

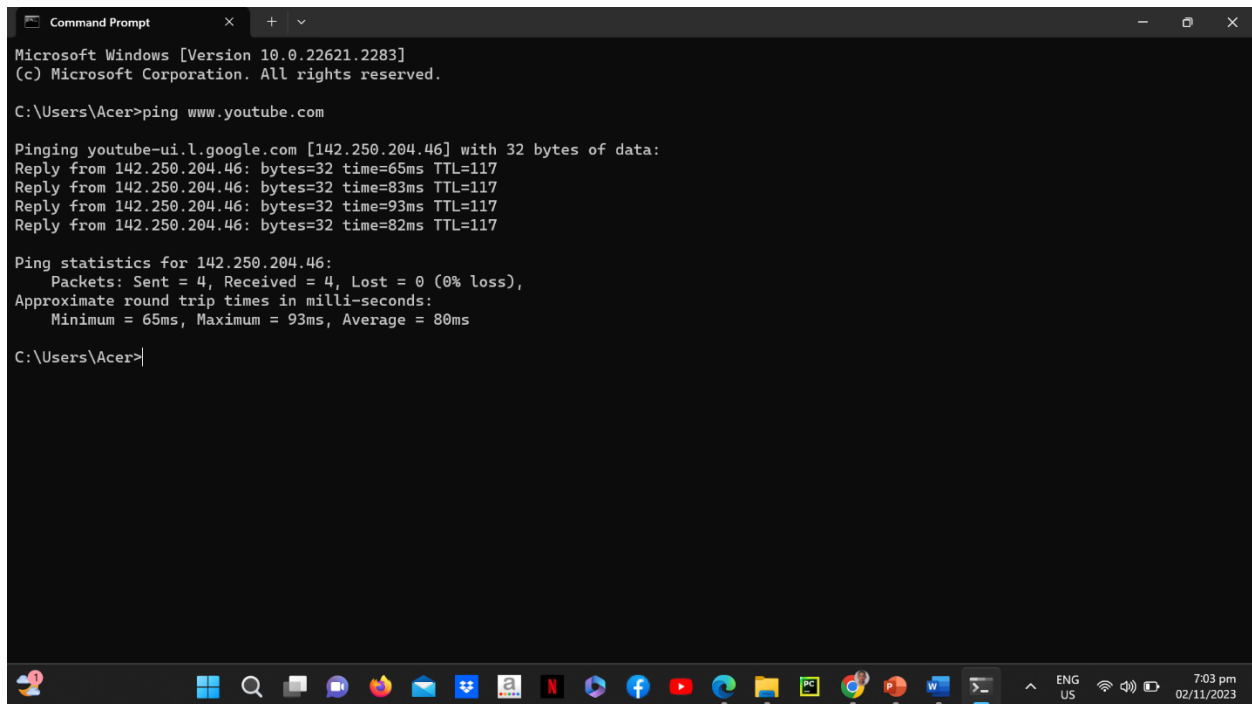
Name: Earl George A. Lapak
Course/Section: BSIT – 3B

Subject: IT115 – Networking 1
Instructor: Ma'am Norianne C. Lamadrid

Ping and Traceroute

Ping Exercise Part 1 (30 points)

1. Pick the address of a site you visit. You are going to use it to test some network diagnostics. What happened when you ping your site?



```
Microsoft Windows [Version 10.0.22621.2283]
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C:\Users\Acer>ping www.youtube.com

Pinging youtube-ui.l.google.com [142.250.204.46] with 32 bytes of data:
Reply from 142.250.204.46: bytes=32 time=65ms TTL=117
Reply from 142.250.204.46: bytes=32 time=83ms TTL=117
Reply from 142.250.204.46: bytes=32 time=93ms TTL=117
Reply from 142.250.204.46: bytes=32 time=82ms TTL=117

Ping statistics for 142.250.204.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 65ms, Maximum = 93ms, Average = 80ms

C:\Users\Acer>
```

YouTube is the site I chose to ping. When I ping the domain name of YouTube, I have noticed that the prompt produces a unique IP address for YouTube which is 142.250.204.46. Next to the IP address are four different ping signals with different values of 65ms, 83ms, 93ms, and 82ms.

2. Try it with a few more examples. What is happening?

```
Command Prompt
C:\Users\Acer>ping www.instagram.com

Pinging z-p42-instagram.c10r.instagram.com [163.70.130.174] with 32 bytes of data:
Reply from 163.70.130.174: bytes=32 time=14ms TTL=55
Reply from 163.70.130.174: bytes=32 time=15ms TTL=55
Reply from 163.70.130.174: bytes=32 time=33ms TTL=55
Reply from 163.70.130.174: bytes=32 time=36ms TTL=55

Ping statistics for 163.70.130.174:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 36ms, Average = 24ms

C:\Users\Acer>ping www.canva.com

Pinging www.canva.com [104.17.239.159] with 32 bytes of data:
Reply from 104.17.239.159: bytes=32 time=14ms TTL=58
Reply from 104.17.239.159: bytes=32 time=15ms TTL=58
Reply from 104.17.239.159: bytes=32 time=39ms TTL=58
Reply from 104.17.239.159: bytes=32 time=14ms TTL=58

Ping statistics for 104.17.239.159:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 39ms, Average = 20ms

C:\Users\Acer>ping www.facebook.com

Pinging star-mini.c10r.facebook.com [163.70.130.35] with 32 bytes of data:
Reply from 163.70.130.35: bytes=32 time=15ms TTL=55
Reply from 163.70.130.35: bytes=32 time=33ms TTL=55
```

```
Command Prompt

Ping statistics for 163.70.130.174:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 36ms, Average = 24ms

C:\Users\Acer>ping www.canva.com

Pinging www.canva.com [104.17.239.159] with 32 bytes of data:
Reply from 104.17.239.159: bytes=32 time=14ms TTL=58
Reply from 104.17.239.159: bytes=32 time=15ms TTL=58
Reply from 104.17.239.159: bytes=32 time=39ms TTL=58
Reply from 104.17.239.159: bytes=32 time=14ms TTL=58

Ping statistics for 104.17.239.159:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 39ms, Average = 20ms

C:\Users\Acer>ping www.facebook.com

Pinging star-mini.c10r.facebook.com [163.70.130.35] with 32 bytes of data:
Reply from 163.70.130.35: bytes=32 time=15ms TTL=55
Reply from 163.70.130.35: bytes=32 time=33ms TTL=55
Reply from 163.70.130.35: bytes=32 time=33ms TTL=55
Reply from 163.70.130.35: bytes=32 time=14ms TTL=55

Ping statistics for 163.70.130.35:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 33ms, Average = 23ms

C:\Users\Acer>
```

When I try different websites, I have noticed that each website produces unique IP address as well as different ping signals. I also noticed that each packet being sent has been received which means there is no packet loss. I observe that by pinging different websites, I can say that my network is performing well and I can access websites at its best.

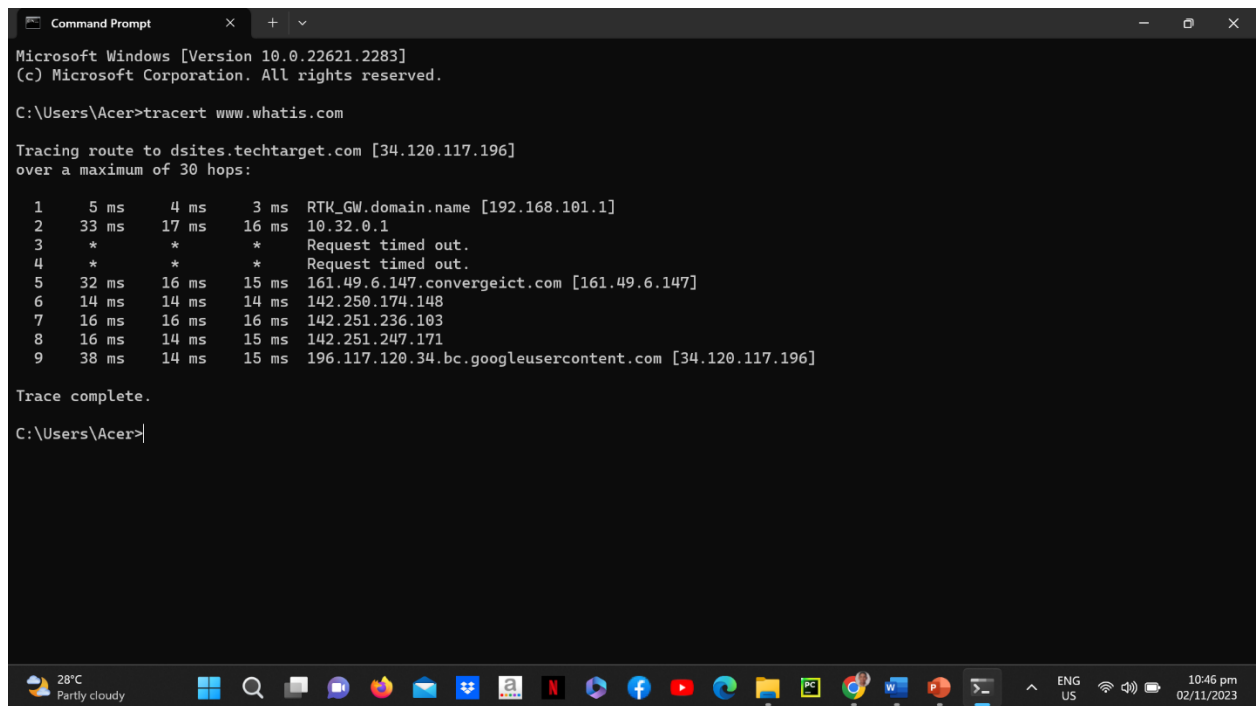
3. How can ping be useful?

Ping can be very useful because we can test if our network connection is performing well or not. Through ping, we can determine if our network connection is experiencing connectivity issue. We can also determine the capacity of what we can do with our networking connection because of the ping. For example, if our ping is good, we can use social media and other online platforms with ease and accessible and also, we can play online games smoothly without experiencing any lags and if our ping is not good and there is a connectivity issue, we can't perform those activity well.

Tracert Exercise Part 2 (40 POINTS)

1. Using the command prompt and tracert command, find the route to

- www.whatis.com



```
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Acer>tracert www.whatis.com

Tracing route to dsites.techtarget.com [34.120.117.196]
over a maximum of 30 hops:

  0  5 ms  4 ms  3 ms  RTK_GW.domain.name [192.168.101.1]
  1  33 ms  17 ms  16 ms  10.32.0.1
  2  *      *      *      Request timed out.
  3  *      *      *      Request timed out.
  4  *      *      *      Request timed out.
  5  32 ms  16 ms  15 ms  161.49.6.147.convergeict.com [161.49.6.147]
  6  14 ms  14 ms  14 ms  142.250.174.148
  7  16 ms  16 ms  16 ms  142.251.236.103
  8  16 ms  14 ms  15 ms  142.251.247.171
  9  38 ms  14 ms  15 ms  196.117.120.34.bc.googleusercontent.com [34.120.117.196]

Trace complete.

C:\Users\Acer>
```

- 139.84.19.200

```
Command Prompt

Tracing route to 139.84.19.200 over a maximum of 30 hops

  1    4 ms    4 ms    4 ms RTK_GW.domain.name [192.168.101.1]
  2   33 ms   25 ms   17 ms 10.32.0.1
  3    *      *      *    Request timed out.
  4    *      *      *    Request timed out.
  5   57 ms   41 ms   41 ms 161.49.11.223.convergeict.com [161.49.11.223]
  6    *      *      *    Request timed out.
  7   387 ms  322 ms  220 ms be2913.ccr41.lax04.atlas.cogentco.com [154.54.27.54]
  8   266 ms  326 ms  295 ms be3271.ccr41.lax01.atlas.cogentco.com [154.54.42.101]
  9   391 ms  294 ms  246 ms be2931.ccr31.phx01.atlas.cogentco.com [154.54.44.85]
 10   229 ms  282 ms  309 ms be2979.ccr21.elp02.atlas.cogentco.com [154.54.5.218]
 11   394 ms  303 ms  273 ms be3850.ccr41.iah01.atlas.cogentco.com [154.54.0.53]
 12   389 ms  317 ms  296 ms be2687.ccr41.atl01.atlas.cogentco.com [154.54.28.69]
 13   387 ms  310 ms  303 ms be2112.ccr41.dca01.atlas.cogentco.com [154.54.7.157]
 14   390 ms  296 ms  309 ms be2369.rcr71.bwi01.atlas.cogentco.com [154.54.90.209]
 15   298 ms  269 ms  337 ms be2751.rcr21.phl01.atlas.cogentco.com [154.54.90.214]
 16   329 ms  404 ms  305 ms 38.32.43.42
 17    *      *      *    Request timed out.
 18    *      *      *    Request timed out.
 19    *      *      *    Request timed out.
 20    *      *      *    Request timed out.
 21    *      *      *    Request timed out.
 22    *      *      *    Request timed out.
 23    *      *      *    Request timed out.
 24    *      *      *    Request timed out.
 25    *      *      *    Request timed out.
 26    *      *      *    Request timed out.
 27    *      *      *    Request timed out.
 28    *      *      *    Request timed out.
 29    *      *      *    Request timed out.

28°C
Partly cloudy
10:56 pm
02/11/2023

Command Prompt

  4    *      *      *    Request timed out.
  5   57 ms   41 ms   41 ms 161.49.11.223.convergeict.com [161.49.11.223]
  6    *      *      *    Request timed out.
  7   387 ms  322 ms  220 ms be2913.ccr41.lax04.atlas.cogentco.com [154.54.27.54]
  8   266 ms  326 ms  295 ms be3271.ccr41.lax01.atlas.cogentco.com [154.54.42.101]
  9   391 ms  294 ms  246 ms be2931.ccr31.phx01.atlas.cogentco.com [154.54.44.85]
 10   229 ms  282 ms  309 ms be2979.ccr21.elp02.atlas.cogentco.com [154.54.5.218]
 11   394 ms  303 ms  273 ms be3850.ccr41.iah01.atlas.cogentco.com [154.54.0.53]
 12   389 ms  317 ms  296 ms be2687.ccr41.atl01.atlas.cogentco.com [154.54.28.69]
 13   387 ms  310 ms  303 ms be2112.ccr41.dca01.atlas.cogentco.com [154.54.7.157]
 14   390 ms  296 ms  309 ms be2369.rcr71.bwi01.atlas.cogentco.com [154.54.90.209]
 15   298 ms  269 ms  337 ms be2751.rcr21.phl01.atlas.cogentco.com [154.54.90.214]
 16   329 ms  404 ms  305 ms 38.32.43.42
 17    *      *      *    Request timed out.
 18    *      *      *    Request timed out.
 19    *      *      *    Request timed out.
 20    *      *      *    Request timed out.
 21    *      *      *    Request timed out.
 22    *      *      *    Request timed out.
 23    *      *      *    Request timed out.
 24    *      *      *    Request timed out.
 25    *      *      *    Request timed out.
 26    *      *      *    Request timed out.
 27    *      *      *    Request timed out.
 28    *      *      *    Request timed out.
 29    *      *      *    Request timed out.
 30    *      *      *    Request timed out.

Trace complete.

C:\Users\Acer>
```

2. Ask your classmate for their ip address – trace the route to them.

- 192.168.7.232 – IP address of Mr. Kevin Miralles

```
Command Prompt
C:\Users\Acer>tracert 192.168.7.232

Tracing route to 192.168.7.232 over a maximum of 30 hops

  1    40 ms    4 ms    4 ms    RTK_GW.domain.name [192.168.101.1]
  2   146 ms   17 ms   245 ms   10.32.0.1
  3    *        *        *        Request timed out.
  4    *        *        *        Request timed out.
  5    *        *        *        Request timed out.
  6    *        *        *        Request timed out.
  7    *        *        *        Request timed out.
  8    *        *        *        Request timed out.
  9    *        *        *        Request timed out.
 10   *        *        *        Request timed out.
 11   *        *        *        Request timed out.
 12   *        *        *        Request timed out.
 13   *        *        *        Request timed out.
 14   *        *        *        Request timed out.
 15   *        *        *        Request timed out.
 16   *        *        *        Request timed out.
 17   *        *        *        Request timed out.
 18   *        *        *        Request timed out.
 19   *        *        *        Request timed out.
 20   *        *        *        Request timed out.
 21   *        *        *        Request timed out.
 22   *        *        *        Request timed out.
 23   *        *        *        Request timed out.
 24   *        *        *        Request timed out.
 25   *        *        *        Request timed out.
 26   *        *        *        Request timed out.
 27   *        *        *        Request timed out.
 28   *        *        *        Request timed out.
```

```
Command Prompt

 3    *        *        *        Request timed out.
 4    *        *        *        Request timed out.
 5    *        *        *        Request timed out.
 6    *        *        *        Request timed out.
 7    *        *        *        Request timed out.
 8    *        *        *        Request timed out.
 9    *        *        *        Request timed out.
10   *        *        *        Request timed out.
11   *        *        *        Request timed out.
12   *        *        *        Request timed out.
13   *        *        *        Request timed out.
14   *        *        *        Request timed out.
15   *        *        *        Request timed out.
16   *        *        *        Request timed out.
17   *        *        *        Request timed out.
18   *        *        *        Request timed out.
19   *        *        *        Request timed out.
20   *        *        *        Request timed out.
21   *        *        *        Request timed out.
22   *        *        *        Request timed out.
23   *        *        *        Request timed out.
24   *        *        *        Request timed out.
25   *        *        *        Request timed out.
26   *        *        *        Request timed out.
27   *        *        *        Request timed out.
28   *        *        *        Request timed out.
29   *        *        *        Request timed out.
30   *        *        *        Request timed out.

Trace complete.
C:\Users\Acer>
```

Other TCP/IP diagnostic commands:

Command	Meaning	Job
Nbtstat	NetBIOS over TCP/IP Statistics	is a TCP/IP utility that displays current TCP/IP connections and statistics using NetBIOS over TCP/IP (NetBT). Nbtstat is installed on a computer running Microsoft Windows when the TCP/IP protocol stack is installed.
Netstat	Network Statistics	It is a command used to show network status. Traditionally, it is used more for problem determination than for performance measurement. However, the netstat command can be used to determine the amount of traffic on the network to ascertain whether performance problems are due to network congestion.
Ipconfig	Internet Protocol Configuration	It is a command-line utility used for managing and troubleshooting network connections, display information about IP addresses, subnet masks, default gateways, DNS servers, and more. You can also use it to renew or release DHCP leases, flush DNS caches, and perform other network-related tasks.
Arp	Address Resolution Protocol	It is a command that displays and modifies the Internet-to-adaptor address translation tables used by the Address in Networks and communication management. The arp command displays the current ARP entry for the host specified by the HostName variable. The

		host can be specified by name or number, using Internet dotted decimal notation.
Hostname		The hostname command can be used to retrieve and set the host, domain, or node name of the current system. Hostnames are important as they are what is used by most networking programs to identify your machine. Using unique hostnames, you will be able to identify and connect to machines within a network quickly.
Route		It displays or modifies the computer's routing table. For a typical computer that has a single network interface and is connected to a local area network (LAN) that has a router, the routing table is pretty simple and isn't often the source of network problems. Still, if you're having trouble accessing other computers or other networks, you can use the route command to make sure that a bad entry in the computer's routing table isn't the culprit.

References:

<https://networkencyclopedia.com/nbtstat/>

<https://www.ibm.com/docs/en/aix/7.2?topic=analysis-netstat-command>

<https://blog.invgate.com/ipconfig>

<https://www.ibm.com/docs/en/aix/7.2?topic=arp-command>

<https://pimylifeup.com/hostname-command/>

Another Exercise Part 3 (30 points)

- Find the ipconfig for your machine.

```
Command Prompt
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Acer>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::142c:e9d2:e05:8a85%15
    IPv4 Address. . . . . : 192.168.101.72
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.101.1

C:\Users\Acer>
```

- Open the command window
- Use the NBTSTAT command
- Run the NBTSTAT command using your ip address for your machine. Use the -A option.

What did you find out?

```
Command Prompt

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::142c:e9d2:e05:8a85%15
    IPv4 Address. . . . . : 192.168.101.72
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.101.1

C:\Users\Acer>nbtstat -A 192.168.101.72

Ethernet:
Node IpAddress: [0.0.0.0] Scope Id: []

    Host not found.

Wi-Fi:
Node IpAddress: [192.168.101.72] Scope Id: []

    Host not found.

Local Area Connection* 1:
Node IpAddress: [0.0.0.0] Scope Id: []

    Host not found.

Local Area Connection* 2:
Node IpAddress: [0.0.0.0] Scope Id: []

    Host not found.

C:\Users\Acer>
```


Trying the NBTSTAT command with the -A option in my ip address, I found out that for my IP address there is no host that has been found which means that there is no registered NETBIOS name on the IP address.