**CSIS2270 - Lab #8**

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***Configuring Virtual Network Adapter in Virtual Box,***

***Working with Virtual Networks: FTP and Remote Desktop services***

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**Due: Saturday, March 20th, 11:59 PM**

**Introduction:**

VMs can be connected to a virtual network in Oracle VirtualBox which provides four virtual Ethernet adapters for each VM which can be configured in the ***Network*** section of the ***Settings*** dialog (or up to eight if configured using the command line commands). Each virtual adapter, can be individually configured for the hardware that will be virtualized, and the virtualization mode that the virtual adapter operates in, with respect to your physical networking hardware on the host.

Oracle VirtualBox can virtualize the following types of networking hardware:

* AMD PCNet PCI II (Am79C970A)
* AMD PCNet FAST III (Am79C973)
* Intel PRO/1000 MT Desktop (82540EM)
* Intel PRO/1000 T Server (82543GC)
* Intel PRO/1000 MT Server (82545EM)
* Paravirtualized network adapter (virtio-net)

Each of the virtual networking adapters can be separately configured to operate in one of the following modes:

* **Not attached:**  A network adapter is present, but that there is no connection.
* **Network Address Translation (NAT): The default mode where** you can browse the Web, download files, and view email inside the guest VM
* **NAT Network.** A NAT network is a type of internal network that allows outbound connections.
* **Bridged networking.** This is for more advanced networking needs, such as network simulations and running servers in a guest.
* **Internal networking.** This can be used to create a different kind of software-based network which is visible to selected virtual machines, but not to applications running on the host or to the outside world.
* **Host-only networking.** This can be used to create a network containing the host and a set of virtual machines, without the need for the host's physical network interface.
* **Generic networking.** Rarely used modes which share the same generic network interface, by allowing the user to select a driver which can be included with Oracle VirtualBox or be distributed in an extension pack.

In this lab, you will configure a virtual networking adapter to work under the Host-only adapter networking mode where you will create a virtual network containing the two VMs that you created in the previous lab *VM1Win10* and *VM1C Win10* with the host machine, test the connectivity between the VMs using the ***ping*** command and after then you will practice some of the popular services over computer networks like ***FTP*** and ***Remote Desktop ,*** where you will set up an FTP server for file transfer and you will also learn about remote desktop service. File Transfer Protocol (FTP) is a widely used protocol to move files between devices, and remote desktop is a Windows service that supports remote connect to a computer. Applications have been built based on the FTP protocol for data communications.

**Objectives:**

1. To configure a virtual networking adapter in the Virtual Box and assign it to a VM.
2. To create a virtual network using the virtual adapter in the VM and test the connectivity.
3. To implement the FTP and Remote Desktop services on the virtual network.
4. **Creating and configuring Host-Only Ethernet adapter and assigning it to the VMs [\_\_\_/4]**
   1. Start the Virtual Box Manager and click on Tools and select Network from the menu
   2. Click on Create icon to create a new VirtualBox Host-Only Ethernet Adapter. Click the check box to enable the adapter. What is the IPv4 and Mask shown **192.168.56.1/24**
   3. Click on Properties icon and then on the DHCP server tab. Make sure the Enable Server box is checked.   
       Write the server IP address **192.168.56.100**   
       Write the server Mask **255.255.255.0**  
       Write the Lower Address Bond **192.168.56.101**   
       Write the Upper Address Bond **192.168.56.254**
   4. Open the network connection window on your computer (Control Panel 🡪 Network and Sharing Center 🡪 Change adapter settings) and make sure you can see the Host-only adapter. Right click on it and select properties, then select IPv4 protocol and check its properties.   
       Write the IP address **192.168.56.1**   
       Write the Subnet mask **255.255.255.0**   
       What is the type of this address static or dynamic? **Static**
   5. Click on VM1 Win 10 virtual machine (but do not start it now), and click ***Settings*** then select ***Network***
   6. Under Adapter1 click the Enable Network Adapter check box then click the ***Attached to*** drop down menu and select Host-Only Adapter , then click on the Name drop down menu and select the required adapter of this type ( if you have created more than on Host-Only adapter the you will see their names in this menu and also they will be seen on your host computer network connection window)
   7. Click on ***Advanced*** and keep the default settings.   
       Write the Adapter Type **Intel PRO/1000 MT Desktop (82540EM)**   
       Write the MAC Address **08:00:27:E9:64:7B**
   8. Repeat steps 5 to 7 and assign the same Host-Only adapter to VM1C Win 10  
       Write the Adapter Type **Intel PRO/1000 MT Desktop (82540EM)**   
       Write the MAC Address **08:00:AC:E9:D4:70**
5. **Checking the connectivity of the virtual network [\_\_\_\_/3]**
6. Start VM1 Win 10 and VM1C Win 10 virtual machines
7. Turn off the ***Fire Wall*** on both machines
8. Open the ***cmd*** on VM1 Win 10 and type ***ipconfig*** command  
    Write the IP address **192.168.56.101**
9. Open the ***cmd*** on VM1C Win 10 and type ***ipconfig*** command  
    Write the IP address **192.168.56.102**
10. Using the ***ping*** check the connectivity in your network  
     Can VM1 Win 10 ping VM1C Win 10 **YES** Can VM1C Win 10 ping VM1 Win 10 **YES** Can your host computer ping the VMs **YES**  
     Can the VMs ping your host computer **YES**
11. **FTP service** **[\_\_\_\_\_/8]**

FTP (File Transfer Protocol) is the protocol and network service used for transferring files between two devices. It runs on top of the TCP/IP stack to provide reliable data transfer between devices. The device that uploads or downloads a file is referred to as the FTP client, the device that stores the files or provides the files is referred to as FTP server. It is necessary to set up an FTP server and turn on the FTP service on the server before the FTP service can be provided. Note that many FTP servers allow any users to upload and download files by using the user id ***anonymous*** with no password. You are required to set up an FTP server on PC A with anonymous login.

1. Enable FTP service on **VM1 Win 10** PC as follow:
2. Start the VirtualBox Manager and start VM1 Win 10.
3. On the desktop of VM1 Win 10, click Start 🡪 Windows System 🡪 Control Panel 🡪 Programs and Features 🡪 Turn Windows features on or off
4. Under ***Internet Information Services 🡪*** ***FTP Server*** 🡪 check ***FTP Extensibility*** and ***FTP Services*** and under ***Web Management Tools***, check ***IIS Management Console*** and ***IIS Management Service.*** Click Ok. Wait until windows completes the requested changes and click Close. Close the Programs and Features window.
5. Configuring and Starting FTP service

Click ***Start*** button and search for ***Internet Information Services (IIS) Manager***. Execute IIS Manager and an IIS manager window will open.

Right click the name of your PC on the VM and select ***Add FTP Site***(to find the name of your PC on the VM1 Win 10 VM, start 🡪 Windows System 🡪right click on This PC 🡪 more 🡪 Properties and write down the name of the PC from there)

Enter the following info.:

1. FTP site name: my FTP server

Content Directory 🡪 Physical path: C:\Users\public 🡪 Next

1. check "Start FTP site automatically"

check "No SSL" 🡪 Next

1. Authentication: Anonymous

Allow access to: Anonymous users

Permissions: Read, Write

1. Click finish

Click on the arrow next to the name of your computer under ***Connections*** to expand it, then click on ***Sites*** folder under it, you should be able to see my FTP server has the Status "Started" in the IIS Manager window.

1. Testing the FTP service
   1. Start VM1C Win 10 .
   2. Prepare a file ***test.txt*** by using the Notepad, enter the following line in the file

**This is a test file created for CSIS 2270 FTP testing.**

Save the file under the folder C:\users\public

* 1. Prepare a file ***server.txt*** by using the Notepad on VM1 Win 10. Enter the following line in the file

**I am a FTP server.**

Save the file under the folder C:\users\public

* 1. Testing the FTP server

Open ***cmd*** window on VM1 Win 10.

Start a FTP session as follow:

* At the command prompt type the command **ftp** *localhost*
* user: anonymous
* password: (press enter with no password) . What is the system prompt now? **?**
* Type**?** to see the available commands under ftp.
* Check if the file ***server.txt*** is under the current working directory by entering the command ***dir***
* End the ftp session by entering the command ***quit***
  1. Open a cmd window on VM1C Win 10 , i.e. the FTP client.
* Change the working directory by entering the command ***cd \users\public***
* Ensure the file ***test.txt*** is under the working directory by entering the command ***dir/w***

Start a FTP session from VM1C Win 10 as follow:

* In the ***cmd*** enter the command ***c:\users\public***> **ftp** *ip\_address\_of\_VM1 Win 10 PC*
* user: ***anonymous***
* password: (press enter with no password)
* Type**?** to see the available commands under ftp. Write any two of them: **debug and put**
* Check if the file ***server.txt*** is under the current working directory on the ftp server by entering the command ftp>***dir ,*** can you see the ***server.txt*** file? **YES**
* Upload the file from the client machine (VM1C Win 10) by entering the command ***put test.txt***Write down the response you see after ftp>

**200 PORT command successful.**

**125 Data connection already open; Transfer starting.**

**226 Transfer complete.**

**ftp: 54 bytes sent in 0.05seconds 1.04Kbytes/s**

* Download the file ***server.txt*** by entering the command ***get server.txt***  
  Write down the response you see after ftp>

**200 PORT command successful.**

**125 Data connection already open; Transfer starting.**

**226 transfer complete.**

**ftp: 18 bytes received in 0.02Seconds 0.95Kbytes/s**

* End the ftp session by entering the command ***quit***
  1. Verify that you have successful uploaded ***test.txt*** file to the FTP server and downloaded the ***server.txt*** file from the FTP server.  
     - Open ***cmd*** window on both PCs, change directory to ***c:/users/public>*** , use ***dir*** command to list the contents.  
     Can you see both files ***test.txt*** and ***server.txt*** exist on bot machines? **YES**

1. **Remote Desktop Service [\_\_\_\_\_/5]**

Remote desktop service (RDS) is a Microsoft Windows service that allows a user to connect to a remote computer over a network connection. The client station basically takes control of the remote computer and can run all software on the remote system. With RDS, only the screen display is transferred over the network to the client and all software executions take place at the remote server machine.

1. Set up VM1 Win 10 to allow remote connection as follow:

Start 🡪 Windows System 🡪 Control Panel 🡪 System and Security 🡪 System 🡪 Remote Settings 🡪 Select *Allow remote connections to this computer*

Leave the check box below this line unchecked to allow connection from any computer.

1. To start a remote desktop session, go to VM1C Win 10 , run the program *Remote Desktop Connection*.

- From the pop-up window, click *Show Options*, and enter the IP address of VM1 Win 10   
 and the account name on VM1 Win 10 . Enter the password as required. Ignore the  
 Certificate errors that are shown on the window and click yes.

- If the system failed to connect, try switching off the firewall on VM1 Win 10.

3. Try to put the desktops of the two VMs on your host PC desktop side by side (you may need  
 to adjust the size of the VM PCs desktop).   
 Make a screen shot of your host PC desktop. And attach it to the lab’s report.

Graphical user interface, application

Description automatically generated

1. Is it allowed to have both the remote connection and a local session log on to VM1 Win 10 at the same time? **Could not be able to verify but form previous experience it windows remote access it should not let the local session to be logged on.**

Disconnect from the remote machine VM1 Win 10.

Finish all the steps and answer all the questions then save the lab report file as instructed in the submission instructions below.

**Lab Submission instructions:**

1. Save your report file as yourFirstnameLastname\_Lab8.docx.  
    (example: RupaManabala\_Lab8.docx)
2. Send the file to your instructor not later 11:59 pm on March 20th, 2021 via Blackboard Only (do not send labs by email please. Any lab submitted by email will be ignored).
3. Late submissions will not be marked and the student will lose the mark of that lab.
4. Students who don’t save lab files with proper names as indicated in 1,2,3 above, will lose 50% of the lab’s mark.