Nested Virtualization_RDP SSH

Last updated by | Sagar Yele | Jun 3, 2025 at 7:40 PM GMT+5:30

Tags

cw.How-To	cw.RDP-SSH

Contents

Summary

This article explains how to create a nested environment in Azure to recover a VM when all other recovery options have been exhausted and you need full console access for troubleshooting.

References

Public References

- Nested Virtualization in Azure
- Introducing the new Dv3 and Ev3 VM sizes

Internal References

- For a video on how to create this environment, refer to Hyper-V in Azure VMs - Nested Virtualization

Customer Enablement

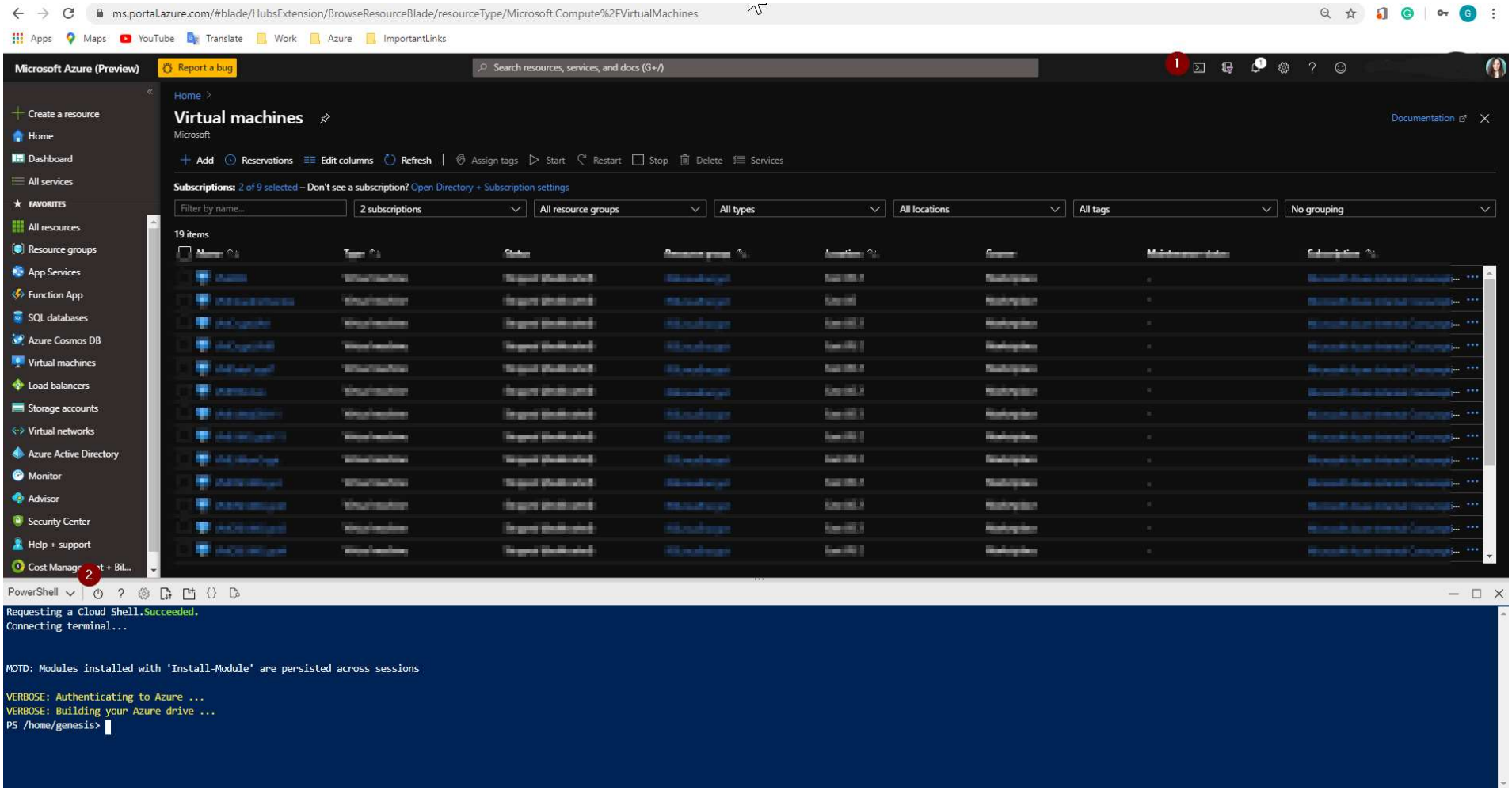
- Manual: Troubleshoot a problem Azure VM by using nested virtualization in Azure
- Automatic: Repair a Windows VM by using the Azure Virtual Machine repair commands

Instructions

Azure support teams do not directly support the nested environment itself. We support the host VM as with any other VM. However, if there are issues building or using the nested environment, support is provided by Windows Devices and Deployment, as this is a standard Hyper-V role.

Nested Virtualization using az vm repair and CLI

1. Go to the Azure portal.
2. Open Cloud Shell to start a CLI session.



3. Run the following commands:

```
az account set -s <SubscriptionID>
az extension add -n vm-repair
az vm repair create -g <ResourceGroupName> -n <VMName> --enable-nested --verbose
```

Note:

- Replace `<ResourceGroupName>` and `<VMName>` with the details of the broken VM.
- When prompted, enter the login credentials. The rescue VM will be deployed in a separate VNet/subnet. To ensure remote access, select **Yes** when asked to assign a Public IP address.

4. Wait for the rescue VM to be created. This process automatically attaches a copy of the affected disk as a data disk. A new resource group will be created; note the name of the new resource group and the rescue VM for use in later steps.

5. At this point, you can work on your VM as you would with any on-premises VM. Perform any troubleshooting or mitigation steps as needed.

6. Once troubleshooting is complete, swap the fixed OS disk (currently attached to the rescue VM) with the broken disk attached to the original VM. Run the following command:

```
az vm repair restore -g <ResourceGroupName> -n <VMName> --verbose
```

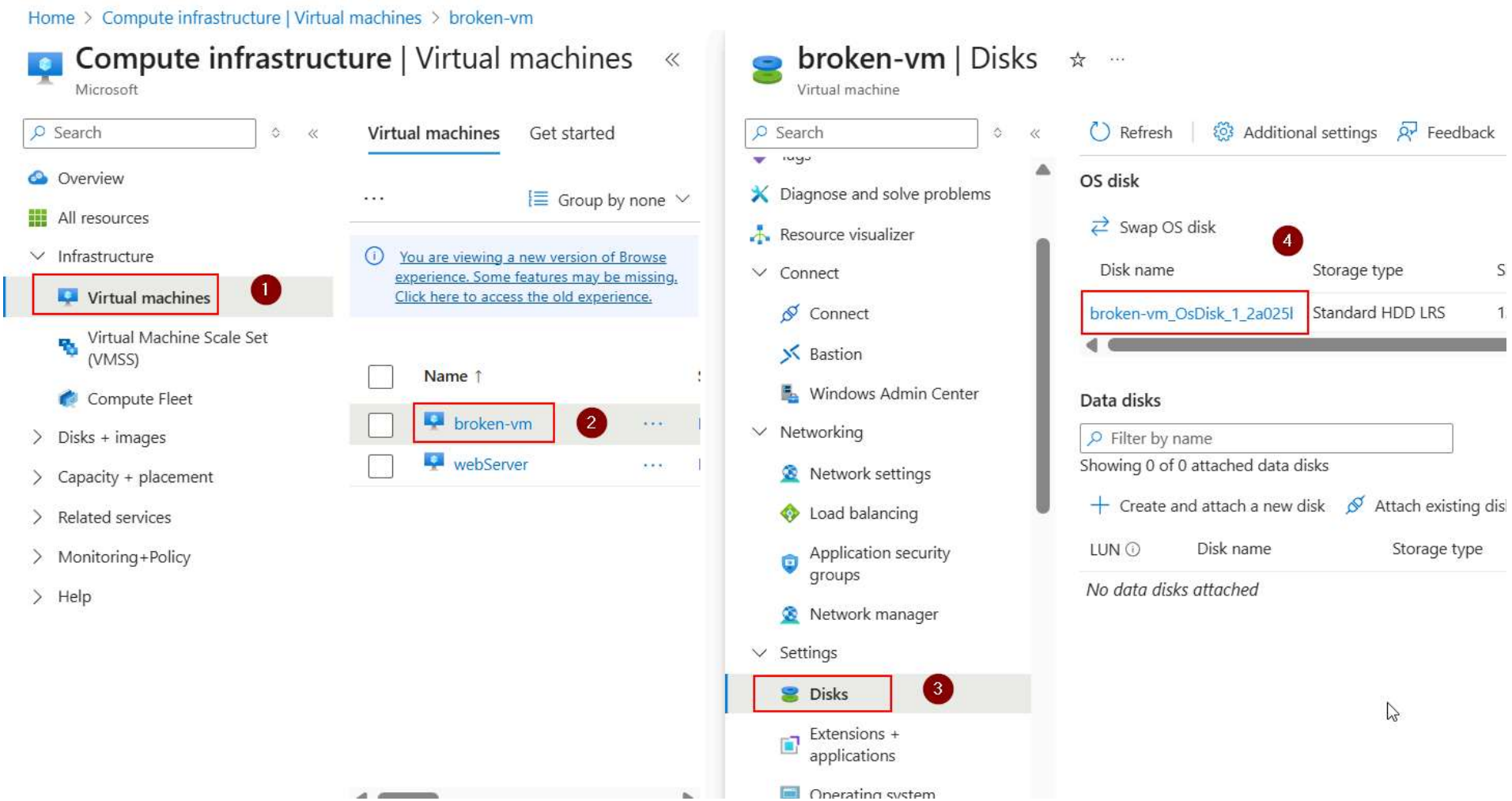
Note:

- Replace `<ResourceGroupName>` and `<VMName>` with the details of the broken VM.

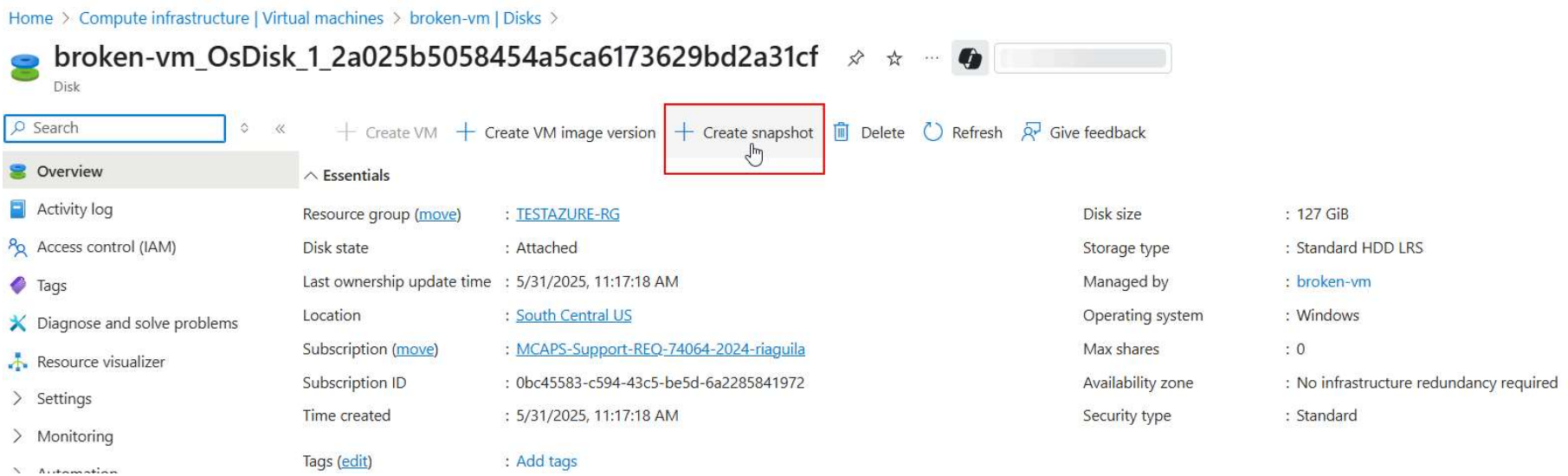
Manually Create Rescue VM and Provide IP to Hyper-V VM to Test RDP Connectivity

Step 1: Snapshot the Broken Disk

1. Go to **Azure Portal > Disks** and select the broken VM's OS disk.



2. Click **Create Snapshot**.



3. Set the name to `Snapshot-BrokenDisk`.

4. Set the type to **Full**, storage to **Standard HDD** or **Premium**, and use the same resource group as the rescue VM.

Create snapshot

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * : MCAPS-Support-REQ-74064-2024-riaguila

Resource group * : TESTAZURE-RG

Create new

Instance details

Name * : Snapshot-BrokenDisk

Region : (US) South Central US

Snapshot type * :

- ○ **Incremental:** Save on storage costs by making a partial copy of the disk based on the difference between the last snapshot.
- ◉ **Full:** Make a complete read-only copy of the selected disk.

Source type : Disk

Source subscription : MCAPS-Support-REQ-74064-2024-riaguila

Source disk : broken-vm_OsDisk_1_2a025b5058454a5ca6173629bd2a31cf

Security type : Standard

VM generation :

- ○ Generation 1
- ◉ Generation 2

VM architecture :

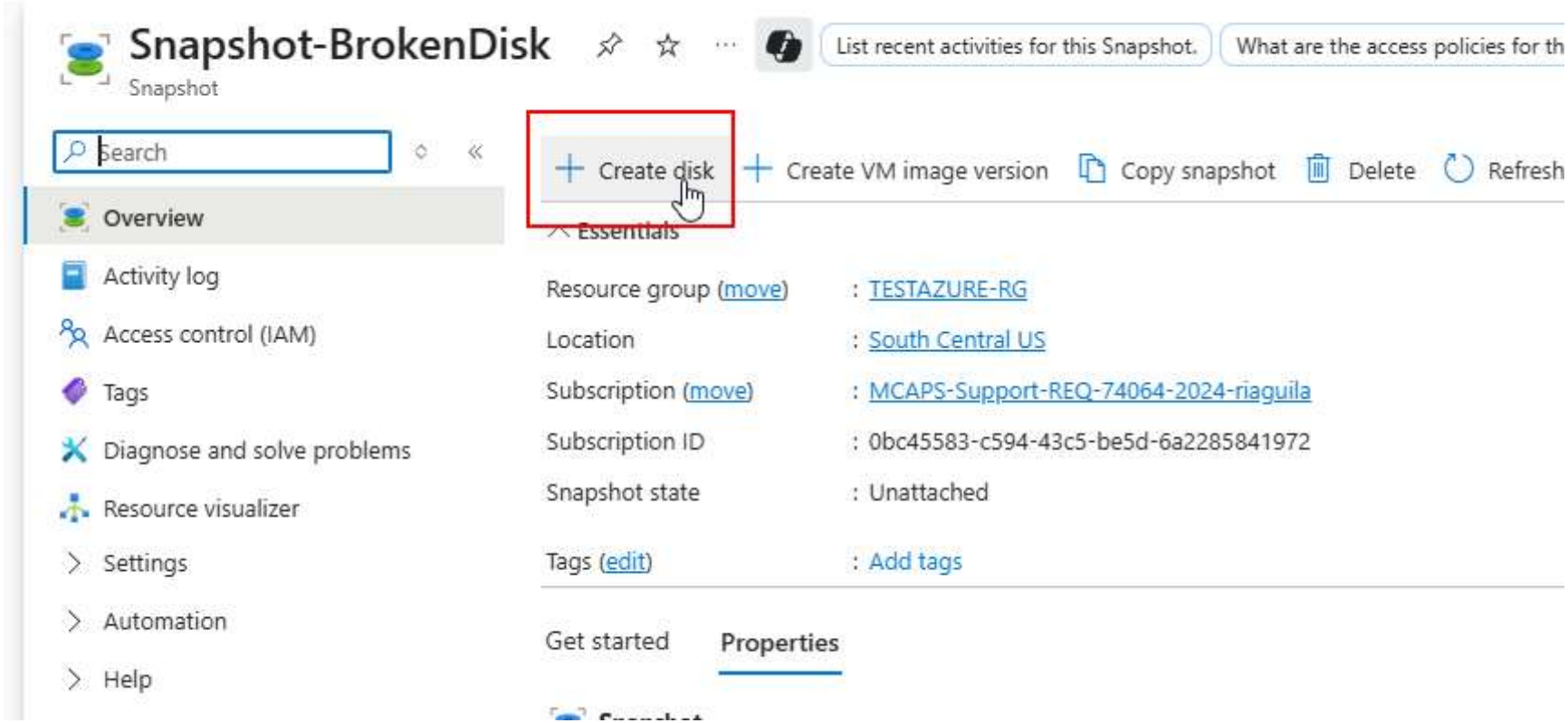
- ◉ x64
- ○ Arm64

5. Click **Create.**

Step

1. Go to **Snapshots** and select `Snapshot-BrokenDisk`.

2. Click **Create Disk.**



3. Name the disk `RecoveredDisk` and ensure it is in the same region and resource group as the rescue VM.

Home > Snapshots > Snapshot-BrokenDisk >

Create a managed disk ...

Basics | Encryption | Networking | Advanced | Tags | Review + create

Select the disk type and size needed for your workload. Azure disks are designed for 99.999% availability. Azure managed disks encrypt your data at rest, by default, using Storage Service Encryption. Learn more about disks.

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * : MCAPS-Support-REQ-74064-2024-riaguila

Resource group * : TESTAZURE-RG

Create new

Disk details

Disk name * : RecoveredDisk

Region : (US) South Central US

Availability zone : No infrastructure redundancy required

Source type : Snapshot

Source subscription : MCAPS-Support-REQ-74064-2024-riaguila

Source snapshot : Snapshot-BrokenDisk

OS type :
- None (data disk)
- Linux
- Windows

Security type : Standard

VM generation :
- Generation 1
- Generation 2

VM architecture :
- x64
- Arm64

Size * : **127 GiB**
Standard HDD LRS
Change size

4. Click **Create.**

Step

1. In the **Basics** tab, provide the following values:

   - **Image:** Windows Server 2019 or 2022
   - **Security Type:** Standard (disable Trusted Launch)
   - **Size:** Use a nested virtualization-supported size (e.g., Standard_D4s_v3)

Create a virtual machine

Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.

Help me create a low cost VM | Help me create a VM optimized for high availability | Help me choose the right VM size for my workload

Basics | Disks | Networking | Management | Monitoring | Advanced | Tags | Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Learn more

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * : MCAPS-Support-REQ-74064-2024-riaguila

Resource group * : TESTAZURE-RG

Create new

Instance details

Virtual machine name * : RescueVM

Region * : (US) South Central US

Availability options : No infrastructure redundancy required

Security type : Standard

Image * : Windows Server 2022 Datacenter - x64 Gen2

See all images | Configure VM generation

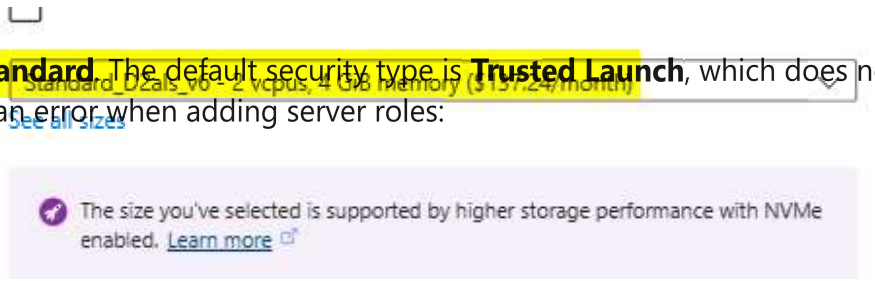
This image is compatible with additional security features. Click here to swap to the Trusted launch security type.

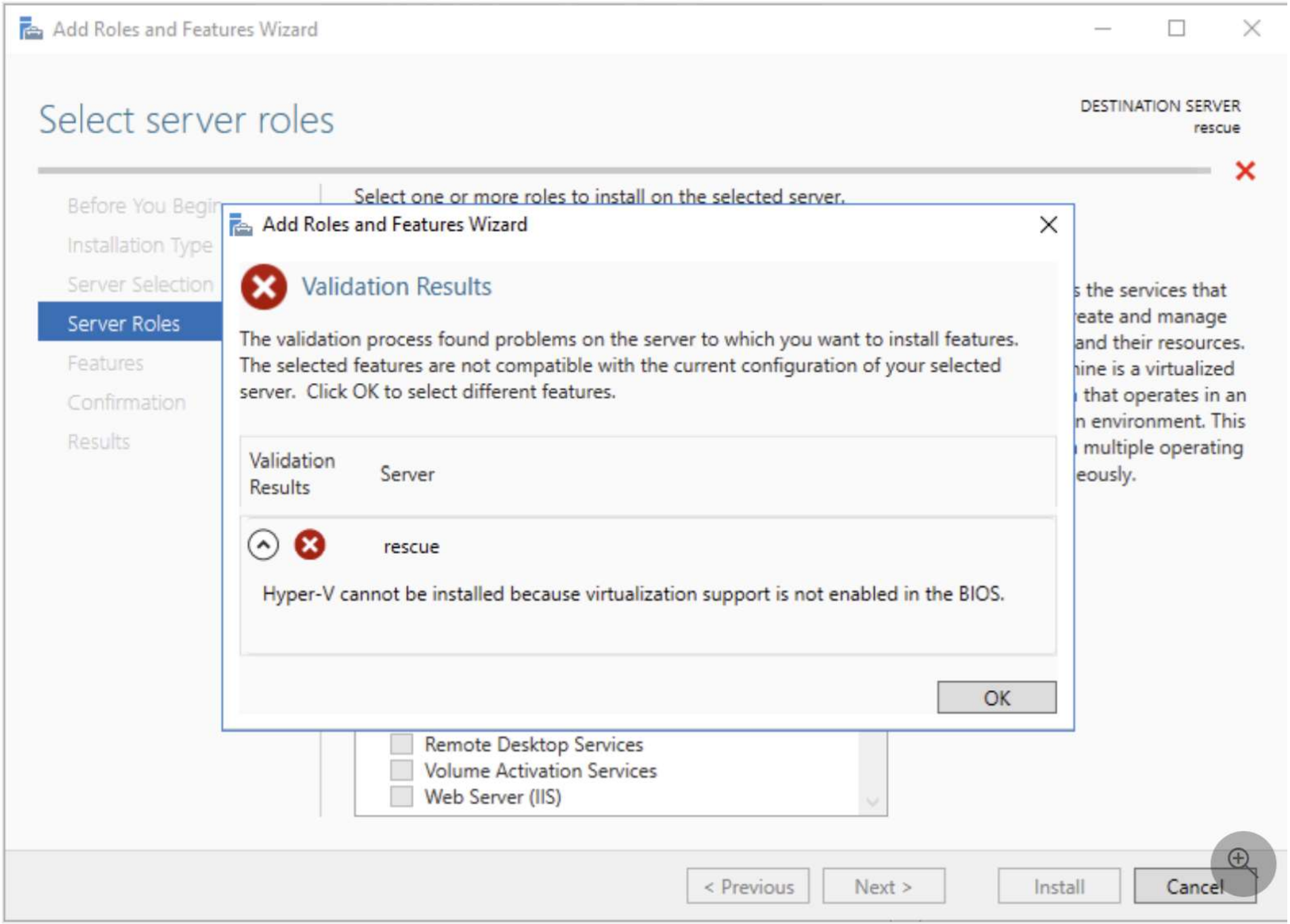
VM architecture : Arm64 / x64

Arm64 is not supported with the selected image.

Note:

Ensure the security type is set to **Standard**. The default security type is **Trusted Launch**, which does not support nested virtualization. If Trusted Launch is enabled, you will receive an error when adding server roles:





2. In the **Disks** tab, under **Data disk for RescueVM**, select **Attach existing disk**.

Home > Compute infrastructure | Virtual machines > TESTAZURE-RG > Marketplace >

Create a virtual machine ...

Help me create a low cost VM | Help me create a VM optimized for high availability | Help me choose the right VM size for my workload

Basics | Disks | Networking | Management | Monitoring | Advanced | Tags | Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. Learn more

VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ⓘ ☐

Encryption at host is not registered for the selected subscription. Learn more

OS disk

OS disk size ⓘ: Image default (127 GiB)

OS disk type * ⓘ: Standard HDD (locally-redundant storage)

The selected VM size supports premium disks. We recommend Premium SSD for high IOPS workloads. Virtual machines with Premium SSD disks qualify for the 99.9% connectivity SLA.

Delete with VM ⓘ ☑

Key management ⓘ: Platform-managed key

Enable Ultra Disk compatibility ⓘ ☐

Data disks for RescueVM

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM ⓘ

Create and attach a new disk | Attach an existing disk

Advanced

Select the disk you created from the broken OS disk:

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. Learn more

VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ⓘ ☐

ⓘ Encryption at host is not registered for the selected subscription. Learn more

OS disk

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Delete with VM ⓘ ☑

Key management ⓘ: Platform-managed key

Enable Ultra Disk compatibility ⓘ ☐

Data disks for RescueVM

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM ⓘ
0	Select an existin...			None	☐

Create and

Adva

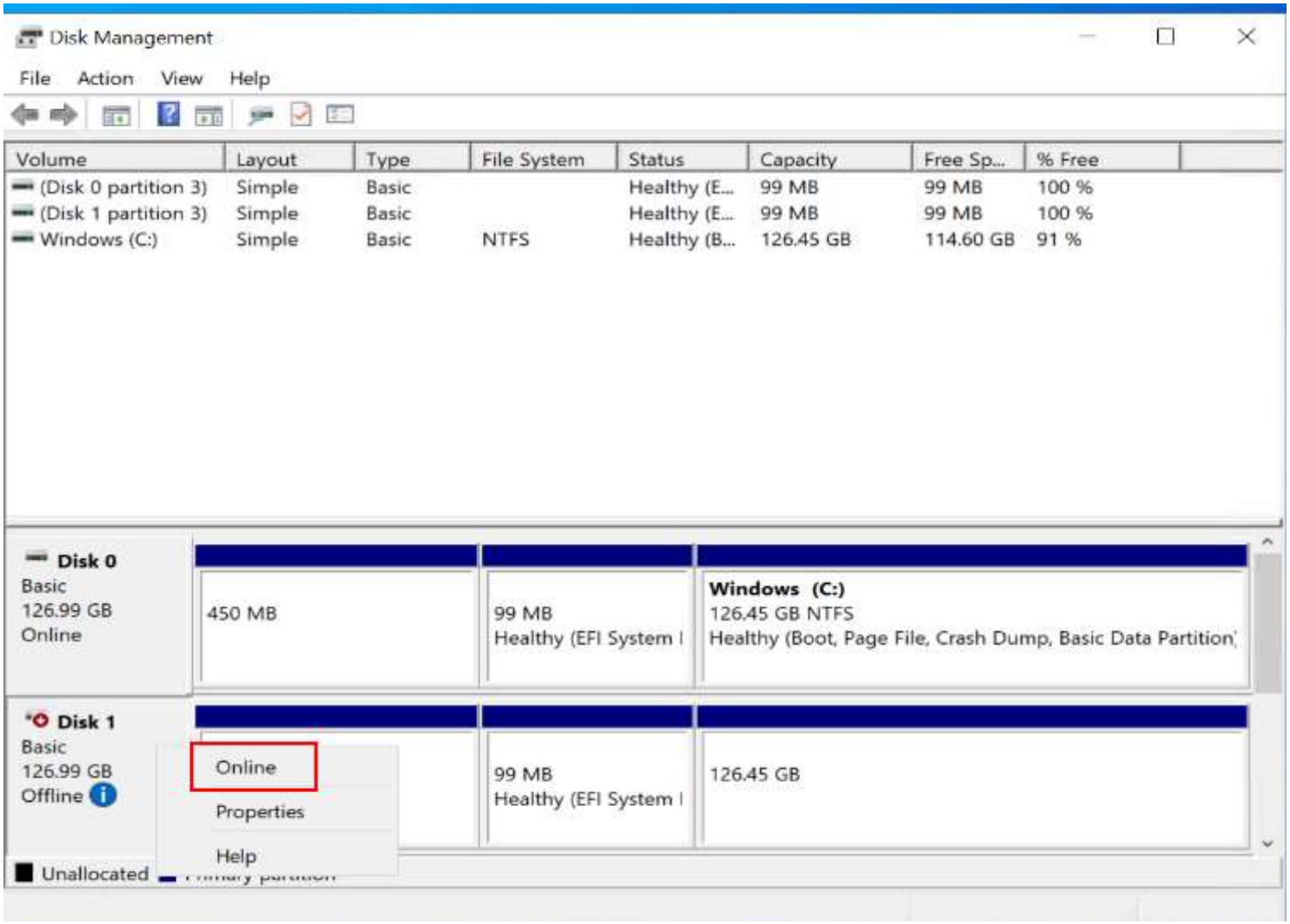
- webServer-DiskCopy-20250302204201
  size: 127 account type: Standard_LRS disk shares used: 0 of 1
- webServer-DiskCopy-20250302235934
  size: 127 account type: Standard_LRS disk shares used: 0 of 1
- broken-vm-DiskCopy-20250531174243
  size: 127 account type: Standard_LRS disk shares used: 0 of 1
- RecoveredDisk

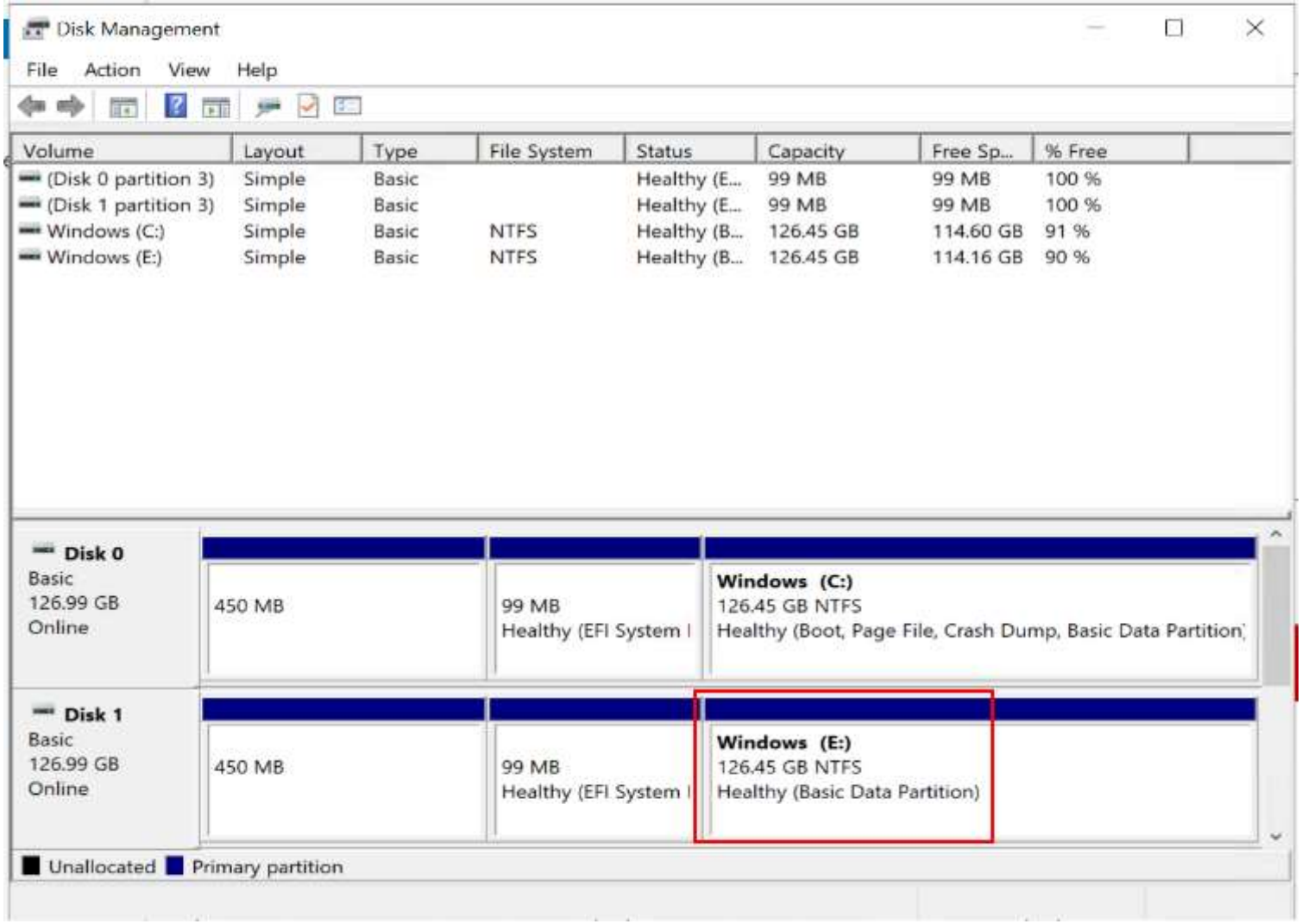
3. Select the appropriate virtual network and leave other values as default if desired.

4. Click **Create**.

Step 4: Access the Disk

1. RDP to the RescueVM.
2. Use **Disk Management** to bring the disk online and assign a drive letter if not assigned automatically.

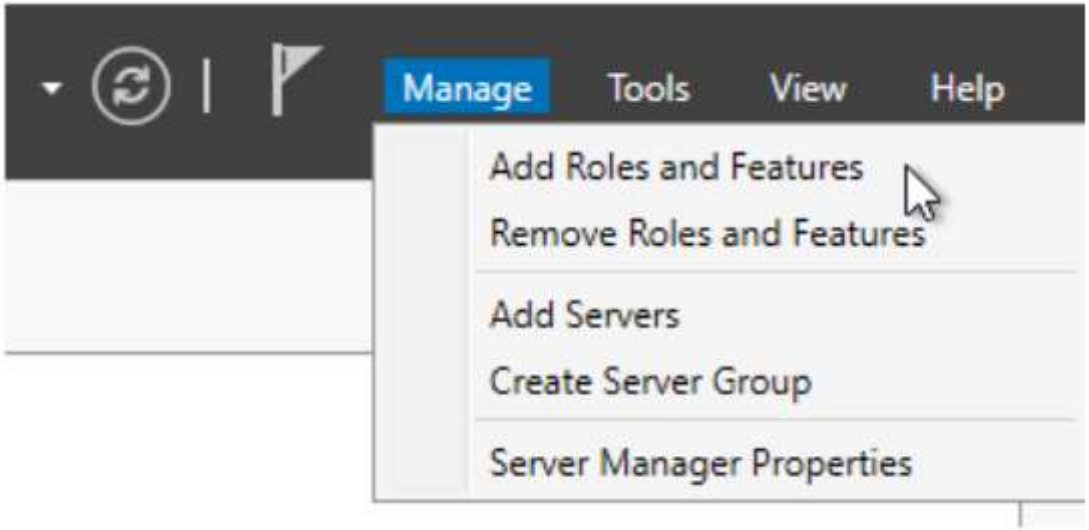

Disk Management
File Action View Help
Volume Layout Type File System Status Capacity Free Sp... % Free
(Disk 0 partition 3) Simple Basic Healthy (E... 99 MB 99 MB 100 %
(Disk 1 partition 3) Simple Basic Healthy (E... 99 MB 99 MB 100 %
Windows (C:) Simple Basic NTFS Healthy (B... 126.45 GB 114.60 GB 91 %
Disk 0
Basic
126.99 GB
Online
450 MB
99 MB
Healthy (EFI System I
Windows (C:)
126.45 GB NTFS
Healthy (Boot, Page File, Crash Dump, Basic Data Partition
Disk 1
Basic
126.99 GB
Offline
Online
Properties
Help
99 MB
Healthy (EFI System I
126.45 GB
Unallocated



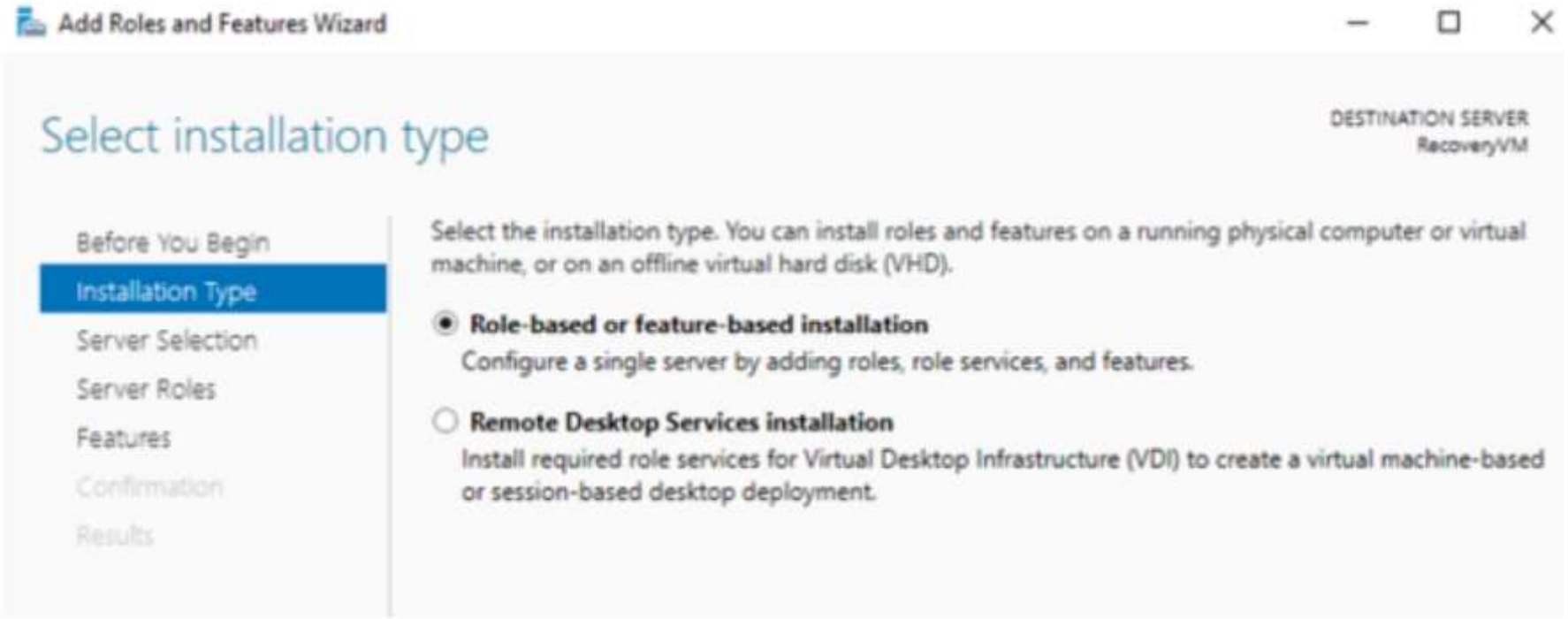
3. Recover or troubleshoot data as needed. If you require access to the guest OS via nested virtualization, continue to Step 5.

Step 5: Install Hyper-V on the Rescue VM

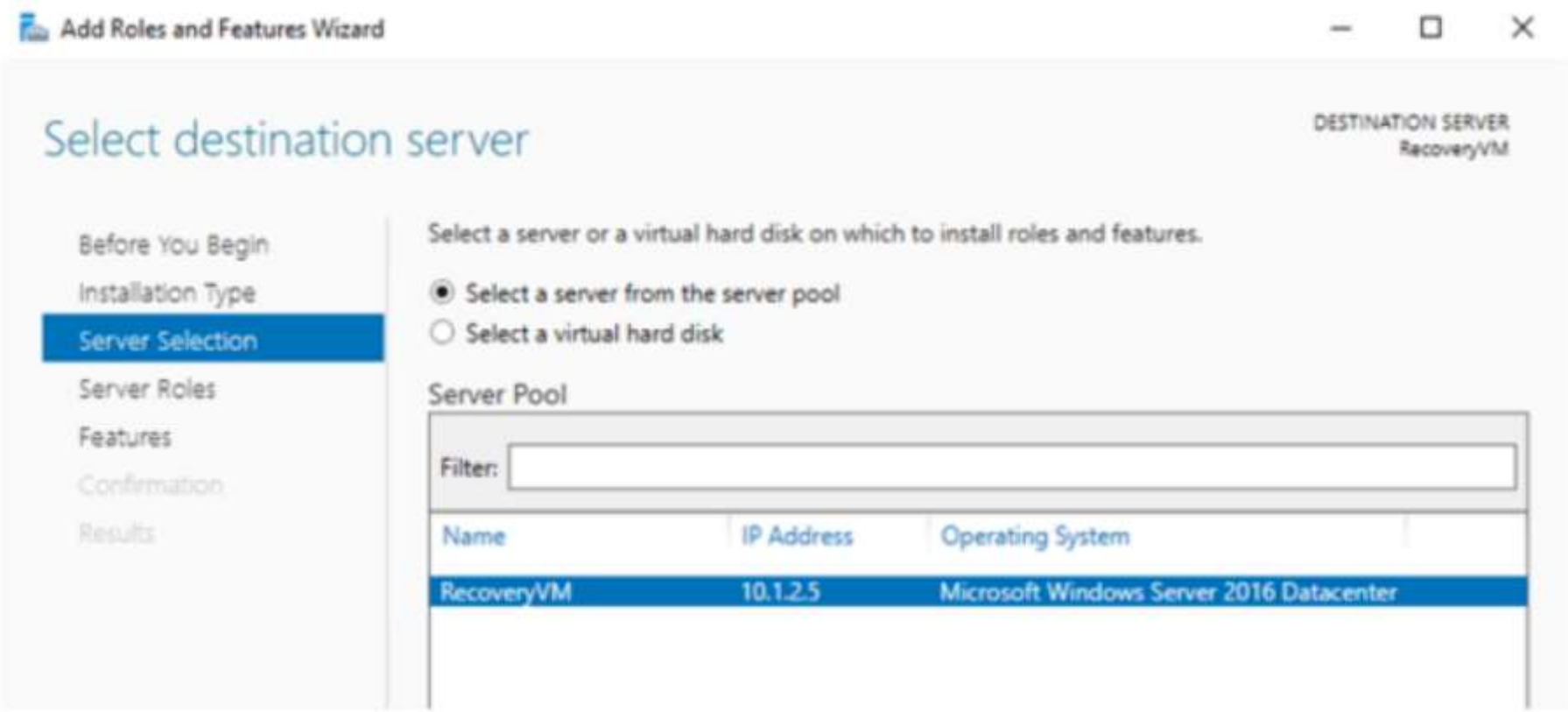
1. In **Server Manager**, select **Manage > Add Roles and Features**.



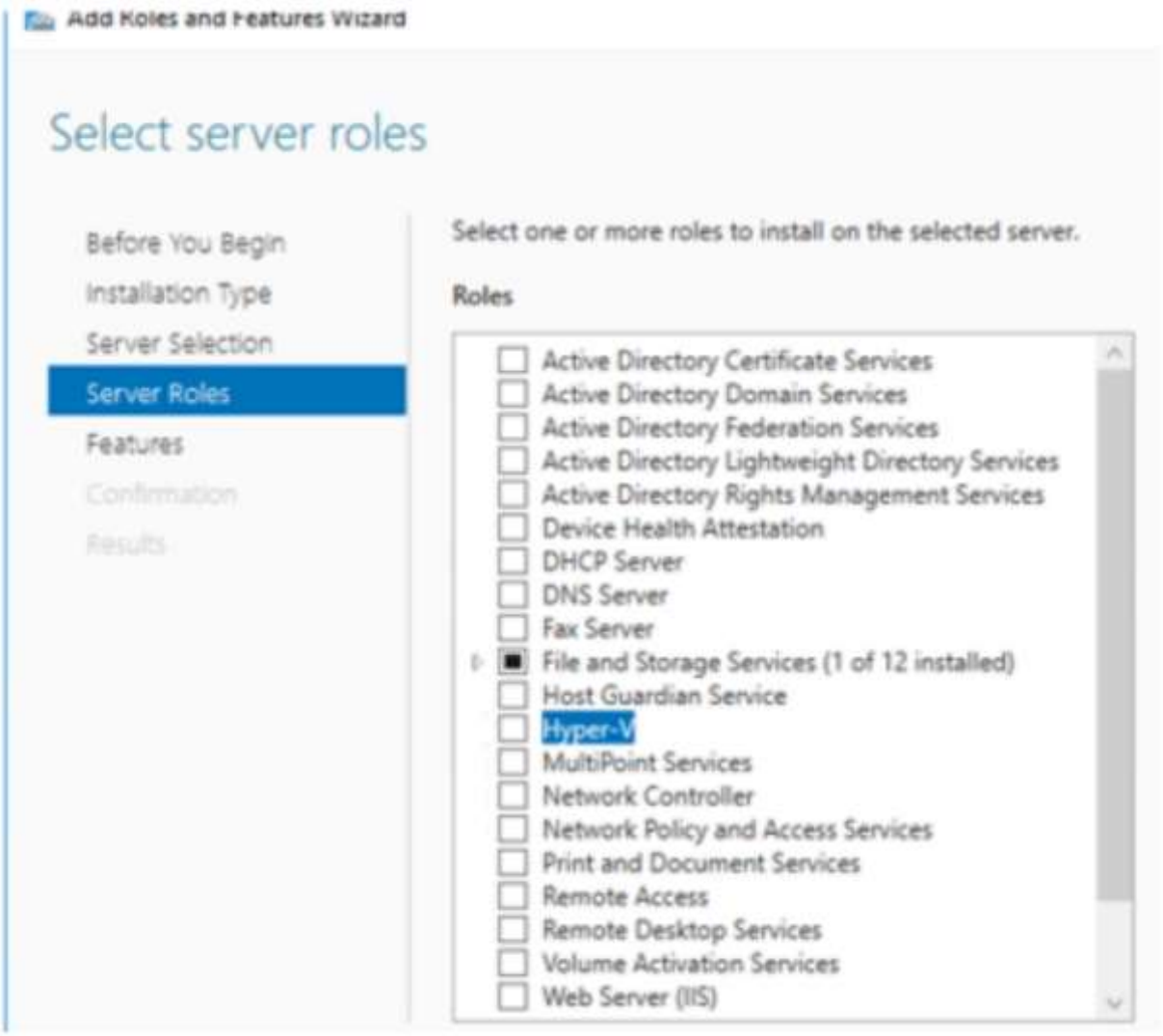
2. For **Installation Type**, select **Role-based or feature-based installation.**

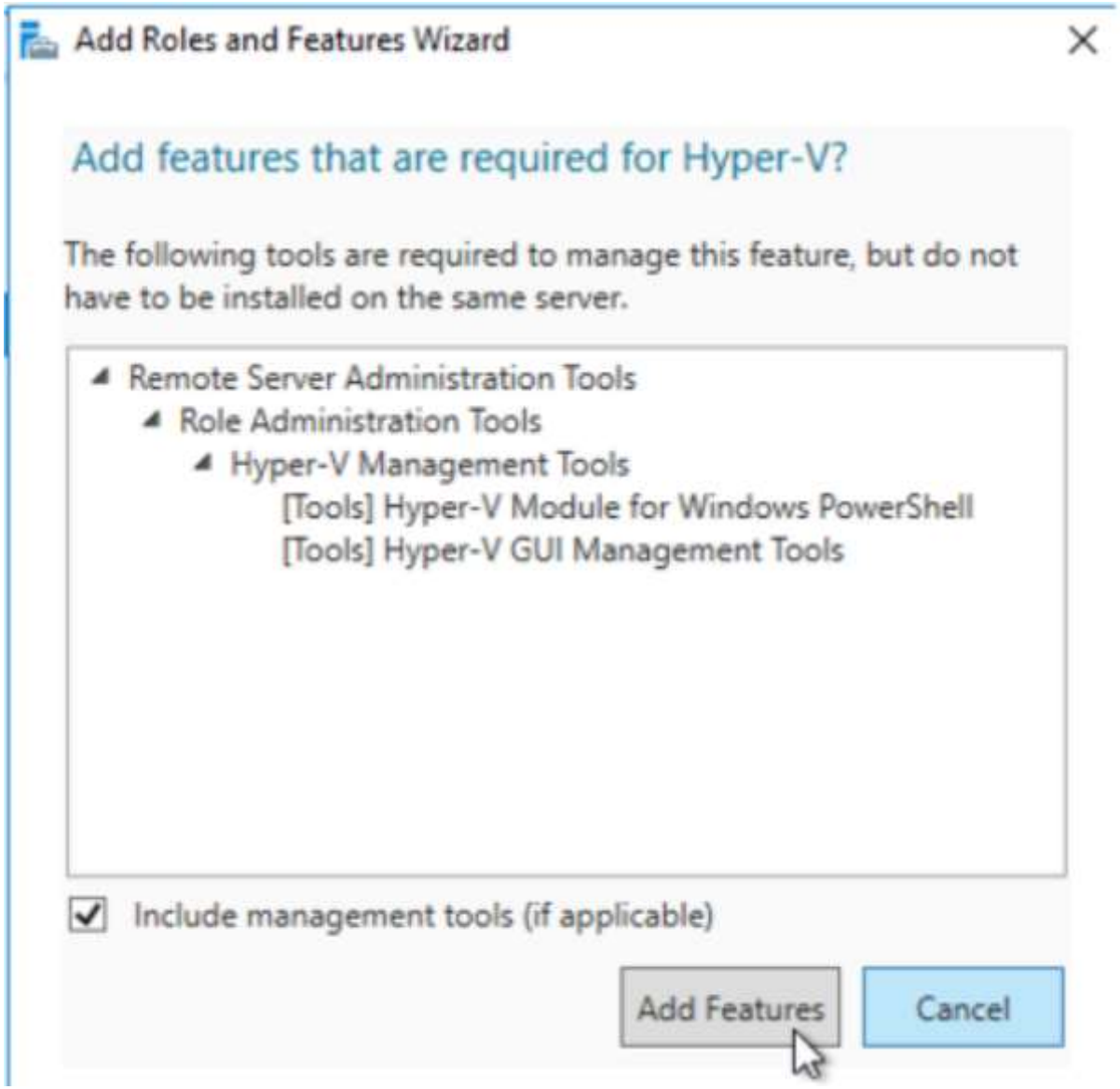


3. Ensure the Rescue VM is selected.



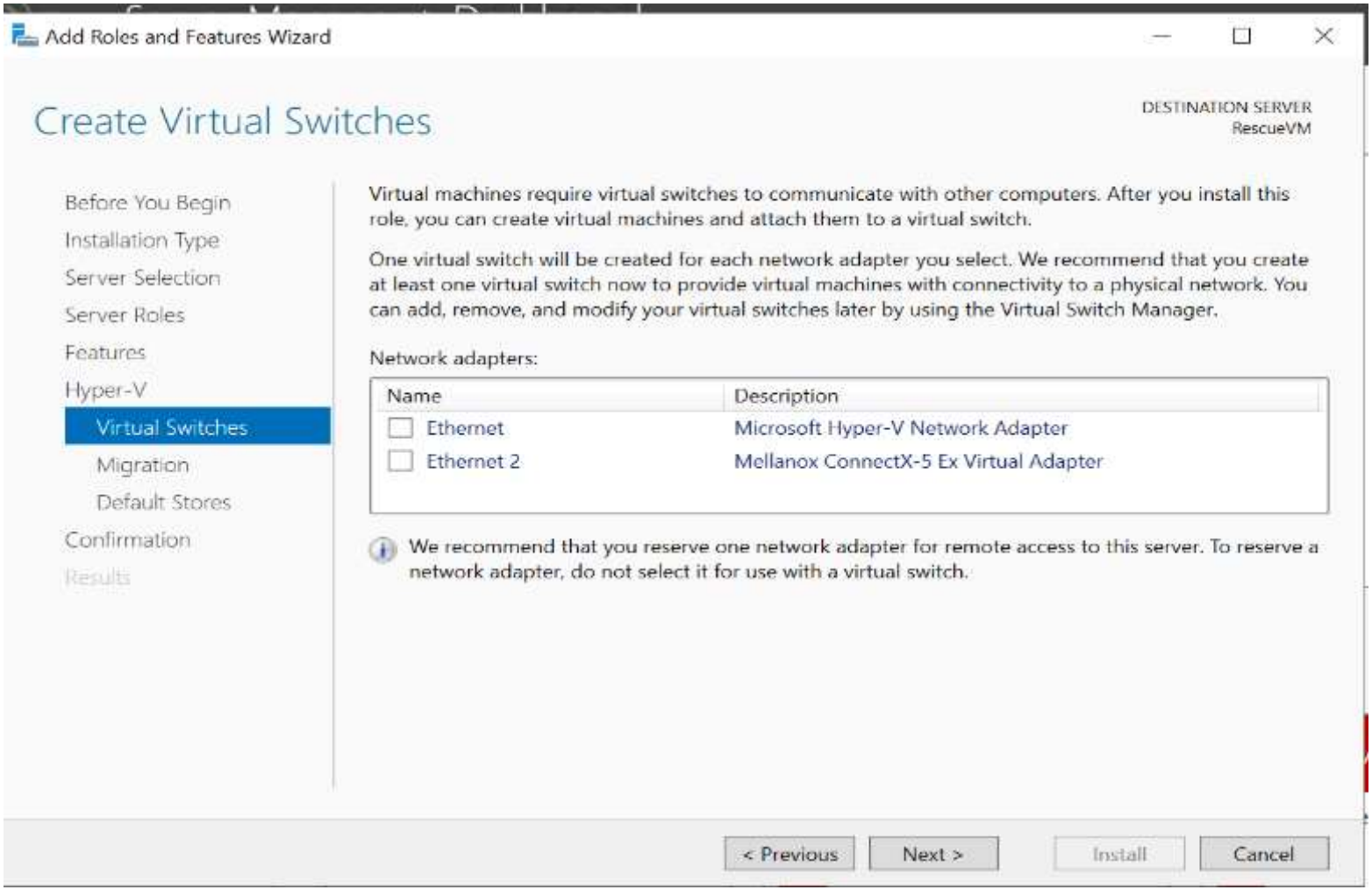
4. Select the **Hyper-V** role.


Add Roles and Features Wizard
Select server roles
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select one or more roles to install on the selected server.
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 Controller
Network Policy and Access Services
Print and Document Services
Remote Access
Remote Desktop Services
Volume Activation Services
Web Server (IIS)



5. Click **Next** on the Features screen.

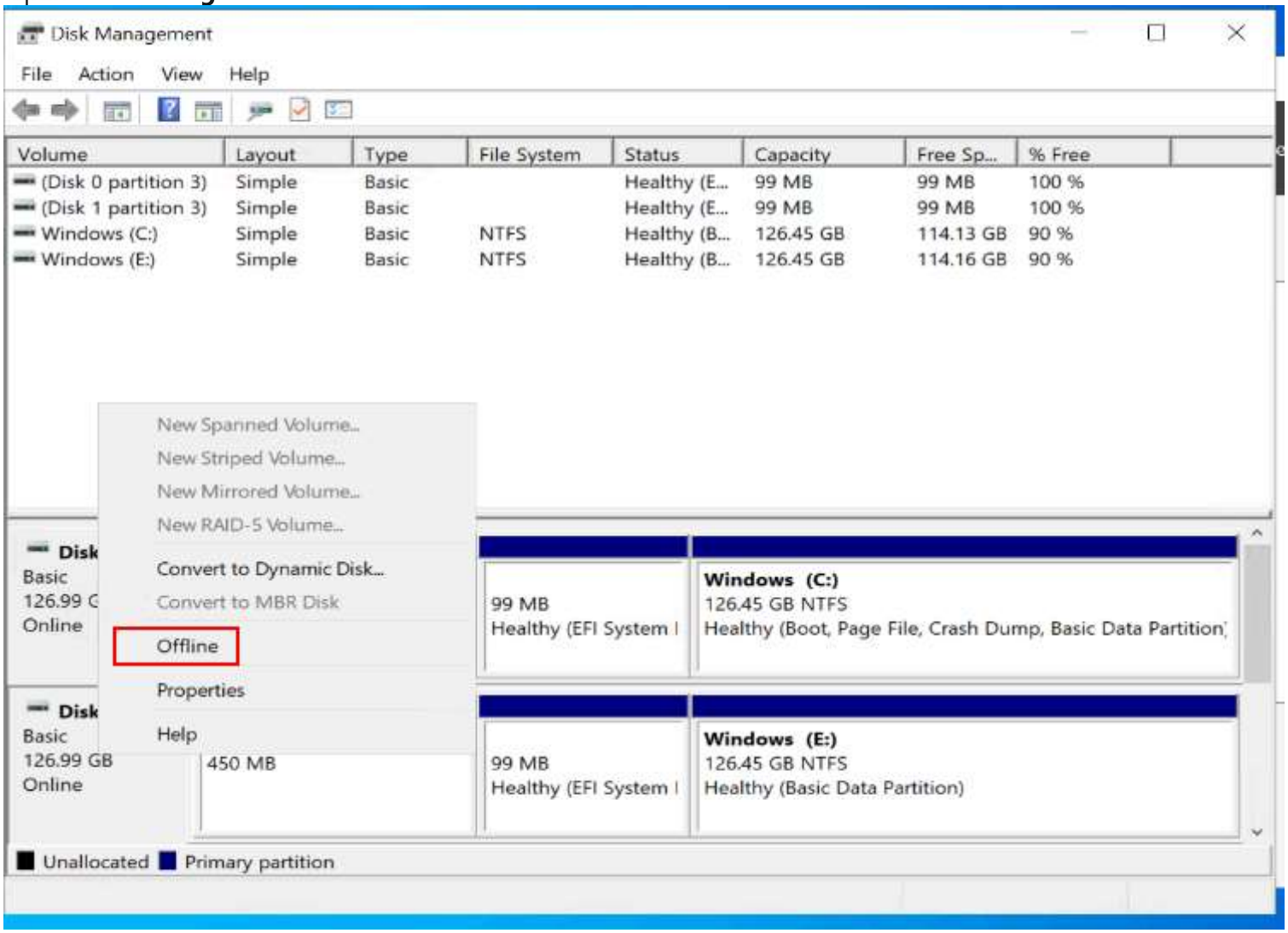
6. On the **Virtual Switches** screen, click **Next**.



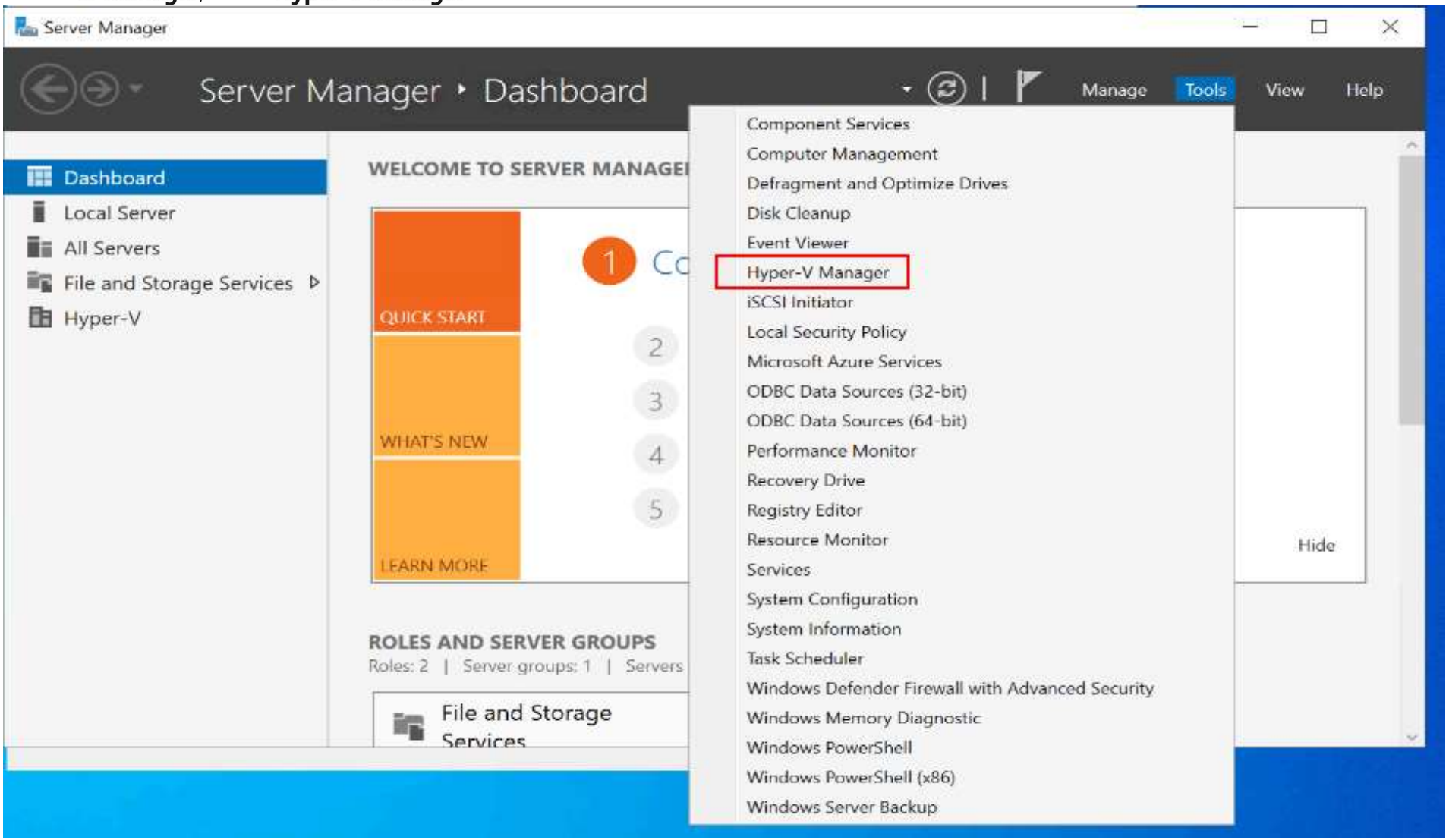
7. On the **Migration** page, click **Next**.
8. On the **Default Stores** page, click **Next**.
9. Check the box to restart the server automatically if required.
10. Click **Install.**
11. Allow the server to install the Hyper-V role. This process may take a few minutes and the server will reboot automatically. You can monitor the reboot using the **Boot Diagnostics** tab in the Azure Portal.

Step 6: Create the Hyper-V VM in Hyper-V Manager

1. Open **Disk Management** and ensure the VHD of the broken VM is set to **Offline.**

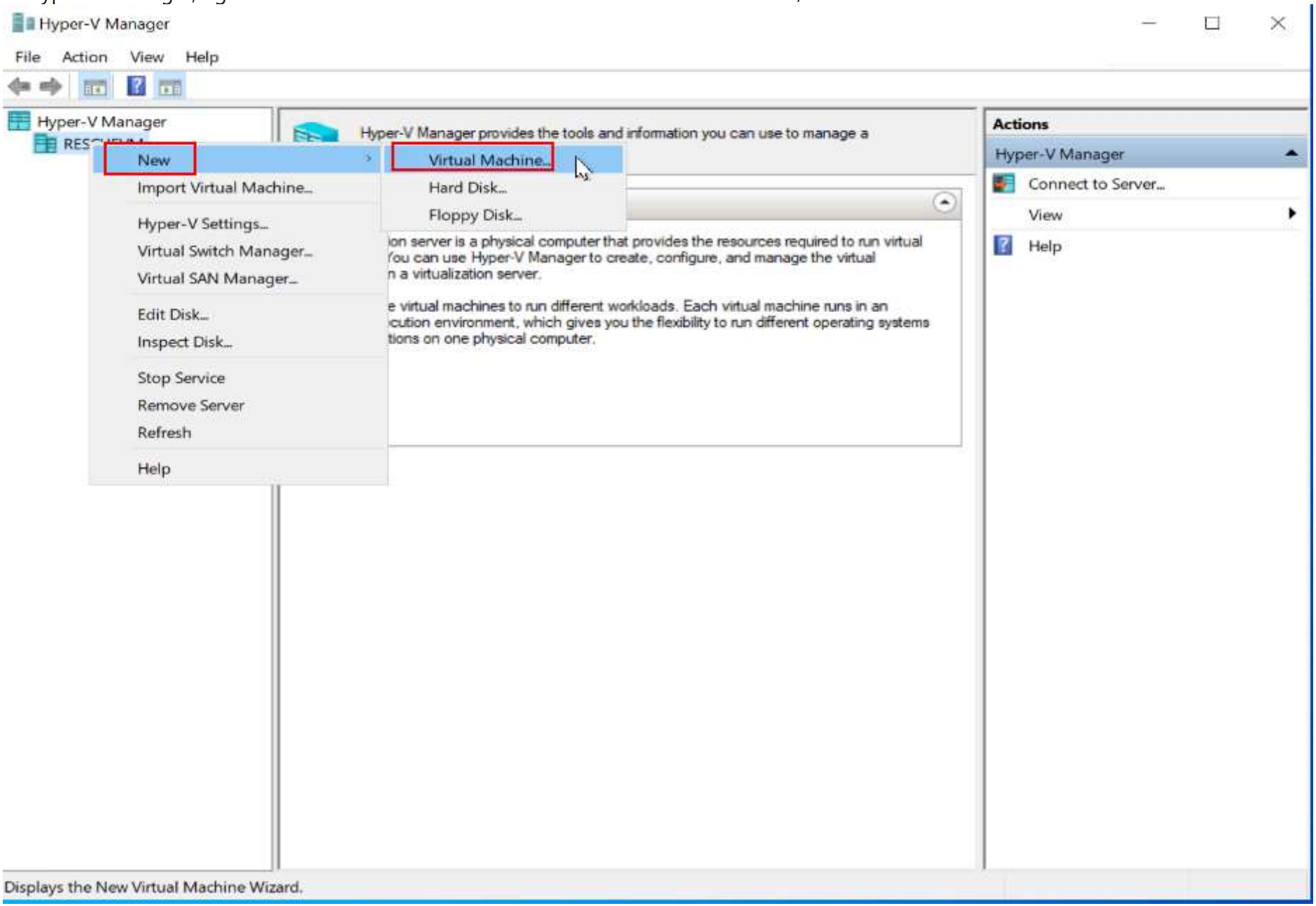


2. In **Server Manager**, select **Hyper-V Manager.**

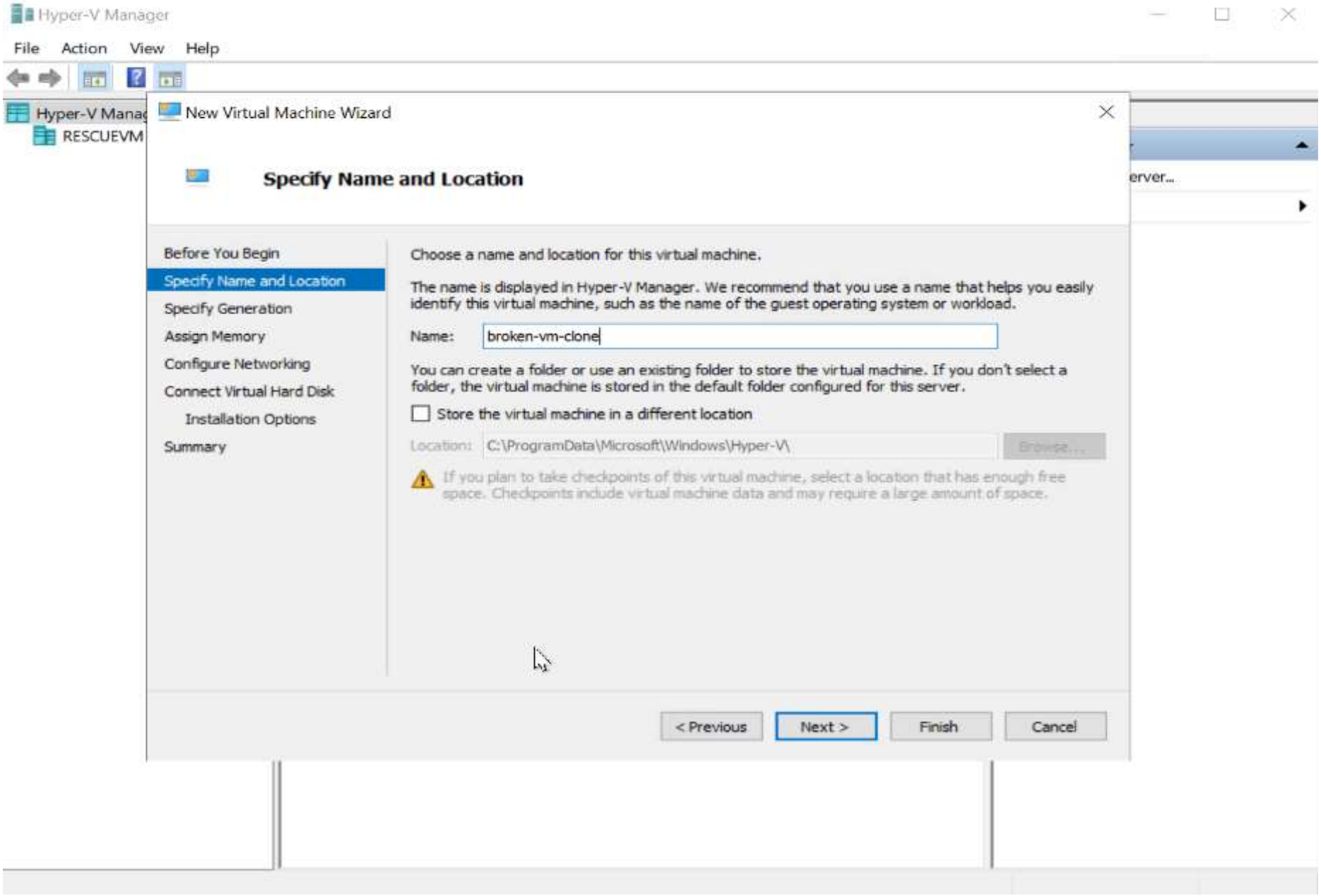


3. Right-click on the server and select **Hyper-V Manager.**

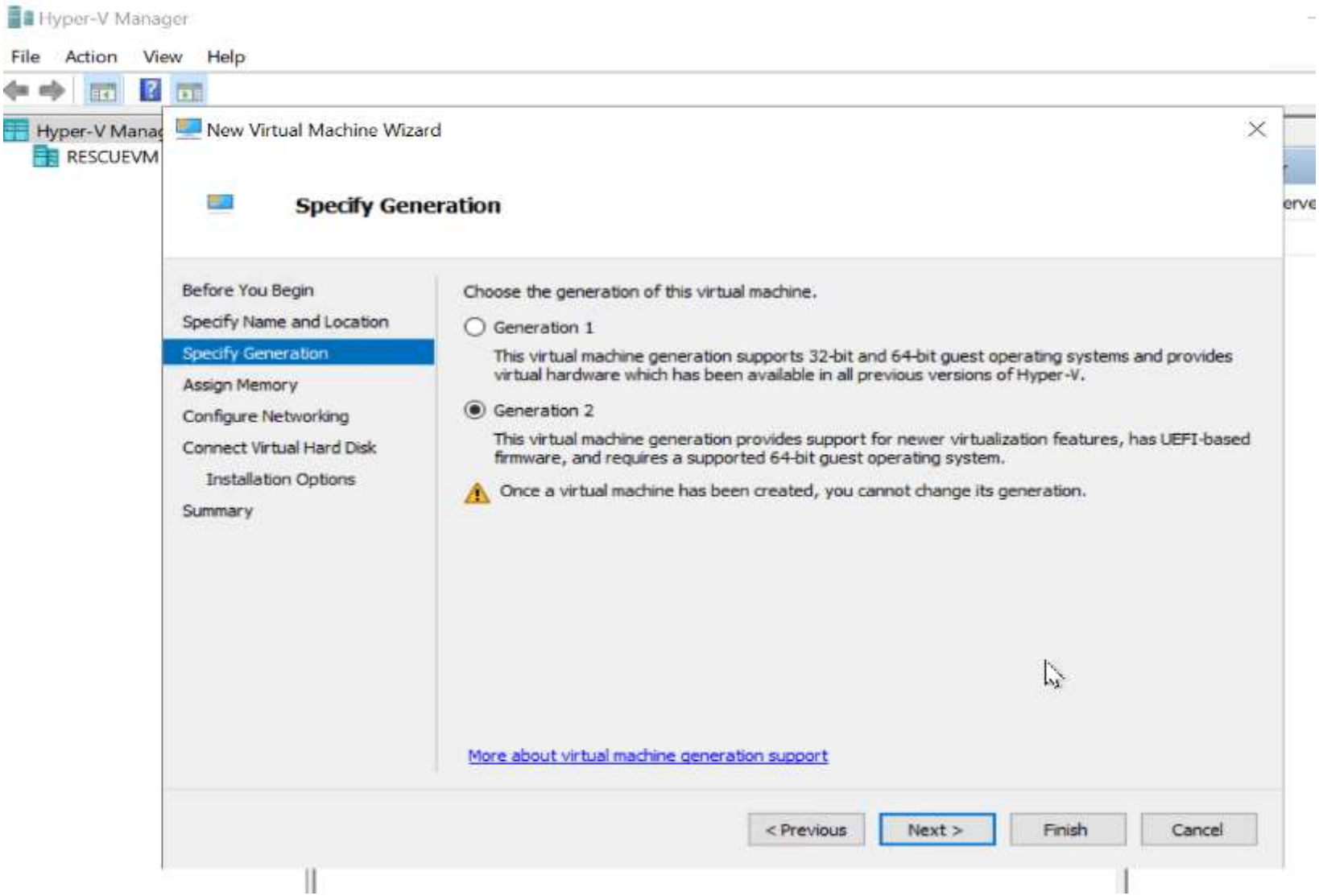
4. In Hyper-V Manager, right-click on the rescue VM and select **New > Virtual Machine**, then click **Next.**



5. Name the virtual machine and click **Next.**



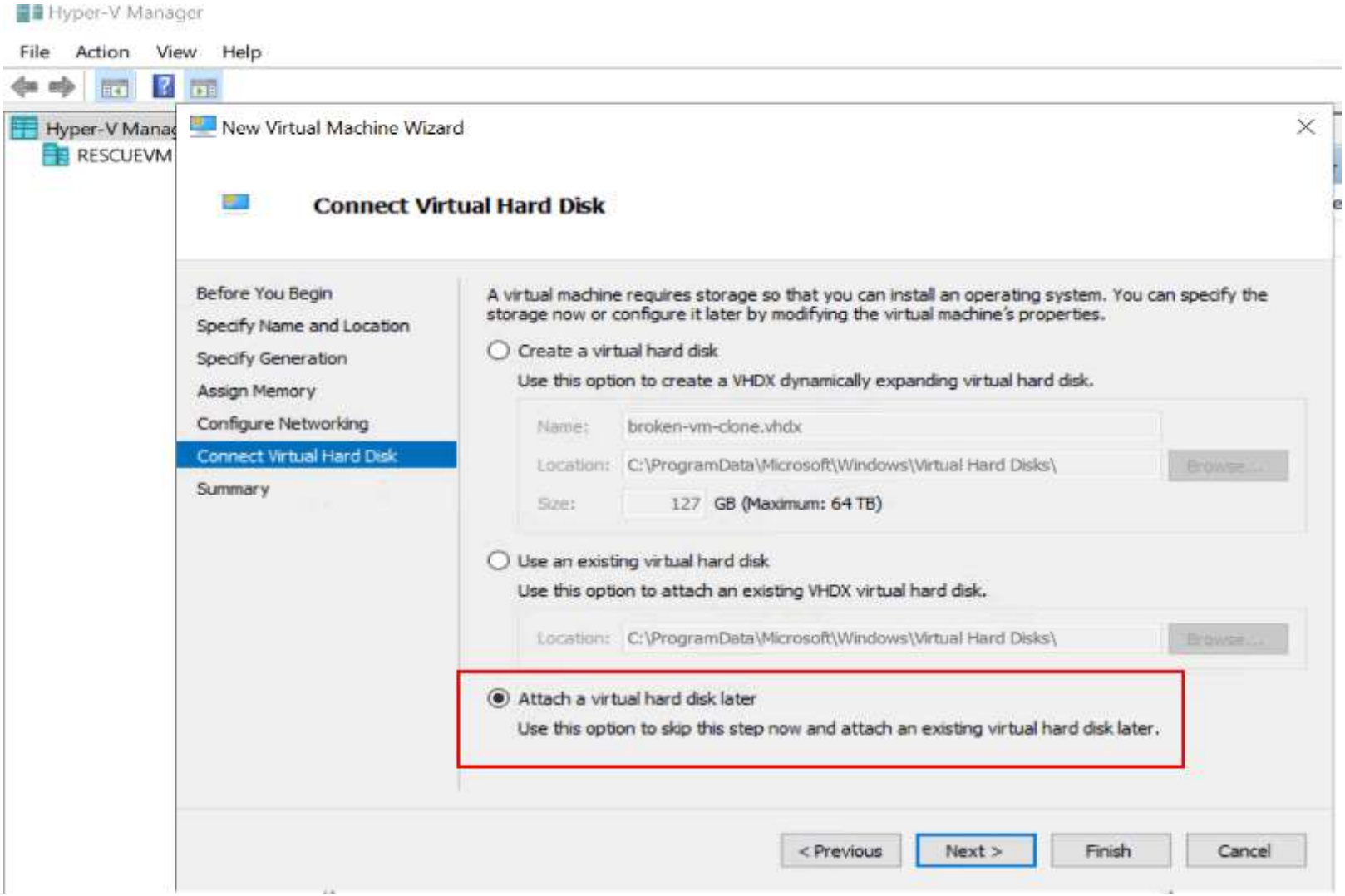
6. Select the generation that matches the source VM. In this example, select **Generation 2.**



7. Leave the startup memory at **4096 MB** unless your VM requires more.

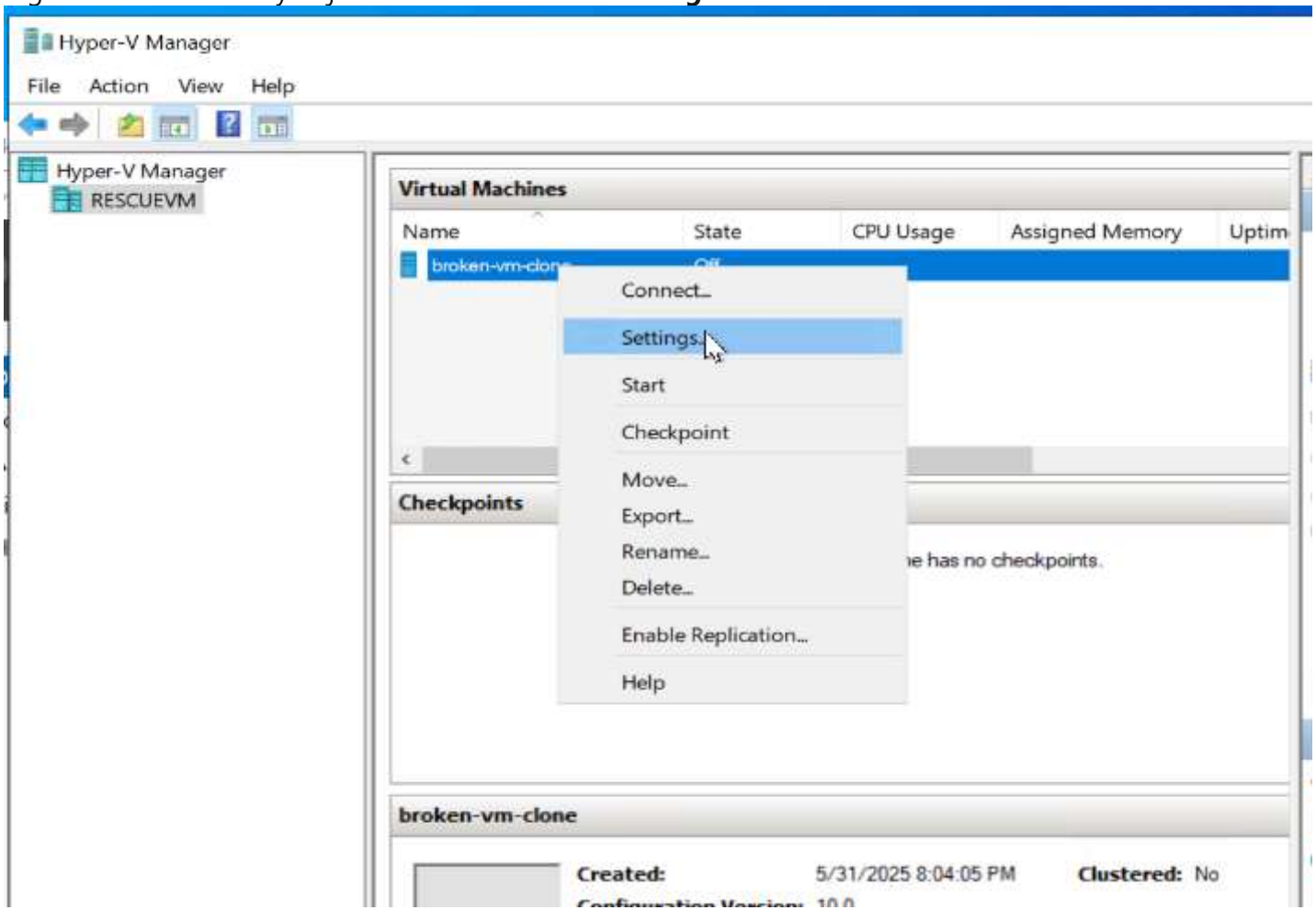
8. In the **Configure Networking** step, leave the connection as **Not connected**.

9. Choose **Attach a virtual hard disk later.**



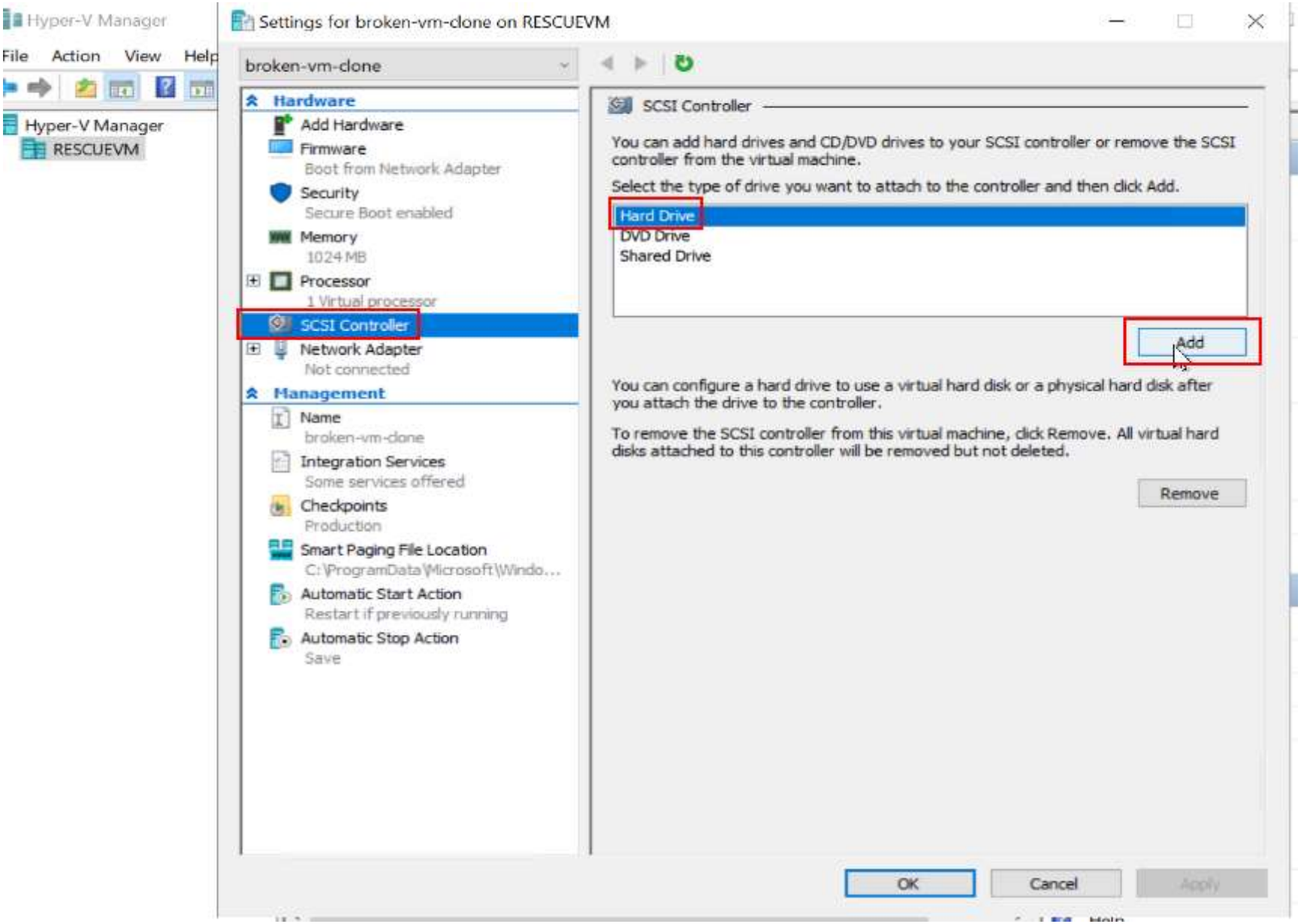
10. Click **Finish** to create the VM.

11. Right-click on the VM you just created and select **Settings.**



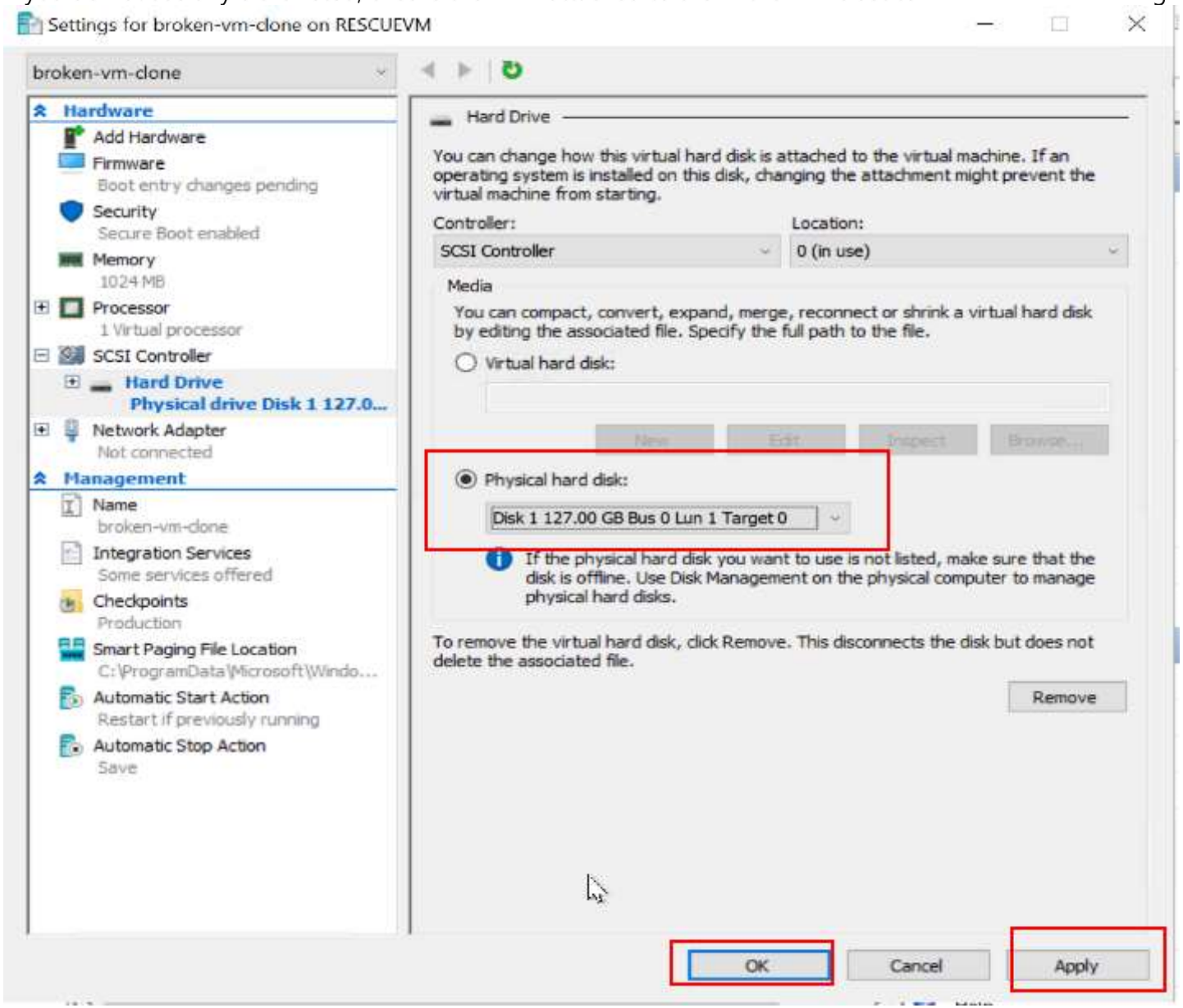
12. Select **SCSI Controller** for a Gen 2 VM (or **IDE Controller** if Gen 1).

13. Select **Hard Drive** and click **Add.**



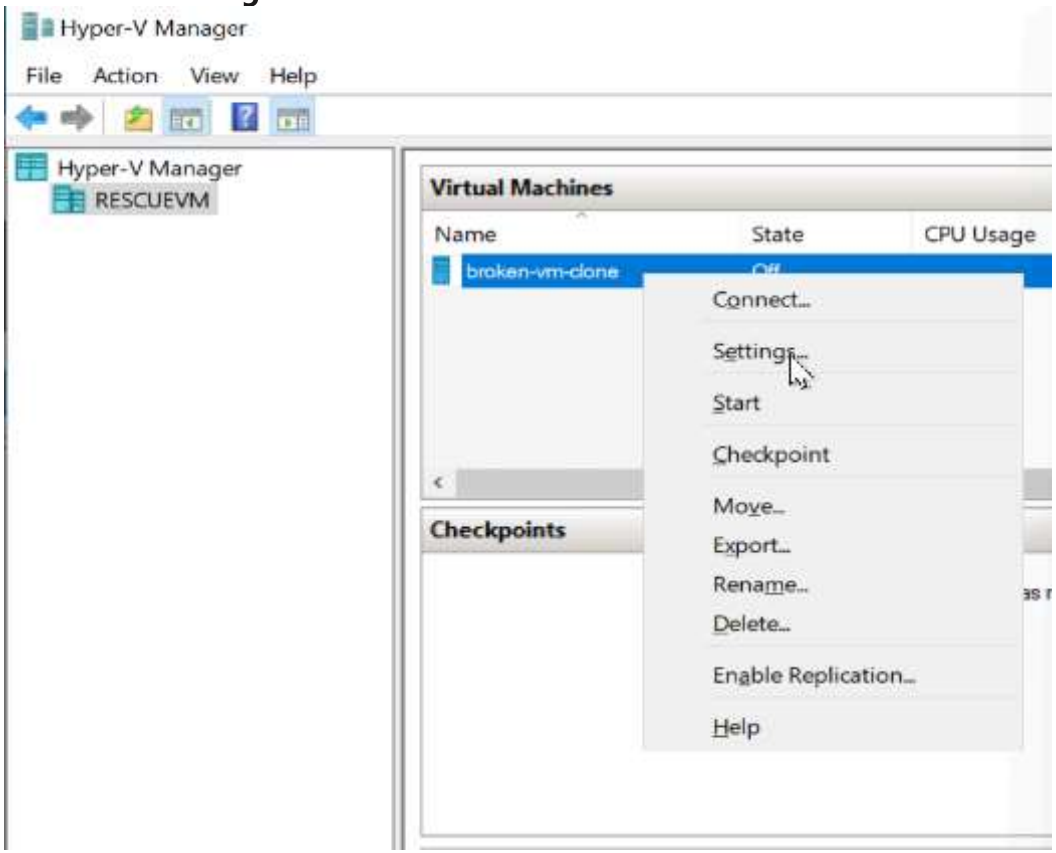
14. Under **Physical Hard Disk**, select the VHD of the broken VM that you attached to the Azure VM.

15. If you do not see any disks listed, ensure the VHD attached to the Azure VM is set to **Offline** in Disk Management on the rescue VM.

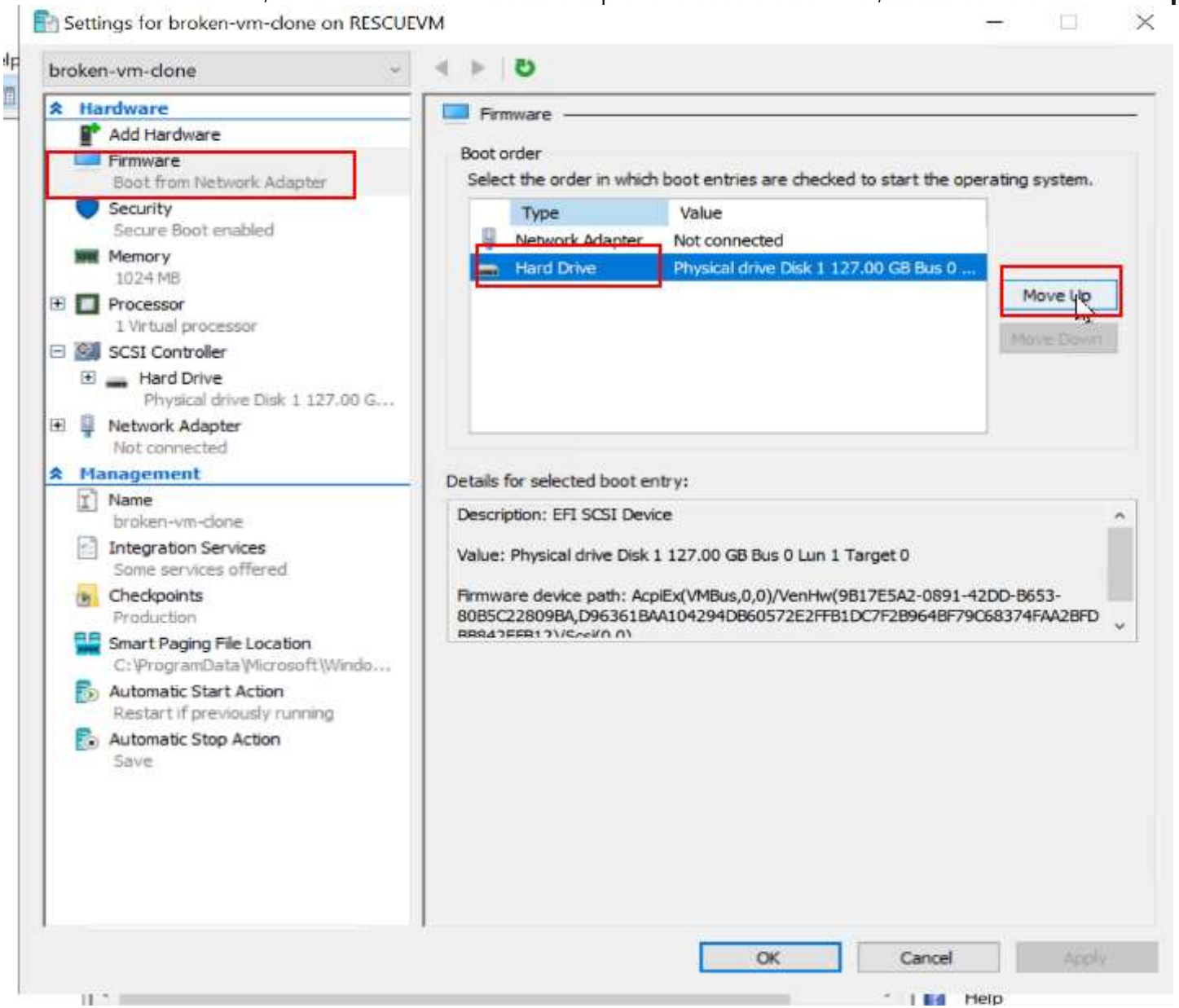


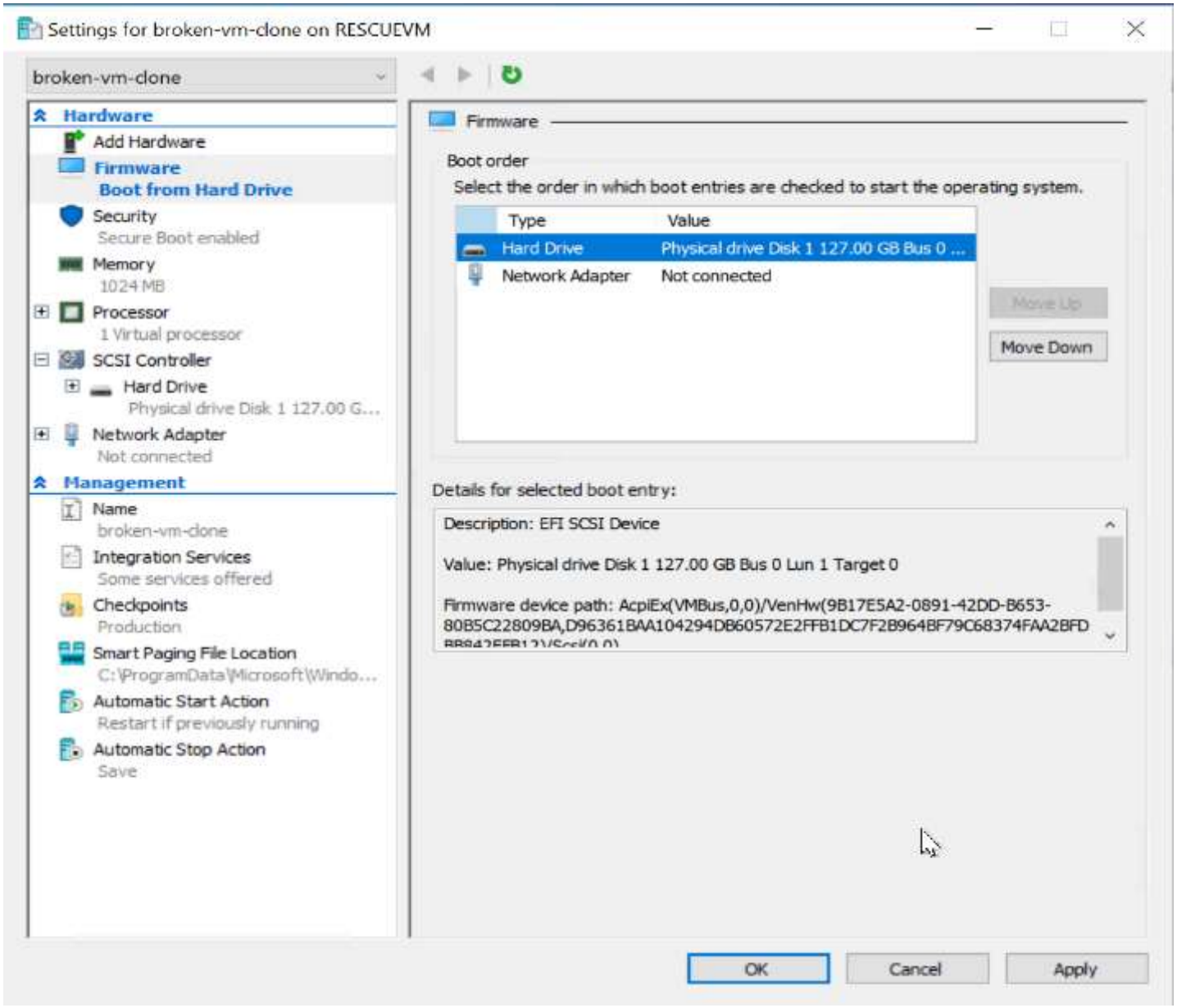
16. Click **Apply** and **OK**.

17. Go back to **Settings**:



18. In the **Firmware** section, ensure **Hard Drive** is at the top of the boot order. If not, select it and click **Move Up.**





Click **Apply** and **OK** to save the changes.

19. Double-click on the VM and click **Start**.

At this point, you are ready to work on your VM as you would with any on-premises VM. You can now proceed with any troubleshooting or mitigation steps as needed.

Step 7 (Optional): Hyper-V DHCP Setup

If you need to test RDP connectivity from the Rescue VM to the Hyper-V VM, follow these steps to create a virtual switch, install the DHCP role on the Rescue VM, configure an IP scope, and connect the Hyper-V VM to the newly created virtual switch.

1. **Create a Virtual Switch**
   Connect to the Rescue VM, open an administrative PowerShell session, and run:

```
New-VMSwitch -Name "DHCPRescueSwitch" -SwitchType Internal
```

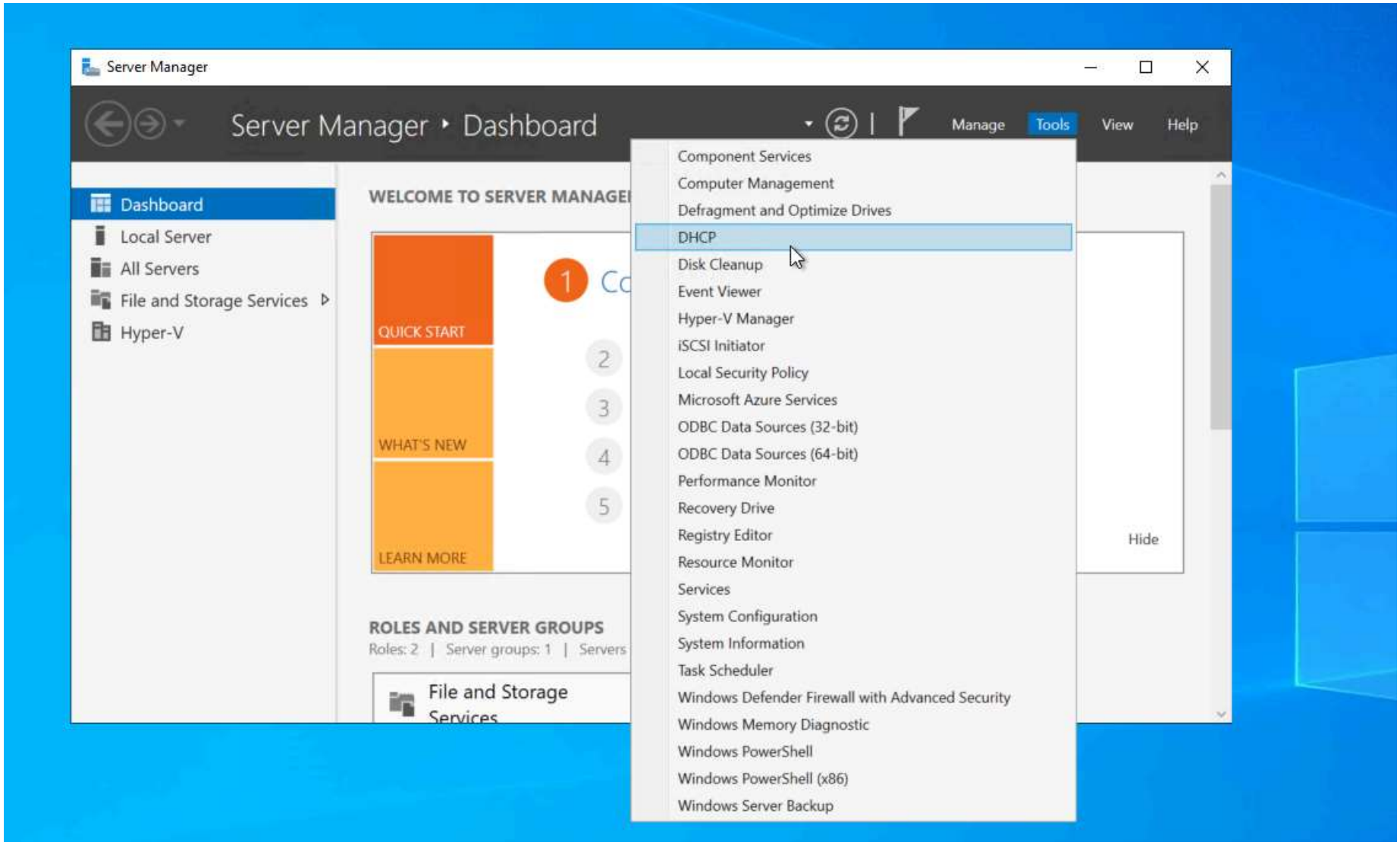
2. **Assign a Static IP to the Host Interface**

```
New-NetIPAddress -IPAddress 192.168.100.1 -PrefixLength 24 -InterfaceAlias "vEthernet (DHCPRescueSwitch)"
```

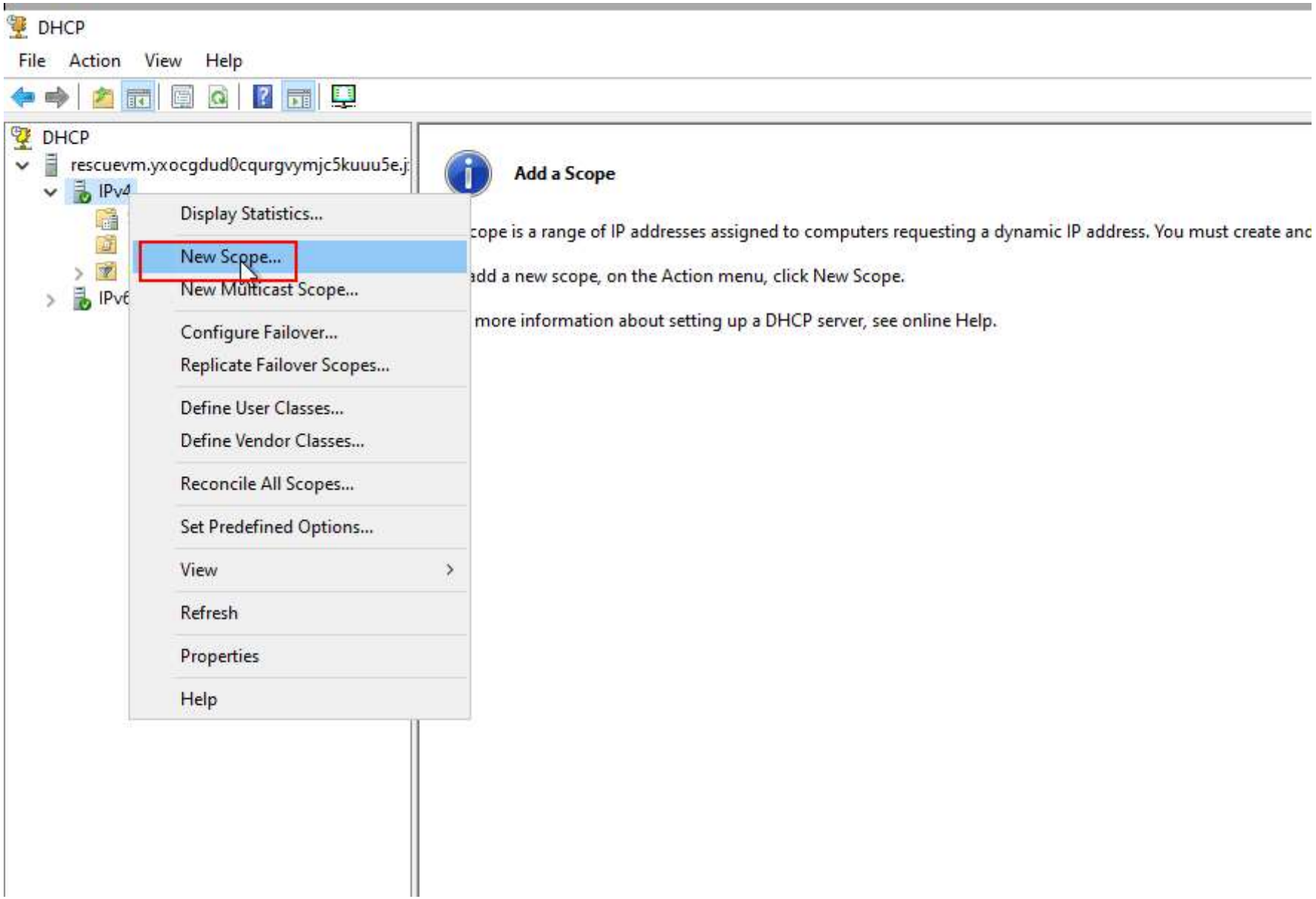
3. **Install the DHCP Server Role on the Rescue VM (Windows Server only)**

```
Install-WindowsFeature -Name DHCP -IncludeManagementTools
```

4. **Configure the DHCP Scope**
   - Open **Server Manager** on the Rescue VM.
   - Go to **Tools > DHCP**.



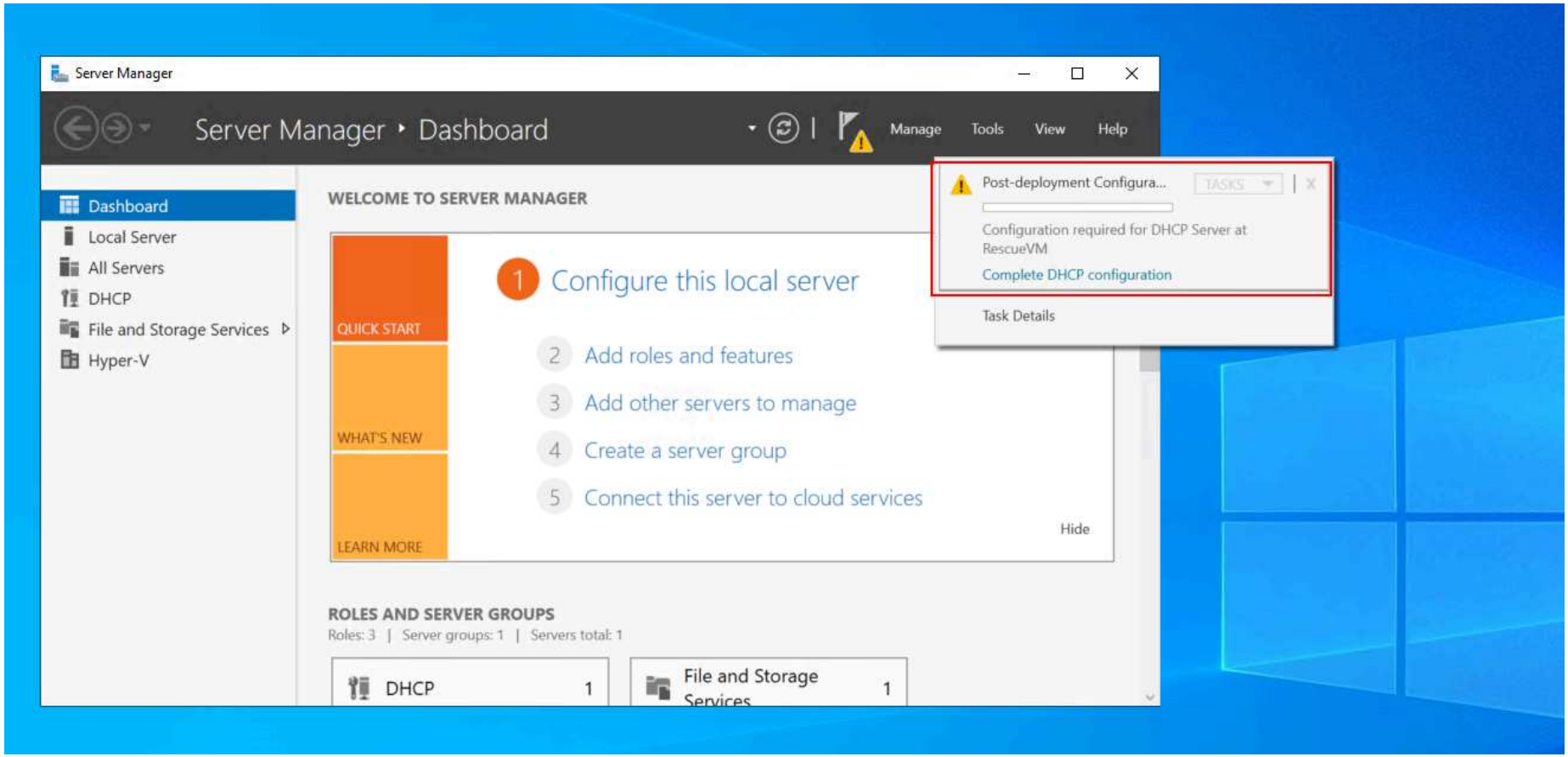
5. **Create a New Scope**
    - Select your server, expand **IPv4**, right-click **IPv4**, and select **New Scope**.

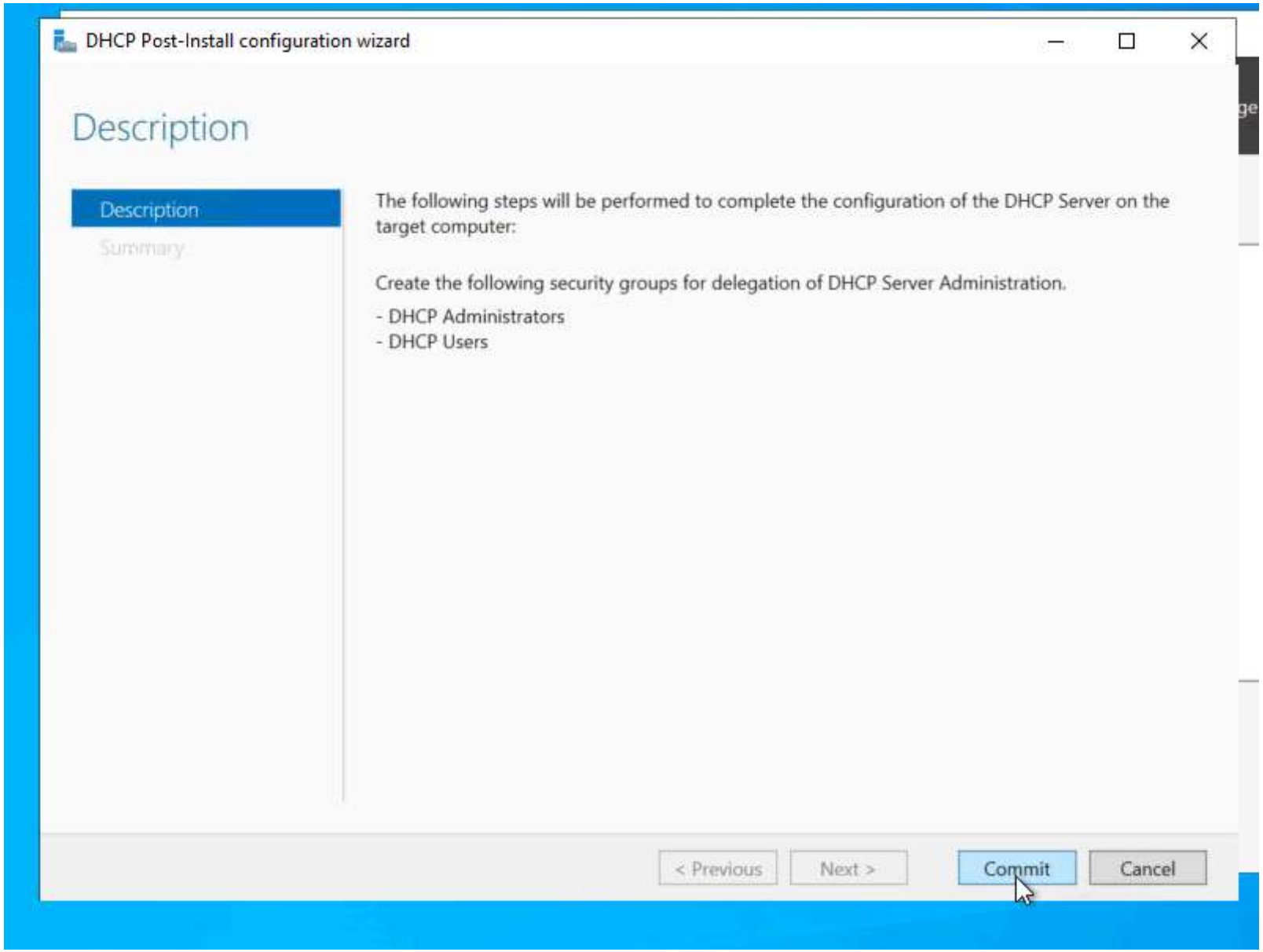


6. **Define Scope Settings**

   - **Scope Name:**
     - Name: `TestScope`
     - Description: (leave blank)
   - **IP Address Range:**

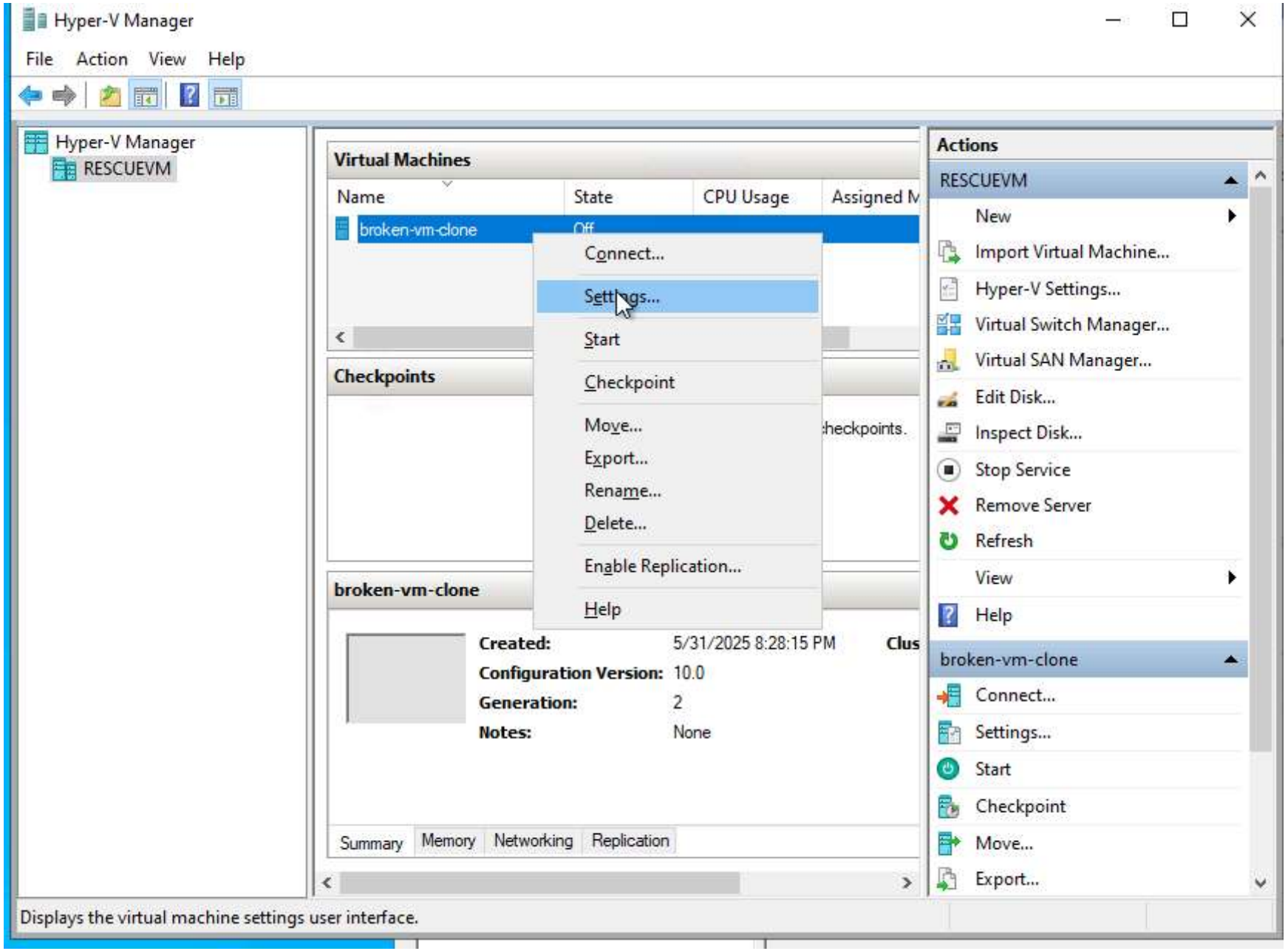
        - Start IP address: `192.168.100.10`
        - End IP address: `192.168.100.100`
        - Length: `24`
        - Subnet mask: `255.255.255.0`
    - **Exclusions and Lease Duration:** Leave as default.
    - **Configure DHCP Options:** Select **Yes, I want to configure these options now**.
    - **Router (Default Gateway):** Enter `192.168.100.1` and click **Add.**
    - **Domain Name and DNS Server:** If an address like `168.63.129.16` is listed, select it and click **Remove**.
    - **WINS Servers:** Leave as is.
7. Finish the configuration by going to **Server Manager** and clicking on the yellow alert, then selecting **Complete DHCP configuration**:


Server Manager
Server Manager ▸ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
DHCP
File and Storage Services
Hyper-V
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
Post-deployment Configura...
TASKS
Configuration required for DHCP Server at RescueVM
Complete DHCP configuration
Task Details
ROLES AND SERVER GROUPS
Roles: 3 | Server groups: 1 | Servers total: 1
DHCP 1
File and Storage Services 1

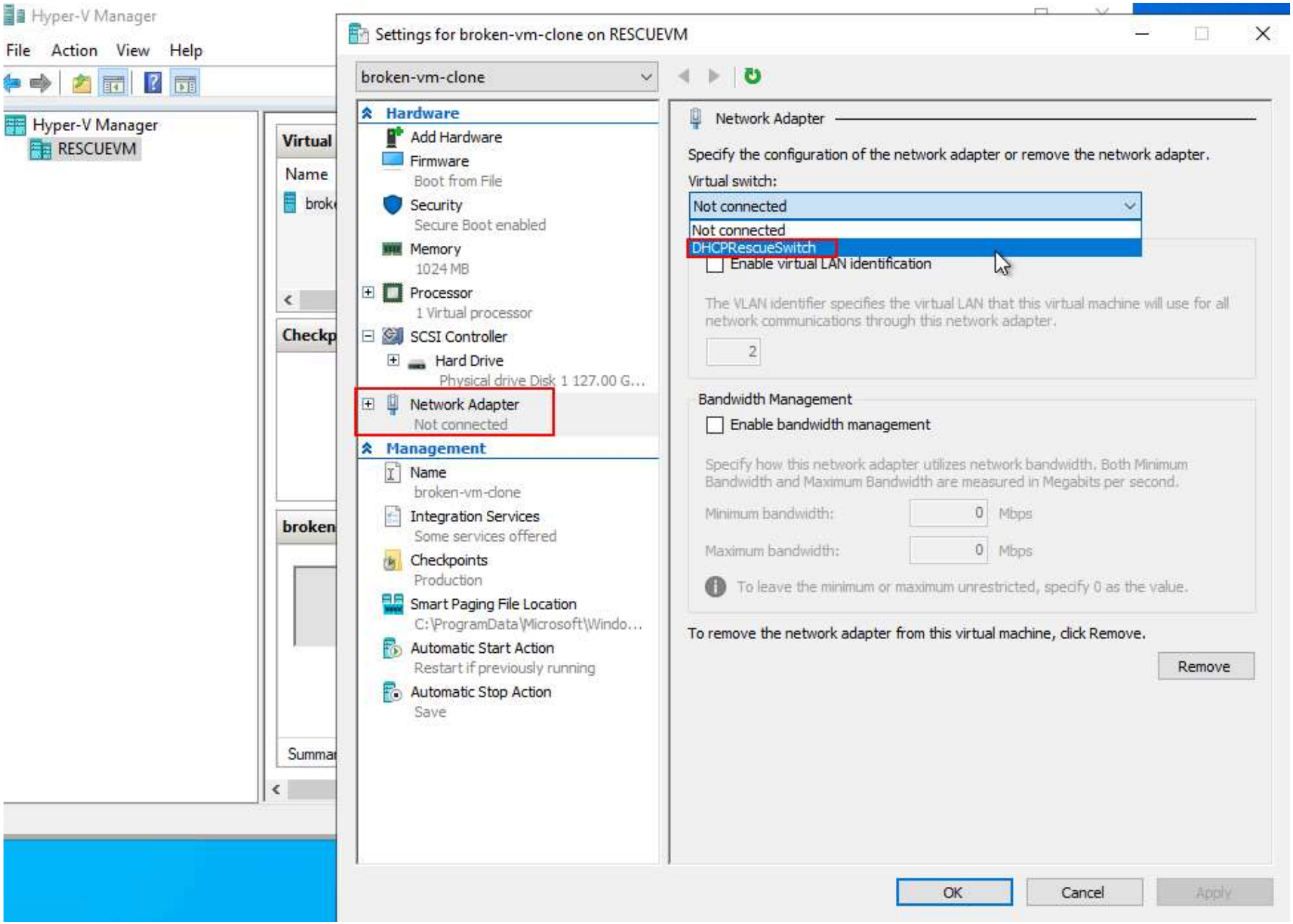


8. **Assign the Virtual Switch to the Hyper-V VM:**
   Ensure the Hyper-V VM is turned off.

9. Right-click on the Hyper-V VM and select **Settings**:



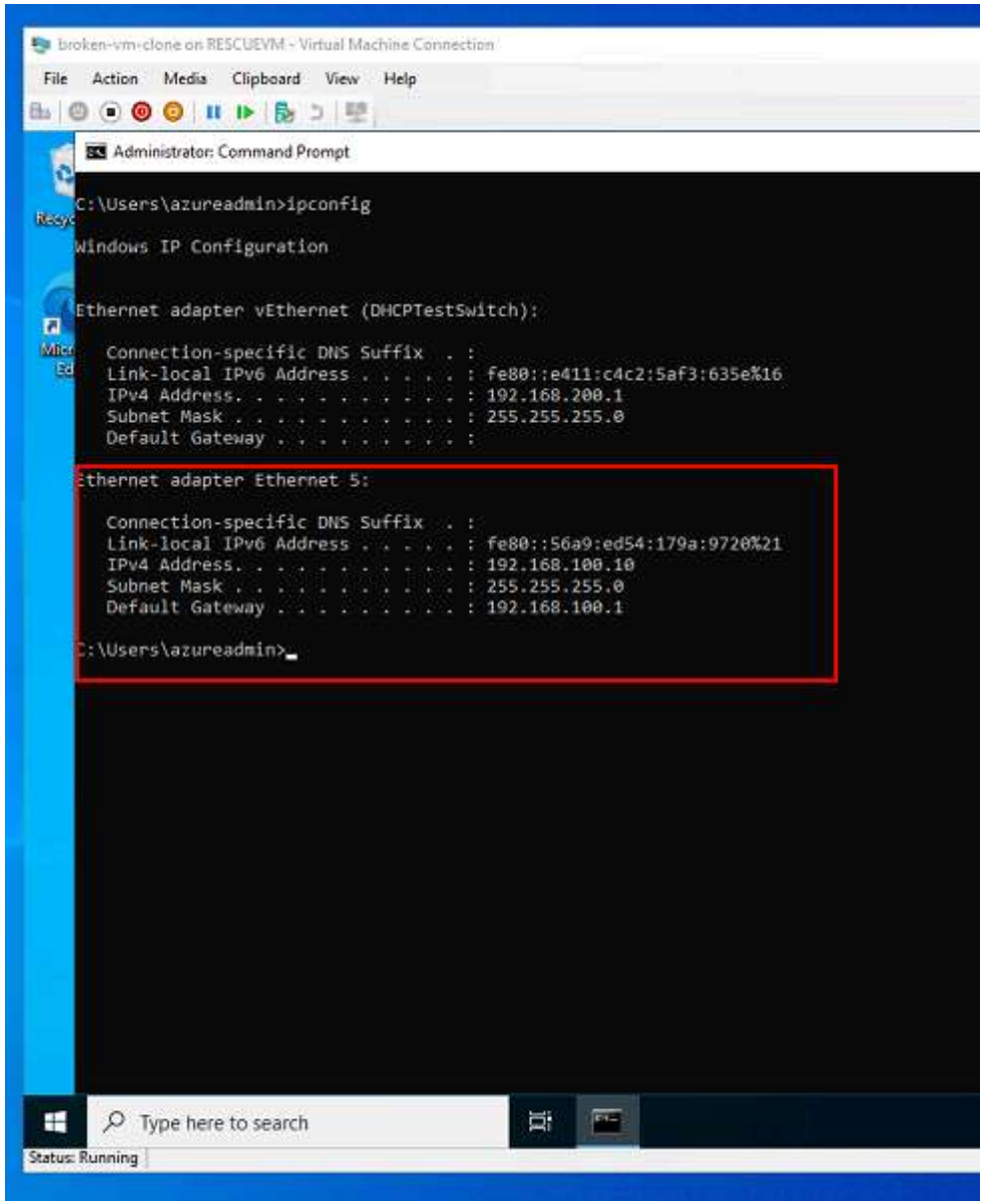
10. Select **Network Adapter**, and under **Virtual Switch**, choose the switch you recently created:



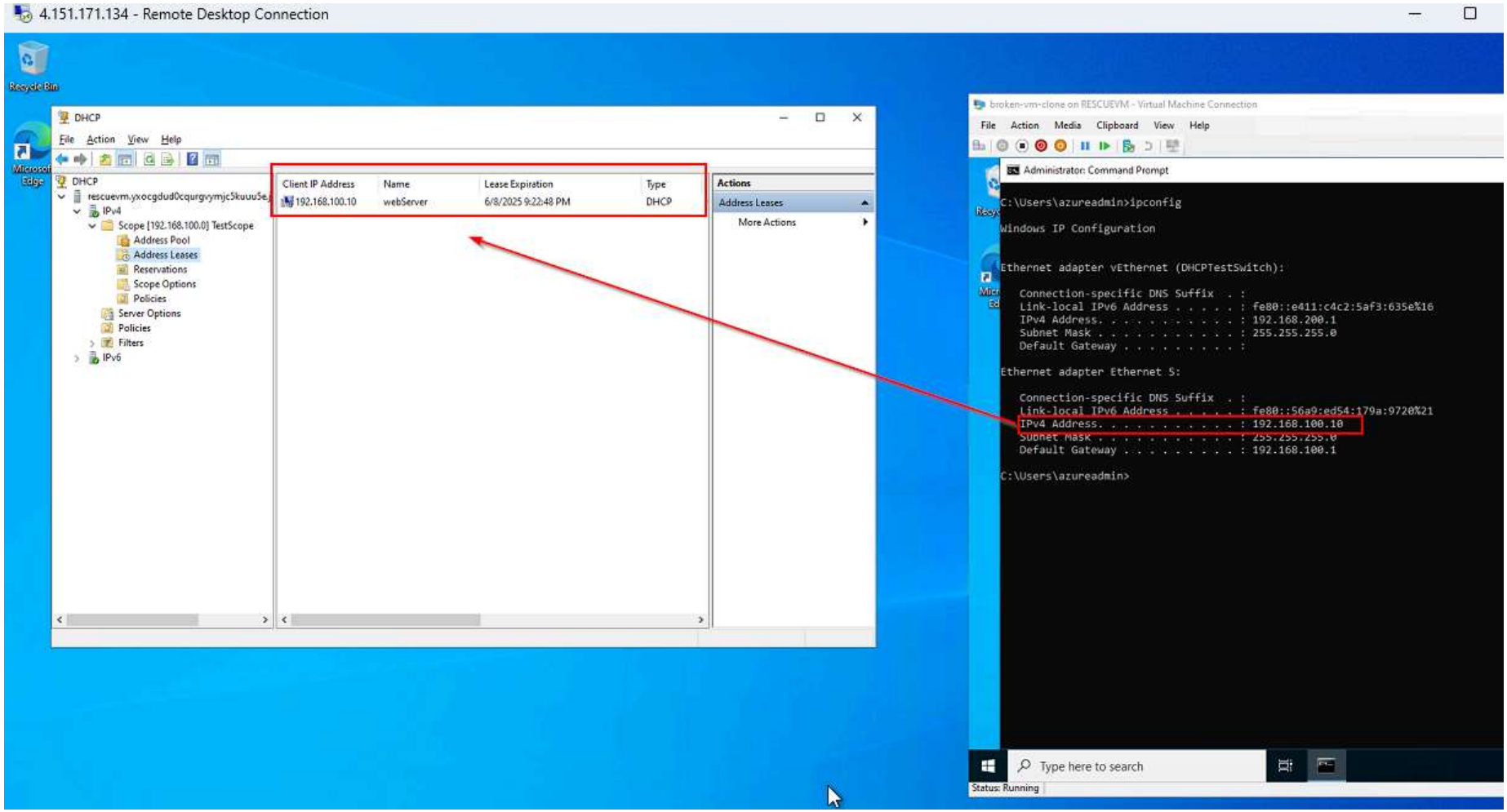
Click **Apply** and **OK** to save the changes.

11. Power on the Hyper-V VM and check if an IP address has been assigned:

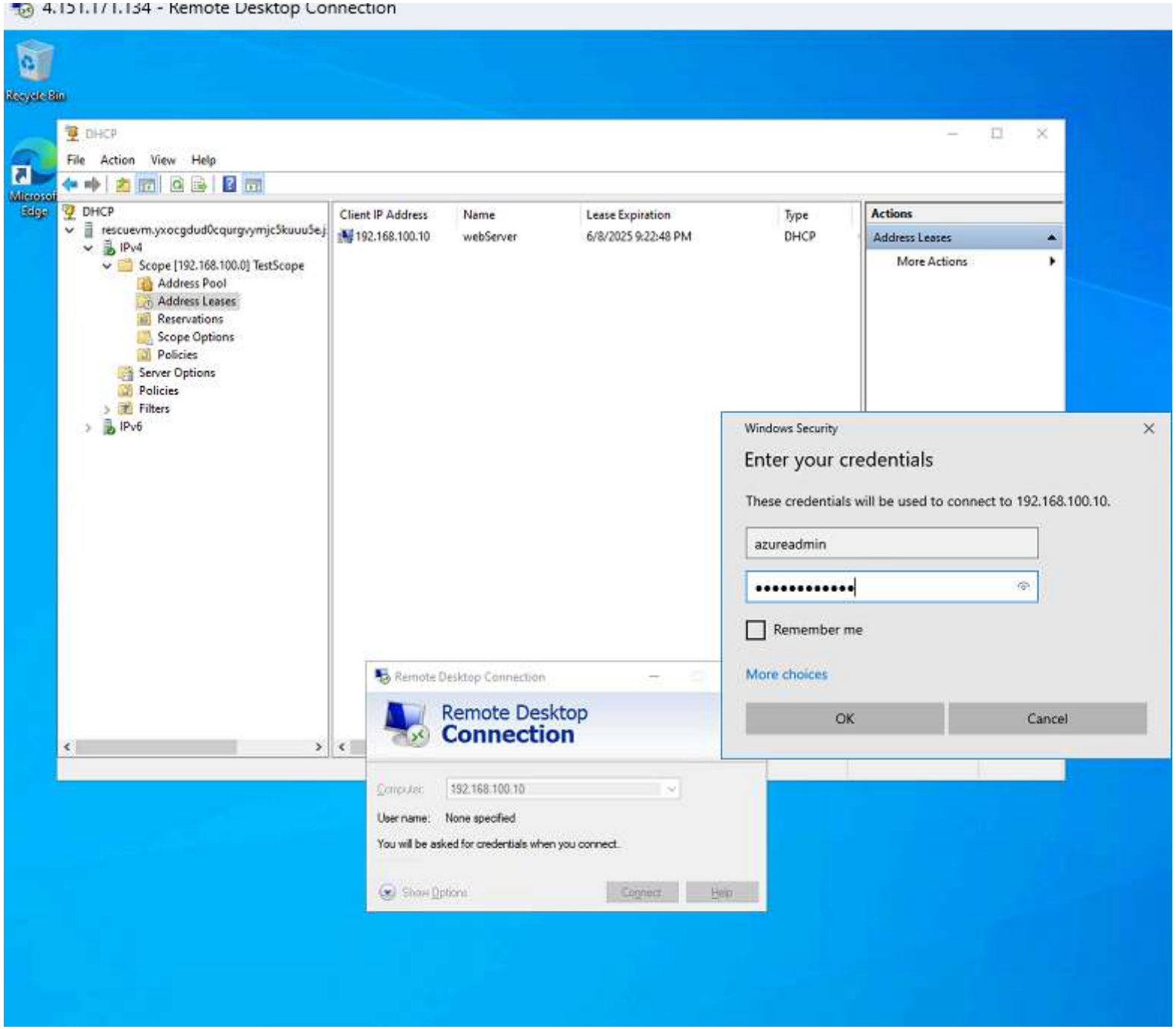
Inside the Hyper-V VM, run `ipconfig`. You should see one of the IP addresses from the DHCP scope you created on the rescue VM:



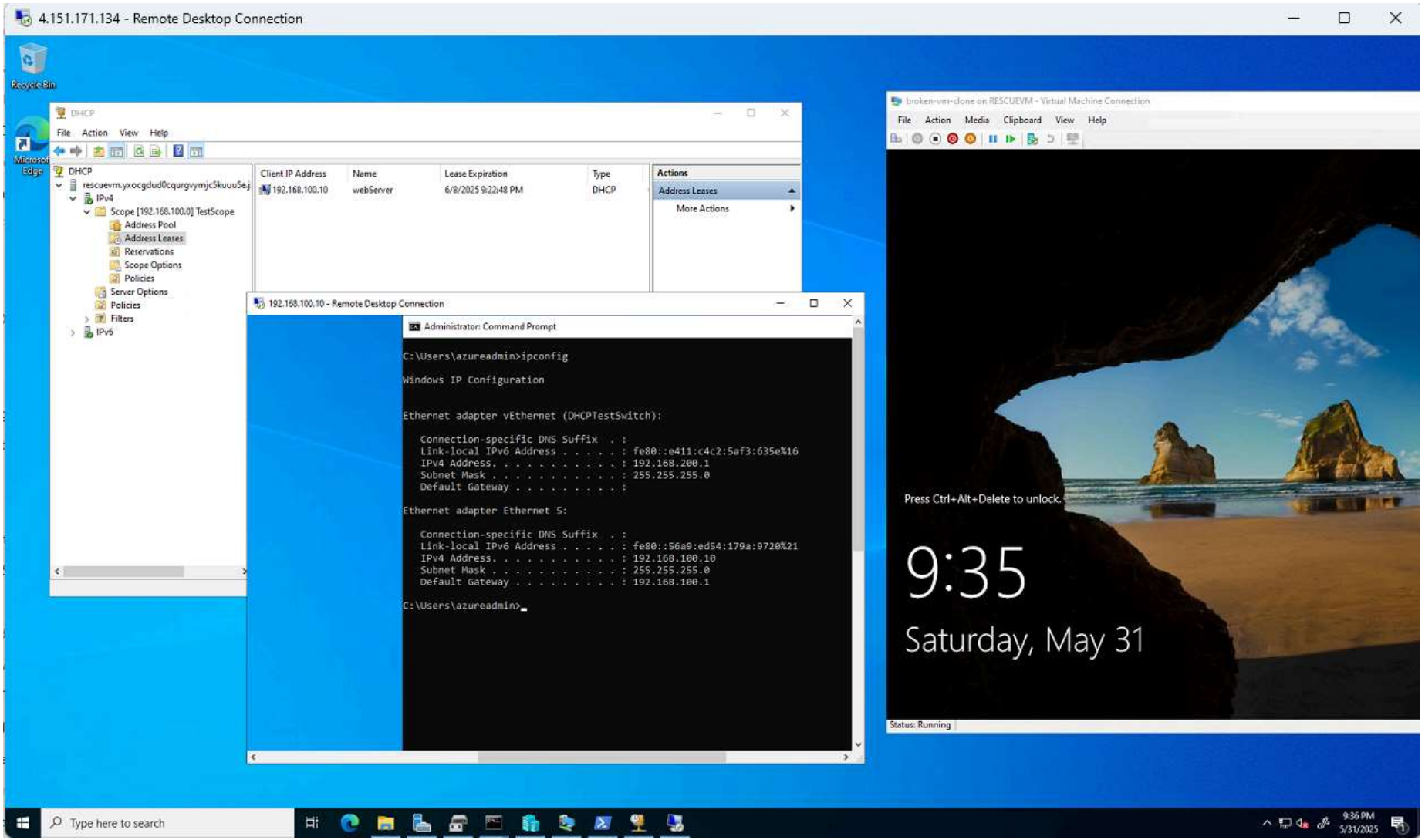
You can also verify the assigned IP address in the rescue VM under **Address Leases** for the DHCP scope:



12. Now, try to RDP to the Hyper-V VM from the rescue VM:

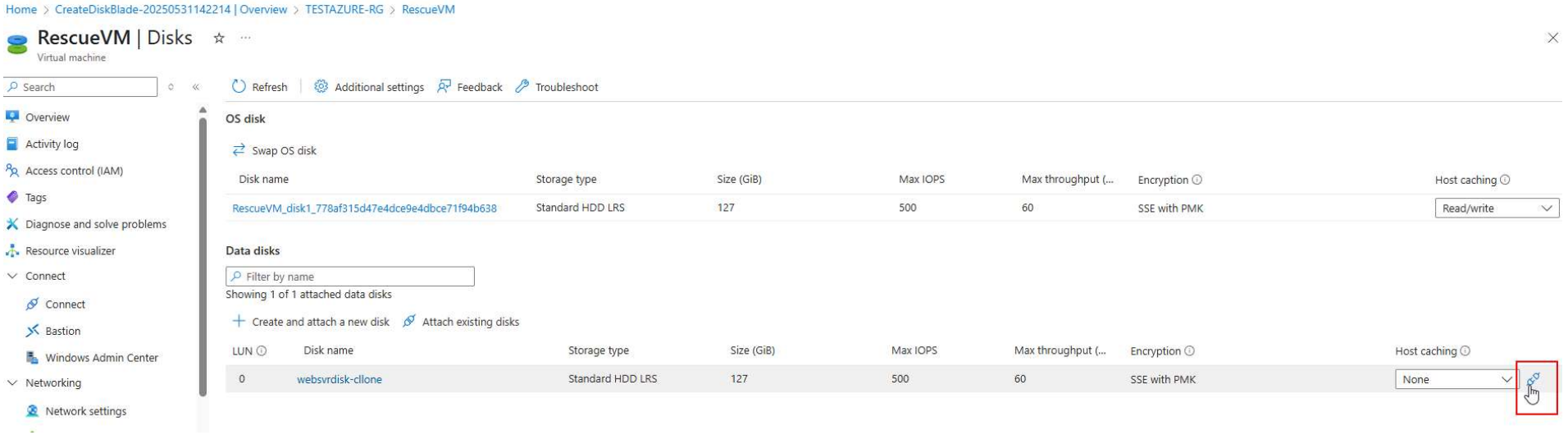


You should now have a remote desktop connection:



Step 8: Swap Broken OS Disk with Fixed Disk

1. Once you have the VM back online, shut down the nested VM in Hyper-V Manager.
2. In the Azure Portal, select the Rescue VM, then go to **Disks.**
3. Detach the now fixed VHD from the Rescue VM.


Home > CreateDiskBlade-20250531142214 | Overview > TESTAZURE-RG > RescueVM
RescueVM | Disks
Virtual machine
Search
Refresh
Additional settings
Feedback
Troubleshoot
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Connect
Bastion
Windows Admin Center
Networking
Network settings
OS disk
Swap OS disk
Disk name
Storage type
Size (GiB)
Max IOPS
Max throughput (...
Encryption
Host caching
RescueVM_disk1_778af315d47e4dce9e4dbce71f94b638
Standard HDD LRS
127
500
60
SSE with PMK
Read/write
Data disks
Filter by name
Showing 1 of 1 attached data disks
Create and attach a new disk
Attach existing disks
LUN
Disk name
Storage type
Size (GiB)
Max IOPS
Max throughput (...
Encryption
Host caching
0
websvrdisk-cllone
Standard HDD LRS
127
500
60
SSE with PMK
None

RescueVM | Disks

Virtual machine

Search

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Connect
Bastion
Windows Admin Center
Networking
Network settings
Load balancing
Application security groups
Network manager
Settings
Disks
Extensions + applications

Refresh | Additional settings | Feedback | Troubleshoot

OS disk

Swap OS disk

Disk name	Storage type
RescueVM_disk1_778af315d47e4dce9e4dbce71f94b638	Standard HDD LRS

Data disks

Filter by name

Showing 0 of 0 attached data disks

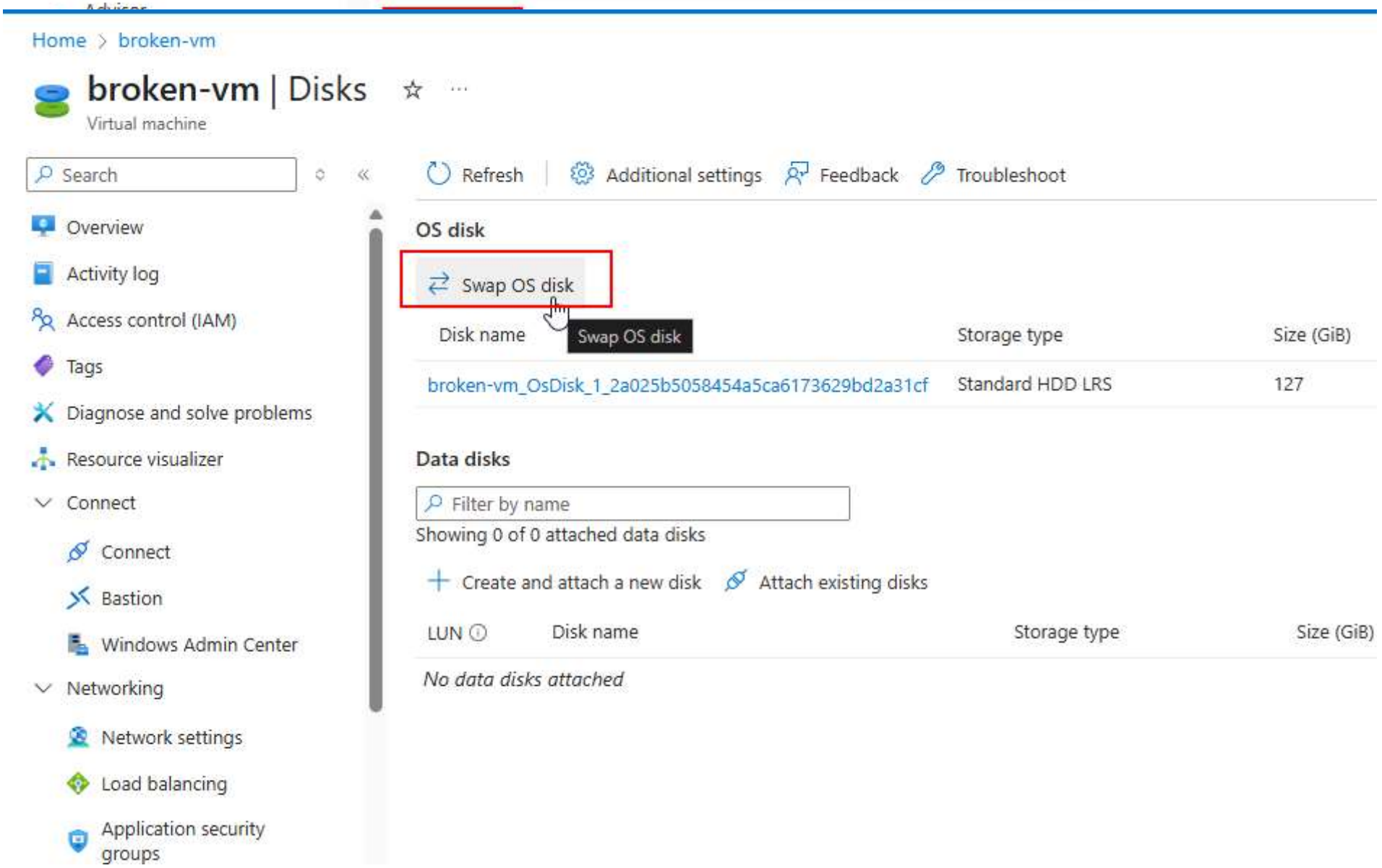
Create and attach a new disk | Attach existing disks

LUN	Disk name	Storage type

No data disks attached

4. Replace the OS disk used by the faulty VM:

a. Go to the broken VM, then to **Disks**, and select **Swap OS disk**.



b. Select the fixed disk, type the VM name, and click **OK**.

Swap OS Disk ...

Swap the OS disk for a backup disk or another disk for VM troubleshooting, Learn more.

Choose disk *

Select an existing disk

All disks

webServer-DiskCopy-20250302204201
size: 127 GiB, account type: Standard HDD LRS, resource group: TEST-CUSTOMFQDN-RG, disk shares ...

webServer-DiskCopy-20250302235934
size: 127 GiB, account type: Standard HDD LRS, resource group: TEST-CUSTOMFQDN-RG, disk shares ...

broken-vm-DiskCopy-20250531174243
size: 127 GiB, account type: Standard HDD LRS, resource group: TESTAZURE-RG, disk shares used 0 of ...

Disks in resource group 'TESTAZURE-RG'

broken-vm-DiskCopy-20250531174243
size: 127 GiB, account type: Standard HDD LRS, disk shares used 0 of 1

Swap OS Disk ...

Swap the OS disk for a backup disk or another disk for VM troubleshooting, Learn more.

Choose disk *

broken-vm-DiskCopy-20250531174243

⚠ This VM will be stopped (deallocated) and the OS disk will be replaced. Any existing data on the OS disk will be lost.

Confirm you want to swap the OS disk for this VM by entering the name of the vm 'broken-vm'

broken-vm

Cred

▼ Cli

If the customer requests a credit refund for the extra work involved in creating the nested environment for troubleshooting, follow this process:

1. Open a problem ticket to Billing with the following details in the issue description area:
    - **Product:** Azure Billing
    - **Support topic:** Credit request / Help with credit request for a scenario not listed
    - **Issue description:**

```
Subscription ID for the affected subscription:
Services affected (SQL Server, Virtual Machine):
Instance ID:
VM Size:
Problem description:
Cause:
Effect:
Issue start (in UTC):
Issue end (in UTC):
```

Need additional help or have feedback?

To engage the Azure RDP-SSH SMEs...	*To provide feedback on this page...*	*To provide kudos on this page...*
If you are in the **OneVM team** then reach out to the **RDP-SSH SMEs** AVA channel via Teams. If you are a **VM Delivery Partner** then follow your team's process for swarming or ask your TA. Make sure to use the **Ava process** for faster assistance.	Use the **RDP-SSH Feedback** form to submit detailed feedback on improvements or new content ideas for RDP-SSH. ***Please note*** the link to the page is required when submitting feedback on existing pages! If it is a new content idea, please put N/A in the Wiki Page Link.	Use the **RDP-SSH Kudos** form to submit kudos on the page. Kudos will help us improve our wiki content overall! ***Please note*** the link to the page is required when submitting kudos!