

OS

Optional Assignment-3

Akshala Bhatnagar
2018012

- **All steps taken to create a virtual machine**

1. Install Virtualbox.
 - `sudo apt-get install virtualbox`
2. Download ISO file for linux 16.04 (File:ubuntu-16.04.1-desktop-amd64.iso) was from the iiit ftp server : <ftp://ftp.iiitd.edu.in/Linux%20OS/Ubuntu/>
3. Create a new machine on Virtualbox. For this open Virtualbox and select the new icon.
4. Give a name to the virtual machine. Set its type to Linux and version to Ubuntu(64-bit).
5. Give the virtual machine 4096MB RAM.
6. Then choose "Create a virtual hard disk now". Select hard disk file type to be "VDI(Virtual Disk Image)" and dynamically allocate hard disk.
7. Choose the location to create the virtual hard disk and set the virtual hard disk size to 50GB.
8. Afterwards start the machine with the downloaded ISO image.
9. For this click on the virtual machine and then select the start icon. Then give the location of the downloaded ISO file.
10. Now the virtual machine has been booted. Select install ubuntu option.
11. Select the region which was kolkata and keyboard layout. Then give the name, username and password.
12. Now the virtual machine has been setup.

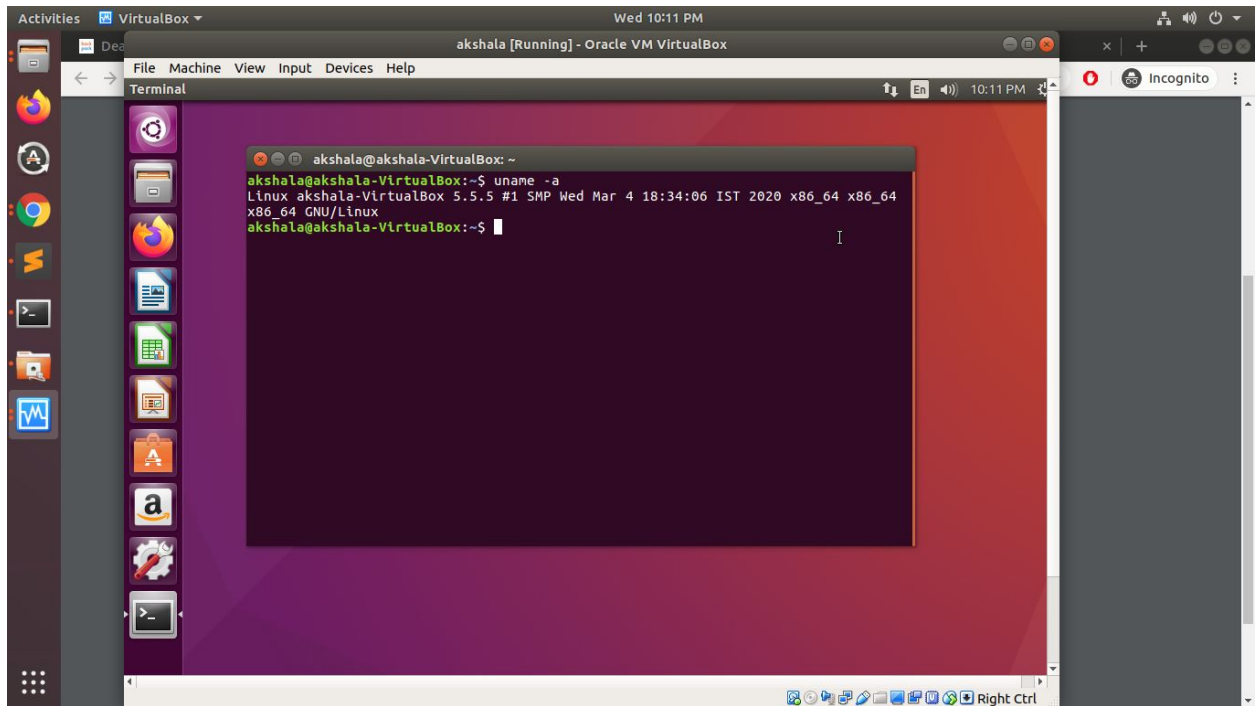
13. To speed up the process of building the linux kernel, we assign 4 cores to this machine. This is done by shutting down the machine and then going to the settings of the machine. In settings go to processors. Now assign 4 cores to this machine.

14. The virtual machine has now been setup.

● **All steps taken in compiling the linux-5.5.5 kernel**

1. Open the terminal in the virtual machine and run the following commands.
 - `sudo apt-get update`
 - `Sudo apt-get upgrade`
2. Download the source code file for linux-5.5.5 kernel. Provide password aos
 - `scp aos@192.168.1.161:linux-5.5.5.tar.xz .`
3. Download packages for building kernel.
 - `sudo apt-get install git fakeroot build-essential ncurses-dev xz-utils libssl-dev bc flex libelf-dev bison`
4. Extract the kernel source code file.
 - `tar xvzf linux-5.5.5.tar.xz`
5. Move to this folder
 - `cd linux-5.5.5`
6. Copy the current kernel's config file
 - `cp /boot/config-$(uname -r) .config`
7. Run the make command. Keep enter pressed for a long time to answer all the questions asked in the make command as default.
 - `make -j4`
8. Install the modules which were enabled
 - `sudo make modules_install -j4`
9. Install the kernel.
 - `sudo make install`
10. Enable kernel for boot.
 - `sudo update-initramfs -c -k 5.5.5`
11. Update grub.
 - `sudo update-grub`
12. Now restart the machine. Open the terminal and run the following command.
 - `uname -a`

- Output for `uname -a`



The screenshot shows a desktop environment with a VirtualBox window titled "akshala [Running] - Oracle VM VirtualBox". Inside the VirtualBox window is a Linux desktop with a purple and red background. A terminal window is open, displaying the output of the `uname -a` command. The output is as follows:

```
akshala@akshala-VirtualBox: ~  
akshala@akshala-VirtualBox:~$ uname -a  
Linux akshala-VirtualBox 5.5.5 #1 SMP Wed Mar 4 18:34:06 IST 2020 x86_64 x86_64  
x86_64 GNU/Linux  
akshala@akshala-VirtualBox:~$
```