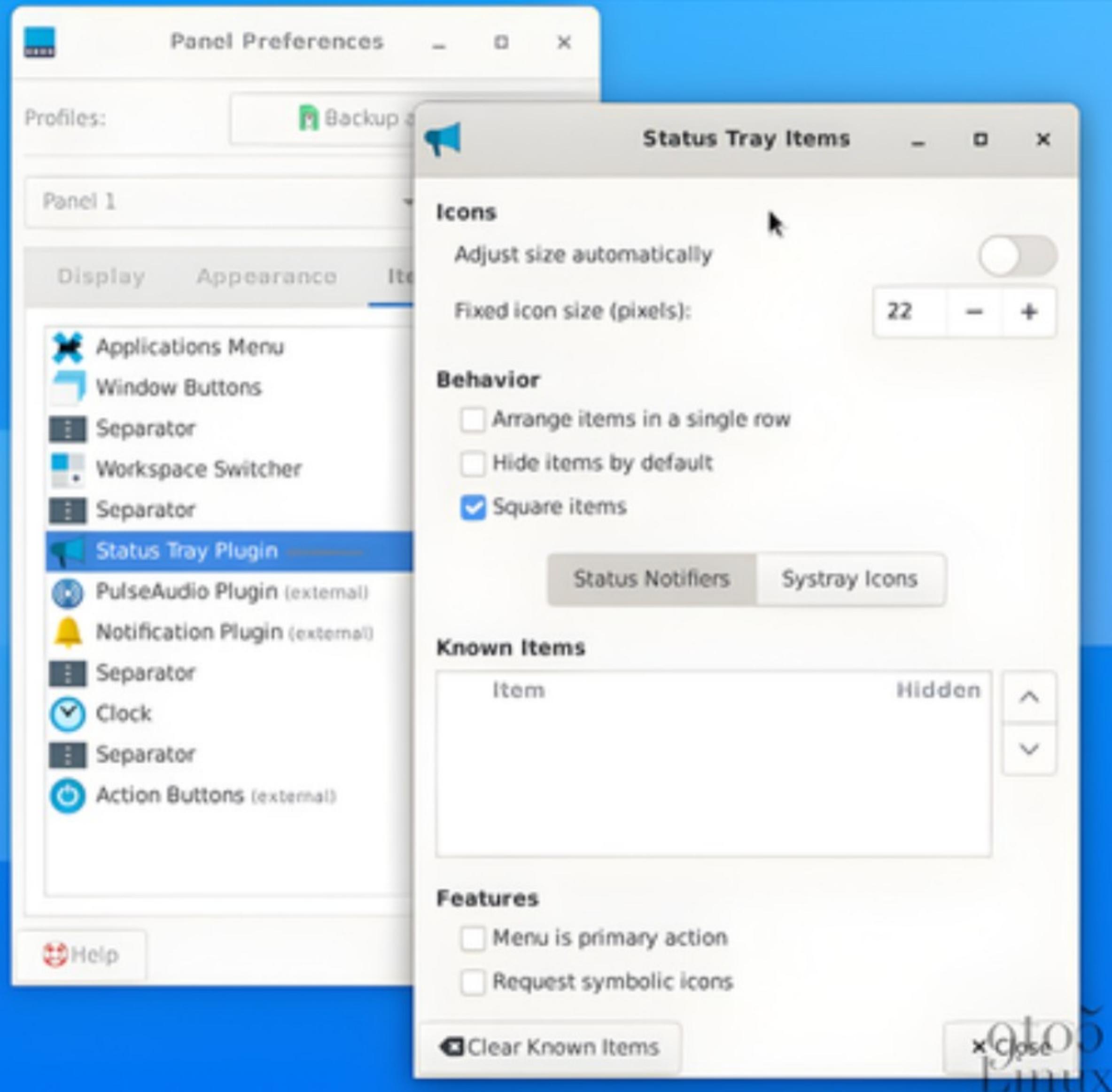




KDE PLASMA







xfce



kde



Gnome



Installing all of them
and switching every
other week



WHY LINUX?

- Free and Open Source
- Lightweight and Fast
- Highly Customisable
- Security and Privacy



WAYS TO EXPLORE LINUX

- Dual Booting
- Virtual Machine



DUAL BOOTING



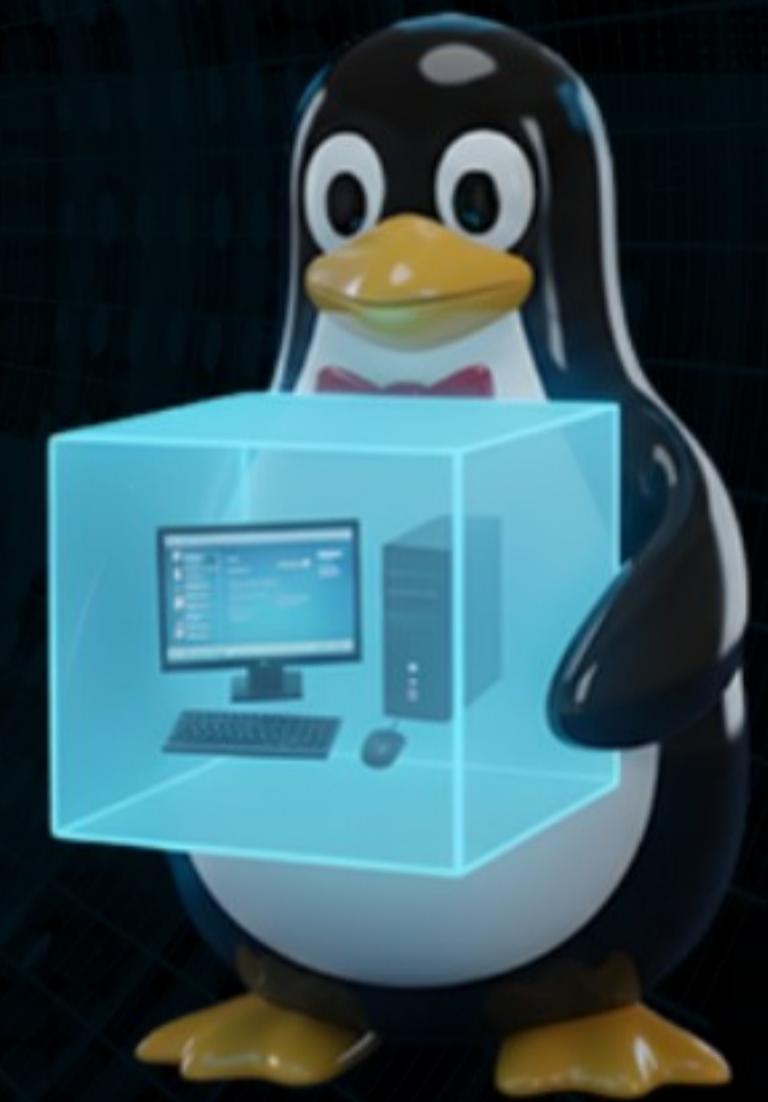
DUAL BOOTING



Running multiple operating systems on a single computer

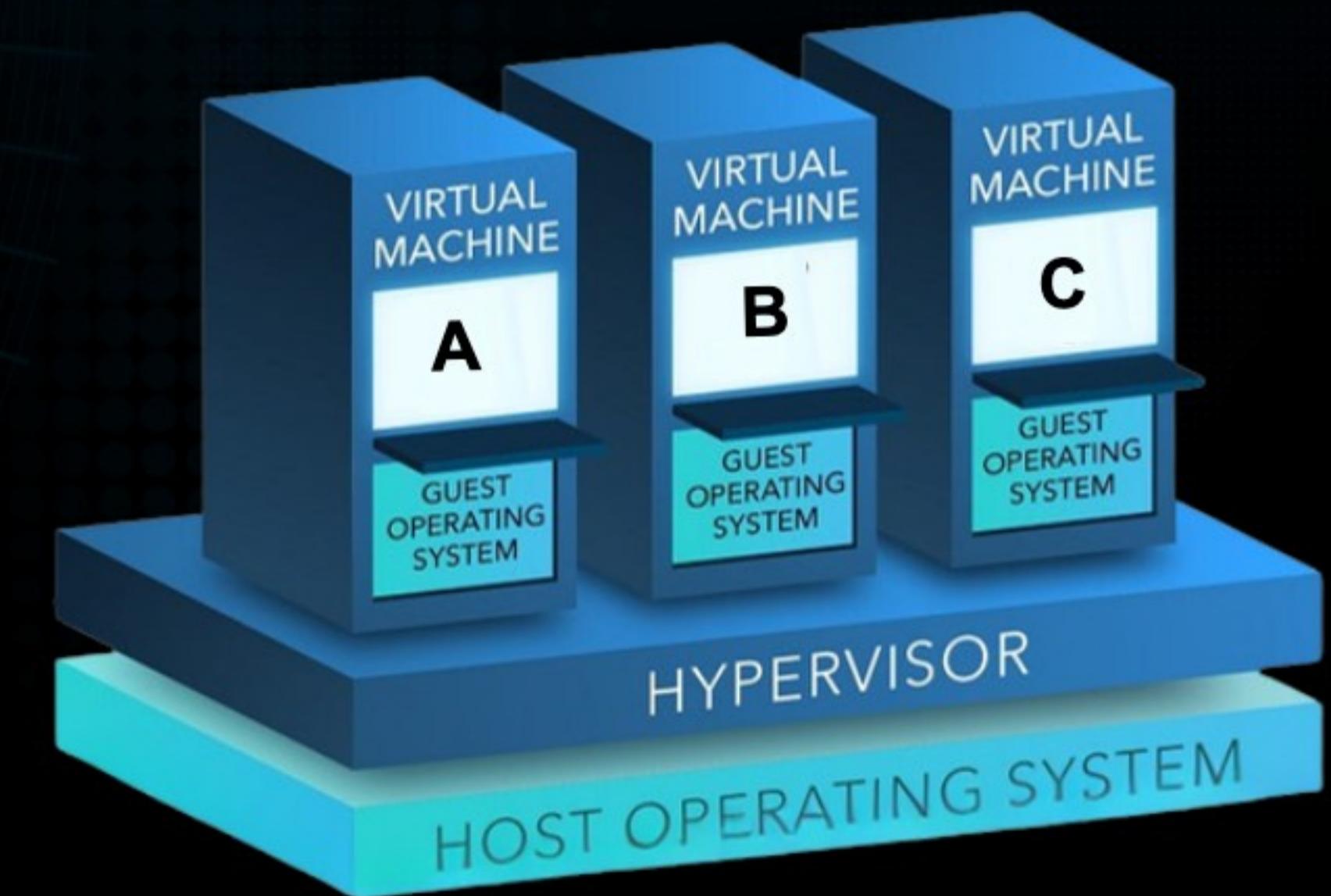


VIRTUAL MACHINE



VIRTUAL MACHINE

Virtual computer that runs on a physical computer and operates independently



GUI vs CLI



GUI vs CLI

Visual, uses icons and windows

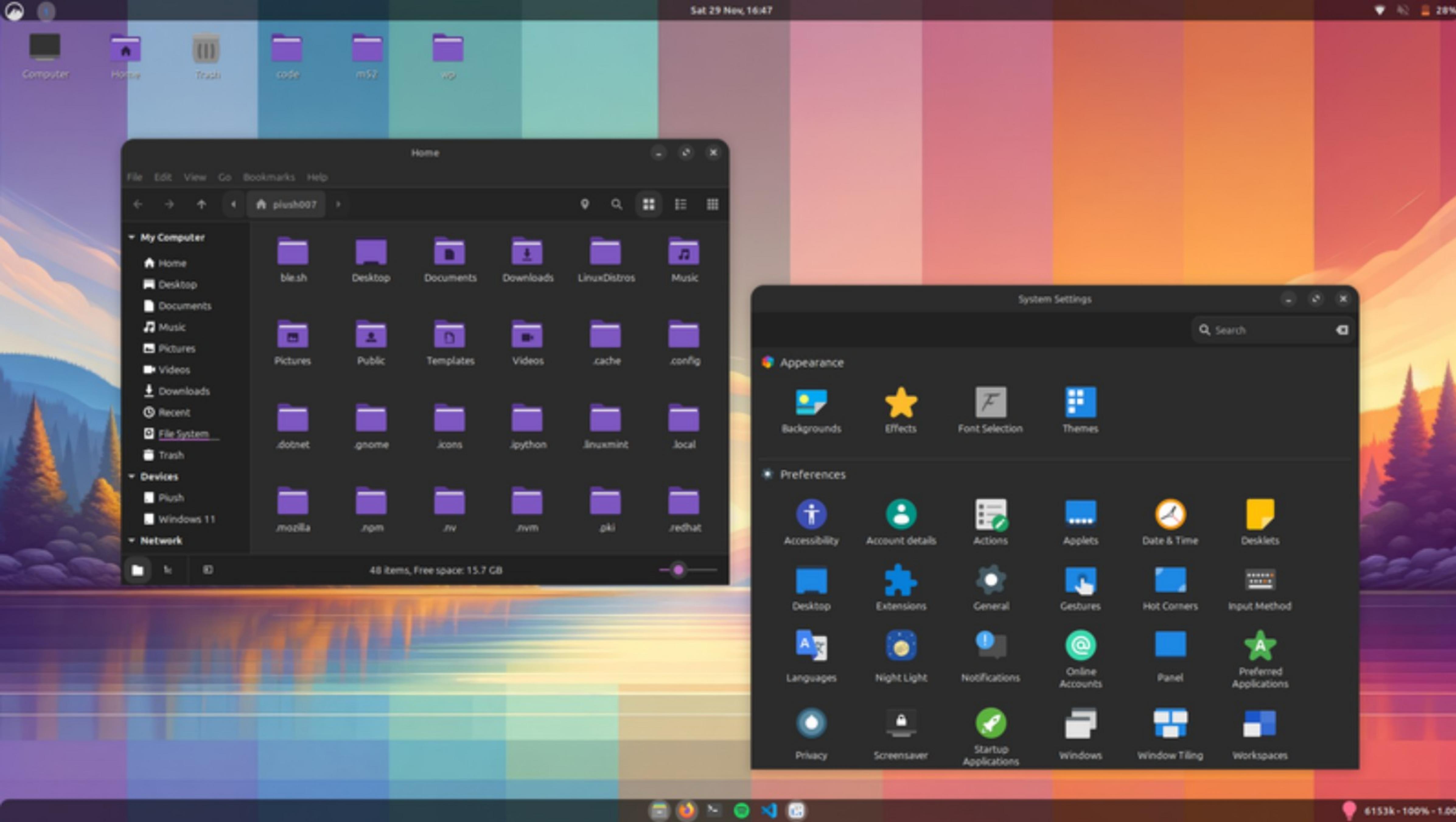
Easy for beginners

Heavy on system resources

Text-based, uses commands

Requires learning commands

Lightweight



Sat 29 Nov 16:47

28%

6153k - 100% - 1.00

```
~/LinuxDistros
```

```
> neofetch
```

```
...-:::::-...  
.----MMMMMMMMMMMMMMMM-.  
.---MMHM`..-:::::-..`MMHM-.  
. :MMHM.:MMMMMMMMMMMMMMH:.MMHM:.  
-MM-M---MMMMMMMMMMMMMMMMMM.MMM-  
' :MMM:MM` :MMHM:....:-...-MMHM:MM:`  
:MMH:MMH` :MM: `` `` `:MMH:MMH:  
.MMH.MMMH` :MM. -MM. .MM- `MMHM.MMM.  
:MMH:MMHM` :MM. -MM- .MM: `MMHM-MMM:  
:MMH:MMHM` :MM. -MM- .MM: `MMHM:MMH:  
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.MMH.MMMH` :MM:--:MM:--:MM: `MMHM.MMM.  
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:MMH:MMH:` ` :MMH:MMH:  
.MMH.MMMH:-----:MMHM.MMM.  
`-MMHM.-MMMMMMMMMMMMMMH-.MMHM-`  
`.-MMHM` `` --::::--`MMHM-.`  
`-MMMMMMMMMMMMH-`  
` ``-::::-``
```

```
piush007@piush007-Dell-G15-5515
```

```
-----  
OS: Linux Mint 22.1 x86_64  
Host: Dell G15 5515 1.27.0  
Kernel: 6.8.0-85-generic  
Uptime: 1 hour, 35 mins  
Packages: 2979 (dpkg)  
Shell: bash 5.2.21  
Resolution: 1920x1080  
DE: Cinnamon 6.4.8  
WM: Mutter (Muffin)  
WM Theme: Orchidea (Mint-Y)  
Theme: Jasper-Purple-Dark [GTK2/3]  
Icons: Papirus [GTK2/3]  
Terminal: gnome-terminal  
CPU: AMD Ryzen 7 5800H with Radeon Graphics (16) @ 4.463GHz  
GPU: NVIDIA GeForce RTX 3050 Mobile  
GPU: AMD ATI Radeon Vega Series / Radeon Vega Mobile Series  
Memory: 6161MiB / 15333MiB
```



```
~/LinuxDistros took 2s
```

```
> █
```



>
TERMINAL

WHAT IS TERMINAL?

- Terminal is a text-based interface used to interact with the OS
- The terminal itself doesn't understand your commands
- e.g. Konsole, XTerm

```
Terminal

~ > echo "Hola Amigos"
Hola Amigos

~ > pwd
/home/piush007

~ > ls
ble.sh  Documents  LinuxDistros  Pictures  Templates
Desktop  Downloads  Music        Public    Videos

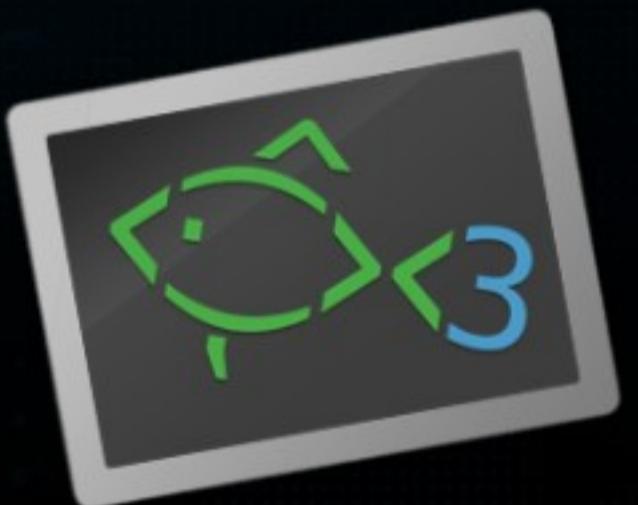
~ > cd LinuxDistros/
~/LinuxDistros
~ > ls
Arch  Debian  Fedora  Garuda  Kali  Mint  Ubuntu

~/LinuxDistros
~ >
```



WHAT IS SHELL?

- A command interpreter that processes commands and scripts
- It reads your commands, understands them and displays output on terminal
- e.g. bash, zsh, fish



BASIC COMMANDS



○ pwd

To print current working directory



```
$ pwd
```

○ ls

To list directory content

-l: long listing format

-a: show hidden files



```
$ ls
```

```
$ ls -l
```

//long list

```
$ ls -a
```

//hidden files

cd

To change directory



```
$ cd Desktop/
```

mkdir

To make a directory



```
$ mkdir Linux/
```

rm

To remove files and
directories

-r: To delete directories with
their content



```
$ rm doubts.txt
```



```
$ rm -r MyFolder //recursive remove
```

rmdir

To remove empty directory



```
$ rmdir oldfolder
```

touch

To create an empty file



```
$ touch notes.txt
```

mv

To move or rename a file



```
$ mv file.txt backup.txt      //rename  
$ mv notes.txt /home/user/Study //move
```

 **cat**

To display contents of file



```
$ cat cmd.txt
```

 **echo**

To print or output text



```
$ echo "Hello Linux"
```

 **whoami**

To print current logged in username



```
$ whoami
```

 **man**

To view detailed help for any command



```
$ man [commandname]
```

cmatrix

To display a Hacker-style
falling code animation



```
$ cmatrix
```

neofetch

To display system information
in a stylish way



```
$ neofetch
```

HANDS-ON TIME!



HANDS-ON TIME!



QUIZ TIME!



QUIZ TIME!



JOIN US!



JOIN US!



@WCEWLUG

THANK YOU!