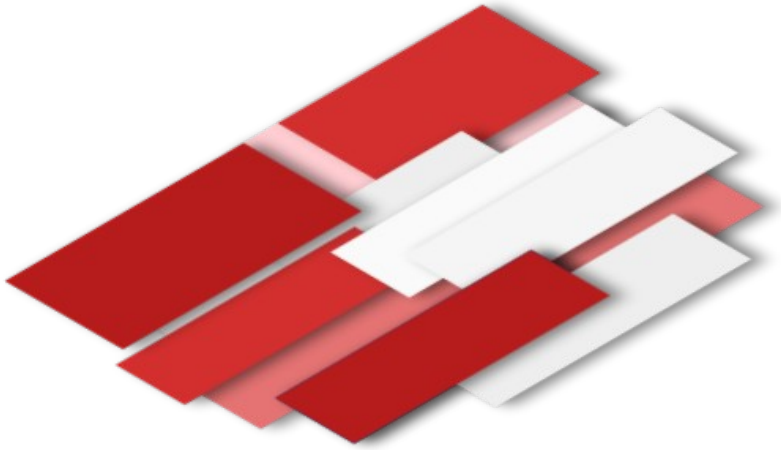
Linux Diversity

Dive into Linux Subsystem

for Personal Educational Purpose.



Jakarta, Indonesia

2 February, 2020

About Epsi

Yet, another underachiever.

But hey, I have my own blog.

YET ANOTHER OPEN SOURCE BLOG

About This Material

After watching this, you will understand:

1) A more systematic steps to learn GNU/linux.
2) How to make your own learning plan (syllabus).

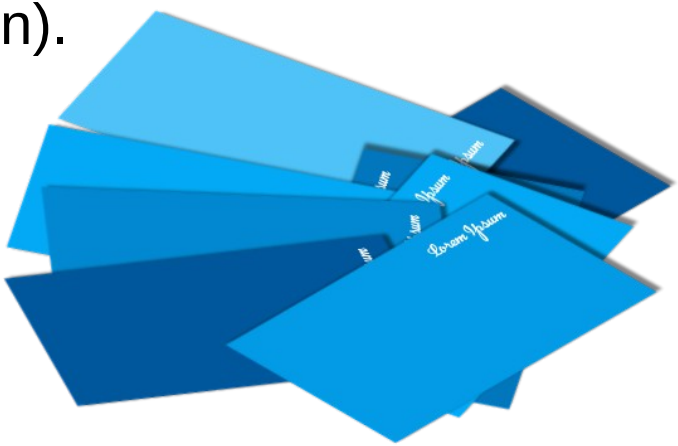
This material is not really comprehensive.

I still have so much to learn.

After first linux install?

You might desire to

- Join linux community.
- Read documentation (statistically rare person).
- Update system.
- Install a bunch of application.
- Get busy with command line terminal.
- Surfing wiki and search engine.



And then what?

Where to go from here?

- Should I try other distro?
- What other distro should I try?
- So many distro, so little differences!
- Should I use VM or multiboot?

Learn part of system!
Instead just switching distro.

How Modular is Linux?

How Modular is Linux?

Package Manager

APT, ALPM, DNF, XBPS,

Zypper, Portage

Init

SysV, systemd, openRC,

runit, S6.

File System

ext4, XFS, Reiserfs,

BTRFS, ZFS.

Standard C Library

glibc or musl

Desktop Environment

GTK+ based, QT based,

enlightenment.

Window Manager

Stacking, Tiling,

Dynamic, Compositor.

Modular Linux

You still need to Switch distro,
by considering these three diversity

Package Manager

You can learn using docker.

File System

Require long time examination.

Init

You can learn using docker.

When do I need a physical OS?

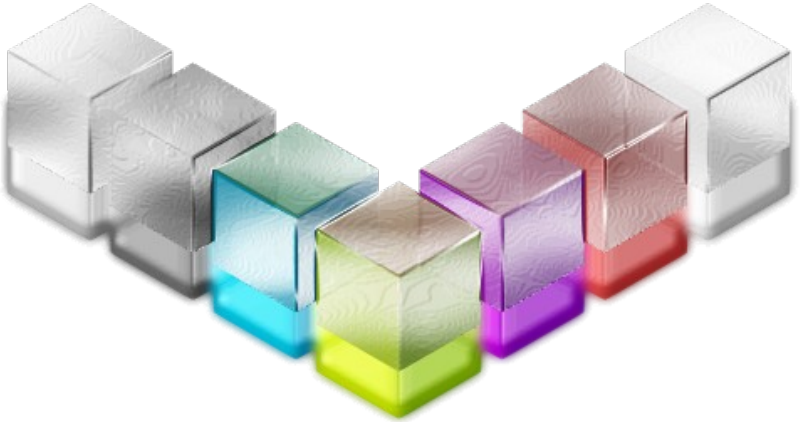
- You can learn Package Manager using Docker.
- You can also learn Init using Docker.
- But you cannot learn Filesystem using Docker.

File system experience require long time examination.

Thus you have to live with baremetal (physical) OS.

Desktop Environment/ Window Manager

Most beginner start from switching DE/WM



[Desktop Customization]

Yet Another Presentation.

Common Subsytem?

A few must have knowledge

Wireless

[Wireless Command Line]

Audio

[Audio Command Line]

Boot Process: Grub2

[What to Do]

When the System Stuck, on Boot

Dbus (for WM user only)

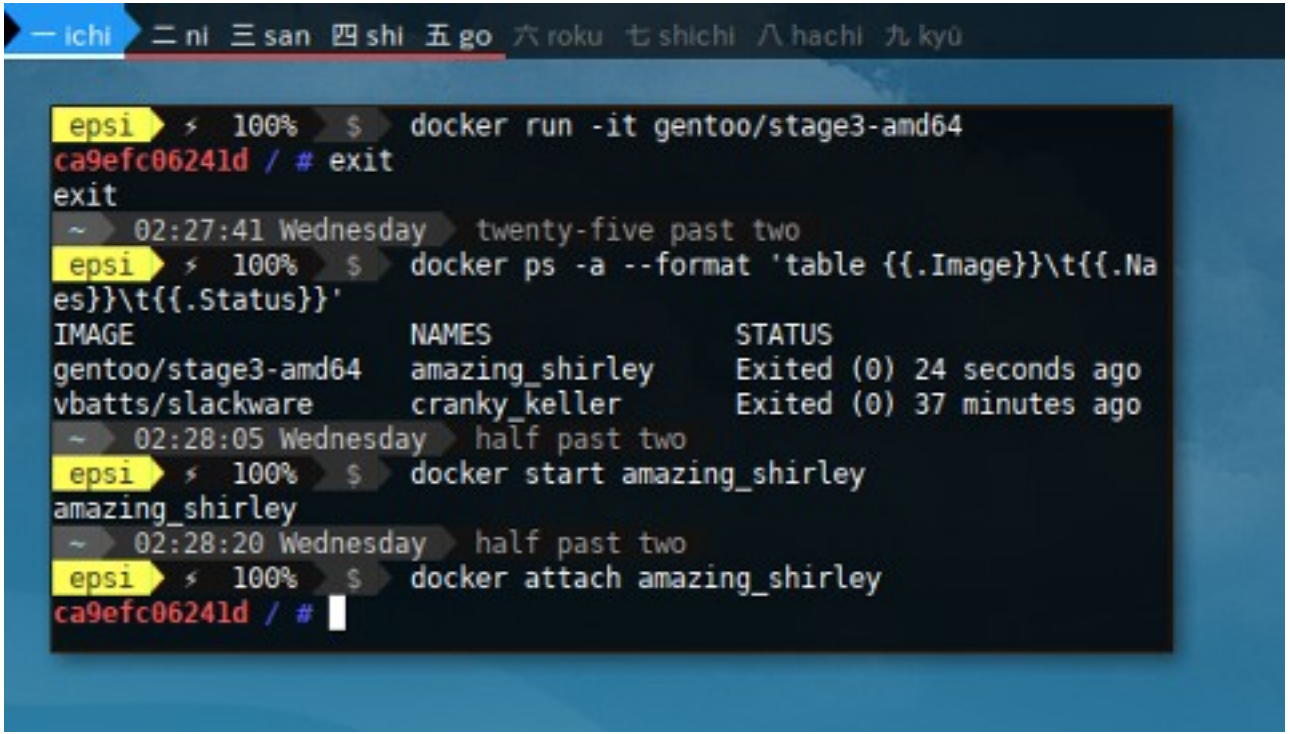
[dbus in Window Manager]

Package Manager

Docker Test Bed

Package Manager with Docker

- APT
- ALPM
- DNF
- XBPS
- Zypper
- Portage



Docker is suitable for
old notebook with low resources.

More Articles about

Docker Test Bed

- [Debian - APT]
- [openSUSE - Zypper]
- [Fedora - DNF]
- [Void - XBPS]
- [Slackware - Package]
- [Gentoo - Portage]

Package Manager Feature?

Deep knowledge require long time experience.

Most of issues comes months after install.

Be Aware of Package Manager Advantage/Issue

- [APT Pinning]
- [Selective Emerge]
- [Unbundling AUR in ALPM]
- [Upgrading Fedora]
- [GhostBSD Ports]

Init?

Who Use What!

OpenRC

Gentoo, Artix, Devuan, GhostBSD.

SysV

Slackware, Devuan.

runit

Void, Artix.

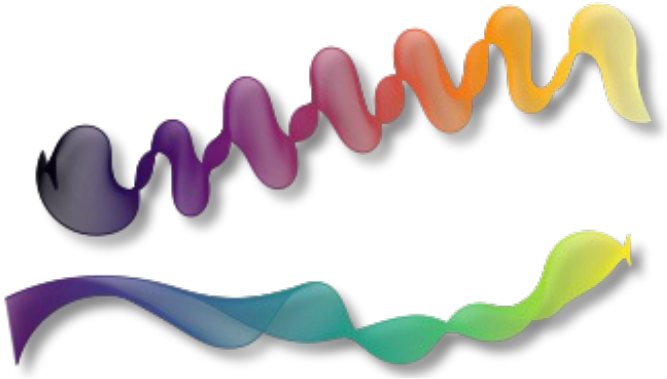
s6

Obarun, Artix.

systemd

Most major distro.

Civil War



[The systemd Controversy]

Still debating in 2020 between:

systemd+gnome versus **linux+diversity**.

The Four Elements of an Init System

/sbin/init

pid 1

Process Supervision

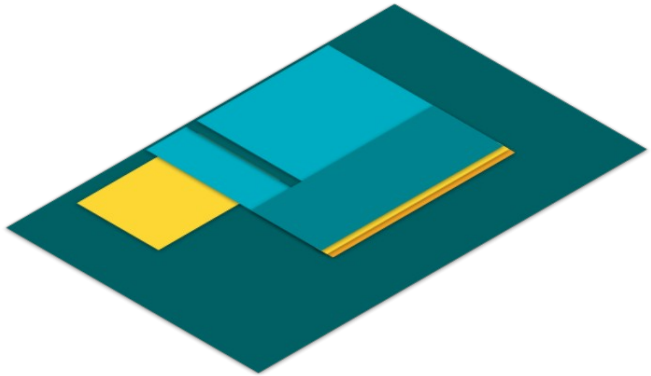
Service Management

Reference:

[s6_lightning_talk.pdf]

Example Usage

[Setup LAMP stack with Manjaro OpenRC]



File System?

ext4, XFS, Reiserfs, BTRFS, ZFS.

Deep knowledge require long time experience.
Most of issues comes months after install.
You cannot just install, and just understand file system instantly.

File System

and how to find them

ext4

Most common in GNU/Linux.

ZFS

Common in BSD.

UFS

Common in BSD

BTRFS

Default in openSUSE /

XFS

Used to be Default in openSUSE /home

Example Issue and Workaround:

- BRTRFS snapshots:
  - [File System - Trapped in Snapper Rollback]
- BRTRFS with GRUB:
  - [File System - GRUB2 support for BTRFS]
- UFS along with linux Multiboot:
  - [GhostBSD - Multiboot]
- NixOS in Multiboot:
  - Use chainloader in GRUB

Standard C library in OS?

glibc or **musl**.

I must admit,
I do not have any experiece with musl.

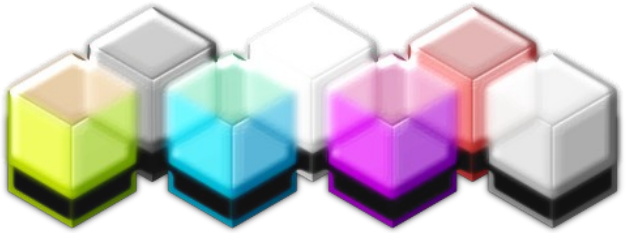
Switching Distro?

While you are young and still have time.
Get yourself quarterly (three months) curriculum/plan.

Just get pass through it.
No need to go deep with coding.
Be an ordinary user.

After this one year,
you are already mature enough
with broader view to choose
whatever linux you want.

If you want to get more wisdom.
Learn BSD land in the second year.



Example Syllabus (learning plan)

Make a target of first year with linux.

Ubuntu/ Manjaro/ Mint	openSUSE	Arch	Gentoo
Quarter I	Quarter II	Quarter III	Quarter IV
• learn the DE universe: gnome-shell, plasma, xfce4 • learn basic command line.	• learn filesystem: btrfs, xfs • also learn yast2	• know your system, • dive into the world of cli/terminal shell	• learn init other than systemd • learn patience

Example Q1:
Ubuntu/ Mint/ Manjaro

Basic Terminal Command

- ls, cat, grep, ps, top, man, info, su, sudo
- always use $ man for documentation before google.

Read The Fine Manual

- [ubuntu-manual] (GUI)
- [debian-handbook] (hertzog)

Also learn about basic linux briefly

- Examine Filesystem Hierarchy Standard (FHS)
- Examine boot process.
- Solving audio or wireless issue.

More Terminal Command

- nmcli, ncdu, ntop, cfdisk
- lspci, lsusb, lsmod, dmesg, ip ,iw

Example Q3:
Arch: Leverage yourself to Arch

Install with command line only

- add driver manually, add username manually, add DE manually, use pacman

Read the holy arch wiki

- there is a lot of good material here

Use packer, cower, or other AUR Helper

- automatic compilation, try any unofficial application from AUR

Dare to use minimalis WM, rather than eyecandy DE

- openbox, awesome, i3, bspwm

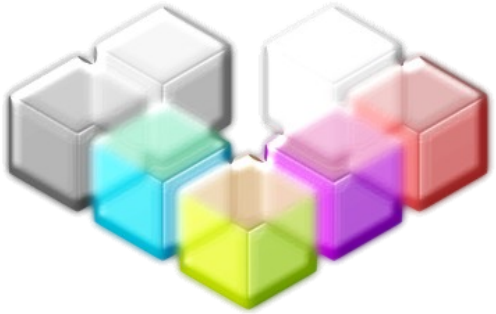
Penetration Testing Application

- add and install repo: BlackArch or maybe ArchStrike

Philosophy: Knowing Your System

Install Log/ Post Install Log

- [Fedora]
- [openSUSE]
- [Debian wheezy] (old)
- [GhostBSD]
- [Mageia]
- [Slackware]

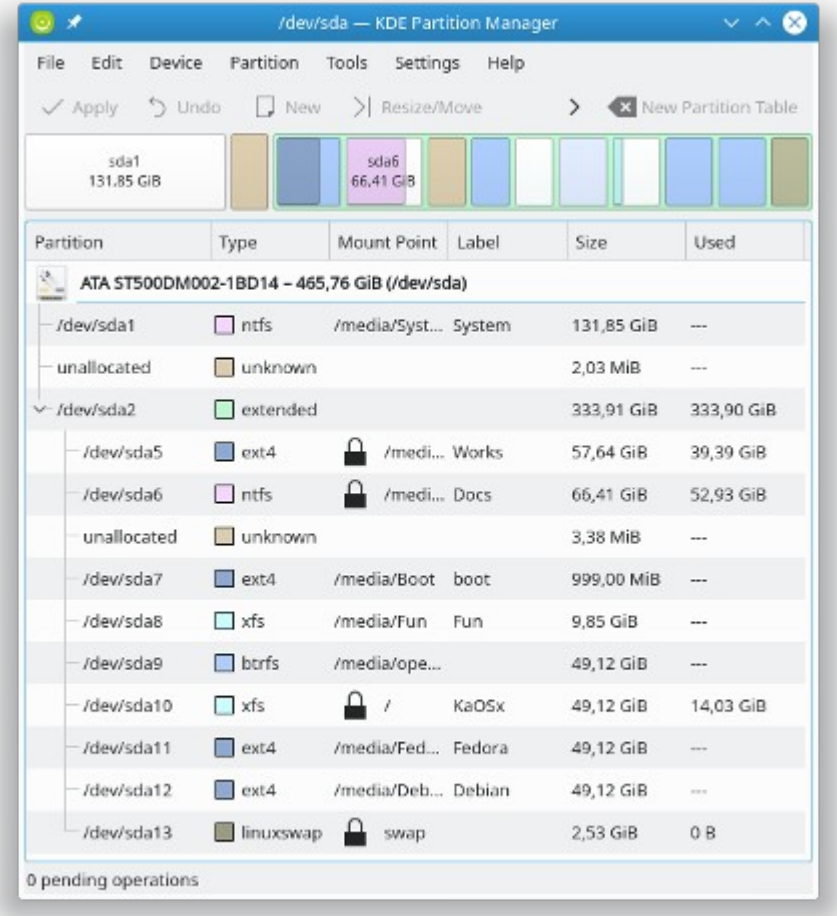


Multiboot?

For linux enthusiast.

Multiboot

[Partition Schema]



Partition Schema

Old Example Using MBR

Primary: Windows

Usually with UEFI Partition.

Extended: Linux

- Swap
- Shared Partition
- First Distro
- Second Distro
- Third Distro

Extended: BSD

Not discussed here.

fstab

- Learn to make shared partition.
- BTRFS subvolume is interesting.

[Multiboot - /etc/fstab]

chroot

- Some OS is comfortably installed using chroot:
  - such as: Gentoo, LFS.
- Other OS can be updated using chroot:
  - beware of small issues.

[Multiboot - chroot]

Tips

Keep your samba's network share persistence along multiboot.

[Multiboot - Samba]

Tips

Linux Multiboot with BSD,
can be done using UFS, instead of ZFS.

[GhostBSD: Multiboot]

Kernel?

make menuconfig

Interesting Diversity?

Interesting Diversity?

Project Trident

Runit + ZOL + XBPS + MUSL.

LFS

No comment.

Alpine Linux

Busybox (no GNU tools).

NixOS

Exotic Package Manager.

And many more

You name it!

What is Next?

More Wisdom!

Learn BSD land!

Questions?

Don’t be shy!

The End

Thank You for Your Time.