LAB 10
CONFIGURING IPV4 AND IPV6 ADDRESSING

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This lab contains the following exercises and activities:

Exercise 10.1   Calculating IP Addresses

Exercise 10.2   Document Server IP Addresses

Lab Challenge   Configuring TCP/IP Using Windows PowerShell

Exercise 10.3   VirtualBox Guest Additions

BEFORE YOU BEGIN

The lab environment consists of computers connected to a local area network, along with a server that functions as the domain controller for a domain called *adatum.com*. The computers required for this lab are listed in Table 10-1.

Table 10-1
Computers Required for Lab 10

Computer	*Operating System*	*Computer Name*
Domain controller	Windows Server 2016	SERVERA
Member server	Windows Server 2016	SERVERB
Member server	Windows Server 2016	SERVERC

In addition to the computers, you also require the software listed in Table 10-2 to complete Lab 10.

Table 10-2
Software Required for Lab 10

Software	*Location*
Lab 10 student worksheet	Lab10_worksheet.docx (provided by instructor)

Working with Lab Worksheets

Each lab in this manual requires that you answer questions, take screen shots, and perform other activities that you will document in a worksheet named for the lab, such as Lab10_worksheet.docx. It is recommended that you use a USB flash drive to store your worksheets, so you can submit them to your instructor for review. As you perform the exercises in each lab, open the appropriate worksheet file, fill in the required information, and save the file to your flash drive.

After completing this lab, you will be able to:

- ■ Calculate network addresses and IP addresses

- ■ Manually configure the Windows Server 2016 TCP/IP client

- ■ Configure TCP/IP using Windows PowerShell

- ■ Test network connections using Ping

Estimated lab time: 60 minutes

Exercise 10.1	Calculating IP Addresses
Overview	In this exercise, you are responsible for subnetting a network to suit a particular network organization plan.
Mindset	What IPv4 addressing policies does your organization have in place?
Completion time	20 minutes

To complete this exercise, you must determine what IPv4 addresses you should use on the workgroup for which you are responsible. Your supervisor has assigned you a group of computers that consists of three servers and seven workstations. Your entire department must share an IPv4 network with the address **192.168.75.0/24**, and your supervisor has asked you to subnet that address into as many networks as possible with at least **10** hosts each.

Create a list of the network addresses your subnetting can create, using CIDR notation, and enter these in Table 10-3 under the heading IPv4 Network

Addresses. Then choose one of the subnets for use by your computers and enter the IP addresses in that subnet in Table 10-3 under the heading IP Addresses, along with the corresponding subnet mask value in Table 10-3 under the heading Subnet Mask.

Table 10-3

IPv4 Network Addresses, IP Addresses, and Subnet Mask

	IPv4 Network Addresses
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

14	
15	
IP Addresses	
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Subnet Mask	

The MAC addresses of three computers in a network are listed in Table 10-4. Using these MAC addresses to form interface IDs, create three unique local unicast addresses on the fd00::/8 network and enter them into the table.

Table 10-4

MAC Addresses and IPv6 Addresses

Computer	MAC Address	IPv6 Address
SERVERA	12-AA-BC-32-23-12	
SERVERB	12-AA-BC-32-23-11	
SERVERC	00-15-5D-01-01-C1	

End of exercise. You can leave any windows open for the next exercise.

Exercise 10.2	Document Server IP Addresses
Overview	In this exercise, you document the IP addresses of the three servers.
Mindset	What parameters do you have to configure to ensure that the computers on your network can communicate with each other?
Completion time	20 minutes

Table 10-5

Server IP Addresses

	SERVERA	SERVERB	SERVERC
IP Address			
Subnet Mask			
Preferred DNS Server			

Lab Challenge	Configuring TCP/IP with Windows PowerShell
Overview	In addition to using Server Manager, you can also manually configure TCP/IP on servers using Windows PowerShell.
Completion time	10 minutes

To complete this challenge, you must use Windows PowerShell commands on the SERVERC server to configure the TCP/IP client to use the IP Address, Subnet Mask, and Preferred DNS Server address you specified for that computer in Table 10-5 and the IPv6 address you calculated in Table 10-4. Write the necessary commands in the following space:

End of exercise. You can leave any windows open for the next exercise.

| Exercise 10.3	VirtualBox Guest Additions
Overview	The Guest Additions are designed to be installed inside a virtual machine after the guest operating system has been installed. They consist of device drivers and system applications that optimize the guest operating system for better performance and usability.
Completion time	20 minutes

If you don't have a Windows 10 VM installed in VirtualBox yet, download one from the FTP server in the lab or from Google Drive (https://drive.google.com/drive/folders/1_D9FAg0zp4a9Gk_eFNVfXq3751bFIDF8), create and install a new VM.

1. **Download and Install Guest Additions**

   If you are using Mint Linux, you can go to Software Manager, search "virtualbox",
   select **Virtualbox-guest-additions-iso** in the result, and install.
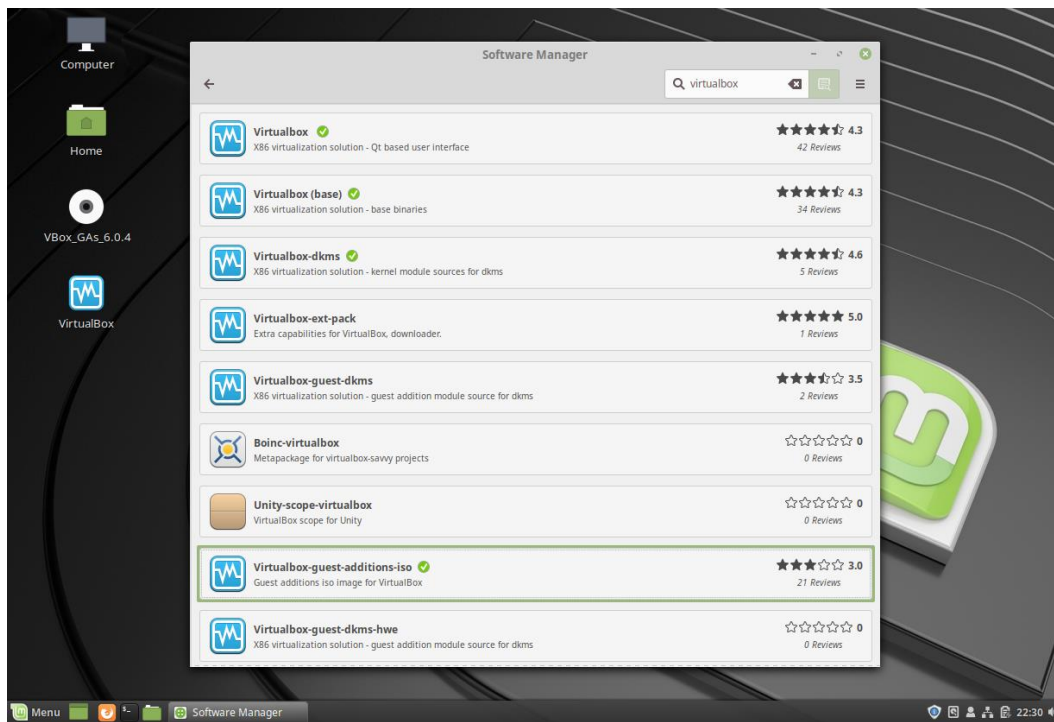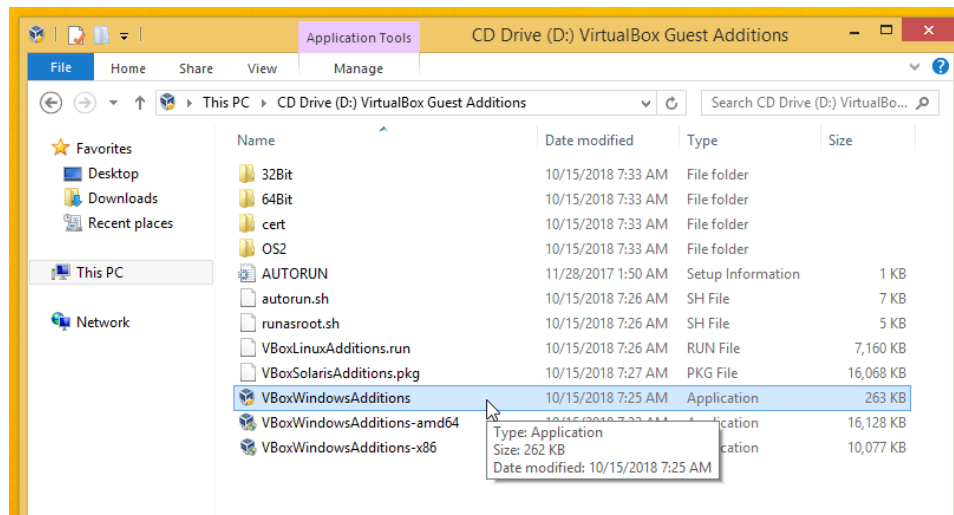

   Start Windows 10 VM, go to **Devices** menu, select **Install Guest Additions**.
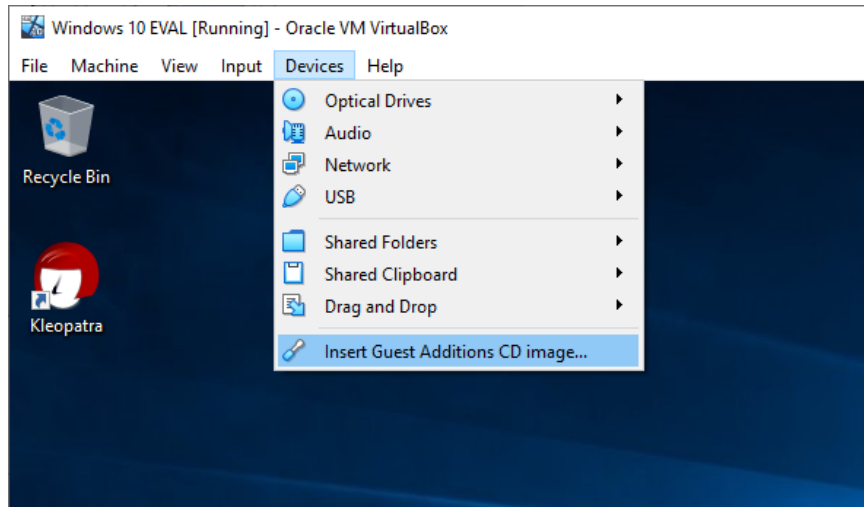
When the AutoPlay window is displayed, prompting you to run the **VBoxWindowsAdditions.exe** program, click Run.
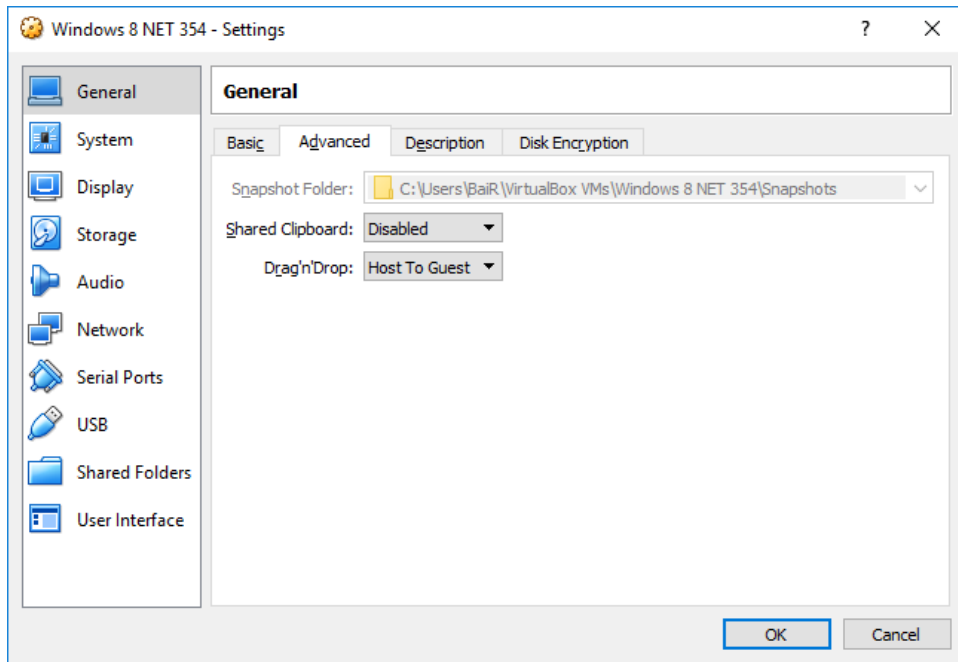
If no AutoPlay, go to the CD Drive and manually run that file.

Follow the wizard to complete the installation process. At the end, the Windows VM will reboot.
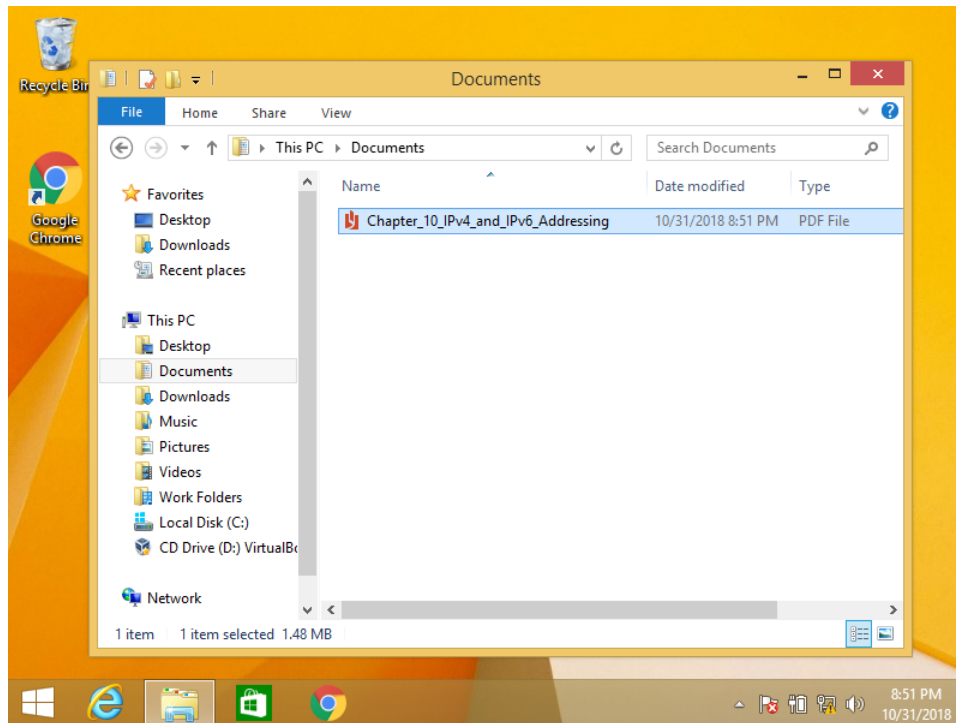

2. **Enable and Use Drag n Drop between Host and Guest**

After the VM is started, go **Machine** > **Settings…** > **General** > **Advanced**, change Drag'n'Drop to "**Host to Guest**".

In VM, open file manager, go to **Documents** folder. From host computer, download Chapter_10_IPv4_and_IPv6_Addressing.pdf file from Blackboard, drag n drop that file from host to guest.

[SCREEN SHOT 1] Take a screen copy including both host file manager and windows VM, similar to the following image, demonstrate that drag n drop is working properly.