

Student Name : _____

Group : _____

Date : _____

Location (On/Off campus) when you did the experiment: _____

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

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 :
IP address :
MAC address :

EXERCISE 1C: PHYSICAL/MAC/ETHERNET ADDRESSES

Determine the MAC address of your PC:

MAC Address :
Manufacturer :

EXERCISE 1D: IP ADDRESSES

NTU IP address range (**NOT** your PC IP address) :

Determine the special uses of the following IP addresses:

{ 127, <any> } :
{ 172.21, <any> } :

EXERCISE 1E: DYNAMIC HOST CONFIGURATION PROTOCOL (DHCP)

Determine the following for your laboratory PC:

DHCP Enabled :
DHCP Server :
IP Address :
Network/Subnet Mask :

What is your IP address (from Ipconfig) :
What is the reported IP address from website (try <https://www.apnic.net/>) :

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

EXERCISE 1F: PORT NUMBERS

Determine the well-known ports for the following services:

TELNET :
Simple Mail Transfer Protocol (SMTP) :
Domain Name Service (DNS) :
Hyper-Text Transfer Protocol (HTTP) :
Hyper-Text Transfer Protocol Secure (HTTPS) :

EXERCISE 1G: DOMAIN NAMES

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

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

Determine the followings:

Local DNS servers for your laboratory PC :
Authoritative DNS servers for ntu.edu.sg :
IP address of domain name www.ntu.edu.sg :

What is the command to show the entries in the DNS cache?
What is the command to clear the entries in the DNS cache?

EXERCISE 1J: PROPRIETARY MICROSOFT WINS

Determine the followings for your laboratory PC:

NetBIOS/Host name :
Primary WINS server :
Secondary WINS server :

EXERCISE 1K: DEFAULT GATEWAY

IP address of default gateway :

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

Physical MAC address of default gateway :

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?

Physical address of neighbour's PC :

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)?

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