Virtual Machine Networking

Introduction to Virtual Machine (VM) Networking

Introduction to Networking of Virtual Machine (VM) and Host Computer.

In order for VM to communicate with each other as well as with Host Computer, each VM and Host Computer must be configured properly.

This document describes step-by-step user guide of configuration of VM and Host Computer. Topics listed below are covered in subsequent sections of this document.

1) How to check IP Address
2) How to change IP Address
3) How to check Network Communication
4) How to access Available Networks

How to check IP Address

Perform following steps in order to check IP Address of a computer.

It is assumed that you have two Virtual Machines (VM1 and VM2) installed on your computer, which makes your computer Host Computer.

NOTE: *Following steps are performed on VM1*

1) From system tray, click on **Network** icon.
2) From the pop-up, click on the **Open Network and Sharing Center** link.
3) Network and Sharing Center window displays following information:
    - Options to change Adapter Settings and Advance Sharing Settings
    - List of active networks and connections to those networks

- Options to setup new networks or to make changes to existing networks

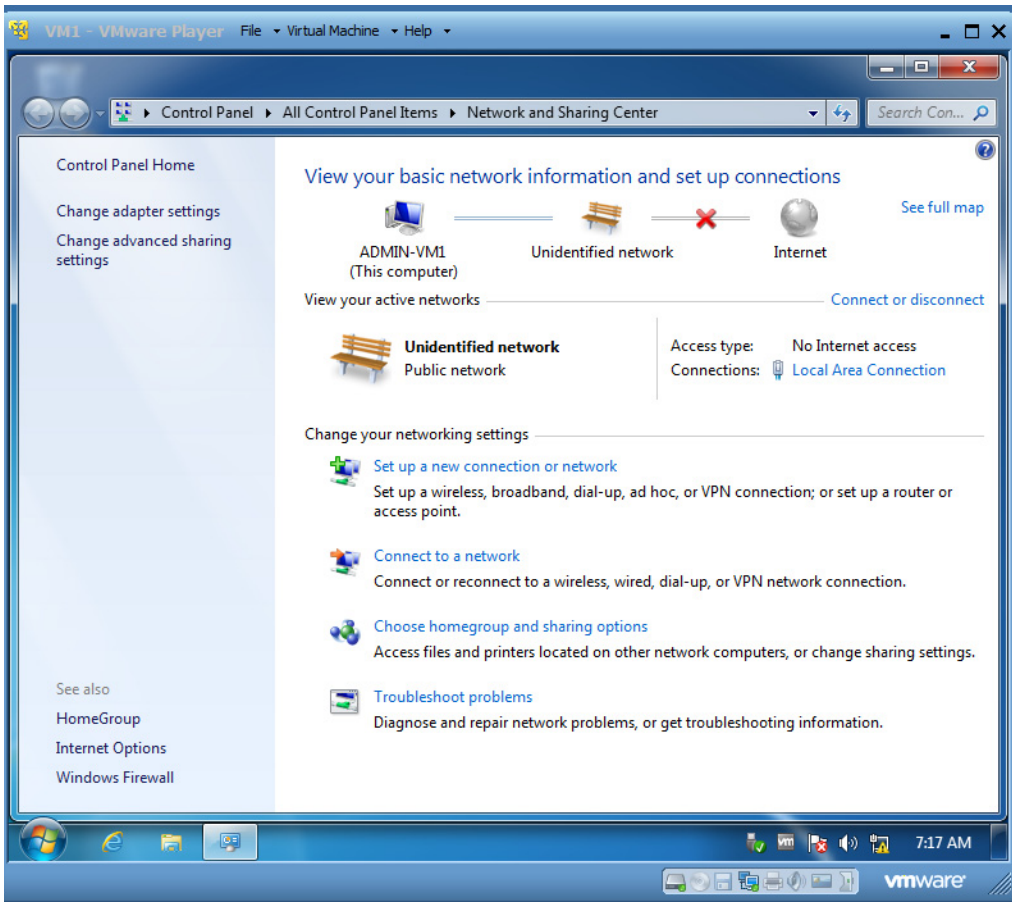

Figure 1: Network & Sharing Center

4) In Network and Sharing Center, from the **View your active networks** section, click on **Local Area Connections** link.

5) Local Area Connection Status dialog box displays.

6) Click on **Details** button, this will open up **Network Connection Details** dialog box.

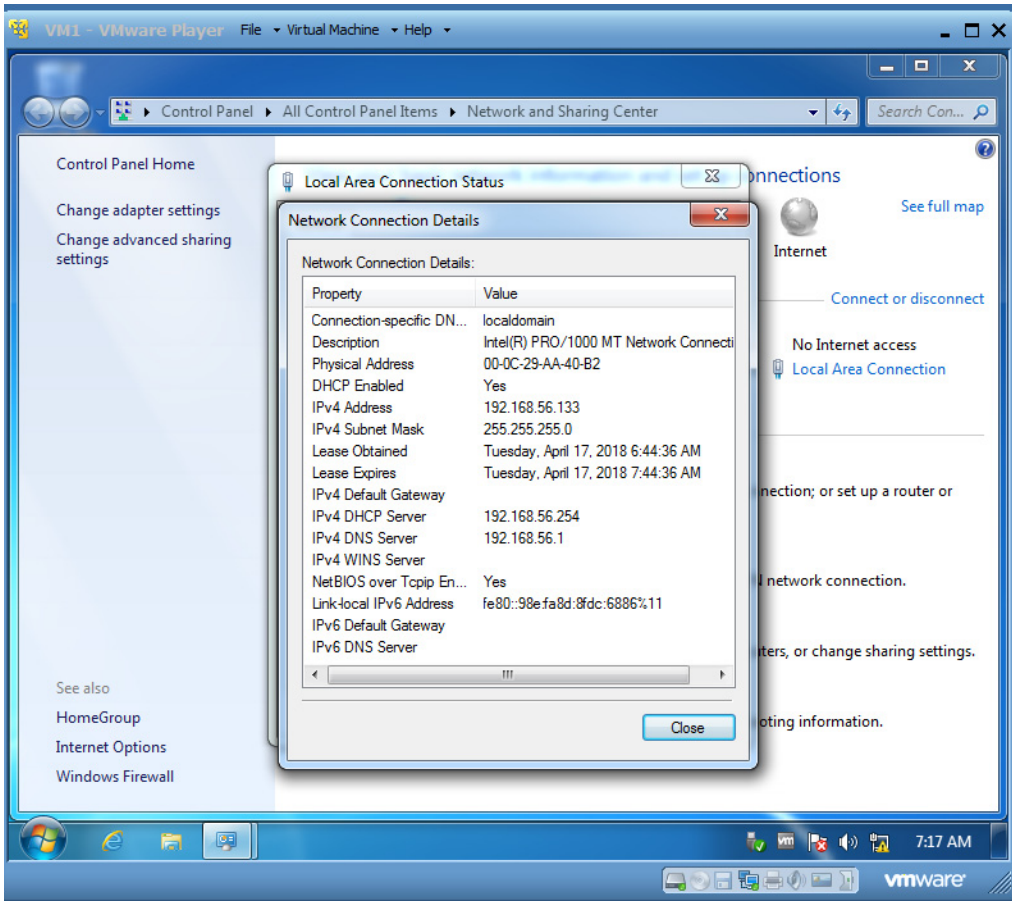

Figure 2: Local Area Connection Details

NOTE: *Read and understand the following details*

- DHCP Enabled is set to Yes, which means this IP Address is assigned dynamically (auto-assigned)
- IPv4 Address, this is the IP Address of the computer
- IPv4 Subnet Mask, this is the Subnet Mask of the computer

7) Close Network Connection Details and Local Area Connection Status dialog boxes.

8) Finally, close the Network and Sharing Center window.

Repeat all steps described above and check the IP Address of VM2 and Host Computer.

How to change IP Address

Perform following steps in order to change IP Address of a computer.

It is assumed that you have two Virtual Machines (VM1 and VM2) installed on your computer, which makes your computer Host Computer.

NOTE: *Following steps are performed on VM1*

1) From system tray, click on **Network** icon.

2) From the pop-up, click on the **Open Network and Sharing Center** link.

3) Network and Sharing Center window displays following information:

- Options to change Adapter Settings and Advance Sharing Settings
- List of active networks and connections to those networks.
- Options to setup new networks or to make changes to existing networks

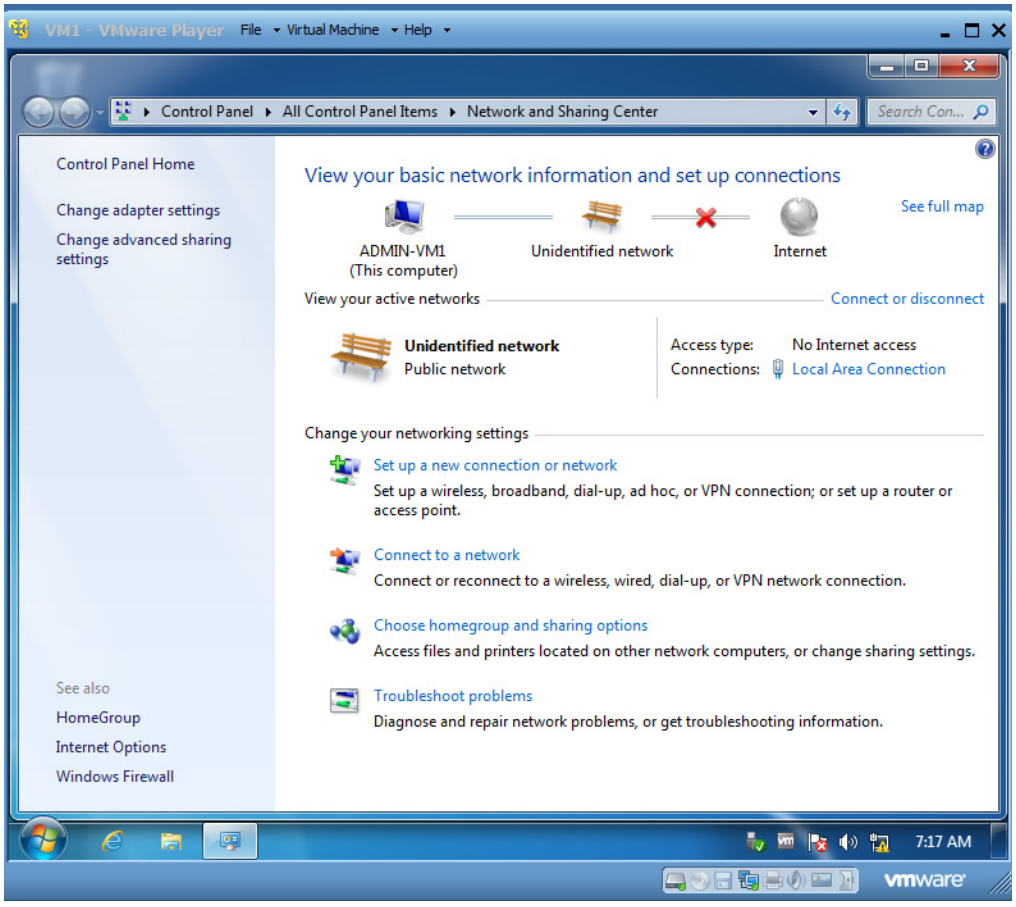

Figure 3: Network & Sharing Center

4) In Network and Sharing Center, from the **View your active networks** section, click on **Local Area Connections** link.

5) Local Area Connection Status dialog box displays.

6) Click on **Properties** button, this will open up **Local Area Connection Properties** dialog box.

7) From the Local Area Connection Properties dialog box, select **Internet Protocol Version 4 (TCP/IPv4)** and then click on **Properties** button.

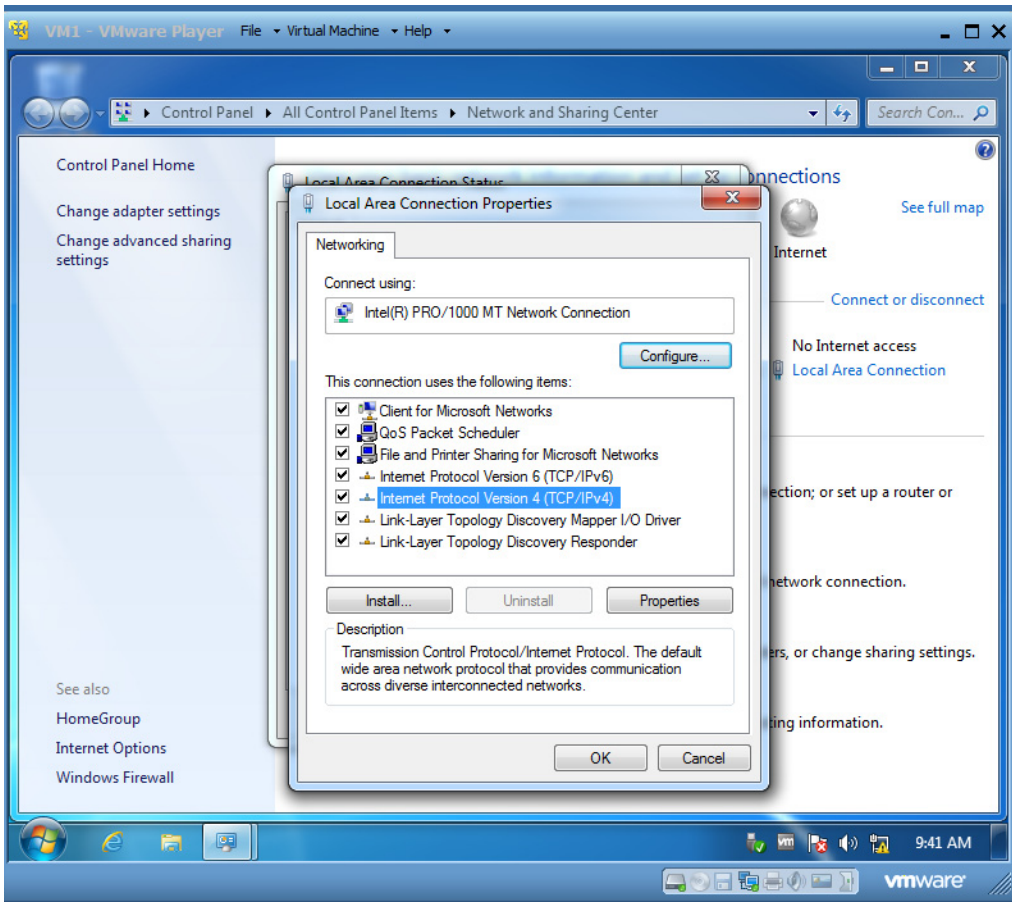

Figure 4: Local Area Connection Properties

8) Internet Protocol Version 4 (TCP/IPv4) Properties dialog box displays. In **General** tab, make the following changes.

- Click on **Use the following IP Addresses** option
- Set IP Address to **192.168.1.101**
- Set Subnet Mask to **255.255.255.0**

9) Close all the dialog boxes and the Network and Sharing Center window.

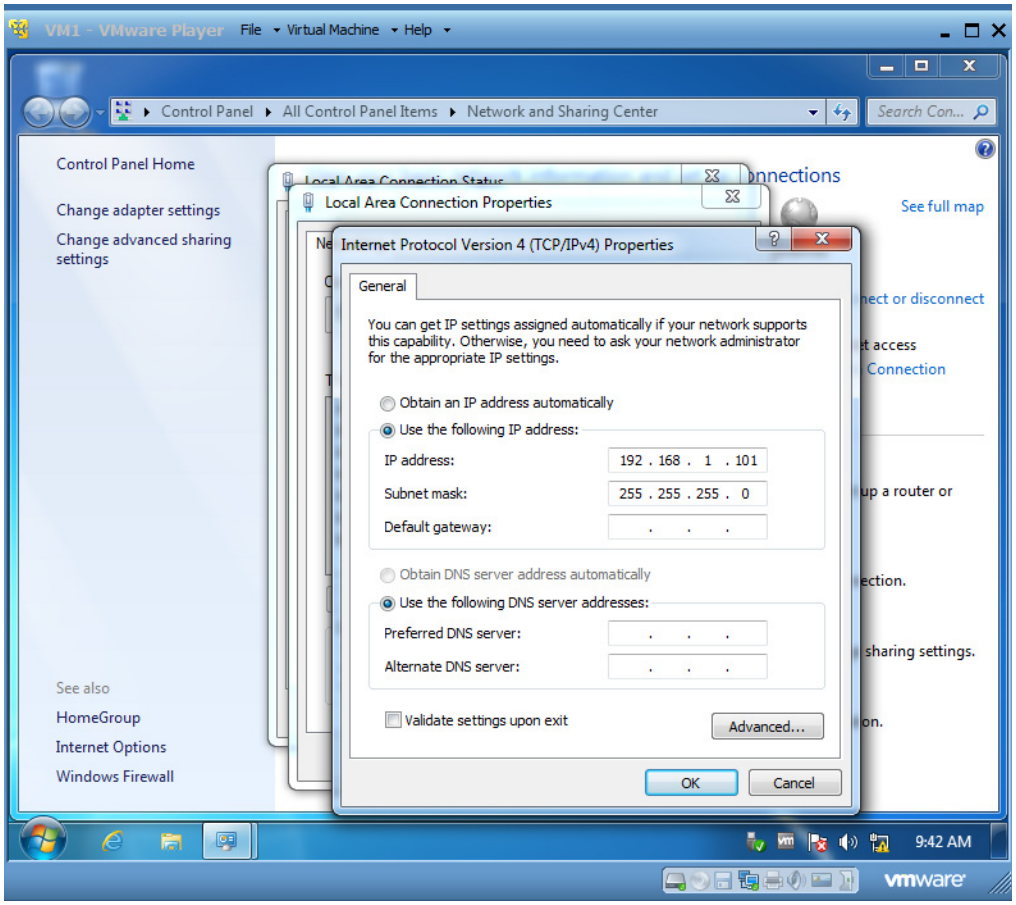

Figure 5: Change IP Address - VM1

Repeat all steps described above and change the IP Addresses of VM2 (see Note below).

NOTE: *For VM2, set IP Address to* ***192.168.1.102*** *and set Subnet Mask to* ***255.255.255.0***

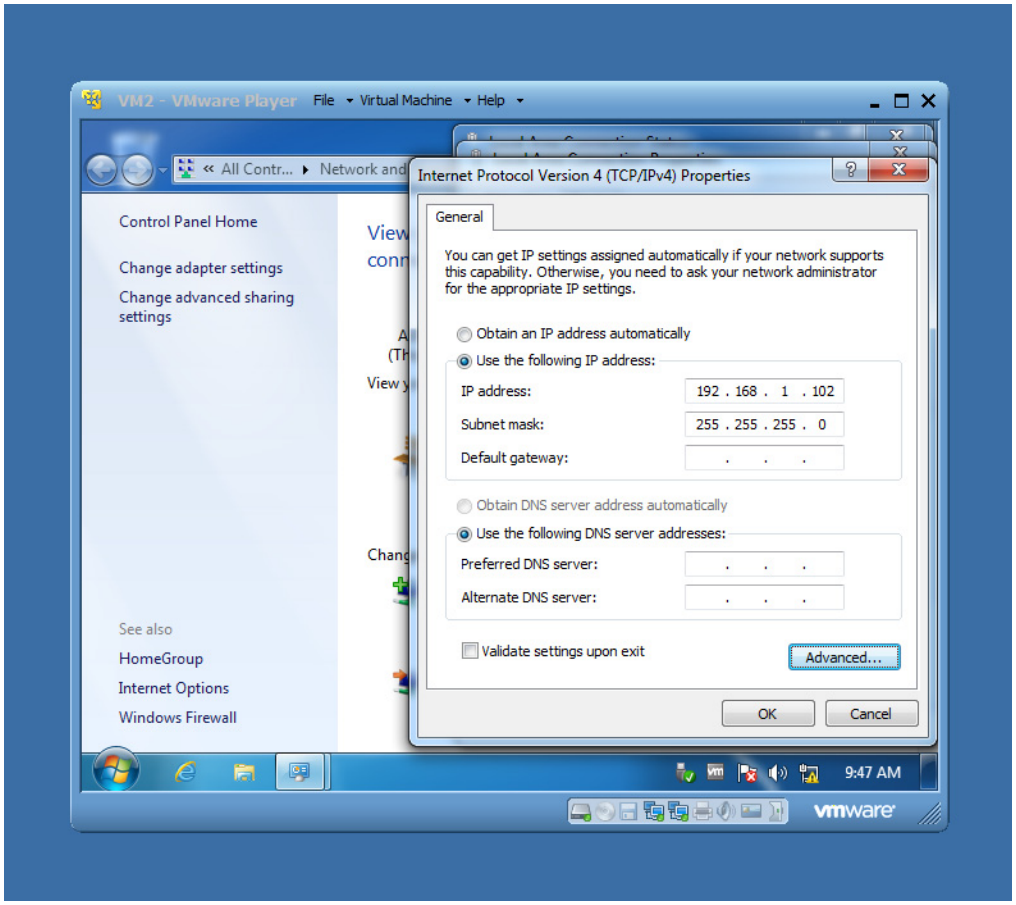

Figure 6: Change IP Address - VM2

Check VM Communication

Using DOS Command Line instruction for IPCONFIG and PING.

In this section, we will look at two most widely used command Prompt instructions, IPCONFIG and PING.

- **IPCONFIG** is used to check IP Address related information of the present computer
- **PING** is used to check communication between two computers, VMs or even Networks

Access Command Prompt

IPCONFIG and PING commands are assigned through Windows **DOS Command Prompt**. To access the command prompt, follow these steps:

1) In Windows Operating System, click on the **Start** button.

2) In the Search box, type-in **CMD**, then from search result, click on **cmd.exe** to open the Command Prompt.

DOS Command Prompt will open in a new window.

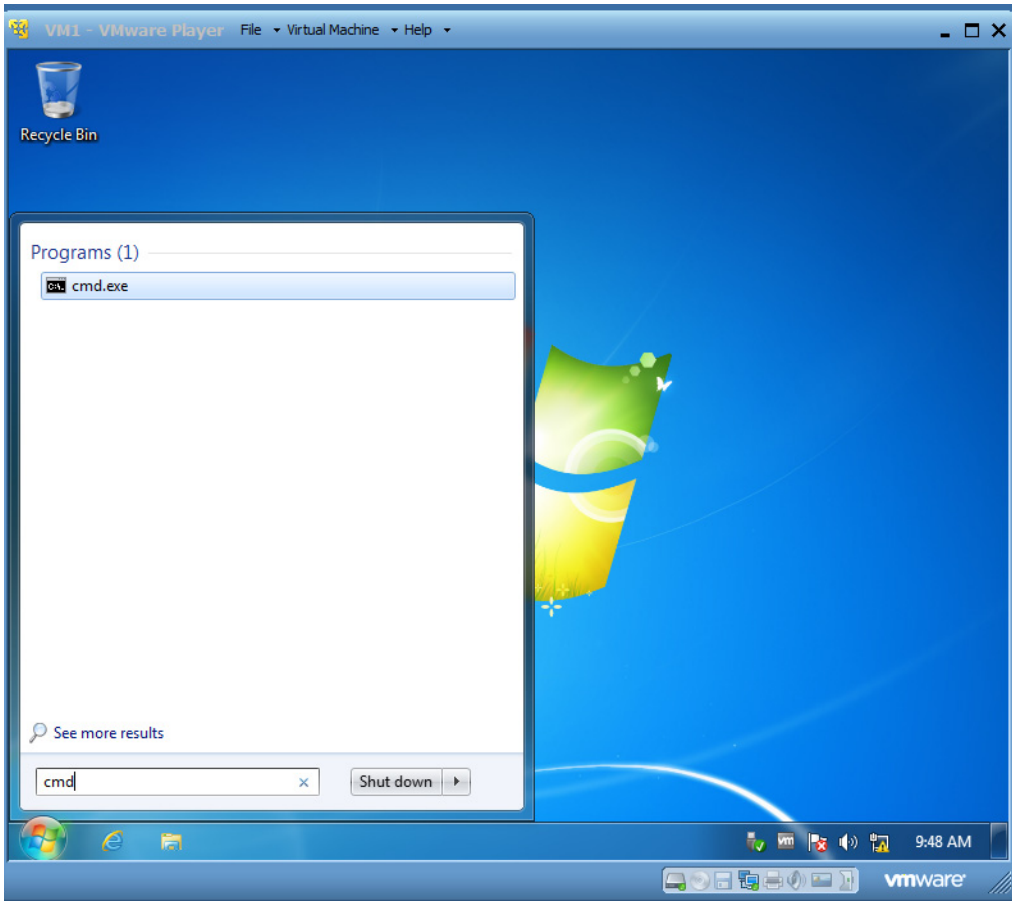

Figure 7: DOS Command Prompt

Apply IPCONFIG Command

As mentioned before, IPCONFIG command is used to check IP Address related information of the present computer. There are two variations of this command. One is **IPCONFIG**, which is used to view simple IP Address of the

computer; second one is **IPCONFIG /ALL**, which is used to view detailed IP Address information of the computer.

NOTE: *Following steps are performed on VM1*

Follow these steps to apply IPCONFIG command:

1) At the DOS command prompt, type-in **ipconfig** and press **Enter** (or Return) key.

2) Check the **Ethernet Adapter Local Area Connection** information.

   - Displays IPv6, IPv4, Subnet Mask and Default Gateway information
   - Also displays other Local Area Connection information

NOTE: *If you are connected to your network through Wireless Connection or Wifi, it should also be listed here. Alternatively, you an also type-in* ***ipconfig /all*** *command, to display detailed information about the* ***Windows IP Configuration****.*

3) Repeat the above steps to display IP Address information for VM2 and Host Computer.

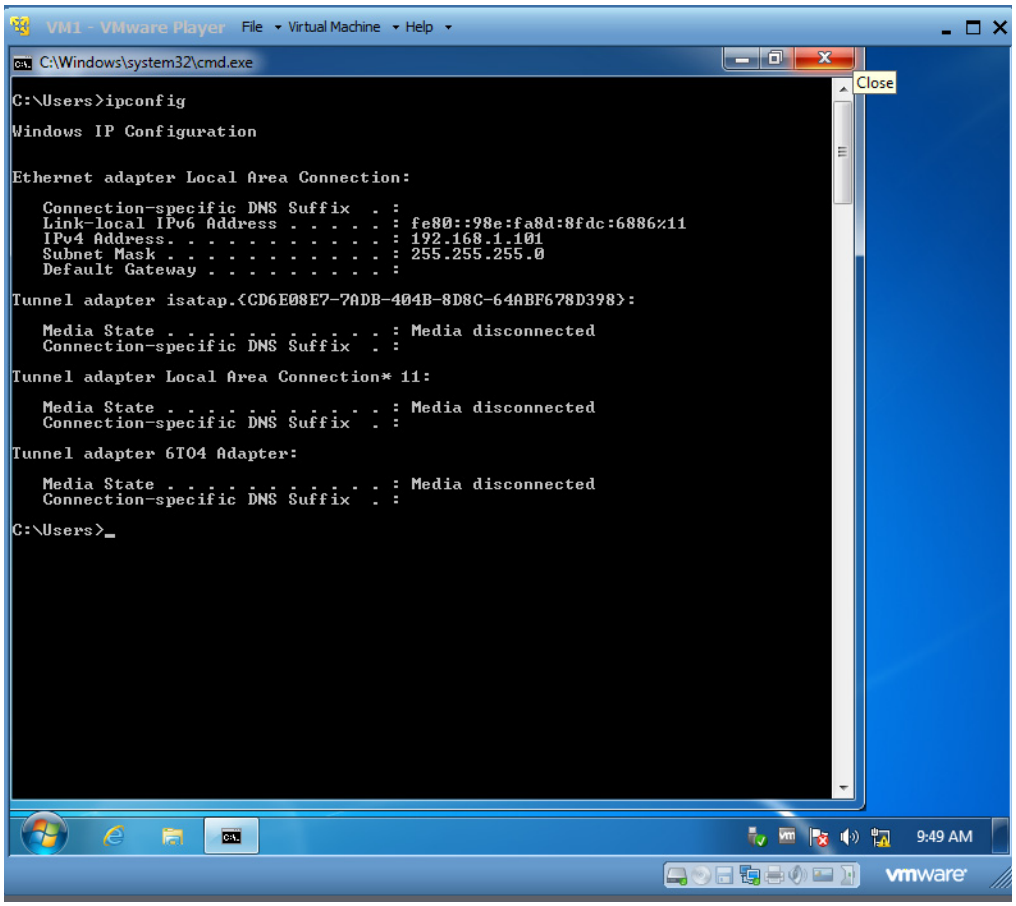

Figure 8: IPCONFIG Command - VM1

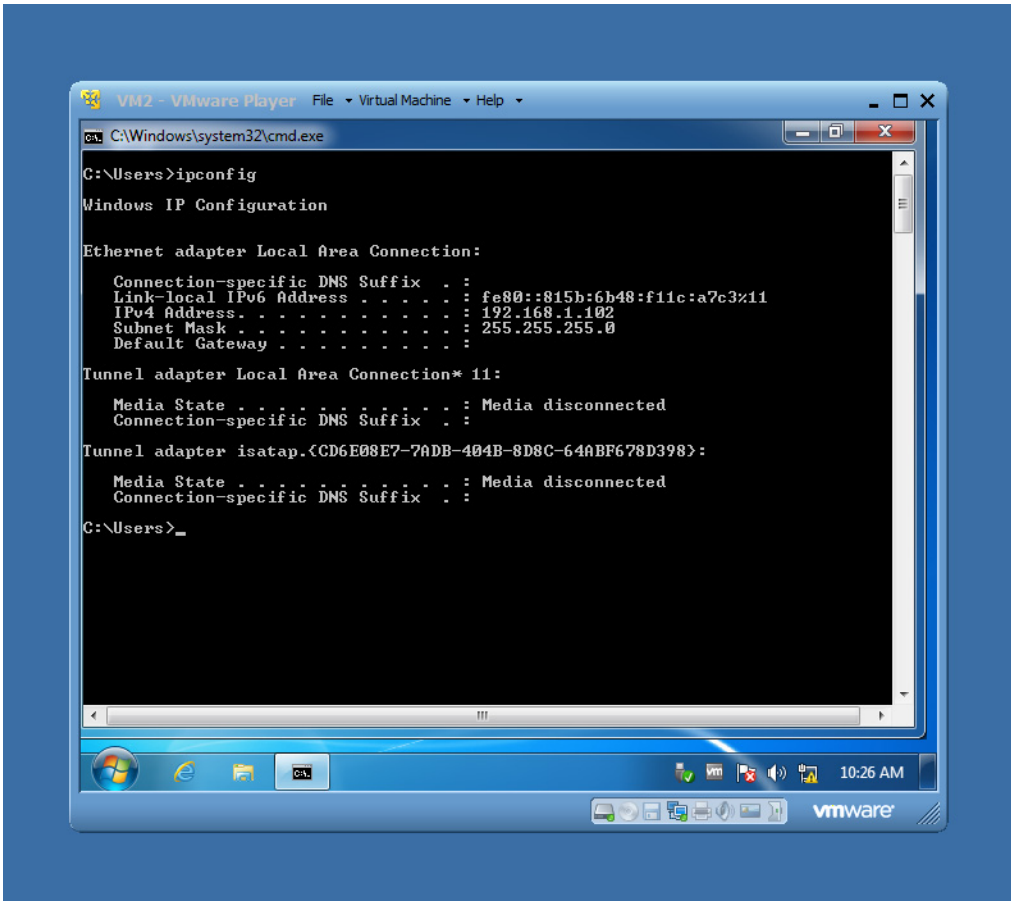

Figure 9: IPCONFIG Command - VM2

Apply PING Command

As mentioned before, PING command is used to check communication between two computers, VMs or even Networks. PING is the most basic and widely used troubleshooting command in Computer Networking.

PING from VM1 to VM2

To check communication from VM1 to VM2: In VM1, at the DOS command prompt, type-in **ping 192.168.1.102** and press **Enter** (or Return) key.

NOTE: *Note that in previous syntax, VM1 is sending a message to VM2 through the IP Address (of VM2)*

- VM1 will send Test Packets to VM2
- Upon successful communication, Packets Sent equals to Packets Received, and Packets Lost is Zero

- As shown in our example Packets Sent = 4, Packets Received = 4 and Packets Lost = 0.

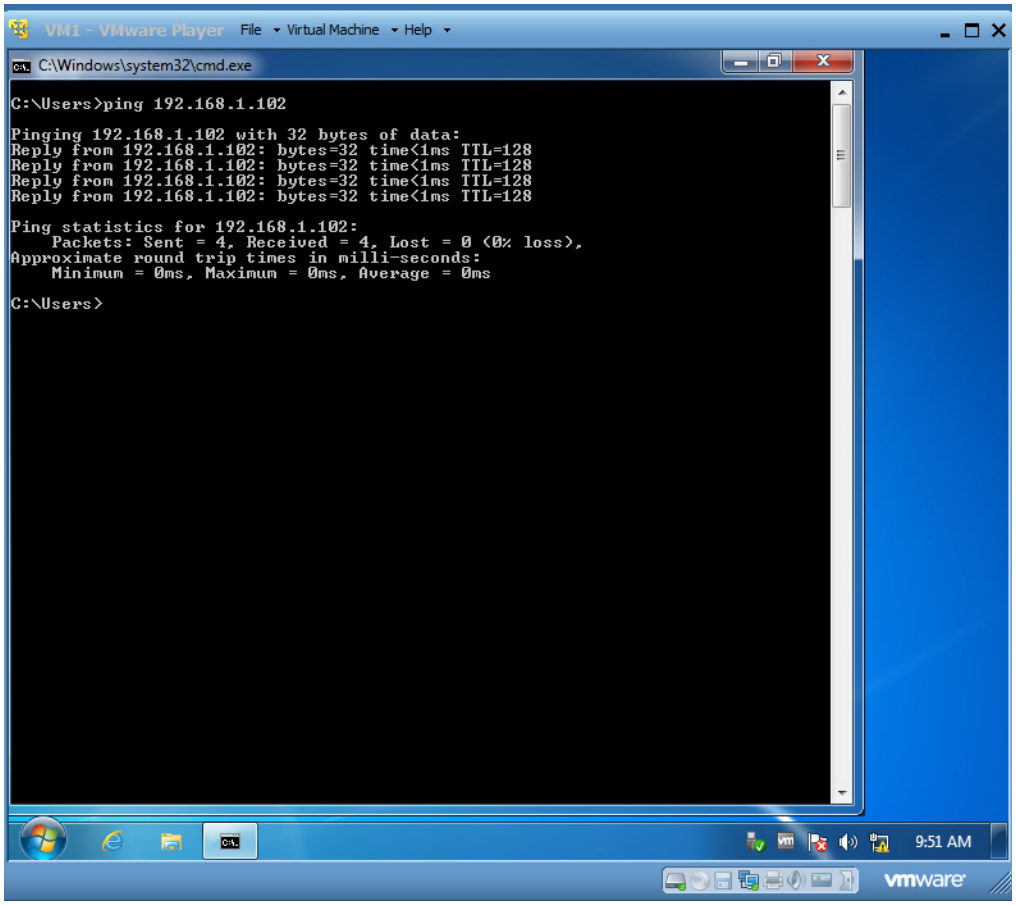

Figure 10: PING Command - VM1

PING from VM2 to VM1

To check communication from VM2 to VM1: In VM2, at the DOS command prompt, type-in **ping 192.168.1.101** and press **Enter** (or Return) key.

NOTE: *Note that in previous syntax, VM2 is sending a message to VM1 through the IP Address (of VM1)*

- VM2 will send Test Packets to VM1
- Upon successful communication, Packets Sent equals to Packets Received, and Packets Lost is Zero
- As shown in our example Packets Sent = 4, Packets Received = 4 and Packets Lost = 0.

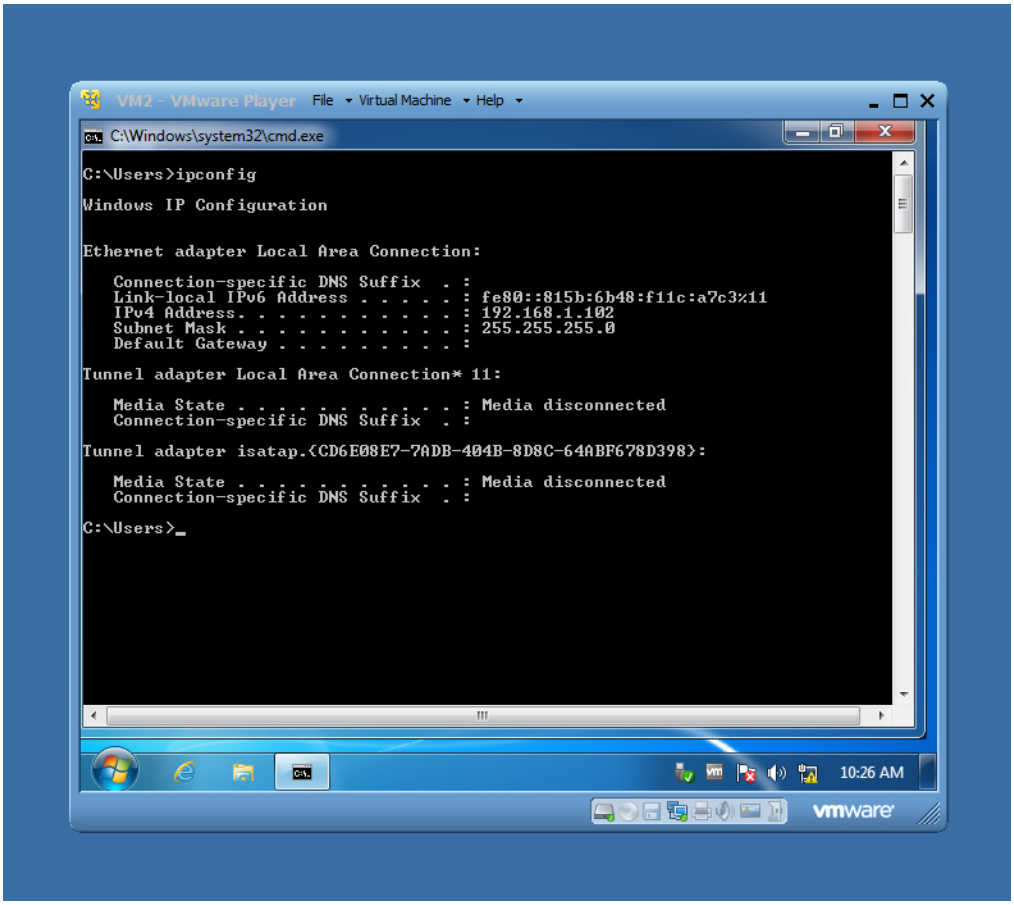

Figure 11: PING Command - VM2

NOTE: *Repeat the above process to check the communication between VM1 to Host Computer and VM2 to Host Computer*

How to access Available Networks

Perform following steps in order to access Available Networks on each of the computer.

It is assumed that you have two Virtual Machines (VM1 and VM2) installed on your computer, which makes your computer Host Computer.

Also, make sure that Communication between VM1, VM2 and Host Computer is manually established and reviewed, therefore, Network is working and ready to use.

NOTE: *Following steps are performed on VM1, VM2 and Host Computer*

1) Restart Host Computer, and then restart VM1 and VM2.

2) Check the Networks:

   a) When Windows Operating System has started, click on the **Windows Explorer** button to open file manager.

   b) In the folder tree (on the left-side), click on **Network** and expand the Network section including folders and sub-folders.

   c) All available networks in**VM1, VM2 and Host Computer** are displayed. Now files and folders between each computer can be shared through these folders.

NOTE: *For any reason, if VMware Networking is not communicating then refer to Section Check VM Communication to make sure IPCONFIG and PING commands are working as expected. Furthermore, refer to Section Change VM IP Address in order to make any necessary changes in IP Address*

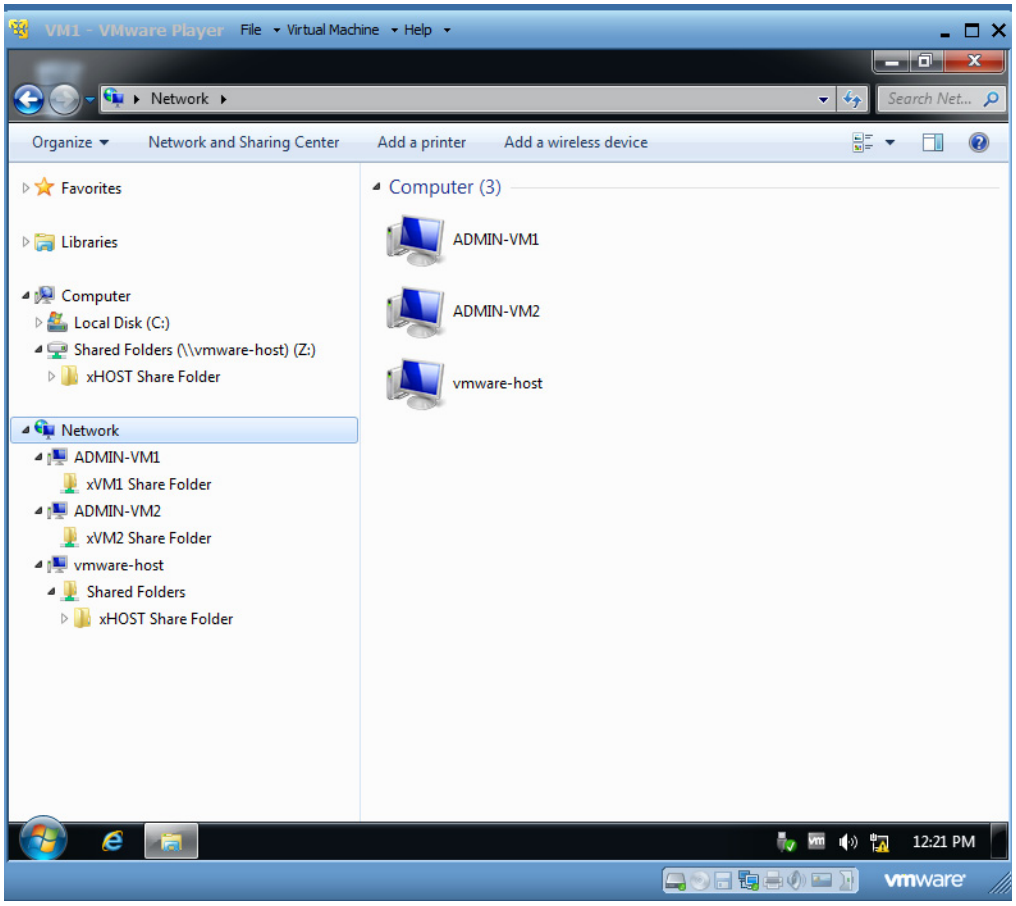

Figure 12: VM Networks & Folders