LAB 2 – INSTALLING AND MANAGING UBUNTU SERVER

2.1 Installing Ubuntu Server

Ubuntu is a free open-source Linux based operating system that is widely used for desktop, server and cloud platforms. It was developed and maintained by Canonical Ltd, and was the first released in October 2004. Ubuntu is based on Debian, another well-known Linux distribution but focuses on usability, regular updates and ease of installation.

Ubuntu editions include:

- Ubuntu desktop: For personal computers and laptops
- Ubuntu server: Designed for server enviroments, cloud computing and data centers
- Ubuntu core: Minimal version focused on IoT and containerized applications

In this cource practicing, we only concerntrate on **Ubuntu Server**

Source Iso File for Ubuntu server to install in Vmware virtual machines:

ubuntu-24.04.2-live-server-amd64.iso

The process of creating virtual machine and installing ubuntu server operating system are completely similar to Lab 1.

After installing Ubuntu Server, the three components that are the most commonly used consists of ***hostname management***, ***ip address management*** and ***system datetime management.***

To configure IP address, view 2.3.1 part of this material

To configure DateTime, view 2.3..2.3 part of this material

To configure hostname:

- To change hostname: ***sudo hostnamectl set-hostname NEW_NAME***
- To view hostname: ***hostnamectl***
- To map hostname with ip localhos or 127.0.0.1: Update ***/etc/hosts*** (so local resolution still works)

2.2 Files and folders storage in Ubuntu and related commands:

Start Ubuntu server with Vmware Workstation:

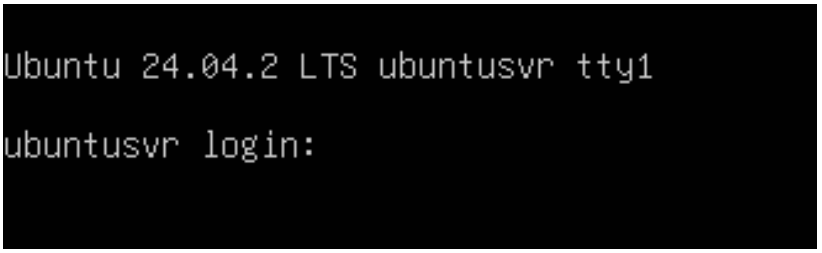

Image 2.1 UI of Ubuntu server as start running

Provide username and password that declared in the process of ubuntu server installation

Image 2.2 UI of successful login into Ubuntu server.

View files and sub folders of the current folder: command **ls**

Change to another folder: command cd <folder_name>

Note: ./ represent the current folder and ../ represent the parent folder of the current folder.

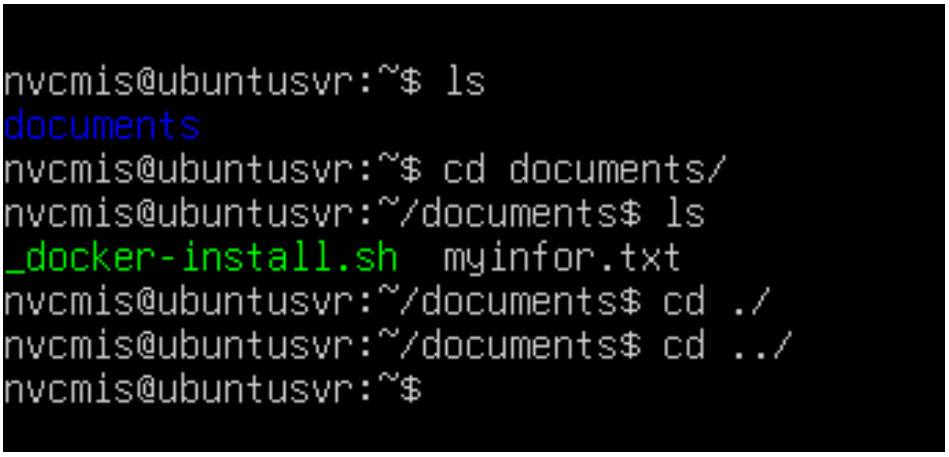

Image 2.3 Example of ls, cd commands, the symbols ./ and ../

You see in Image 2.3, the folder documents has two files including _docker-install.sh and myinfor.txt, how to open files to read and to write in ubuntu enviroment. The solution is similar to other Linux versions including MacOS, we could use tool *vi* to open and edit the file. Syntax of the command: **vi <file_name>**

For instance: vi myinfor.txt

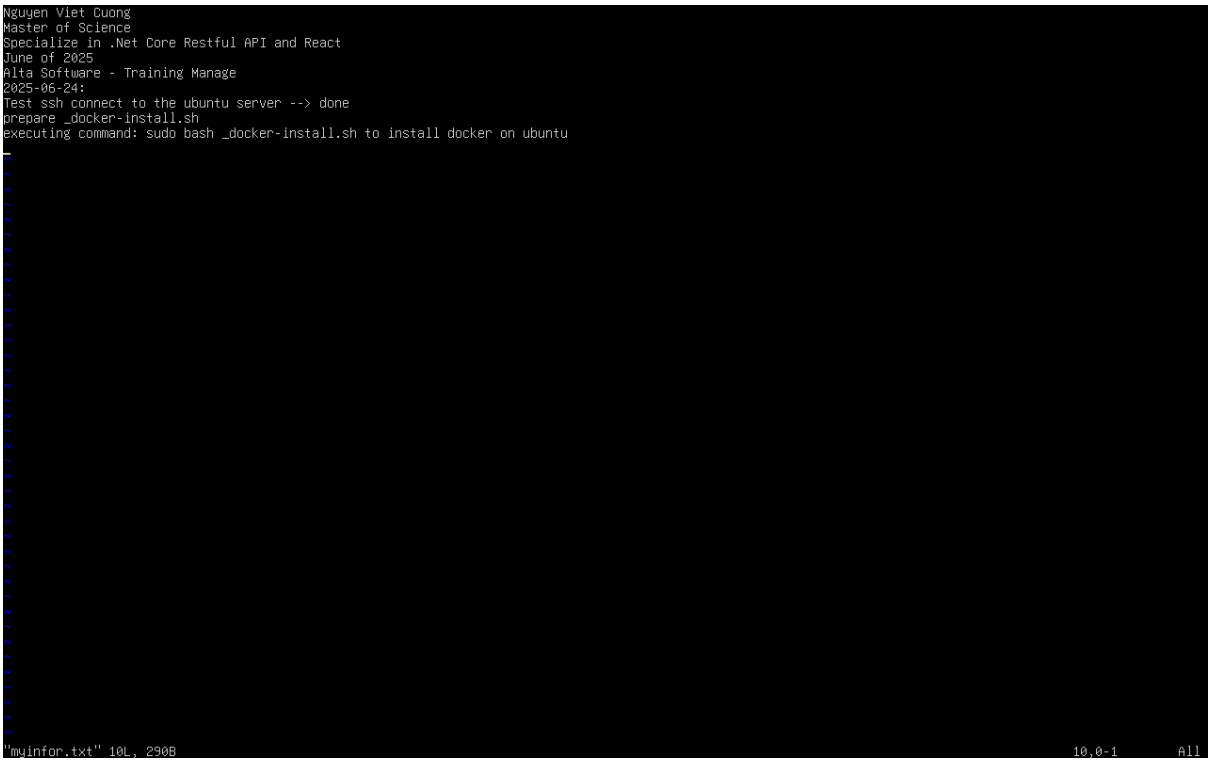

Image 2.4 Command line interface of vi tool in Ubuntu and other linux versions

To quit edit mode and save file, press **Esc** button and execute command **:wq**,

Image 2.5 :wq to quit and save file

To quit without saving file, you execute the command :q!

To create new file in ubuntu, you could use either **touch <file_name>** or **vi <file_name>**

To sign out from the current user: **pkill -KILL -u <user_name>**

To restart the server: **sudo reboot**

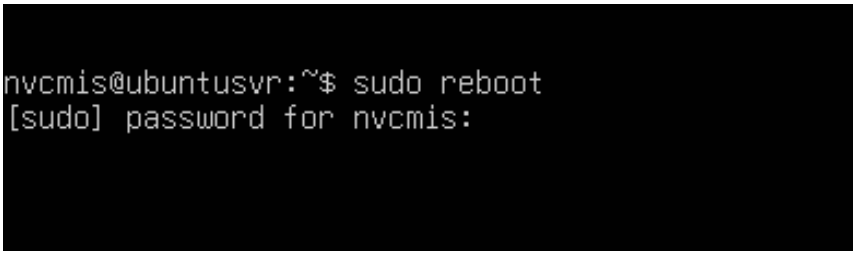

Image 2.6 Restart the server with sudo reboot command

To shutdown the server use: sudo shutdown <number>

The system will be shutdown right after [number] **minutes** from executing the command, or sudo shutdown now to shutdown immediately.

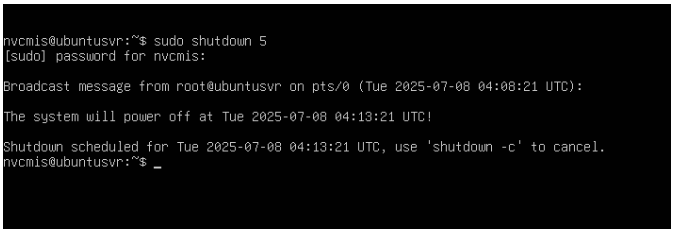

Image 2.7 Schedule shutdown the system in 5 minutes

2.3 Commands related to system and installing softwares:

2.3.1 Network configuration:

To get Ip address: use command **ip a** or **ip addr show**

To get default gateway: use command **ip route**

To get dns server: use command **cat /etc/resolv.conf**

To config network such as set IP address, default gateway and dns server, edit file /etc/netplan/50-cloud-init.yaml as the following:

```
network:
  version: 2
  ethernets:
    enp0s3:
      dhcp4: no
      addresses: [192.168.1.100/24]
      gateway4: 192.168.1.1
      nameservers:
        addresses: [8.8.8.8, 1.1.1.1]
```

Then apply the changes by command: **sudo netplan apply**

Test the configuration by command: ping 8.8.8.8 and ping google.com

2.3.2 Software installation and other commands:

2.3.2.1 Software installation:

In windows, if you need to install softwares, you must have administrator privileges, commonly, you usually run the installation package with administrator role. In Linux, the similar that run a command as administrator is **sudo** key word.

Command: **sudo apt install <package_name>** to install software on ubuntu

Apt stands for Advanced Package Tool is commonly used for software installation on Linux.

Practice: Install web server Nginx on Ubuntu

1/ Install nginx:

sudo apt install nginx -y

2/ Start and enable nginx:

sudo systemctl start nginx

sudo systemctl enable nginx

At this step, port 80 of ubuntu might has been used by the other process. You have to list the process that used port 80 by command: **sudo lsof -i :80**

```
nvcmis@ubuntusvr:~$ sudo lsof -i :80
COMMAND  PID USER   FD   TYPE DEVICE SIZE/OFF NODE NAME
httpd   6144 root    4u  IPv6  43044      0t0  TCP *:http (LISTEN)
httpd   6147 root    4u  IPv6  43044      0t0  TCP *:http (LISTEN)
httpd   6148 root    4u  IPv6  43044      0t0  TCP *:http (LISTEN)
httpd   6149 root    4u  IPv6  43044      0t0  TCP *:http (LISTEN)
nvcmis@ubuntusvr:~$
```

Image 2.8 Display services that have been using port 80

If you stop httpd or apache may be there is errors because you stopped the wrong services name. Therefore, it's need to find exact service name

```
nvcmis@ubuntusvr:~$ systemctl list-units --type=service | grep -i apache
  snap.nextcloud.apache.service
ud.apache
nvcmis@ubuntusvr:~$
```

Image 2.9 Display full exactly service name that contains string apache

sudo snap stop nextcloud.apache

sudo snap set nextcloud apache.enable=false

Finally, start and enable nginx

3/ Allow nginx through firewall:

sudo ufw allow 'Nginx Full'

4/ Check web page: http://your-server-ip/

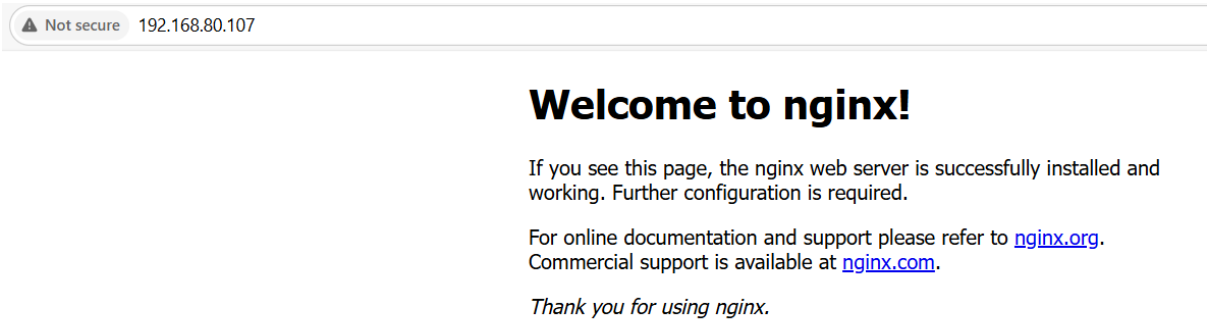

Image 2.10 Test nginx page from other machines

5/ Serve a custom page: /var/www/html/

2.3.2.2 Software uninstallation:

To uninstall a software on ubuntu, this document recommend you to use apt tool:

To uninstall and do not remove configuration file:

sudo apt remove <package_name>

To uninstall and remove configuration file:

sudo apt purge <package_name>

To clean up unused dependencies: sudo apt autoremove

How to know precisely packname to remove: **dpkg -l | grep keyword**

```
nvcmis@ubuntusvr:~$ dpkg -l | grep docker
ii  docker-buildx-plugin                0.24.0-1~ubuntu.24.04~noble
ii  docker-ce                           5:28.2.2-1~ubuntu.24.04~noble
ii  docker-ce-cli                       5:28.2.2-1~ubuntu.24.04~noble
ii  docker-ce-rootless-extras           5:28.2.2-1~ubuntu.24.04~noble
ii  docker-compose-plugin               2.36.2-1~ubuntu.24.04~noble
nvcmis@ubuntusvr:~$ docker --version
Docker version 28.2.2, build e6534b4
nvcmis@ubuntusvr:~$
```

Image 2.11 Docker elements installed in the system

```
nvcmis@ubuntusvr:~$ sudo apt purge docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin
[sudo] password for nvcmis:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  containerd.io libltdl7 libslirp0 pigz slirp4netns
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  docker-buildx-plugin* docker-ce* docker-ce-cli* docker-ce-rootless-extras* docker-compose-plugin*
0 upgraded, 0 newly installed, 5 to remove and 72 not upgraded.
After this operation, 319 MB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 127402 files and directories currently installed.)
Removing docker-buildx-plugin (0.24.0-1~ubuntu.24.04~noble) ...
Removing docker-ce (5:28.2.2-1~ubuntu.24.04~noble) ...
Removing docker-ce-cli (5:28.2.2-1~ubuntu.24.04~noble) ...
Removing docker-ce-rootless-extras (5:28.2.2-1~ubuntu.24.04~noble) ...
Removing docker-compose-plugin (2.36.2-1~ubuntu.24.04~noble) ...
Processing triggers for man-db (2.12.0-4build2) ...
(Reading database ... 127182 files and directories currently installed.)
Purging configuration files for docker-ce (5:28.2.2-1~ubuntu.24.04~noble) ...
nvcmis@ubuntusvr:~$ dpkg -l | grep docker
nvcmis@ubuntusvr:~$ docker --version
-bash: /usr/bin/docker: No such file or directory
nvcmis@ubuntusvr:~$ _
```

Image 2.12 Uninstall docker

```
nvcmis@ubuntusvr:~$ sudo apt autoremove
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  containerd.io libltdl7 libslirp0 pigz slirp4netns
0 upgraded, 0 newly installed, 5 to remove and 72 not upgraded.
After this operation, 126 MB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 127180 files and directories currently installed.)
Removing containerd.io (1.7.27-1) ...
Removing libltdl7:amd64 (2.4.7-7build1) ...
Removing slirp4netns (1.2.1-1build2) ...
Removing libslirp0:amd64 (4.7.0-1ubuntu3) ...
Removing pigz (2.8-1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.4) ...
nvcmis@ubuntusvr:~$ _
```

Image 2.13 Remove all unused dependencies

2.3.2.3 Other commands:

Introduction of curl tool in Linux: **curl** lets you make a network request (http, ftp) from the command line. It's commonly used to download file, send data to API or test web services. Curl usually comes with Ubuntu as default.

Practice 1: Using curl to get countries and their capitals around the world with the url: https://countriesnow.space/api/v0.1/countries/capital

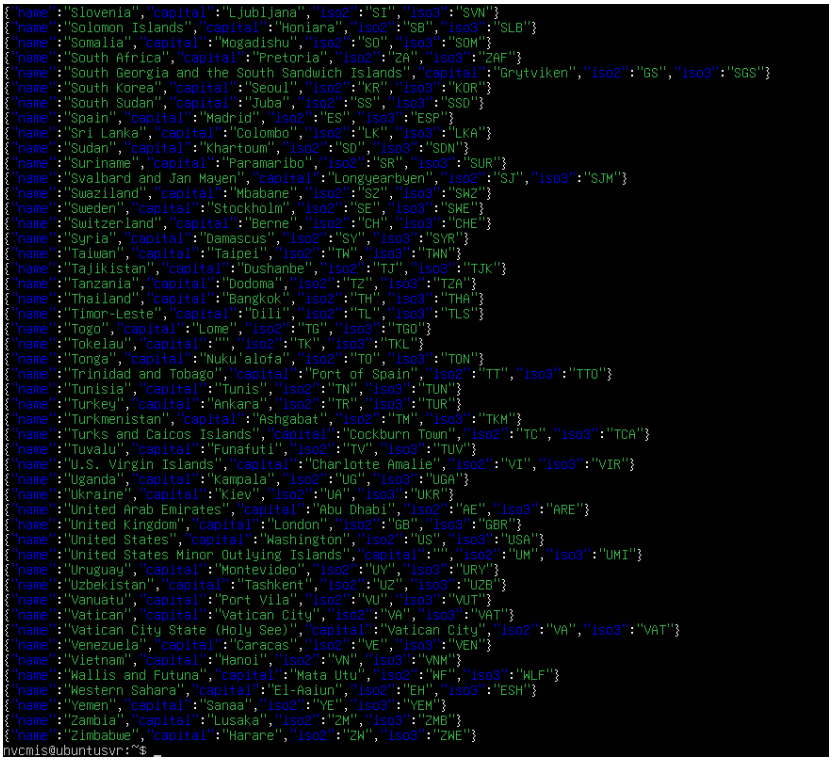

Image 2.11 View list of countries'capitals around the world with curl command.

If you want to display each object per line, in Linux, jq tool is used with parametter -c and iterates the array '.[]'

View system date time with Ubuntu Server: **timedatectl** command

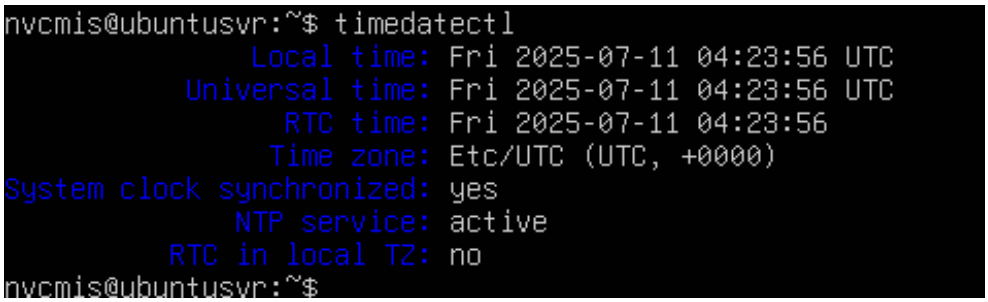

Image 2.12 View the current date time with Ubuntu server

To adjust display current date time with UTC+07 Asia/Ho_Chi_Minh use command timedatectl set-timezone

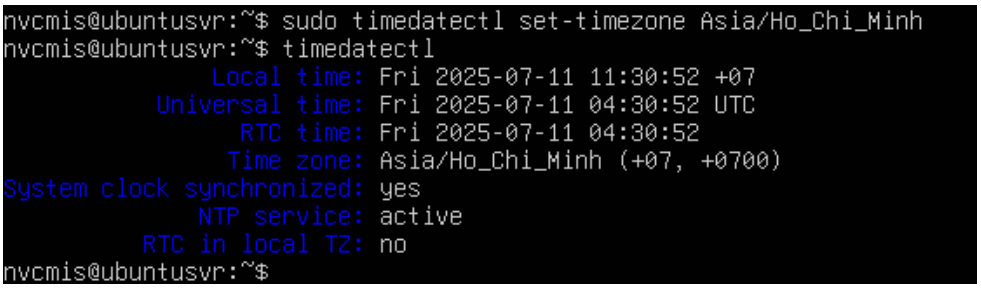

Image 2.13 Adjust display current date time with UTC+07:00

Set System Time and Date Manually (if NTP is off):

Step 1: Disable NTP

sudo timedatectl set-ntp false

Step 2: Set Date/Time

sudo timedatectl set-time '2025-07-11 15:45:00'

Enable/Disable NTP Sync: **sudo timedatectl set-ntp true**