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IFT 259: Introduction to Internet Networking

Lab 20 Troubleshooting Utilities

After you complete each step, put a ' $\sqrt{}$ ' or 'x' in the completed box

- We need to test the network for connectivity i.e. connectivity to the servers, gateway/router etc.
- Use ip config, ping, tracert, nslookup, netstat
- 1. Open the command prompt and type in ipconfig

```
Vireless LAN adapter Vi-Fi:

Connection-specific DNS Suffix .: home
Link-local IPv6 Address . . : fe80::3112:94c6:b789:177fz3
IPv4 Address . . . : 192.168.1.5
Subnet Mask . . . . : 255.255.26
Default Gateway . . . : 192.168.1.1
```

This command shows the IP address, Subnet Mask and default gateway. It is useful if you set the client
up to DHCP as you cannot see this information by going to the NIC and right clicking and looking at
properties (you cannot see what IP address you received). However, we do not see our DNS servers
for examples



3. Now type ipconfig /all (allows us to see more stuff e.g. more servers, IPv6 information)



- 4. **Ping:** allows you to see if we are connected in the network e.g. if you can get a response from your routers. Allows you ping other computers on the network and see if they are reachable.
- 5. Ping the default gateway (based on the address your got from running the ipconfig /all command)

```
C:\>ping 192.168.1.1

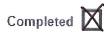
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=15ms TTL=64
Ping statistics for 192.168.1.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 15ms, Average = 5ms
```

Completed X

6. You can even ping domain names (ping yahoo.com)

```
C:\>ping yahoo.com

Pinging yahoo.com [98.138.253.109] with 32 bytes of data:
Reply from 98.138.253.109: bytes=32 time=141ms TIL=53
Reply from 98.138.253.109: bytes=32 time=62ms TIL=53
Reply from 98.138.253.109: bytes=32 time=63ms TIL=53
Reply from 98.138.253.109: bytes=32 time=61ms IIL=53
Ping statistics for 98.138.253.109:
Packets: Sent = 4. Received = 4. Lost = 0 (0% loss).
Approximate round trip times in milli-seconds:
Minimum = 61ms, Maximum = 141ms, Average = 81ms
```



7. **Tracert:** almost like ping but much more detailed. As the request for replies travel across the Internet, each router along the way will send a return message back (tracert vahoo.com)

```
C:\>tracert yahoo.com
Tracing route to yahoo.com [98.138.253.109]
over a maximum of 30 hops;
                                                                  Vireless Broadband Router.home [192.168.1.1]
L100.BSINMA-UFITP-94.verizon-gni.net [98.118.16
                                17 ms
                                                                  GØ-5-5-2.BSTNMA-LCR-22.verizon-gni.net [130.81.
             13 ns
                                30 ms
                                                   22 ms
                                                                  ae4-0.BOS-BB-RTR2.verizon-gni.net [130.81.151.8
                                                                 0.ae11.XL4.NYC1.ALTER.NET [152.63.20.117]
0.xe-9-0-6.BRI.NYC1.ALTER.NET [152.63.19.213]
Request timed out.
ae-1-3501.edge4.Chicago3.Level3.net [4.69.203.2
                              175 ms
                                                 187 ms
           196 ms
                                                                 YAHOO-INC.edge4.Chicago3.Level3.net [4.53.98.50
                                                  62 ms
56 ms
58 ms
57 ms
58 ms
63 ms
                                                                 ae-7.pat2.nez.yahoo.com [216.115.184.126]
ae-1.msri.nei.yahoo.com [216.115.180.5]
UNKNOUN-98-138-97-X.yahoo.com [98.138.97.3]
UNKNOUN-98-138-97-X.yahoo.com [98.138.97.45]
po-12.bas2-7-prd.nei.yahoo.com [98.138.248.20
iri.fp.vip.nei.yahoo.com [98.138.253.189]
```



8. **Nslookup** (Name Server lookup): resolves a name to an IP address. When we pinged yahoo.com, we got messages back but behind the scenes, DNS was resolving these names to IP addresses. Nslookup allows us to find those IP addresses straight away.

```
C:\>nslookup yahoo.com
Server: Wireless_Broadband_Router.home
Address: 192.168.1.1
Non-authoritative answer:
Name: yahoo.com
Addresses: 98.139.183.24
98.138.253.109
206.190.36.45
```



9. Netstat: useful for seeing whether we have listening TCP ports or network connections on our system.



Completed