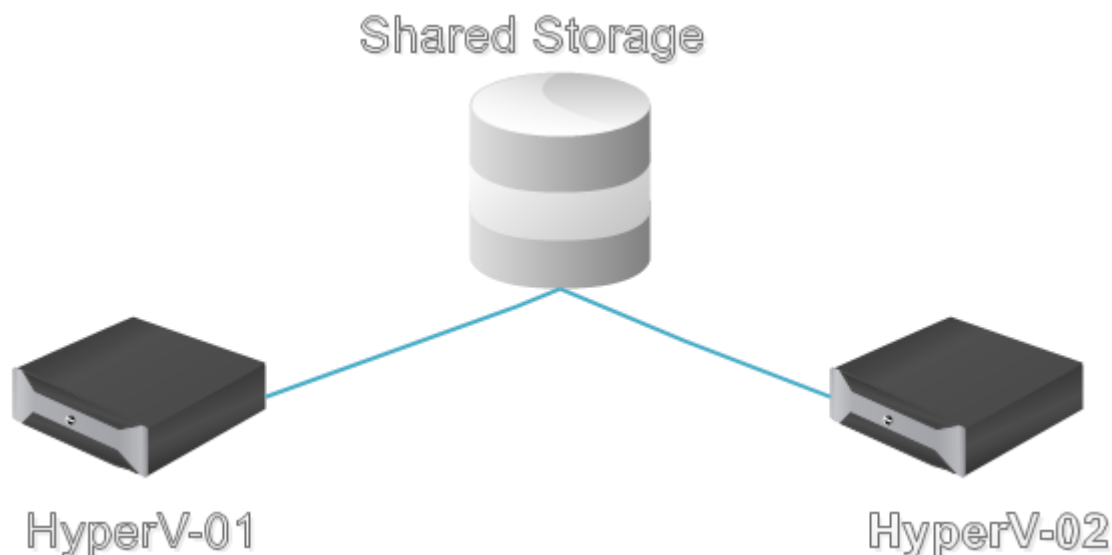


Lab10: Hypver-V Cluster:



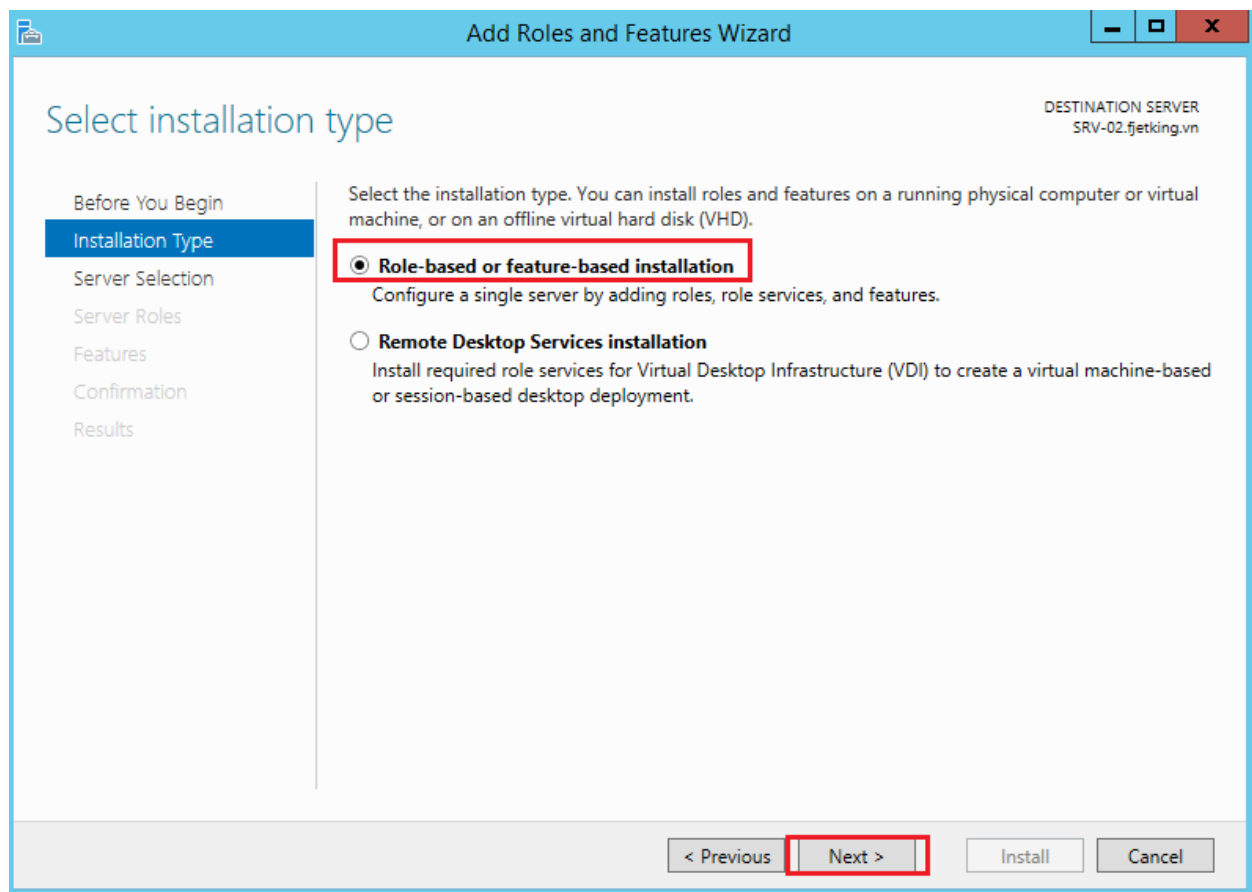
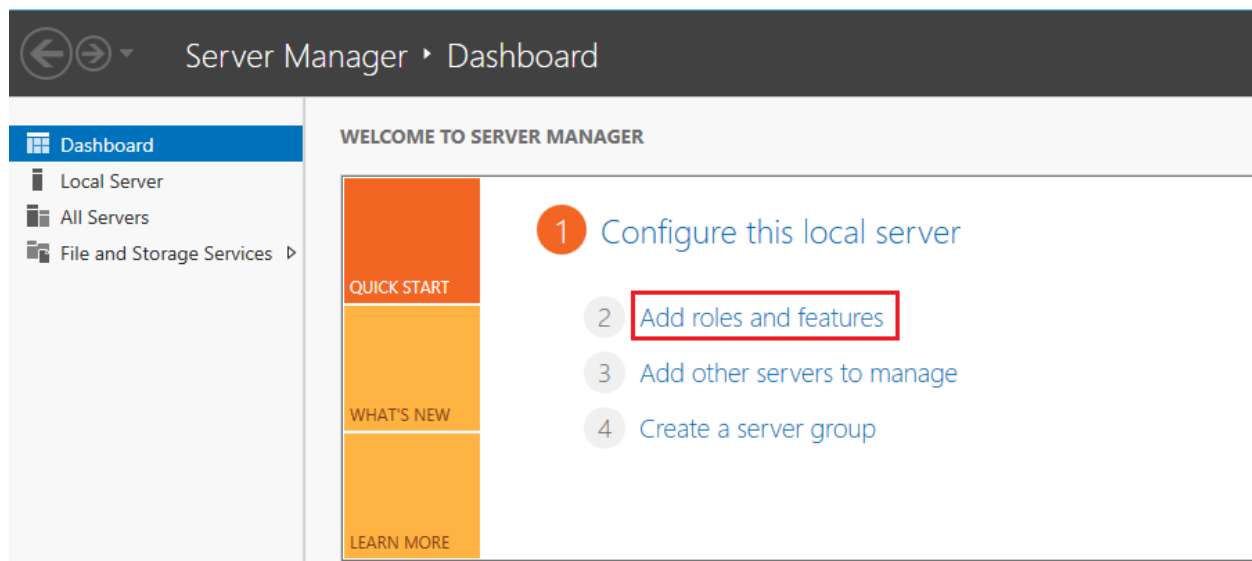
- Chuyển bị 03 VMs Windows 2012 R2 Datacenter
- + DC: Domain controller, Shared Storage
- + HyperV-Host01: Joind domain, cài HypverV, Failover Cluster Roles
- + HyperV-Host02: Joined domain, Cài HyperV, Failover Cluster Roles
- Bài LAB gồm các bước chính sau đây:
 - 1- Cấu hình Shared Storage cho Cluster
 - 2- Kết nối Hyper-V Hosts đến Shared Storage
 - 3- Cài đặt HyperV, Failover Cluster roles
 - 4- Tạo các volume cần thiết cho Failover Cluster
 - 5- Tạo Failover Cluster
 - 6- Add disk cho Failover Cluster
 - 7- Kiểm tra tính tương thích của Failover Cluster
 - 8- Tạo máy ảo trong Cluster
 - 9- Kiểm tra tính chịu lỗi (Unplanned Failover)
 - 10- Live Migration (Planned Failover)

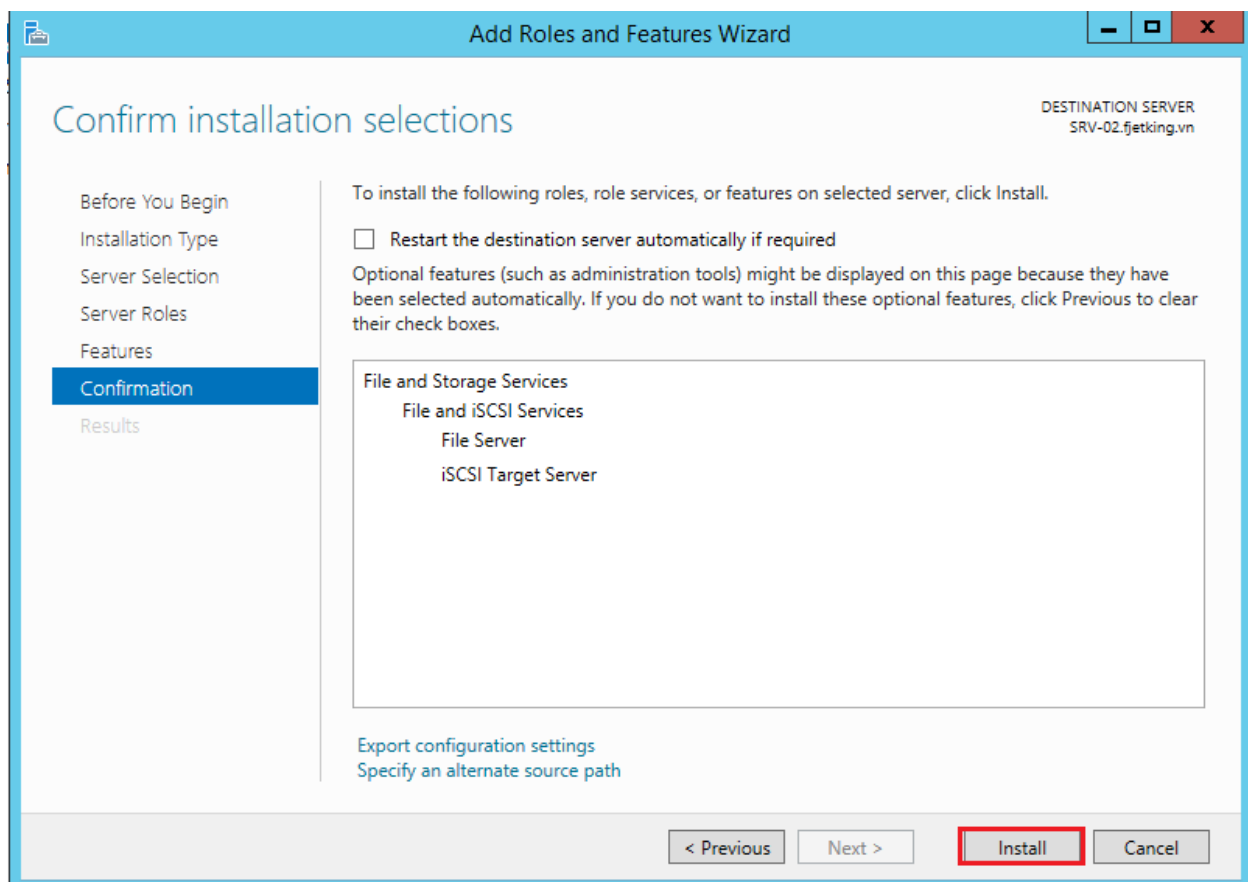
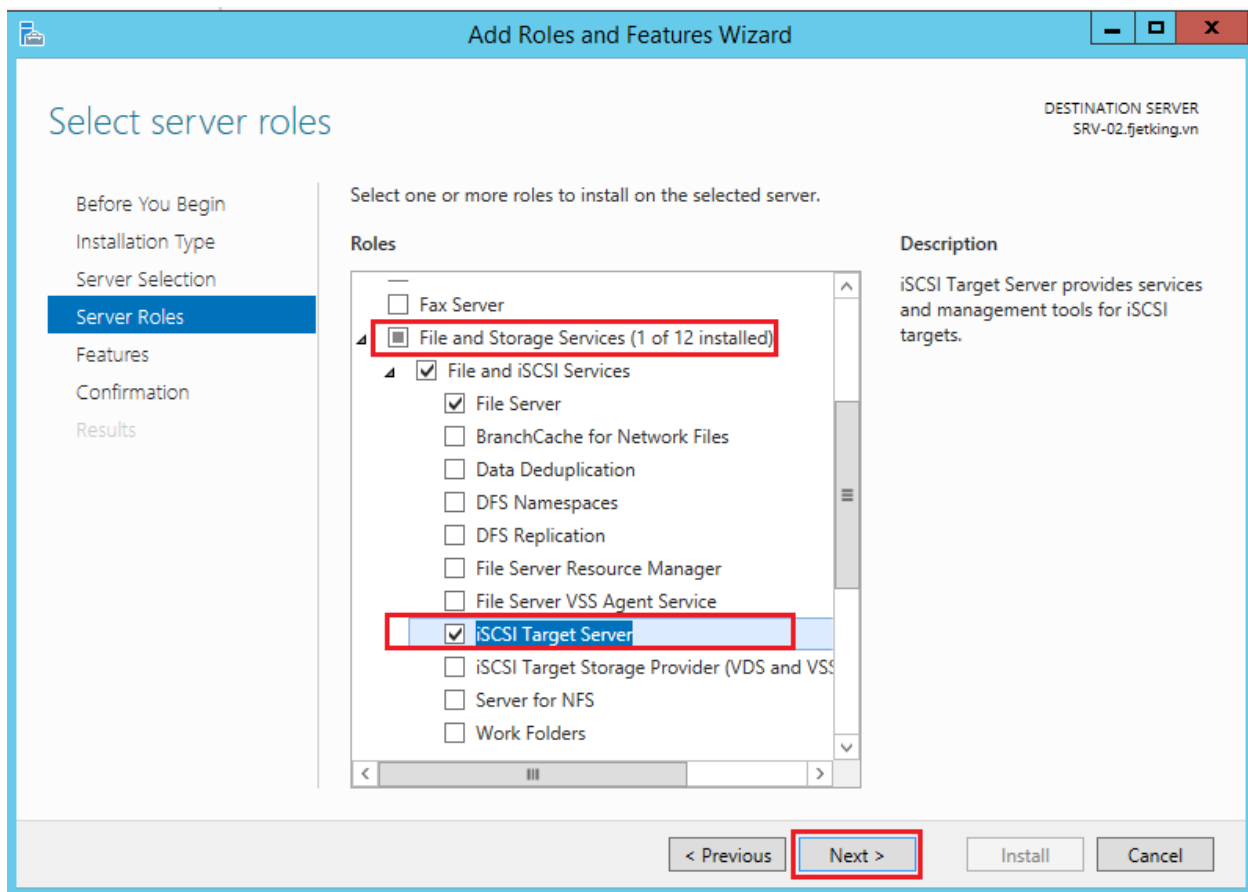
1- Cấu hình Shared Storage cho Cluster

Do một Failover Cluster cần một hệ thống lưu trữ chung (Shared Storage) để hoạt động nên trước khi cấu hình Failover Cluster chúng ta cần cấu hình hệ thống storage phù hợp. Trên Windows Server 2012 đã tích hợp sẵn dịch vụ storage iSCSI SAN.

Để xây dựng hệ thống Shared Storage trên Windows 2012 ta tiến hành các bước sau:

Trên **DC**, cài đặt dịch vụ **iSCSI Targer server**





- Add thêm 03 HDD vào DC:

Add Hardware Wizard

Hardware Type

What type of hardware do you want to install?

Hardware types:

Hard Disk

CD/DVD Drive

Floppy Drive

Network Adapter

USB Controller

Sound Card

Parallel Port

Serial Port

Printer

Generic SCSI Device

Explanation

Add a hard disk.

< Back

Next >

Cancel

Add Hardware Wizard

Select a Disk Type

What kind of disk do you want to create?

Virtual disk type

☐ IDE (Cannot be added while the VM is powered on)

☒ SCSI (Recommended)

☐ SATA

Mode

☐ Independent

Independent disks are not affected by snapshots.

☒ Persistent

Changes are immediately and permanently written to the disk.

☐ Nonpersistent

Changes to the disk are discarded when you power off or restore a snapshot.

< Back

Next >

Cancel

Add Hardware Wizard

Select a Disk
Which disk do you want to use?

Disk

☒ Create a new virtual disk

A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.

☐ Use an existing virtual disk
Choose this option to reuse a previously configured disk.

☐ Use a physical disk (for advanced users)
Choose this option to give the virtual machine direct access to a local hard disk.

< Back Next > Cancel

Add Hardware Wizard

Specify Disk Capacity
How large do you want this disk to be?

Maximum disk size (GB): 32

Recommended size for Windows Server 2012: 60 GB

☐ Allocate all disk space now.

Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.

☒ Store virtual disk as a single file

☐ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

< Back Next > Cancel

Add Hardware Wizard

×

Specify Disk File

Where would you like to store the disk file?

Disk file

One disk file will be created for each 2 GB of virtual disk capacity. File names for each file beyond the first will be automatically generated using the file name provided here as a basis.

File name:

< Back

Finish

Cancel

Add Hardware Wizard

×

Specify Disk File

Where would you like to store the disk file?

Disk file

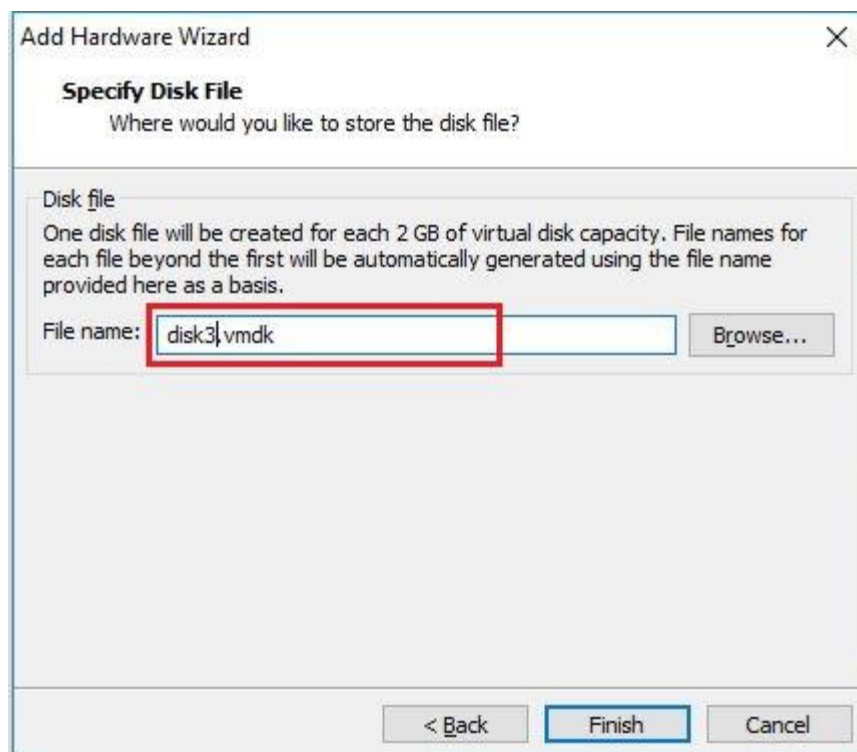
One disk file will be created for each 2 GB of virtual disk capacity. File names for each file beyond the first will be automatically generated using the file name provided here as a basis.

File name:

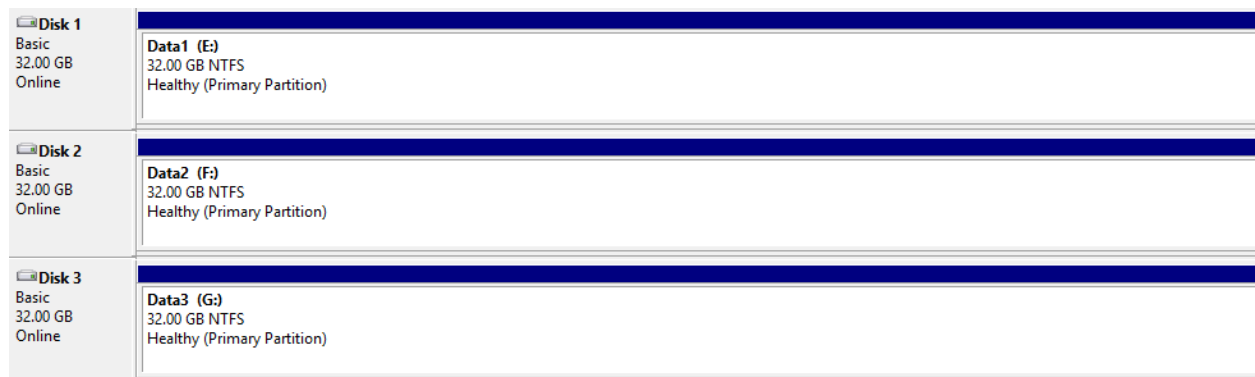
< Back

Finish

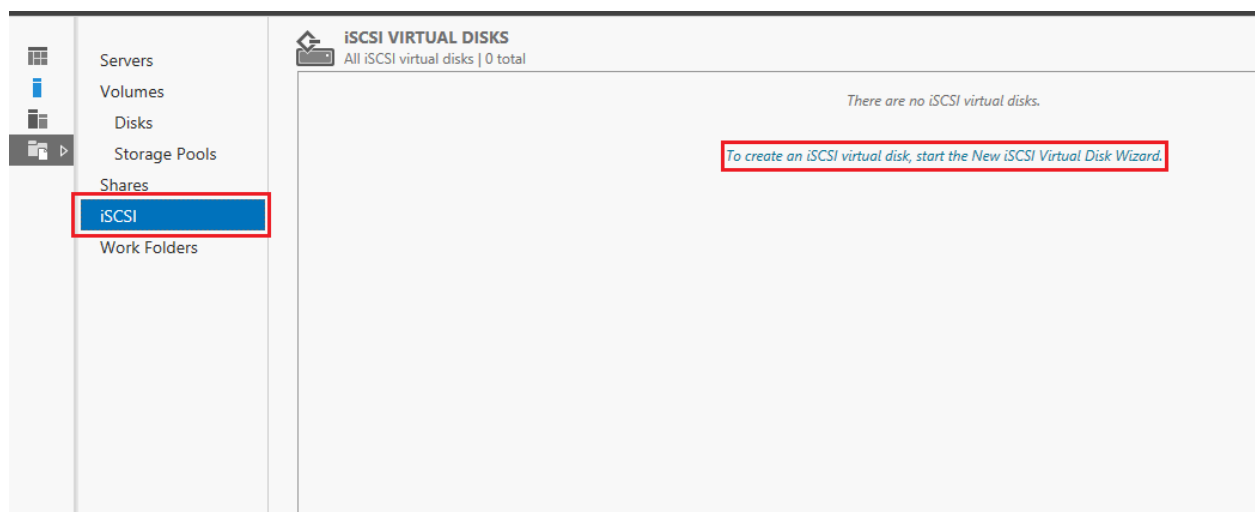
Cancel



- Mở *diskmgmt.msc* để khởi tạo các ổ đĩa và partitions:



- Tạo *iSCSI Virtual Disk*:



Select iSCSI virtual disk location

ISCSI Virtual Disk Location

ISCSI Virtual Disk Name

ISCSI Virtual Disk Size

ISCSI Target

Target Name and Access

Access Servers

Enable authentication ser...

Confirmation

Results

Server:

Server Name	Status	Cluster Role	Owner Node
SRV-02	Online	Not Clustered	

The list is filtered to show only servers with the iSCSI Target Server role installed.

Storage location:

Select by volume:

Volume	Free Space	Capacity	File System
C:	50.8 GB	59.7 GB	NTFS
E:	31.9 GB	32.0 GB	NTFS
F:	31.9 GB	32.0 GB	NTFS
G:	31.9 GB	32.0 GB	NTFS

The iSCSI virtual disk will be saved at \ISCSI\VirtualDisk on the selected volume.

Type a custom path:

Browse...

< Previous

Next >

Create

Cancel

Specify iSCSI virtual disk name

ISCSI Virtual Disk Location

ISCSI Virtual Disk Name

ISCSI Virtual Disk Size

ISCSI Target

Target Name and Access

Access Servers

Enable authentication ser...

Confirmation

Results

Name:

vDisk1

Description:

Path: E:\ISCSIVirtualDisks\vDisk1.vhdx

Specify iSCSI virtual disk size

iSCSI Virtual Disk Location

iSCSI Virtual Disk Name

iSCSI Virtual Disk Size

iSCSI Target

Target Name and Access

Access Servers

Enable authentication ser...

Confirmation

Results

Free space: 31.9 GB

Size: GB

☒ Fixed size

This type of disk provides better performance and is recommended for servers running applications with a high I/O workload. It does not change when data is added or deleted.

☒ Clear the virtual disk on allocation

Note: Un-selecting is NOT RECOMMENDED. Clearing a disk to zero will remove any fragments of data that re

☐ Dynamically expanding

This type of disk provides better use of physical storage space and is recommended for servers running applications that are created and grows as data is written to it.

☐ Differencing

This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can create a new disk and easily revert the changes later.

Parent virtual disk path:

Assign iSCSI target

iSCSI Virtual Disk Location

iSCSI Virtual Disk Name

iSCSI Virtual Disk Size

iSCSI Target

Target Name and Access

Access Servers

Enable authentication ser...

Confirmation

Results

Assign this iSCSI virtual disk to an existing iSCSI target or create a new target for it.

☐ Existing iSCSI target:

Target Name	Initiator IDs	Description

☒ New iSCSI target

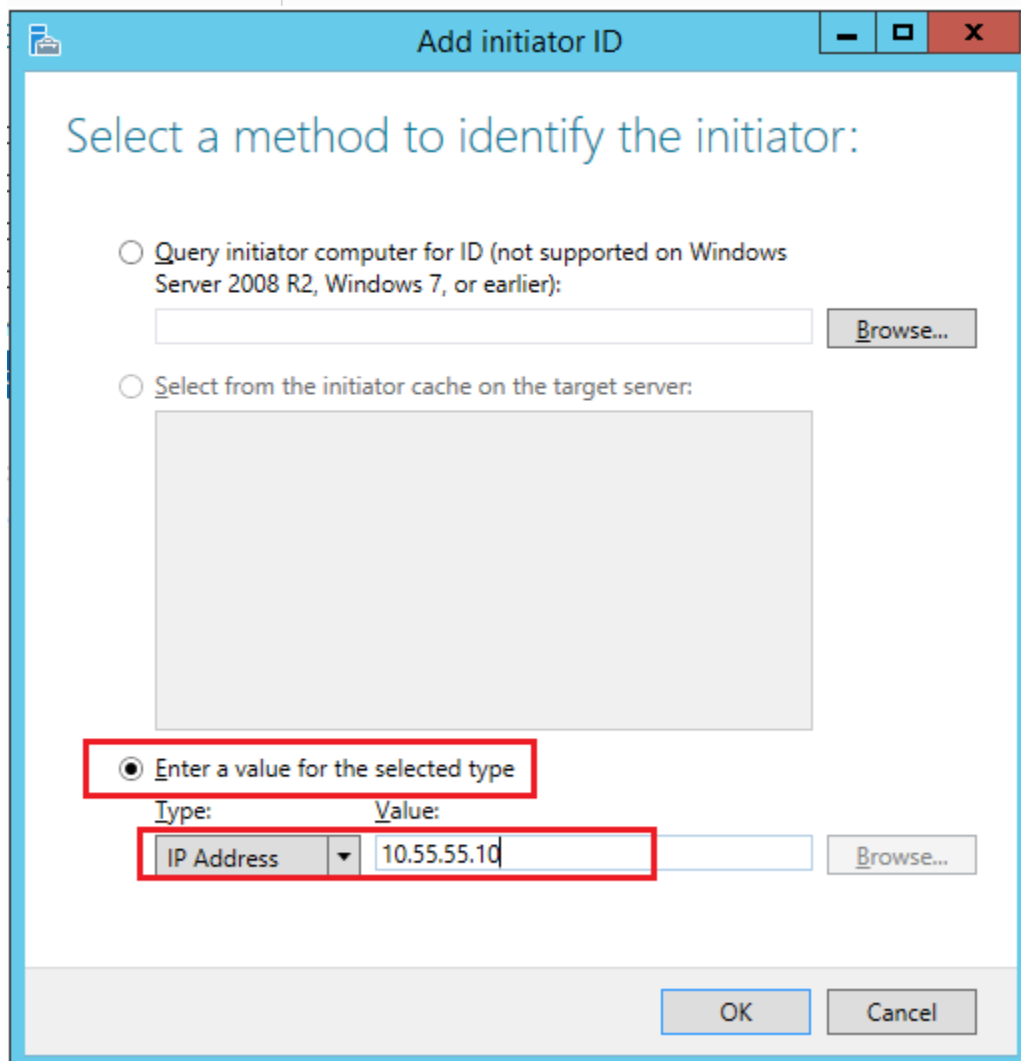
Specify target name

iSCSI Virtual Disk Location
iSCSI Virtual Disk Name
iSCSI Virtual Disk Size
iSCSI Target
Target Name and Access
Access Servers
Enable authentication ser...
Confirmation
Results

Name:

shared-storage-server

Description:



The image shows a Windows dialog box titled "Add initiator ID". It has a blue title bar with standard minimize, maximize, and close buttons. The main content area is white and contains the instruction "Select a method to identify the initiator:". There are three radio button options. The first option is "Query initiator computer for ID (not supported on Windows Server 2008 R2, Windows 7, or earlier):", which is disabled and has a text box and a "Browse..." button next to it. The second option is "Select from the initiator cache on the target server:", which is also disabled and has a large empty list box next to it. The third option is "Enter a value for the selected type", which is selected. This option has a "Type:" label with a dropdown menu showing "IP Address" and a "Value:" label with a text box containing "10.55.55.10". Both the "Type:" dropdown and the "Value:" text box are highlighted with a red rectangle. There is also a "Browse..." button next to the value text box. At the bottom right of the dialog are "OK" and "Cancel" buttons.

Select a method to identify the initiator:

☐ Query initiator computer for ID (not supported on Windows Server 2008 R2, Windows 7, or earlier):

☐ Select from the initiator cache on the target server:

☒ Enter a value for the selected type

Type: IP Address Value: 10.55.55.10

OK Cancel

Specify access servers

iSCSI Virtual Disk Location

iSCSI Virtual Disk Name

iSCSI Virtual Disk Size

iSCSI Target

Target Name and Access

Access Servers

Enable authentication ser...

Confirmation

Results

Click Add to specify the iSCSI initiator(s) that will access this iSCSI virtual disk.

Type	Value
IPAddress	10.55.55.10
IPAddress	10.55.55.20

Add...

Remove

- Làm tương tự với vDisk2 và vDisk3 ta được kết quả như sau:

←

→

▼

Server Manager ▸ File and Storage Services ▸ iSCSI

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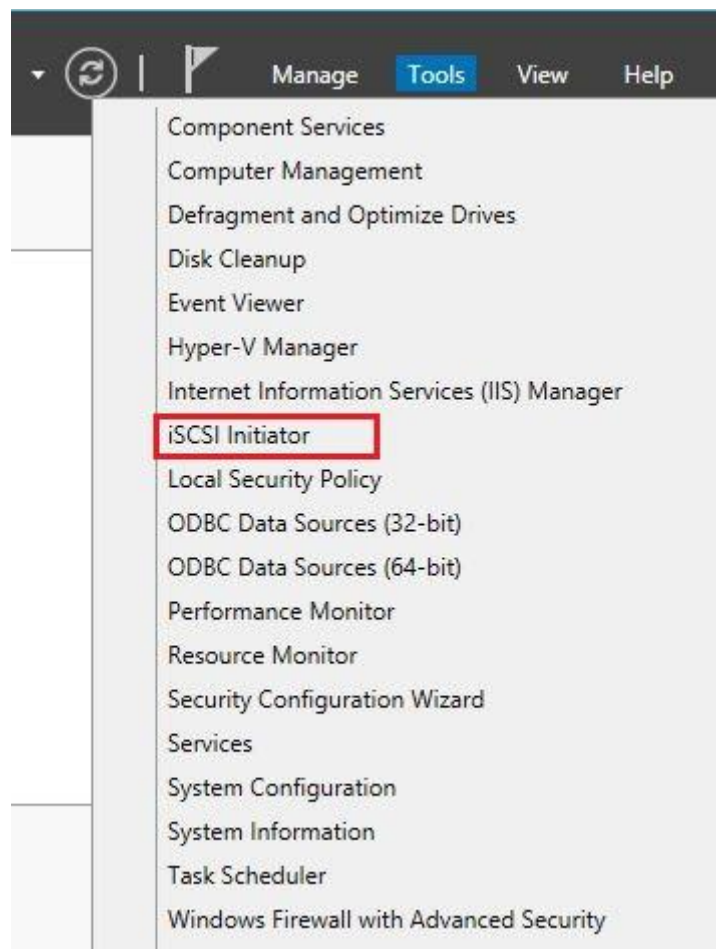
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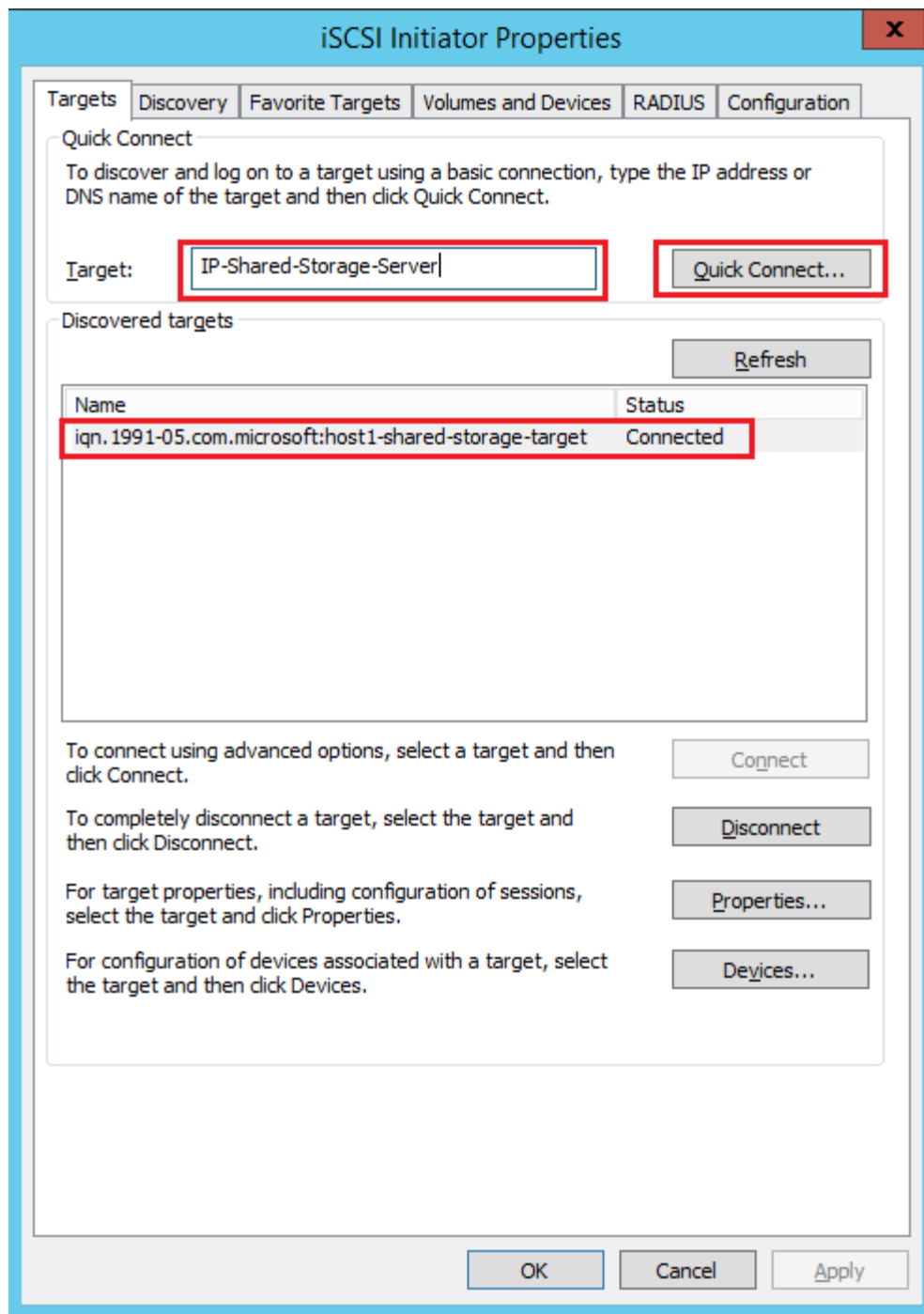
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2. Kết nối HyperV-Host1 và HyperV-Host2 vào Shared-Storage-Server



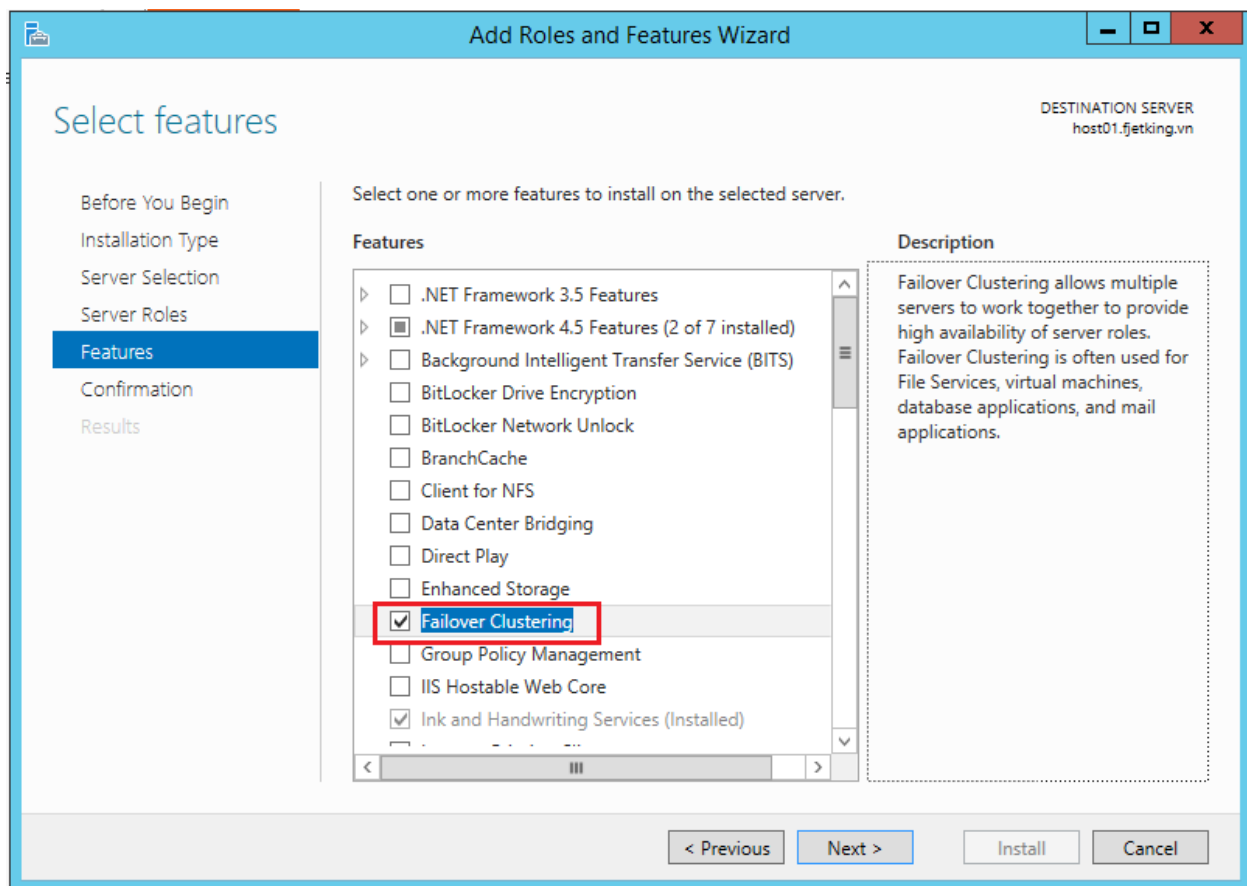


- Trên HyperV-Host1 vào diskmgmt.msc tạo các partition như sau:

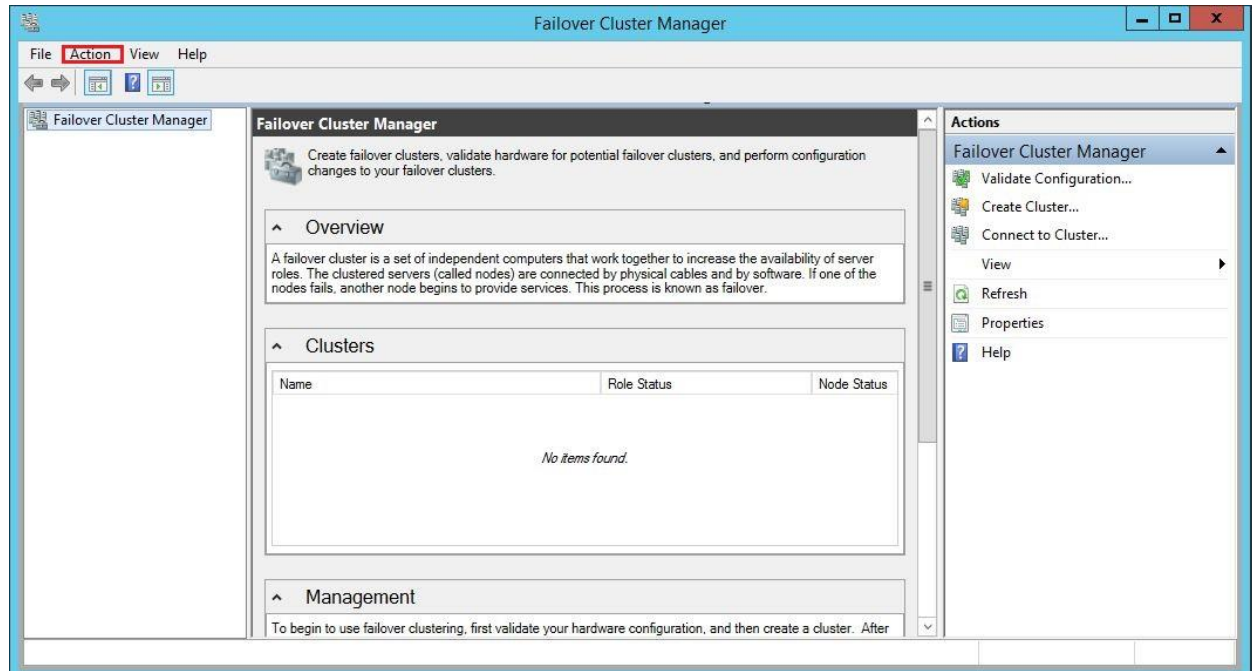
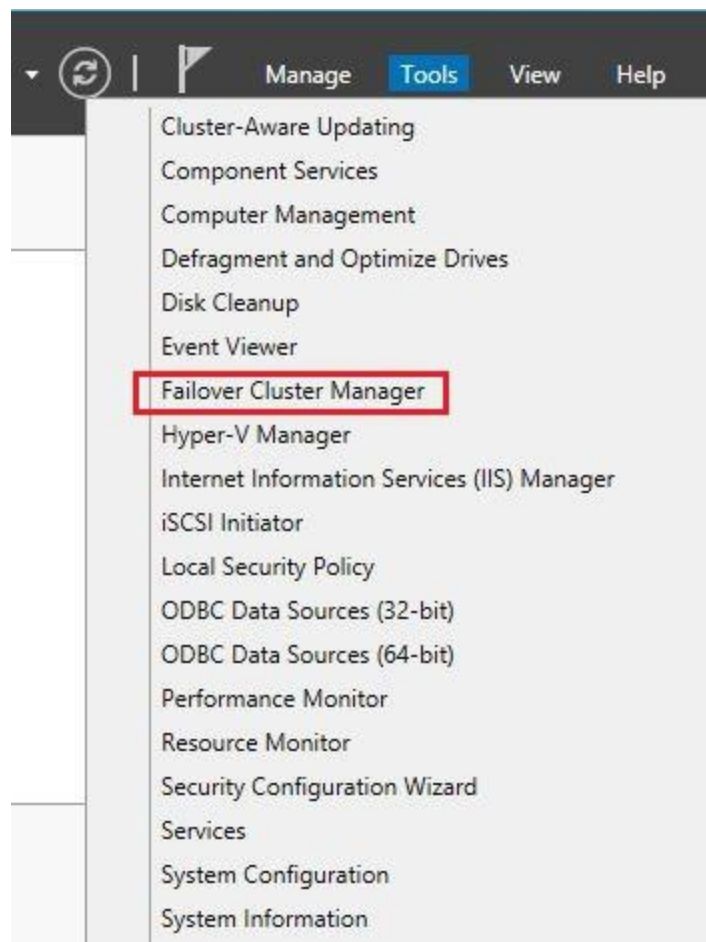
Disk 1 Basic 31.57 GB Online	clusterDisk1 (E:) 31.57 GB NTFS Healthy (Primary Partition)
Disk 2 Basic 31.57 GB Online	clusterDisk2 (F:) 31.57 GB NTFS Healthy (Primary Partition)
Disk 3 Basic 31.57 GB Online	clusterDisk3 (G:) 31.57 GB NTFS Healthy (Primary Partition)


- Sang HyperV-Host2 mở diskmgmt.msc thấy xuất hiện partition tương tự như trên.


3. Cài đặt Roles Hyper-V và Failover Cluster trên Host1 và Host2:



4. Triển khai cụm Cluster cho HypervV:



Create Cluster Wizard

Before You Begin

Before You Begin

Select Servers

Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

This wizard creates a cluster, which is a set of servers that work together to increase the availability of clustered roles. If one of the servers fails, another server begins hosting the clustered roles (a process known as failover).

Before you run this wizard, we strongly recommend that you run the Validate a Configuration Wizard to ensure that your hardware and hardware settings are compatible with failover clustering.

Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in the Validate a Configuration Wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2012 R2."


You must be a local administrator on each of the servers that you want to include in the cluster.


To continue, click Next.

[More about Microsoft support of cluster solutions that have passed validation tests](#)

☐ Do not show this page again

Next >Cancel

Create Cluster Wizard

Select Servers

Before You Begin

Select Servers

Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

Add the names of all the servers that you want to have in the cluster. You must add at least one server.

Enter server name: Browse...

Selected servers:

host01.fjetking.vn
host2.fjetking.vn

AddRemove

< PreviousNext >Cancel

Create Cluster Wizard

**Validation Warning**

Before You Begin

Select Servers


Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary



For the servers you selected for this cluster, the reports from cluster configuration validation tests appear to be missing or incomplete. Microsoft supports a cluster solution only if the complete configuration (servers, network and storage) can pass all the tests in the Validate a Configuration wizard.

Do you want to run configuration validation tests before continuing?

☐ Yes. When I click Next, run configuration validation tests, and then return to the process of creating the cluster.

☒ No. I do not require support from Microsoft for this cluster, and therefore do not want to run the validation tests. When I click Next, continue creating the cluster.

[More about cluster validation tests](#)

< Previous

Next >

Cancel

Create Cluster Wizard

**Access Point for Administering the Cluster**

Before You Begin

Select Servers

Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

Type the name you want to use when administering the cluster.

Cluster Name:

 The NetBIOS name is limited to 15 characters. One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.

	Networks	Address
<input checked="" type="checkbox"/>	10.55.55.0/24	10 . 55 . 55 . 11

< Previous

Next >

Cancel

Create Cluster Wizard

Confirmation

Before You Begin

Select Servers

Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

You are ready to create a cluster.
The wizard will create your cluster with the following settings:

Cluster:HyperV-Cluster

Node:host01.fjetking.vn

Node:host2.fjetking.vn

IP Address:10.55.55.11

☐ Add all eligible storage to the cluster.

To continue, click Next.

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Next >

Cancel

Create Cluster Wizard

Summary

Before You Begin

Select Servers

Validation Warning

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

You have successfully completed the Create Cluster Wizard.

Cluster:HyperV-Cluster

Node:host01.fjetking.vn

Node:host2.fjetking.vn

IP Address:10.55.55.11

Warnings

An appropriate disk was not found for configuring disk witness. The cluster is not configured with a quorum witness. As a best practice, configure a quorum witness to help achieve the highest availability of the cluster.

To view the report created by the wizard, click View Report.
To close this wizard, click Finish.

View Report...

Finish

5. Tạo Volumes cho Failover Cluster:

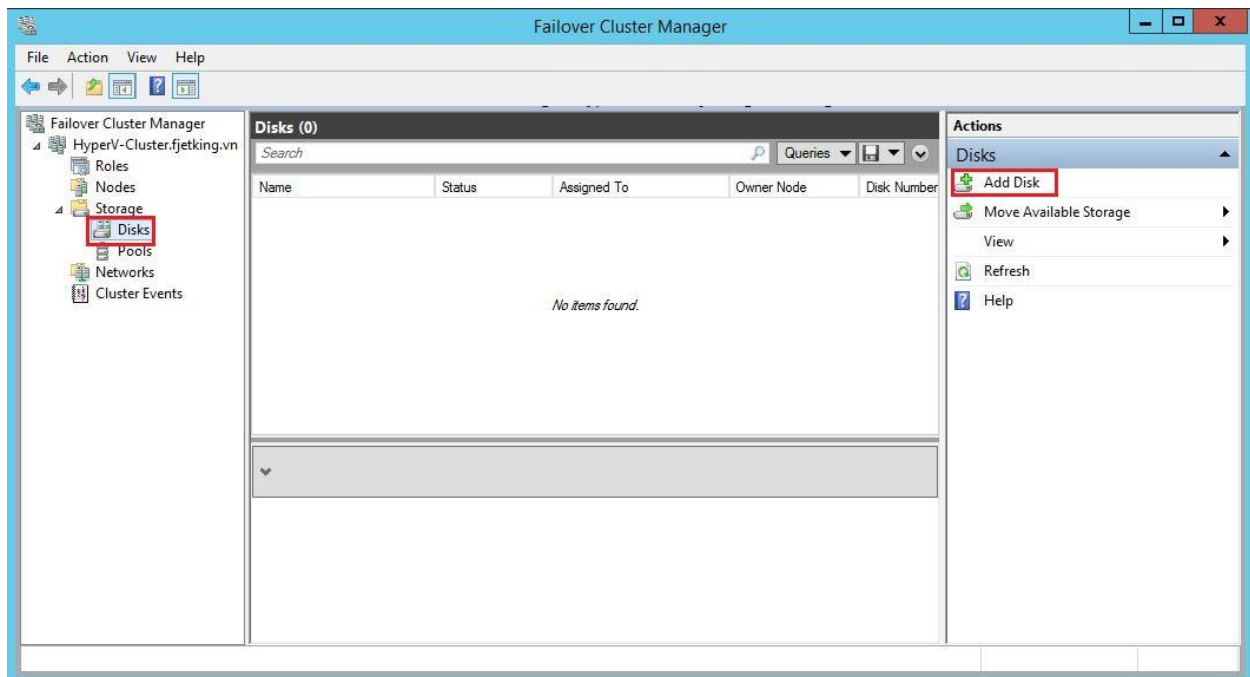
+ *Cluster Shared Volume (CSV):*

Nơi lưu trữ các máy ảo tập chung cho HyperV-Host1 và HyperV-Host2

+ ***Quorum Witness:***

Lưu trữ thông tin cấu hình các Nodes trong Cluster, đảm bảo một Node luôn active để cung cấp các dịch vụ, khi Node bị Down thì Node khác sẽ nên thay thế.

-***Add các Shared Storage vào Cluster:***



Chọn Disk1 và Disk2 làm Cluster Shared Volumes (CSV), Disk3 làm Witness:

Disks (3)

Name	Status	Assigned To	Owner Node	Disk Number	Capacity
Cluster Disk 1	Online	Available Storage	host01	1	31.7 GB
Cluster Disk 2	Online	Available Storage	host01	2	31.7 GB
Cluster Disk 3	Online	Available Storage	host01	3	31.7 GB

Actions

- Disks
 - Add Disk
 - Move Available Storage
 - View
 - Refresh
 - Help
- Selected Disks (2)
 - Bring Online
 - Take Offline
 - Simulate Failure
 - Add to Cluster Shared Volumes
 - More Actions
 - Remove

Failover Cluster Manager

File Action View Help

Failover Cluster Manager

- HyperV-Cluster
 - Roles
 - Nodes
 - Storage
 - Disks
 - Pools
 - Networks
 - Cluster Event

Cluster HyperV-Cluster.fjetking.vn

Summary of Cluster HyperV-Cluster
HyperV-Cluster has 0 clustered roles and 2 nodes.

Name: HyperV-Cluster.fjetking.vn
Current Host Server: host01
Recent Cluster Events: None in the last hour
Witness: None

Networks: Cluster Network 1
Subnets: 1 IPv4 and 0 IPv6

More Actions

- Configure Cluster Quorum Settings...
- Copy Cluster Roles...
- Shut Down Cluster...
- Destroy Cluster...
- Move Core Cluster Resources
- Cluster-Aware Updating

[Cluster-Aware Updating...](#)

[Failover cluster topics on the Web](#)

Configure Cluster Quorum Wizard

Before You Begin

Before You Begin

Select Quorum Configuration Option

Confirmation

Configure Cluster Quorum Settings

Summary

This wizard guides you through configuring the quorum for your failover cluster. The relevant cluster elements are the nodes and, in some quorum configurations, a disk witness or file share witness.

The quorum configuration affects the availability of your cluster. A sufficient number of cluster elements must be online, or the cluster "loses quorum" and must stop running. Note that the full function of a cluster depends not only on the quorum, but also on the capacity of each node to support the clustered roles.

Important: Run this wizard only if you have determined that you need to change the quorum configuration for your cluster. When you create a cluster, the cluster software automatically chooses a quorum configuration that will provide the highest availability for your cluster.

To continue, click Next.

[Failover Cluster Quorum and Witness Configuration Options](#)

☐ Do not show this page again

Next > **Cancel**

Configure Cluster Quorum Wizard

Before You Begin

Select Quorum Configuration Option

Confirmation

Configure Cluster Quorum Settings

Summary

Select a quorum configuration for your cluster.

☒ Use default quorum configuration

The cluster determines quorum management options, including the quorum witness.

☐ Select the quorum witness

You can add or change the quorum witness. The cluster determines the other quorum management options.

☐ Advanced quorum configuration

You determine the quorum management options, including the quorum witness.

[Failover Cluster Quorum and Witness Configuration Options](#)

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Cancel

Configure Cluster Quorum Wizard

Before You Begin

Select Quorum Configuration Option

Confirmation

Configure Cluster Quorum Settings

Summary

You are ready to configure the quorum settings of the cluster.

Witness Type:

Witness Resource:

Cluster Managed Voting:

Disk Witness

Cluster Disk 3

Enabled

All nodes are configured to have quorum votes

Your cluster quorum configuration will be changed to the configuration shown above.

To continue, click Next.

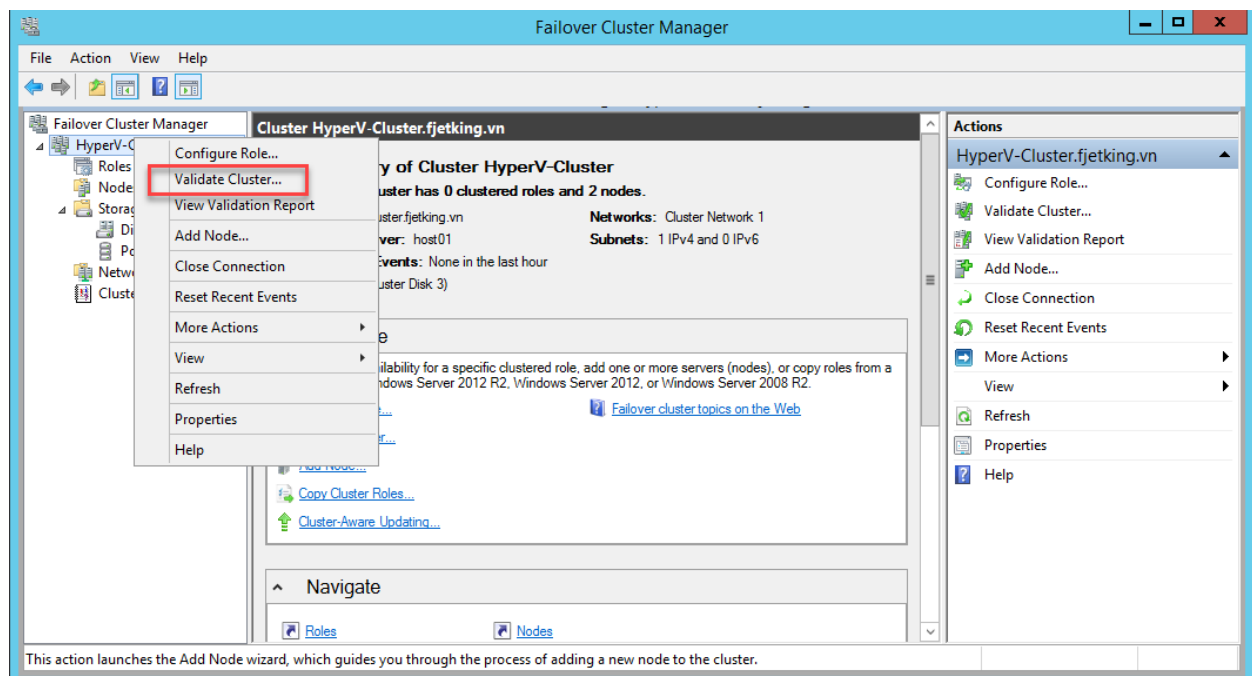
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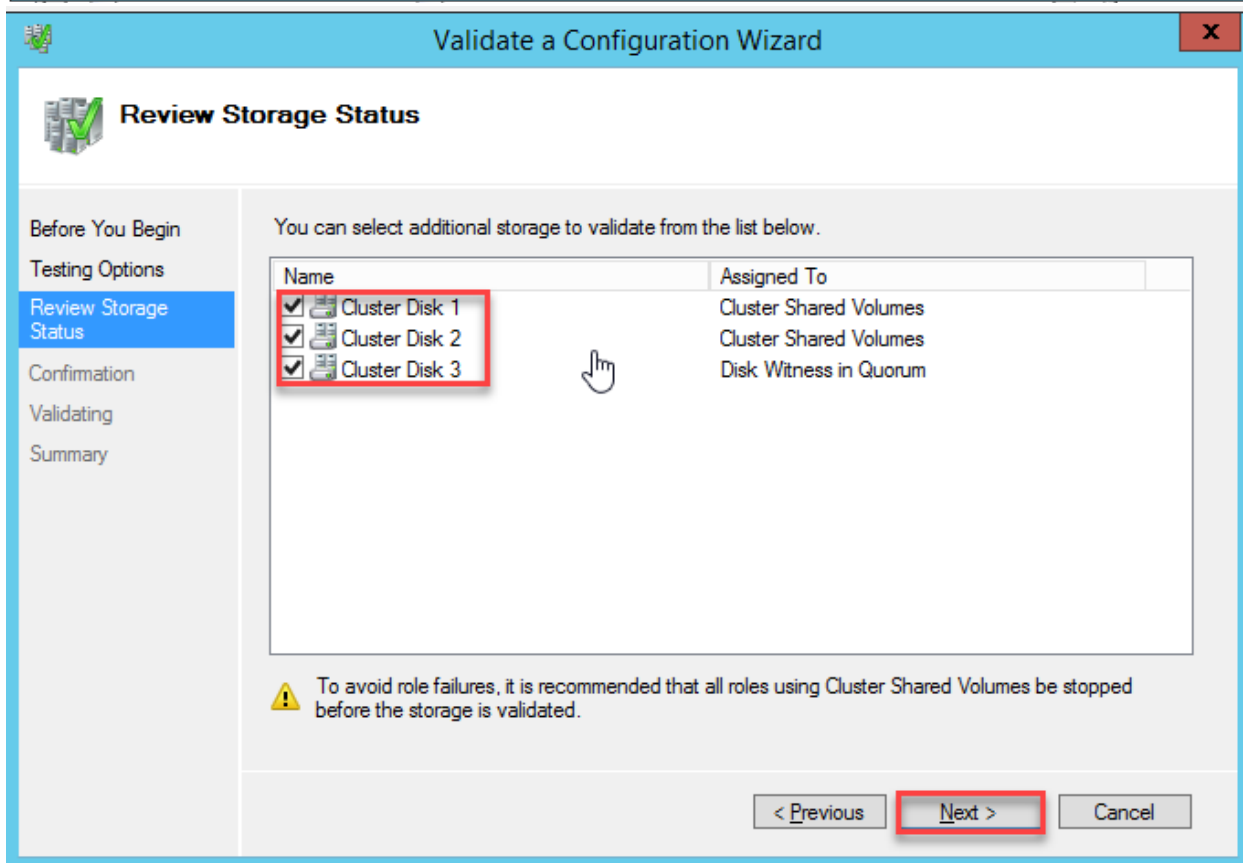
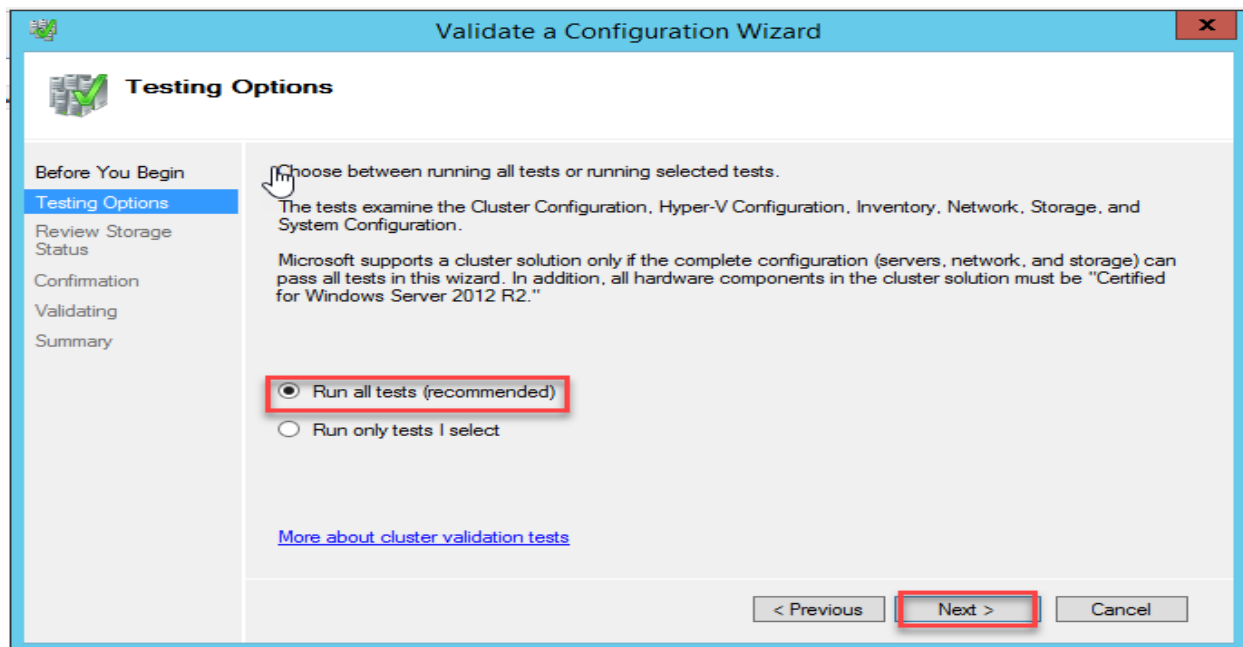
Next >

Cancel

Name	Status	Assigned To	Owner Node	Disk Number	Capacity	Int
Cluster Disk 1	Online	Cluster Shared Volume	host01	1	31.7 GB	
Cluster Disk 2	Online	Cluster Shared Volume	host2	2	31.7 GB	
Cluster Disk 3	Online	Disk Witness in Quorum	host01	3	31.7 GB	

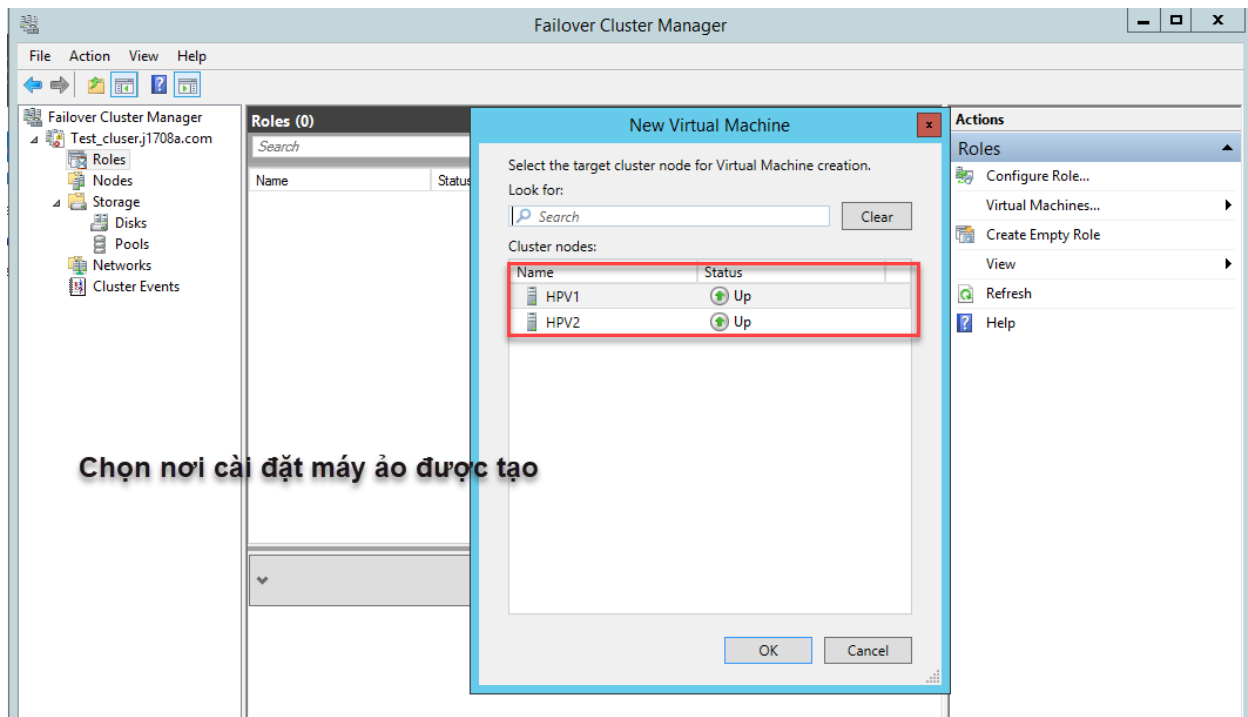
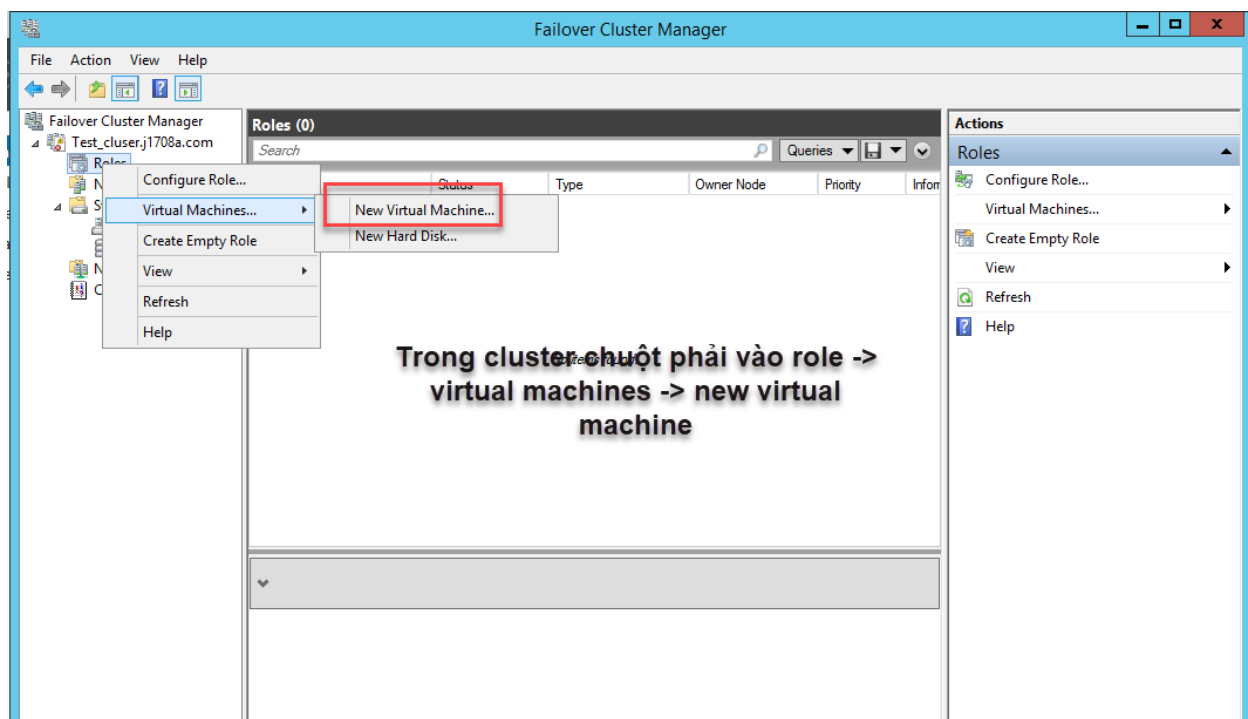
6. Kiểm tra tính tương tích của các Node trong Cluster

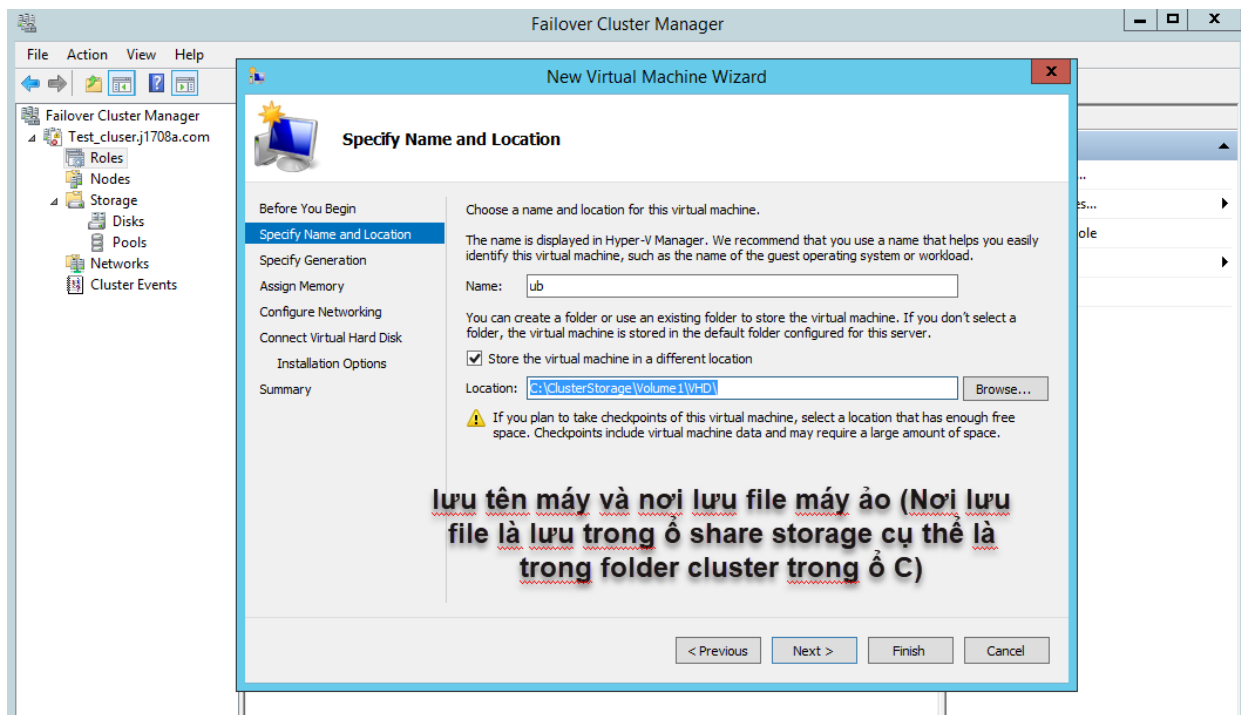
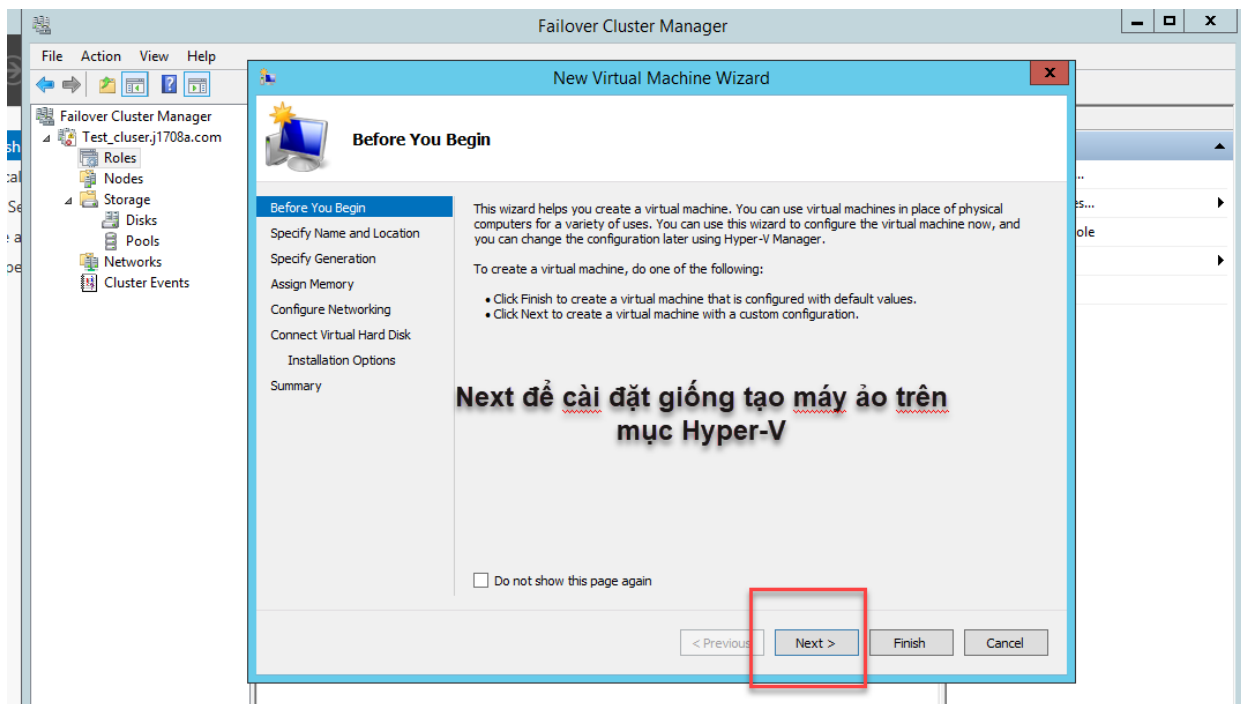





More: <https://social.technet.microsoft.com/wiki/contents/articles/19837-cau-hinh-high-availability-virtual-machine-hyper-v-failover-cluster-vi-vn.aspx>

7. Tạo máy ảo trong cluster:





New Virtual Machine Wizard



Specify Generation

Before You Begin

Specify Name and Location

Specify Generation

Assign Memory

Configure Networking

Connect Virtual Hard Disk

Installation Options

Summary


Choose the generation of this virtual machine.

☒ Generation 1

This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

☐ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.



 Once a virtual machine has been created, you cannot change its generation.

Chọn kiểu tương ứng với os


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Finish

Cancel

New Virtual Machine Wizard



Assign Memory

Before You Begin

Specify Name and Location

Specify Generation

Assign Memory

Configure Networking

Connect Virtual Hard Disk


Installation Options

Summary

Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 1750 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: MB

☐ Use Dynamic Memory for this virtual machine.



 When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

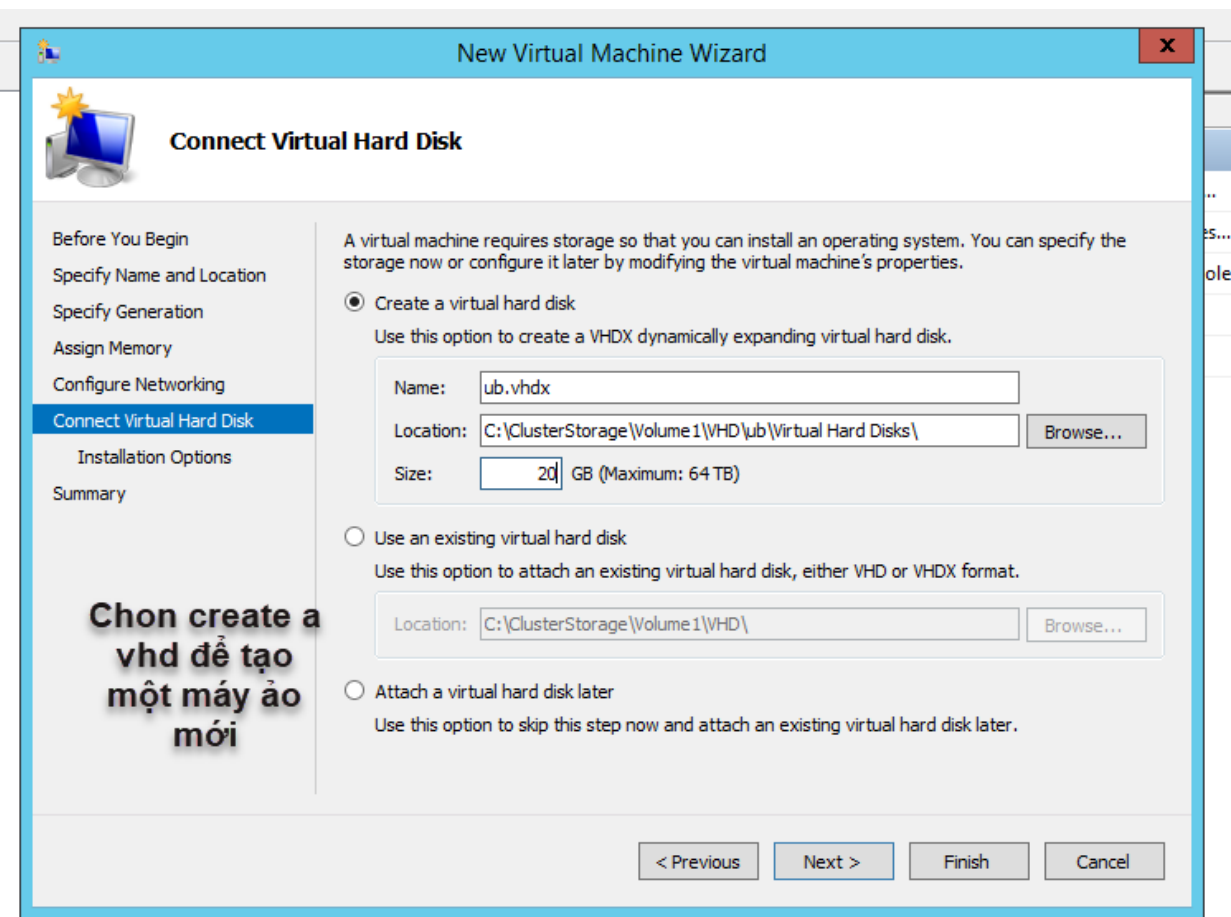
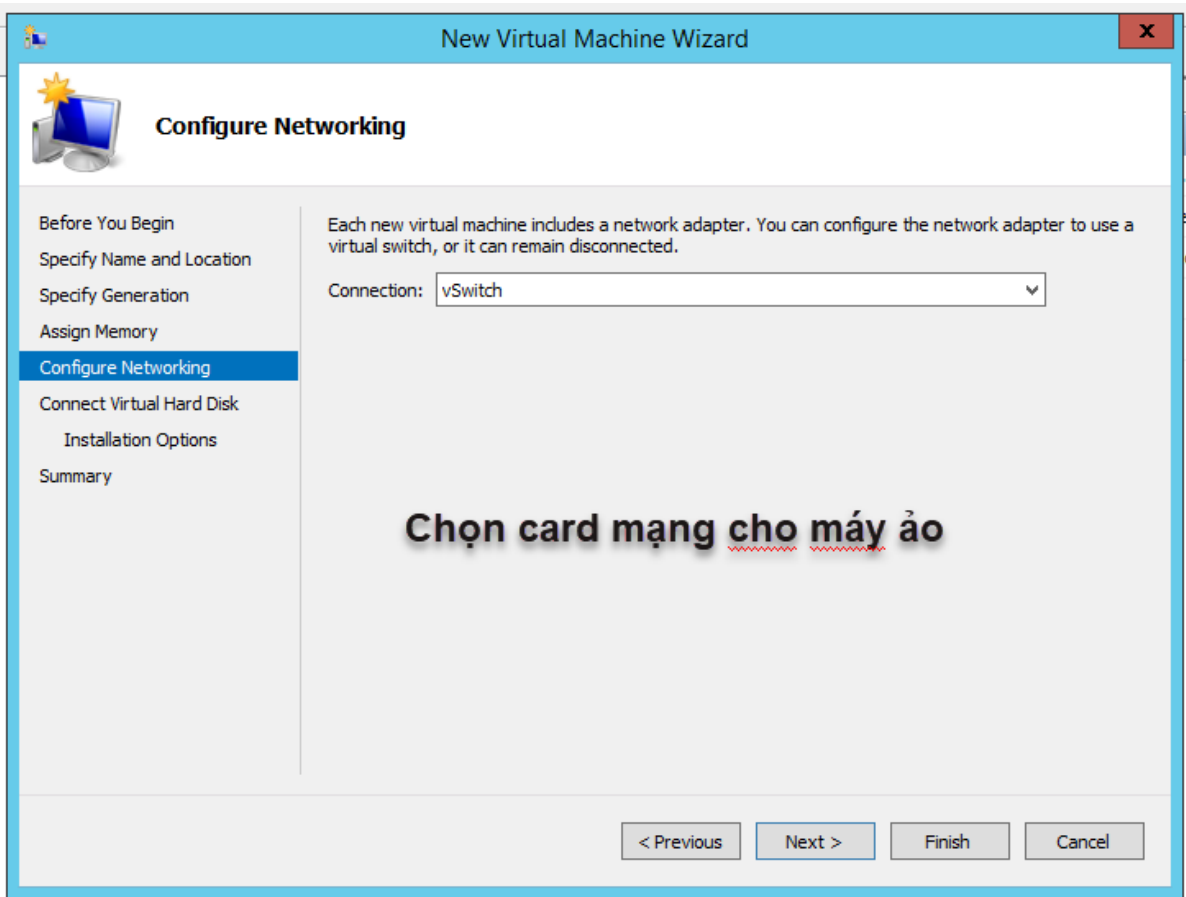
Dung lượng ram máy ảo

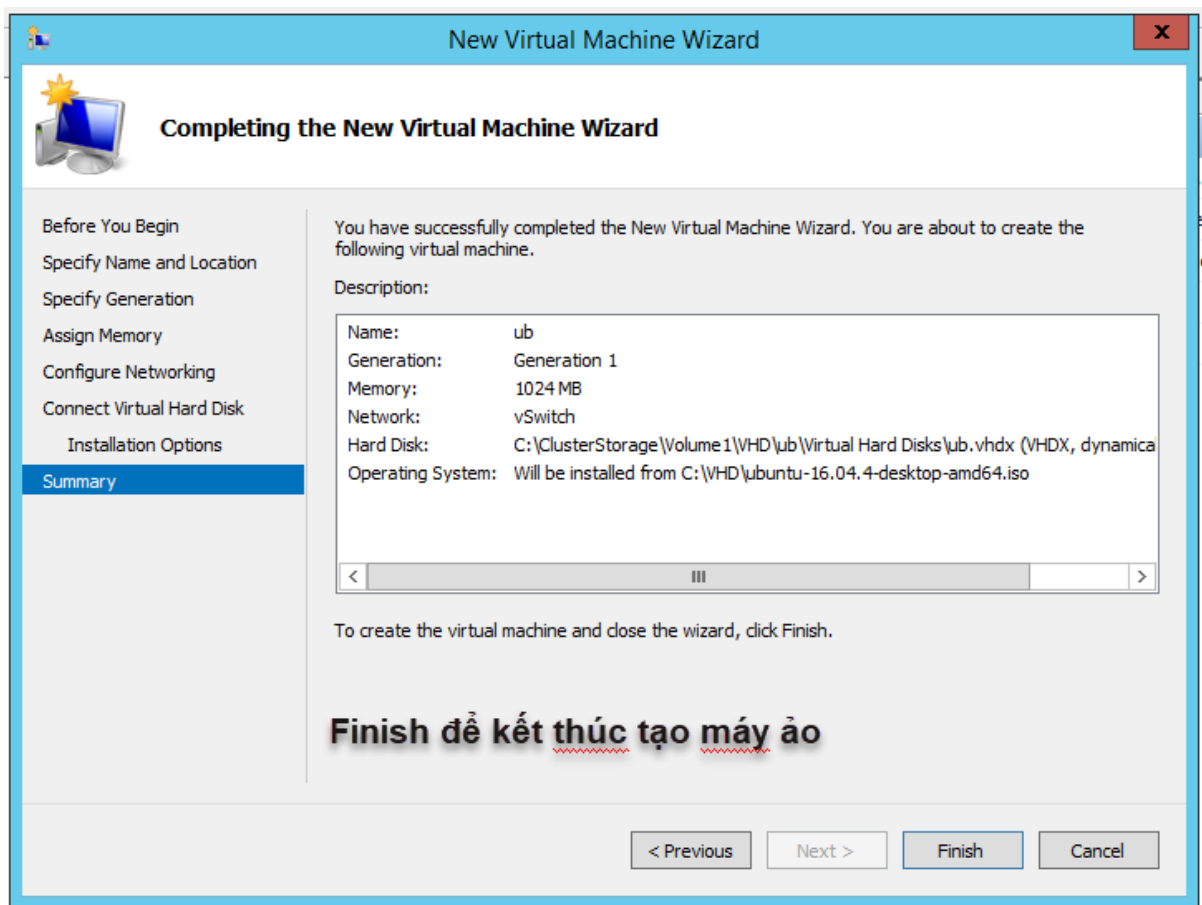
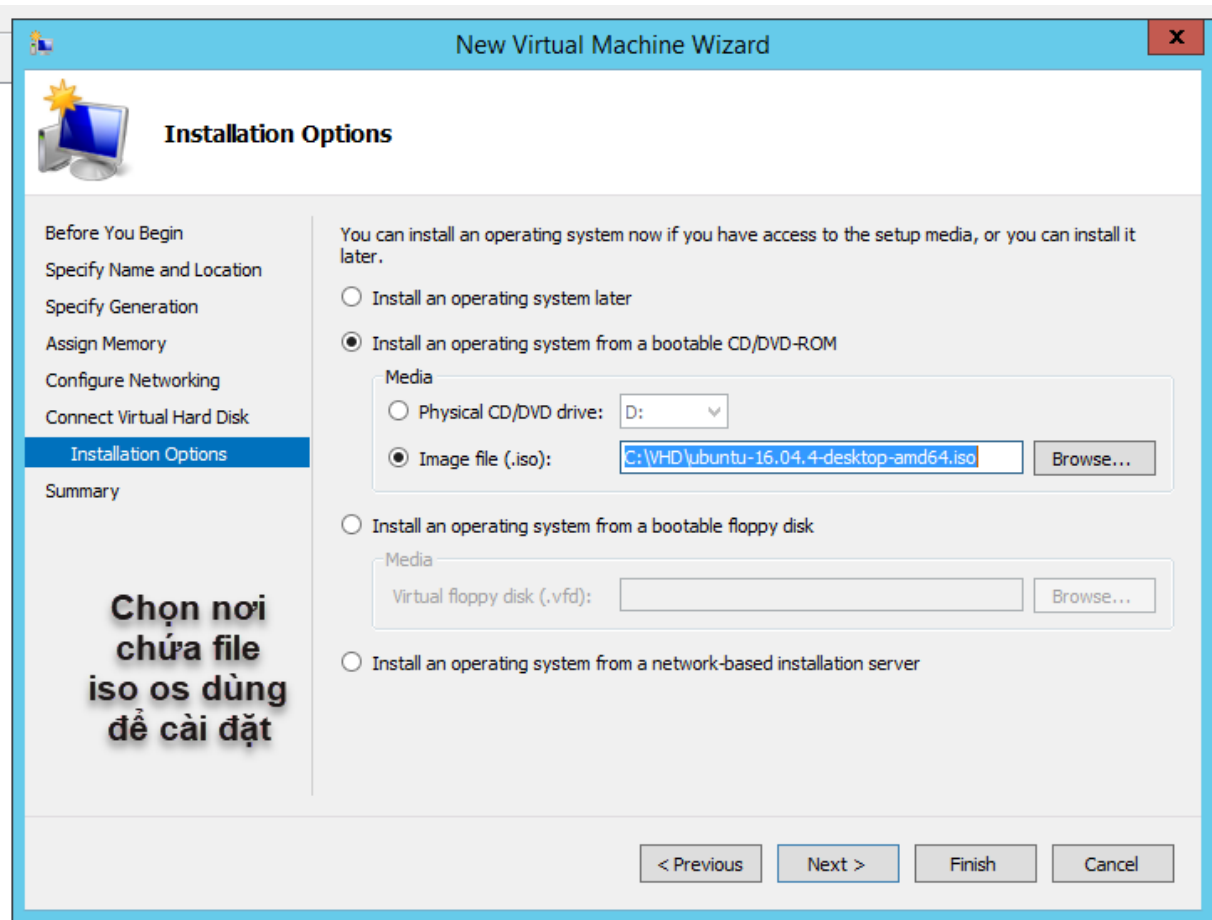
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Finish

Cancel





8. Test failover load cluster

