KERNEL MASTERS

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Setup

Linux Device Drivers Development Environment

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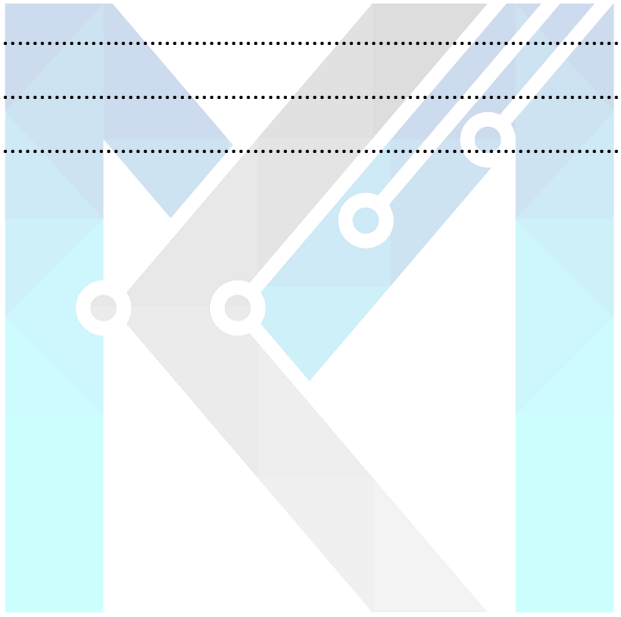
Issue 1: 4



Kernel Configuration, Compilation and installation [Own built Kernel]

Two ways to own built kernel:

1. Manual Method
2. Automation Method using script

1. Automation Method

Run the below script and execute all above commands automatically using shell script.

$ ./x86_kernel_build.sh

2. Manual Method

2.1. Install Required Packages

$ sudo apt-get install flex bison ncurses-dev libssl-dev

2.2. Download Kernel Source code

Create KM_GITLAB folder in home directory

$ mkdir ~/KM_GITLAB

Enter KM_GITLAB folder

$ cd ~/KM_GITLAB

Clone linux-5.4.182 repository from KM GITLAB Server.

$ git clone http://138.197.197.6/eldd-level1/linux-5.4.182.git

2.3. Kernel Configuration

Enter kernel source tree

$ cd ~/KM_GITLAB/ linux-5.4.182

$ du -sh .

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Run configuration command to configure kernel source code

$ make menuconfig (By default configuration file for x86 platform is /boot/config-`uname -r`)

output of kernel configuration is .config file.

CONFIG_<option>=y/m/notset ; y -Static ; m-module(Dynamic)

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2.4. Kernel Compilation

Static Compilation

$ make -j4 (Static Compilation)

out put is vmlinux (kernel raw image) - virtual memory linux

$ du -sh vmlinux (without compressing)

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Dynamic Compilation

$ make modules (Dynamic Compilation)

out put is .ko

$ du -sh .

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2.5. Kernel Installation

Dynamic Installation

$ sudo make modules_install (.ko installation)

out put is /lib/modules/`uname -r`/build/

Static Installation

$ sudo make install

out put is /boot/vmlinuz-`uname -r`

(vmlinuz is compressed linux kernel is virtual memory linux gZip)

out put is /boot/config-`uname -r`

out put is /boot/System.map-`uname -r`

out put is /boot/initrd-`uname -r`

out put is /boot/abi-`uname -r`

$ du -sh vmlinuz-`uname -r`

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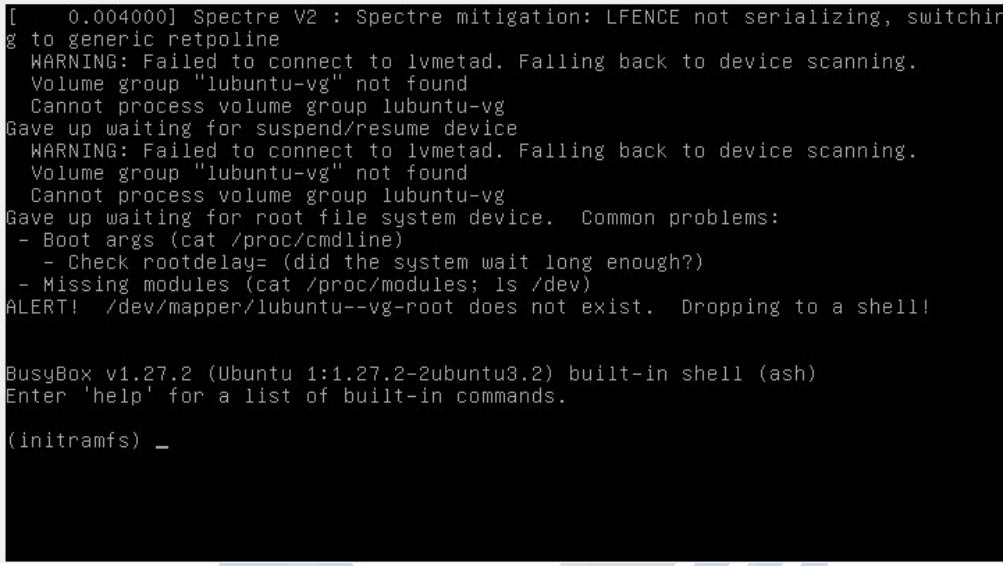
2.6. Reboot

$ sudo reboot

In grub menu, select advanced options then select 5.4.182 kernel to boot.

3. Issues

Issue 1:



This issue seems like initramfs failed and this problem occur first install modules then static installation.

$ sudo make modules_install

$ sudo make install

Solution:

First static install then module installation. See the below steps

$ sudo make install

$ sudo make modules_install