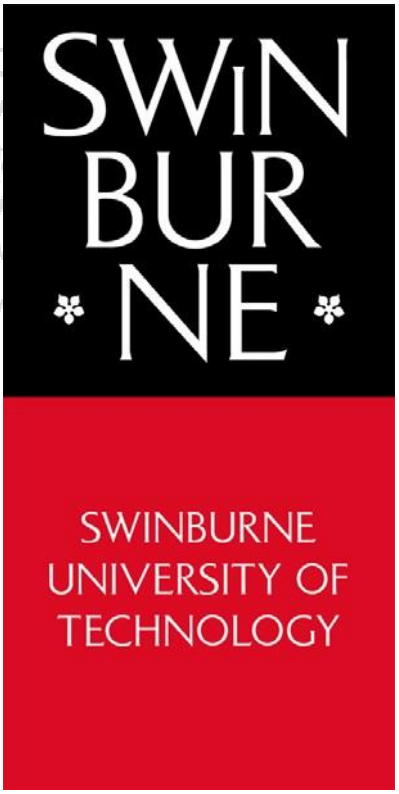
TNE10005/TNE60002

Network Administration

Lab 1

Using Hyper-V *and*
Installing Windows Server 2016
As a Virtual Machine in Hyper-V



Aim:

- To learn how to use Hyper-V at an introductory level.
- To install Windows Server 2016 in a virtual machine.

Resources:

"Get Started with Windows Server 2016"

https://docs.microsoft.com/en-us/windows-server/get-started/server-basics

Windows 10 (Multiple Editions), Version 1703, 32/64-bit (English) iso image

https://aka.ms/devtoolsforteaching

There is a video to help orient you:

Downloading Software from Microsoft Azure for Students
https://commons.swinburne.edu.au/items/0c593bda-3ff6-4742-b374-34a02c82f22d/1/

Preparation:

Minimum Hardware Requirements:

CPU _____GHz

RAM for installing a Virtual Machine:_____MB

Disk Space _____GB

Besides hardware what else will be needed before you can both start and complete the installation?

_____

_____

Where can you get these?

_____

_____

We have already downloaded the Windows Server 2016 Datacenter 64-bit (English) iso image from the *MICROSOFT AZURE FOR STUDENTS* - Microsoft Imagine website.

You will need to connect with *Microsoft Azure for Students* to get the Product Key. If you are uncertain how to do this you can download the document "Accessing and Downloading software from *MICROSOFT AZURE FOR STUDENTS*" from

Introduction to using Hyper-V

Hyper-V is Microsoft's software for running multiple and independent computers within software so that they can share the same computer hardware. We call the physical computer the **host** and its operating system is called the host operating system. The computers that run in software are called virtual computers, virtual machines, or **guests**. The part of the host operating system that allows the virtual machines to share the hardware is called the hypervisor, and this is where Hyper-V gets its name.

Most current computers (i.e. those built since 2012) have processors that support virtualisation with hypervisors. Microsoft Windows Server 2008 or above with Windows 8 Professional or above can all function as a guest operating system for Hyper-V. Unfortunately the home editions of Windows 8 & Windows 10 do not support Hyper-V. If you do have to learn how to install Hyper-V

- on Windows Server 2012, Windows Server 2012 R2, Windows 8, or Windows 8.1 Professional and Enterprise editions, click here.
- on Windows 10, click here, and
- on Windows Server 2016, click here to learn how to set up Hyper-V, click here. to learn how to create a virtual machine in Hyper-V.

However, keep in mind that you need lots of RAM, and lots of free disk space.

If you do not have a host operating system that supports Hyper-V then you may be able to use VMware, but remember that the tutors in this unit may not have the experience to help you with these products.

Loading the Hyper-V Manager

The Hyper-V Manager icon should appear on your desktop or toolbar.

Figure 1: Hyper-V Manager Icon

1. Double clicking the Hyper-V Manager icon will launch it. If the icon is missing on your computer press the **Win** ⊞ key and then select **Hyper-V Manager**.

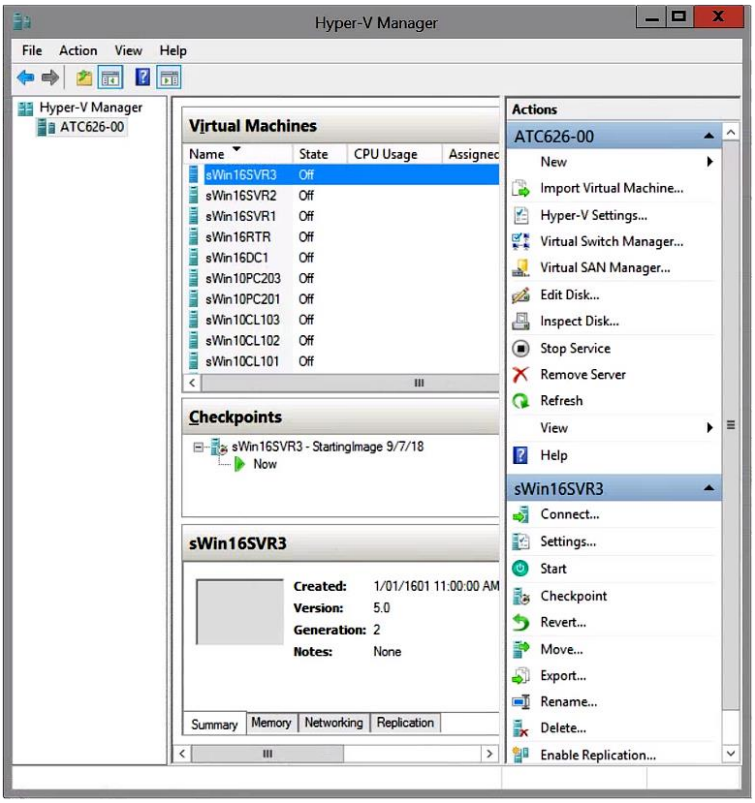


Figure 2: Hyper-V Manager Interface

In the Hyper-V manager interface, notice the panes *Virtual Machines,* and *Actions*. We will be mainly using these panes in this lab.

2. Click on **ATC626-XY** (where XY is your computer number).

3. In the ***Virtual Machines*** pane, right click the virtual machine ***sWin16SVR3***. You will see the options *Connect*, *Settings, Start, Checkpoint and Revert.*

Let's first look at ***Settings***.

4. Click on **Settings**.

   - Observe how much RAM has been allocated to this virtual machine: _____
   - Which controller has the hard disk attached? _____
   - What network is the virtual machine attached to: _____

Notice that at the top left of the settings window you can change the virtual machine focus i.e. you can choose other virtual machines to change the settings of.

Click on **Cancel**.

Launching a Virtual Machine

5. Right click on **sWin10PC203**, and select **Start**.

   Notice that no window opens, but in the **sWin10PC203** pane notice there is a thumbnail image of the virtual machine and this shows it is running.

   It is important to remember that virtual machines can run in the background. But if we want to interface with it then we need to connect to it.

6. Right click on **sWin10PC203**, and select **Connect**. A window will now open.

7. Type in the password and either press **Enter** or click on the **Submit** icon (i.e. "→"). The password for **Jack** is **Pa55w.rd**.
   This will be the standard password for all user accounts in all labs and exams this semester – so remember it!

8. When the login is complete, click the **Win** key to bring up the **Start screen**.

Figure 3: Windows 10 Start screen

9. At the Start screen, start typing **Notepad**.
   Note that when you start typing, a search bar appears and lists the applications and files that match you typing. Click **Notepad** to launch it. Now that you know how to launch an application in Windows 10, we can close **Notepad**.

10. Press **Esc** key to go back to the Windows 10 **desktop,** if you are not already at the Desktop.

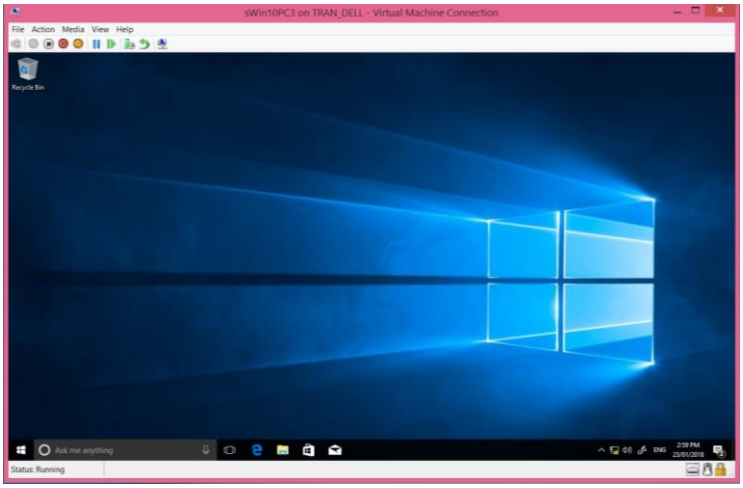


Figure 4: Windows 10 Desktop

11. Right- click the **Win** key on the tool bar at the bottom left of the window, the Windows 10 **Start Menu** will pop up.

Figure 5: Windows 10 Start Menu

12. Select **Run**. In the **Open** box, type **cmd** and click **OK**.

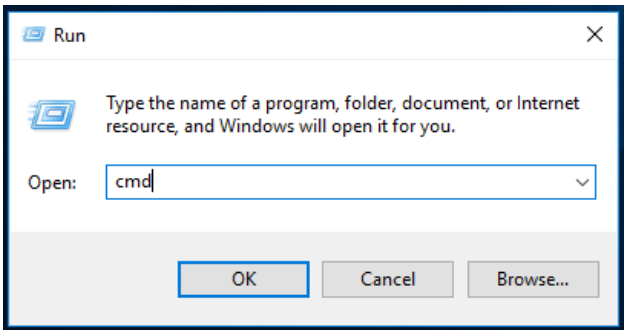


Figure 6: To Launch Command Prompt

13. In the **Command** Prompt, type **Ipconfig** and press **Enter**.

14. Record the output for the **Ethernet Adapter** here:

_____

_____

_____

_____

15. Type **shutdown –s –t 0** and press **Enter**. This should take you back to the Hyper-V Manager. Note that this could also have been typed at the Start screen.

    Some other ways of shutting down Windows 10 is by right clicking the **Win** key from the **Desktop**, click **Shutdown or sign out**, then select **Shut down**; or by pressing **Alt-F4** from an empty desktop, select **Shutdown** and click **OK**, then click **Yes**.

    If you only want to log off a Windows 10 computer you can type **logoff** from either the **Start screen** or **Command Prompt**.

    These tips also work with Windows Server 2016.

Creating a Virtual Switch

16. From the **Actions** pane of **Hyper-V Manager** select **Virtual Switch Manager…**

17. From the **Create virtual switch** windows, click the button **Create Virtual Switch.**

18. In the **Name:** field, enter the name **NetAdLab1SwitchXX** (substitute XX with your Initial, i.e. RS, CL, UT, etc.). In the **Notes:** field, enter a note that lets others know that you created the switch for this lab. Configure the **Connection type** to be a **Private network.** Click **OK.**

19. From the **settings** of **sWin10PC203**, change the **Network Adapter** configuration so that it is connected to the **NetAdLab1SwitchXX** (don't forget to click **OK**).

Creating a Windows Server 2016 Virtual Machine

20. From the **Hyper-V Manager**, **Actions** pane, click **New**, then **Virtual Machine**.
21. At the **Before You Begin** dialog box, click **Next**.
22. Name the new Virtual Machine **WindowsServer2016XX** (*substitute XX with your Initial, i.e. RS, CL, UT, etc*.), and click **Next.** On the **Specify Generation** dialog box choose **Generation 2** (*see extension activity on this*)**,** and next.
23. Assign the minimum amount of memory **for a virtual machine** as recorded in the **Preparation** section at the start of this document.
24. Connect the new virtual machine to the **NetAdLab1SwitchXX**.

Note

ATC626 lab is a shared lab for Network Administration and ENSA students. In this section, all names, i.e. Virtual machine name, Virtual hard disk name, are appended with XX, where XX are your initials, to ensure any new virtual machine or virtual hard disk created does not have the same name as an existing virtual machine or virtual hard disk.

25. On the **Connect Virtual Hard Disk** dialog, choose **Create a virtual hard disk**.

    Name the virtual hard disk **NetAdLab1HDDXX**.

    Keep the default location c:\Hyper-V\.

    Set the size to the minimum disk space requirements as recorded in the **Preparation** section at the start of this document

26. In the **Installation Options** dialog, choose **Install an operating system from a bootable CD/DVD,** then select **Image file (.iso)**. **Browse** to your desktop to **en_windows_server_2016_x64_dvd-9718492.iso**, click **Open,** then click **Finish**. The new virtual machine will now be created.

27. From the **Hyper-V Manager,** right click the **WindowsServer2016XX** virtual machine, then connect.

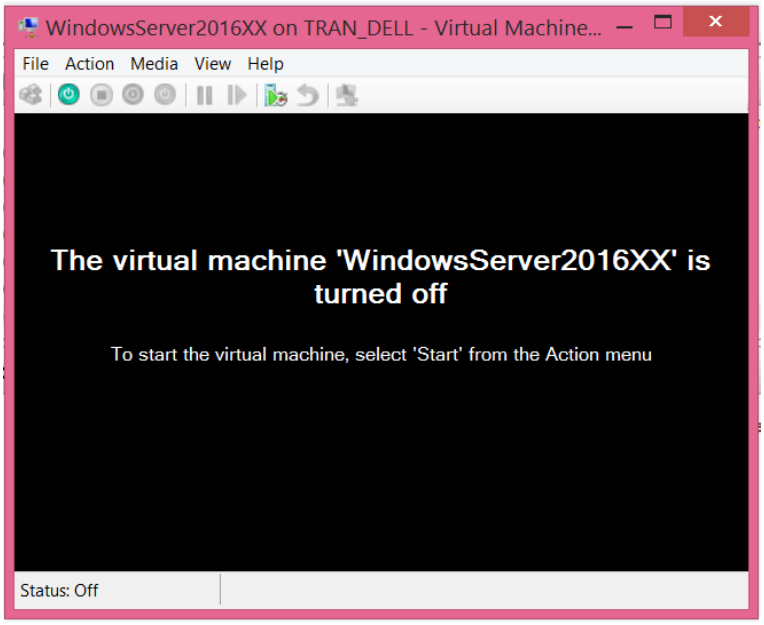


Figure 7: Connection to a Turned Off VM

28. Look under the **Action** menu.

    Notice that it advises you that the keyboard shortcut for Ctrl+Alt+Del is **Ctrl+Alt+End**. This means that whenever you are asked to press Ctrl+Alt+Del to log onto a virtual machine in Hyper-V, you need to press **Ctrl+Alt+End.** This is because Ctrl+Alt+Del is reserved for the host operating system.
    Also notice the options **Start, Shutdown…, Checkpoint,** and **Revert.**

    We will not be using **Checkpoint** in these labs, but at home it is very useful. It used to be called Snapshots in older versions of Hyper-V. It will save the state of the virtual machine. **Revert** deletes the changes and reverts the virtual machine back to the state when the last Checkpoint was made.

    You should always revert your virtual machines at both the start and end of each lab.

29. Click **Start**.

30. We will install from the bootable DVD inserted in step 28 , so press ***any key*** to continue.

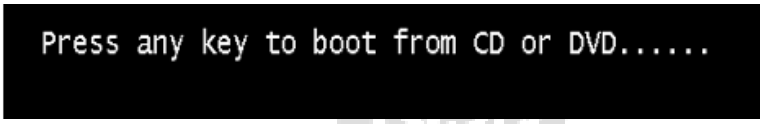


Figure 8: CD or DVD Boot option

31. When the installation begins, keep the **language time and currency format** the defaults, click **Next**.

32. There is no preinstalled operating system in the VM hard disk, and we are going to install a fresh Windows Server 2016, click **Install** now. Setup will start.

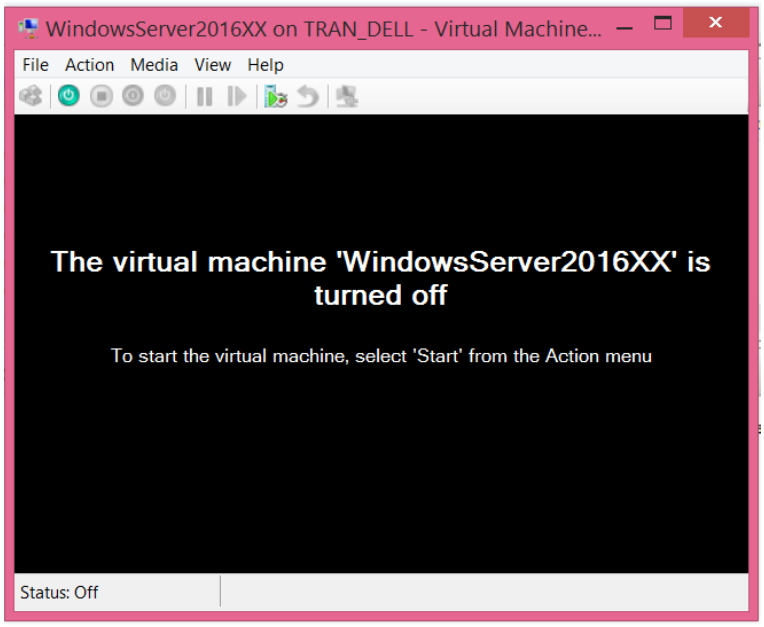


Figure 9: Connection to a Turned Off VM

33. At the Activate Windows window, you have to type the Product key obtained from the *MICROSOFT AZURE FOR STUDENTS* website in the **Preparation** section, and activate the Windows operating system after installation.

    We will only use the installed machine for the duration of this lab only, so click **I don't have a product** key, then click **Next**

Figure 10: Activate Windows Option

34. At the Windows Setup dialog, select the last operating system in the list i.e. Windows Server 2016 Datacenter (Desktop Experience). This option is useful when a GUI is required, also it supports all server roles and features..

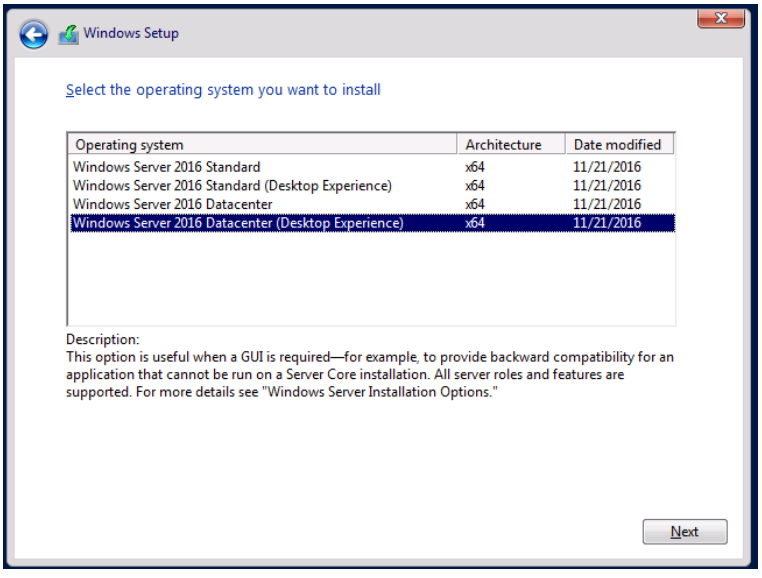


Figure 11: Select Operating System Type to Install

35. Accept the license agreement.

36. For **Which type of installation do you want?**, select **Custom: Install Windows only (advanced)** since we did not previously have an operating system on the virtual machine

37. When asked **Where do you want to install Windows?,** select **Drive 0 unallocated space** and click **Next**.

38. The installer will then take some time to copy files, install features and updates and reboot.

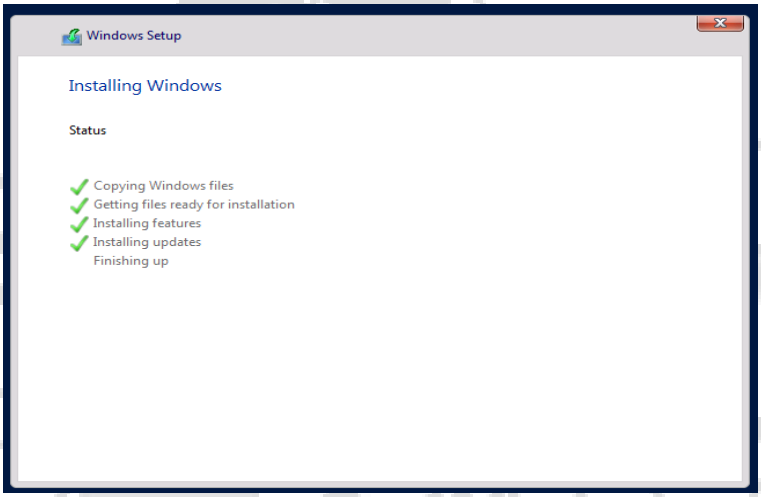


Figure 12: Installing Windows

39. After virtual machine reboots, you will be asked to perform Customize settings.

    To set the password for the built-in administrator account, type **Pa55w.rd** (Capital P, letter a, double five, letter w, a period, letter r and letter d) in both the **Password** and the **Re-enter password** boxes, then click **Finished**. The machine again reboots.

    Note: **Pa55w.rd** in our standard lab password (see step 7), and make sure you do not make a mistake.

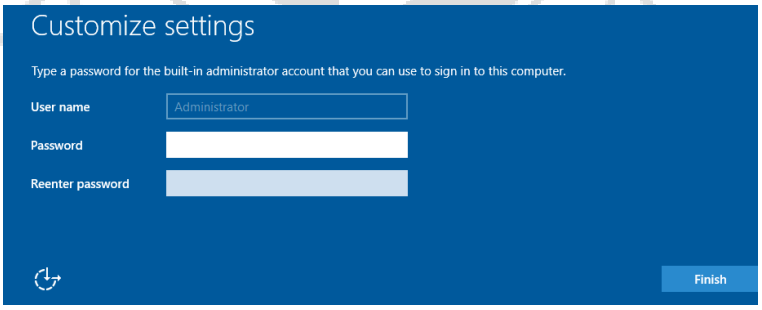


Figure 13: Customize Settings - Password

40. While waiting for the newly installed server to reboot after configuring the administrator's password, start the **sWin10PC203** virtual machine. Then log on as **Jack** with password as **Pa55w.rd**.

41. After the **WindowsServer2016XX** completes rebooting, press the key combination for the guest operating system (see step 27), and enter the password.

Configuring IP Settings

42. On **WindowsServer2016XX,** click **Local Server** in the most left pane. Below the **properties** section, click the link next to **Ethernet.** In the **Network Connections**, right click **Ethernet** and select **Properties**

43. Without removing the tick, click on **Internet Protocol Version 4 (TCP/IPv4)**, and select the **Properties** button.

44. Select **Use the following IP address:** and enter the following details:

- IP address: 192.168.100.100
- Subnet mask: 255.255.255.0

45. In order to prepare for testing, right click the **Win** key and select the **Control Panel**.

From the **Control Panel** click **System and Security**, then **Windows Firewall.**

From the left pane, click **Allow an app or feature through Windows Firewall**. Then scroll down until you see **File and Printer Sharing** and click the check boxes under the **Private** and **Public** columns, and click **OK**.

Testing the Network

46. Switch back to the **sWin10PC203** virtual machine, and log on.

47. Launch **Command** Prompt (see steps 11-12).

48. Type **ping 192.168.100.100**
If you receive a reply from 192.168.100.100, then you have verified that you have network connection between the two virtual machines

Do not leave the lab until the pack up stage is complete

Extension

1. Change the **IP Address** on **WindowsServer2016XX** to **192.168.10.100**. From **sWin10PC203,** try to ping **WindowsServer2016XX** newly configured IP **192.168.10.100**.

   What is the result this time? _____

   Can you explain this change? (*If not you will be able to soon*).

2. What is the difference between a Generation 1 virtual machine and a Generation 2 virtual machine?

3. Locate the hard disk file of the **WindowsServer2016XX** virtual machine, and use it as the **base hard disk** (aka *Parent* hard disk) to create a new hard disk (aka *Differencing* hard disk) for a new virtual machine. Click here for an explanation of Hyper-V virtual hard disk formats, and here for how to create a Child/ Differencing hard disk.

Pack Up

1. Shut down all virtual machines.
2. From Hyper-V Manager right click **WindowsServer2016XX** and select **Delete**.
3. Right click **sWin10PC203** and select **Revert**.
4. From the **Virtual Switch Manager…,** click on **NetAdLab1SwitchXX**, and then click on the **Remove** button.
5. Log off the Host server **ATC626-XY**
6. Push your chair in as you leave.

End of Lab