Assignment 1-1: System Discovery

Name: _____

Objective

The purpose of this lab is to introduce you to the methods for discovering your computer's network connection, host name, MAC (Layer 2) address and network IP (Layer 3) address.

Scenario

This lab assumes you are using any version of Windows. You will go out and see your system's hostname, MAC address, and network address. Mac users should be able to use the Terminal application to get similar results.

Ideally, this lab will be done in a classroom or other LAN with multiple computers connected to the Internet – even a home LAN where a Smartphone and or tablet may also be present.

Part 1

Use the Start menu to open the Command Prompt (DOS-like) window (Start | Programs | Accessories | Command Prompt or Start | Run and type **cmd** and Press Enter.
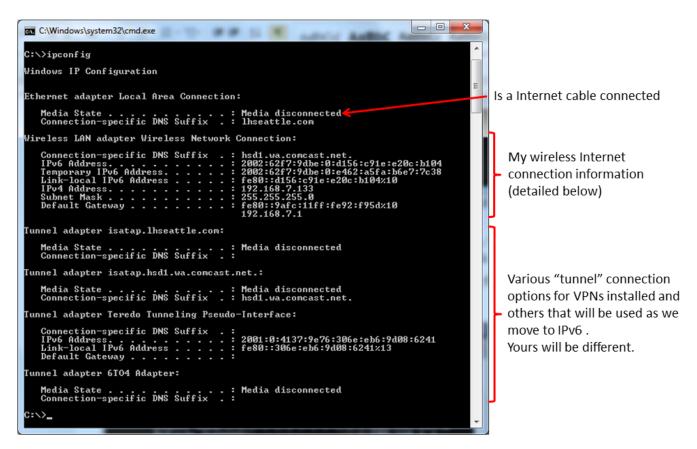

Notice that the prompt is quite long indicating the folder or directory it opened in. Yours will be unique to your machine.

Typing **cd** and **Enter** takes you to the Root or main directory as shown above. While not necessary for our purposes it will tidy up the screen and make your results look more like mine.

Type **ipconfig** and press **Enter** while in the command window. Ipconfig spelling is critical while case is not. This the response we got until just a few years ago. Very simple: IP address, Subnet Mask and Default Gateway – the very things we are looking for.

But you don't get off so easy, on today's computers we get something more like this:

The part we are interested in now is either the Ethernet Adapter LAN (a cable connection) or the Wireless LAN (for WiFi connections). Data like the following will appear under the right heading:

The green arrows point to what would be your IPv6 address if your network was using it. Most network technologies have supported both for several years. We will cover these in the IPv6 lecture and materials. You might note that there are both IPv6 and IPv4 Address and Default Gateway but only an IPv4 Subnet mask – that goes away in IPv6.

You should find that the IP address and the default gateway are on the same network or subnet. Otherwise, this host wouldn't be able to communicate outside the network. In the figure, the subnet mask tells us that the first three octets must be the same to be on the same network.

Note: If you are on a LAN, you might not see the default gateway if you are running behind a Proxy Server.

Write down your IPv4 address: _____

Write down your Subnet Mask: _____

Write down your IPv4 Default Gateway: _____

Part 2

If you are doing this on a LAN, compare the information of several machines.

Are there any similarities? _____

What are similar about the IP addresses? _____

What are similar about the default gateways? _____

The IP addresses should share the same network portion. All machines in the LAN should share the same default gateway.

Record a couple of the IP Addresses? _____

Part 3

To see more info – way more than you ever wanted to see, type **ipconfig /all** and press **Enter**.

The output below shows the detailed IP configuration screen. Yes, I know there is a lot of red ink, but it addresses questions that always come up.

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C:\>ipconfig /all
Windows IP Configuration
    Host Name . . . . . . . . . . . . : BOB-PC  (My computer's name)
    Primary Dns Suffix  . . . . . . . : lhseattle.com   (Domain my PC belongs to)
    Node Type . . . . . . . . . . . . : Hybrid
    IP Routing Enabled. . . . . . . . : No
    WINS Proxy Enabled. . . . . . . . : No  (We're not using a proxy server)
    DNS Suffix Search List. . . . . . : lhseattle.com
                                        hsd1.wa.comcast.net.  (ISP's Domain Name)

Ethernet adapter Local Area Connection:
    Media State . . . . . . . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : lhseattle.com
    Description . . . . . . . . . . . : Intel(R) 82567LM Gigabit Network Connection
    Physical Address. . . . . . . . . : 00-21-70-BE-4F-C8  (Network port MAC address*1)
    DHCP Enabled. . . . . . . . . . . : Yes  (PC can get IP from the network – usually router*²)
    Autoconfiguration Enabled . . . . : Yes   (PC can get rest of configuration from the network)

Wireless LAN adapter Wireless Network Connection:
    Connection-specific DNS Suffix  . : hsd1.wa.comcast.net.
    Description . . . . . . . . . . . : Intel(R)  WiFi Link 5300 AGN  (WiFi adapter)
    Physical Address. . . . . . . . . : 00-21-6A-04-B2-46  (WiFi port MAC address*1)
    DHCP Enabled. . . . . . . . . . . : Yes  (PC can get IP from the network –
usually router*²)
    Autoconfiguration Enabled . . . . : Yes  (PC can get rest of configuration from the network)
    IPv6 Address. . . . . . . . . . . : 2002:62f7:9dbe:0:d156:c91e:e20c:b104(Prefer)
    Temporary IPv6 Address. . . . . . : 2002:62f7:9dbe:0:e462:a5fa:b6e7:7c38(Prefer)
    Link-local IPv6 Address . . . . . : fe80::d156:c91e:e20c:b104%10(Preferred)
    IPv4 Address. . . . . . . . . . . : 192.168.7.133(Preferred)
    Subnet Mask . . . . . . . . . . . : 255.255.255.0
    Lease Obtained. . . . . . . . . . : Monday, January 07, 2013 7:09:14 PM*5
    Lease Expires . . . . . . . . . . : Wednesday, January 09, 2013 9:54:26 AM*5
    Default Gateway . . . . . . . . . : fe80::9afc:11ff:fe92:f95d%10 (IPv6)
                                        192.168.7.1*4 (IPv4)
    DHCP Server . . . . . . . . . . . : 192.168.7.1*4 (Dynamic Host Configuration Protocol*²)
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       DHCPv6 IAID . . . . . . . . . . . : 201335146
       DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-16-6E-E0-3E-00-21-70-BE-4F-C8
       DNS Servers . . . . . . . . . . . : 192.168.7.1*4  (Domain Naming Service*3)
                                           75.75.76.75 (alternative DNS server)
       NetBIOS over Tcpip. . . . . . . . : Enabled

   Tunnel adapter isatap.lhseattle.com:    (not in use VPN connection to my PC's Domain *6)
       Media State . . . . . . . . . . . : Media disconnected
       Connection-specific DNS Suffix  . :
       Description . . . . . . . . . . . : Microsoft ISATAP Adapter
       Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
       DHCP Enabled. . . . . . . . . . . : No
       Autoconfiguration Enabled . . . . : Yes

   Tunnel adapter isatap.hsd1.wa.comcast.net.: (not in use VPN connection to my ISP)
       Media State . . . . . . . . . . . : Media disconnected
       Connection-specific DNS Suffix  . : hsd1.wa.comcast.net.
       Description . . . . . . . . . . . : Microsoft ISATAP Adapter #2
       Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
       DHCP Enabled. . . . . . . . . . . : No
       Autoconfiguration Enabled . . . . : Yes

   Tunnel adapter Teredo Tunneling Pseudo-Interface:  (an optional IPv4 to IPv6 connection)
       Connection-specific DNS Suffix  . :
       Description . . . . . . . . . . . : Teredo Tunneling Pseudo-Interface
       Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
       DHCP Enabled. . . . . . . . . . . : No
       Autoconfiguration Enabled . . . . : Yes
       IPv6 Address. . . . . . . . . . . : 2001:0:4137:9e76:306e:eb6:9d08:6241(Prefer)
       Link-local IPv6 Address . . . . . : fe80::306e:eb6:9d08:6241%13(Preferred)
       Default Gateway . . . . . . . . . :
       NetBIOS over Tcpip. . . . . . . . : Disabled

   Tunnel adapter 6TO4 Adapter:            (Microsofts optional IPv4 to IPv6 connection)
       Media State . . . . . . . . . . . : Media disconnected
       Connection-specific DNS Suffix.   :
       Description . . . . . . . . . . . : Microsoft 6to4 Adapter
       Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
       DHCP Enabled. . . . . . . . . . . : No
       Autoconfiguration Enabled . . . . : Yes
   C:\>
```

*1 First six digits identifies the Manufacturer and model of connector – item right above it

*2 DHCP Server supplies PC with IP, subnet mask, gateway, and **DNS** address to use

*3 DNS Servers resolve URLs (i.e. uw.edu or Microsoft.com) to IP addresses

*4 the fact all the same IP address indicates a small network using the router for these tasks)

*5 Lease Obtained – when PC last got its IP, etc. Expires – when they must renew)

*6 VPN: Virtual Private Network – encrypted for privacy/security)

You should now see the host name (computer name, NetBIOS name), the DHCP server's address if used, and the date the IP lease starts and ends. Look over the information. You may see one or more entries for a DNS server, which are used in resolving URLs and email addresses to IP addresses.

Do all of the servers (DHCP and DNS) share the same network portion of the IP address as your workstation? It would not be unusual for some or all to be on another network in

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larger networks. It means that your default gateway is going to forward (route) your requests to the other network.

The above example reveals that the router is also performing DHCP and DNS services for this small network – this would be common in a home, small office / home office (SOHO), small branch office implementation, or for public WiFi HotSpots (i.e. McDonald's, Starbucks).

We also see the Physical Address (MAC) and the NIC (network card) model (Description).

In the LAN, what similarities do you see about the Physical (MAC) Addresses?

_____

While not a requirement many LAN administrators try to standardize components like NICS or computer models with built-in NICs, so it would not be surprising to find all machines share the first three Hex pairs in the adapter address. These three pairs identify the manufacturer of the adapter.

Write down the IP addresses of any servers listed: _____

_____

Write down the computer's Host Name: _____

Write down the Host Names of a couple other computers: _____

_____

Close the screen when you are finished looking around.

Repeat the above steps as necessary to make sure that you can return to and interpret this screen. Try it at a couple of different networks you frequent: work, Starbucks, McDonald's, school and not the differences

Part 5 –Finding the IP and MAC address on your phone or tablet

Phones, tablets, Smart TVs, and any device with Internet features also have IP setups although they often just get the data from the WiFi unit and don't easily share it with users – typically no need.

Because of the variety of makers and versions of software, you may have to experiment with this a bit.

Finding the MAC Address on Your Android Tablet

To locate the MAC Address of your Android phone or Android tablet, follow these steps:

1. On the Home screen, tap the Menu key and go to Settings.
2. Scroll down and tap About Tablet then tap Status and then scroll down to view WiFi Mac address.

Finding the MAC Address on Your Android Phone

Depending on your device, attempt to follow one set of instructions listed below:

1. On the Home screen, tap the Menu button and go to Settings.
2. Tap About Phone.
3. Tap Status.
4. Scroll down to see your WiFi MAC address.

Or,

1. On the Home screen, tap the Menu button and go to Settings.
2. Tap About Phone.
3. Tap Hardware information.
4. Scroll down to see your WiFi MAC address.

Finding the iPad, iPhone or iPod Touch MAC Address

To locate the MAC Address of your iPad, iPhone or iPod Touch, follow these steps:

1. Tap Settings.
2. Select General.
3. Then select About.
4. The MAC address is listed as WiFi Address. Does the IP address appear?

Note your results: _____

_____

_____

_____