ISCB SC RSG Turkey Student Symposium 2021 Workshop

Introduction to Linux and Theory

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PhD candidate

- ETS Family Transcription Factors
- Transcriptional regulation of neuronal differentiation
- Evolution of neurogenesis
- Gene regulatory network inference algorithms
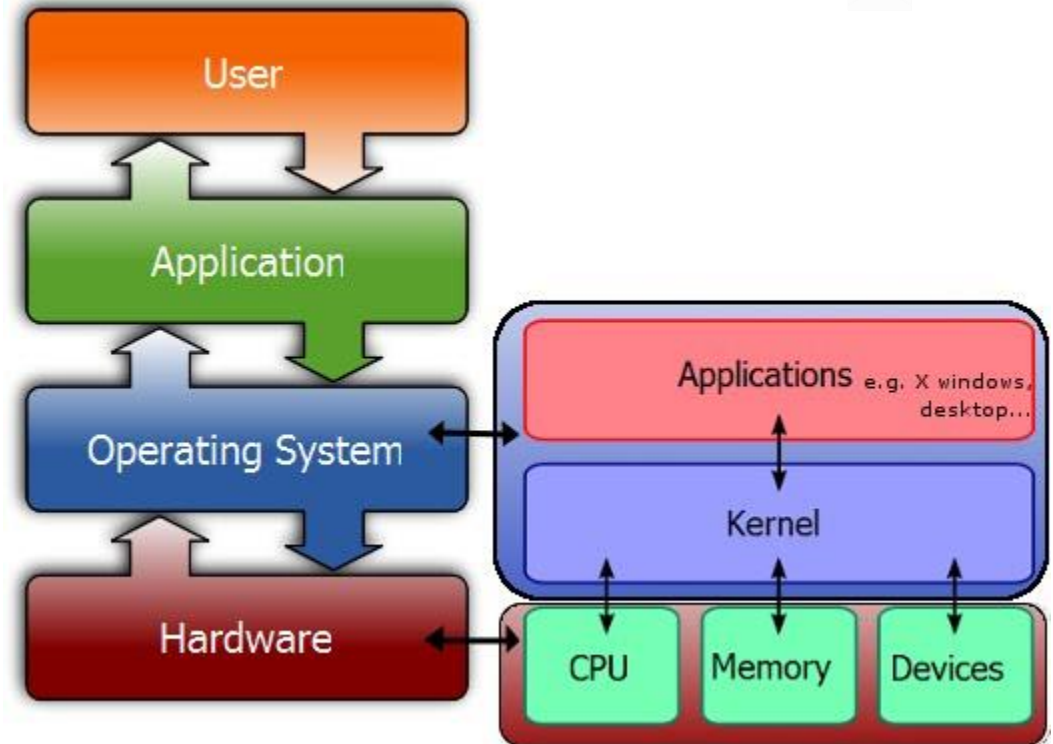- Quantitative kinetic modeling
- Brain tumor progression

https://yigitbabal.xyz ykbabal@gtu.edu.tr https://github.com/rsgturkey/Workshop2021

Operating System (OS)

- System software
- Common services of computer
- Connection between hardware and user

Computers in 60s

- Every computer had a different operating system.

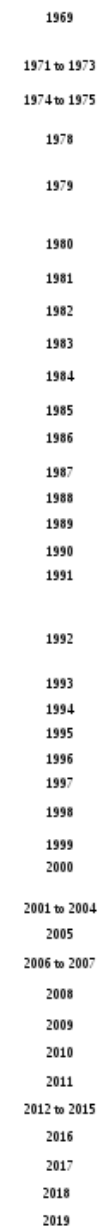- Softwares were design for specific device and purposes. It did not run other system.

Unix Systems

The Bell Labs developers Ken Thompson (left), Dennis Ritchie (right) developed a new operating system named ''UNIX'' in 1969.

- Simple and elegant.

- Written in the C programming language instead of in assembly code.
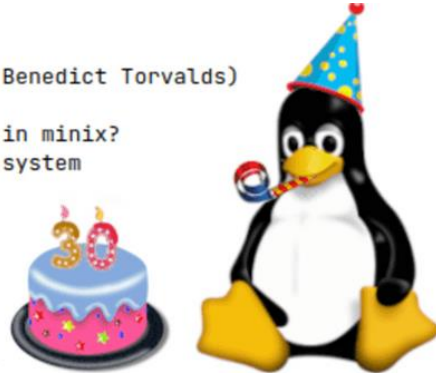
- Able to recycle code.
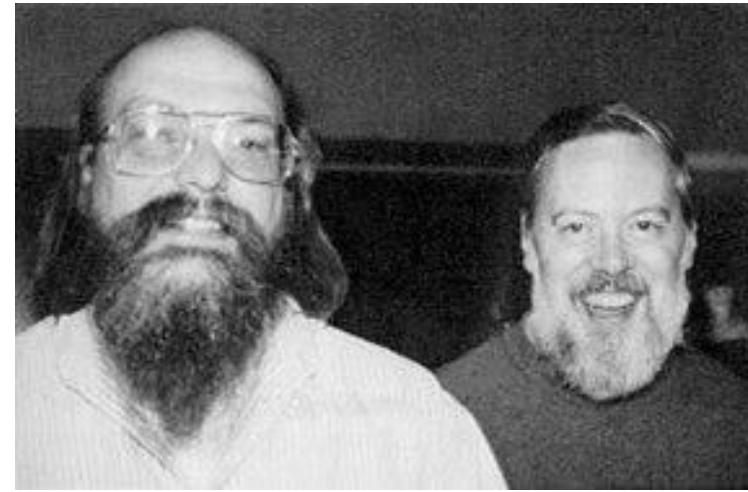
Linus Torvalds and Linux


```
From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)
Newsgroups: comp.os.minix
Subject: What would you like to see most in minix?
Summary: small poll for my new operating system
Message-ID:
Date: 25 Aug 91 20:57:08 GMT
Organization: University of Helsinki

Hello everybody out there using minix -

I'm doing a (free) operating system (just a hobby, won't be big and
professional like gnu) for 386(486) AT clones.  This has been brewing
since april, and is starting to get ready.  I'd like any feedback on
things people like/dislike in minix, as my OS resembles it somewhat
(same physical layout of the file-system (due to practical reasons)
among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work.
This implies that I'll get something practical within a few months, and
I'd like to know what features most people would want.  Any suggestions
are welcome, but I won't promise I'll implement them :-)

            Linus (torvalds@kruuna.helsinki.fi)

PS.  Yes - it's free of any minix code, and it has a multi-threaded fs.
It is NOT protable (uses 386 task switching etc), and it probably never
will support anything other than AT-harddisks, as that's all I have :-(.
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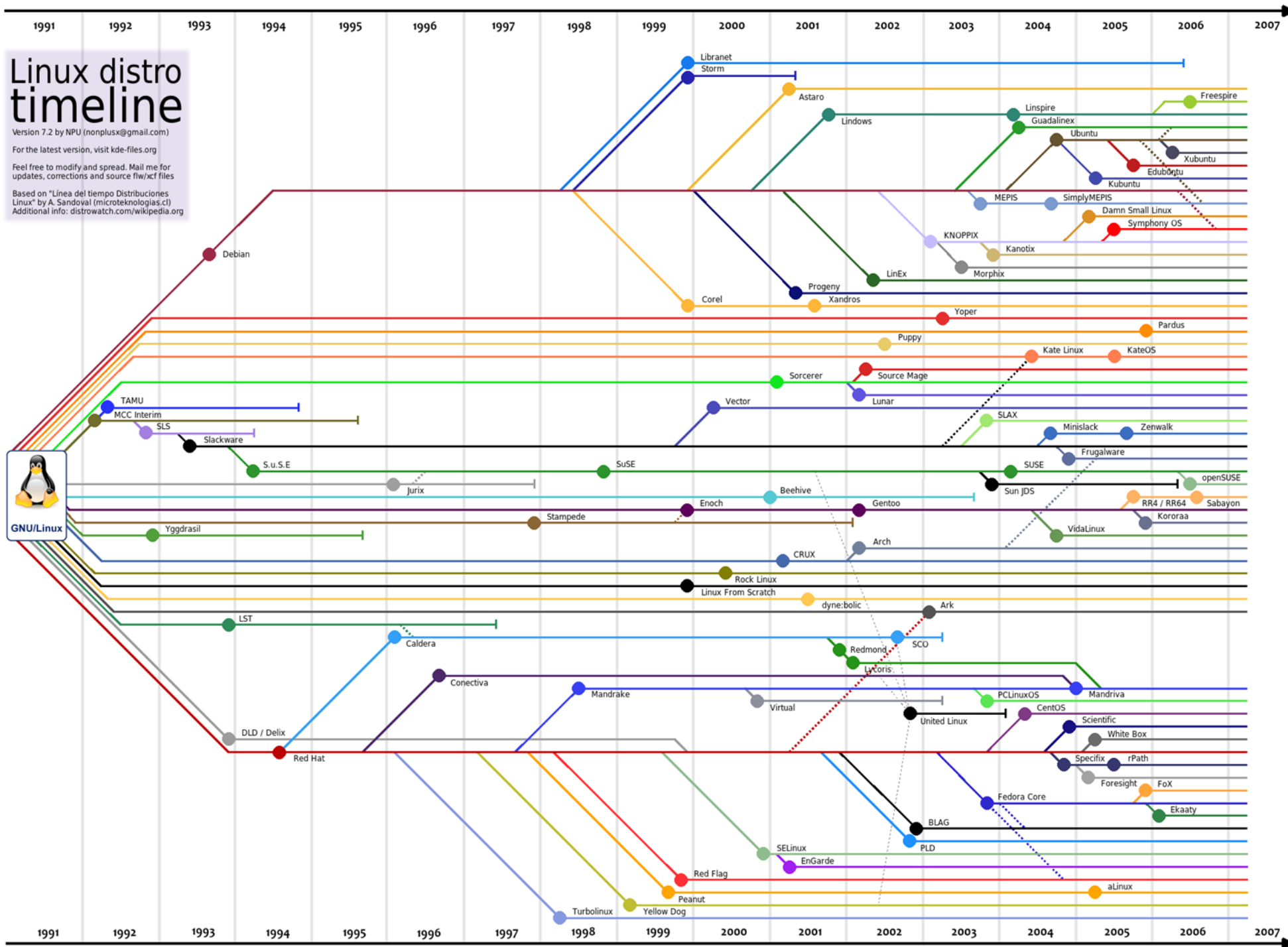
Linux distro timeline

Version 7.2 by NPU (nonplusx@gmail.com)

For the latest version, visit kde-files.org

Feel free to modify and spread. Mail me for updates, corrections and source flw/xcf files

Based on "Línea del tiempo Distribuciones Linux" by A. Sandoval (microteknologias.cl)
Additional info: distrowatch.com/wikipedia.org

ISCB REGIONAL
Student GROUP

Turkey

Linux

- Kernel
- Open-source and Unix-like OS
- Most of parts provided by GNU Project (Free Software)
- Linux distributions (Ubuntu, Debian, Fedora etc.)
- %90 of cloud structures
- % 70 of smartphones
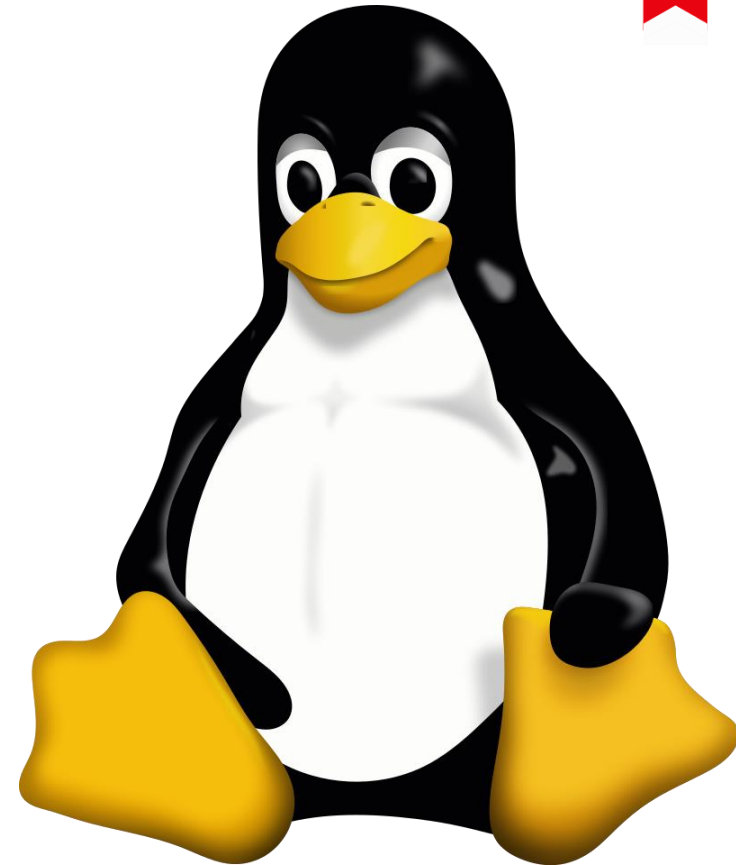
Linux OS

- Free & open-source
- Flavors or variety
- Full control update
- Secure
- Full control terminal
- Run without reboot

Windows

- Commercial & closed-source code
- Simple customization
- Inconvenient update
- The most vulnerable OS
- Limited usage of terminal
- Shorter Uptime

File System Hierarchy

/
root

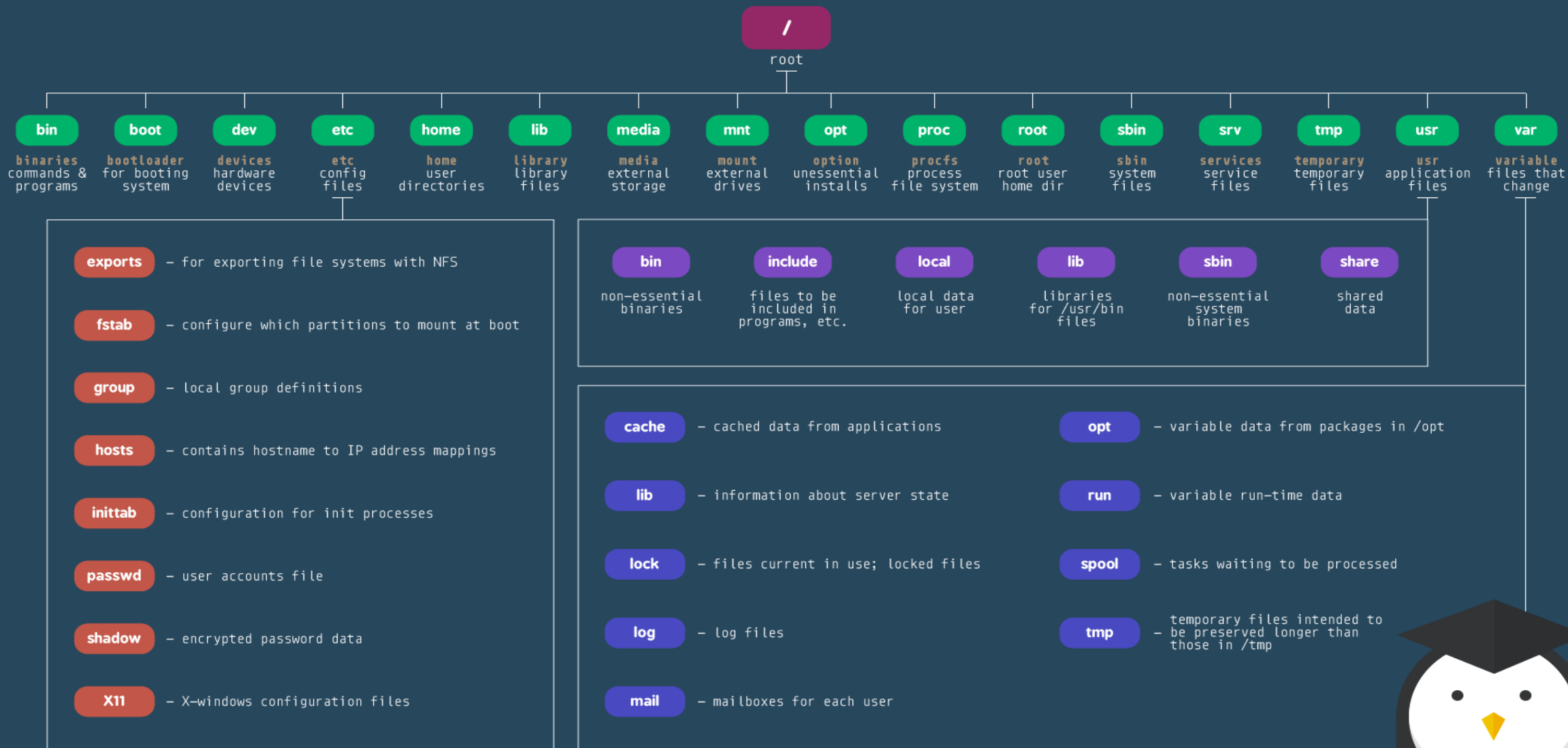|													
bin	**boot**	**dev**	**etc**	**home**	**lib**	**media**	**mnt**	**opt**	**proc**	**root**	**sbin**	**srv**	**tmp**	**usr**	**var**

bin
binaries
commands &
programs

boot
bootloader
for booting
system

dev
devices
hardware
devices

etc
etc
config
files

home
home
user
directories

lib
library
library
files

media
media
external
storage

mnt
mount
external
drives

opt
option
unessential
installs

proc
procfs
process
file system

root
root
root user
home dir

sbin
sbin
system
files

srv
services
service
files

tmp
temporary
temporary
files

usr
usr
application
files

var
variable
files that
change

---

exports – for exporting file systems with NFS

fstab – configure which partitions to mount at boot

group – local group definitions

hosts – contains hostname to IP address mappings

inittab – configuration for init processes

passwd – user accounts file

shadow – encrypted password data

X11 – X–windows configuration files

---

bin
non–essential
binaries

include
files to be
included in
programs, etc.

local
local data
for user

lib
libraries
for /usr/bin
files

sbin
non–essential
system
binaries

share
shared
data

---

cache – cached data from applications

lib – information about server state

lock – files current in use; locked files

log – log files

mail – mailboxes for each user

opt – variable data from packages in /opt

run – variable run–time data

spool – tasks waiting to be processed

tmp – temporary files intended to be preserved longer than those in /tmp

# Why Linux for Computational Biology

- The best tools available in this field are open-source tools written for Linux.

- Easy text manipulation by one-line bash code (you can't open single fastq file with Notepad in Windows!)

- Easy to build simple pipelines (awk, bash, piping, bash redirection, texttools)

- Simple to install and use software development tools (gcc, g++, python, perl)

- Ability to perform analyses on computer clusters (important for big/long computational jobs)

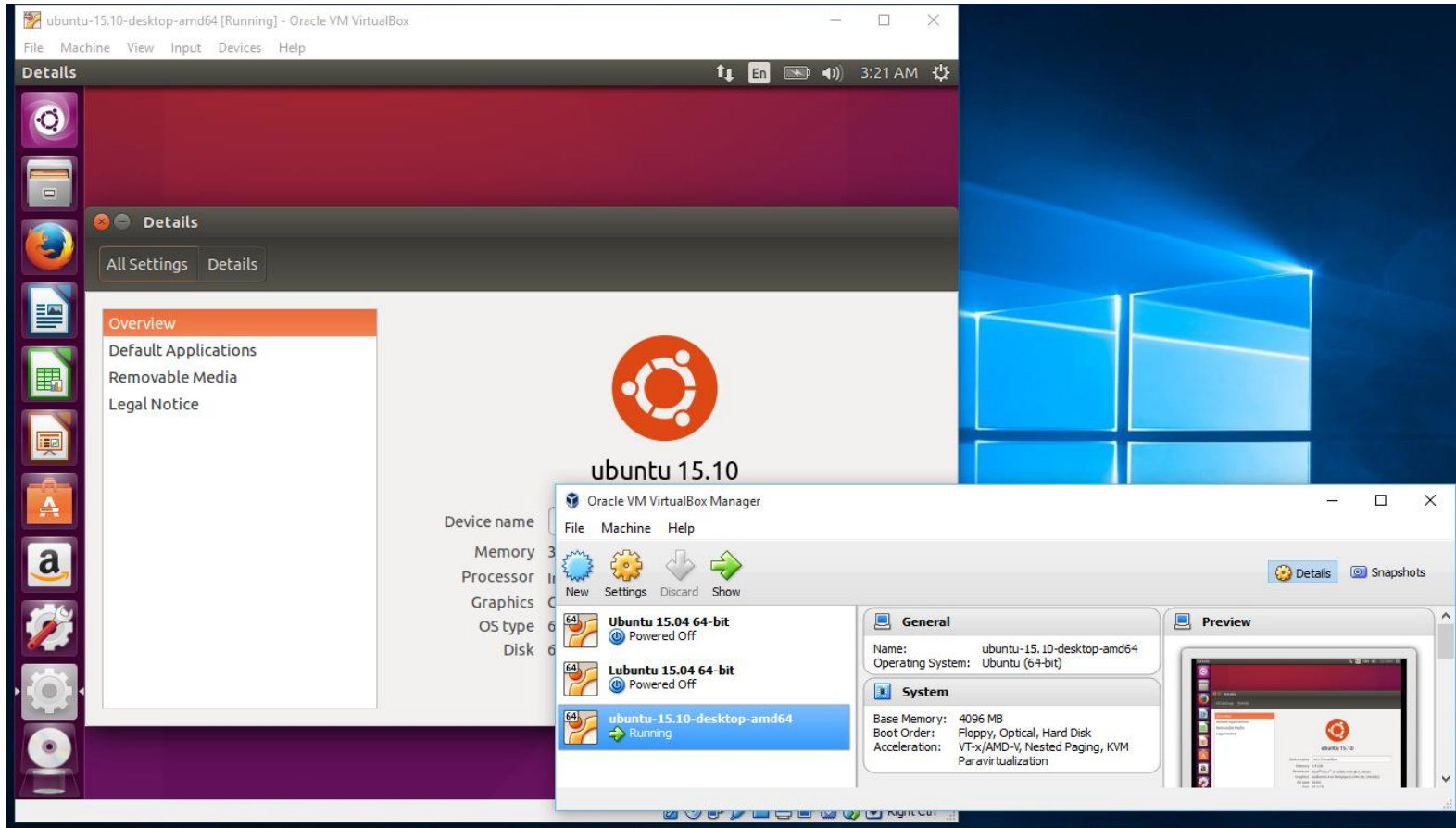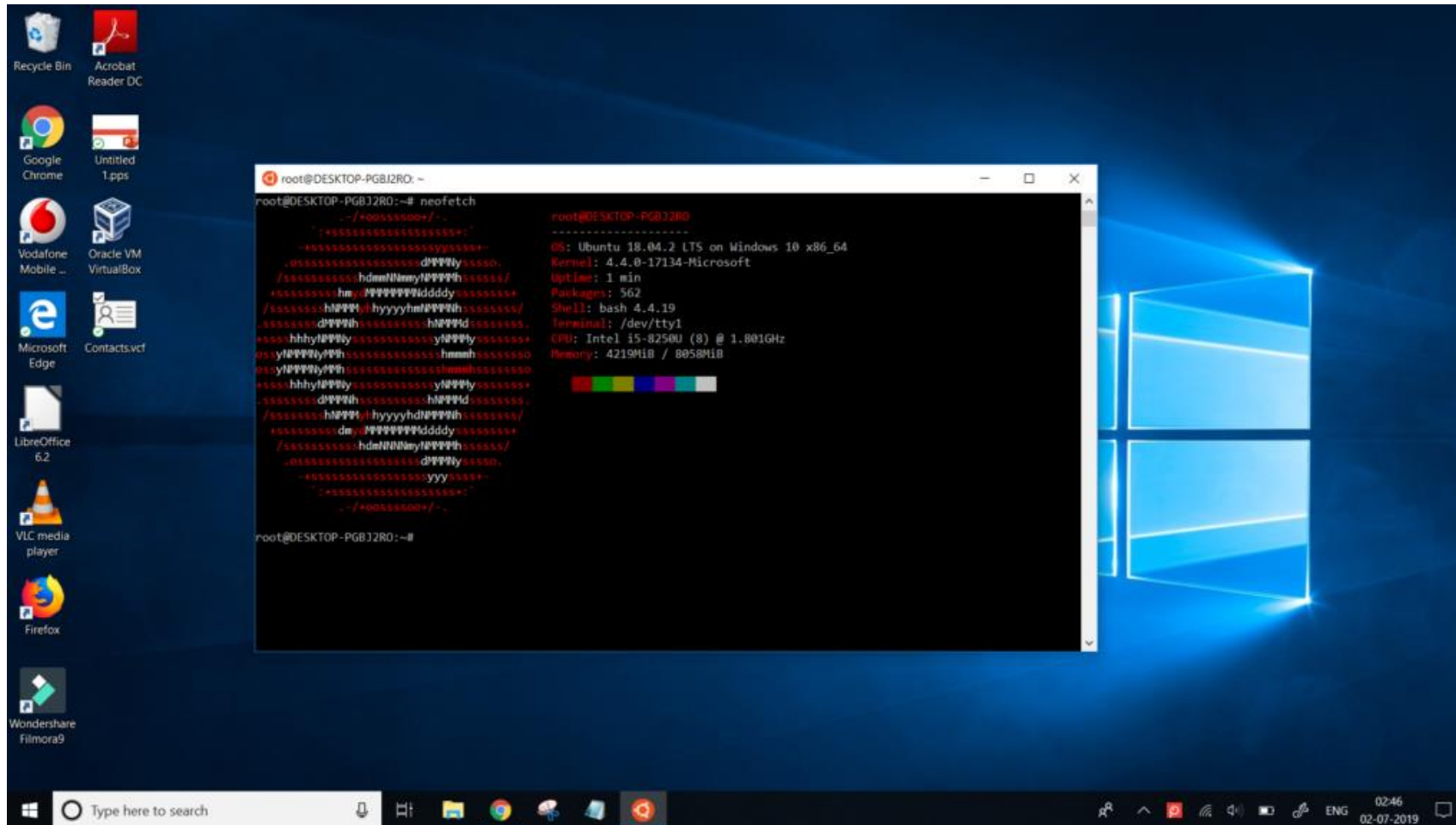- Contribute to and develop open-source tools for the community

Linux Distributions

Ubuntu Desktop

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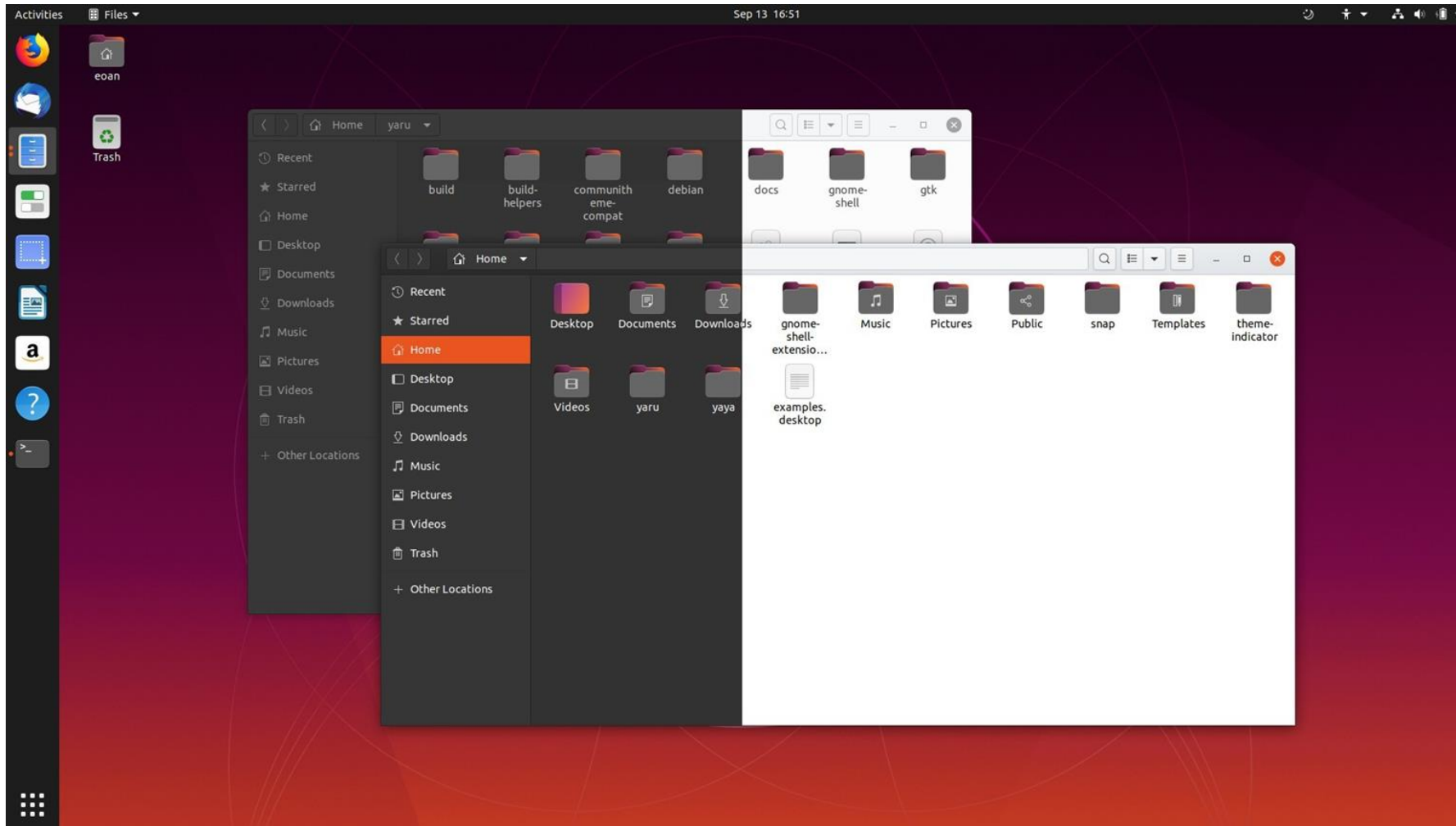
Ubuntu Desktop into Virtual Machine

Ubuntu- Windows Subsystem for Linux (WSL)

Note: Virtual Machine Feature must be enabled

https://docs.microsoft.com/en-us/windows/wsl/install-win10

Workshop

- **Ubuntu installation into Virtualbox**
- **First look of Ubuntu Desktop**
- **Update OS or application**
- **Install an application or package**
- **Conda installation**

https://github.com/rsgturkey/Workshop2021

THANK YOU FOR YOUR LISTENING!

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