Step-by-Step Guide

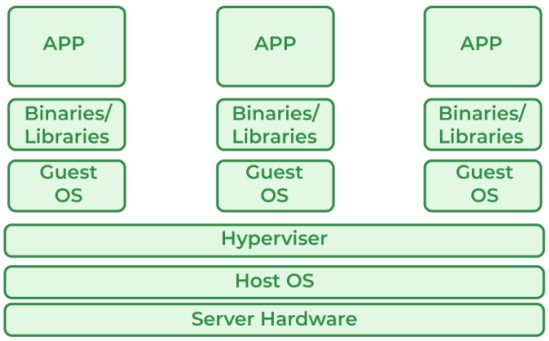
Creating Virtual Machines in Hyper-V

Submitted by: Rahul K G

www.linkedin.com/in/rahul-k-gopi-a703ba16a

Introduction to Virtualization

Virtualization is the technology that allows you to create multiple virtual machines (VMs) on a single physical server. Each VM behaves like a separate computer with its own operating system and applications, but they all share the same underlying hardware.



The application that enables us to run multiple operating systems on a single physical machine is commonly called a *Hypervisor*.

There are two types of virtualization technology:

1. **Bare-metal (Type 1 Hypervisor)** – Installed directly on the physical hardware. It doesn't require an underlying operating system. Example: VMware ESXi.
2. **Hosted (Type 2 Hypervisor)** – Runs on top of an existing operating system like Windows or Linux. Example: VMware Workstation, Oracle VirtualBox.

Benefits of Virtualization

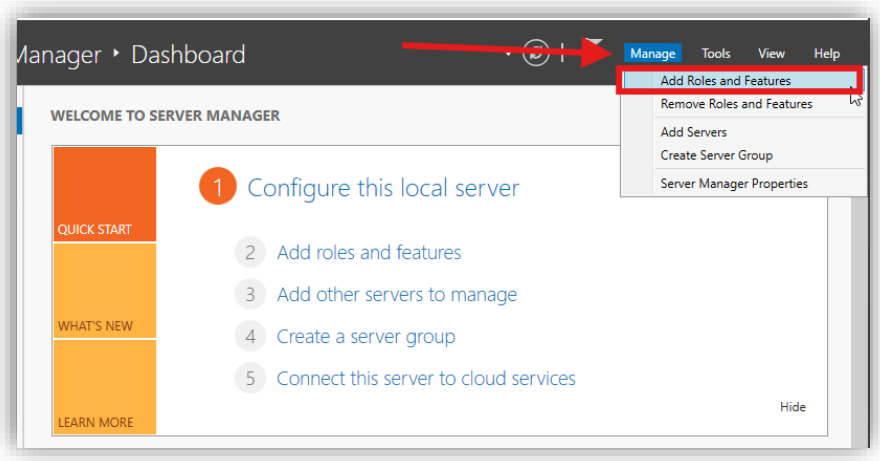
- Better utilization of hardware resources
- Cost savings (less hardware required)
- Easy testing and lab setups
- Flexibility to run multiple OS environments
- Improved backup and disaster recovery options

Hyper-V in Windows Server

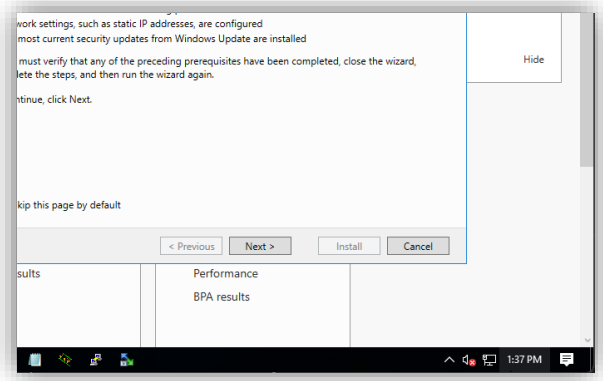
Windows Server comes with a built-in hypervisor called **Hyper-V**, which allows us to create and manage virtual machines. In this lab, we will use Hyper-V to set up a VM step by step.

1. Install Hyper-V Role

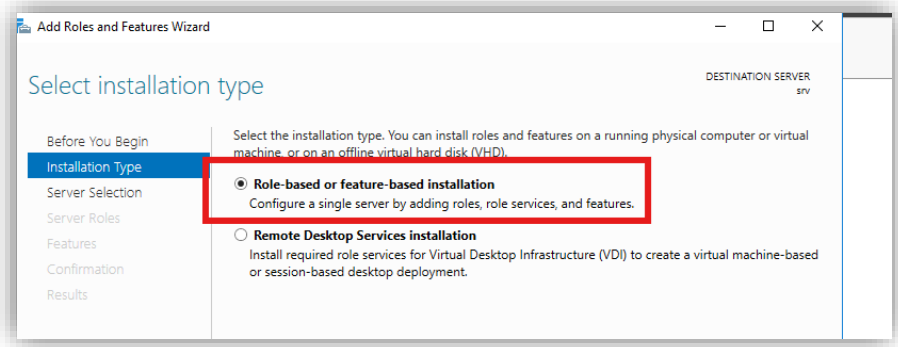
Open **Server Manager** → click **Add Roles and Features**.



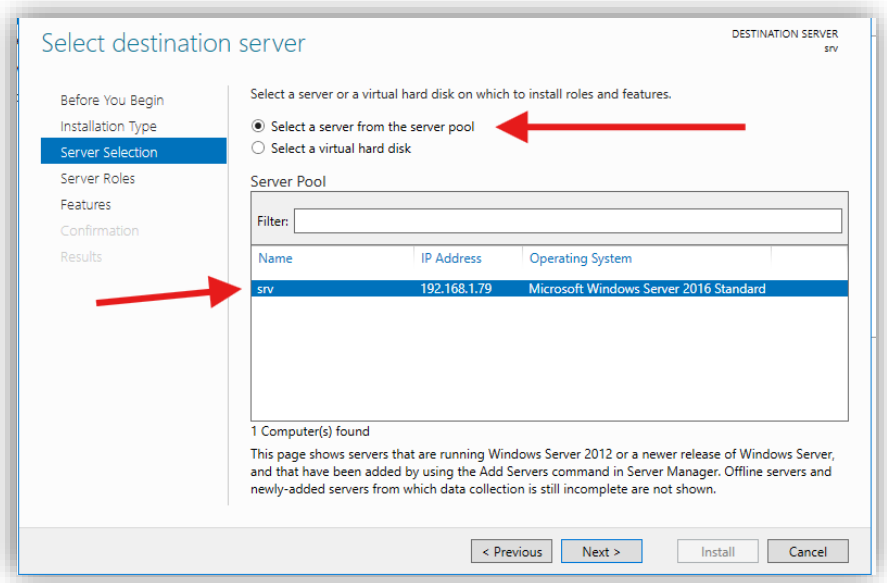
Click Next



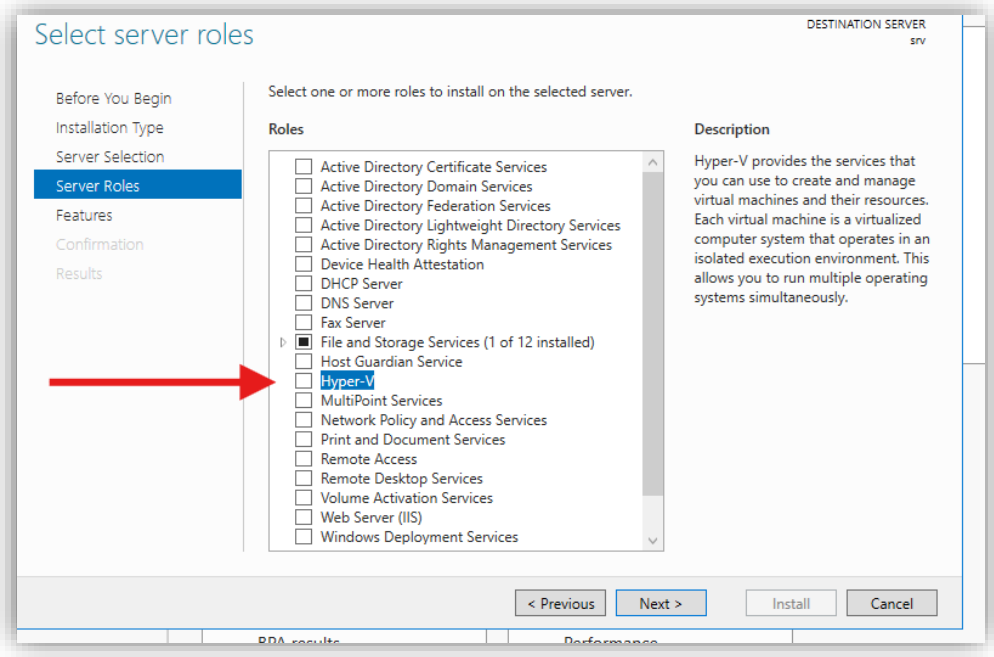
Select **Role-based or feature-based installation**.

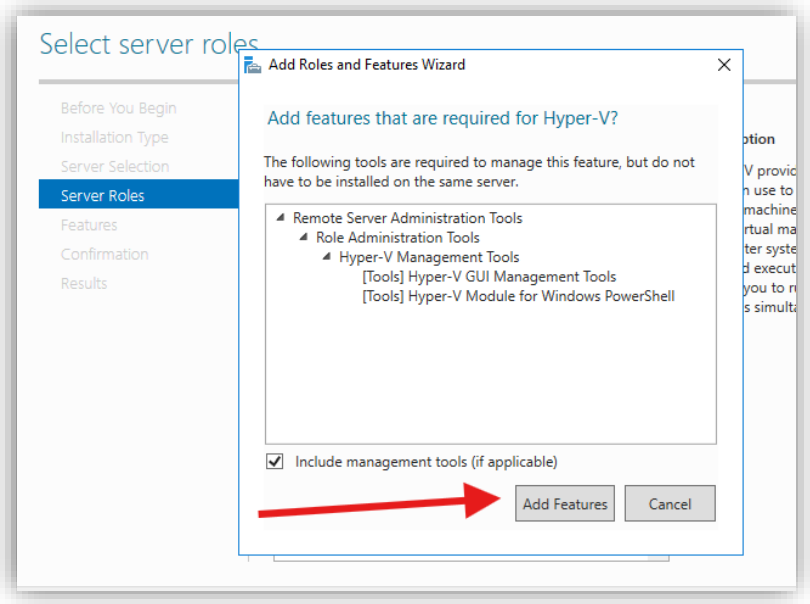


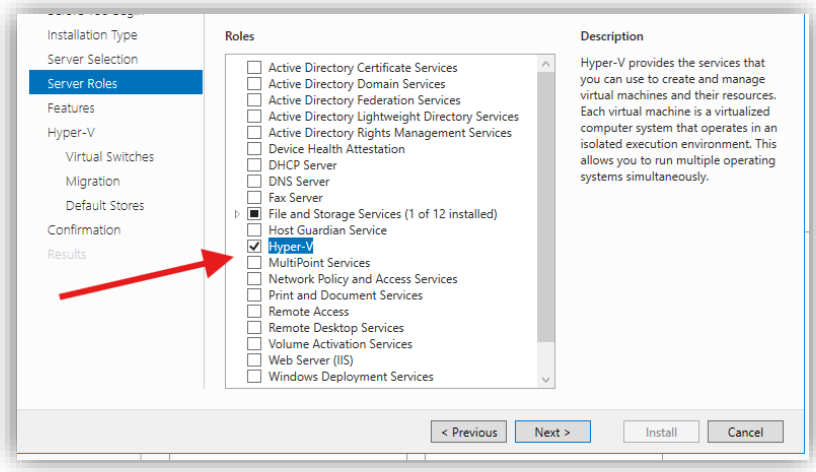
Under **Server Selection**, choose **Select a server from the server pool**, then pick your server.



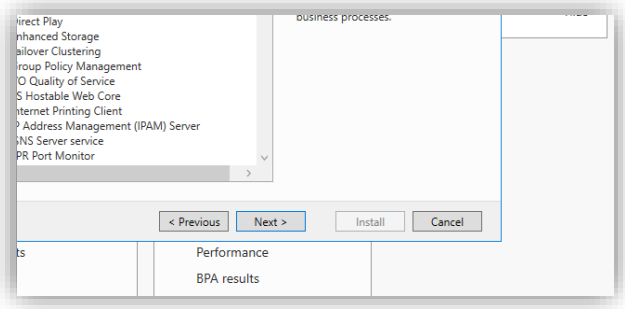
Check **Hyper-V** role and add required features.

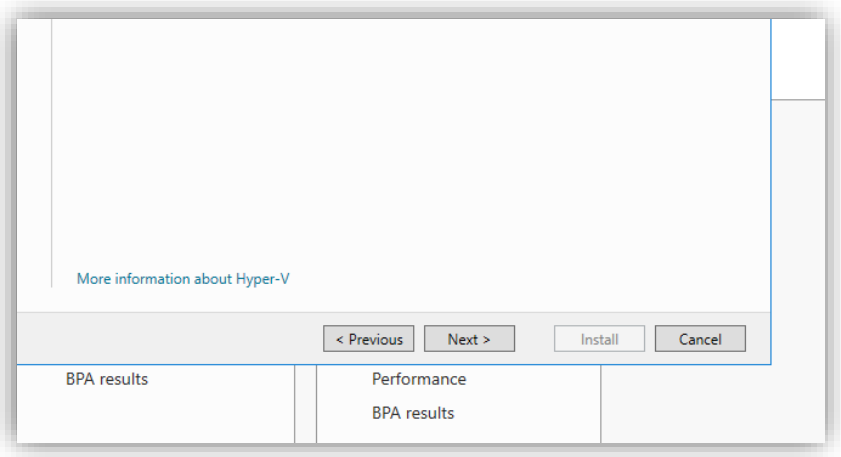



Select server roles
Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Add features that are required for Hyper-V?
The following tools are required to manage this feature, but do not have to be installed on the same server.
Remote Server Administration Tools
Role Administration Tools
Hyper-V Management Tools
[Tools] Hyper-V GUI Management Tools
[Tools] Hyper-V Module for Windows PowerShell
Include management tools (if applicable)
Add Features
Cancel

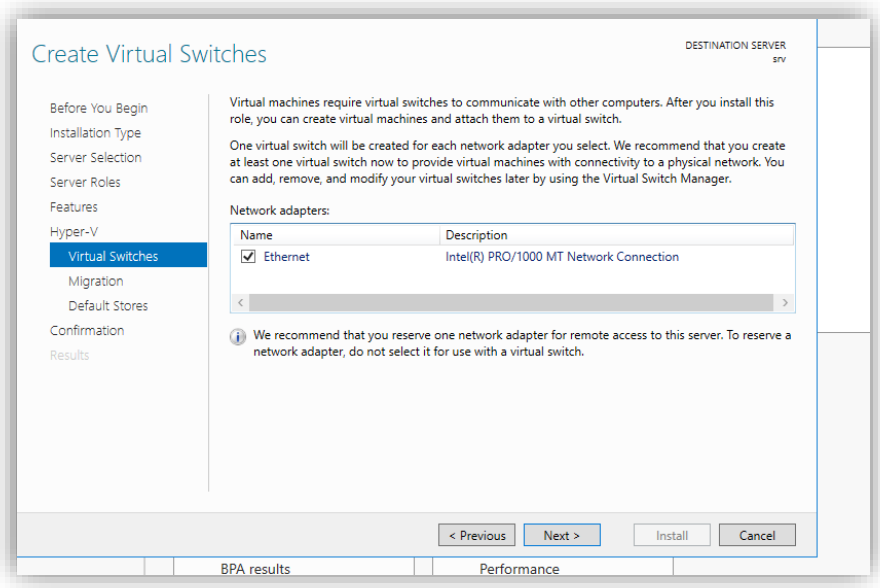

Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
Roles
Active Directory Certificate Services
Active Directory Domain Services
Active Directory Federation Services
Active Directory Lightweight Directory Services
Active Directory Rights Management Services
Device Health Attestation
DHCP Server
DNS Server
Fax Server
File and Storage Services (1 of 12 installed)
Host Guardian Service
Hyper-V
MultiPoint Services
Network Policy and Access Services
Print and Document Services
Remote Access
Remote Desktop Services
Volume Activation Services
Web Server (IIS)
Windows Deployment Services
Description
Hyper-V provides the services that you can use to create and manage virtual machines and their resources. Each virtual machine is a virtualized computer system that operates in an isolated execution environment. This allows you to run multiple operating systems simultaneously.
< Previous
Next >
Install
Cancel

Click Next

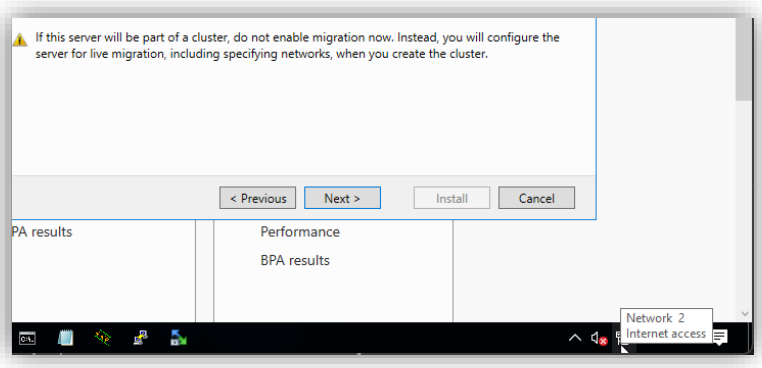

Enhanced Storage
Failover Clustering
Group Policy Management
Quality of Service
Hostable Web Core
Internet Printing Client
Address Management (IPAM) Server
DNS Server service
PR Port Monitor
< Previous
Next >
Install
Cancel
Performance
BPA results



Under **Create Virtual Switch** : Select your **network adapter**. This allows the VM to communicate with the **host machine** and/or the **external network,** depending on the switch type

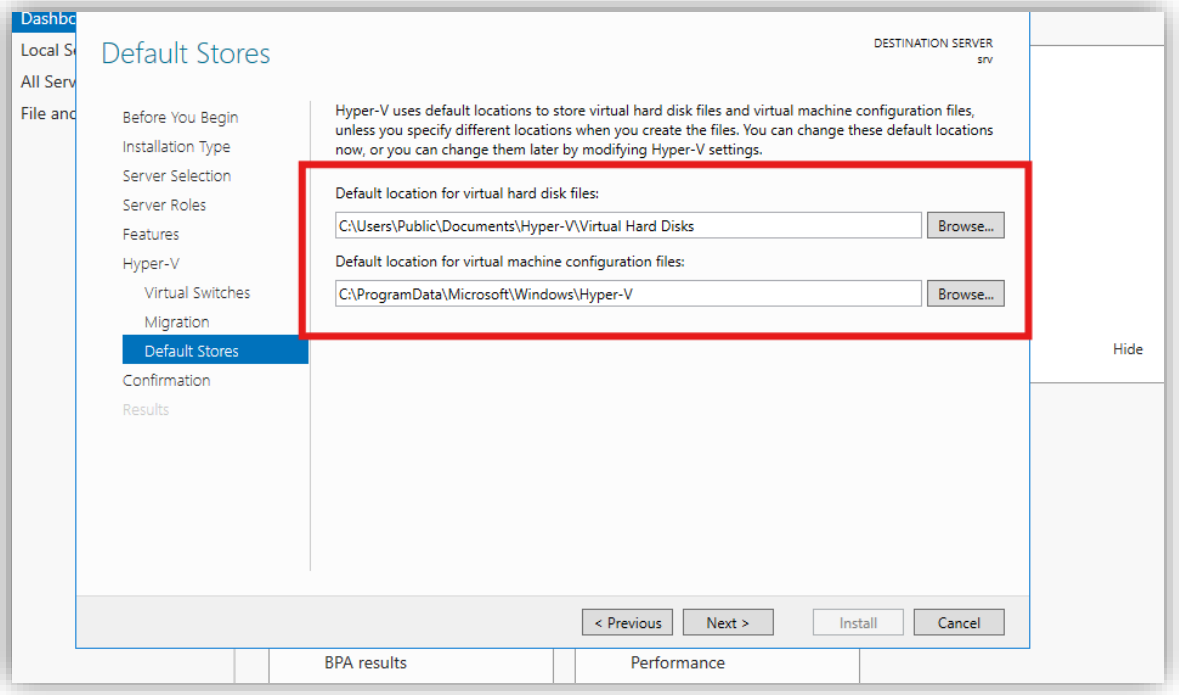


Click Next

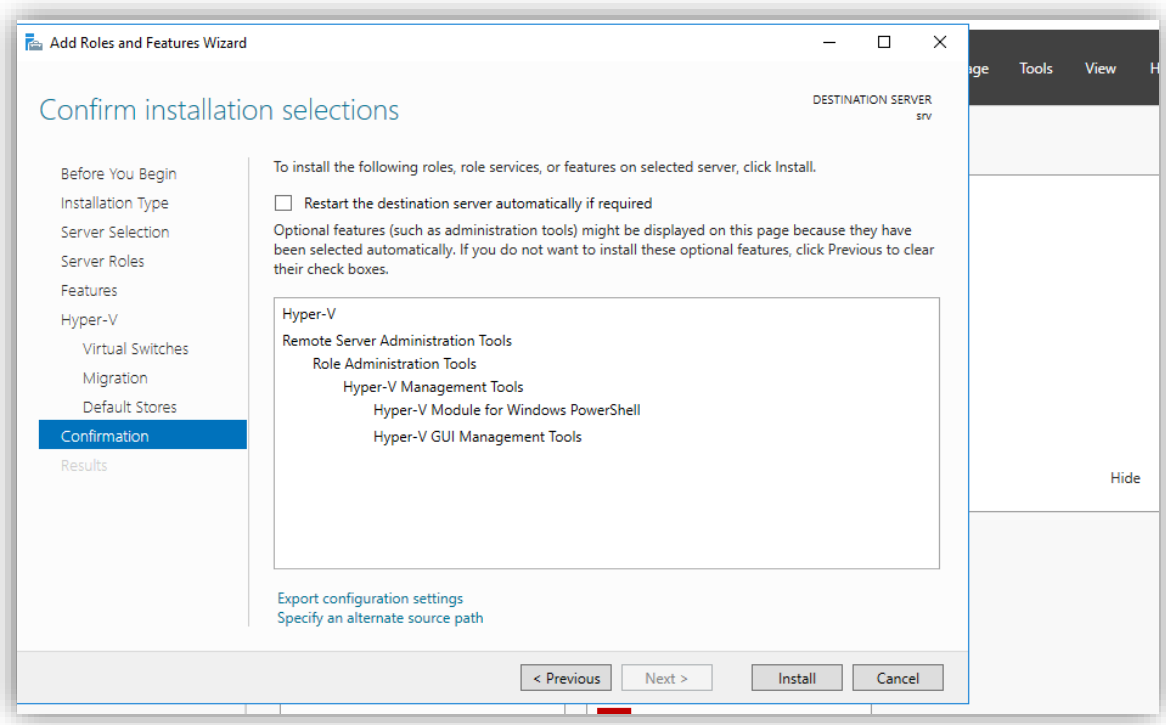


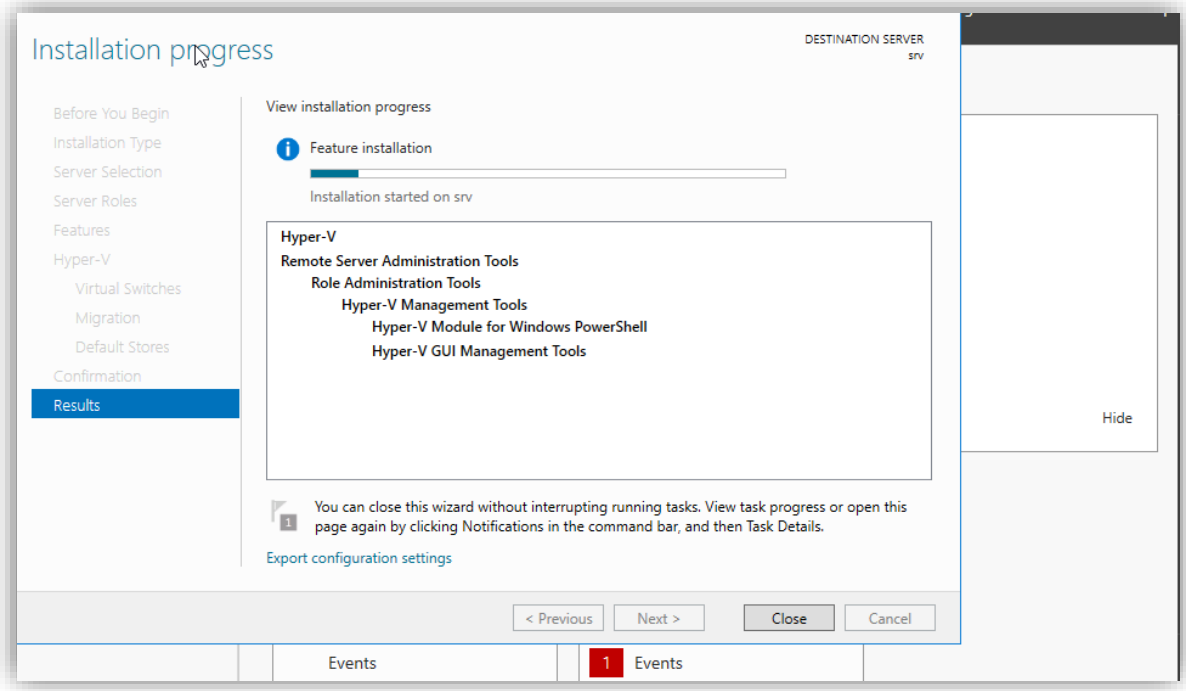
Under Default Store

- Specify the folder where **virtual hard disks (VHDX)** and **VM configuration files** will be stored.
- This helps organize your VMs and manage disk space efficiently.

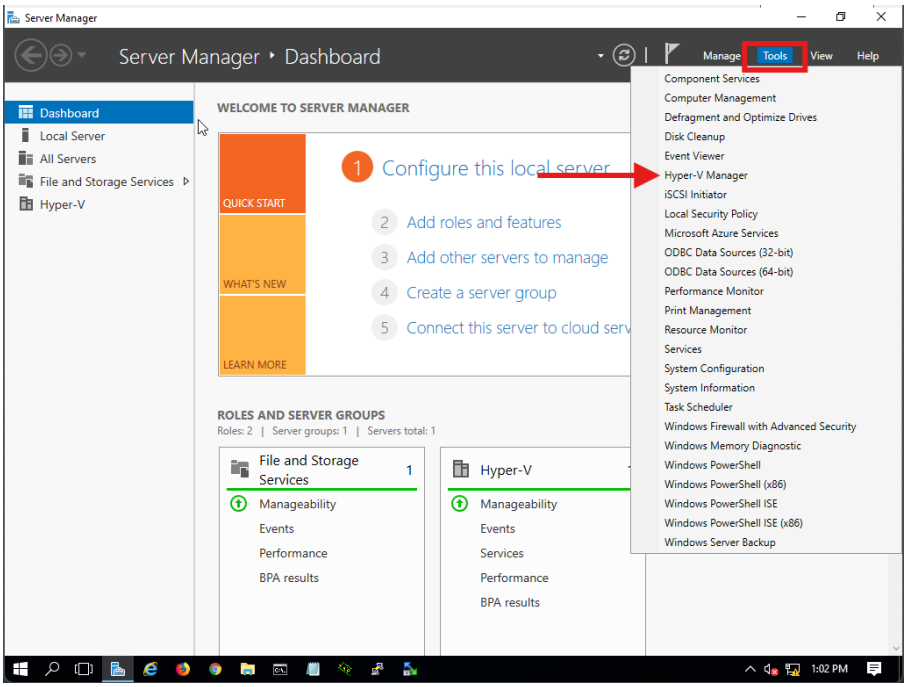


Click **Install** → restart the server if prompted.



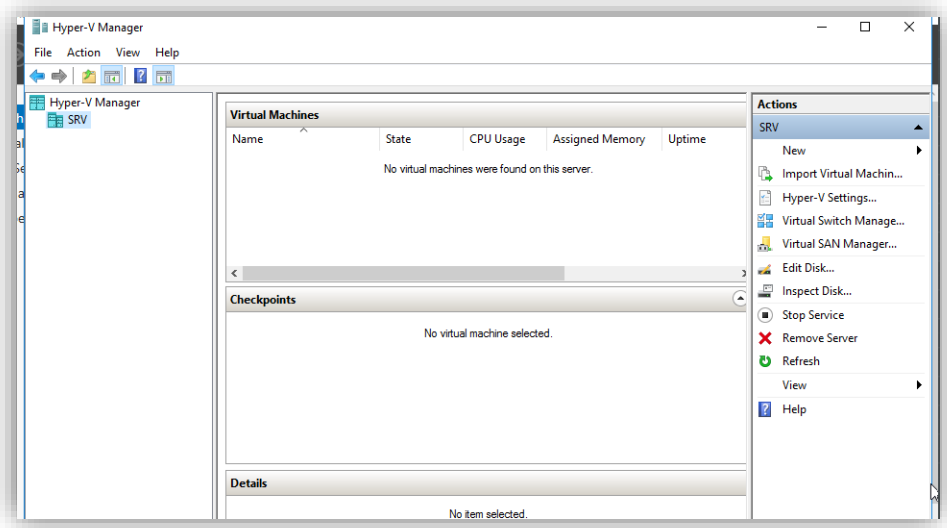


After restarting the server, open Server Manager and click on Tools — you will now see Hyper-V Manager, indicating that the Hyper-V role is installed successfully.

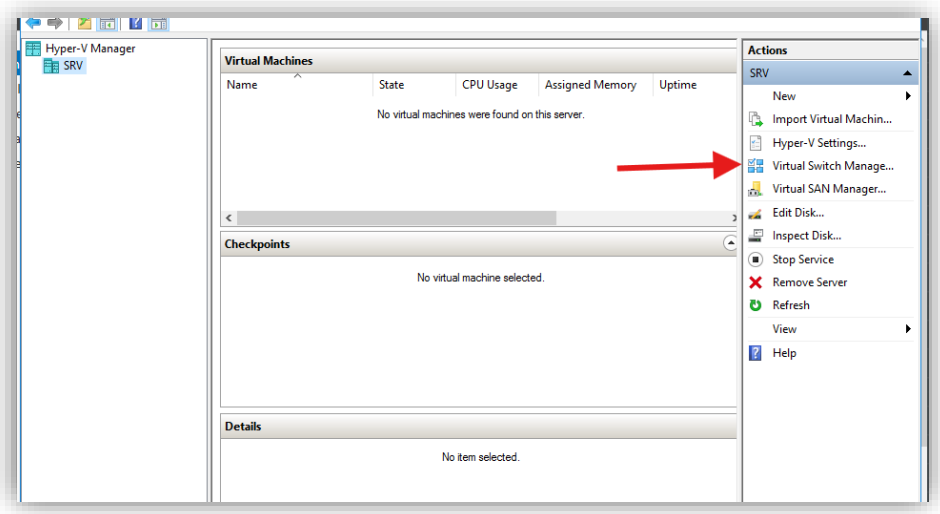


2. Create a Virtual Switch

Open **Hyper-V Manager**

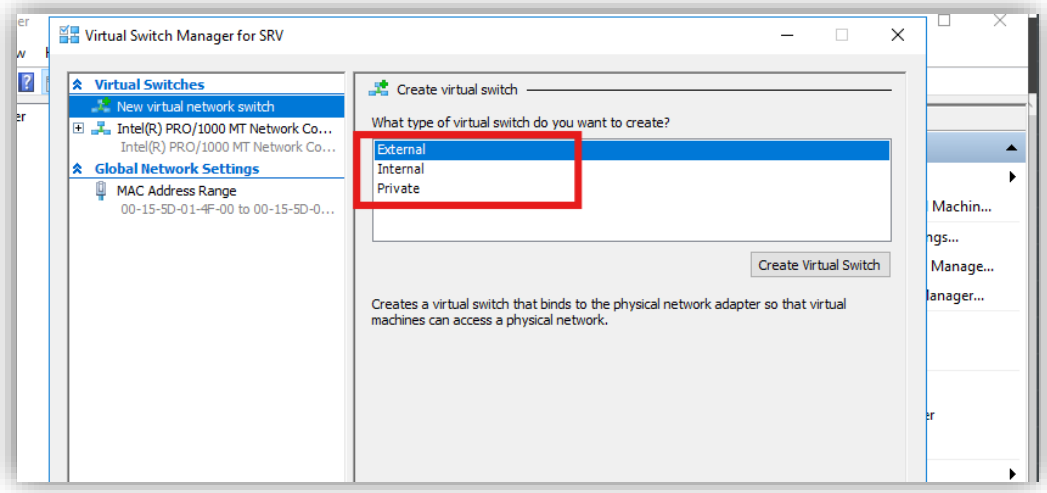


From the **Actions** pane, choose **Virtual Switch Manager**.

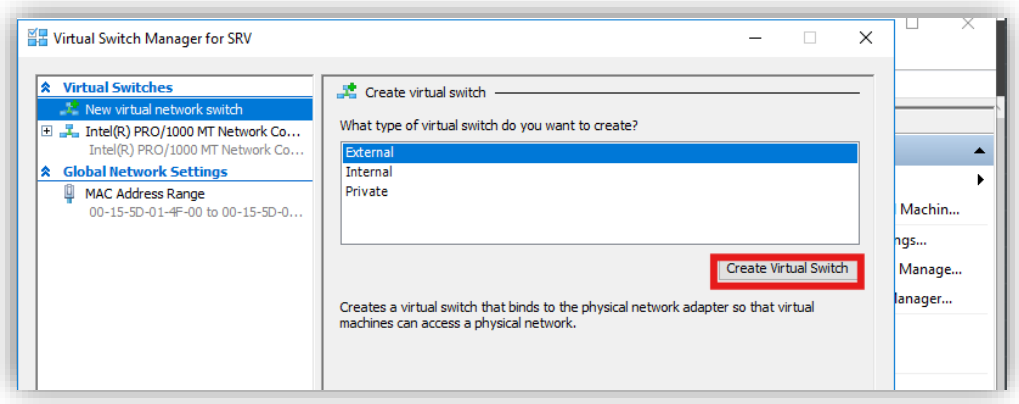


Here, you can see the available switch types:

- **External** – Connects VMs to the physical network.
- **Internal** – Allows VMs to communicate with the host.
- **Private** – VMs can communicate only with each other.

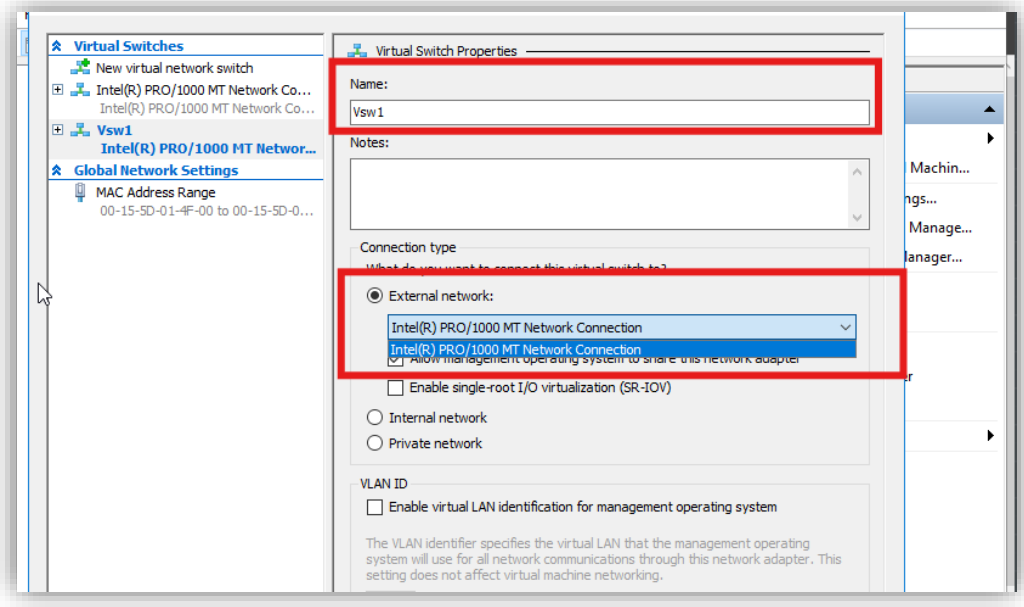


Since I want the VM to communicate with the external network, I am selecting the External switch type.

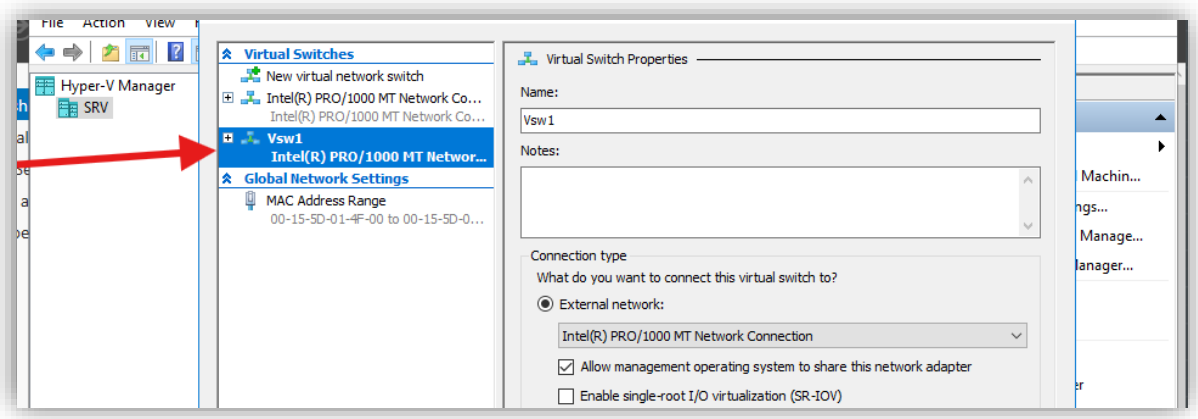


Give a name to the virtual switch and select the External network. From the drop-down menu, you can see the available network adapters. If the server has multiple NICs, all will be listed.

In a production environment, it is recommended to dedicate one NIC for the host and separate NICs for VMs. Since our VM has only one NIC, I am selecting that one.

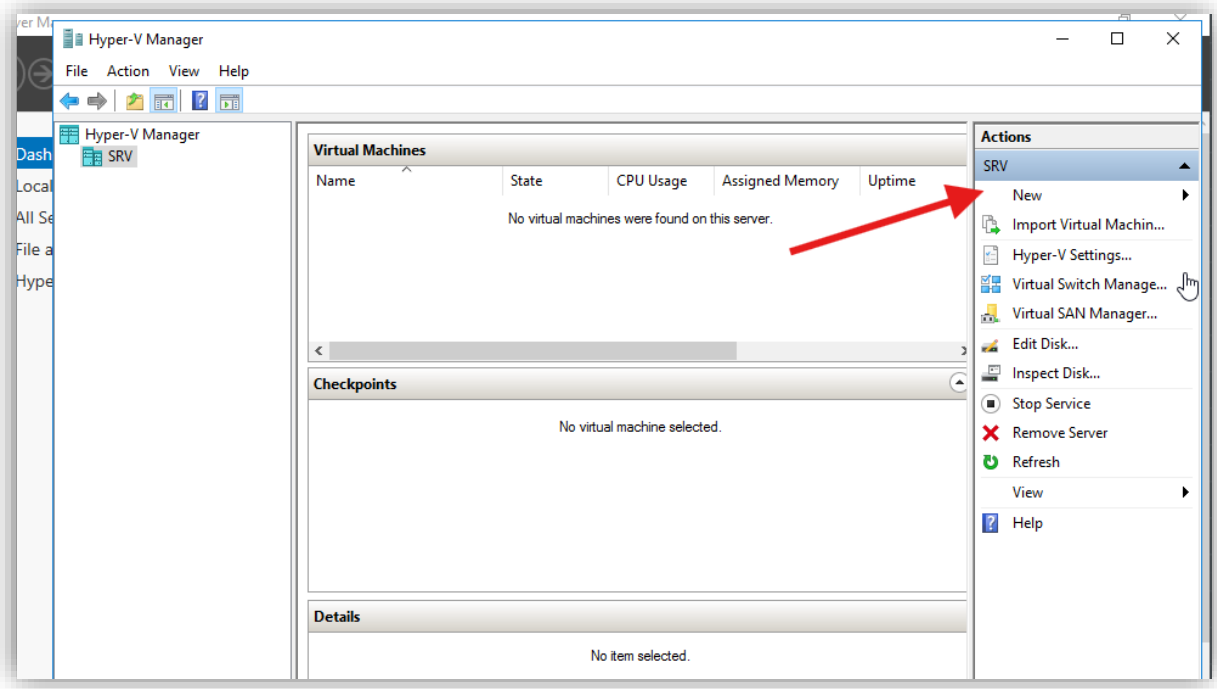


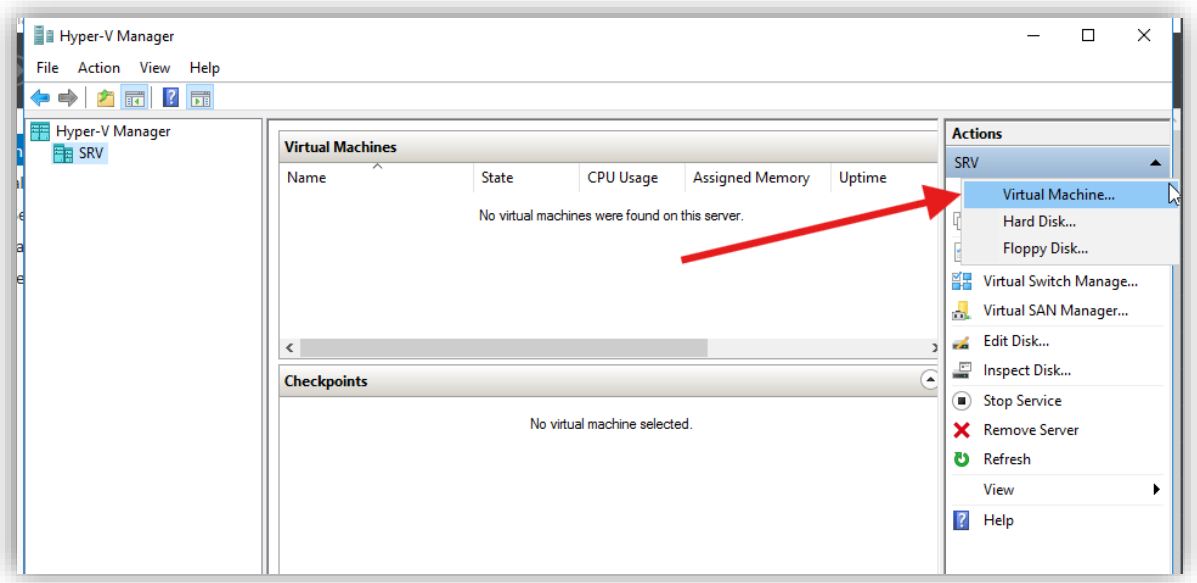
After clicking Apply and OK, you will be able to see the newly created virtual switch.



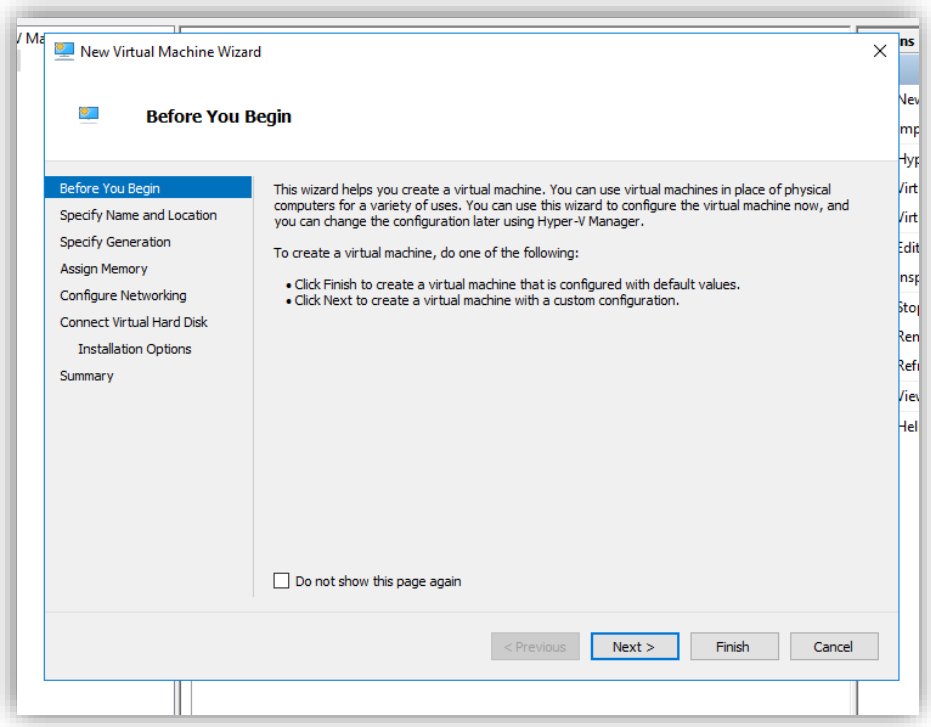
2. Creating a Virtual Machine

In **Hyper-V Manager** → click **New → Virtual Machine**.

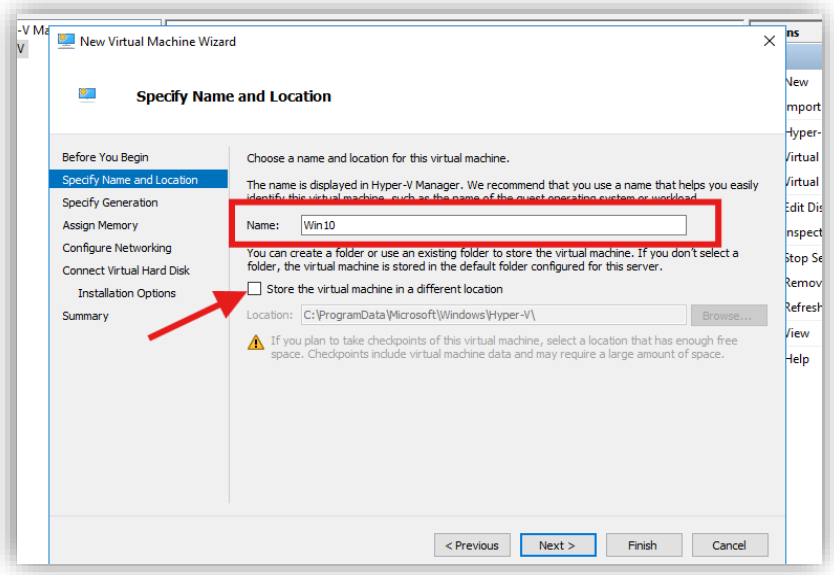



Hyper-V Manager
File Action View Help
Hyper-V Manager
SRV
Virtual Machines
Name State CPU Usage Assigned Memory Uptime
No virtual machines were found on this server.
Checkpoints
No virtual machine selected.
Actions
SRV
Virtual Machine...
Hard Disk...
Floppy Disk...
Virtual Switch Manage...
Virtual SAN Manager...
Edit Disk...
Inspect Disk...
Stop Service
Remove Server
Refresh
View
Help

Click next


New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.
To create a virtual machine, do one of the following:
• Click Finish to create a virtual machine that is configured with default values.
• Click Next to create a virtual machine with a custom configuration.
Do not show this page again
< Previous
Next >
Finish
Cancel

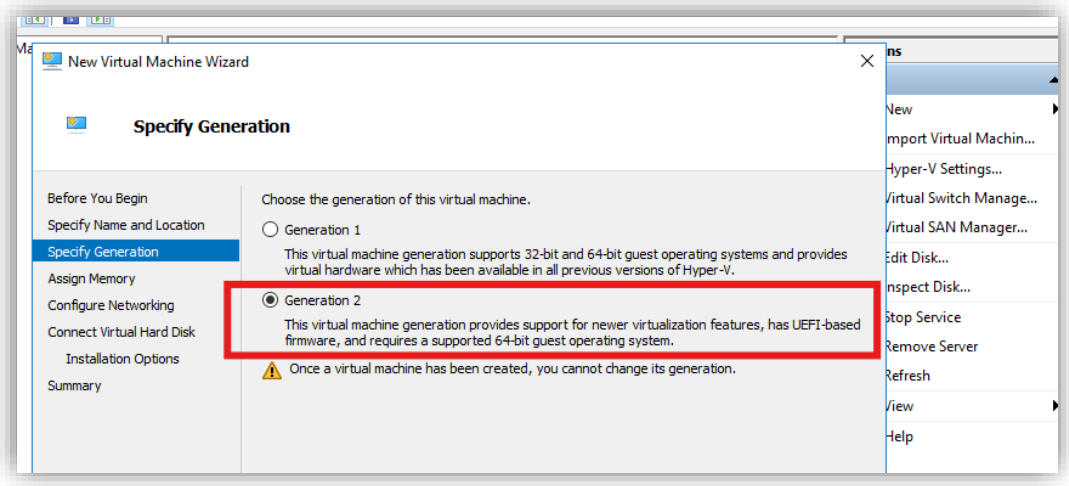
Give a name to the VM, and if you want to store the virtual machine in a different location, you can specify the folder path where you would like it to be saved



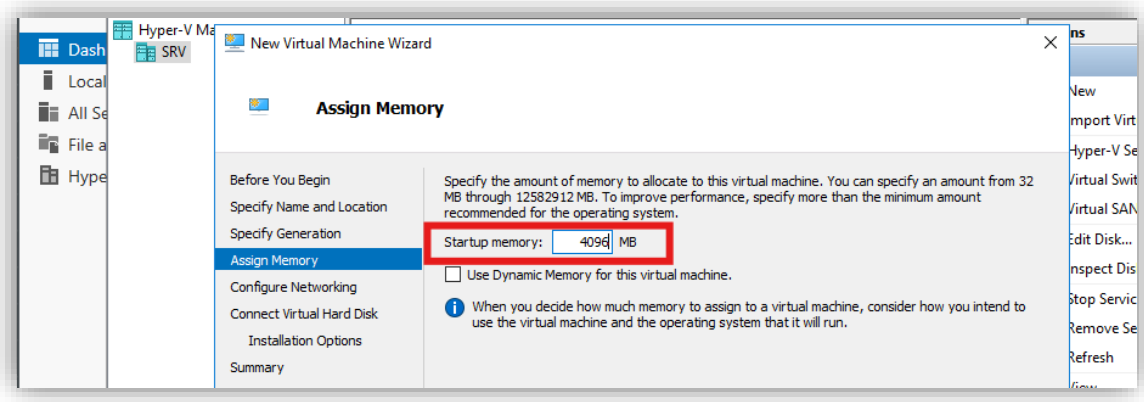
Specify the Generation of the VM:

- **Generation 1** – Supports legacy BIOS-based boot, compatible with older operating systems.
- **Generation 2** – Supports UEFI-based boot, faster boot times, secure boot, and newer OS features.

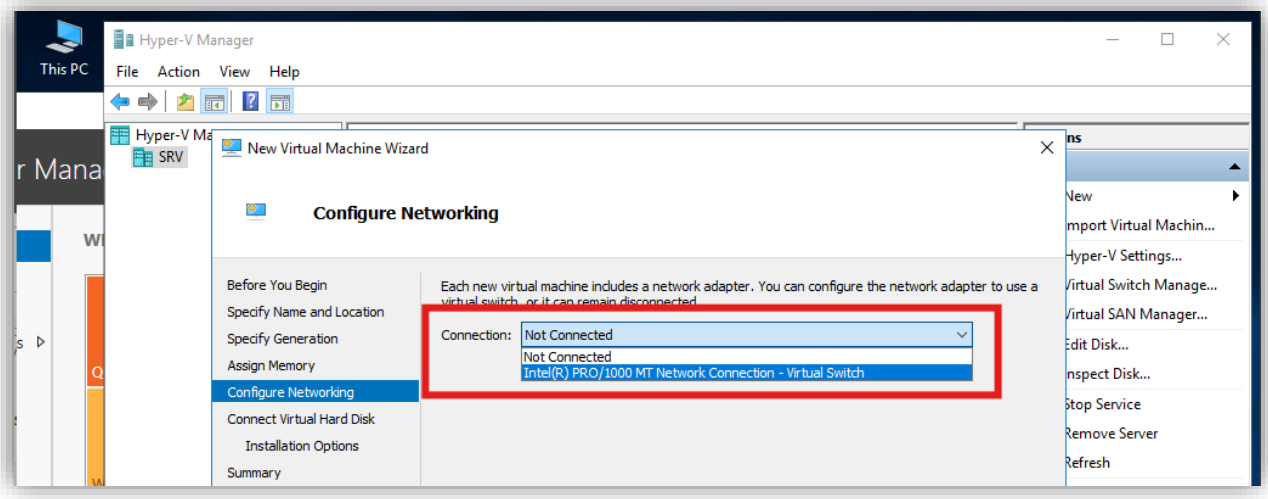
For this lab, we are selecting Generation 2.



In the Assign Memory section, you can specify the amount of RAM for the VM



In the Configure Network section, open the drop-down menu and select the virtual switch you want the VM to connect to.

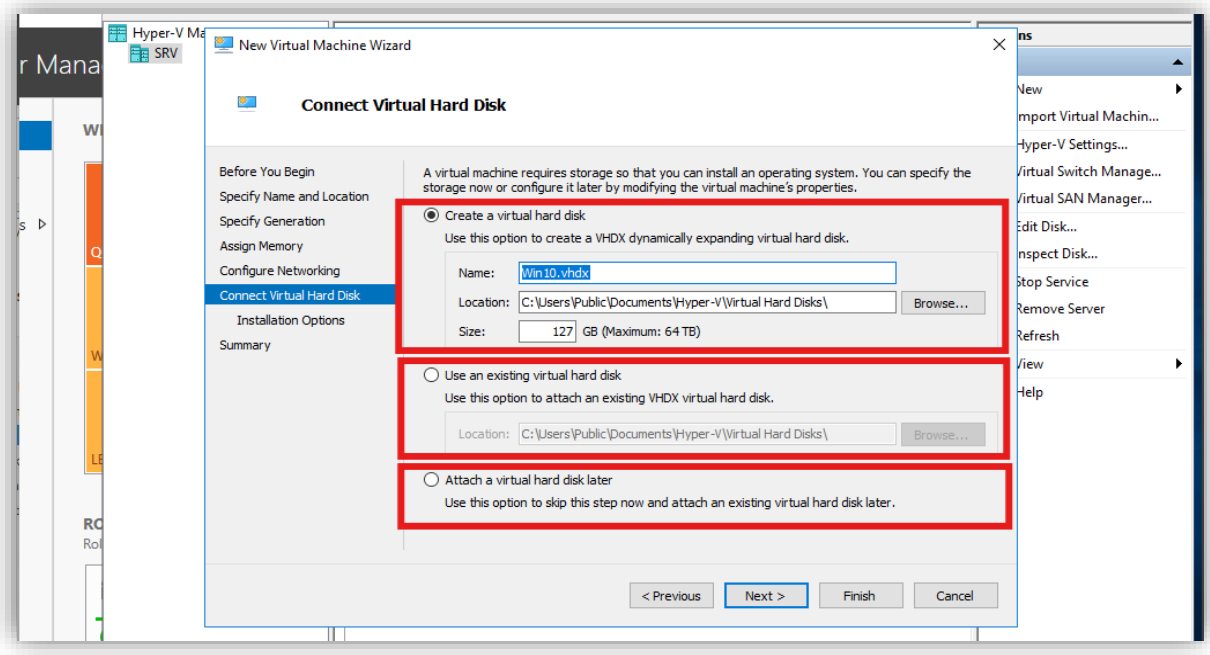


Connect Virtual Hard Disk

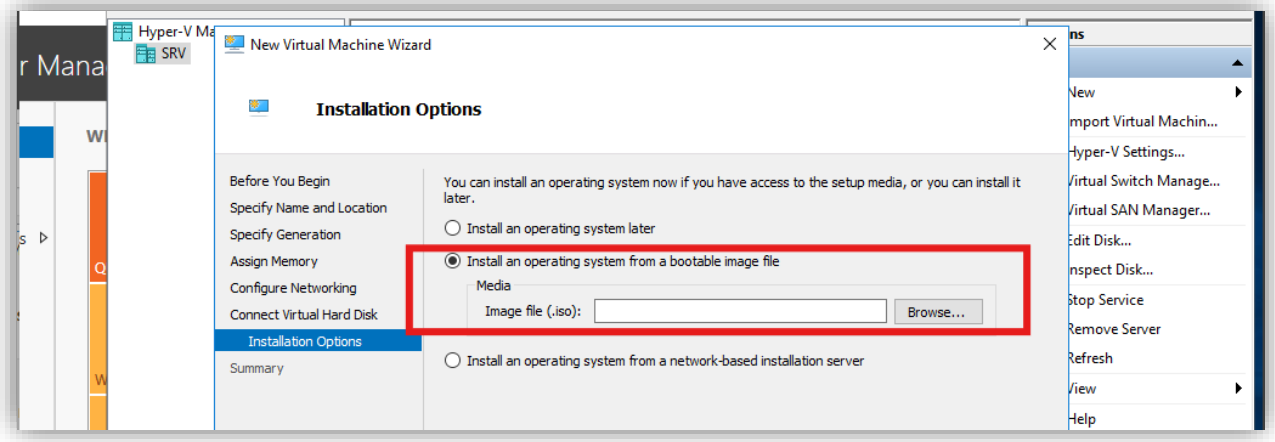
In this section, you have three options:

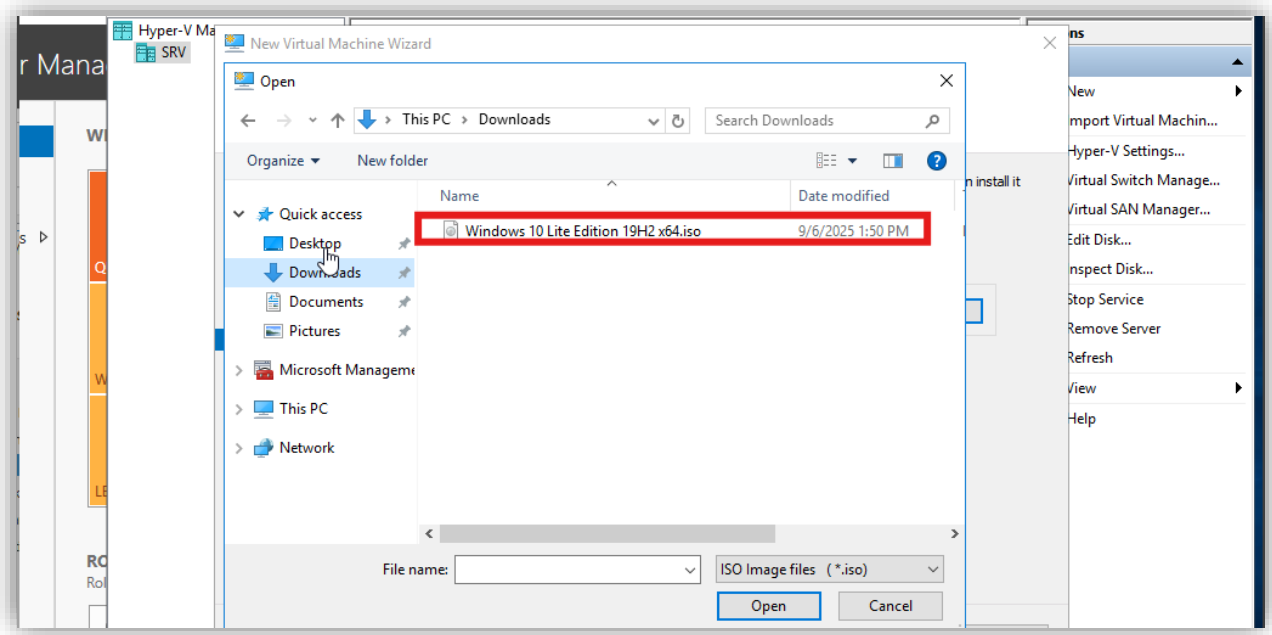
1. **Create a virtual hard disk** – Create a new VHDX file for the VM. You can specify the name, location, and size.
2. **Use an existing virtual hard disk** – Attach an already created VHDX file to the VM.
3. **Attach a virtual hard disk later** – Skip disk creation for now and add it later.

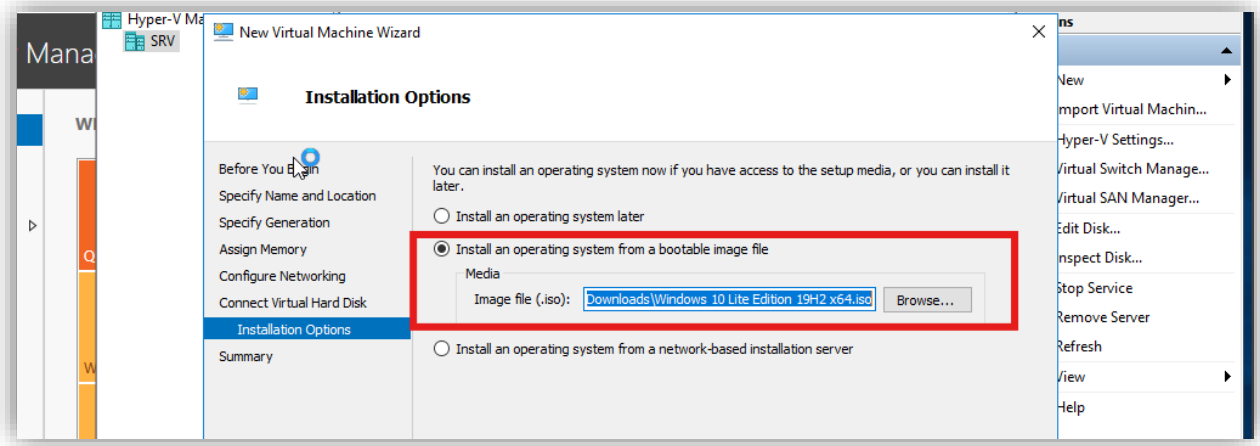
Here, we are selecting “Create a virtual hard disk” and specifying its name, storage path, and size.



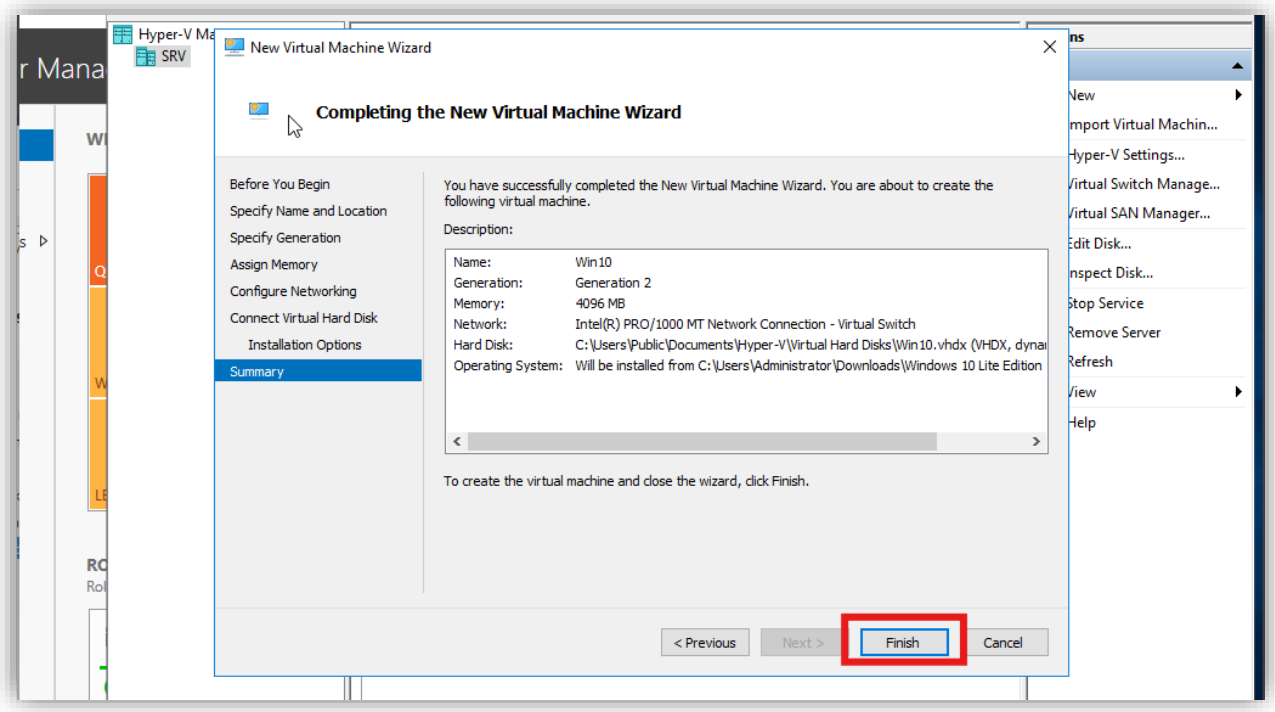
Under the Installation Options, we are selecting “Install an operating system from a bootable image file” and browsing to attach the ISO image.



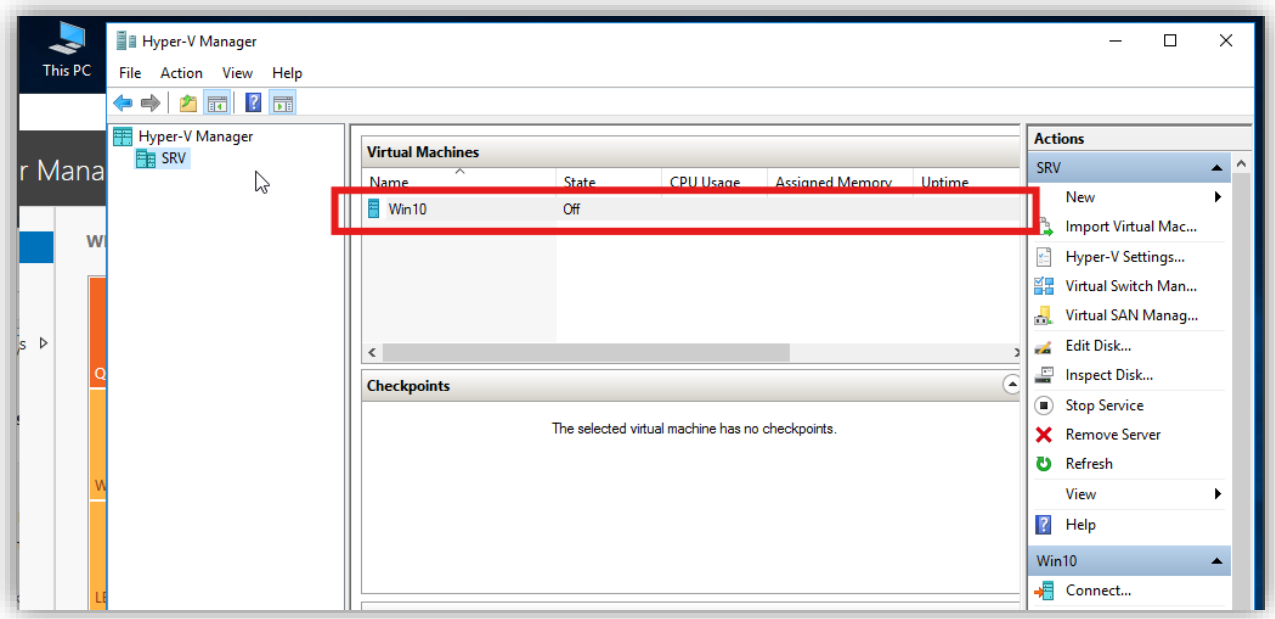

Hyper-V Ma
SRV
New Virtual Machine Wizard
Open
This PC › Downloads
Search Downloads
Organize
New folder
Name
Date modified
Quick access
Desktop
Documents
Pictures
Microsoft Manageme
This PC
Network
Windows 10 Lite Edition 19H2 x64.iso
9/6/2025 1:50 PM
File name:
ISO Image files (*.iso)
Open
Cancel
New
Import Virtual Machin...
Hyper-V Settings...
Virtual Switch Manage...
Virtual SAN Manager...
Edit Disk...
Inspect Disk...
Stop Service
Remove Server
Refresh
View
Help


Hyper-V Ma
SRV
New Virtual Machine Wizard
Installation Options
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
You can install an operating system now if you have access to the setup media, or you can install it later.
Install an operating system later
Install an operating system from a bootable image file
Media
Image file (.iso):
Downloads\Windows 10 Lite Edition 19H2 x64.iso
Browse...
Install an operating system from a network-based installation server
New
Import Virtual Machin...
Hyper-V Settings...
Virtual Switch Manage...
Virtual SAN Manager...
Edit Disk...
Inspect Disk...
Stop Service
Remove Server
Refresh
View
Help

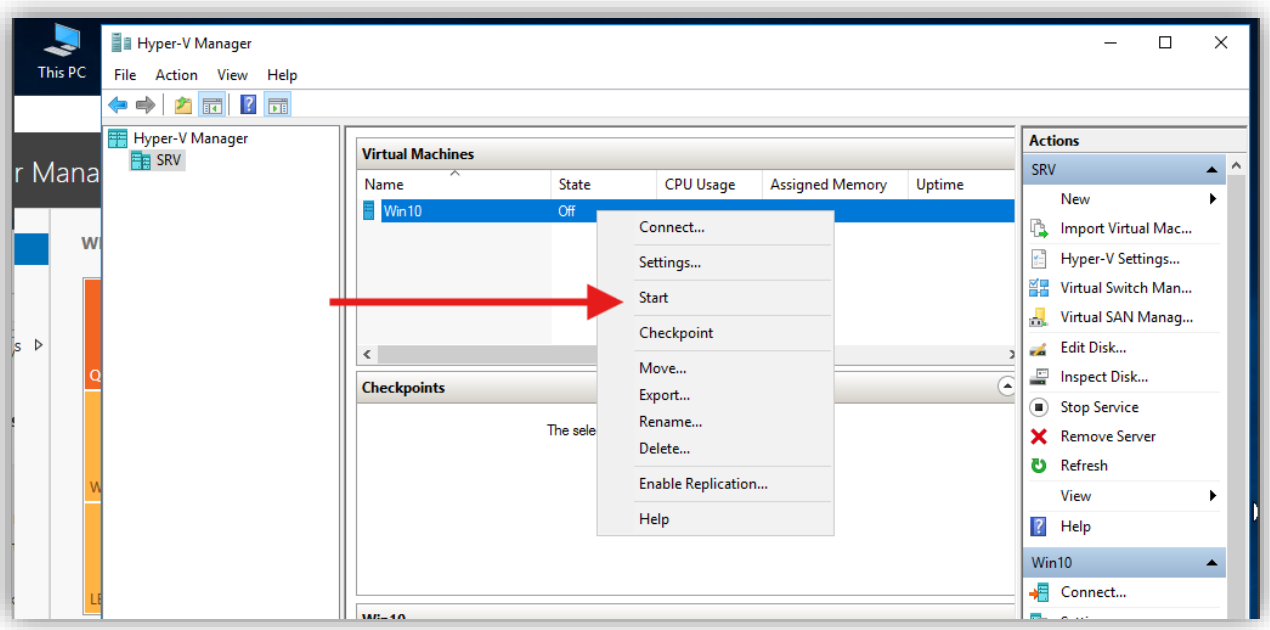
After reviewing all the settings, click **Finish** to create the VM.



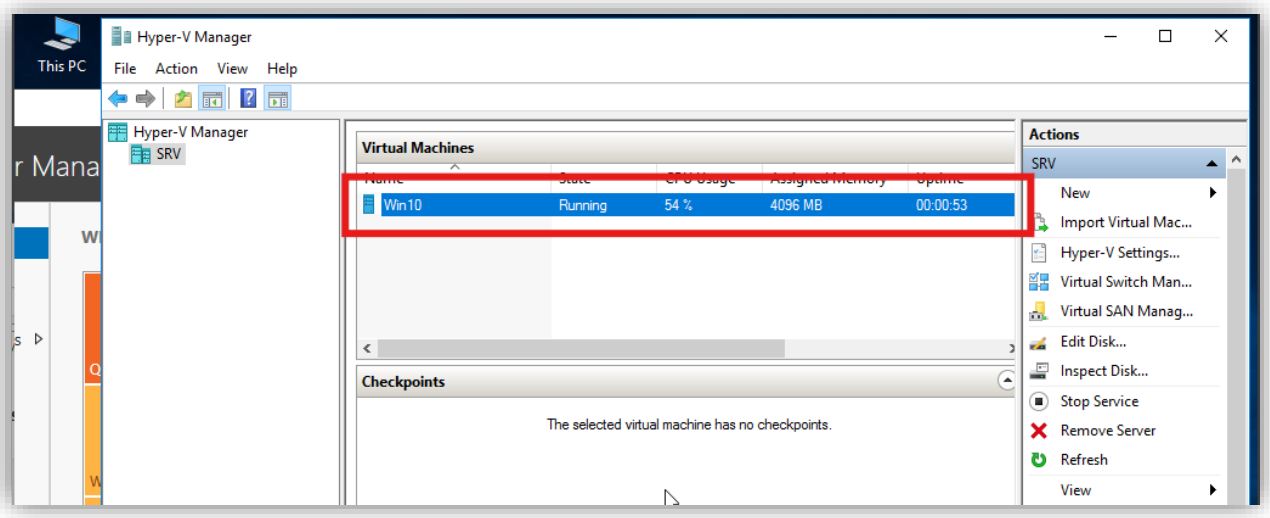
The newly created VM now appears in Hyper-V Manager.



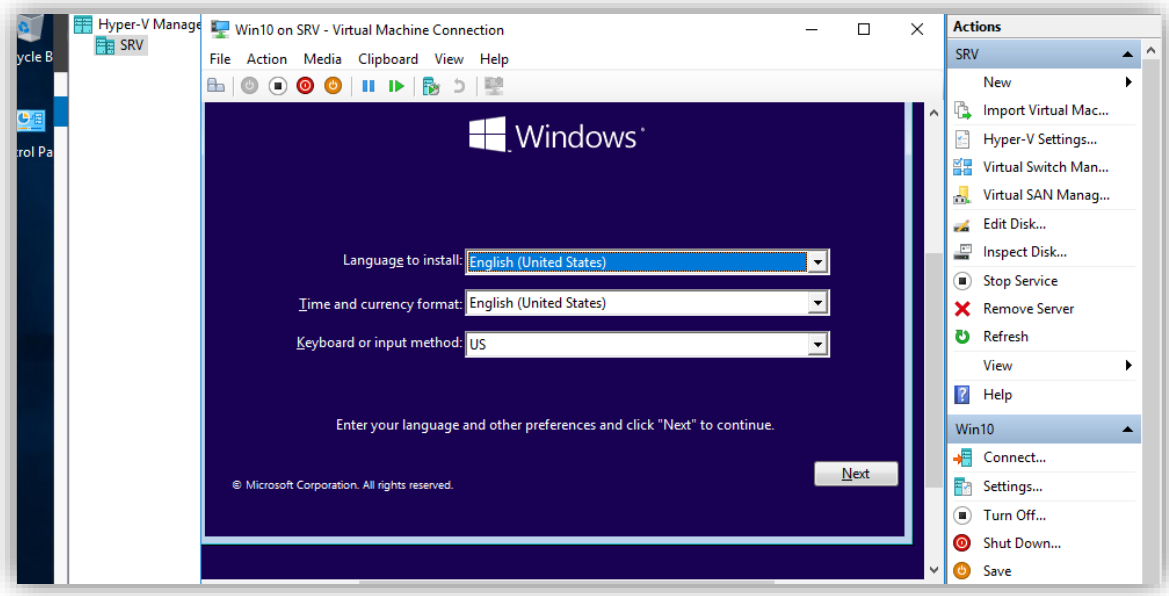
To start the VM, right-click on it and select the **Start** option.



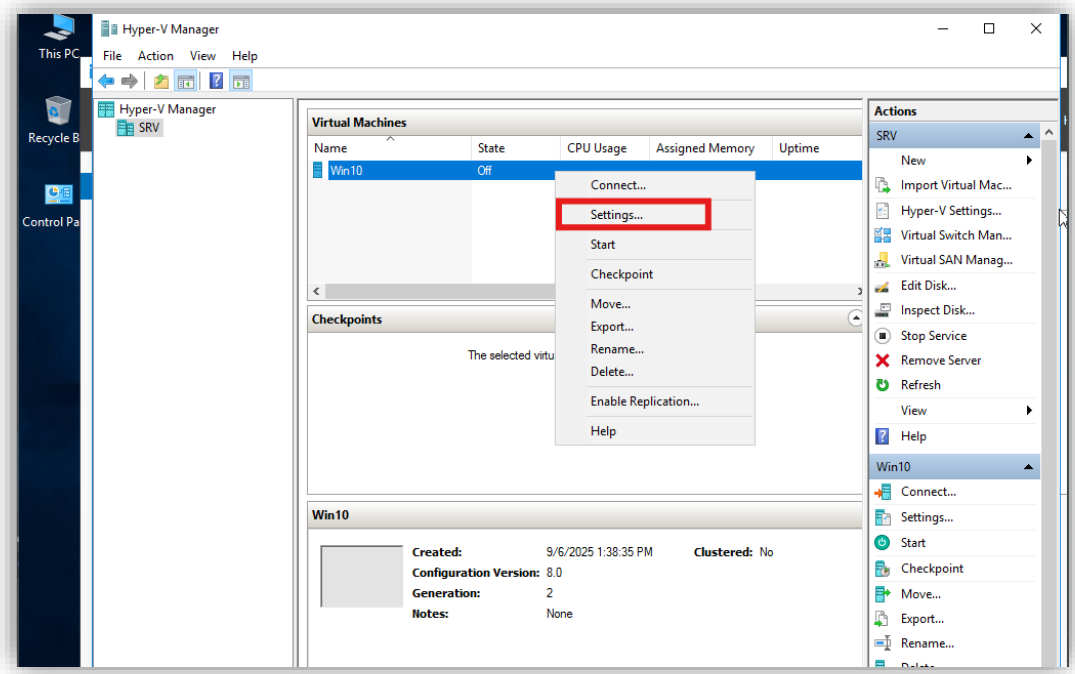
You can now see that the VM has changed from the Off state to the Running state.

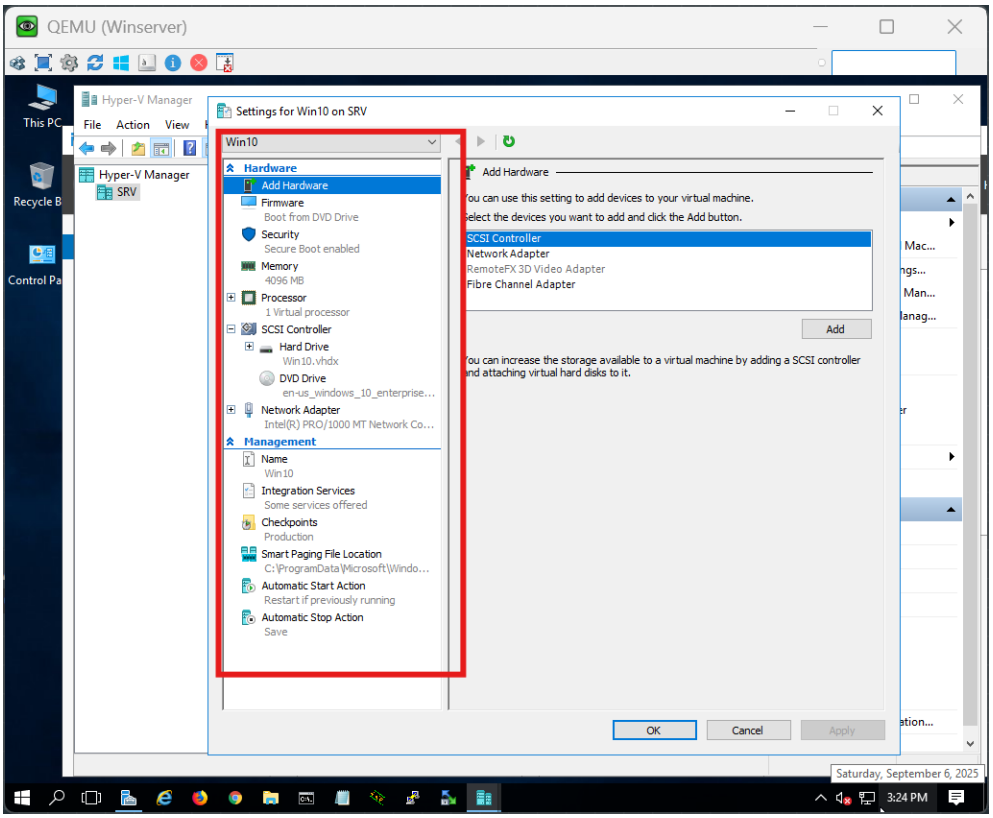


Double-click on the VM, and the Virtual Machine Connection window will open, allowing you to see the VM's console.



If you want to access the VM settings, right-click on the VM and select **Settings**.





Conclusion

In this lab, we successfully installed the Hyper-V role, created a virtual switch, and deployed a new virtual machine. These fundamental steps form the basis of building and managing a virtualized environment with Hyper-V.

Please note that this exercise focused only on the basics of VM creation. Hyper-V is a powerful virtualization platform that provides many additional capabilities such as checkpoints, live migration, replication, advanced networking, and resource optimization. In future labs, we will cover these features to gain a deeper understanding and hands-on experience with Hyper-V.

Thanks for your time!

Keep learning, and keep growing!....