

Lab 3
MCSE 1
Objective:

Name Gren Lopez

NOTE: IP ADDRESSES (v4) ARE:
- 32 bits; 8 nibbles; 4 bytes; 2 words; 1 D-word
- IP + SUBNET = (NETWORK, BROADCAST, HOST) ADDRESS

- Configure Windows 7, Windows 8, and Windows 10 clients on various networks to practice network principals.

Procedure:



- Make sure Ottawa, Hamilton, and Saskatoon are connected to VMNet2.

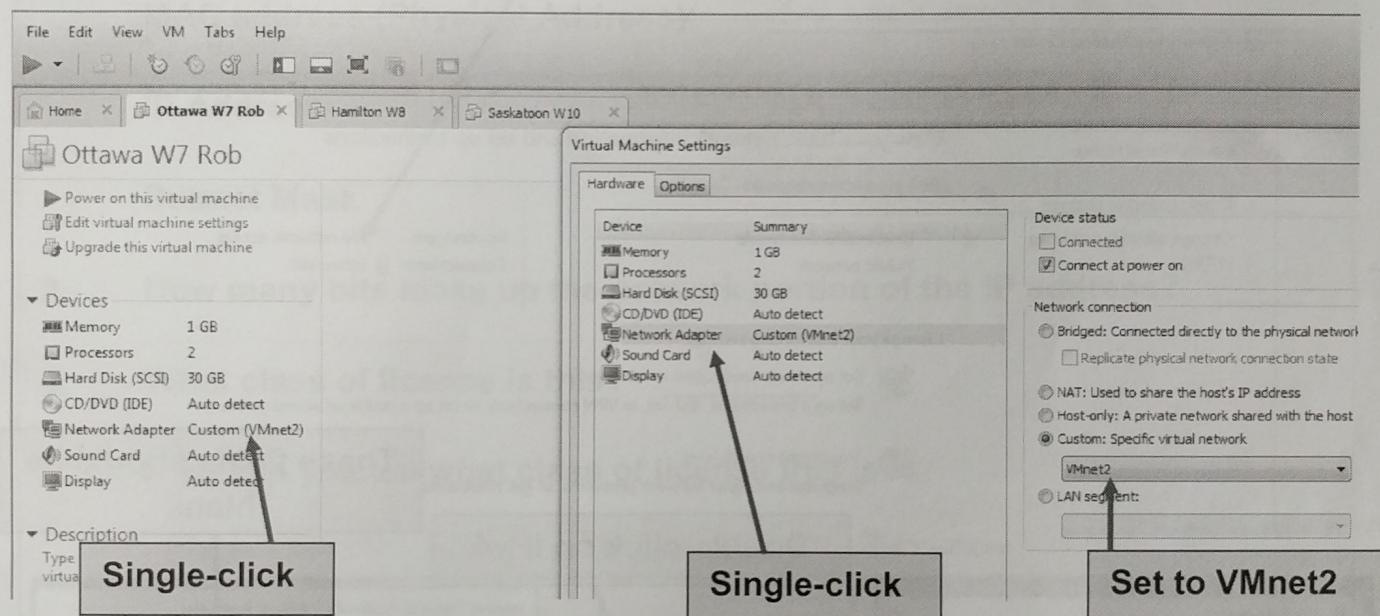


Fig. 1 Connecting the virtual machine to VMNet2

- Make sure all 3 virtual machines are set for at least 1 GB. You can change the amount of RAM allocated to virtual machine the same way you set the VMNet connection.



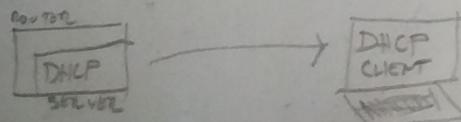
- Start Ottawa, Hamilton and Saskatoon.

Your network at home has a router that acts like a DHCP server that will automatically give your computers IP addresses. The network in the lab is just three computers connected to a switch. There is no DHCP server to give your computer an IP address.

* NOTE

DHCP: DYNAMIC HOST CONFIG PROTOCOL

- AUTOMATICALLY CONFIGS A LOCAL IP ADDRESS FOR A JOINING COMP ON THAT NETWORK



1

Saskatoon:

- Configure the network card on Saskatoon to obtain a DHCP address. To do this, right-click on **Network** icon in the task bar and select **Open Network and Sharing Center**. Click on the **Ethernet0** connection. Configure the NIC as shown below.

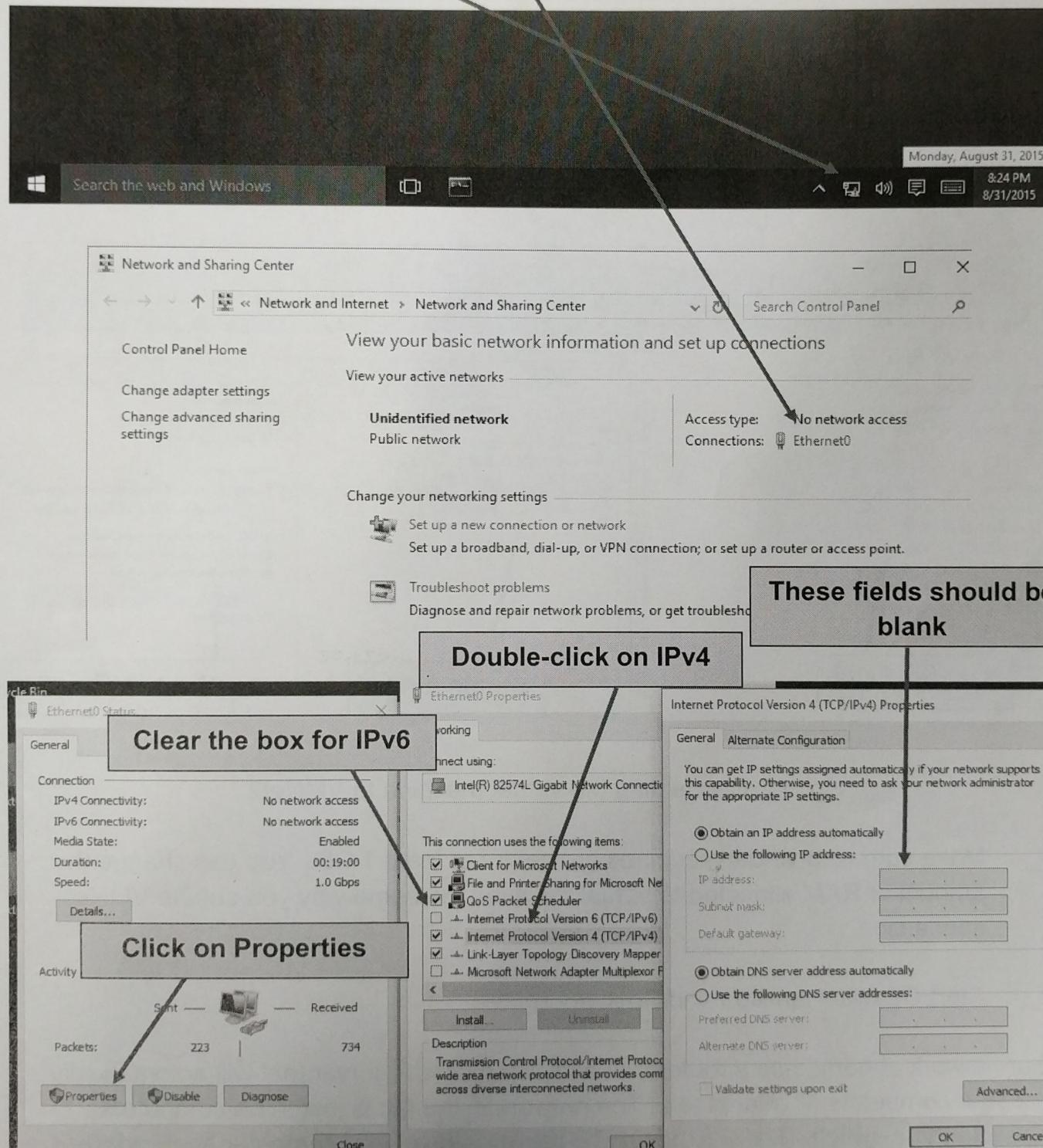


Fig. 2 Configuring the NIC to obtain an IP address

129	64	32	16	8	4	2	1
0	0	= 0		A	00 = 0 - 128		
1	0	= 128		B	10 = 129 - 191		
1	1	= 192		C	11 = 191 - 224		

$127 = \text{loopback}$

Note: There will be no screen captures for this lab. You will answer all the questions on this printed copy of the lab and then submit the paper lab to be marked.

- ✓ Click on **OK** a couple of times to close the properties page of the network card.
- ✓ In the DOS window type **ipconfig /all**.

1. Record the following information:

MAC address (Physical Address): 00:0C:29:D5:9D:04

IP Address 169.254.43.49

Subnet Mask 255.255.0.0
 $8 + 8 = 16$

2. How many bits make up the network portion of the IP address? 16 bits

3. What class of license is this? B

4. How can you tell what class of license this is?

First octet binary configuration is between 1xxx xxxx - 11xx xxxx

5. What is the network address? 169.254.0.0

The client tried to obtain an IP address from the server. There is no server so the client gave itself an **APIPA** (Automatic Private IP Address) address.

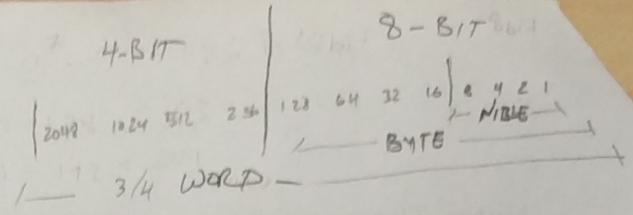
Ottawa:

- ✓ Configure Ottawa so it will try to obtain a DHCP address. Follow the instructions You used for Windows 10.

$$A = 0 - 127 \rightarrow \begin{array}{r} 0000\ 0000 \\ 0111\ 1111 \end{array}$$

$$B = 128 - 191 \rightarrow \begin{array}{r} 1000\ 0000 \\ 1011\ 1111 \end{array}$$

$$C = 192 - 223 \rightarrow \begin{array}{r} 1100\ 0000 \\ 1101\ 1111 \end{array}$$



6. Record the following information:

MAC address (Physical Address): 00:0C:29:0C:53:C7

IP Address 169.254.131.27

Subnet Mask 255.255.0.0
 ↓
 NETWORK

7. How many bits make up the network portion of the IP address? 16

8. What class of license is this? B

9. What is the network address? 169.254.0.0

**10. Will Ottawa and Saskatoon be able to communicate with each other?
 Explain why you think they will or will not.**

Sask & Ottawa BELONG TO THE SAME NETWORK & ASSIGNED DIFFERENT HOST IP VIA SUBNET MASKING. SWITCH IS EMULATED VIA "VMnet2" SO OTTAWA SHOULD BE ABLE TO PING SASK.

✓ Ping Ottawa from Saskatoon. You should be successful.

✗ Ping Saskatoon from Ottawa. You will probably be unsuccessful.

Windows 10 on Saskatoon may have its firewall on. This blocks the ping command.

✓ On Saskatoon, turn the firewall off by following these steps.

✓ Open the **Control Panel**. Select **System and Security**. Scroll to the bottom of the Security Center window. Click on **Windows Firewall**. Select **Turn Windows Firewall on or off**.

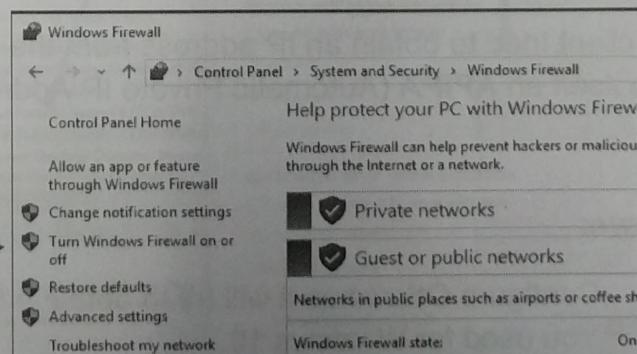


Fig. 3 Turning the firewall off

- Try pinging Saskatoon from Ottawa, again. You should be successful this time.

Hamilton:

- Configure Hamilton so it tries to request an IP address from a DHCP server.

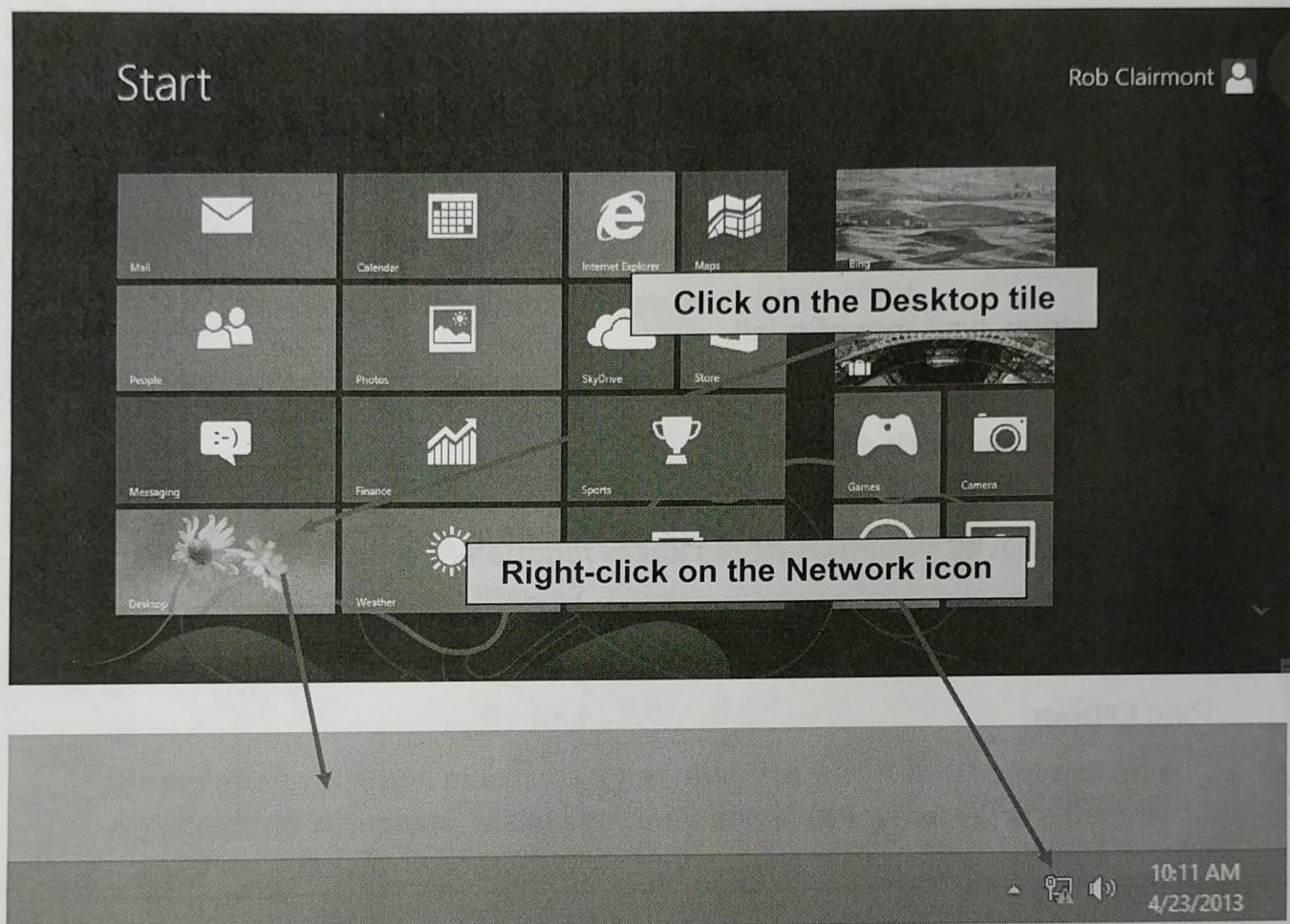


Fig. 4 Configuring the NIC on Windows 8

- After clicking on the network icon in figure 4, the rest of the steps are the same as they were for Windows 10. See figure 2.
- Get back to the Start screen shown in figure 4 by pressing the windows key.
- Click on the dark background of the desktop and type **cmd**.
- Type **ipconfig /all**.

CIDR = CLASSLESS INTERN DOMAIN ROUTING

= SUPER NETTING

= USED TO MATHEMATICALLY EXTEND PUBLIC IPs BY SUBGROUPING PRIVATE NETWORK INTO 1 PUBLIC IP ADDRESS USING BINARY LOGIC/MATH

11. What is the IP address?

169.254.117.251 /16

12. What is the network address? Assuming subnet is 255.255.0.0 → 169.254.0.0

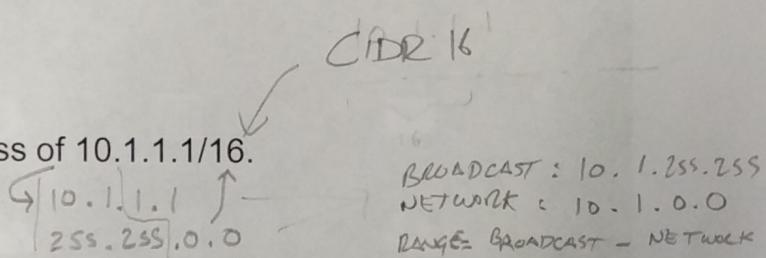
13. Is Hamilton on the same network as Saskatoon and Ottawa? YES

✓ Ping Ottawa and Saskatoon. You should be successful.

Saskatoon:

✓ Configure Saskatoon to use an IP address of 10.1.1.1/16.

✓ On Saskatoon, type ipconfig /all.



14. What is the network address? 10.1.0.0

15. Is Saskatoon on the same network as Hamilton and Ottawa? NOT ANY MORE

Hamilton:

✓ Ping Ottawa.

✓ Ping Saskatoon.

* NOTE: CALCULATING BROADCAST & DR

Ex: 172.16.20.19

↓
255.255.240.0

BROADCAST = 172.16.31.255

IF THEN 255

$$\begin{array}{r} 256 \\ 240 \\ \hline 16 \\ \text{NUMBER} \end{array}$$

$$\begin{array}{r} 16+16=32 \\ 32 \text{ is } > 20 \\ \hline 32 \\ -1 \\ \hline 31 \end{array}$$

APP MULTIPLIER UNTIL IT IS LARGER THAN 20
THEP SUBTRACT 1 FROM TOTAL GAINED FROM ADDING THE MULTIPLIER

16. Record the results of the last 2 pings and explain why you got those results.

HAMILTON → OTTAWA : PACKETS(LOST:0, SENT:4, REC:4)

HAMILTON → SASKATOON : PACKETS(LOST:4, SENT:4, REC:0)

* 10.1.0.0 is NOT 169.254.0.0 (NOT IN THE SAME NETWORK ANYMORE)

Ottawa:

✓ Configure the NIC on Ottawa with an IP address of 10.1.2.2/16

Hamilton:

Configure the NIC on Hamilton with an IP address of 10.1.3.3/16

17. What is the network address for Ottawa? 10.1.0.0

18. What is the network address for Hamilton? 10.1.0.0

✓ From Hamilton, ping Saskatoon and Ottawa. You should be successful both times.

✓ On Hamilton change the subnet mask to 255.255.255.0.

✓ From Hamilton, ping Saskatoon and Ottawa. You should be unsuccessful both times.

* 19. Why did changing the subnet mask cause Hamilton to not be able to ping Saskatoon and Ottawa? *Going from CIDR 16 to CIDR 24*

*CHANGES THE NETWORK ADDRESS
[10.1.0.0] vs [10.1.1.0]*

Configure the 3 virtual machines so they are using an IP address on a private class B license. Make sure they are all using the same network.

20. What address did you use for Saskatoon? 172.16.42.1/24

21. What address did you use for Hamilton? 172.16.42.2/24

22. What address did you use for Ottawa? 172.16.42.3/24

23. What subnet mask did you use? 255.255.255.0

24. What network are the 3 computers on? 172.16.42.0

✓ Try pinging from Saskatoon to Ottawa and Hamilton. You should be successful.

✓ Configure the 3 virtual machines for so they are using an IP address on a private class C license. Make sure they are all using the same network.

192

- | | |
|---|------------------------|
| 25. What address did you use for Saskatoon? | <u>192.168.1.1 /24</u> |
| 26. What address did you use for Hamilton? | <u>192.168.1.2 /24</u> |
| 27. What address did you use for Ottawa? | <u>192.168.1.3 /24</u> |
| 28. What subnet mask did you use? | <u>255.255.255.0</u> |
| 29. What network are the 3 computers on? | <u>192.168.1.0</u> |

✓ Try pinging from Saskatoon to Ottawa and Hamilton. You should be successful.

✓ Configure Saskatoon for 10.1.1.1/24.

✓ Configure Ottawa for 10.1.1.2/24.

✓ Configure Hamilton for 10.1.1.3/24

✓ Ping to make sure you can communicate between the 3 hosts.

Windows 7 and Windows 8 Tips: Pinning applications to the Taskbar

With Windows 7, 8 and 10, you can add or pin frequently used applications to the taskbar to make them readily available.

Ottawa:

✓ Open a command prompt.



Notice the icon representing the window appears in the task bar. To make it stay on the taskbar after the window is closed, right-click the icon and select **pin this program to taskbar**.

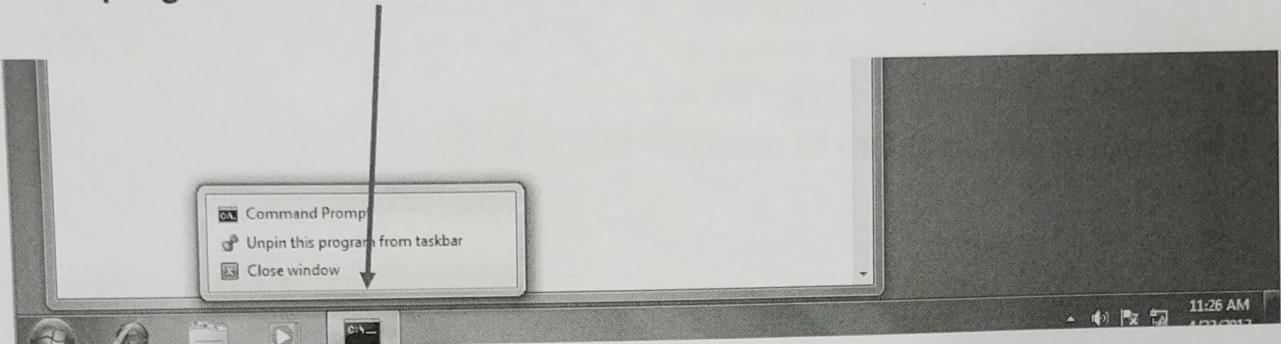


Fig. 5 Pinning the command prompt to the task bar

The same thing can be done with Windows 8.

- From the start window on Hamilton, click on the dark background on the desktop and type **cmd**.
- Right-click on the Command prompt box in the upper left corner and select **pin to taskbar** at the bottom of the screen.
- Return to the **Start** window and click on the **Desktop tile**.

You should see the command prompt icon on the taskbar.

**OK....
YOU'RE
DONE !!!!!!!**

