- 1. 4. 5. Running virtual machines with Hyper-V -

Caution!

You cannot have working VirtualBox and Hyper-V at the same time in the same real computer, so do only the following exercises in a real computer where you do NOT have VirtualBox working.

You can use Hyper-V to create and run virtual machines—effectively, computers within a computer.

A console on your computer acts as a monitor for a virtual machine (sometimes called a VM), which generally has most of the features and capabilities of a standalone computer.

The only difference is that a virtual machine runs as a program on a host computer, under the control of a system-level software layer called a hypervisor.

Virtual machines running under Hyper-V are useful in the following situations, among many others:

- People who have programs that do not work properly in Windows 10 can run them in a virtual machine using an older version of Windows.
- Developers who need to test their programs in different Windows versions or under different resource configurations can set up a virtual machine for each target platform.
- Security researchers and curious users who want to test software of unknown provenance or explore potentially dangerous websites can do so safely within the confines of a virtual machine (assuming it's properly isolated from the host and the host network). If a virus or other malware is found, the host machine remains unscathed, and the virtual machine can be rolled back to a safe state.
- Tech enthusiasts who want to test a new beta (prerelease) version of Windows or other software can install it in a virtual machine. This way, they can try the software without having to dedicate a physical machine (or worse, upgrading their main system to run an operating system that still has issues).
- Authors of books and tutorials can use virtual machines not only to test various setups, but also to capture images of screens that would be impossible to grab using ordinary screen-capture tools (for example, images showing sign-in screens or even Windows setup before Windows itself is fully functional).

To use Hyper-V, your system must meet certain minimum requirements and you might need to enable the Hyper-V feature.

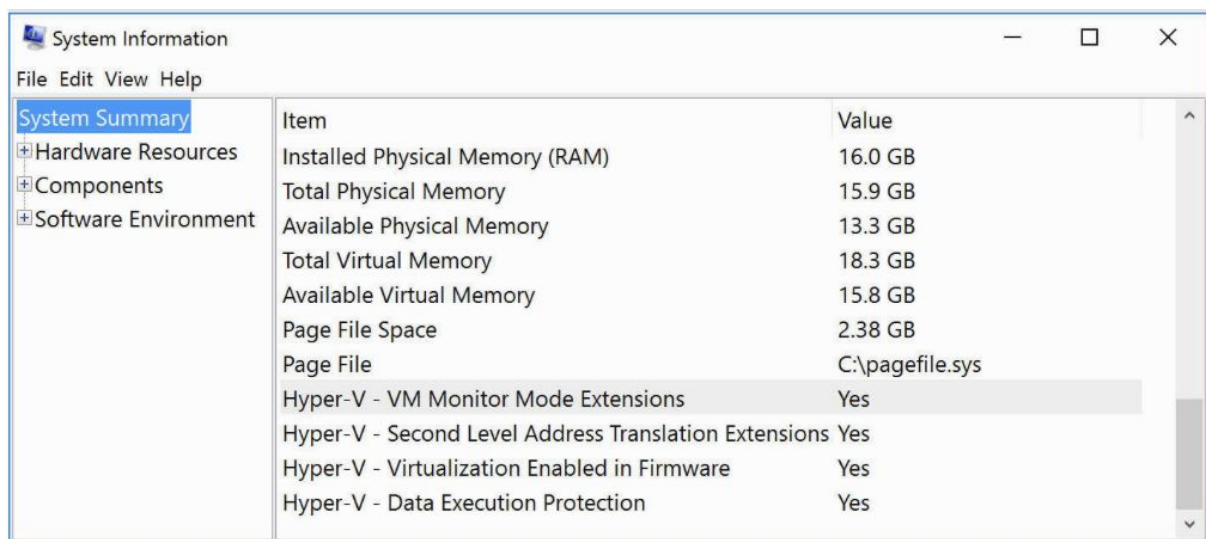After that is done, you use Hyper-V Manager to create virtual machines.

With enough system resources, you can then run one or more virtual machines, each in its own window.

Because they function as independent computers, each virtual machine can run a different version of Windows—32-bit or 64-bit, old or new, server or desktop—or even other operating systems that work on PC-compatible hardware.

Determine whether your computer supports Hyper-V

On a PC that's already running Windows 10, checking for Hyper-V support is as easy as opening the System Information app (Msinfo32.exe).

Scroll to the bottom of the System Summary tab to see four entries that begin with "Hyper-V," as shown here:
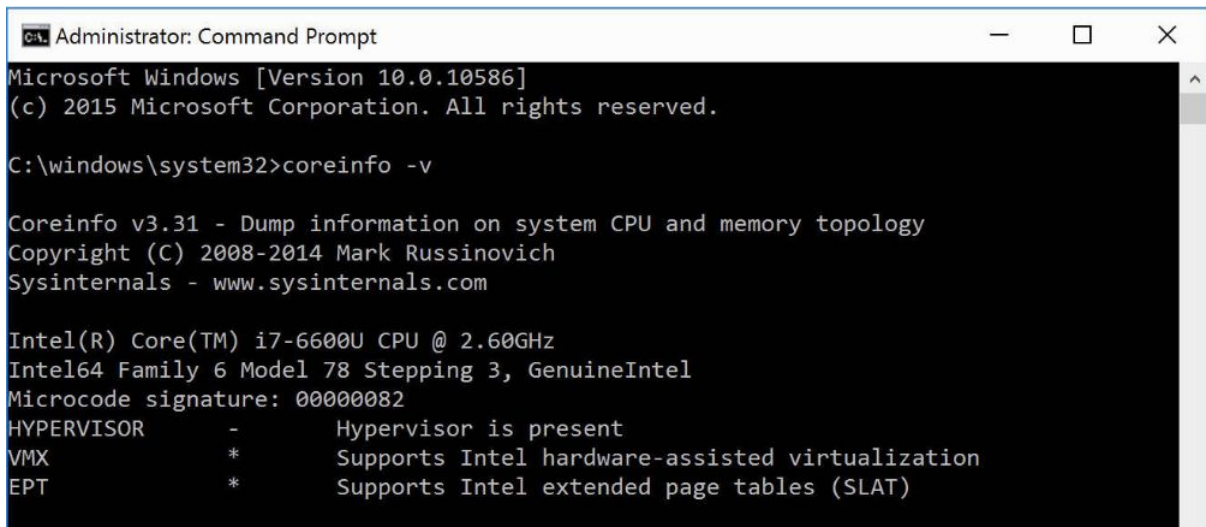

If you see the value "Yes" for every item on that list, you can turn on Hyper-V.

To check Hyper-V compatibility before upgrading a PC running an older version of Windows, use the CoreInfo utility from Windows Sysinternals, which is available from https://bit.ly/sysinternals-coreinfo .

At an elevated command prompt, enter **"coreinfo –v"** to see results similar to this:

For an Intel processor (as shown here), an asterisk in the EPT line indicates support for Second Level Address Translation (SLAT), a requirement for running Hyper-V ; a hyphen in that space indicates that the processor does not support SLAT.

For an AMD processor, the line to look for is NP.

Note that you'll get valid results only if Hyper-V is not already running.

But if it's already running, you didn't need to run this diagnostic test anyway, did you?

Setting up Hyper-V

Before you get started with Hyper-V, be sure your computer meets the system requirements.

Because each virtual machine uses system resources on a par with a standalone computer, the requirements are somewhat steep:

- 64-bit version of Windows 10 Pro, Enterprise, or Education. Hyper-V is unavailable on 32-bit versions and is also not part of Windows 10 Home.
- At least 4 GB of RAM. With 4 GB of total RAM, you can probably run one or two low-resource virtual machines simultaneously. In our experience, you need at least 8 GB of total RAM for satisfactory performance with one or more virtual machines running Windows 10.
- Copious disk space. Each virtual machine is stored in files on your hard drive. The size can vary considerably depending on how you configure your virtual machines (for example, the operating system and the size of the VM's virtual hard disks), how many checkpoints you save, and so on—but expect to use at least 20 GB of disk storage for each virtual machine.
- A CPU with Hyper-V features enabled. Your computer must have a 64-bit processor that supports virtualization in the firmware and has Data Execution Prevention enabled. Most 64-bit processors sold by Intel and AMD in the past

few years have this capability. In addition, Second Level Address Translation (SLAT) is essential for acceptable performance.

With those prerequisites in place, you're ready to turn on the Hyper-V features, which are installed but are off by default.

To do so, open Windows Features, shown in the next figure.

In the search box, type **"features"** and then click **"Turn Windows Features On Or Off"**.
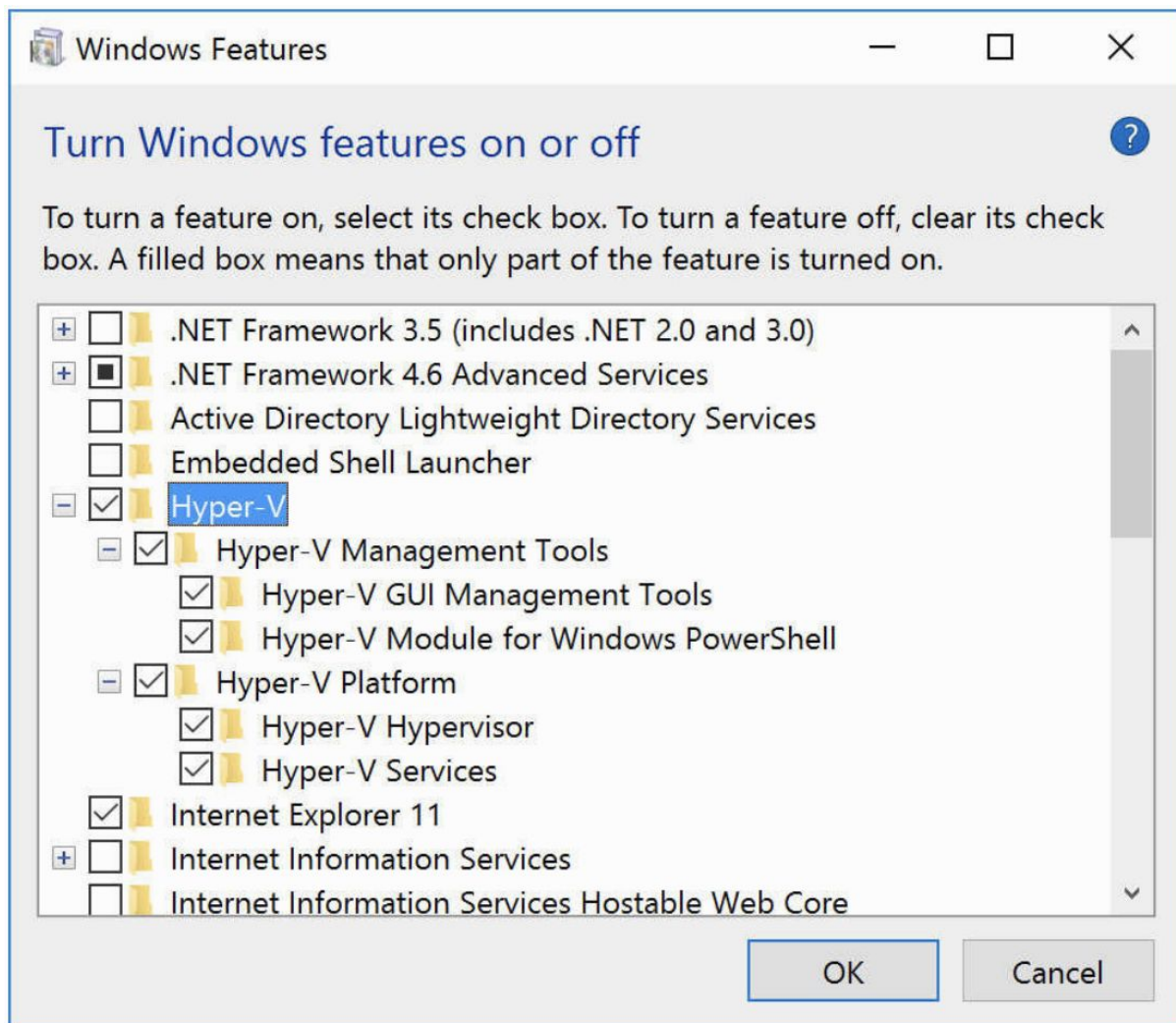
Click the plus sign by the top-level Hyper-V entry to show all the subentries.

If your computer does not fully support Hyper-V, the Hyper-V Hypervisor entry is not available.

Select Hyper-V (which also selects all the available subentries) to enable it, and then click OK. After a few moments, Windows asks you to restart your computer.

Using Hyper-V Manager

Hyper-V Manager is the program you use to create, run, and manage your virtual machines.

When you start Hyper-V Manager, the initial view, shown here, might leave you scratching your head.

You're faced with a barren console window, one that has only one available action:
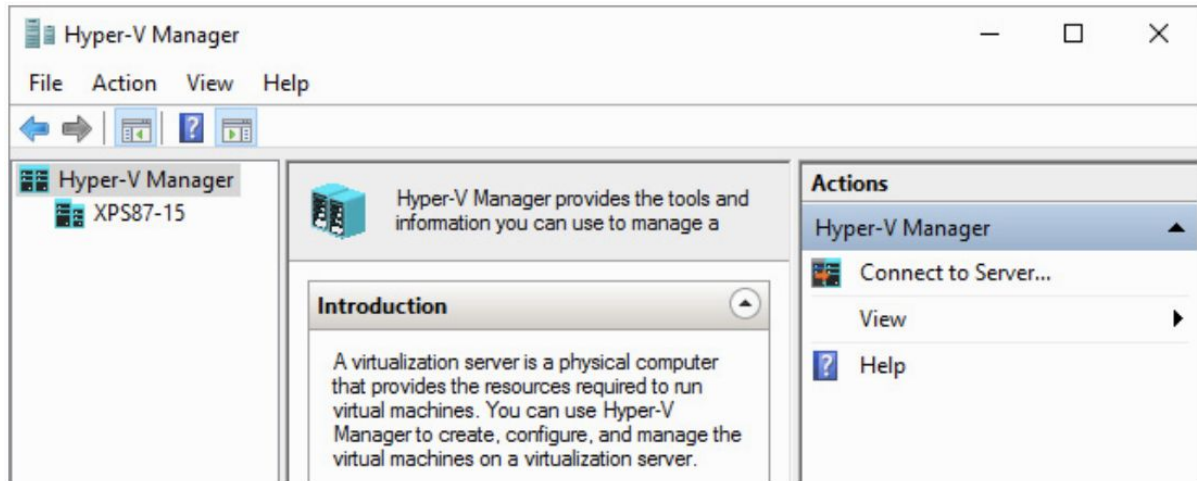
The trick is to select a "server" (in this case, your local computer) in the left pane, the console tree.

Lots more information and options then appear:
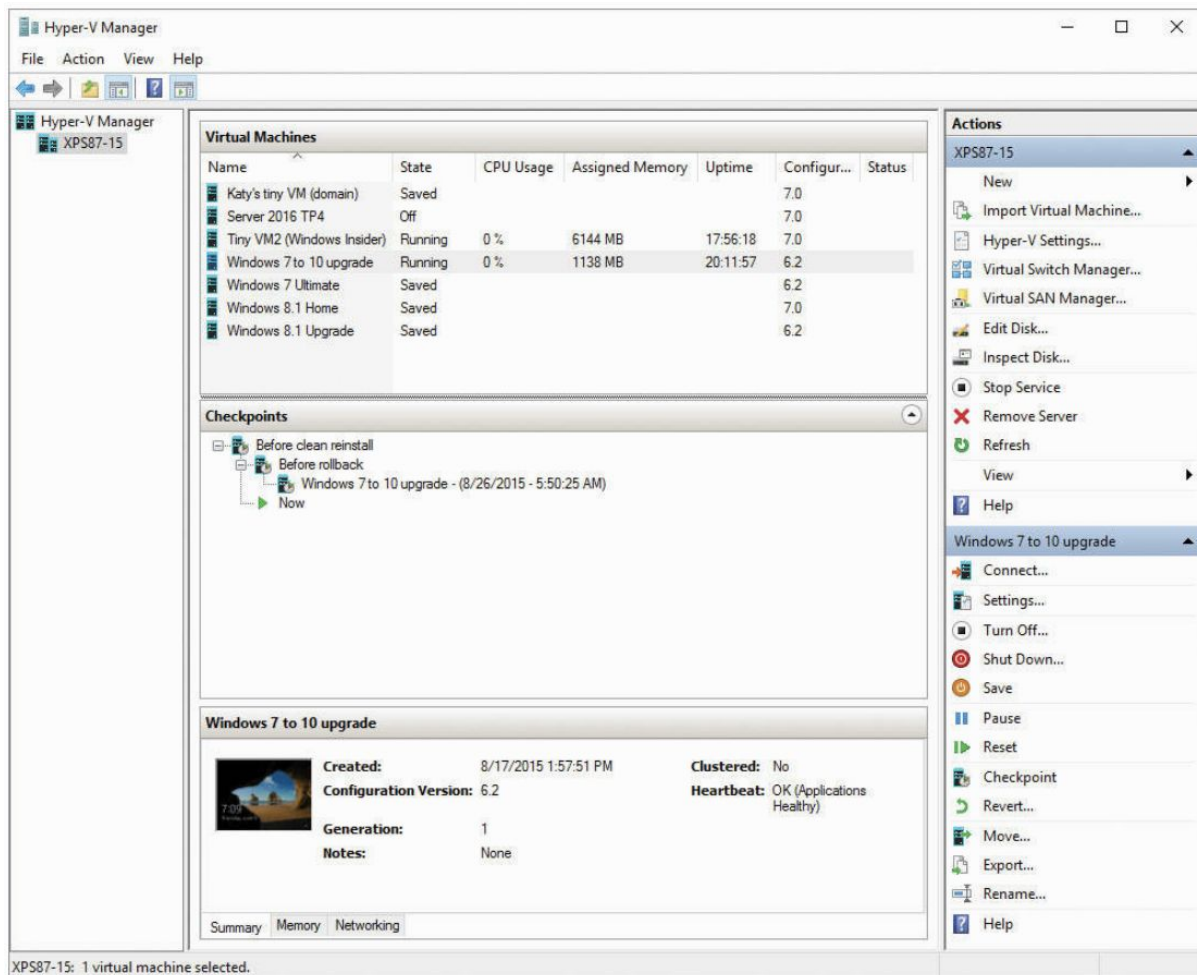
When you select a Hyper-V host in the console tree (in this case, your PC running Windows 10 Pro or Enterprise), the center pane lists the virtual machines available on that host and shows a bit of information about the current state of each one.

Below that, you'll see a list of checkpoints for the selected virtual machine.

A checkpoint captures the configuration and data of a virtual machine at a point in time.

At the bottom of the center pane, the Summary, Memory, and Networking tabs show additional details about the selected virtual machine.

Here you can see at a glance what IP address has been assigned to the virtual machine, how much memory is in use, and so on.

The thumbnail image on the Summary tab also provides a convenient launching method for the virtual machine; double-click it to connect to that virtual machine.

As in other console applications, the right pane shows available actions for the items selected in the left and center panes.

Creating a network switch

By default, a new virtual machine is set up as a standalone computer with no network connection.

It can't connect to the internet or to other computers on your network.

That disconnected configuration might be useful for some testing scenarios, but for most situations you'll probably want to give your virtual machines access to a network connection.

To do that, you must first have a bit of networking infrastructure in place—namely, a virtual switch.

A virtual switch connects the virtual network adapter in your virtual machine to the physical network adapter in your physical computer, thereby allowing the virtual machine to connect to the outside world.

You can create and manage a virtual switch after you set up a virtual machine and then modify your virtual machine to use the virtual switch.

Setting up the virtual switch before you set up your virtual machines simply saves a few steps.

In addition, you can create multiple virtual switches using different network adapters or configurations and choose the type of virtual switch you need for each VM, at startup time or while the VM is running.

To create a virtual switch or make changes to an existing one, in the Actions pane (or on the Action menu) click or tap Virtual Switch Manager.

Then select the type of switch you want to create:

- External. This is the most common type for a VM that you want to use as if it were another PC on your local network. This configuration binds the virtual switch to your computer's physical network adapter so that you can access your physical network. Assuming your physical network adapter is connected to the internet, your virtual machines using this type of switch also have internet access.
- Internal. An internal virtual switch can be used only to make a connection among the virtual machines running on your physical computer, and between the virtual machines and your physical computer.
- Private. Use a private virtual switch to set up a network that comprises only the virtual machines running on your physical computer and using the same virtual switch. This network is isolated from all physical computers, including the Hyper-V host on which it's installed.

When you click or tap Create Virtual Switch, you're asked for more details, as shown in the following figure.

Click OK to complete the switch creation.
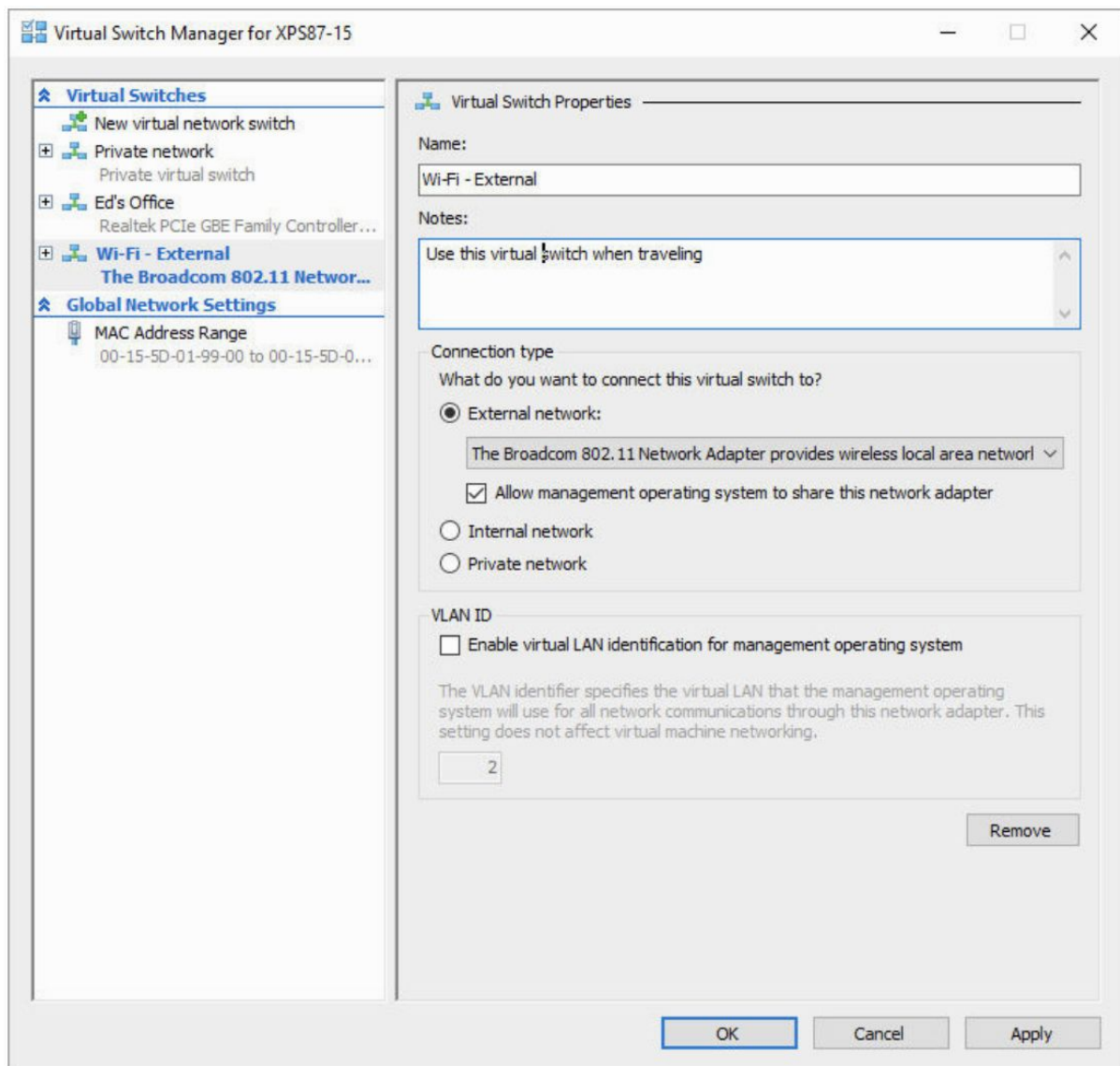
Creating a virtual machine

To create a new virtual machine, open Hyper-V Manager and, in the Actions pane, click or tap New > Virtual Machine, which launches the New Virtual Machine Wizard.

Navigating through the wizard leads you through the process of setting up a virtual machine, by using the Next and Previous buttons or the links along the left side.

At any point in the wizard, you can click Finish to create a virtual machine that uses default values for any wizard pages you skip.

Specify name and location

After you step through the Before You Begin page, the wizard asks you to provide a name for your virtual machine.

Enter a name or description that'll help you differentiate this virtual machine from others you might create. (

he wizard will use this entry again later, as the suggested name for the virtual hard disk you create.

If you don't like the proposed storage location for the virtual machine files, select the check box and specify another, as shown in the next image:

The default location is %ProgramData%\Microsoft\Windows\Hyper-V\.

%ProgramData% is an environment variable that is set to C:\ProgramData on a standard Windows installation.

If your computer has a small system drive—a common configuration in some desktop systems that use a solid state drive for system files and a large hard disk for data files—you might want to store the files elsewhere.

Keep in mind that a virtual machine can occupy 10–40 GB or more, and each checkpoint can consume equivalent amounts of space.

It's possible to move the virtual machine files after you create the machine, but it's not easy.

Although some parts of a virtual machine (the virtual hard disk and the paging file, for example) can be moved by changing the settings of the virtual machine, this option isn't available for some of the core files.

To completely move a machine at a later time, you can import a virtual machine, copy it, and store it in a different location.

You're much better off choosing a suitable location before you create the virtual machine.

Specify generation

On the Specify Generation page, shown here, select either Generation 1 or Generation 2 for the style of virtual machine you need:
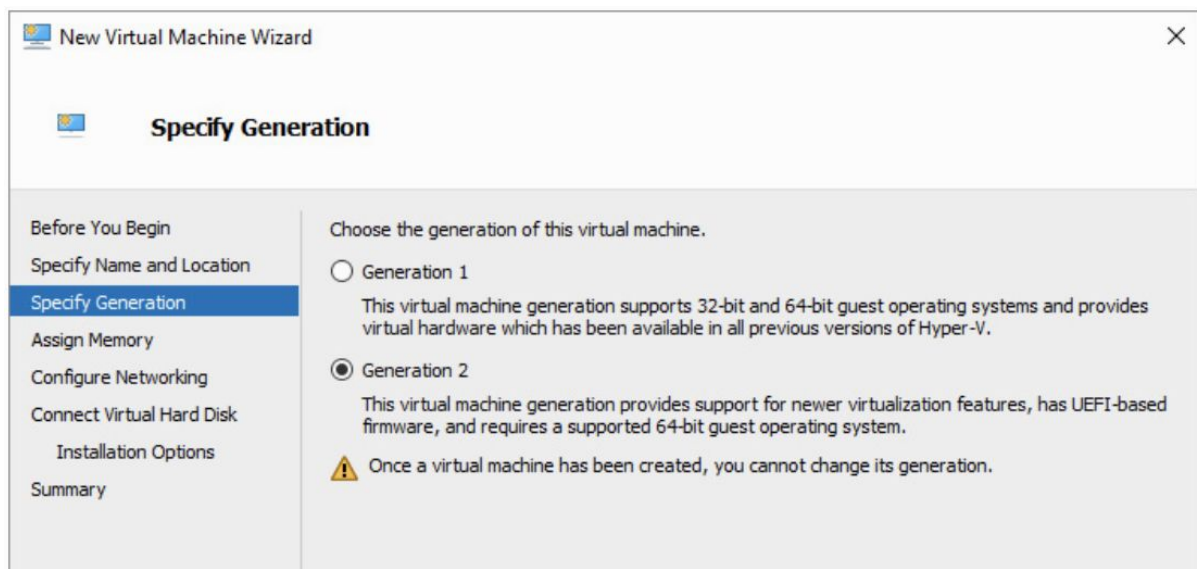
Generation 1 supports a wide range of guest operating systems, including most versions of Windows (32-bit and 64-bit) and Linux.

The virtual hardware in a generation 1 virtual machine is typical of that found in BIOS-based PCs for many years.

Generation 2 currently supports only 64-bit Windows versions: among desktop operating systems, Windows 8, Windows 8.1, and Windows 10 are supported; support for Windows Server as a guest operating system is restricted to Windows Server 2012 and later versions.

In addition, generation 2 removes support for attaching physical DVD drives and other older hardware to a virtual machine.

But a generation 2 virtual machine has modern UEFI-based firmware, which enables Secure Boot and booting from a network adapter, SCSI hard drive, or virtual DVD.

In addition, generation 2 virtual machines enable new Hyper-V features, such as the ability to adjust memory or add a network adapter while the virtual machine is running.

If you're going to install one of the newer supported operating systems in your virtual machine, select Generation 2 to enable additional features.

For an older operating system, you must stick with the default option, Generation 1.

Assign memory

On the Assign Memory page, shown in the next picture, you specify the amount of RAM your virtual machine will have:
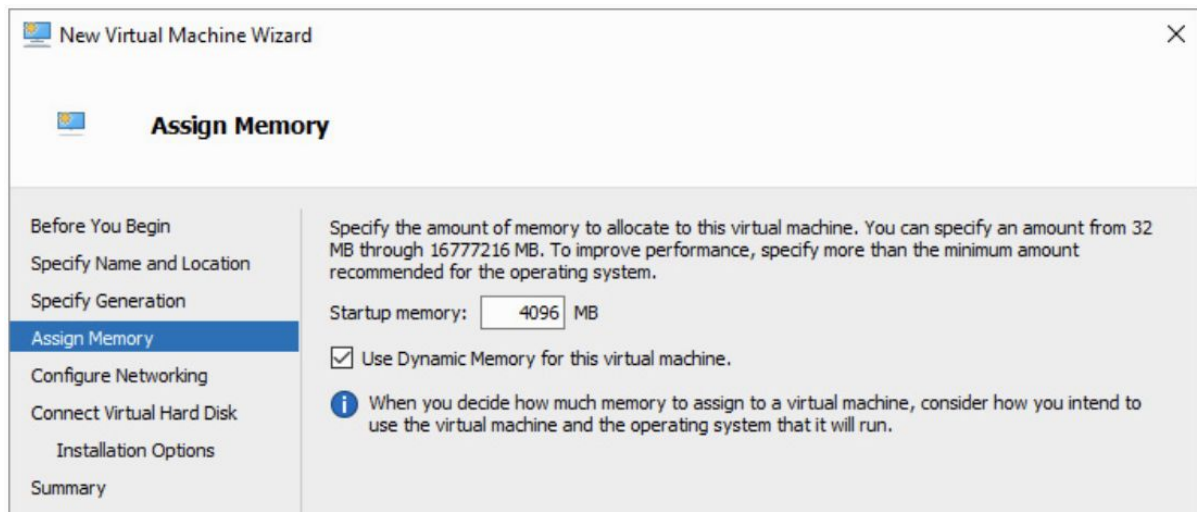
If you enable Dynamic Memory, Hyper-V uses memory as a shared resource that can be reallocated as needed among running virtual machines.

This way, each machine gets as much memory as it needs, but it doesn't reserve a fixed amount of memory (which would preclude other virtual machines or the host operating system from using that memory).

Therefore, if you plan to run more than one virtual machine at once, we recommend you select Use Dynamic Memory For This Virtual Machine to get the best performance.

Then set Startup Memory to at least the minimum amount required for the operating system you plan to install in this virtual machine.

If you plan to run only one virtual machine, or if you know how much memory your virtual machine will need to perform its given tasks, you can turn off Dynamic Memory and specify a fixed amount of memory.

This setup works more like a physical computer, in that whatever memory you specify is the total amount of installed RAM in the virtual machine.

Note that the options for configuring memory in the New Virtual Machine Wizard are extremely limited.

You can exercise far more granular control over memory by adjusting the settings for a VM, as we explain a bit later in this section.

Configure networking

On the Configure Networking page, shown in the following picture, you specify the virtual network switch where you want to connect your virtual machine's network adapter.

The default option is Not Connected, which results in a virtual machine that's isolated from all other computers (physical and virtual) and from the internet.

Even to connect to the physical computer on which the virtual machine runs, you must create a virtual network switch and select it here.
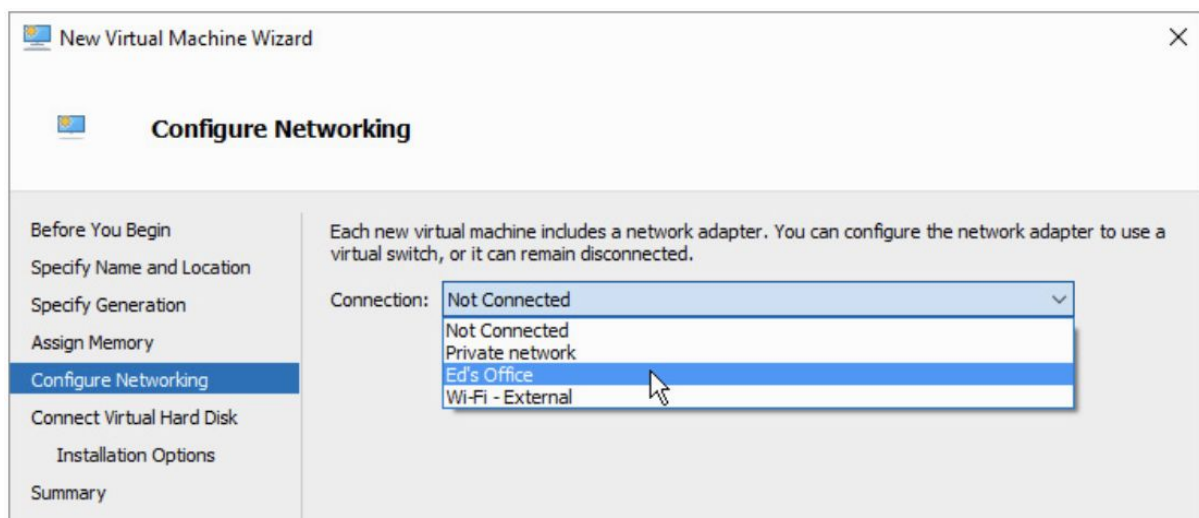
To determine which type of network switch you're using (External, Internal, or Private), you need to return to the Virtual Switch Manager.

Connect virtual hard disk

On the Connect Virtual Hard Disk page, shown in the following figure, you set up the virtual machine's first virtual hard disk.

A virtual hard disk is actually a file in the VHD or VHDX format.

By default, the New Virtual Machine Wizard creates a dynamically expanding virtual hard disk (VHDX).

If you want a fixed-size virtual hard disk (VHD), you need to create it separately.

Just like a physical computer, a virtual machine can have multiple hard drives; the wizard allows you to create or attach the system drive only.

By default, this drive is created in a subfolder of the virtual machine location you specified earlier.

But you can override that default and store the virtual hard disk on any physical disk that's accessible to the host computer running Hyper-V.

In addition to specifying the name and location of your virtual hard disk file, you must specify the disk's capacity, in gigabytes.

Be sure you create a virtual hard disk that's big enough to store the operating system, programs, and data you plan to use on the virtual machine.

Although you don't want to go overboard, don't worry too much about specifying a size that's too big.

Because of the way data is stored in a dynamically expanding virtual hard disk, the size of the VHDX file roughly corresponds with the amount of disk space in use rather than the size you specify, which is the maximum.

However, its dynamically expanding nature also means that the VHDX file can grow to that maximum size; be sure that the physical hard drive where you store it has enough room to accommodate growth.

You can change the location later, but it's a multistep process.

And it's possible to resize a virtual hard disk after it has been created, but doing so brings some risk of data loss.

Therefore, it's best to get this setting right from the beginning.

If you have an existing virtual hard disk you want to use instead of creating a new one, select the second or third option on this wizard page.

Installation options

Almost done!

You use the Installation Options page, shown in the next image, to specify how and when you want to install an operating system in your new virtual machine.

Because this is a generation 2 virtual machine, the only options available are to use an ISO image file or install from a network server running enterprise deployment tools.

Generation 1 VMs offer options to install from the physical CD/DVD drive on the Hyper-V host or from a bootable virtual floppy disk.
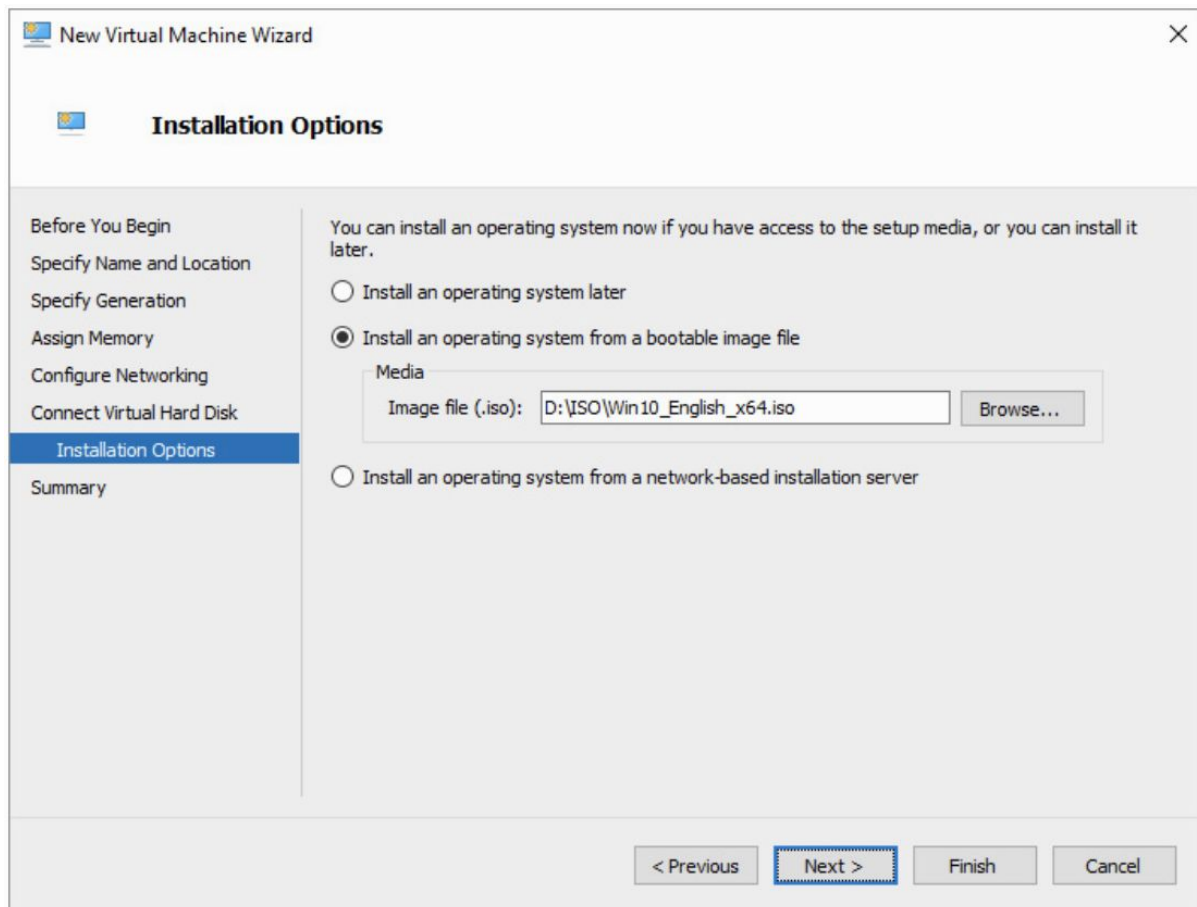
Like a physical computer, a virtual machine is useless without an operating system, so installing one should be your first order of business.

Select the appropriate option, specify the location of your operating system installation media, and click Next.

This brings you to a Summary page, where you can review your settings before clicking Finish to complete the wizard.

At this point, even though you specified installation options, you still don't have a working virtual machine.

Now back in Hyper-V Manager, you have two choices: you can select the newly created VM and then fine-tune its settings (as described in the next section).

Or you can double-click the new virtual machine to open it in a Virtual Machine Connection window.

Then click or tap the Start button on the toolbar or choose Start on the Action menu.

This "powers on" your virtual machine and launches the operating-system setup from the location you specified in the wizard.

Changing settings for a virtual machine

The options you specify when you use the New Virtual Machine Wizard are but a small subset of the settings you can apply to a virtual machine.

You can change almost all the settings you make in the New Virtual Machine Wizard plus scores more.

You can add virtual devices such as network adapters and hard drives, change the location of some of the files that make up the virtual machine, adjust Dynamic Memory settings, reconFigure devices at a granular level, and more.

To dive into these settings, in Hyper-V Manager select the name of the virtual machine and then, near the bottom of the Actions pane, click or tap Settings.

A dialog box like the one shown in the next image appears, containing two groups of settings, one for the virtual hardware and the other for management options.

Note that some hardware options available here differ slightly, depending on whether the VM is generation 1 or generation 2.
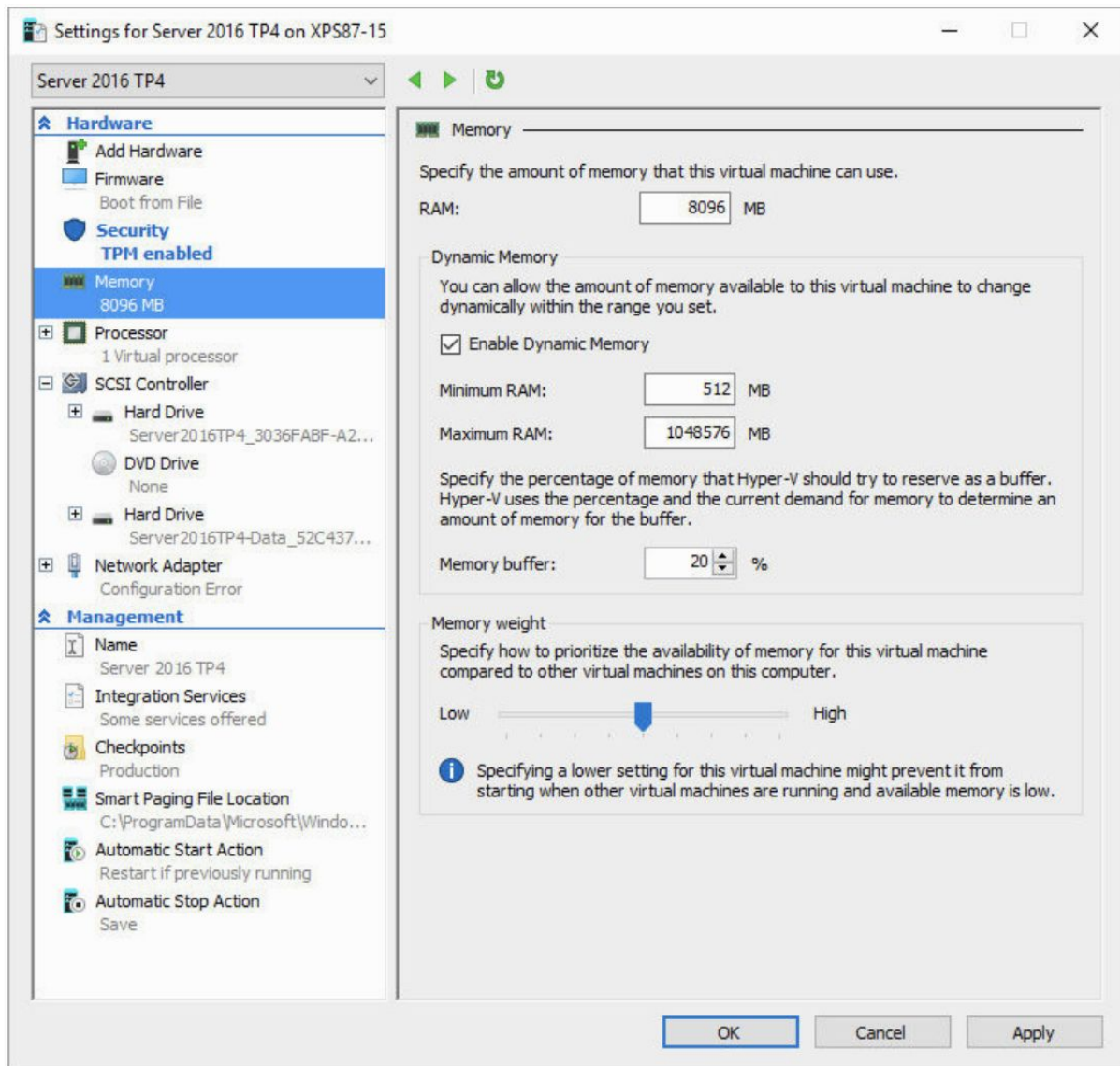
Some settings can be changed even while a machine is running (which is important for virtual machines running critical tasks), especially on generation 2 virtual machines.

Other configuration changes, however, require that the VM be turned off (not just saved).

Changing boot order

If you want a VM to start from something other than the default system drive, such as a virtual DVD or a secondary virtual hard disk, use the BIOS tab (for a generation 1 VM) or the Firmware tab (in generation 2 VMs).

Advanced security options

On generation 2 VMs only, the Security tab offers the same security features you get with Windows 10 running on a UEFI-based physical PC.

The next figure shows these options for a virtual machine running a preview release of Windows Server.

Note that Secure Boot is enabled using the Microsoft Windows template.

For a virtual machine running a distribution of Linux that supports Secure Boot, choose the Microsoft UEFI Certificate Authority template instead.
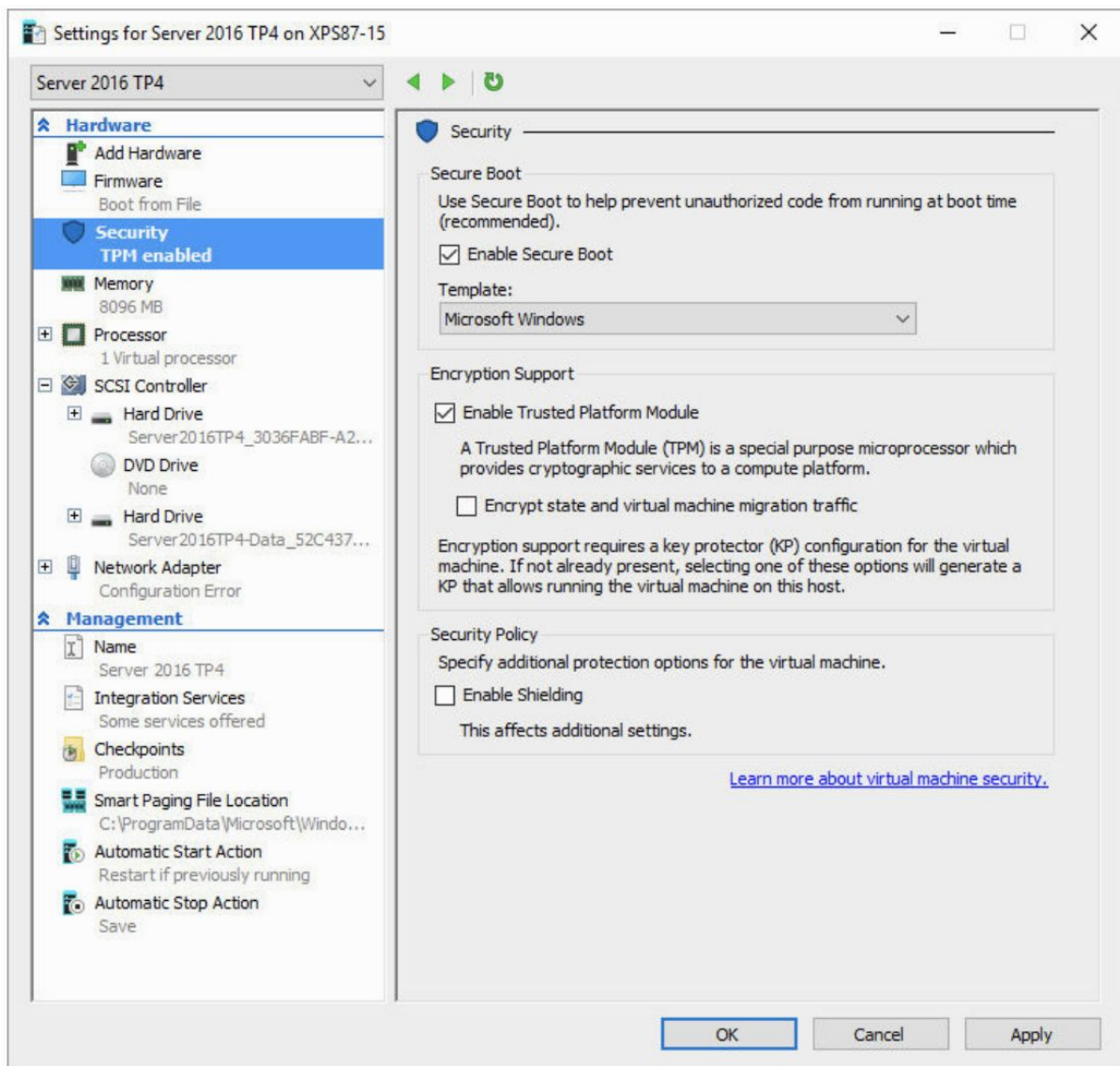
This tab also contains an option to enable a virtual Trusted Platform Module (TPM), which allows the disks in a virtual machine to be encrypted with BitLocker Disk Encryption.

Fine-tuning virtual memory usage

Options on the Memory tab are identical for both generations of virtual machines.

When Dynamic Memory is enabled, you can specify minimum and maximum amounts of memory to be available to that VM.

If you're obsessed with memory tuning, you can also change buffer sizes for Dynamic Memory and adjust the priority for memory usage when multiple virtual machines compete for a limited supply of physical RAM.

Adding, removing, and adjusting virtual hard disks

To work with existing virtual hard disks and create new ones, click SCSI Controller in the console tree on a generation 2 machine, or select an IDE Controller on a generation 1 machine.

Choose an unused location on the controller and click New to open the New Virtual Hard Disk Wizard.

The default option, Dynamically Expanding, is the same type of VHDX file you create with the New Virtual Machine Wizard.

Fixed Size disks, as the name implies, reserve the full allotted disk space, marginally improving performance and avoiding the risk of running out of actual disk space on the Hyper-V host.

The Differencing option is an advanced type of disk configuration intended for scenarios where you want to use a base disk that remains intact, with changes to the operating system or data saved to a separate file, making it easy to reverse those changes.
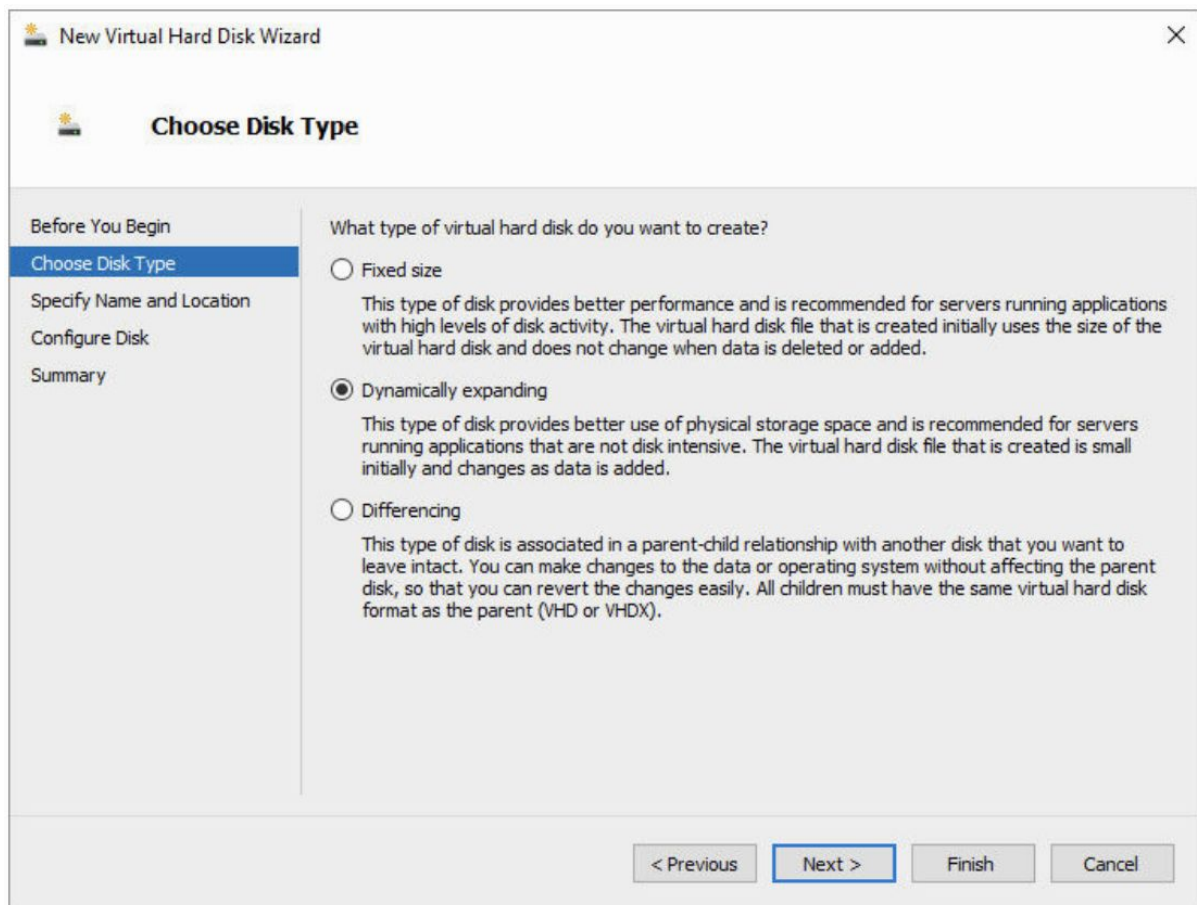
To expand a virtual disk or convert it to a different format, you need to first remove any checkpoints from the virtual machine.

After doing so, shut down the VM, select the hard disk from the Settings dialog box, and click Edit.

That opens yet another wizard, with Compact, Convert, and Expand options that are relatively easy to follow.

It's also possible to connect a volume on a physical disk to a virtual machine.

The drive must be offline on the Hyper-V host to be available here.

Automatic start and stop actions

You use the final two options under the Management heading to specify what happens to a virtual machine when you shut down or start the Windows 10 Hyper-V host.

For most purposes, the correct setting for Automatic Stop Action is Save; for Automatic Start Action, you can conFigure a VM to start automatically (with or without a delay) or start the VM only if it was running when the system shut down previously.

Running a virtual machine

As the final step in creating a virtual machine, as described earlier, you double-click the name of a virtual machine in Hyper-V Manager to open the machine in a Virtual Machine Connection window.

You then click the Start button on the toolbar to power on the machine.

You can run the virtual machine session in a Virtual Machine Connection (VMConnect) window using one of two session types:

- Basic sessions run in the VMConnect console window, which can be expanded to any resolution supported by the virtual display adapter. This type of session accepts keyboard and mouse input and displays the contents of the VM display; there's also no access to audio hardware or external USB devices.
- Enhanced sessions, which debuted with Hyper-V in Windows 8.1, provide a significantly richer experience, with the ability to share the Clipboard with the host machine, redirect audio from the VM to the host PC's speakers or headphones, share local drives and some USB devices in the VM, connect to a printer through the host PC, and sign in with a smart card. Enhanced sessions can also use multitouch displays and multiple-monitor configurations.

Enhanced session mode uses Remote Desktop Protocol over the virtual machine bus (VMBus); as a result, it requires a supported guest operating system: Windows 8.1 or Windows 10 (Pro, Enterprise, or Education); or Windows Server 2012 R2 or later.

Remote Desktop connections do not have to be enabled in the guest operating system. F

or operating systems that don't support enhanced sessions, such as Windows 7 Pro, the only option is to configure a network connection in the VM and use the Remote Desktop client to connect to it.

Using basic session mode

As shown in the following picture, a virtual machine running in a Virtual Machine Connection window looks (and, for the most part, acts) just like a separate physical computer, except that it's contained in a window on your desktop.
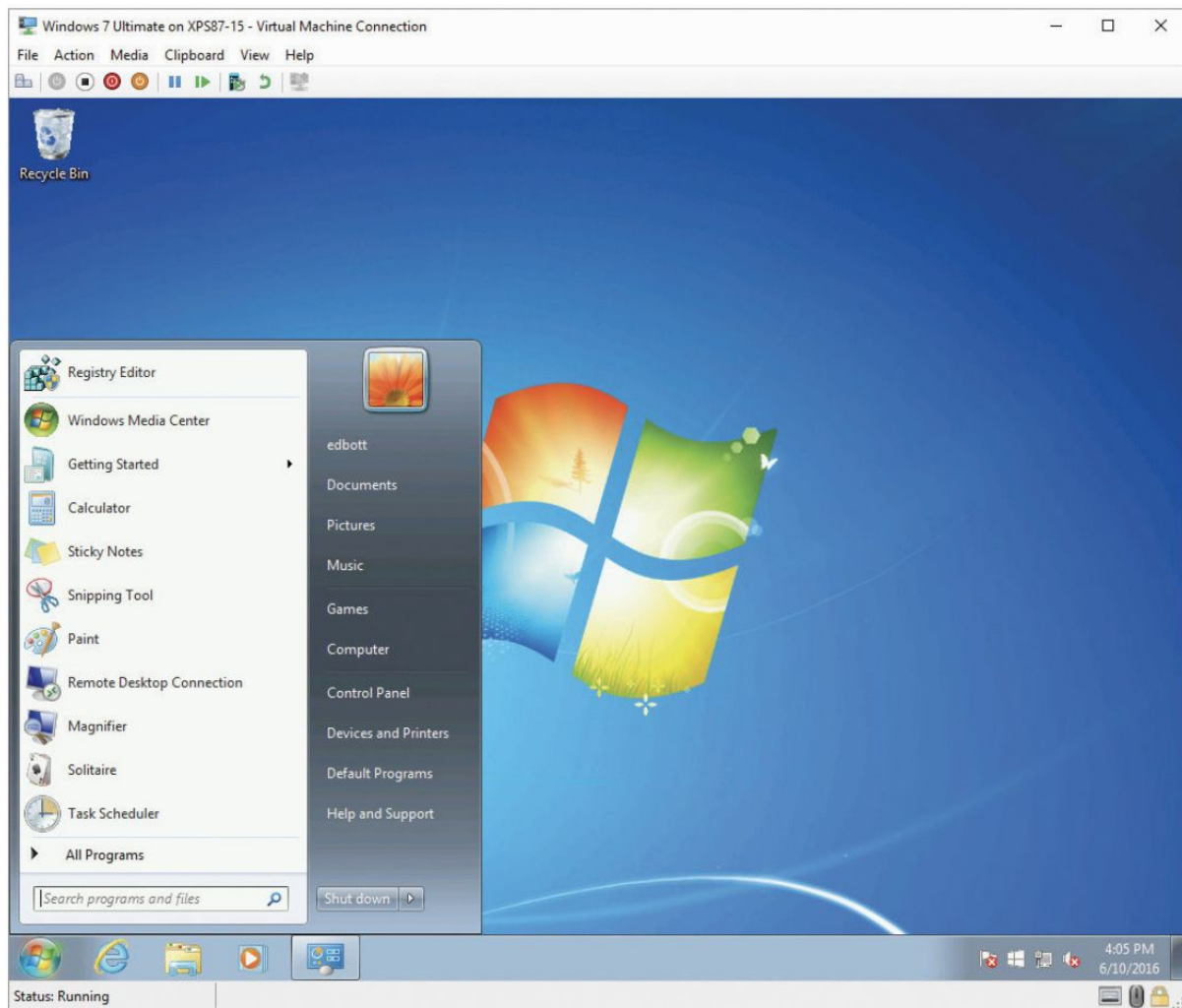
Use the toolbar at the top of the window (or the corresponding commands on the Action menu) to operate the virtual machine.
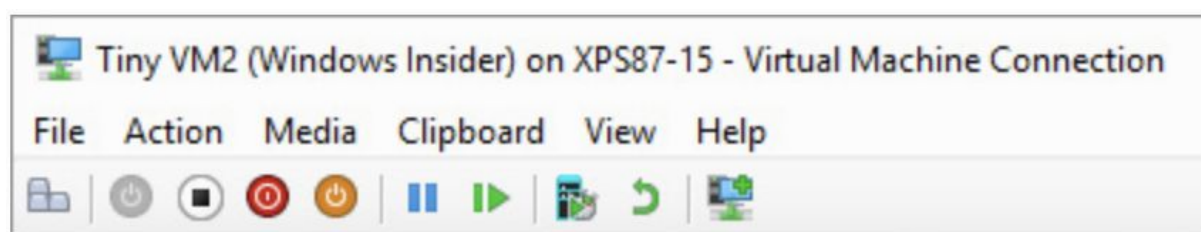
From left to right, the buttons have the following functions:

- Ctrl+Alt+Del. Because the Ctrl+Alt+Del key combination is reserved by Windows 10 on your physical computer, when you press it while you're using a virtual machine, the key combination goes to your host computer. To mimic the effect of Ctrl+Alt+Del within a virtual machine, press Ctrl+Alt+End, or click or tap this toolbar button.
- Start. This button turns on a virtual machine that is off.
- Turn Off. This button turns the virtual machine off, but it does so by effectively unplugging the machine. This, of course, is a quick but not graceful way to shut down a computer, and you'll lose any unsaved data.

- Shut Down. Clicking this button is equivalent to using the Shut Down command on the Start menu, and the machine goes through the usual shutdown process. Note that some (usually older) operating systems do not support Shut Down, even with Integration Services enabled. For a virtual machine without this support, use commands within the virtual machine to shut down properly.
- Save. This button saves the virtual machine state and then turns it off, much like hibernation on a physical computer. When you next start the virtual machine, you return immediately to where you left off.
- Pause/Resume. Pausing a virtual machine stops it temporarily but does not fully release its resources, as the Turn Off, Shut Down, and Save options do.
- Reset. Resetting a virtual machine discards any changes and reboots using the last saved version.
- Checkpoint. This button creates a checkpoint, which is a snapshot of the virtual machine's state and its data.
- Revert. This button restores the virtual machine to its condition at the previous checkpoint and restarts the virtual machine.
- Enhanced Session. On guest operating systems that support it, this button toggles the virtual machine between basic session mode and enhanced session mode.

Within the Virtual Machine Connection window, you use the virtual machine just as you would a physical computer, with only a few exceptions:

- When you run a guest operating system that does not include integration services, using a mouse is not as fluid as it is when your guest operating system is Windows 7 or later. That's because once you click inside the virtual machine window, the mouse becomes trapped in that window. To release it, press Ctrl+Alt+Left Arrow.
- Not all of your physical computer's hardware is available in all virtual machines. For example, access to the physical DVD drive on the Hyper-V host is not available in generation 2 virtual machines. You can, however, mount an ISO image as a DVD drive. For generation 1 machines, only one virtual machine can use a physical DVD drive at any given time. To release the DVD drive from one virtual machine so that you can use it in another, use commands on the Media menu.
  USB devices, audio devices, and some other local resources work only in enhanced session mode. (For more information, see "Using enhanced session mode.")

Using enhanced session mode

As we noted earlier, Hyper-V support in earlier versions of Windows included severe limitations on access to physical hardware from a VM.

You could overcome some of these limitations (specifically, audio playback and file copying) by using Remote Desktop Connection to connect to a virtual machine, but that option requires a working network connection to the virtual machine.

The solution in Windows 10 is enhanced session mode, which solves many of these shortcomings.

With enhanced session mode, you can redirect the following resources from your physical computer to a virtual machine in a Virtual Machine Connection window:

- Audio devices.
- Printers.
- Plug and Play devices.
- Clipboard (which you use to copy and paste files and other information between the virtual machine and your physical computer).

Determine at a glance whether you're in enhanced session mode

Need a quick way to tell whether your machine is running in enhanced session mode?

Look at the speaker icon in the notification area of your virtual machine's taskbar.

If it has a red X, that's because no audio device is available, which means you're in basic session mode.

Get ready-to-run virtual machines

As part of its support for developers, Microsoft offers fully configured virtual machines you can download and run.

Each one has a different guest operating system with certain software installed.

These virtual machines are for testing and evaluation and expire after a limited time, but instructions provided with the virtual machine files explain how to use the files after expiration.

You can find these virtual machine files at https://developer.microsoft.com/en-us/windows/downloads/virtual-machines .

Working with checkpoints

A checkpoint captures the data and configuration of a running virtual machine—a snapshot in time.

Indeed, in earlier versions of Hyper-V, checkpoints were called snapshots.

A checkpoint can be restored so that you can quickly and easily return your virtual machine to an earlier time—this capability is particularly valuable for providing a consistent test environment for evaluating software.

After the testing is complete, revert to the previous checkpoint to start another round of testing under conditions that are exactly the same as they were before the previous test.

To capture a checkpoint, click or tap the Checkpoint button on the Virtual Machine Connection toolbar, or use the keyboard shortcut Ctrl+N.

You can provide a descriptive name for the checkpoint, but no other interaction is required.

The checkpoints you collect for a given virtual machine appear in the center of the Hyper-V window, as shown in the next image.

To revert to an earlier checkpoint, select the checkpoint and, in the Actions pane, click or tap Apply.
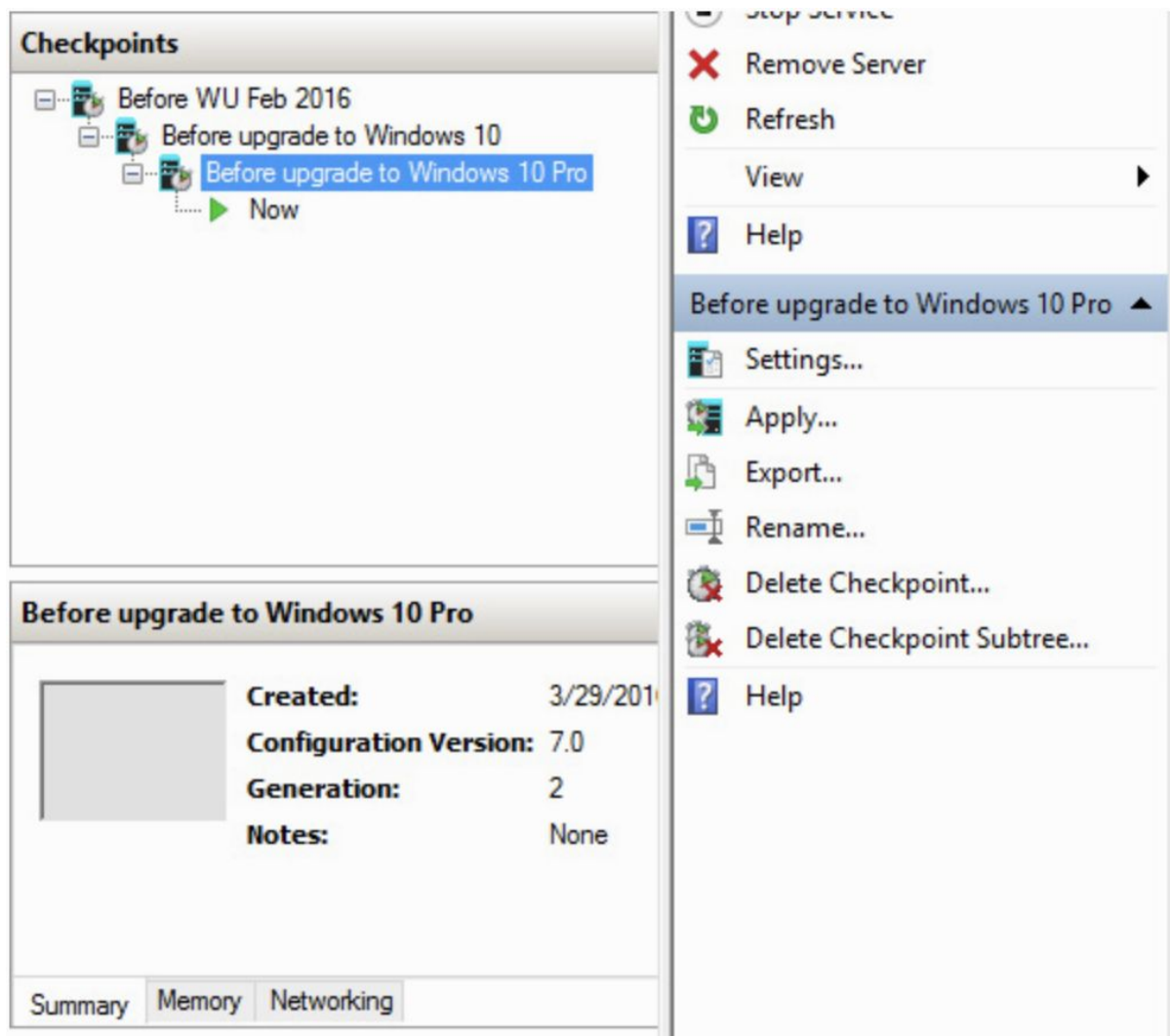
Microsoft engineers discovered that droves of Hyper-V users use checkpoints as a form of backup.

Although it doesn't provide the full capabilities of a more traditional backup program—such as the ability to restore individual folders and files—it's convenient and easy.

However, the checkpoint feature as implemented in earlier Hyper-V versions is far from ideal for backup.

Because those checkpoints (now called standard checkpoints) include information on the virtual machine state, running applications, and network connections, restoring one often takes you to an unstable condition (for example, the same network connections might not be available).

In response, Client Hyper-V in Windows 10 adds a new type of checkpoint called a production checkpoint.

A production checkpoint uses the Volume Snapshot Service (VSS) backup technology to save the data and configuration of a running virtual machine but not its state.

This provides a much better backup solution, and it's now the default checkpoint in Hyper-V.

You can still use standard checkpoints if you prefer; to make the switch, open Settings for a virtual machine and, under Management, click Checkpoints:
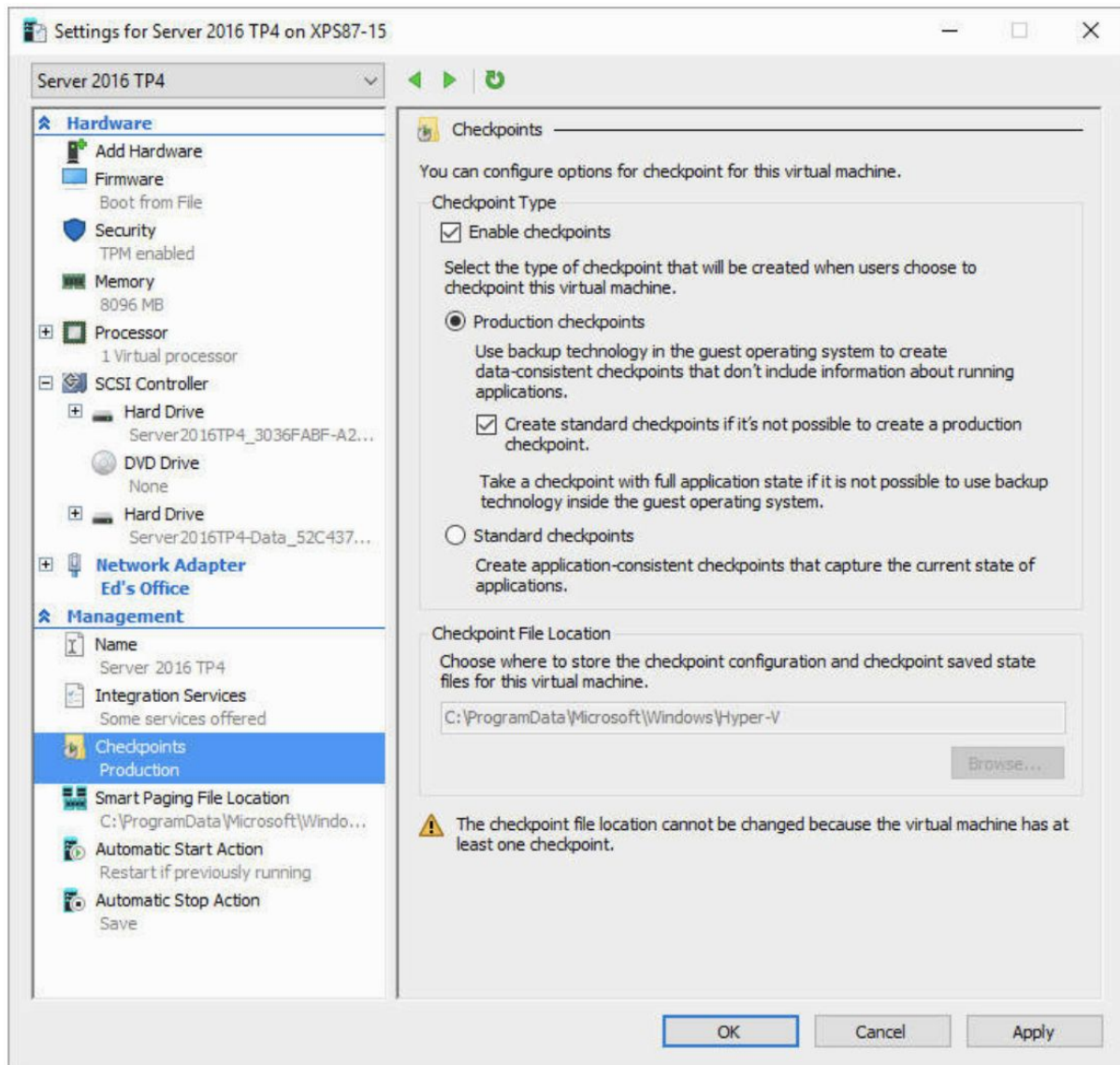
- Exercises - 1. 4. 5. Running virtual machines with Hyper-V -

Caution!

Remember that you cannot have working VirtualBox and Hyper-V at the same time in the same real computer, so do only the following exercises in a real computer where you do NOT have VirtualBox working.

Open the following Google Document that you have created in a previous sub-unit:

"1. 4. Windows 10 for experts and IT pros - Apellidos, Nombre"

being "Apellidos, Nombre" your Last Name and Name.

Inside this Google Document you are going to copy and answer all the "Exercises" of this sub-unit:

1. Open the System Information app (Msinfo32.exe) and scroll to the bottom of the "System Summary" tab to see four entries that begin with "Hyper-V". Which values do you have in Windows (real computer)? And in your Virtual Box virtual machine?
2. In Windows of your real computer, in the Windows search box, type "features" and then click on "Turn Windows Features On Or Off". Click the plus sign by the top-level Hyper-V entry to show all the subentries. If your computer does not fully support Hyper-V, the "Hyper-V Hypervisor" entry is not available. Select "Hyper-V" (which also selects all the available subentries) to enable it, and then click OK. After a few moments, Windows asks you to restart your computer.
3. Open "Hyper-V Manager" and create a Network Switch (External).
4. Open "Hyper-V Manager" and Virtual Machine: Generation 2, RAM 4 GB Dynamic Memory, Networking Switch (External), Create a 30 GB virtual hard disk (.VHDX), Installation Options (.ISO file of the operating system to install).
5. Start the Virtual Machine and install de operating system from the .ISO file.