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Location (On/Off campus) when you did the experiment: Software Lab 2

LAB 1: UNDERSTANDING NETWORKING WITH INTERNET TECHNOLOGIES
EXERCISE 1A: COMMUNICATION ARCHITECTURES

Classify the following installed communication modules into their appropriate layers in the TCP/IP architecture(ie protocol stack in figure 1.1):

Internet Protocol (IP) : Network

Network controller card
(eg. Realtek PCIe GBE Family Controller) : Data Link

EXERCISE 1B: ADDRESSING

Classify the use of the following addresses into their appropriate layers in the TCP/IP architecture(protocol stack in figure 1.1):

Port number : Transport

IP address : Network

MAC address : Data Link

EXERCISE 1C: PHYSICAL/MAC/ETHERNET ADDRESSES

Determine the MAC address of your PC:

MAC Address : 00-4E-01-BD-B4-CF

Manufacturer : ~~Intel~~ Dell Inc.

EXERCISE 1D: IP ADDRESSES

NTU IP address range(NOT your PC IP address) : 155.69.XX.0 - 155.69.XX.255

Determine the special uses of the following IP addresses.

{ 127, <any> } : ~~Local host~~ loopback

{ 172.21, <any> } : Private

EXERCISE 1E: DYNAMIC HOST CONFIGURATION PROTOCOL (DHCP)

Determine the following for your laboratory PC:

DHCP Enabled : Yes

DHCP Server : 155.69.3.89

IP Address : 172.21.150.205

Network/Subnet Mask : 255.255.248.0

What is your IP address(from Ipconfig) : 172.21.150.205

What is the reported IP address from website(try https://www.apnic.net : 155.69.178.9

Who is the owner of the IP address reported by the website?

Nanyang Technological University

EXERCISE 1F: PORT NUMBERS

Determine the well-known ports for the following services:

TELNET : 23
Simple Mail Transfer Protocol (SMTP) : 587
Domain Name Service (DNS) : 53
Hyper-Text Transfer Protocol (HTTP) : 80
Hyper-Text Transfer Protocol Secure (HTTPS) : 443

EXERCISE 1G: DOMAIN NAMES

How do you register/buy a domain name under .sg, e.g. myweb.per.sg?

1G) The ".sg" category is available to all persons. A foreign applicant must appoint and duly authorise a local agent as its administrative contact. The administrative contact must furnish a valid Singapore postal address for SGNIC's records.

Applicants can register their ".sg" domain names with any of our registrars accredited by SGNIC. Prices of each registrar varies.

EXERCISE 1H: DOMAIN NAMES/IP ADDRESSES TRANSLATION - DOMAIN NAME SYSTEM (DNS)

Determine the followings:

Local DNS servers for your laboratory PC : 155.69.3.8
155.69.3.9

Authoritative DNS servers for ntu.edu.sg : nde-dns-dhcp-01.nth.edu.sg 155.69.3.8

IP address of domain name www.ntu.edu.sg : 155.69.7.173

What is the command to show the entries in the DNS cache? ipconfig /displaydns
What is the command to clear the entries in the DNS cache? ipconfig /flushdns

EXERCISE 1J: PROPRIETARY MICROSOFT WINS

Determine the followings for your laboratory PC:

NetBIOS/Host name : SW2R2-29
Primary WINS server : 155.69.5.54
Secondary WINS server : 155.69.5.154

EXERCISE 1K: DEFAULT GATEWAY

IP address of default gateway : 172.21.151.254

EXERCISE 1L: IP ADDRESS/PHYSICAL ADDRESS TRANSLATION - ADDRESS RESOLUTION PROTOCOL (ARP)

Physical MAC address of default gateway : 00-08-e3-ff-fc-a0

EXERCISE 1M: NETWORK REACHABILITY - *PING* COMMAND

ping your neighbour's PC and run *arp* command again. Do you see your neighbour's PC listed? Why?

Yes. It is in the same subnet as my PC.

Physical address of neighbour's PC : 00-4e-01-bd-a8-dc

EXERCISE 1N: TRACE ROUTE - *TRACERT* COMMAND

How many routers are separating your laboratory PC and the local DNS servers (insert the output in your answer)?

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Run *arp* command again. Can you find the MAC address of the DNS servers? Why?

No. It is not in the same subnet as my PC.