

## ITT300 INTRODUCTION TO DATA COMMUNICATION AND NETWORK

### LAB ACTIVITY: BASIC NETWORK CONFIGURATION COMMAND

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#### Objective

The objective of this activity is to recognize IP addresses, MAC address, DNS, default gateway, and other network configuration information.

#### Details

1. Open Windows command interpreter: *Start / Run / type 'cmd'*
2. Type *hostname* to find out your PC name.

```
C:\Users\60115>hostname  
IRFAN
```

3. Study IP configuration of the PC and identify physical address, logical address and DNS server IP by using *ipconfig*.

Kedah.uitm.edu.my

Physical address: 1C-BF-C0-BE-26-79

Logical address: 10.30.112.255

DNS server IP : 10.30.1.1

4. Type *arp -a* and explain the output.

The result of running the '*arp -a*' command in a Windows command prompt is it will displays the Address Resolution Protocol (ARP) cache of the computer, which is a table that maps IP addresses to their corresponding physical addresses or Media Access Control (MAC) addresses.

Each entry in the ARP cache shows an Internet address (IP address), a physical address (MAC address), and a type (either dynamic or static). Dynamic entries are created dynamically by the system, usually in response to network traffic, while static entries are manually added to the ARP cache and do not change.

In this particular output, the interface is listed as '10.30.112.255 --- 0x8', which refers to the network interface on the computer that has the ARP cache being displayed. The IP and MAC addresses listed in the table belong to other devices on the same network as the computer. The static entries listed are multicast addresses used for communication between network devices. The dynamic entry corresponds to a device that was recently active on the network and its IP address was mapped to its

MAC address by the ARP protocol. The IP address 255.255.255.255 is a special broadcast address used to send data to all devices on the network.

5. Find hostname for two Internet Addresses in the above *arp-a* output with *tracert* command. Screenshot the output. Describe how many hops to access the selected Internet Addresses. Explain your answer.

```
C:\Users\60115>tracert 10.30.65.191

Tracing route to 10.30.65.191 over a maximum of 30 hops

 1  46 ms      9 ms      14 ms  10.30.65.191
```

10.30.65.191 = 1 hops

The output shows one line of information, indicating that the destination IP address was reached in a single hop. This means that the destination is likely on the same network as the computer running the command, and there were no intermediary routers or devices that the packets had to travel through to reach the destination.

```
C:\Users\60115>tracert 10.30.114.100

Tracing route to 10.30.114.100 over a maximum of 30 hops

 1      *          *          *      Request timed out.
 2  273 ms      13 ms      49 ms  10.30.114.100
```

10.30.114.100 = 2 hops

The output shows two lines of information. The first line indicates the hop number, which is the number of intermediary network devices or routers the packets travel through to reach the destination. In this case, there are only two hops listed, which means that the destination is likely on the same network as the computer running the command.

6. Tracert UiTM Shah Alam gateway. Screenshot and explain the output.

```
C:\Users\60115>tracert uitm.edu.my

Tracing route to uitm.edu.my [10.0.31.16]
over a maximum of 30 hops:

  1      6 ms      5 ms     10 ms  10.30.127.254
  2    296 ms     48 ms    459 ms  UiTM-kedah.IVPN [10.30.255.6]
  3     32 ms      9 ms      4 ms  58.139.141.149
  4     45 ms    537 ms     84 ms  58.139.64.249
  5    286 ms     31 ms    105 ms  58.139.64.250
  6    408 ms     43 ms     61 ms  10.0.0.242
  7     87 ms     31 ms     14 ms  10.0.1.2
  8   318 ms    206 ms    199 ms  www.uitm.edu.my [10.0.31.16]
```

The output shows the route taken by network packets from the computer to the destination IP address, which is divided into several hops. Each hop represents a network device, such as a router or a switch, that the packets traverse on their way to the destination. The first hop in the output is the default gateway for the computer's network, which is represented by the IP address of 10.30.127.254. The next few hops are part of the IVPN network infrastructure that connects the computer's network to the destination network, which is located in UiTM Kedah.

7. Find IP addresses for web site [www.uitm.edu.my](http://www.uitm.edu.my) and [www.melaka.uitm.edu.my](http://www.melaka.uitm.edu.my) by using nslookup. Screenshot the output

```
C:\Users\60115>nslookup www.uitm.edu.my
Server:  idns3.uitm.edu.my
Address: 10.0.7.12

Name:  www.uitm.edu.my
Address: 10.0.31.16

C:\Users\60115>www.melaka.uitm.edu.my
'www.melaka.uitm.edu.my' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\60115>nslookup www.melaka.uitm.edu.my
Server:  idns3.uitm.edu.my
Address: 10.0.7.12

Name:  melaka.uitm.edu.my
Address: 10.0.31.10
Aliases: www.melaka.uitm.edu.my
```

8. Tracert [www.google.com.my](http://www.google.com.my). Screenshot and explain the output.

```
C:\Users\60115>tracert www.google.com.my

Tracing route to www.google.com.my [142.250.199.35]
over a maximum of 30 hops:

 1  3 ms    3 ms    5 ms  10.30.127.254
 2  5 ms    1 ms    5 ms  UiTM-kedah.IVPN [10.30.255.6]
 3  29 ms   3 ms    3 ms  58.139.141.149
 4  41 ms   12 ms   14 ms  58.139.85.41
 5  42 ms   20 ms   13 ms  58.139.85.42
 6  43 ms   *        40 ms  10.0.6.254
 7  20 ms   12 ms   12 ms  10.0.6.1
 8  40 ms   16 ms   23 ms  202.58.91.4
 9  40 ms   21 ms   15 ms  219.94.15.101
10  19 ms   15 ms   16 ms  10.55.48.20
11  55 ms   19 ms   18 ms  72.14.214.196
12  49 ms   18 ms   19 ms  108.170.230.51
13  19 ms   18 ms   18 ms  142.250.56.103
14  43 ms   18 ms   18 ms  kul08s12-in-f3.1e100.net [142.250.199.35]

Trace complete.
```

the request starts at hop 1 on the local machine, which is connected to a router at IP address 10.30.127.254. The request passes through several routers until it reaches the Google web server at IP address 142.250.199.35.

9. For any command used, you can get help with 'command /help', for example *ipconfig /help*, *arp /help* and type *exit* or *^c* (*CTRL-c*) when in trouble.

10. Write your conclusions about all the functions used in this lab.

The tracert command is used to trace the path that data takes from one networked device to another over the internet. It shows how many "hops" or intermediary devices the data passes through before reaching its destination, and the amount of time it takes to reach each device. The ipconfig command is used to display the IP address configuration of a device on a network, including the device's IP address, subnet mask, and default gateway. It is also used to flush the DNS cache and renew or release an IP address assigned by a DHCP server. Both of these commands are very useful for troubleshooting network connectivity issues and diagnosing problems with network configurations.

11. Print and send your report document to your lecturer.