Computer Network 1

Lab 2

Network tools in Windows and Linux

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I. Objectives

- Know how to configure TCP/IP in Microsoft Windows and Linux operating systems.
- Know common networking tools.

II. Contents

1. Configuration of TCP/IP in Microsoft Windows

1. Configuration parameters of TCP/IP

- Use ipconfig to look for TCP/IP configuration details
- There are commonly two Adapters (Network Interface Card and PPP)
- Note down configuration of Network Interface Card:

IP Address: 192.168.0.163.....Subnet Mask: 255.255.255.0.....

Default Gateway: 192.168.0.1.....DNS Server: 192.168.0.1 (tenda access point).....

2. Configure TCP/IP: automatic IP or manual

- Start -> Settings -> Control Panel -> Network Connections -> Local Area Connection -> Properties -> Internet Protocol (TCP/IP) -> Properties

2. Configuration of TCP/IP in Linux

- Look into the network configuration file /etc/sysconfig/networking/devices/ifcfg-eth0. Information in file /etc/sysconfig/networking/devices/ifcfg-eth0 is used to configure TCP/IP parameters for the first NIC.
- If there is any change about TCP/IP configuration, change the configuration parameters in /etc/sysconfig/ifcfg-ethx, the, use the following command to restart network service:

```
# service network restart
```

3. Learn basic network commands

1. ***ipconfig*** *(****ifconfig*** *in Linux/UNIX)*

- System administrator uses this command to examine TCP/IP configuration parameters and also to configure parameters for network interfaces:
- Detail basic syntax of ***ipconfig/ifconfig***:

```
$ ifconfig -h
Usage:
  ifconfig [-a] [-v] [-s] <interface> [[<AF>] <address>]
  [add <address>[/<prefixlen>]]
  [del <address>[/<prefixlen>]]
  [[-]broadcast [<address>]]  [[-]pointopoint [<address>]]
  [netmask <address>]  [dstaddr <address>]  [tunnel <address>]
  [outfill <NN>] [keepalive <NN>]
  [hw <HW> <address>]  [mtu <NN>]
  [[-]trailers]  [[-]arp]  [[-]allmulti]
  [multicast]  [[-]promisc]
  [mem_start <NN>]  [io_addr <NN>]  [irq <NN>]  [media <type>]
  [txqueuelen <NN>]
  [[-]dynamic]
  [up|down] ...

  <HW>=Hardware Type.
  List of possible hardware types:
    loop (Local Loopback) slip (Serial Line IP) cslip (VJ Serial Line IP)
    slip6 (6-bit Serial Line IP) cslip6 (VJ 6-bit Serial Line IP) adaptive (Adaptive Serial Line IP)
    ash (Ash) ether (Ethernet) ax25 (AMPR AX.25)
    netrom (AMPR NET/ROM) rose (AMPR ROSE) tunnel (IPIP Tunnel)
    ppp (Point-to-Point Protocol) hdlc ((Cisco)-HDLC) lapb (LAPB)
    arcnet (ARCnet) dlci (Frame Relay DLCI) frad (Frame Relay Access Device)
```

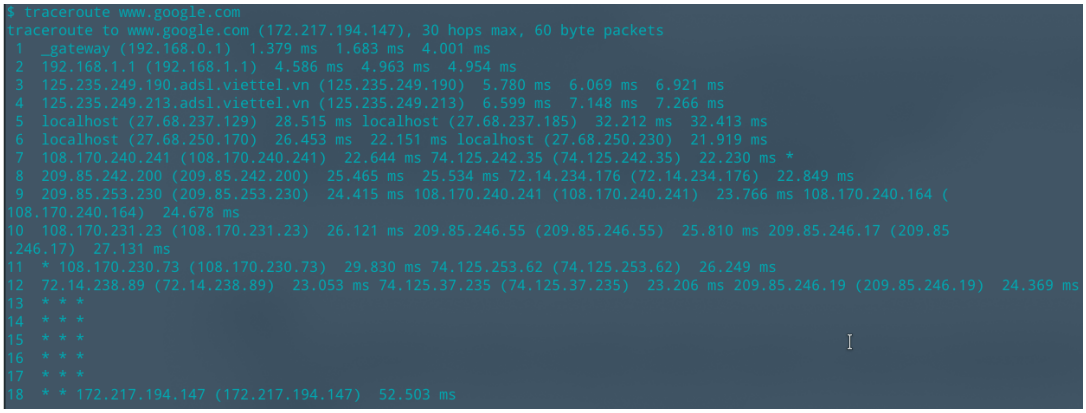
2. ***netstat***

- This command is used to examine information about network connections of the computer and TCP/IP protocols.
- Provide the result when run the command "**netstat –a**"

```
$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:ipps          0.0.0.0:*               LISTEN
tcp        0      0 tommy.local:36234       server-13-35-12-5:https ESTABLISHED
tcp        0      0 tommy.local:60148       sc-in-f97.1e100.n:https ESTABLISHED
tcp        0      0 tommy.local:37992       static.vnpt.vn:https    ESTABLISHED
tcp        0      0 tommy.local:58136       ec2-52-33-134-128:https ESTABLISHED
tcp        0      0 tommy.local:53842       static.vnpt.vn:https    ESTABLISHED
tcp        0      0 tommy.local:43576       edge-star-shv-02-:https ESTABLISHED
tcp        0      0 tommy.local:52746       server-13-35-8-12:https ESTABLISHED
tcp        0      0 tommy.local:43914       static.vnpt.vn:www-http TIME_WAIT
tcp        0      0 tommy.local:43614       edge-star-shv-02-:https ESTABLISHED
tcp        0      0 tommy.local:34116       sc-in-f138.1e100.:https ESTABLISHED
tcp        0      0 tommy.local:43832       static.vnpt.vn:www-http TIME_WAIT
tcp        0      0 tommy.local:51786       172.217.194.95:https    ESTABLISHED
tcp        0      0 tommy.local:43830       static.vnpt.vn:www-http TIME_WAIT
tcp        0      0 tommy.local:45528       edge-star-shv-02-:https ESTABLISHED
tcp        0      0 tommy.local:39310       74.125.24.138:https     TIME_WAIT
tcp        0      0 tommy.local:43944       static.vnpt.vn:www-http TIME_WAIT
tcp        0      0 tommy.local:37998       static.vnpt.vn:https    ESTABLISHED
tcp        0      0 tommy.local:41064       ec2-34-251-59-153:https ESTABLISHED
tcp        0      0 tommy.local:38076       static.vnpt.vn:https    ESTABLISHED
tcp        0      0 tommy.local:46012       151.101.1.2:https       ESTABLISHED
```

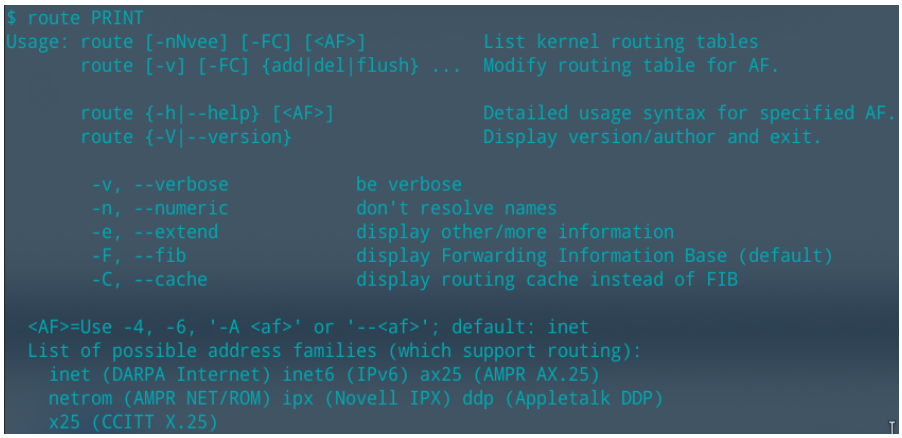
3. ***tracert*** *(traceroute in Linux/UNIX)*

- This command is used to trace a route to a computer in the network. It is usually used to investigate network connections when problems happen.
- Provide the result when run: "**tracert www.google.com"**



4. ***route***

- Route command is used to examine, add or remove a route in routing table of a computer.
- Provide the result when rung "**route PRINT**"



5. ***ping***

- Ping command is used to check if a host in the network is reachable:
- Provide the result when run "**ping www.cse.hcmut.edu.vn**"

```
$ ping www.cse.hcmut.edu.vn
PING server.cse.hcmut.edu.vn (221.133.13.113) 56(84) bytes of data.
^C
--- server.cse.hcmut.edu.vn ping statistics ---
72 packets transmitted, 0 received, 100% packet loss, time 1025ms
```

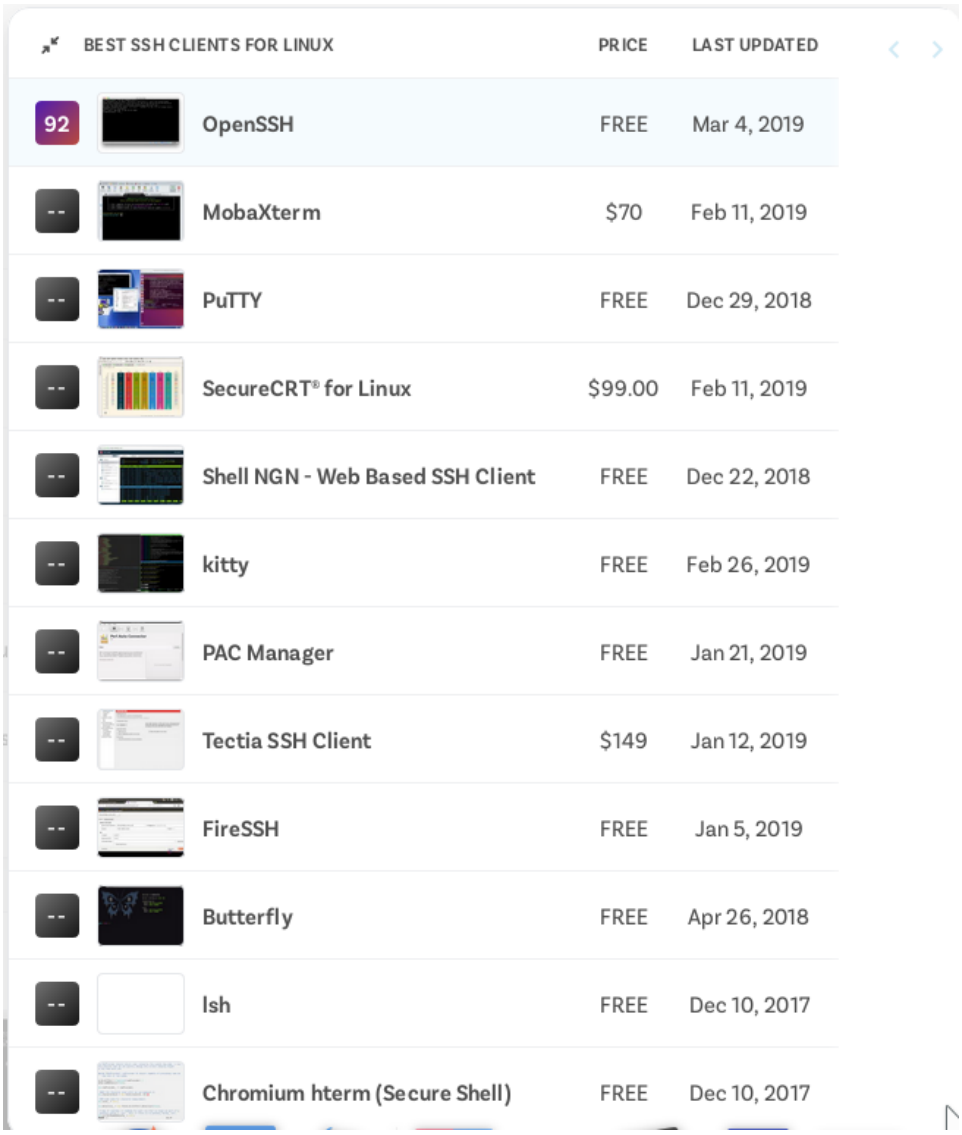
6. ***nslookup***

- nslookup command is used to interact with Domain Name Systems.
- Use nslookup to get IP address of www.vnn.vn (nslookup www.vnn.vn):
- Get IP address of Mail eXchange domain hotmail.com (nslookup -type=MX hotmail.com)

```
$ nslookup -type=MX outlook.com
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
outlook.com     mail exchanger = 5 outlook-com.olc.protection.outlook.com.

Authoritative answers can be found from:


~  12:02:05
$ nslookup -type=MX gmail.com
Server:         192.168.0.1
Address:        192.168.0.1#53

Non-authoritative answer:
gmail.com       mail exchanger = 30 alt3.gmail-smtp-in.l.google.com.
gmail.com       mail exchanger = 5 gmail-smtp-in.l.google.com.
gmail.com       mail exchanger = 20 alt2.gmail-smtp-in.l.google.com.
gmail.com       mail exchanger = 10 alt1.gmail-smtp-in.l.google.com.
gmail.com       mail exchanger = 40 alt4.gmail-smtp-in.l.google.com.

Authoritative answers can be found from:
```

7. SSH (Secure Shell) Client

- SSH client is used for login securely to a remote server.
- Use Google to search for common SSH client on available on the web.



BEST SSH CLIENTS FOR LINUX	PRICE	LAST UPDATED
92 OpenSSH	FREE	Mar 4, 2019
-- MobaXterm	$70	Feb 11, 2019
-- PuTTY	FREE	Dec 29, 2018
-- SecureCRT® for Linux	$99.00	Feb 11, 2019
-- Shell NGN - Web Based SSH Client	FREE	Dec 22, 2018
-- kitty	FREE	Feb 26, 2019
-- PAC Manager	FREE	Jan 21, 2019
-- Tectia SSH Client	$149	Jan 12, 2019
-- FireSSH	FREE	Jan 5, 2019
-- Butterfly	FREE	Apr 26, 2018
-- lsh	FREE	Dec 10, 2017
-- Chromium hterm (Secure Shell)	FREE	Dec 10, 2017