

## 10.5.4 Hyper-V Facts

Hyper-V, Microsoft's enterprise hypervisor, was formerly used exclusively in the Windows Server product line. Windows 10 implements a modified version of this technology as Client Hyper-V. Client Hyper-V:

- Runs virtual machines entirely outside of the Windows OS.
- Is very similar to the version of Hyper-V used on Windows server systems.
- Is disabled by default.
- If enabled, loads Hyper-V first and then loads the Windows OS on top of it.
- Uses the Hyper-V Virtual Machine Connection application to connect to a virtual machine.
- Uses Hyper-V Virtual Machine Manager (VMM) for VM management.

The following table identifies Client Hyper-V requirements:

Component	Requirement
Windows	<p>Client Hyper-V requires a 64-bit version of Windows 10 Professional or Enterprise.</p> <p>To run virtual machines on a 32-bit Windows version, you must install a separate virtualization solution (e.g., VMware Player, VMware Workstation, Virtual PC, or VirtualBox).</p>
System	<p>System requirements for Client Hyper-V include the following:</p> <ul style="list-style-type: none"> <li>▪ A 64-bit CPU.</li> <li>▪ A modern Intel or AMD microprocessor that includes Second Level Address Translation (SLAT) technology.</li> <li>▪ Virtualization enabled in the BIOS/UEFI configuration.</li> <li>▪ At least 4 GB of RAM in the system. However, much more RAM than this will be required if you choose to run multiple virtual machines.</li> </ul>

Virtual networking can be implemented in Client Hyper-V as follows:

Virtual Network	Description
External	An external virtual network is used to provide virtual machines with access to a physical network, allowing them to communicate with externally located servers and clients. This configuration also allows virtual machines on the same virtualization server to communicate with each other. This type of virtual network is sometimes called a <i>bridged</i> network.
Internal	An internal virtual network is used to allow communication between virtual machines on the same virtualization host and between virtual machines and the host operating system. An internal virtual network is not bound to a physical network adapter. As a result, virtual machines using this network are isolated from all external network traffic.
Private	<p>A private virtual network is used to allow communication only between virtual machines on the same virtualization server. A private virtual network is not bound to a physical network adapter. A private virtual network is isolated from all external network traffic on the virtualization server, as well as any network traffic between the management operating system and the external network. This type of virtual network is sometimes called a <i>host-only</i> network.</p> <p>This type of network implementation allows you to create a sandbox environment that is very useful for protecting your network while testing or troubleshooting a virtual host.</p>

Take these actions to use Client Hyper-V:

Action	Description
Enable Hyper-V	<p>To enable Hyper-V, complete the following steps:</p> <ol style="list-style-type: none"> <li>1. Open <b>Settings</b>.</li> <li>2. Select <b>Apps</b>.</li> <li>3. Under Related settings, select <b>Programs and Features</b>.</li> <li>4. In the left pane, select <b>Turn Windows features on or off</b>.</li> <li>5. Mark <b>Hyper-V</b> and select <b>OK</b>. The system will reboot several times as Hyper-V is enabled.</li> </ol>
Configure Virtual Networking	<p>To configure virtual networking:</p> <ul style="list-style-type: none"> <li>▪ Choose the type of network you want to set up: <ul style="list-style-type: none"> <li>▪ External virtual network</li> <li>▪ Internal virtual network</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>Private virtual network</li> <li>Use the Virtual Switch Manager to select an NIC if you are configuring an external virtual network.</li> </ul>
Create Virtual Machines	<p>To create virtual machines, run Hyper-V Manager and specify the following parameters:</p> <ul style="list-style-type: none"> <li>A name for the new VM</li> <li>The virtual machine's generation</li> <li>The amount of RAM the VM is allowed to use</li> <li>The shared network switch that you created earlier for the VM to use for networking</li> <li>The VHD file you want to use. <ul style="list-style-type: none"> <li>You can create a new VHD file or use an existing one.</li> <li>You can use the .vhdx or .vhd format. The .vhd format is older, but is more compatible with other hypervisors.</li> </ul> </li> <li>The optical drive you want to use. <ul style="list-style-type: none"> <li>You can use either a physical optical drive or a virtual .iso file as the optical drive used by the VM.</li> <li>You can install an operating system directly from an ISO file instead of burning it to disk.</li> </ul> </li> </ul>
Start the Virtual Machine	<p>To start the virtual machine, power it on in Hyper-V Manager. If you created a new VHD file, then you must install an operating system. If you choose to install Windows, then you should install Integration Services (IS) after the installation is complete. IS dramatically improves VM performance by installing modified disk, network, and mouse drivers inside the VM that are Hyper-V aware. In addition, IS lets you cut and paste between the host and guest Windows operating systems installed within VMs. It also enables the mouse to move smoothly in and out of the Virtual Machine Connection window.</p>
Connect to the Virtual Machine	<p>You use the Virtual Machine Connection window to interact with a VM. To connect to a VM, run Hyper-V Manager, select the VM that you want to access, and connect to it. You can start, stop, pause, and take snapshots (also called <i>checkpoints</i>) of the virtual machine's current configuration using the Hyper-V manager window.</p>
Move a Virtual Machine	<p>Server versions of Hyper-V provide many virtual machine migration tools that you can use to move a VM between hypervisor hosts. However, Client Hyper-V does not include most of these features. To move a virtual machine between client Hyper-V hosts, you must do the following:</p> <ol style="list-style-type: none"> <li>Export the VM on the source system using Hyper-V Manager.</li> <li>Copy the exported VM files from the source system to the destination system.</li> <li>Import the VM on the destination system using Hyper-V Manager. As you do so, you must select one of the following import options: <ul style="list-style-type: none"> <li>Register the VM in place using its existing unique ID.</li> <li>Restore the VM using its existing unique ID.</li> <li>Copy the VM and create a new unique ID.</li> </ul> </li> </ol>