IERG1000 Project 1
Work schedule
Basic Linux configurations and Website building under LAMP (Linux, Apache, MySQL/MariaDB, PHP)

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Work schedule

- W2 :VMs assignment to student
- W3 : 1st Q/A session to help student with login problems and IP Setting/dhcp/NAT/ping/nslookup (Task 1)
- W4 : same as above
- W5 : ssh/scp/Apache/MySQL/phpMyAdmin (Task 2)
- W6 : CHKT1with written report 1 in blackboard (TA check the task output and the submitted Report 1 after 14 Oct)

Work schedule

- W7: Course enrollment System setup (Task 3.1)
- W8: Course enrollment System setup/Add Form/Change Form/Password Protect (Task 3. 2,3.3 & 3.4)
- W9 : DEMO 2 with submitted written report 2 in blackboard (4 demo sessions on 4 Nov at ERB1004, depend on TAs availability and pandemic situation)

Blackboard discussion board

- Student can post and ask their questions at the course Black discussion board : Project 1. Below are the usage rules of it :
  - Please state your sid and workshop account # whenever you post your questions
  - Please try your best to explain your problems in details including screen cap etc
  - Please allow at least ONE working day for the TA to study and respond your case.

Lab/Zoom Q/A session

- A weekly Q/A session will be conducted at ERB 1004 on Fri PM (2:30pm – 3:30pm)
- If the attendance is low, it will be replaced by Zoom session.

Assessment

- Your work will be graded according to the weight stated in the student manual at CHKP1 and Demo 2
- Help and instructions from TAs will be given to Task 1, Task 2 to Task 3.1
- Task 3.2-3.4 are bonus section; you need to work on your own and reuse your previous knowledge learnt. Help will not be given for these tasks
- The submission of Report 1 and 2 are mandatory. You will be given zero marks for task 1 & 2 for missing Report 1 and zero marks for Task 3 for missing Report 2

Objectives of the Linux workshop

- Learn using the Linux shell and the command line without GUI. Get familiar with some of the basic commands and screen text editor like vim
- Learn basic network setup at Linux using command line and network debugging
- Learn using secure shell (ssh) for remote login
- Learn building a simple website using LAMP framework (Linux, Apache, MySQL/mariaDB and PHP)
- MariaDB is just an open source clone of MySQL

Why Linux

- A very popular OS among computer enthusiasts and geeks and widely used in many universities and internet or cloud services providers say Google/Amazon AWS/IBM
- Due to its costs (free), it is widely used in embedded systems like Android, Broadband router, NAS, Raspberry pi, IoT devices, security and network appliances and VMWare hypervisor, Xen hypervisor (used by AWS) etc (just name a few).

Linux distriubtion

- Linux is characterized by hundred of different distributions unlike Windows and MacOSX which are from a single vendor. (Microsoft and Apple respectively)
- 3 Major distributions and their derivatives. They can be differentiated by the package method:
  - RPM based: RedHat Enterprise Linux (RHEL), CentOS, Fedora, etc
  - Deb based: Debian, Ubuntu, Mint, etc
  - SUSE Enterprise Linux, openSUSE by IBM an widely used in the Europe

LAMP (Linux, Apache, MySQL and PHP)

- An open source web development framework widely used.
- Apache Web server is used by 35.3% of all world' websites (2021 Jan W3techs data) through nginx is growing.
- PHP is used by 79.1% of all the websites whose server-side programming language we know. The 2nd is ASP.NET and the 3rd is Java (2021 Jan W3techs data)
- Top most popular programming languages : Python, Java & C. PHP rank #8 (https://www.tiobe.com/tiobe-index/)
- Low cost (no license fee for production and development), easy to code and deploy
- You easily rent a VPS at commercial cloud hosting firm with LAMP service as low as a hundred HK dollars per month (using Windows VPS will be more expensive)

Introduction to command line

- No GUI overhead.
- Virtually every task can be accomplished using the command line.
- You can script tasks and series of procedures.
- You can log on remotely to networked machines anywhere on the Internet with very low bandwidth.
- You can initiate graphical apps directly from the command line.
- Read the eBook : Linux Command Line: A complete Introduction (Available online by searching the title at http://www.lib.cuhk.edu.hk)

Console and terminal (remote login session)

- A available **console** will prompt for a username (with the string login:) and password. When typing your password, nothing is displayed on the terminal (not even a * to indicate that you typed in something) to prevent others from seeing your password. After you have logged in to the system, you can perform basic operations.
- Once your session is started and with the basic network configured. you can also connect and log in to remote systems via the **Secure Shell (SSH)** utility. Using the ssh command at Linux/MacOSX or the putty tool at Windows

Overview of text editor at Linux

- At some point you will need to manually edit **text files**. Say the Linux system configuration file.
- Notepad is the default text editor at Windows.
- For Linux, it is the vim. However, vim is not straightforward editor. You need to spend 15 to 30 min. to read the reference before using it, otherwise you will be stuck at the 1st ime. Eg : http://yannesposito.com/Scratch/en/blog/Learn-Vim-Progressively/
  - And/or run vimtutor to learn some basic operations online

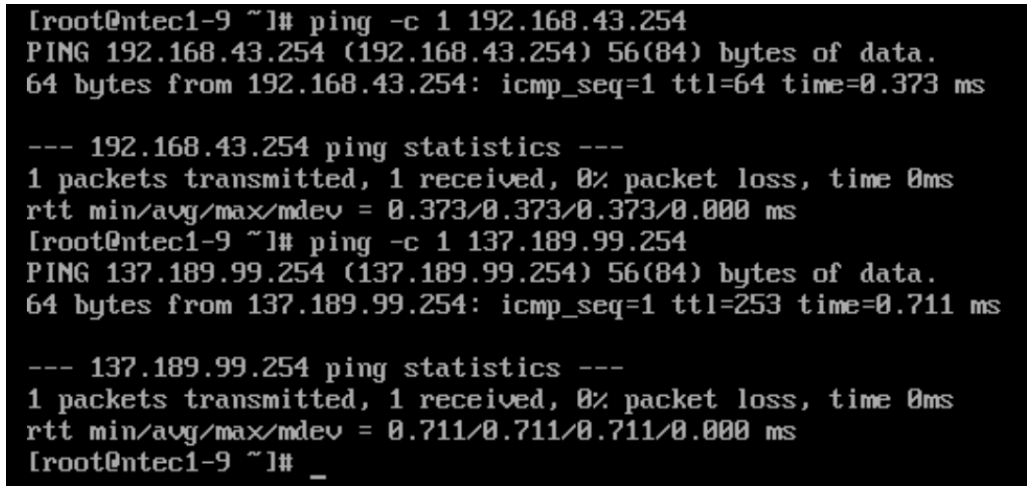
ip, netmask, name server and gateway configuration

- Use ifconfig ens192 to verify the result

```
[root@ntec1-9 ~]# ifconfig ens192
ens192: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.42.11  netmask 255.255.254.0  broadcast 192.168.43.255
        inet6 fe80::250:56ff:fea2:6467  prefixlen 64  scopeid 0x20<link>
        ether 00:50:56:a2:64:67  txqueuelen 1000  (Ethernet)
        RX packets 40  bytes 4330 (4.2 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 52  bytes 3730 (3.6 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

ip, netmask, name server and gateway configuration

- ping 192.168.43.254 & 137.189.99.254 to verify the outside connectivity



- After the completion of the network setup, you can now use ssh client to connect to the vm directly using the assigned ip without using the VM Management console (with connection to NTEC VPN)