Assignment #2

Instructions: Take screen shots and insert them in this document. Run your command prompt as administrator

Objective: To release and renew IP address information on a client that use DHCP

ARP:

1. Check your ARP table. Use the command: arp -a

```
Microsoft Windows [Version 10.0.19042.804]
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C:\WINDOWS\system32>arp -a

Interface: 192.166.4.197 --- 0xf
  Internet Address        Physical Address        Type
  192.166.4.1             00-90-7f-41-87-3c        dynamic
  192.166.4.3             00-1b-a9-71-56-66        dynamic
  192.166.4.120           00-22-19-0c-18-5e        dynamic
  192.166.4.168           ec-f4-bb-4d-3d-ec        dynamic
  192.166.4.177           d0-67-e5-ee-fa-e4        dynamic
  192.166.4.181           d0-67-e5-44-82-f0        dynamic
  192.166.4.255           ff-ff-ff-ff-ff-ff        static
  224.0.0.22              01-00-5e-00-00-16        static
  224.0.0.251             01-00-5e-00-00-fb        static
  224.0.0.252             01-00-5e-00-00-fc        static
  239.255.255.250         01-00-5e-7f-ff-fa        static
  255.255.255.255         ff-ff-ff-ff-ff-ff        static

C:\WINDOWS\system32>
```

Output of arp -a command shown above.

2. Find your IPv4 of your cell phone. And ping your phone.

```
C:\WINDOWS\system32>ping loffer-network.dynu.net

Pinging loffer-network.dynu.net [24.157.239.154] with 32 bytes of data:
Reply from 24.157.239.154: bytes=32 time<1ms TTL=64
Reply from 24.157.239.154: bytes=32 time<1ms TTL=64
Reply from 24.157.239.154: bytes=32 time<1ms TTL=64
Reply from 24.157.239.154: bytes=32 time<1ms TTL=64

Ping statistics for 24.157.239.154:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\WINDOWS\system32>
```

Result of ping command from pinging my home router. Cell phone is connected to a different network.

3. Check your ARP table!

```
C:\WINDOWS\system32>arp -a

Interface: 192.166.4.197 --- 0xf
  Internet Address         Physical Address        Type
  192.166.4.1              00-90-7f-41-87-3c       dynamic
  192.166.4.3              00-1b-a9-71-56-66       dynamic
  192.166.4.120            00-22-19-0c-18-5e       dynamic
  192.166.4.168            ec-f4-bb-4d-3d-ec       dynamic
  192.166.4.177            d0-67-e5-ee-fa-e4       dynamic
  192.166.4.181            d0-67-e5-44-82-f0       dynamic
  192.166.4.255            ff-ff-ff-ff-ff-ff       static
  224.0.0.22               01-00-5e-00-00-16       static
  224.0.0.251              01-00-5e-00-00-fb       static
  224.0.0.252              01-00-5e-00-00-fc       static
  239.255.255.250          01-00-5e-7f-ff-fa       static
  255.255.255.255          ff-ff-ff-ff-ff-ff       static

C:\WINDOWS\system32>
```

Output of arp -a command again shown above.

4. Clear your ARP table with the command arp -d and check your arp table again.

```
C:\WINDOWS\system32>arp -d

C:\WINDOWS\system32>arp -a

Interface: 192.166.4.197 --- 0xf
  Internet Address         Physical Address        Type
  192.166.4.1              00-90-7f-41-87-3c       dynamic
  224.0.0.22               01-00-5e-00-00-16       static
  239.255.255.250          01-00-5e-7f-ff-fa       static

C:\WINDOWS\system32>
```

Arp table cleared with arp -d command and arp table listed again with arp -a command shown above.

DNS:

5. Check your DNS cash on your computer: ipconfig /displaydns

```
C:\WINDOWS\system32>ipconfig /displaydns

Windows IP Configuration

    hts.usitc.gov
    ----------------------------------------
    Record Name . . . . . : hts.usitc.gov
    Record Type . . . . . : 1
    Time To Live  . . . . : 12720
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 65.121.221.210


    r3---sn-8qu-t0ay.googlevideo.com
    ----------------------------------------
    Record Name . . . . . : r3---sn-8qu-t0ay.googlevideo.com
    Record Type . . . . . : 5
    Time To Live  . . . . : 298
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : r3.sn-8qu-t0ay.googlevideo.com


    Record Name . . . . . : r3.sn-8qu-t0ay.googlevideo.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 298
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 96.23.20.14


    fcmconnection.googleapis.com
    ----------------------------------------
    Record Name . . . . . : fcmconnection.googleapis.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 131
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.217.13.138


    nht-2.extreme-dm.com
    ----------------------------------------
    Record Name . . . . . : nht-2.extreme-dm.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 2201
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 18.233.3.105


    Record Name . . . . . : awsns.extreme-dm.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 2201
    Data Length . . . . . : 4
    Section . . . . . . . : Additional
    A (Host) Record . . . : 23.23.128.42
```

DNS cache shown on my computer after executing ipconfig /displaydns command shown above.

6. Clear your DNS cash: ipconfig /flushdns
7. Quickly check your DNS cash again. Check it again in a few min. (for me MS Teams came back by itself.)

```
C:\WINDOWS\system32>ipconfig /displaydns

Windows IP Configuration

    outlook.office.com
    ----------------------------------------
    Record Name . . . . . : outlook.office.com
    Record Type . . . . . : 5
    Time To Live  . . . . : 47
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : substrate.office.com


    Record Name . . . . . : substrate.office.com
    Record Type . . . . . : 5
    Time To Live  . . . . : 47
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : substrate.ms-acdc.office.com


    Record Name . . . . . : substrate.ms-acdc.office.com
    Record Type . . . . . : 5
    Time To Live  . . . . : 47
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : afd-k.office.com


    Record Name . . . . . : afd-k.office.com
    Record Type . . . . . : 5
    Time To Live  . . . . : 47
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : outlook-office-com.k-0002.k-msedge.net


    Record Name . . . . . : outlook-office-com.k-0002.k-msedge.net
    Record Type . . . . . : 5
    Time To Live  . . . . : 47
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : k-0002.k-msedge.net


    Record Name . . . . . : k-0002.k-msedge.net
    Record Type . . . . . : 1
    Time To Live  . . . . : 47
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 13.107.18.11
```

DNS cache cleared using ipconfig /flushdns command and DNS cache checked again by using ipconfig /displaydns command shown above.

8. Ping google.com, and check the DNS cash again.

```
C:\WINDOWS\system32>ipconfig /displaydns

Windows IP Configuration

    fcmconnection.googleapis.com
    ----------------------------------------
    Record Name . . . . . : fcmconnection.googleapis.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 162
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.217.13.106


    smtp.gmail.com
    ----------------------------------------
    Record Name . . . . . : smtp.gmail.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 228
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 173.194.206.109


    www.googleapis.com
    ----------------------------------------
    Record Name . . . . . : www.googleapis.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 196
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.217.13.106


    Record Name . . . . . : www.googleapis.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 196
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.217.13.202


    imap.gmail.com
    ----------------------------------------
    Record Name . . . . . : imap.gmail.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 227
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.253.122.109


    Record Name . . . . . : imap.gmail.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 227
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 172.253.122.108
```

Result of DNS cache table after pinging www.google.com. Result of DNS cache table shown above.

DHCP:

9. Obtain IP information of your computer using ipconfig /all. What is your IPv4 & IPv6 address, subnet mask and MAC?

```
C:\WINDOWS\system32>ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : E5420-Leonardo
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : loffer.DATA

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : loffer.DATA
   Description . . . . . . . . . . . : Broadcom NetXtreme 57xx Gigabit Controller
   Physical Address. . . . . . . . . : D0-67-E5-49-6B-1B
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 192.166.4.197(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : February 24, 2021 6:03:39 PM
   Lease Expires . . . . . . . . . . : February 24, 2021 8:03:39 PM
   Default Gateway . . . . . . . . . : 192.166.4.1
   DHCP Server . . . . . . . . . . . : 192.166.4.1
   DNS Servers . . . . . . . . . . . : 192.166.4.1
   NetBIOS over Tcpip. . . . . . . . : Enabled

C:\WINDOWS\system32>
```

IP configuration of my computer shown after executing ipconfig /all command shown above.

> IPv4 address: 192.166.4.197 (class C - assigned by DHCP)
> IPv6 address: None (not used)
> Subnet mask: 255.255.255.0 (class C)
> MAC address: D0-67-E5-49-6B-1B

10. From output of step 1,

    10.1.   How many interfaces do you have?

Wi-Fi	Disabled	Intel(R) Dual Band Wireless-AC 7260		
OpenVPN	Disabled	TAP-Windows Adapter V9		
Npcap Loopback Adapter	Disabled	Npcap Loopback Adapter		
Ethernet	Loffer 2	Broadcom NetXtreme 57xx Gigabit Controller	Internet access	Private network

From result of ipconfig /all command above, only one interface is shown but my PC in reality has four.
Only my main adapter is enabled. Others are disabled.

10.2.   Determine the one that is providing you internet access, some hints: it's the one with many addresses. It is the one that has a gateway and DNS server address.

My main adapter that is providing me with internet access is the one labeled "Ethernet" shown above in my network adapters list. It is the same adapter shown in the command prompt above as well.

10.3.   note the date and time when your DHCP lease was obtained, and when it is due to expire.

➢ DHCP lease obtained: February 24, 2021 at 6:03:39PM.
➢ DHCP lease expiry date: February 24, 2021 at 8:03:39PM.

11. To terminate DHCP lease, type ipconfig /release. Note you will lose internet when you do this.

12. Type ipconfig /all. What happens to your IP address information? If you got a new address what address did you get? What kind of address is this.

```
C:\WINDOWS\system32>ipconfig /release

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Default Gateway . . . . . . . . . :

C:\WINDOWS\system32>ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : E5420-Leonardo
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Broadcom NetXtreme 57xx Gigabit Controller
   Physical Address. . . . . . . . . : D0-67-E5-49-6B-1B
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Autoconfiguration IPv4 Address. . : 169.254.70.118(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :
   NetBIOS over Tcpip. . . . . . . . : Enabled

C:\WINDOWS\system32>
```

DHCP lease terminated and updated IP configuration of my PC shown above. New address assigned is a private address assigned automatically by Windows.

13. To renew your DHCP lease, type ipconfig /renew. Compare your new IP configuration obtained with those at step 1 & 2.

```
C:\WINDOWS\system32>ipconfig /renew

Windows IP Configuration


Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : loffer.DATA
   IPv4 Address. . . . . . . . . . . : 192.166.4.197
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.166.4.1

C:\WINDOWS\system32>ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : E5420-Leonardo
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : loffer.DATA

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : loffer.DATA
   Description . . . . . . . . . . . : Broadcom NetXtreme 57xx Gigabit Controller
   Physical Address. . . . . . . . . : D0-67-E5-49-6B-1B
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv4 Address. . . . . . . . . . . : 192.166.4.197(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : February 24, 2021 6:51:27 PM
   Lease Expires . . . . . . . . . . : February 24, 2021 8:51:26 PM
   Default Gateway . . . . . . . . . : 192.166.4.1
   DHCP Server . . . . . . . . . . . : 192.166.4.1
   DNS Servers . . . . . . . . . . . : 192.166.4.1
   NetBIOS over Tcpip. . . . . . . . : Enabled

C:\WINDOWS\system32>
```

DHCP address renewed using ipconfig /renew command shown above. Updated IP configuration of my PC shown above using ipconfig /all command. New address assigned by my DHCP server is the same one as before when the lease wasn't renewed.