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Applied Computing

Wales Institute of Science and Art (WISA)

Networks and Cybersecurity Essentials (ACCA4024)

Lab 5: Set up Virtual Lab

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Task

- **Set up a Lab Environment**
- **Use SBA Packet Tracer to configure various servers and record your reflections.**

Description [1]

Computing power and resources have increased tremendously over the last 10 years. A benefit of having multicore processors and large amounts of RAM is the ability to use virtualization. With virtualization, one or more virtual computers operate inside one physical computer. Virtual computers that run within physical computers are called virtual machines. Virtual machines are often called guests, and physical computers are often called hosts. Anyone with a modern computer and operating system can run virtual machines.

A virtual machine image file has been created for you to install on your computer. In this lab, you will download and import this image file using a desktop virtualization application, such as VirtualBox.

Computer with a minimum of 2 GB of RAM and 8 GB of free disk space
High speed Internet access to download Oracle VirtualBox and the virtual machine image file. While you can delete the image file after the virtual machine is imported, the 8 GB free disk space requirement is for users who decide to keep the image file.

Note: The image file is about 2.5 GB, and can grow up to 5 GB after the virtual machine is in operation.

Note: To install and run 64bit virtual machines on a host physical computer, the computer needs to be a 64bit system and have hardware virtualization technology enabled in BIOS. If you are unable to install the virtual machine image you may need to reboot your computer and enter setup mode in BIOS to enable hardware virtualization technology under advanced system settings.

SET UP A LAB ENVIRONMENT

How to do?

Download and install desktop virtualization software, and also download an image file that can be used to complete labs throughout the course. For this lab, the virtual machine is running Linux.

VMware Player and Oracle VirtualBox are two virtualization programs that you can download and install to support the image file. In this lab, you will use VirtualBox.

[1] Cybersecurity Essentials – Cisco Networking academy

1) Navigate to http://www.oracle.com/technetwork/serverstorage/virtualbox/downloads/index.html

   Alternatively, download from our ***Teams Channel***

2) Choose and download the appropriate installation file for your operating system.
3) When you have downloaded the VirtualBox installation file, run the installer and accept the default installation settings.
4) The image file was created in accordance with the Open Virtualization Format (OVF). OVF is an open standard for packaging and distributing virtual appliances. An OVF package has several files placed into one directory. This directory is then distributed as an OVA package. This package contains all of the OVF files necessary for the deployment of the virtual machine. The virtual machine used in this lab was exported in accordance with the OVF standard.
5) Navigate to the Cybersecurity Essentials Virtual Machines (VMs) page on netacad.com.

   Alternatively, download from our ***Teams Channel***

6) Download the **Ubuntu_CyberEss.ova** image files and note the location of the downloaded VM.
7) Open **VirtualBox**. Click **File > Import Appliance...** to import the virtual machine image.
8) In the Appliance to import window, specify the location of the .OVA file and click **Next**.
9) The appliance settings appear. Check the Reinitialize the MAC address of all network cards box at bottom of the window. Leave all other settings as default. Click Import.
10) When the import process is complete, you will see the new Virtual Machine added to the VirtualBox inventory in the left panel. The virtual machine is now ready to use.
11) Select and start a newly-imported virtual machines.
12) In the inventory shown on the left, select the virtual machine you wish to use.
13) Click the Start button. It is the green arrow located at the top portion of the VirtualBox application window.
14) A new window will appear, and the virtual machine boot process will start.
15) When the boot process is complete, the virtual machine will ask for a username and password.
16) Use the following credentials to log into the virtual machine:

    Username: cisco

    Password: password

17) You will be presented with a desktop environment: there is a launcher bar at the bottom, icons on the desktop, and an application menu at the top.

18) Use the Ubuntu_CyberEss virtual machine you just installed to complete the labs that require Ubuntu in this course. Familiarize yourself with the icons in the list below:

A. The launcher icons are on the left (from top to bottom):

(i) Search Tool

(ii) File manager application

(iii) Firefox Web Browser

(iv) Ubuntu Software Center

(v) Amazon

(vi) System Settings

(vii) Terminal

(viii) Trash

Note: If the virtual machine fails to start, either disable the USB Controller by going into the virtual machine's settings and unchecking the USB controller setting under USB or go to the VirtualBox download webpage and download and install the Oracle VM VirtualBox Extension Pack.

Note: The window running the virtual machine is a completely different computer than your host. Functions such as copy and paste will not work between the two without special software tools installed. Notice the keyboard and mouse focus. When you click inside the virtual machine window, your mouse and keyboard will operate the guest operating system. Your host operating system will no longer detect keystrokes or mouse movements. Press the right CTRL key to return keyboard and mouse focus to the host operating system.

Record your reflection

1. List out the options which are available in your virtual machine menu.

Web Browser (Firefox)
Mail Client (Thunderbird)
Office Suite (LibreOffice)
App Store
System Preferences
Terminal Console

2. Find out the IP address of your virtual machine.

10.0.2.15

3. Could you browse through the Internet?

Yes

4. On your own words, share your experience on setting up the virtual machine.

Setting up a virtual machine from an OVA file is very simple, the ability to import pre-configured appliances is convenient for gaining quick access to a system without having to spend hours configuring manually.

5. What do you think as the pros and cons of using virtual machines?

Virtual Machines provides a lot of benefits, from allowing you to try out new and interesting operating systems, to simulating entire networks. They are great for making better use of available hardware as well as isolating the servers operating system from the underlying hardware. This can help with availability, upgrading hardware without taking systems offline and provides many other benefits.

There are some drawbacks too, some applications don't perform as well within virtual machines, also there is a slight overhead of having a host operating system.

For the most part I find the positives outweigh the negatives.

Task 2 Use SBA Packet Tracer to configure various servers and record your reflections.

1. Verify the HTTP Service

Why would a user be able to browse to an IP address but not a FQDN?

This would be because no naming services (DNS) are enabled within the network, or the devices are not pointed towards the correct DNS Servers.

2. Configure the DNS Server

Why is the user able to browse to an FQDN?

The user is able to browse to the FQDN because we've entered a record to match the hostname to the IP address of the servers.

3. Configure the Email Server

Why does the Email service require both SMTP and POP3 to be activated?

Because SMTP is for outbound mail and POP3 is for incoming mail.

Learnings from lab: **Part**

1

- ✓ ***Build a home Network***
- ✓ ***Understand and configure IP Address***
- ✓ ***Use Ping/ Trace route Utility to check the connection status***
- ✓ ***Use ipconfig /all command to determine the MAC address of a Windows computer on an Ethernet network.***
- ✓ ***Analyze a MAC address to determine the manufacturer.***
- ✓ ***Analyze the Wired and Wireless Network connection.***
- ✓ ***Analyze Address Resolution Protocol (ARP).***
- ✓ ***Connect to a Wireless Router and configure the basic settings in a wireless router and add security features.***
- ✓ ***Use nslookup command to understand the url to ip conversion.***
- ✓ ***Configure basic connectivity settings in Intermediate devices (Switch/ Router).***

Part 1

- ✓ ***Set up a virtual lab environment***
- ✓ ***Troubleshoot the virtual lab environment*** ✓ ***Work with virtual machines***
- ✓ ***Work with SBA Packet Tracer Files/ environment***
- ✓ ***Configure ftp, web, email, dns, ntp and aaa Servers***