



Instructor Paul

# Build Your Own Windows Server IT Lab from Home

*eBook version*

This eBook will take you step-by-step through creating an IT lab on your personal computer right from home.

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## INSTRUCTOR PAUL?

Instructor Paul is an IT professional who works as a full time senior systems administrator during the day and I create instructional material and online courses in the evenings!

He has taught over 100,000 students through his courses and has over 7,500 course reviews.

In fact, this eBook is based on a video course which you can check out by [clicking here](#).

You can reach Instructor Paul on his website at [instructorpaul.com](http://instructorpaul.com) or by email at [paul@instructorpaul.com](mailto:paul@instructorpaul.com).



Instructor Paul has been working in the IT (information technology) for over a decade. He has an associate degree in IT and currently holds a Security+ certification.

At his day job he engineers computer networks based on customer requirements. It could involve integrating new services into an existing network or building an entire network from scratch. This would include planning, purchasing hardware/software, assembling hardware, installing and configuring servers and network gear and hardening (securing) these devices.

A few of the key technologies he enjoys working on are Hyper-V/ESXI, Windows/Linux, Cisco/HP network equipment, EMC SANs (storage area networks), AWS (Amazon Web Services), pSQL and MySQL database administration, scripting and many more technologies that would be too long and boring to list here...

## A quick message from Instructor Paul

Hey! Below you can find my contact information. I would love to connect with you personally! So if you would like feel free to email me, go to my website and join my mailing list (if you haven't already), or enroll in one of my video courses.

I started teaching video courses because I wanted to have an impact and it helps me out tremendously to hear what *you* are struggling with so I can tailor my courses to solve your problems!

Thanks for your interest in my training material! Let me know how I can improve it =)

Respectfully,  
Instructor Paul



### EMAIL ME

I would love to hear from you! If you would like to send me a message you can reach me at the email address below:

[paul@instructorpaul.com](mailto:paul@instructorpaul.com)



### WEBSITE

Visit my website and join my mailing list to follow me and my IT video courses

[instructorpaul.com](http://instructorpaul.com)



### COURSES

Visit my website to find IT video courses. In fact, this eBook is based on one of those video courses.

[instructorpaul.com/courses](http://instructorpaul.com/courses)

# Course Overview

This eBook is a transcription of the video course *Build Your Own Windows Server IT Lab*. If you are interested in taking the video course, you may do so by [clicking here](#).

The goal of this course is to help you create your own Windows Server IT lab so you can gain experience at home using your personal computer. Believe it or not, experience gained at home is just as valuable as experience gained on the job. Many people struggle with the catch-22 of not being able to get an IT job because they don't have experience, but also can't get experience because they don't have an IT job. This course will solve that problem for you the student.

Wondering why I say that? Because this is exactly how I got my start in the IT field. In fact, my first employer substituted a 4-year degree because of a mix of volunteer and at home experience I gained. And before you say I must have known the owner of the company...it was a 40,000+ employee company that I had no connections to.

The sad truth is that college is letting so many people down because you come out with debt and very little practical experience. My mission is to solve that issue by providing affordable IT training that prepares you for the IT workplace.

Before you get started with the course, there are a few requirements for this course and we will cover them below.

## Course Prerequisites

1

### 64-bit Processor

This is a must if you want to install Windows Server 2016 like I teach in this course. If you do not have a 64-bit processor then your only other option is to install the 32bit option of Windows Server 2012r2 which [can be found here](#). If the link is dead, run a quick google search for "Windows Server 2012r2 Download" and download the ISO from Microsoft.com.

2

### 64-bit Operating system

The 64-bit operating system is also a requirement if you plan on installing Windows Server 2016. Again, you can opt to go with the 32bit Windows Server 2012r2 option and you will have no issues following along with the course.

3

### Enable Virtualization in Your BIOS

In order to create 64bit VMs you will need to enable virtualization in your BIOS. If you run into trouble when creating your VMs, you can assume that your virtualization is not enabled. You can [click here](#) to view my instructions on how to enable virtualization.

# What is Server Virtualization

## What is Virtualization?

In this course we are going to utilize a concept called virtualization. Virtualization is the practice of running a software computer. Think of when you play a game on your computer, except the “game” is actually an operating system.

In essence, you are running a computer within your computer. These computers within a computer are referred to as a VM (virtual machine) and depending on your hardware you could run several VMs at one time.

## Why use a VM?

In the old days if you wanted to setup your own IT lab you actually needed to purchase a server and networking gear which can be quite expensive. Now we can just download some free virtualization software and we will get the same result.

Using a VM also allows you to easily move the VM from computer to computer. A VM is essentially made up from a hard disk file and a virtual machine file which – which makes them very easy to copy or move anywhere across the globe – I can assure this is not the same with a 60lb physical server.

A few key terms you need to understand are **VM** (which you already know) and the **Host**. The **host** computer is the computer that “hosts” the VM. Or the computer on which the VM operating.

## KEY TERMS

**VM** – Virtual Machine (software computer)

**Host** – The physical computer that operates a VM

There is a lot more detail that I could go into here...but I don't want to bore you to death and I have already given you the quick down and dirty details you need to know about Virtualization – so let's get virtualizing!

## Downloading and Installing VirtualBox

VirtualBox is a free open-source virtualization software that allows to quickly and easily create virtual machines and virtual networks.

You can find the download link for VirtualBox by [clicking here](#).

## VirtualBox binaries

By downloading, you agree to the terms and conditions of the respective license. If you're looking for the VirtualBox 5.1.32 packages, see [VirtualBox 5.1 builds](#).

**Important:** The Guest Additions which come with VirtualBox 5.2.6 and 5.1.32

- **VirtualBox 5.2.6 platform packages.** The binaries are released under
  - [Windows hosts](#)
  - [OS X hosts](#)
  - [Linux distributions](#)
  - [Solaris hosts](#)

Once you open the download page you need to choose what kind of host you will be installing VirtualBox. Most of you will be using Windows but it is important to know that you can follow along with this course on Linux (MAC or Ubuntu for example) as well.

Begin the VirtualBox installation once the download is complete. You can use all of the default options but make sure when you are presented with the Windows Security window you select "Install".



If you choose not to select this option it will cause issues for you later on in the course.

# Downloading Windows Server

If you are completely new to IT you might be wondering what Windows Server is...

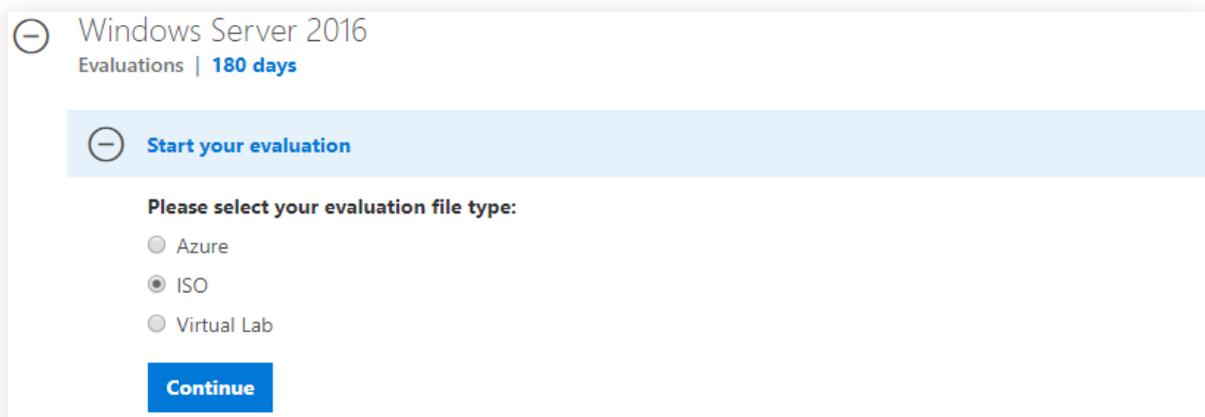
Let me answer that for you. Windows Server 2016 is an operating system that is designed to provide IT services to computer networks on both a very small and very large scale. Windows Server has several tools that come along with the operating system that allow the OS to offer services like user and device authentication, file and printer sharing, web hosting, computer update management, IP management and virtualization (although we won't use this because we will use VirtualBox) just to name a few.

Windows Server can literally do it all when it comes to IT and is often the backbone of most major companies. You find Windows Server in almost every office building that has computers, and that is why you are going to learn how to use it in this course!

Ok...enough rambling on...now it is time for us to start the Windows Server download. Again, if you are using a 32-bit operating system then you should opt for 32-bit Windows Server 2012r2 instead of Server 2016 since 2016 has no 32-bit option available. In this course I am going to assume you want to install Server 2016 although the steps taught in this course are nearly identical for each operating system.

To download Windows Server 2016, google search the term "Windows Server 2016 download" or [click here](#). Make sure you ONLY use Microsoft.com to download Windows Server operating systems and never used pirated software. In this course we will be using a free trial version of Windows Server that will work for 180 days.

Once you reach the Evaluation Center, select Windows Server 2016 and choose the **ISO** option before clicking continue.



The screenshot shows the Microsoft Evaluation Center interface for Windows Server 2016. At the top, it says "Windows Server 2016" with "Evaluations | 180 days" below it. A blue bar contains a minus sign icon and the text "Start your evaluation". Below this, the instruction "Please select your evaluation file type:" is followed by three radio button options: "Azure", "ISO" (which is selected), and "Virtual Lab". A blue "Continue" button is positioned at the bottom of the selection area.

Once you click continue, you will need to register and choose various other options like your language preference. Once you are done registering you will be presented with a download link, click this download link to begin the download.

# Creating a VM with VirtualBox

Now that we have started the Windows Server download we can create our Virtual Machine with VirtualBox. The first thing you need to do obviously is start VirtualBox.

Once VirtualBox is open, click the **New** button in the top left hand corner of the screen.

Once the **Create Virtual Machine** window appears, click **Expert Mode** which is located at the bottom of the screen. Don't let the name intimidate you, it just tells VirtualBox to show more options and less pages.

Now you will need to enter the **Name**. This can be whatever you would like. I am going to enter "ITFLEE". Under **Type**, you need to choose what type of OS will be installed on the VM. Choose **Microsoft Windows**. Next we need to choose the **Version**. In our case, we are going to choose either **Windows Server 2012 (64-bit)** or preferably **Windows Server 2016**. If you have an older version of virtualbox already installed it may not list Server 2016. That's OK, just choose 2016.



## NOTE

If you do not see any 64-bit options that means you either are not using a 64-bit OS, do not have a 64-bit processor or have not enabled virtualization in your bios.

If you don't have a 64bit OS or processor, download the 32-bit Windows Server 2012r2 instead.

If you haven't enabled virtualization, click here and follow the instructions.

For the **Memory Size**, you want to choose an option that is well within the green (left hand side) of the bar. My computer has 16GB of RAM so I am going to choose 4096MB (4gb). If you have less RAM, then you will want to choose a lower option.

I have seen people get away with as little as 512MB-1024MB, so if you crunched on RAM, choose an option within this range but keep in mind your VM will be very slow.

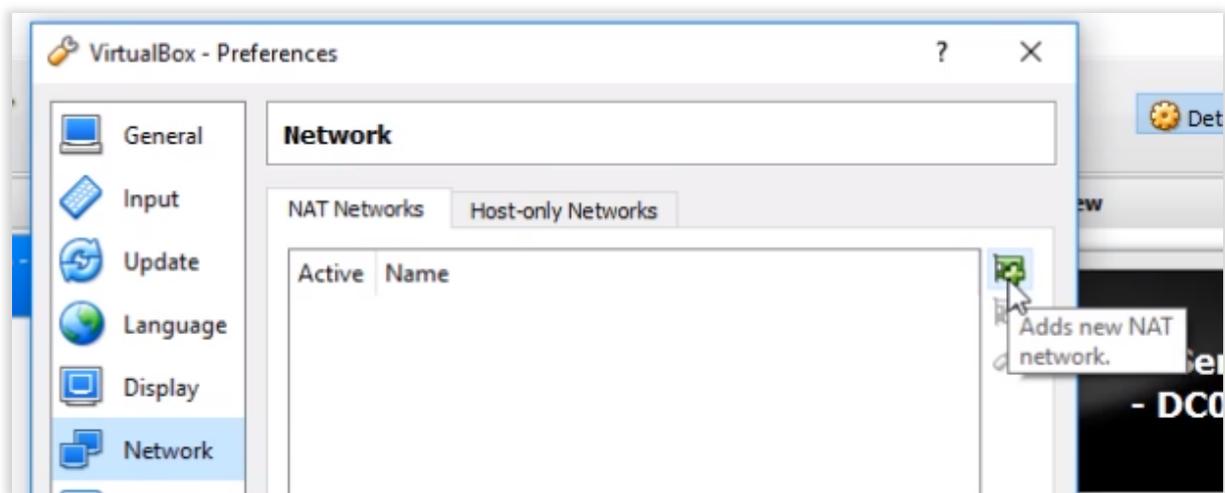
For the **Hard Disk** choose **Create a virtual hard disk now**. Click the create button. Now you will be brought to the **Create Virtual Hard Disk** window. There are two things you need to set here. First, set your **File Size**. This is the hard disk size of the VM. I am going to set mine to 80GB. Next, set your **Storage on physical hard disk** to **Dynamically allocated**. This will cause the hard disk file to expand and shrink as data is added / remove from the VM.

Click the create button, then you should see the new VM has been created!

# Creating a Virtual Network with VirtualBox

Creating a virtual network with VirtualBox is a critical step to building your home IT lab. Thankfully VirtualBox makes this increasingly simple. We are going to create a NAT (network address translation) network that will allow us to have internal VM access (connectivity between VMs) as well as internet access.

To complete this task, within VirtualBox, click **File > Preferences**. Select **Network** and look on the right hand side of the window for the plus icon that adds a new NAT network (see image below).



To rename the network, click the tool wrench that was below the button we used to add a new network. Here you can name the network, change the CIDR (IP address of the network), whether or not the network supports DHCP (automatic IP configuration for VMs), IPv6 support and even port forwarding.

I am going to name the network "MyNatNetwork", and change the CIDR to "192.168.0.0/24" then I will click **OK**. Now click **OK** again on the preferences window and you are completely done creating the network! See I told you it was easy =).

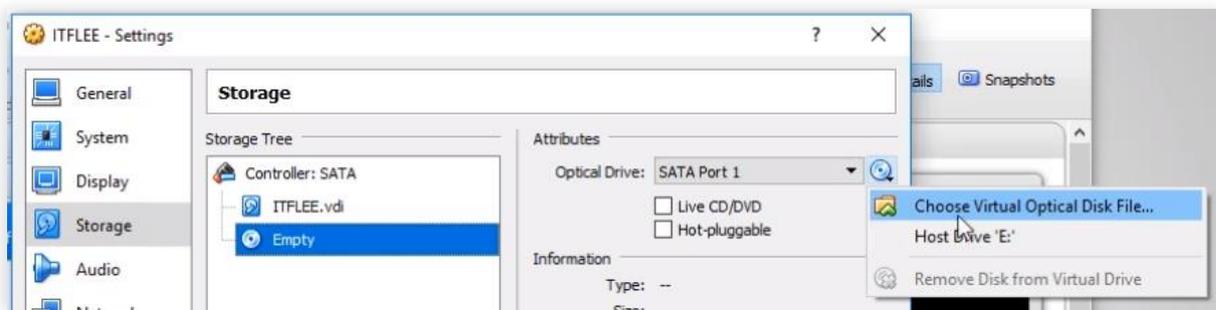


# Configuring the Virtual Machine

In this chapter we are going to configure our new VM. I complete this step at my day job EVERY time I create a new VM no matter if I am using VirtualBox or another virtualization technology (Hyper-V, ESXI, AWS...). While this step is very simple you have to understand what we are doing and also know that this is a must when creating a new VM.

In VirtualBox right-click on our new VM and select **Settings**. The settings window will appear. The first thing we will change is to mount the Windows Server ISO. Mounting an ISO is like inserting a CD into your computer.

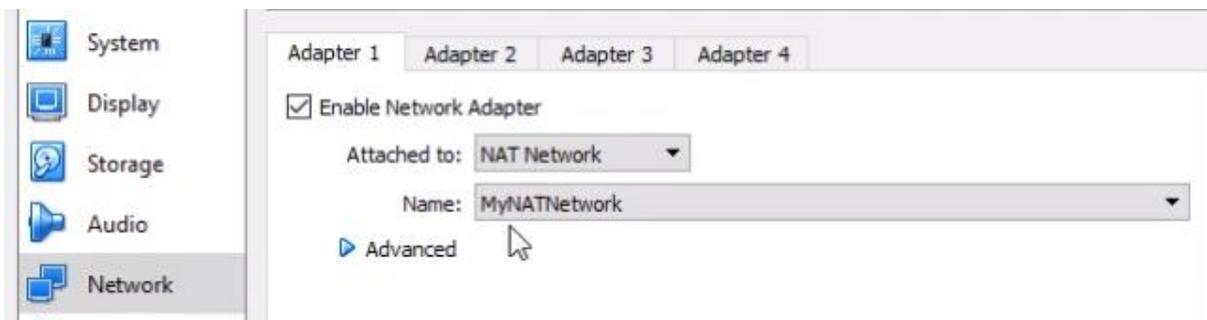
To do this, select the **Storage** tab and look for the disc icon that reads **Empty** under the **Storage Tree** pane. Once you have the empty disc is selected, click the disc icon under the right hand side of the screen under **Attributes** and select **Choose Virtual Optical Disk File** (see image below).



An Open File Browser will appear. Navigate to the Windows Server 2016 ISO that you downloaded earlier and click **Open**.

Now the ISO will be mounted to the disc under the **Storage Tree**. Now we need to connect our VM to the NAT Network we created earlier. To do this, select the **Network** tab. Under the **Attached to** dropdown, change it from **NAT** to **NAT Network**.

Now under the **Name**, make sure it list the NAT Network that you created and intend to use for this lab. Since I renamed my NAT Network to "MyNATNetwork", I can see it listed there.

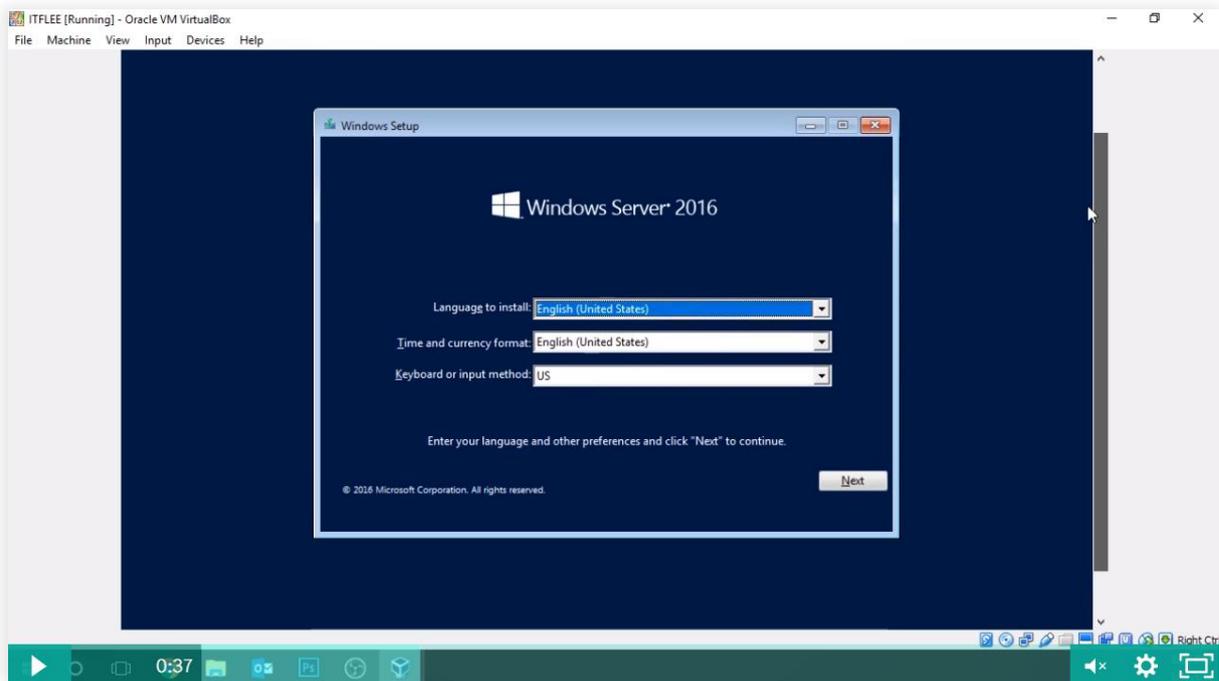


Now click **OK** to close the settings. That is all you need to do in order to configure the VM! Great job!

# Installing Windows Server 2016

Now that our VM has been created and configured, we are ready to launch the VM and install Windows Server 2016. In VirtualBox, select the VM and click the **Start** button. The VM window will appear. Click the Maximize button to bring the VM to full screen.

If your host computer is using a resolution at 1280x720 then the VM will not quite fit on your monitor. You will need to use the scroll bar on the right-hand side of the VM window to see the hidden parts of the VM (see image below).



## NOTE

The screenshot above is from the video course and that is why you see the play button and timeline at the bottom. It is important for you to know that the play button is not displayed in VirtualBox but is there because these screen captures are from the video course version of this eBook.

If you are using a 1080p resolution (1920x1080 for example) then you will not experience this issue. Also this resolution issue will be resolved when we complete some post-installation tasks.

On the **Windows Setup** screen, the default options should work just fine unless you need to change the language, time or keyboard settings. Please be VERY careful when messing with the keyboard input method as choosing the wrong option can lead to you press a key on your keyboard and the VM interpreting the key as a different key.

More than likely you will not need to make changes so just click **Next**. On the next screen, choose **Install now**.

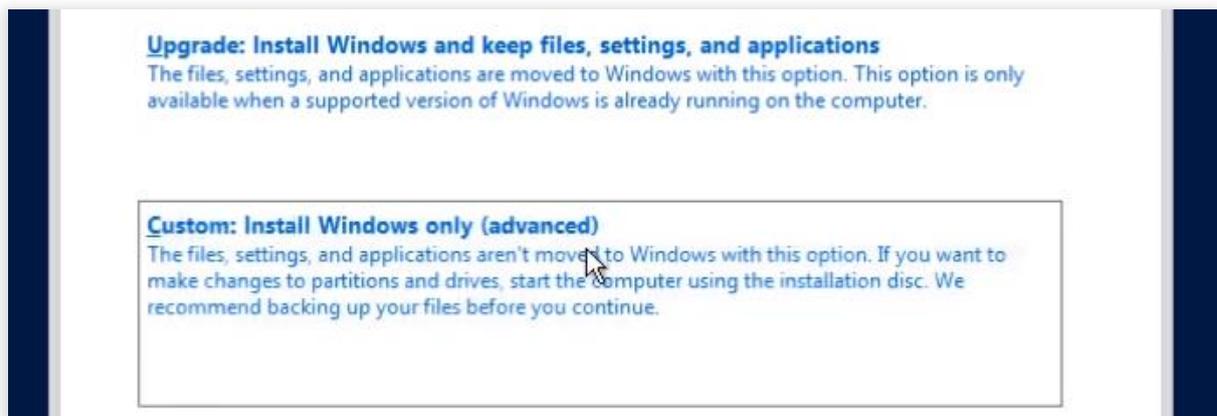
You will need to wait a few minutes while the VM prepares for the installation. Once it is complete you will be brought to the operating system selection. You want to choose a **Desktop Experience** version. I am going to choose the **Windows Server 2016 Datacenter Evaluation (Desktop Experience)** and I will click **Next**.

## NOTE

If you choose an option other than a desktop experience, then you will install what is known as Windows Server 2016 core edition. This is a command line only OS that is designed to be lightweight and efficient. We are not covering this version of Windows Server in this course but I would recommend that you take some time in the future and learn how to use server core.

On the next screen accept the license terms and click **Next**.

Now you need to choose the type of installation. An upgrade is an option that you can use if you already had Windows Server 2012r2 installed but even Microsoft doesn't recommend an upgrade. If at all possible, you should always choose **Custom**. A custom installation is a fresh install of Windows and it erases all the data (if any exists) on the HDD.



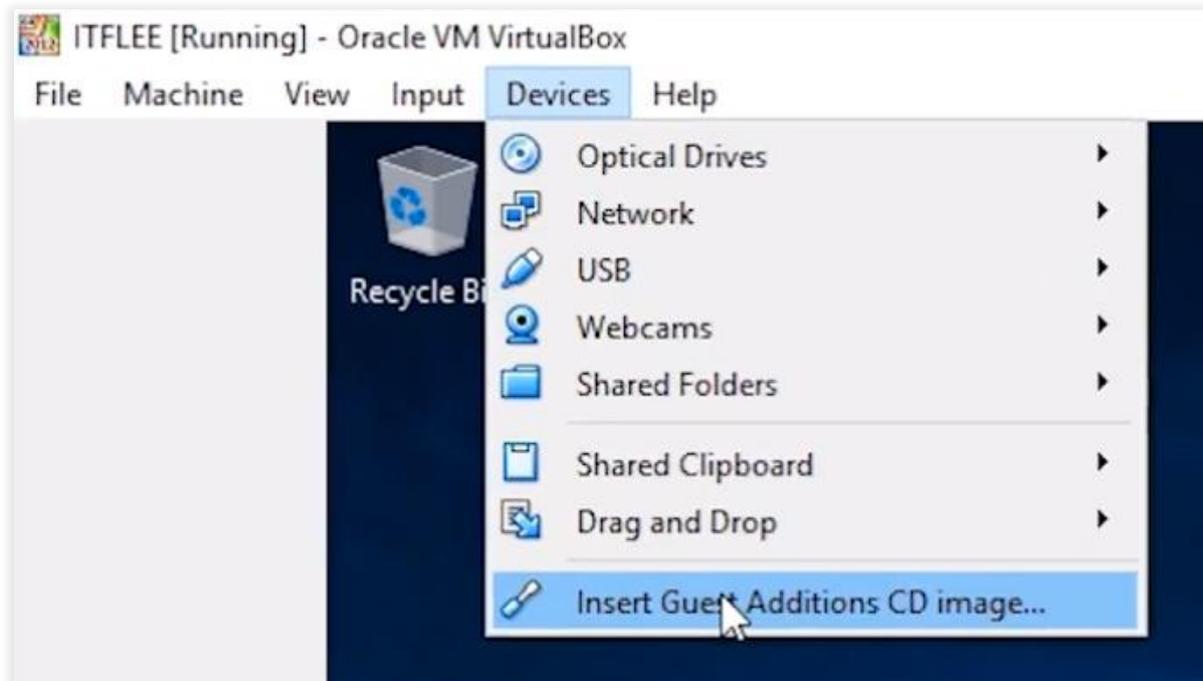
On the next window you need to select the hard drive you want to install Windows on. Since we only have the one hard drive we created when we created the VM, we can simply click **Next**.

Now the installation will begin and you just need to wait for it to finish. This typically takes around 20 minutes but it greatly depends on how fast your host computer is as well as how much RAM you gave to the VM.

Once the install is complete you will be brought to the **Customize settings** screen. Here you need to create a password for the local administrator account. Make sure you remember this password! Write it down if you want...generally you just want to memorize it but since we are in a lab environment there isn't too much risk involved if someone found your password. Once you created the password press enter. There will be more processing that you need to wait through, then you will be brought to the login screen.

Press right-ctrl+del (shortcut for ctrl+alt+del) and login with the username **Administrator** and the password you just created. Once you login you will be brought to the desktop. Great job, now you have installed Windows Server 2016!

Now on the VirtualBox window, select **Devices > Insert Guest Additions CD Image** (see picture below).

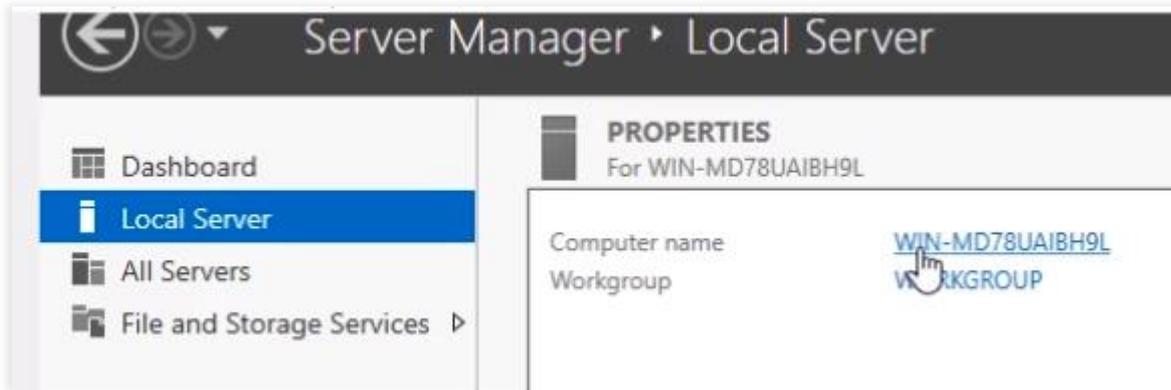


Now this will mount an ISO that helps the VM function better. You need to run the installation package that is on the ISO. You can do this by opening File Explorer and opening the double-clicking on the **VirtualBox Guest Additions** CD drive (from the VM).



You can use the default options when going through the installation. Just make sure you click the **Install** button when you are presented with the Windows Security window.

Once this installation is complete, open Server Manager. You can do this by clicking the **Start Button** and choosing **Server Manager**. Once Server Manager opens, click the blue text next to the **Computer Name** (see image below).



This will open the System Properties window. Click the **Change** button where it says, "To rename this computer..." Under the computer name, I am going to enter "ITFLEEDC01". You can enter the same or whatever you would like.

Once you close all the windows, you will be prompted to restart your computer. Go ahead and do that now. Once your computer reboots you are done with your post installation tasks!



# Course Conclusion

Congratulations! You now have your Windows Server IT Lab completely set up. Below I have the first four things you should learn how to do with your new lab.

It is important for me to let you know that I have created video training for all four (and many more) of the things below.

My personal recommendation is for you to take the video version of this course because there is a lot more information included. You can take that course by [clicking here](#).

Check out the four things you need to learn below:



## ADD ROLES & FEATURES

Learn how to add server roles and features to your server. You can do this from **Server Manager**.



## Windows Domain

Learn how to build a Windows Domain. You can do this by adding the Active Directory Domain Services role to your server. This is the most critical role when you are working on a large corporate network – so don't skip this one!



## Active Directory

Active Directory Users and Computers (commonly called AD) is a tool that is used in just about EVERY major IT environment. This is a MUST-HAVE skill if you want to work in the IT field. Install this on your server and learn how to use it!



## Group Policy

This is another tool you must learn. This tool works hand-in hand with Active Directory and allows you to remotely manage users and computers. Desktop backgrounds, user rights and software deployments are all part of what you can do with Group Policy.