
LINUX
&
SHELL SCRIPTING
Session-1

Agenda

- The first 20 hours to learn anything : Josh Kaufman
- 5W's 1H
- Introduction to Operating Systems
- Linux Introduction (5w's h)
- Open-Source
- Distributions
- File Systems
- Kernel – important parts of the kernel
- Linux Vs Windows
- Virtualization – why?

The first 20 hours to learn anything

Key Points

- Deconstruct the Skill
- Learn enough to self correct
- Remove Practice Barriers
- Practice 20 hours on the skill

https://www.youtube.com/watch?v=5MgBikgcWnY

Deconstruct the skill

Course Enrolled : Devops

This Course

Basics of Linux
Basic Commands
Administration
Networking
Shell Scripting
And much more….

Learn enough to self-correct

Instructor teaching in class

- echo
- ls
- ip addr
- uname

on Ubuntu Operating System

Student Contributing

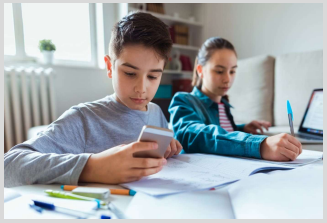
- man echo
- ls –l –t – r –i –h –a
- uname -a

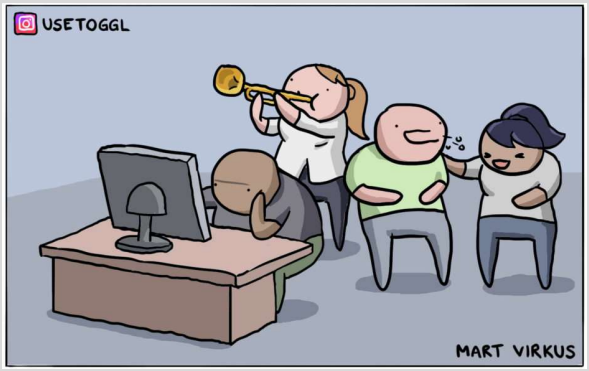
Students experimenting with different features, exploring things, getting doubts,

Within the subject

Remove Practice Barriers

Distractions



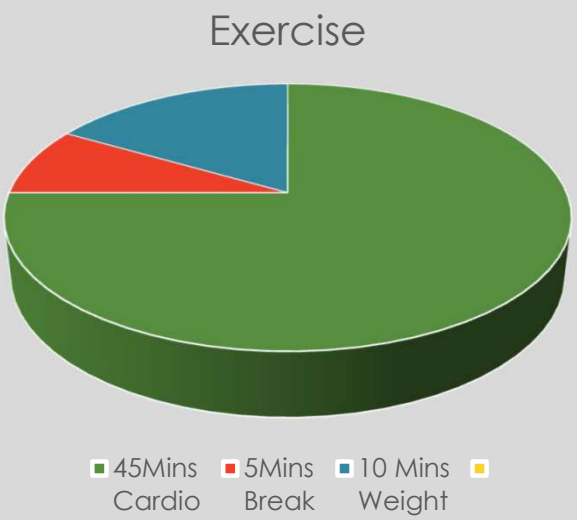


Technical issues

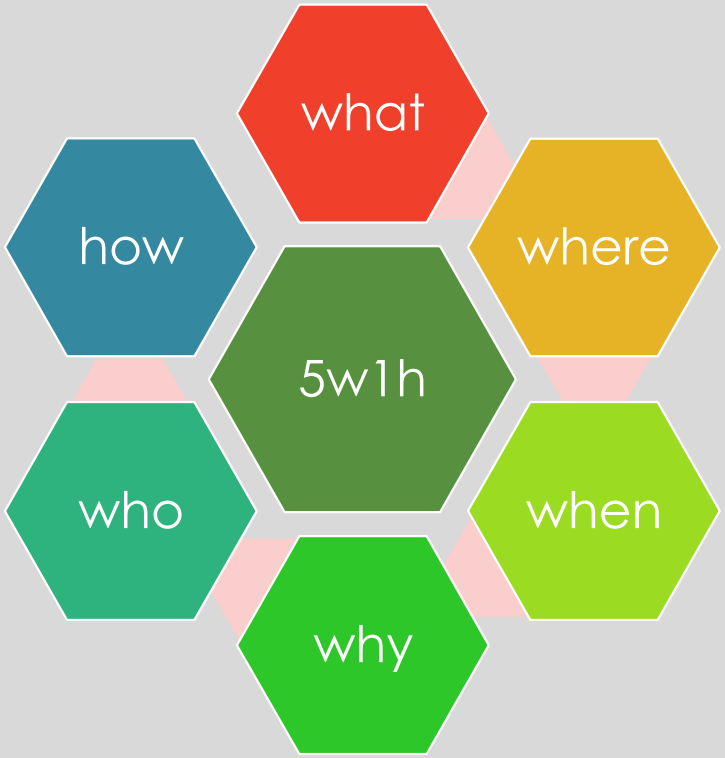
Practice 20 hours

Non - Productive

Productive



5W1H in practice



Question yourself around the topics you're learning
Example:

What is Linux?
Where is Linux used?
When to use Linux?
Why should I learn Linux?
Who developed Linux?
How in real world Linux gained popularity?

Introduction to Operating Systems

Scenario 1

- I have a bare-metal
- I want you to open google chrome and access facebook.com

Solution

Install OS
Install Drivers
Connect to Internet
Download Chrome
Access facebook.com

An **operating system** (OS) is **system software** that manages computer hardware, software resources, and provides common services for computer programs.
(source: Wikipedia)

What are Application Programs?

Linux Operating System

What is Linux?

- An Open-Source operating system and community developed operating system for computers, servers, mainframes, mobile devices and embedded devices.

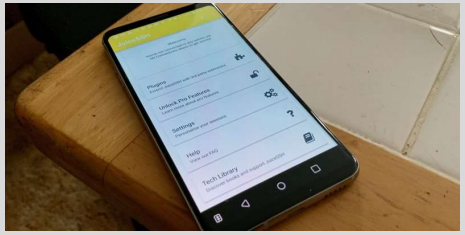
- Ubuntu, Debian, Fedora, OpenSuse, Redhat, Android etc.,
- https://www.linuxvmimages.com/

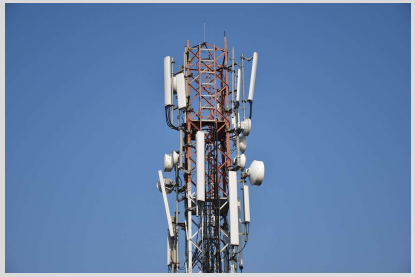
What is Unix?

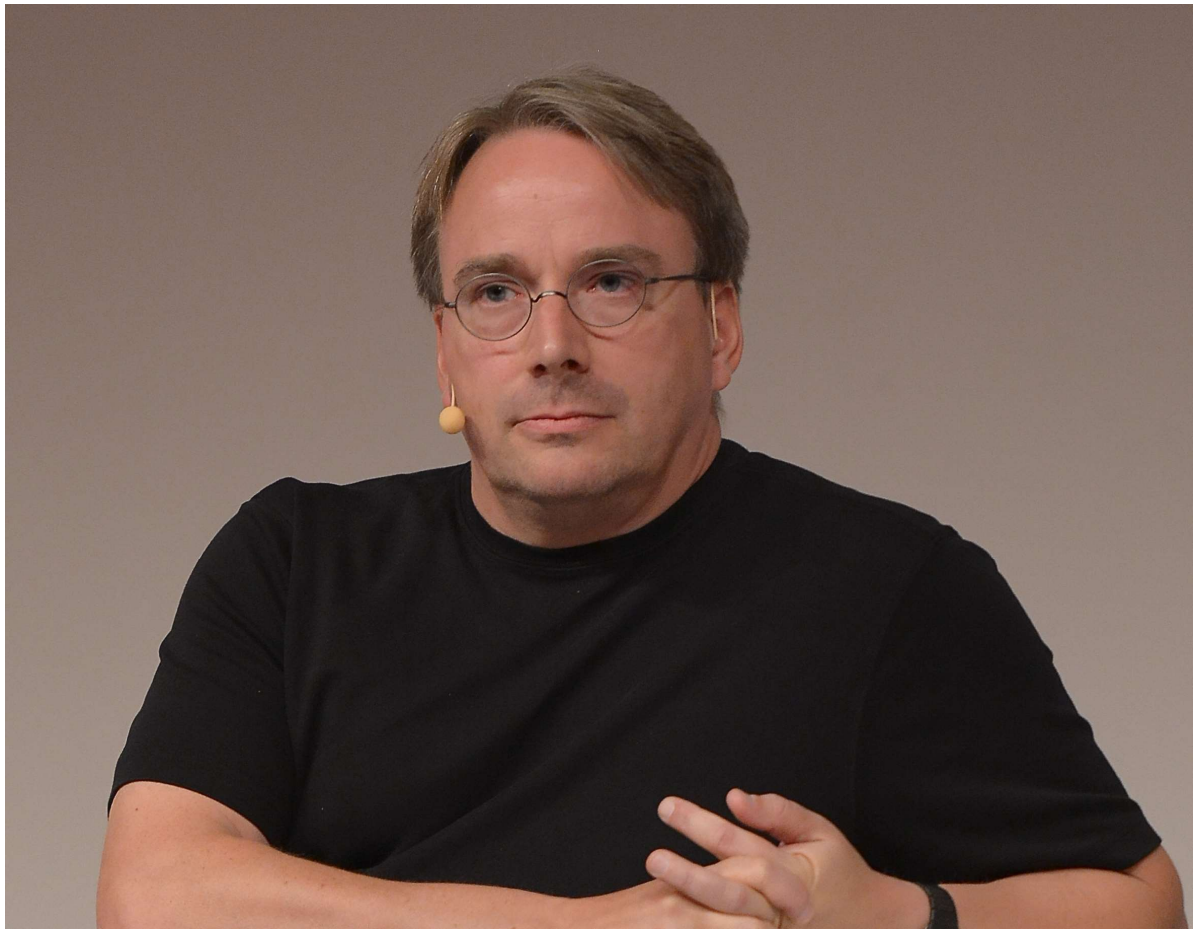
- Unix is an operating system that is installed only on specific hardware
- Unix developed for multi user and multi tasking purposes in mid 1970s
- Unix mostly used by Sun Solaris and supports only few file systems
- IBM AIX, Solaris, HP-UX, Darwin, macOS X, etc.

Where do we find Linux?

https://blog.netdevgroup.com/2016/12/25-cool-linux-facts/







Who developed Linux?

Linus Torvalds, developed the kernel.

https://en.wikipedia.org/wiki/Linus_Torvalds

Who uses Linux?

US Govt, NASA, Metro Rails, Traffic Control,NYSE, Amazon, fortune 500, and the list goes on……

Why Linux?

- Price – Free
- Ease – Not user friendly
- Reliability – runs for years
- Software – Mostly Enterprise level Software
- Multi Tasking – Best for Multi Tasking
- Security – Very Secure
- Open Source – Yes! Lot of distributions

- A must read https://blog.netdevgroup.com/2016/12/25-cool-linux-facts/

- Infrastructure
- Advertising Campaigns
- Company Registration process
- Security Deposits
- Operating System Licensing
- Application Software Licensing

Software auditing happens!

Solution : somehow if we can replace Licensing cost, that would add some benefit.

How? – Linux Operating System and Opensource Tools

How Linux benefits me?

Scenario: a startup company with a team of 10 members

Application Development

Web Development

Data Analytics

Open-Source Vs. Licensed

What is Open-Source

- community developed operating system
- Kernel Programming
- Contribute to the community
- Different Communities

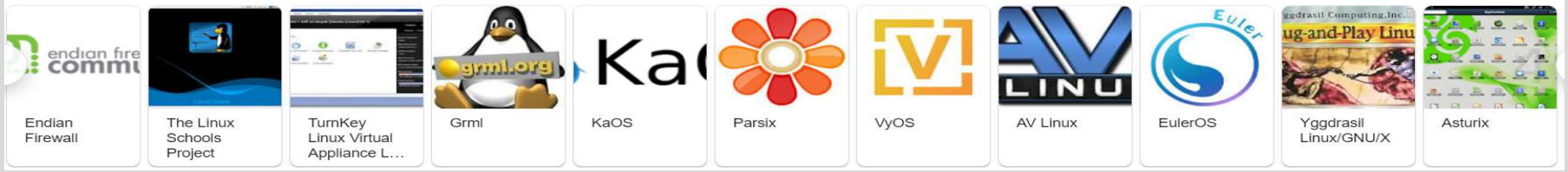
Distributions:

https://www.linuxvmimages.com/

Licensed

- Enterprise Versions
- Windows
- Mac

Distributions (distros)



Redhat Products

Red Hat Enterprise Linux Server

The world's leading enterprise Linux platform. Deploy it on physical systems, as a guest on the most widely available hypervisors, or in the cloud.

US$349

Buy and download

Red Hat JBoss Enterprise Application Platform

A fully certified Java™ EE container that includes everything needed to build, run, and manage Java-based services.

US$8,000

Buy and download

Red Hat Enterprise Linux Workstation

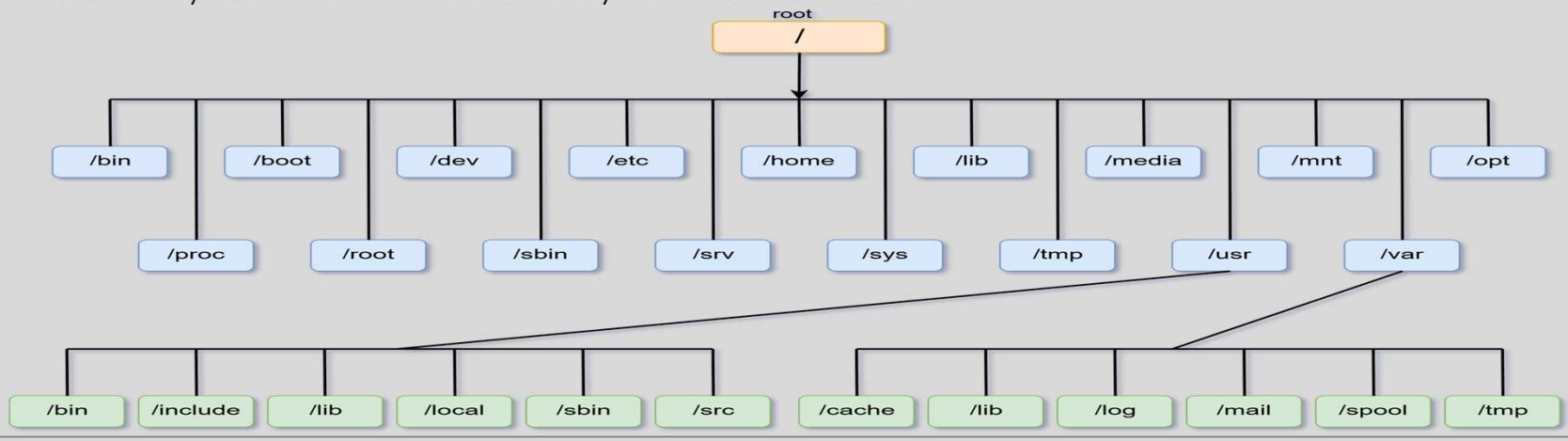
A Linux platform for more powerful systems or systems optimized for high-performance activities like graphics, animation, and scientific computing.

US$299

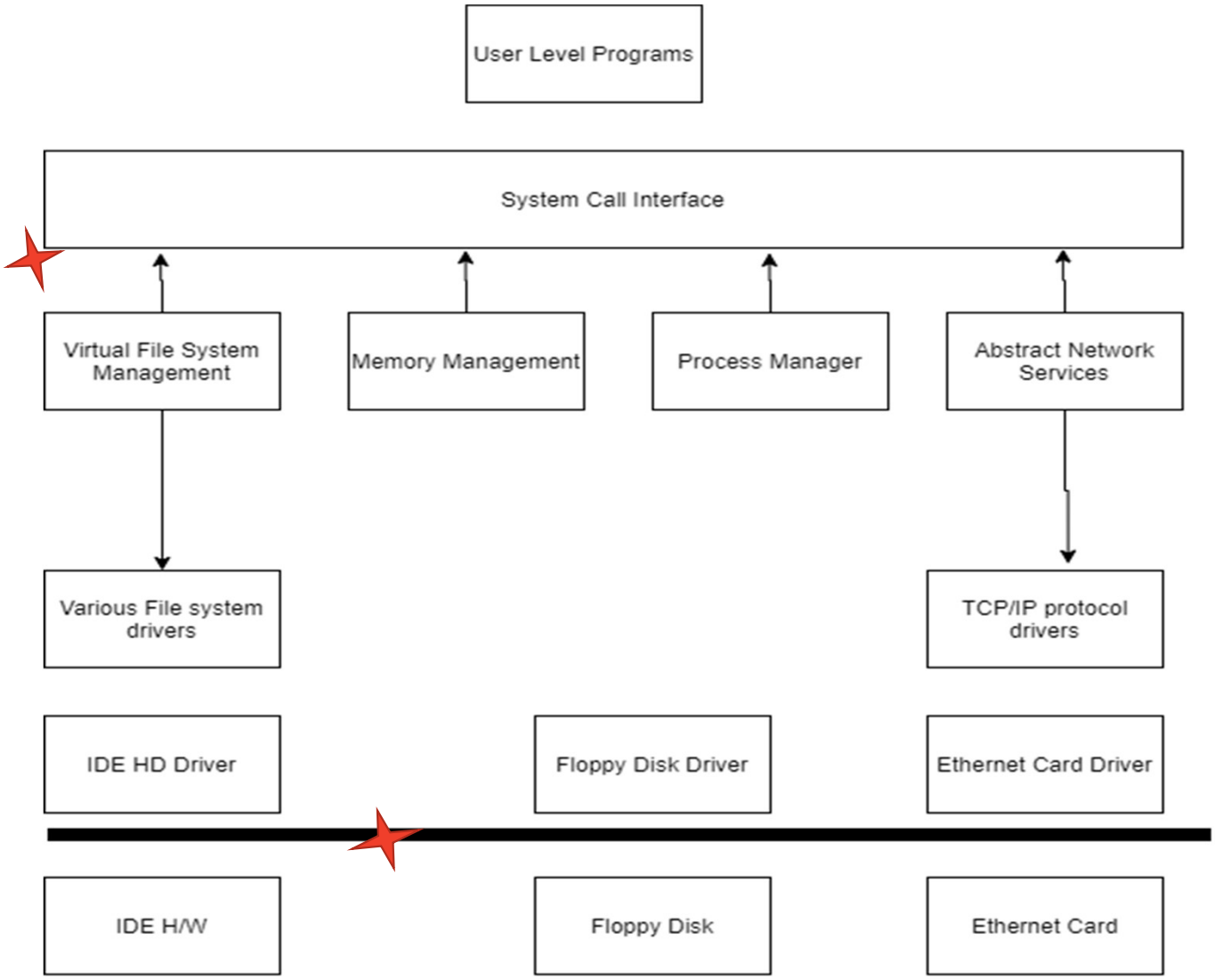
Buy and download

File System

- Linux treats everything as a file
- Every operating system stores data on Disk Drives using structures called a file system.
- The file system consists of files, directories and info needed to access and locate them
- Different types of file systems : EXT2, EXT3, XFS, windows: NTFS, FAT32
- Linux file system stores info in hierarchy of directories and files



- /boot : contains file that is used by the boot loader (grub.cfg)
- /root : root user home directory. It's not the same as /
- /dev : System Devices
- /etc : Configuration files
- /bin: Everyday user commands
- /sbin: System or file system commands
- /opt: Optional add on apps
- /proc: Running processes (only exist in memory)
- /lib: C program library files needed by commands
- /tmp: directory for temporary files
- /home: directory for user
- /var: system logs
- /run: System daemons that run/ start very early to store tmp runtime files like PID files
- /mnt : to mount external file systems (Ex. NFS)
- /media: for CDROM Mounts



Kernel : important parts of kernel

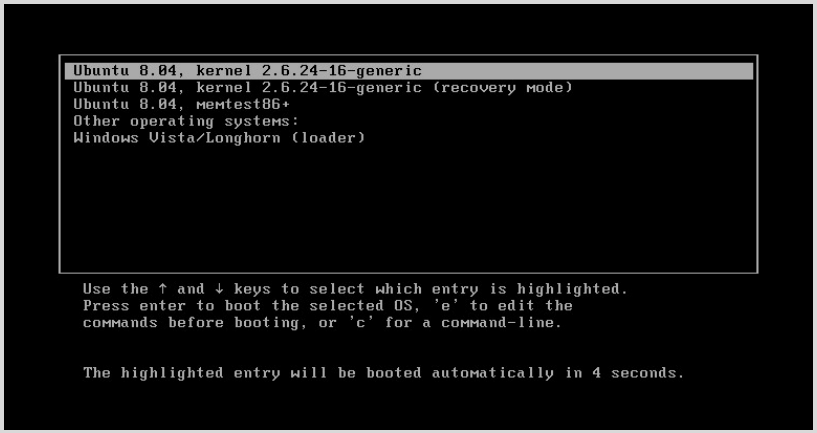
- Process Management
- Memory Management
- Hardware Device Drivers
- Filesystem drivers
- Network Management
- Various other bits and pieces

Linux Vs Windows

	Linux	Windows
Price	Free	$$$$
Ease	Not User Friendly	User Friendly
Reliability	Runs for years	Often requires reboot
Software	Mostly enterprise level SW	Much larger selection of SW
Multi Tasking	Best for multi tasking	Available with High CPU/Mem resource
Security	Very Secure	Somewhat secure (3rd party)
Open Source	Open to Public	Not an Opensource

Virtualization : Why virtualization?

Install OS on Hardware/ Bare – metal



Dual Boot

Host OS – Hypervisor – Linux OS

- Host OS : Windows 10
- Install Hypervisor : oracle virtualbox
- Install Linux OS

Should have decent amount of ram, hdd and processor.

Performance impact,

Another solution : rely on cloud features

Cloud Environment (AWS)

- AWS Account
- Credit/Debit Card (Virtual Cards)
- 750 Hours access for 1 month (Free Tier)
- 3 Servers – for 1 hour (AWS counts it as 3 hours)
- Host OS – git bash
- Key Pair .pem
- SSH protocol – we are going to connect to server in the cloud
- Ensure to shut down servers (stopped state)
- Do not share your credentials!

Amazon Web Services

END OF SESSION 1