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Lab 1 Using ping and tracert from a Workstation

Objective
- Learn to use the TCP/IP Packet Internet Groper (**ping**) command from a
- Learn to use the Trace Route (**tracert**) command from a workstation.
- Observe name resolution occurrences using WINS and/or DNS servers.

Background

This lab assumes the use of any version of Windows. This is a non-destructive lab and can be done on any machine without concern of changing the system configuration.

Ideally, this lab is performed in a LAN environment that connects to the Internet. It can be done from a single remote connection via a modem or DSL-type connection. The student will need the IP addresses that were recorded in the previous lab.

Step 1 - Establish and verify connectivity to the Internet
This ensures the computer has an IP address.

Step 2 - Access the command prompt

Windows 95 / 98 / Me users – Use the Start menu to open the MS-DOS Prompt window. Press **Start** > **Programs** > **Accessories** > **MS-DOS Prompt** or **Start** > **Programs** > **MS-DOS**.
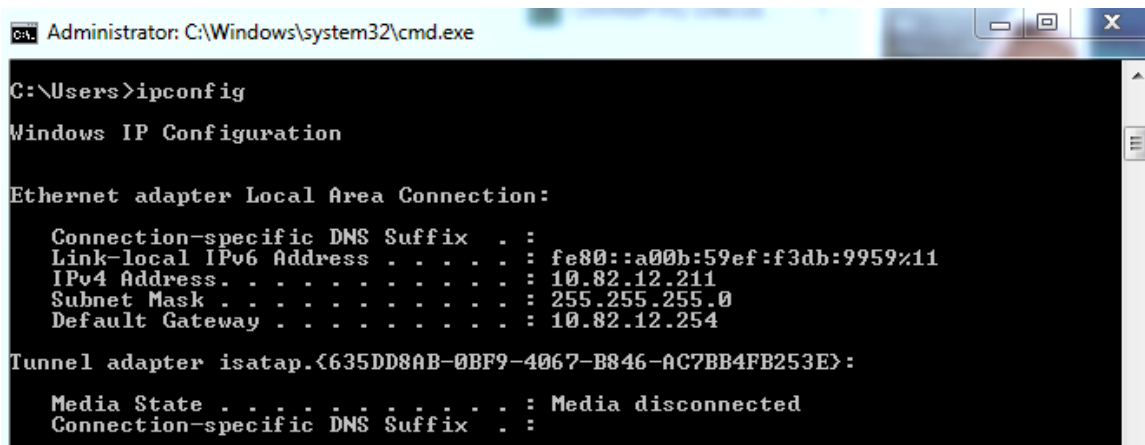**Windows NT / 2000 / XP / Windows 7 and onwards users** – Use the Start menu to open the Command Prompt window. Press
Start > **Programs** > **Accessories** > **Command Prompt** or **Start** > **Programs** > **Command Prompt**
or **Start** > **All Programs** > **Command Prompt**.

Step 3 Find your IP address
To find your machine's IP address, use **ipfonfig** command:
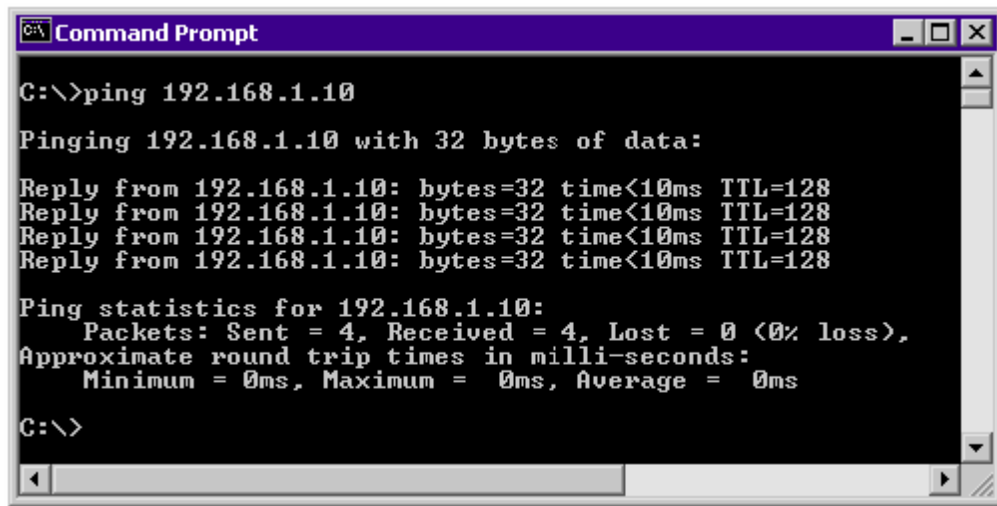
Ipconfig displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, **ipconfig** displays the IP address, subnet mask, and default gateway for all adapters.

Step 4 - Ping the IP address of another computer

In the window, type **ping**, a space, and the IP address of a computer recorded in the previous lab. The following figure shows the successful results of **ping** to this IP address.

```
Command Prompt                                            _ □ ✕

C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 192.168.1.10: bytes=32 time<10ms TTL=128
Reply from 192.168.1.10: bytes=32 time<10ms TTL=128
Reply from 192.168.1.10: bytes=32 time<10ms TTL=128
Reply from 192.168.1.10: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms

C:\>
```

The Internet Ping command bounces a small _packet_ off a domain or IP address to test network communications, and then tells how long the packet took to make the round trip. The Ping command is one of the most commonly used utilities on the _Internet_ by both people and automated programs for conducting the most basic network test: _can your computer reach another computer on the network, and if so how long does it take?_

How Ping was invented. The original PING command stood for "Packet Internet Groper", and was a package of diagnostic utilities used by _DARPA_ personnel to test the performance of the _ARPANET_. However, the modern Internet Ping command refers to a program was written by Mike Muuss in December, 1983, which has since become one of the most versatile and widely used diagnostic tools on the Internet. Muuss named his program after the sonar sounds used for echo-location by submarines and bats; just like in old movies about submarines, sonar probes do sound something like a metallic "ping".

Step 5 - Ping the IP address of the default gateway
Try to **ping** the IP address of the default gateway if one was listed in the last exercise. If the **ping** issuccessful, it means there is physical connectivity to the router on the local network and probably the rest of the world.

Step 6 - Ping the IP address of a DHCP or DNS servers
Try to **ping** the IP address of any DHCP and/or DNS servers listed in the last exercise. If this works for either server, and they are not in the network, what does this indicate?

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Was the **ping** successful? _____
If not, perform appropriate troubleshooting.

Step 7 - Ping the Loopback IP address of this computer
Type the following command**: ping 127.0.0.1**
The 127.0.0.0 network is reserved for loopback testing. If the **ping** is successful, then TCP/IP is
properly installed and functioning on this computer.
Was the **ping** successful? _____
If not, perform appropriate troubleshooting.

Step 8 - Ping the hostname of another computer
Try to **ping** the hostname of the computer that was recorded in the previous lab.

Step 9 -Ping the UiTM web site
Type the following command: **ping www.uitm.edu.my**
What is the result _____

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The first output line shows the Fully Qualified Domain Name (FQDN) followed by the IP address.
A Domain Name Service (DNS) server somewhere in the network was able to resolve the name
to an IP address. DNS servers resolve domain names, not hostnames, to IP addresses.
Without this name resolution, the **ping** would have failed because TCP/IP only understands valid
IPaddresses. It would not be possible to use the web browser without this name resolution.
With DNS, connectivity to computers on the Internet can be verified using a familiar web address,
ordomain name, without having to know the actual IP address. If the nearest DNS server does
not know the IP address, the server asks a DNS server higher in the Internet structure.

Step 10 - Trace the route to the UiTMweb site
Type **tracert www.uitm.edu.my** and press **Enter**.

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tracert is TCP/IP abbreviation for trace route. The first output line shows the FQDN followed by
the IP address. Therefore, a DNS server was able to resolve the name to an IP address. Then
there are listings of all routers the **tracert** requests had to pass through to get to the destination.
tracert uses the same echo requests and replies as the **ping** command but in a slightly different
way. Each router represents a point where one network connects to another network and the
packet was forwarded through.

Step 11 - Trace other IP addresses or domain names
Try **tracert** on other domain names or IP addresses and record the results. An example is
Tracert www.amazon.com

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Step 12 - Trace a local host name or IP address
Try using the **tracert** command with a local host name or IP address. It should not take long
because the trace does not pass through any routers.

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Online ping. If you can't use the Ping command from your own computer because of a firewall or
other restriction, or want to do an Internet ping from another location than your own, you can use
one of the following web sites that offer online ping services:

- http://www.dnsstuff.com/
- http://www.his.com/cgi-bin/ping?
- http://network-tools.com/
- http://www.spfld.com/ping.html
- http://www.theworldsend.net/php-ping.php

Remember when doing an online ping that the packets are sent from that web site, so the times
that are returned reflect the path from that location and not from your computer. Nevertheless, a
ping from an online web site can be useful to test if an address can be reached from different
places around the Internet, to do comparative timing to test how long it takes to reach one site
compared to others.

If the times returned by several online ping sites to an Internet address are consistently long, then
the destination site's network is likely having problems. On the other hand, if you can ping an
address from an online ping site but not from your own computer, then there is likely some block
in your network preventing you from communicating with that site.