Experiment 2

1. Ping

Of all the Windows 10 network commands, Ping is probably the one almost everyone knows about and has used before. The Ping command allows you to test the reachability of a device on a network. Pinging a host should return four data packets, if the data packets are not returned you know there is a problem with your network connection.

To run the basic command, at the prompt type:**ping [host]**

```
Microsoft Windows [Version 10.0.19042.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Mark Kaelin Live>ping techrepublic.com

Pinging techrepublic.com [107.178.248.185] with 32 bytes of data:
Reply from 107.178.248.185: bytes=32 time=28ms TTL=115
Reply from 107.178.248.185: bytes=32 time=27ms TTL=115
Reply from 107.178.248.185: bytes=32 time=33ms TTL=115
Reply from 107.178.248.185: bytes=32 time=28ms TTL=115

Ping statistics for 107.178.248.185:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 27ms, Maximum = 33ms, Average = 29ms

C:\Users\Mark Kaelin Live>
```

2. IPConfig

The IPConfig command is one of the more useful basic Windows network commands everyone should know and use to troubleshoot problems. The IPConfig command displays basic IP address configuration information for the Windows device you are working on. In fact, the command will display information for every network adapter that has ever been installed on your Windows 10 computer.

```
C:\Users\lab314->IPCONFIG

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : mshome.net
   Link-local IPv6 Address . . . . . : fe80::2da1:44d:6f45:27bd%5
   IPv4 Address. . . . . . . . . . . : 175.175.1.139
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . : 175.175.0.2

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::cd3d:f0b7:71a7:528%8
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

C:\Users\lab314->
```

To run the basic command, at the prompt type:**ipconfig**.

3. **Getmac**

Every network capable device on the internet has a unique identifying number called its MAC address. The number is assigned during manufacture and is established in the hardware of the device. Using the Getmac command, a user can determine the MAC address of their various network devices. Some administrators will use the unique MAC addresses of devices to limit

```
C:\Users\lab314->GETMAC

Physical Address    Transport Name
=================== ============================================================
F4-39-09-4B-7F-70   \Device\Tcpip_{321CCCF7-2781-484E-BFA0-D670827CC01F}
0A-00-27-00-00-08   \Device\Tcpip_{60590FB2-C5E4-4271-87B0-3C4AD139C8AE}

C:\Users\lab314->
```

To run the basic command, at the prompt type:**getmac**

4. **HostName**

The Windows 10 HostName network command will simply display the current name of your Windows 10 computer . This is the name your computer uses to identify itself to the other devices and servers on your local network. You can find this name in the System information screen in the GUI, but this command is quicker.

```
C:\Users\lab314->HOSTNAME
lab324-09

C:\Users\lab314->s
```

To run the basic command, at the prompt type:**hostname**

5. **NSLookUp**

The NSLookUp Windows 10 network command displays information that you can use to diagnose Domain Name System (DNS) infrastructure. Using NSLookUp without a parameter will show the DNS server your PC is currently using to resolve domain names into IP addresses. I am using Google's DNS service because the server provided by my ISP is slow and prone to crashes.

```
C:\Users\Mark Kaelin Live>nslookup
Default Server:  dns.google
Address:  2001:4860:4860::8888

>
```

To run the basic command, at the prompt type:**nslookup**

6. Tracert

Another handy tool for troubleshooting network connections in Windows 10 is the Tracert command. This command will trace the route a data packet takes before reaching its destination, displaying information on each hop along the route. Each hop of the route will display the latency between your device and that particular hop and the IP address of the hop, as shown in **below image**.

```
C:\Users\lab314->tracert www.codeforces.com

Tracing route to www.codeforces.com [104.26.7.164]
over a maximum of 30 hops:

  1     7 ms     8 ms     7 ms  175.175.0.2
  2    12 ms    14 ms    14 ms  123.252.147.169
  3    11 ms     *        *     10.129.10.230
  4    14 ms    10 ms    14 ms  121.241.5.101.mumbai-static.vsnl.net.in [121.241.5.101]
  5     7 ms     4 ms     6 ms  172.28.176.221
  6     3 ms     3 ms     3 ms  172.28.177.190
  7    16 ms    25 ms    13 ms  121.240.241.246.static-Mumbai.vsnl.net.in [121.240.241.246]
  8    11 ms    14 ms     9 ms  172.70.216.5
  9    15 ms    19 ms     6 ms  104.26.7.164

Trace complete.
```

To run the basic command, at the prompt type:**tracert [host]**
Where [host] is the name or IP address of a common host server (google.com, techrepublic.com, etc.).

7. Netstat

The Netstat command displays active TCP connections, ports on which the computer is listening, Ethernet statistics, the IP routing table, IPv4 statistics, and IPv6 statistics. When used without parameters, this command displays active TCP connections. The information this command provides can be useful in pinpointing problems in your network connections.

```
Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    175.175.1.139:54216    175.175.5.218:ms-do    ESTABLISHED
  TCP    175.175.1.139:54242    20.198.118.190:https   ESTABLISHED
  TCP    175.175.1.139:54656    a23-212-254-41:https   CLOSE_WAIT
  TCP    175.175.1.139:54657    a23-212-254-41:https   CLOSE_WAIT
  TCP    175.175.1.139:54658    a23-212-254-75:https   CLOSE_WAIT
  TCP    175.175.1.139:54659    a23-212-254-8:https    CLOSE_WAIT
  TCP    175.175.1.139:54662    152.195.38.76:http     CLOSE_WAIT
  TCP    175.175.1.139:54895    Lab220-10:ms-do        ESTABLISHED
```

To run the basic command, at the prompt type**:netstat**

8. Arp

The Windows 10 network command Arp displays entries in the Address Resolution Protocol (ARP) cache, which contains one or more tables that are used to store IP addresses and their resolved Ethernet physical addresses. To get useful information from the Arp command you must provide a parameter. The most general parameter is /a, which displays current Arp cache tables for all interfaces.

```
C:\Users\lab314->ARP

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr] [-v]

  -a            Displays current ARP entries by interrogating the current
                protocol data.  If inet_addr is specified, the IP and Physical
                addresses for only the specified computer are displayed.  If
                more than one network interface uses ARP, entries for each ARP
                table are displayed.
  -g            Same as -a.
  -v            Displays current ARP entries in verbose mode.  All invalid
                entries and entries on the loop-back interface will be shown.
  inet_addr     Specifies an internet address.
  -N if_addr    Displays the ARP entries for the network interface specified
                by if_addr.
  -d            Deletes the host specified by inet_addr. inet_addr may be
                wildcarded with * to delete all hosts.
  -s            Adds the host and associates the Internet address inet_addr
                with the Physical address eth_addr.  The Physical address is
                given as 6 hexadecimal bytes separated by hyphens. The entry
                is permanent.
  eth_addr      Specifies a physical address.
  if_addr       If present, this specifies the Internet address of the
                interface whose address translation table should be modified.
```

To run the basic command, at the prompt type:**arp /a**

9. PathPing

Generally speaking, the Windows 10 network command PathPing combines the ping command with the tracert command, providing information about network latency and network loss at

intermediate hops between a source and destination.the PathPing command provides more detail than either ping or tracert can provide, such as latency reports and statistics on packet loss.

```
C:\Users\Mark Kaelin Live>pathping techrepublic.com

Tracing route to techrepublic.com [107.178.248.185]
over a maximum of 30 hops:
  0  MarkWKaelinm14x.cinci.rr.com [192.168.0.17]
  1  192.168.0.1
  2  142.254.147.225
  3  be60.lsvnkyfb02h.midwest.rr.com [74.128.6.173]
  4  be20.lsvmkyzo01r.midwest.rr.com [65.29.31.26]
  5  be24.clmkohpe01r.midwest.rr.com [65.189.140.162]
  6  107.14.17.252
  7  bu-ether11.chcgildt87w-bcr00.tbone.rr.com [66.109.6.20]
  8  72.14.222.220
  9     *        *        *
Computing statistics for 200 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           MarkWKaelinm14x.cinci.rr.com [192.168.0.17]
                                     0/ 100 =  0%   |
  1    4ms     0/ 100 =  0%      0/ 100 =  0%  192.168.0.1
                                     0/ 100 =  0%   |
  2   11ms     0/ 100 =  0%      0/ 100 =  0%  142.254.147.225
                                     0/ 100 =  0%   |
  3   11ms     2/ 100 =  2%      2/ 100 =  2%  be60.lsvnkyfb02h.midwest.rr.com [74.128.6.173]
                                     0/ 100 =  0%   |
  4   17ms     0/ 100 =  0%      0/ 100 =  0%  be20.lsvmkyzo01r.midwest.rr.com [65.29.31.26]
                                     0/ 100 =  0%   |
  5   24ms     0/ 100 =  0%      0/ 100 =  0%  be24.clmkohpe01r.midwest.rr.com [65.189.140.162]
                                     0/ 100 =  0%   |
  6   32ms     0/ 100 =  0%      0/ 100 =  0%  107.14.17.252
                                     1/ 100 =  1%   |
  7   32ms     1/ 100 =  1%      0/ 100 =  0%  bu-ether11.chcgildt87w-bcr00.tbone.rr.com [66.109.6.20]
                                     0/ 100 =  0%   |
  8   30ms     1/ 100 =  1%      0/ 100 =  0%  72.14.222.220

Trace complete.
```

To run the basic command, at the prompt type:**pathping [host]**
Where [host] is the name or IP address of a common host server (google.com, techrepublic.com, etc.).

10. SystemInfo

The last command on our list is the SystemInfo command, which displays a detailed list of configuration information about your Windows 10 PC. The information listed by this command is too lengthy to mention in full but includes the installed version of Windows 10, the host name, the Product ID, the type and number of CPUs, RAM configuration, network card details and installed hotfixes.

```
C:\Users\lab314->systeminfo

Host Name:                 LAB324-09
OS Name:                   Microsoft Windows 10 Pro
OS Version:                10.0.19045 N/A Build 19045
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:          lab314-
Registered Organization:
Product ID:                00331-20140-75169-AA438
Original Install Date:     01-11-2022, 09:18:03
System Boot Time:          30-01-2024, 14:25:22
System Manufacturer:       HP
System Model:              HP 280 G4 MT Business PC
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 158 Stepping 10 GenuineIntel ~3192 Mhz
BIOS Version:              AMI F.20, 01-11-2018
Windows Directory:         C:\Windows
System Directory:          C:\Windows\system32
```

Result and Discussion:

Conclusion:

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [40%]	Attendance / Learning Attitude [20%]	
Marks Obtained				