HAReplicator: High Available replication for Windows Server 2008 clustering

Monday, January 14, 2013

KernSafe Technologies, Inc

www.kernsafe.com

Table of Contents

Overview

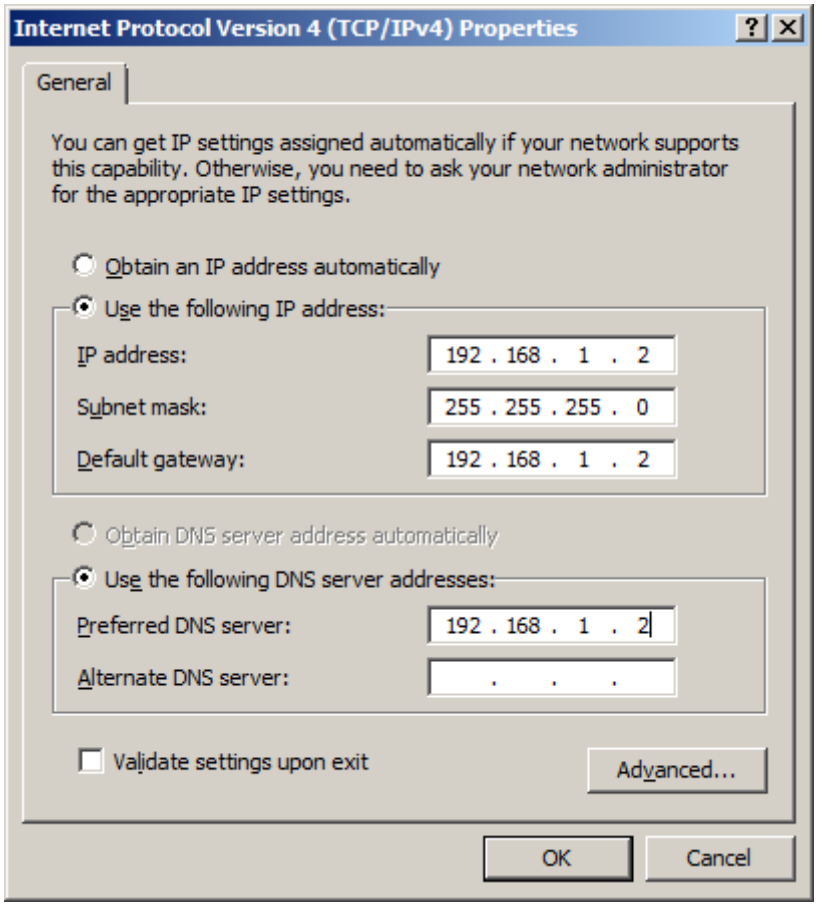
High-availability replication is the main function of HAReplicator which allows user to create **Microsoft Windows Cluster Server (MSCS)** without ISCSI SAN, instead of using SAN for shared volume. HAReplicator can create replication between local storages in two or more servers. Since there is no SAN node, user can create active-active high availability server by using only two servers.
This document gives you detailed step-by-step instructions to create high available replication on HAReplicator. Before to do so, you should prepare following three computers or virtual machine**.**

Name	**IP address**	**detail**
08DC	**192.168.1.2**	**Domain controller**
ServerNode1	**192.168.1.101**	**FailoverNode1**
	192.168.0.101	
ServerNode2	**192.168.1.102**	**FailoverNode2**
	192.168.0.102	

Configuring on Domain Controller

Network Adapter

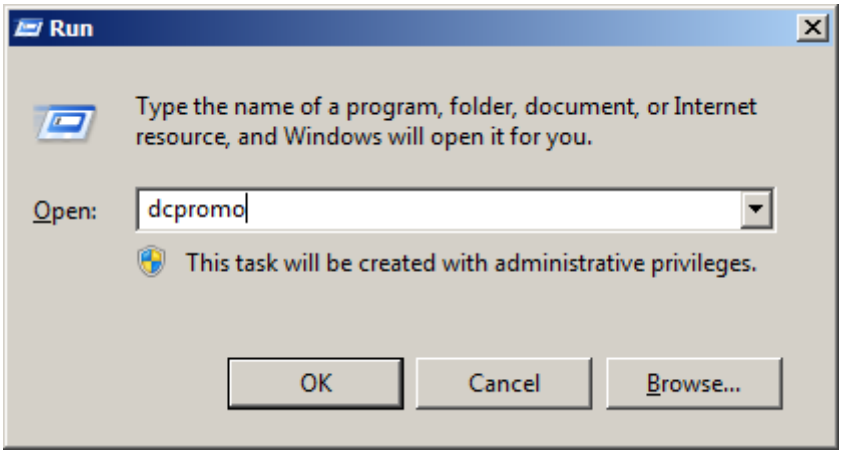
For working in clustering environment, the network adapter must be assigned a static IP address. Select the Internet Protocol Version 4(TCP/IP4) and then press the Properties button, the Internet Protocol Version 4(TCP/IP4) dialog is shown. As Active Directory requires DNS, an address must be provided, in this case we can specify itself IP address.DNS will be installed later after the installation of Active Directory.



Fill in the IP address and the DNS server must point at itself address.
Press the **OK** button.

Install Active Directory

Select **start → run** and type **dcpromo** in the open input box.

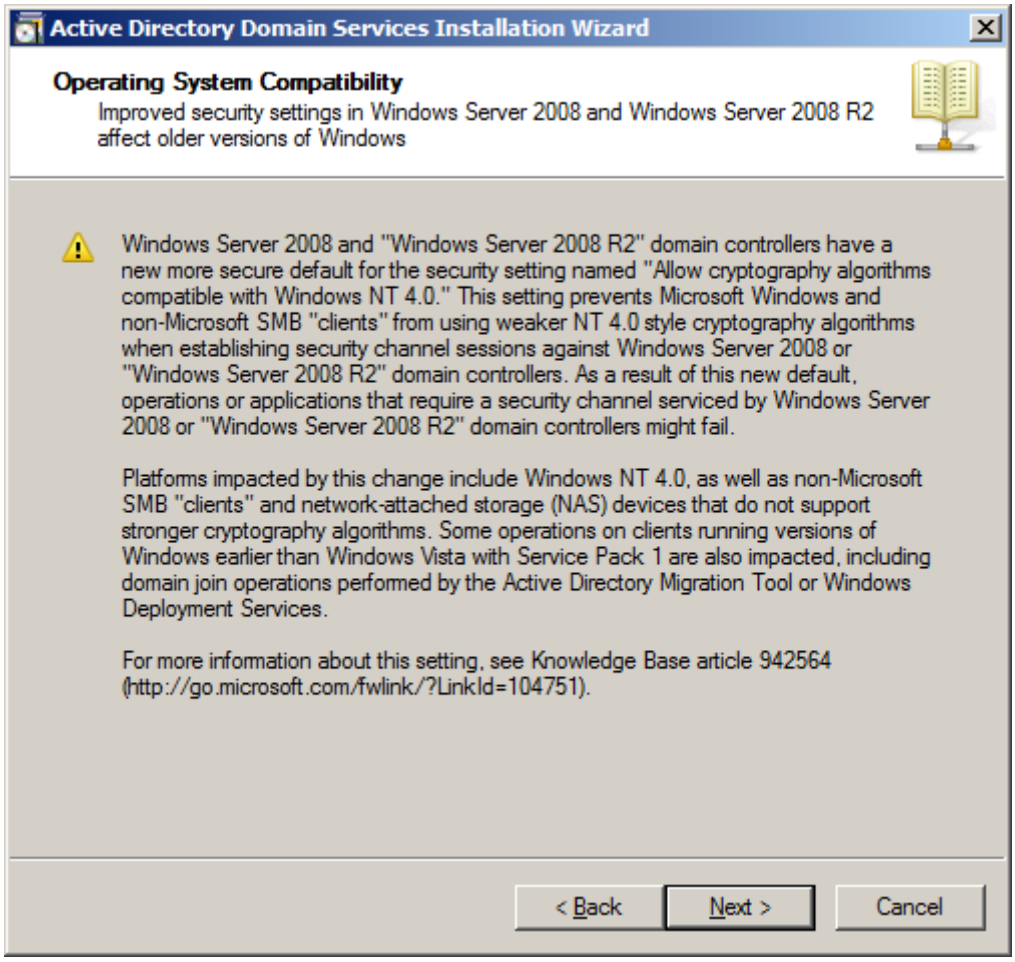


Press the **OK** button to continue.

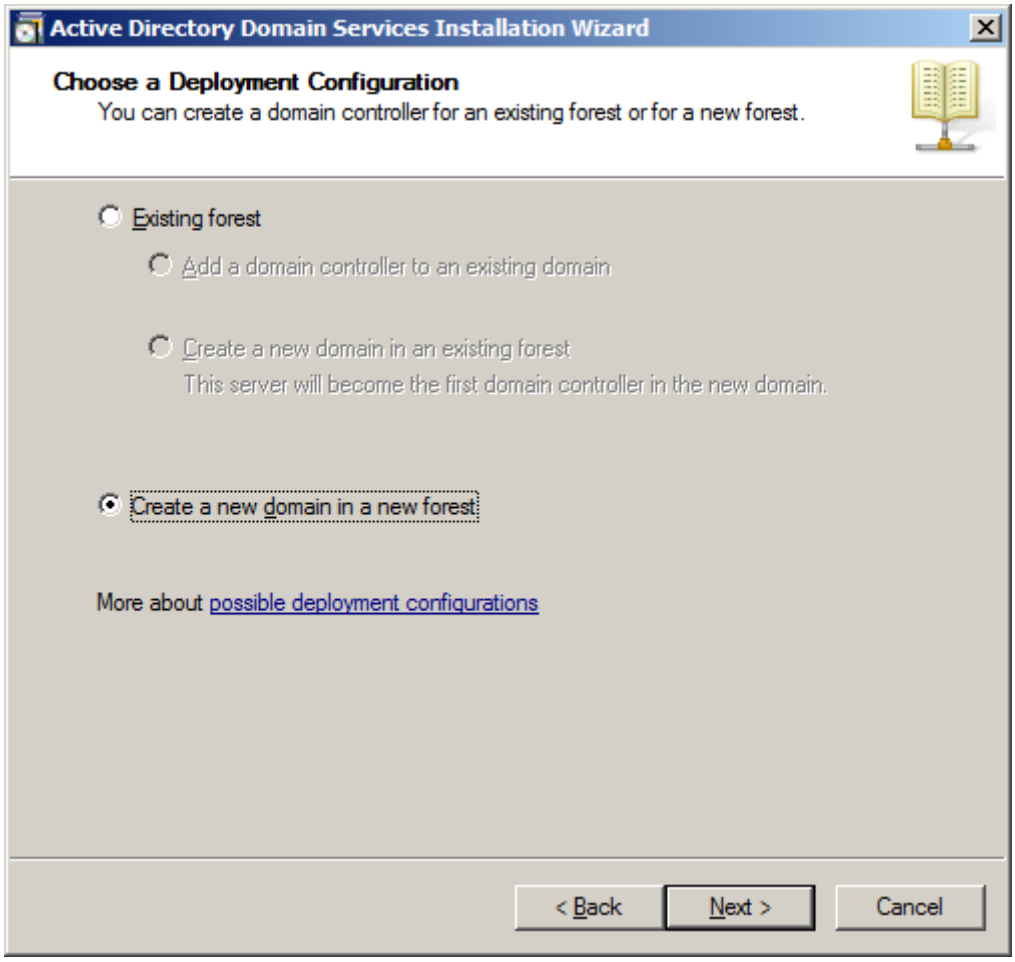
The **Active Directory Services Installation Wizard** is shown.

Press the **Next** button to continue.

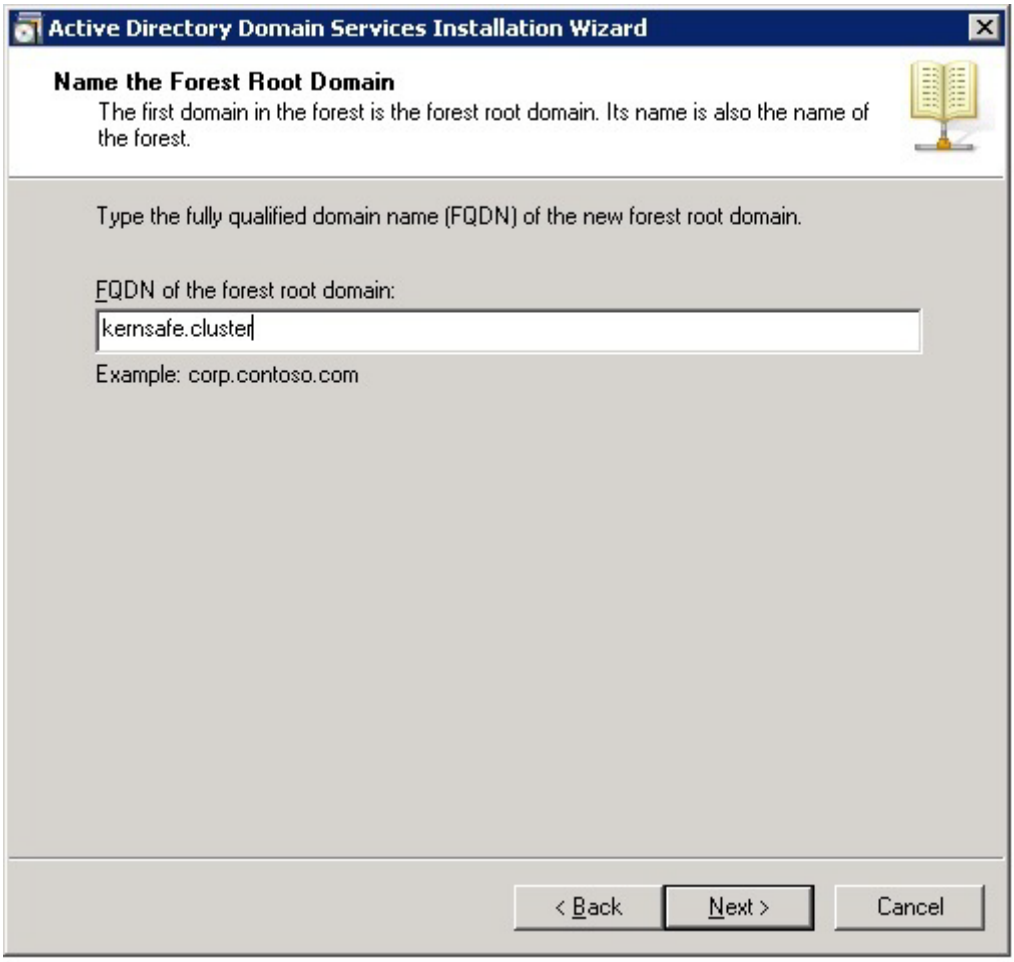
Before click the **Next** button, please read the introducing instructions carefully.



Press the **Next** button to continue.

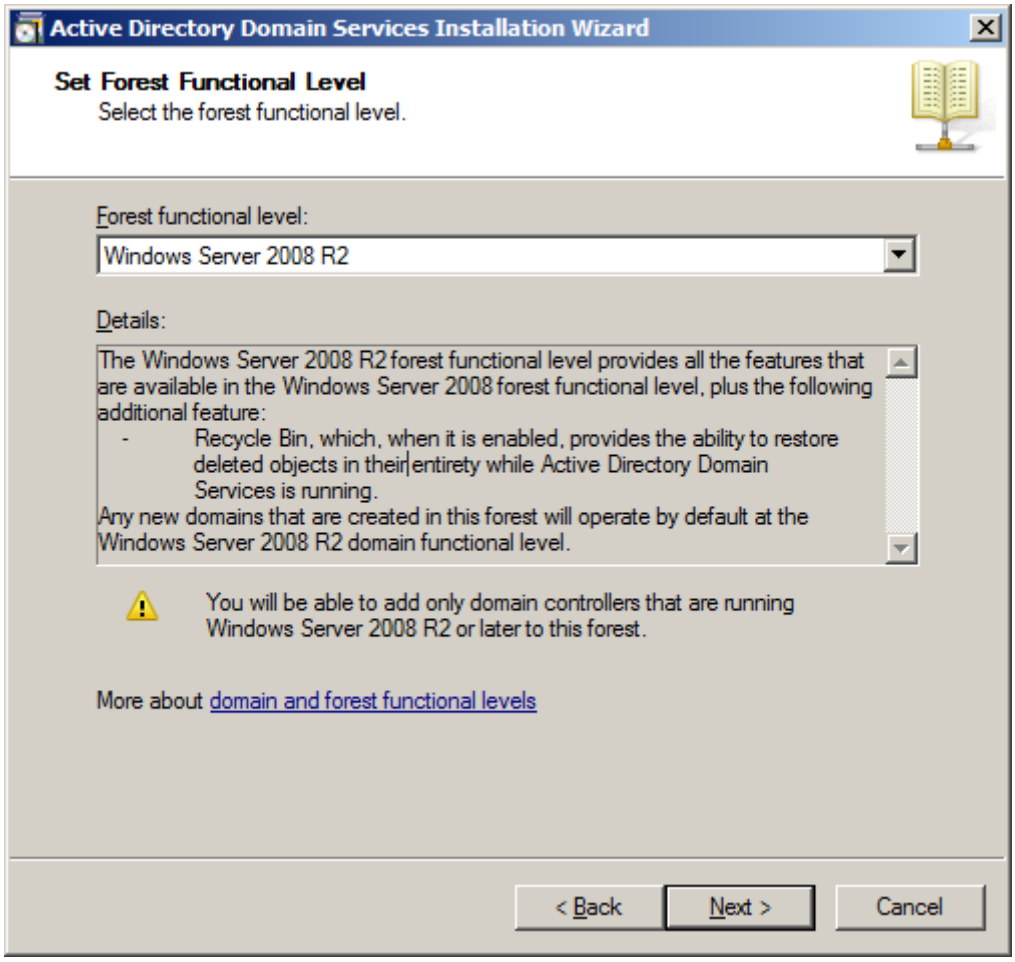


Select **Create a new domain in a new forest,** then press the **Next** button.



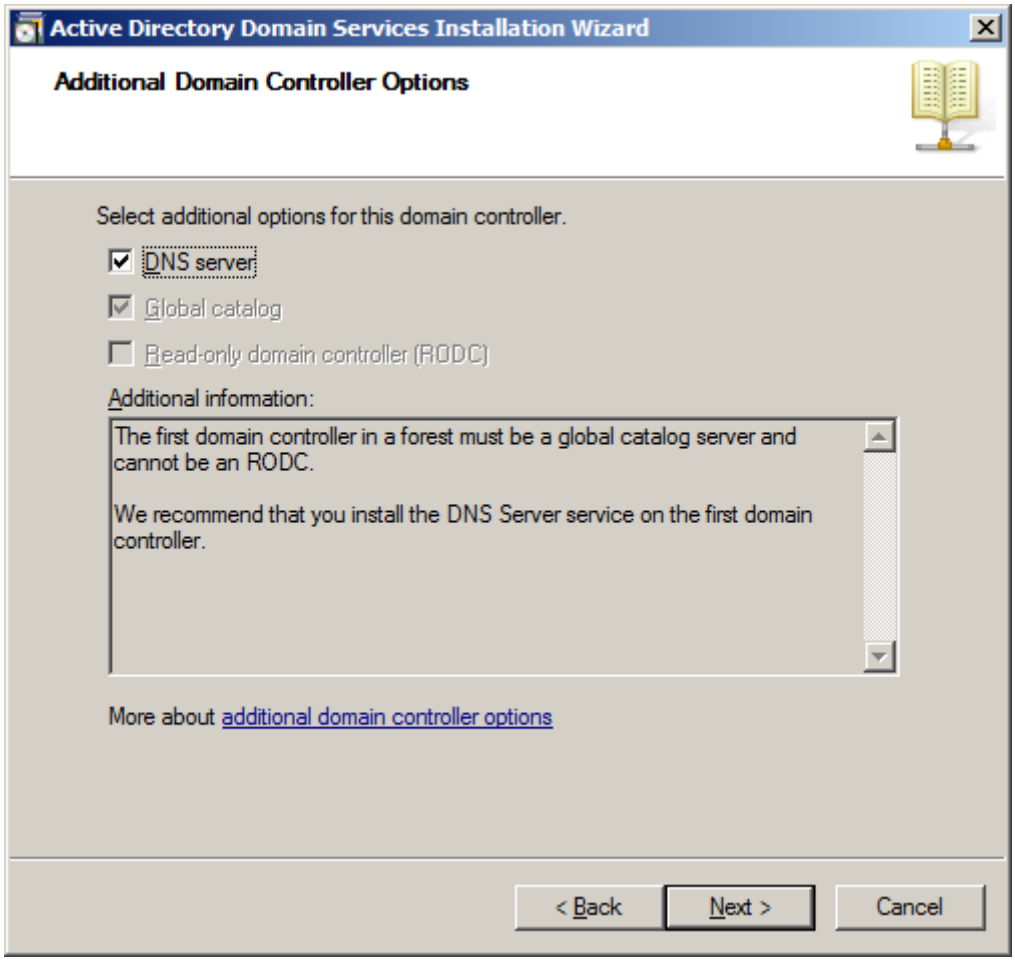
Specify the name of Forest Root Domain.

Press the **Next** button to continue.



Select windows server 2008 or windows server 2008 r2 if building windows server 2008 r2 cluster.

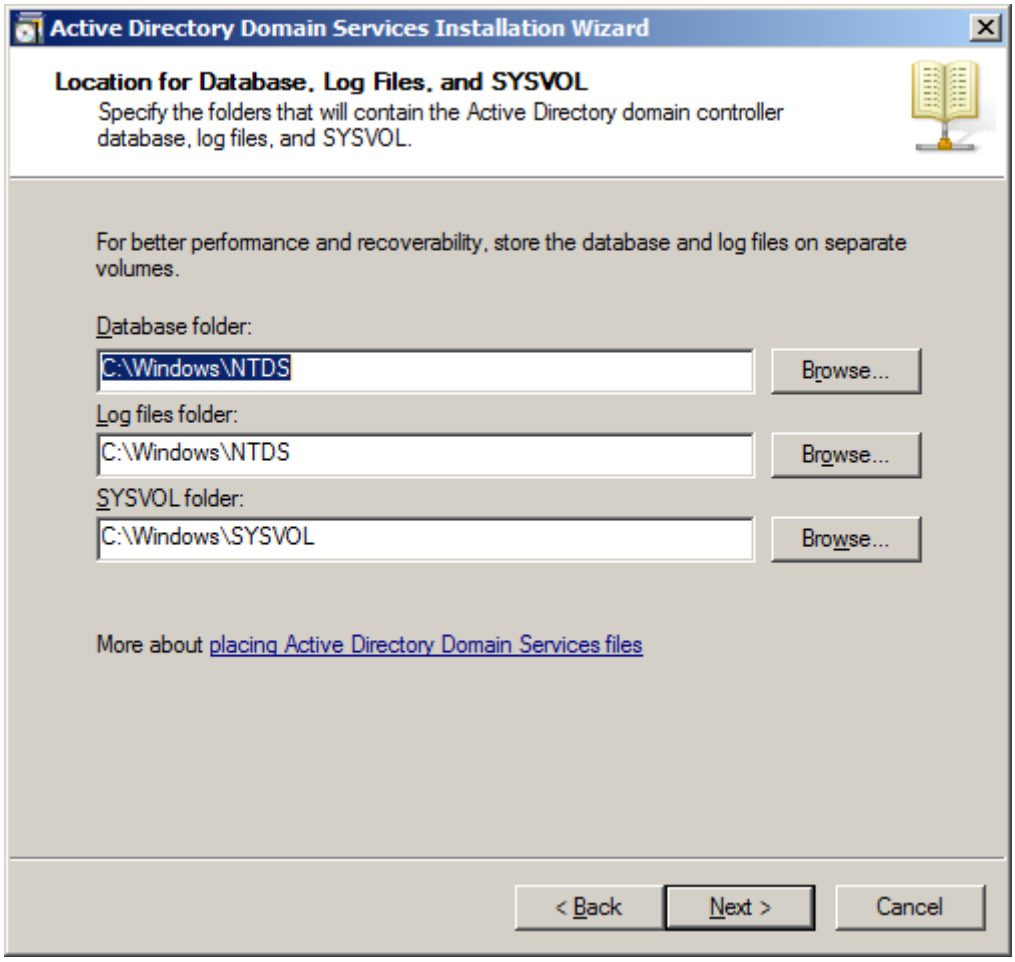
Press the **Next** button to continue.



Keep the selection of the **DNS server.**

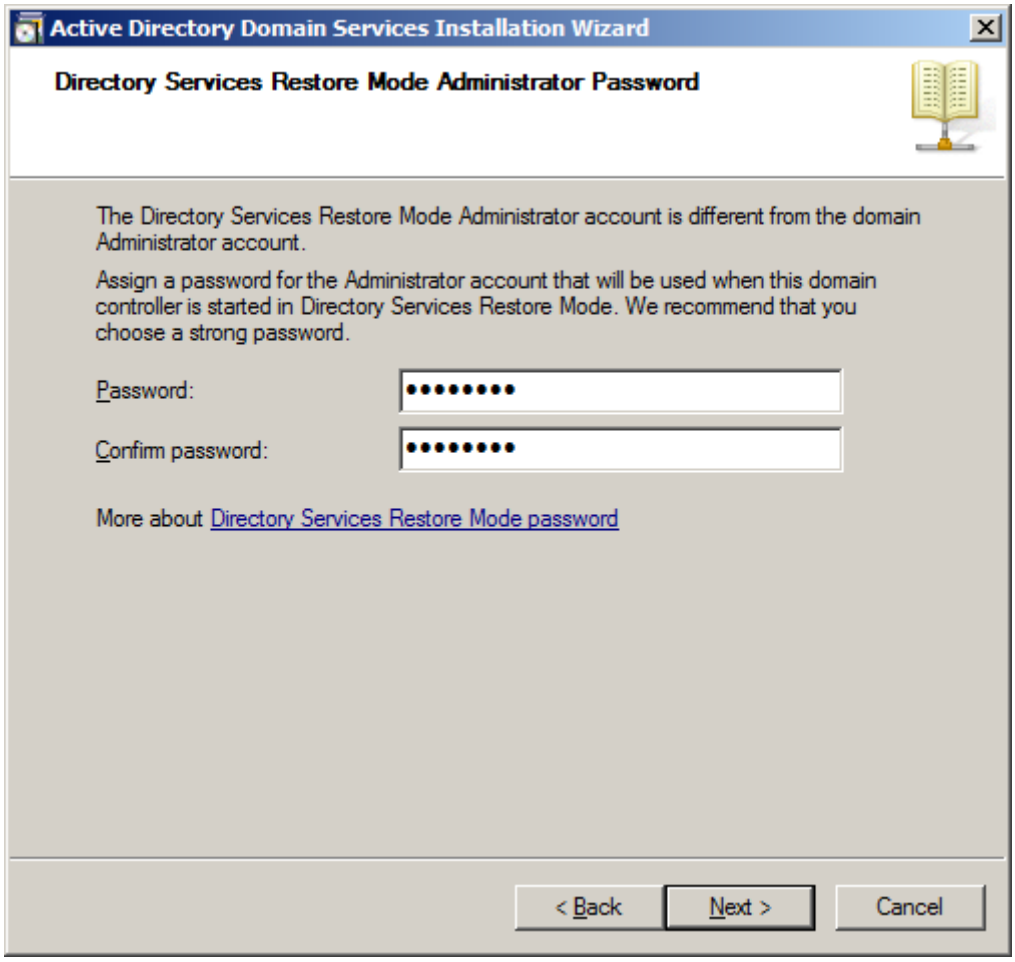
Press the **Next** button to continue.

Press the **Yes** button to continue.



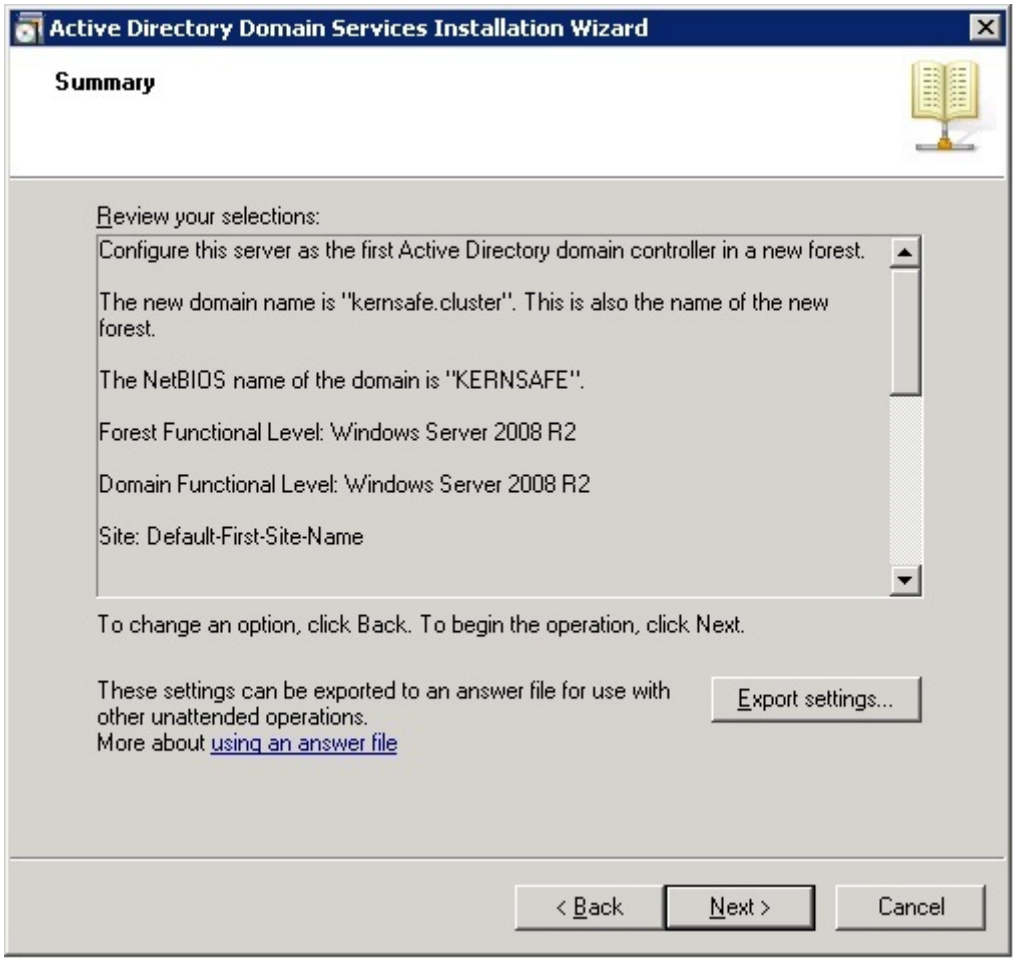
Specify the **location for Database, Log files, and SYSVOL.**

Press the **Next** button to continue.

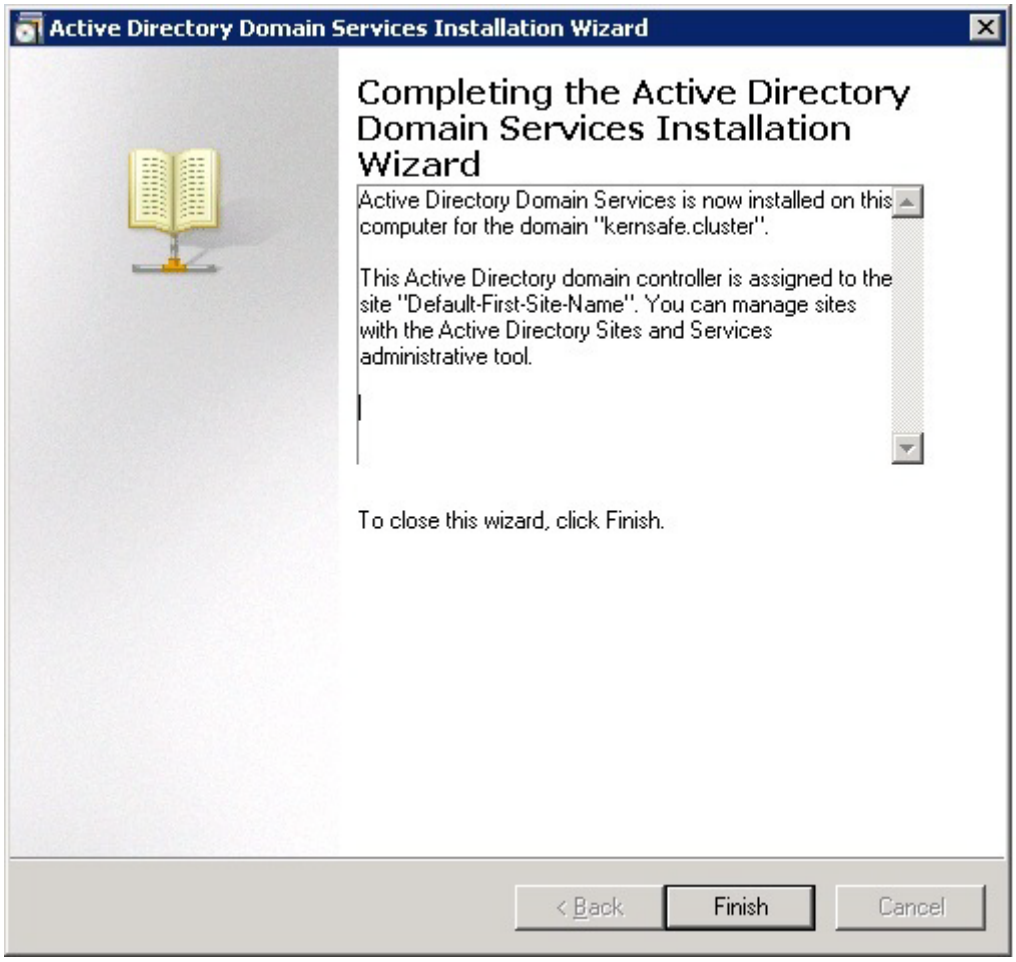


Specify the **Directory Services Restore Mode Administrator Password.**

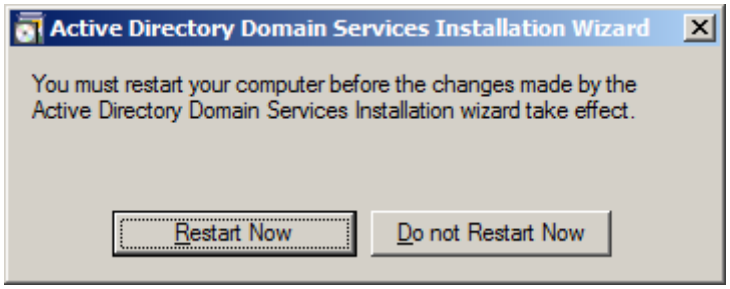
Press the **Next** button to continue.



Specify the information and press the **Next** button to continue.



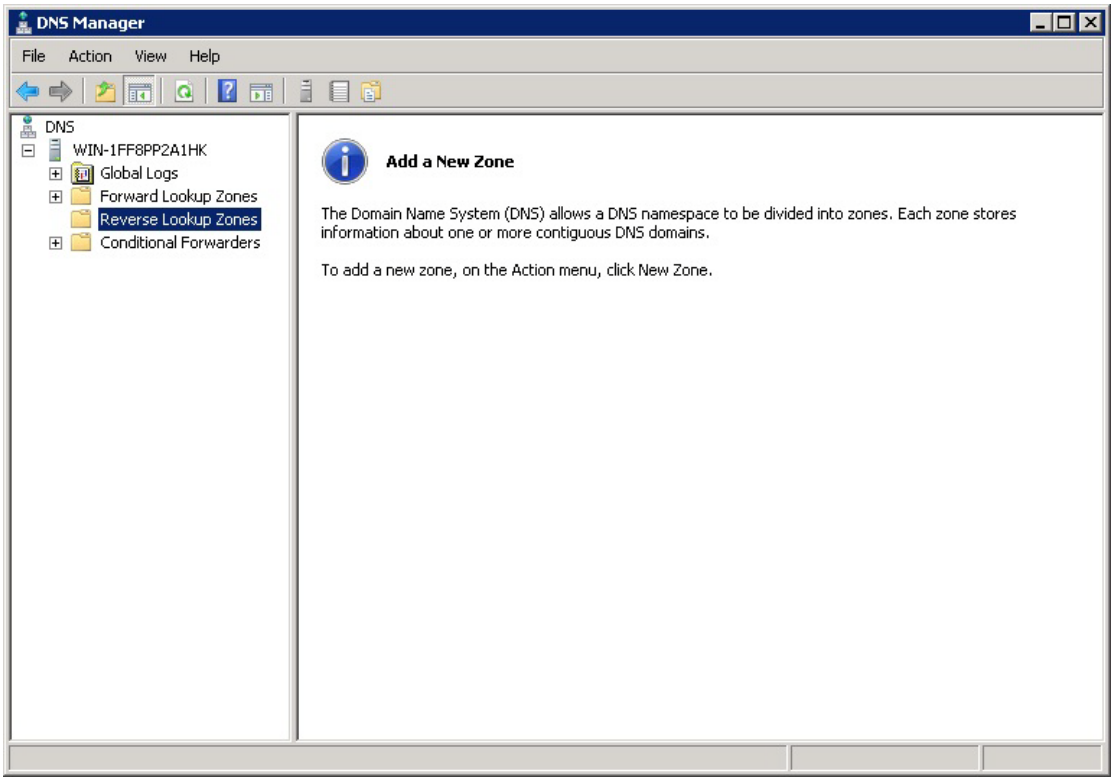
Press the **Finish** button to close the wizard.



Restart is required. Press the **Restart Now** button to restart the computer.

Install DNS

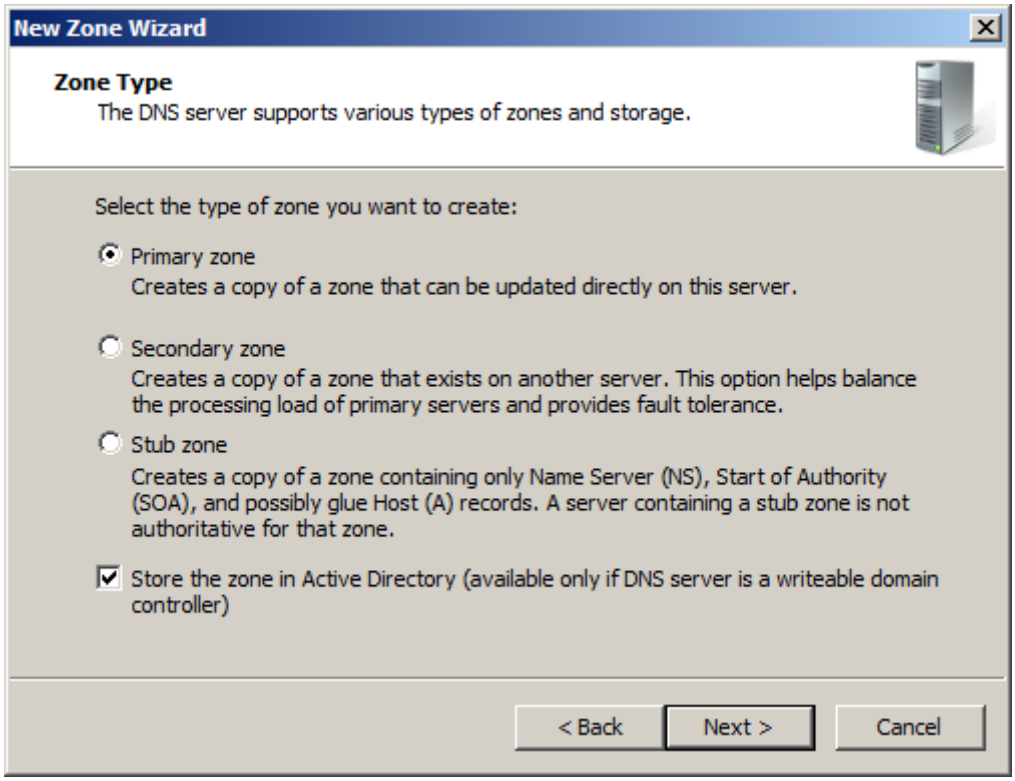
Use the administrator role to log on to the domain controller machine and launch **DNS manager**.



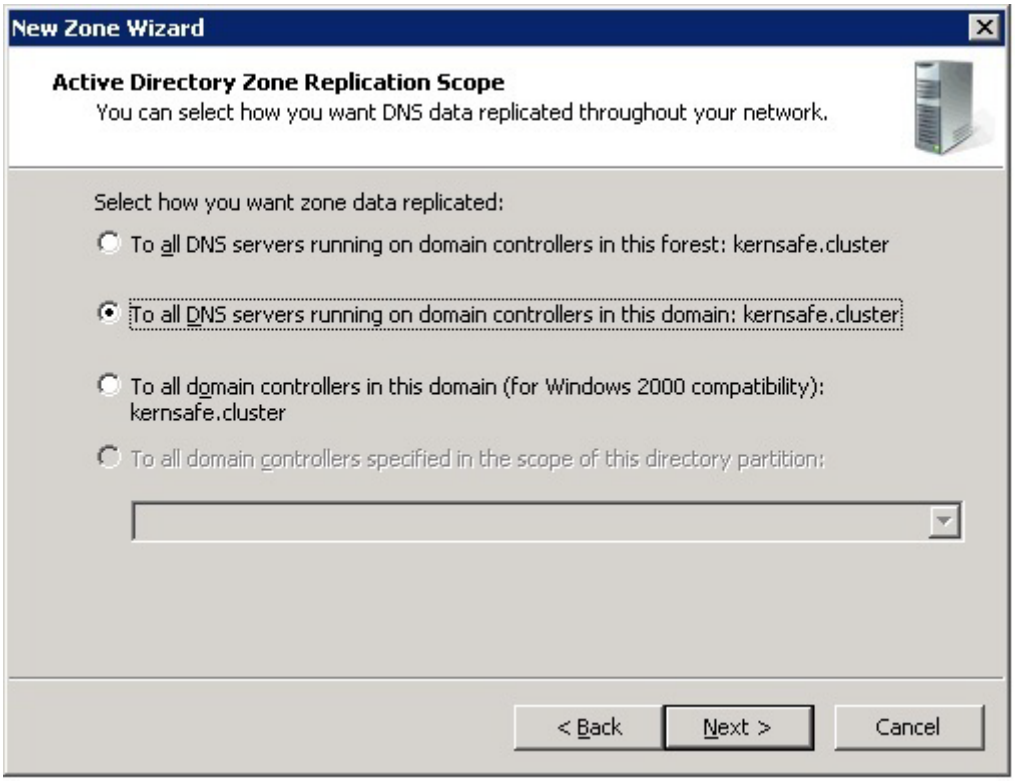
Right click on the **Reverse Lookup Zone** in the left tree view and then select **New Zone…**menu item.

The **New Zone Wizard** is shown

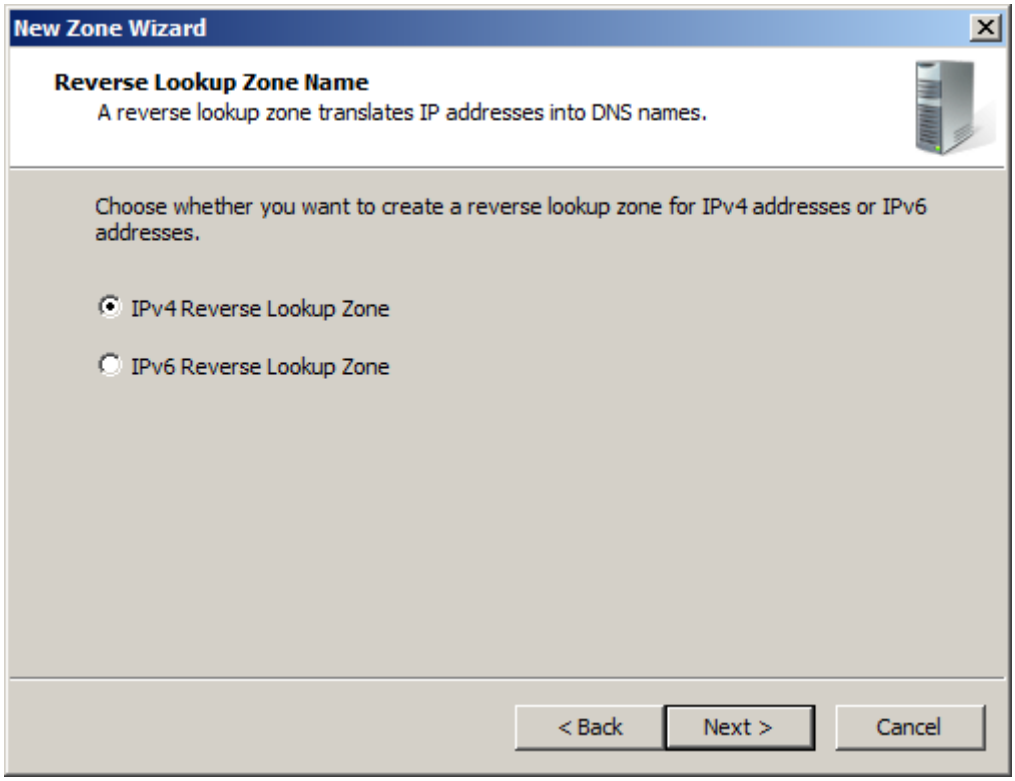
Press the **Next** button to continue



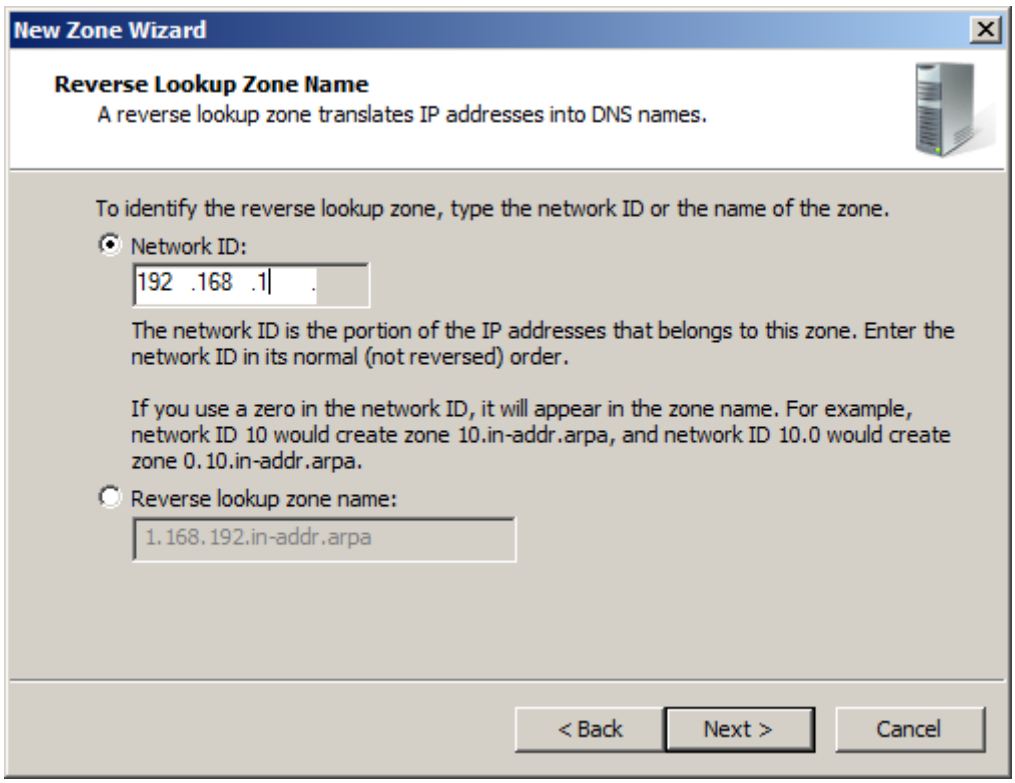
Keep it default and press **Next** to continue.



Keep it default and press **Next** to continue.

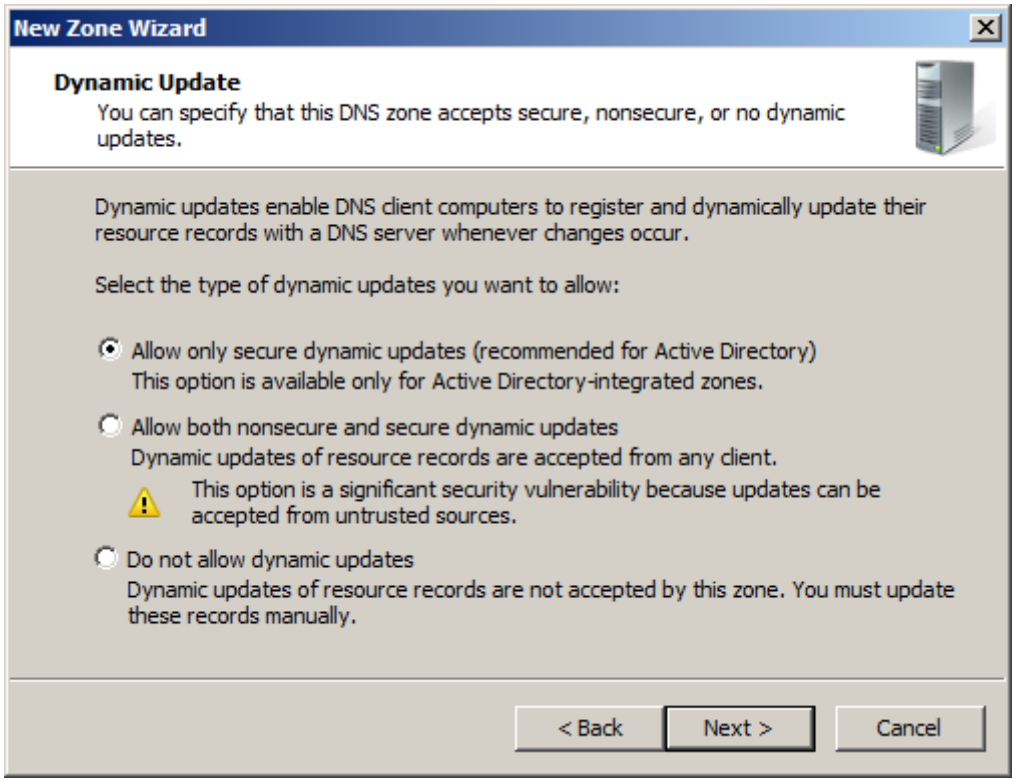


Keep it default and press **Next** to continue.

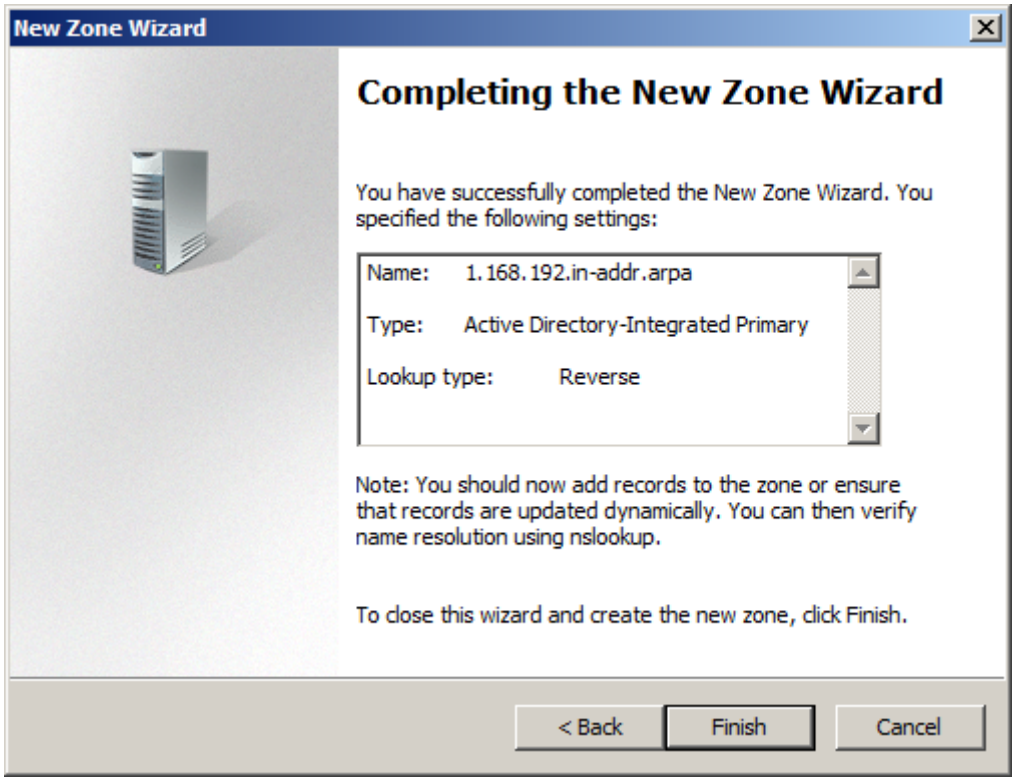


Select the **Network ID** and then type the IP address in the **Network ID**
Note, It depends on the private address.

Press the **Next** button to continue.

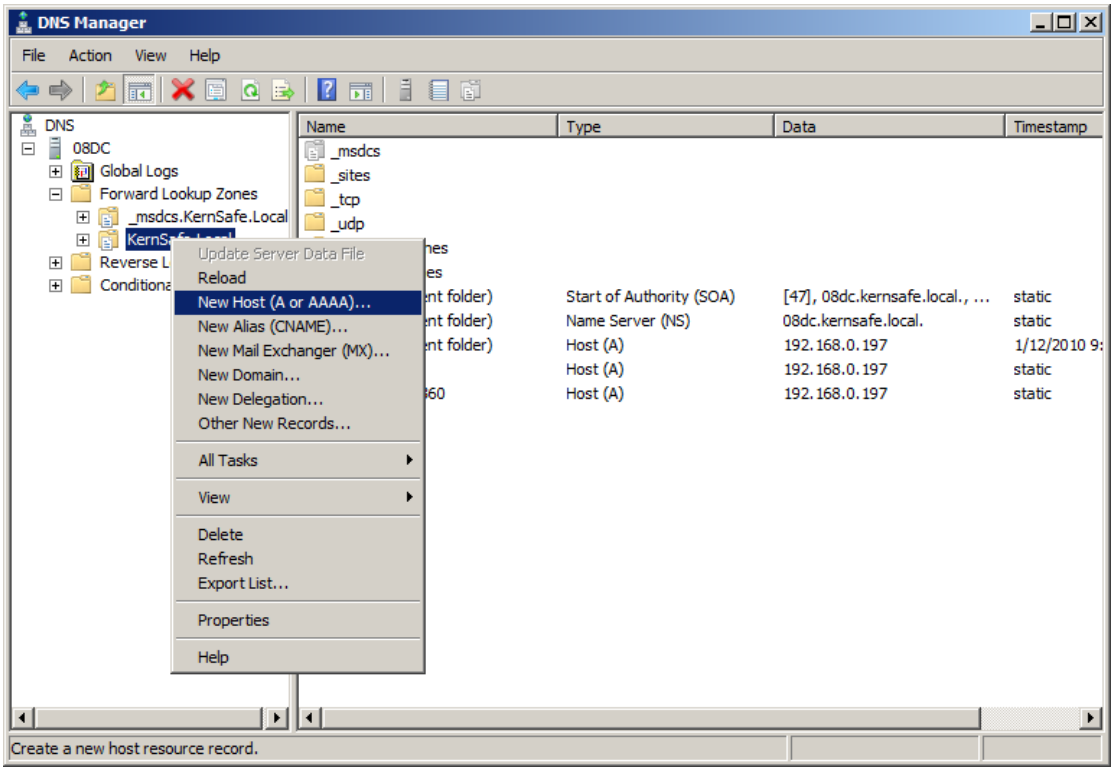


Keep **Dynamic Update** default and press **Next** to continue.

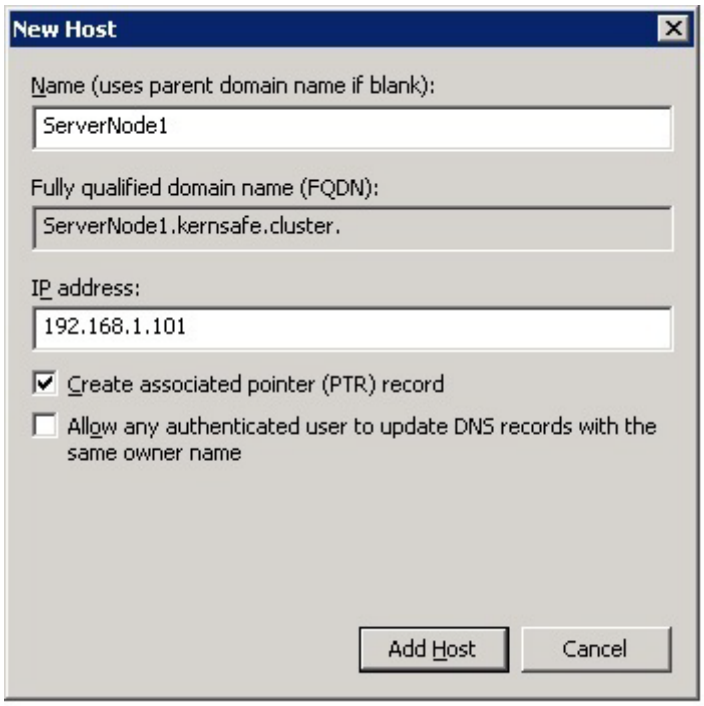


Check all of the parameters are correct, and press **Finish** to create the new zone.

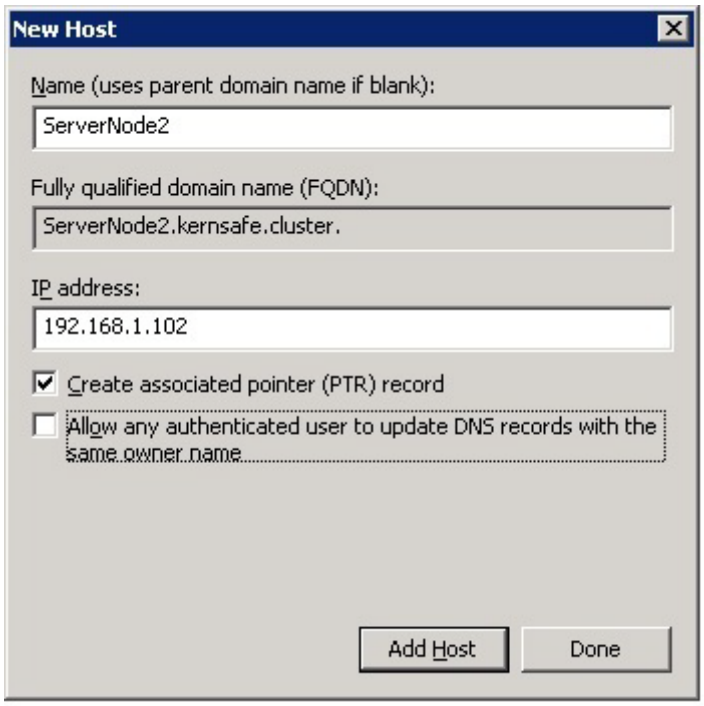
Right click on the **kernsafe.cluster** in the left tree view of DNS manager, the select **new host(A or AAA)...** menu item.



The **New Host** dialog is shown

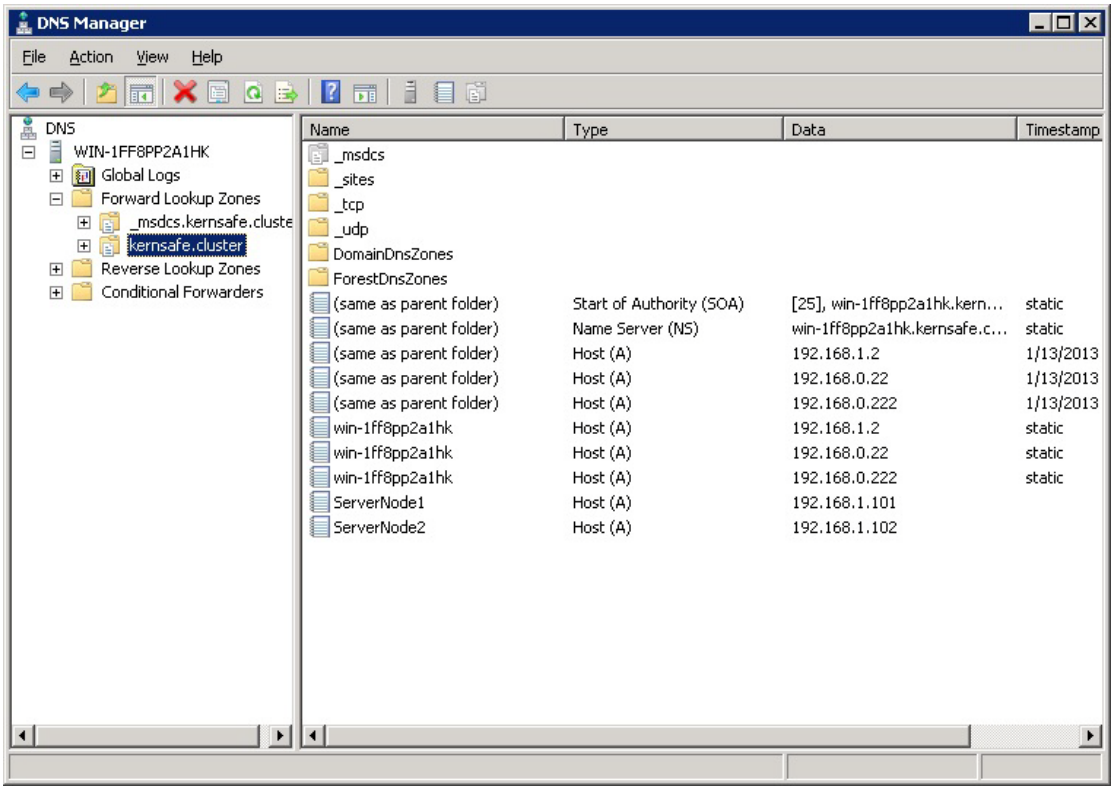


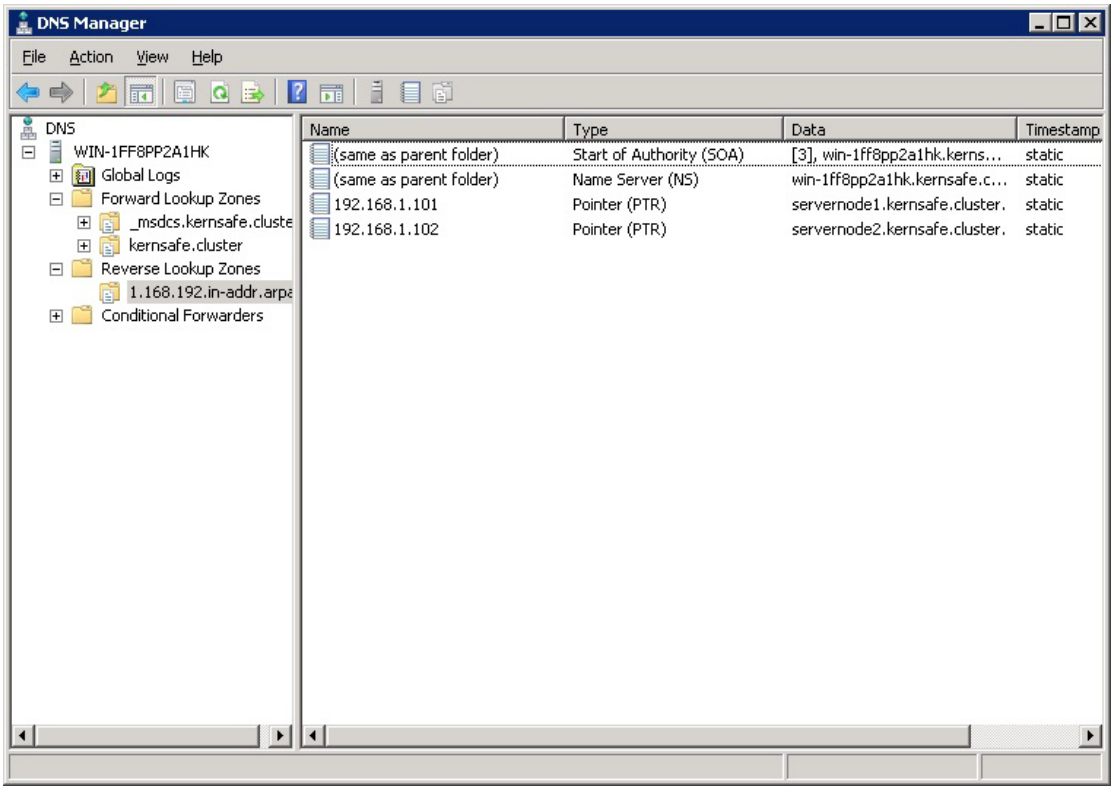
Type Host name and IP address and check the **Create associated pointer (PTR) record** checkbox, then press Add Host to add **ServerNode1.**



Add **ServerNode2** in the same way.

Now we will see the two records in the **DNS manager**.

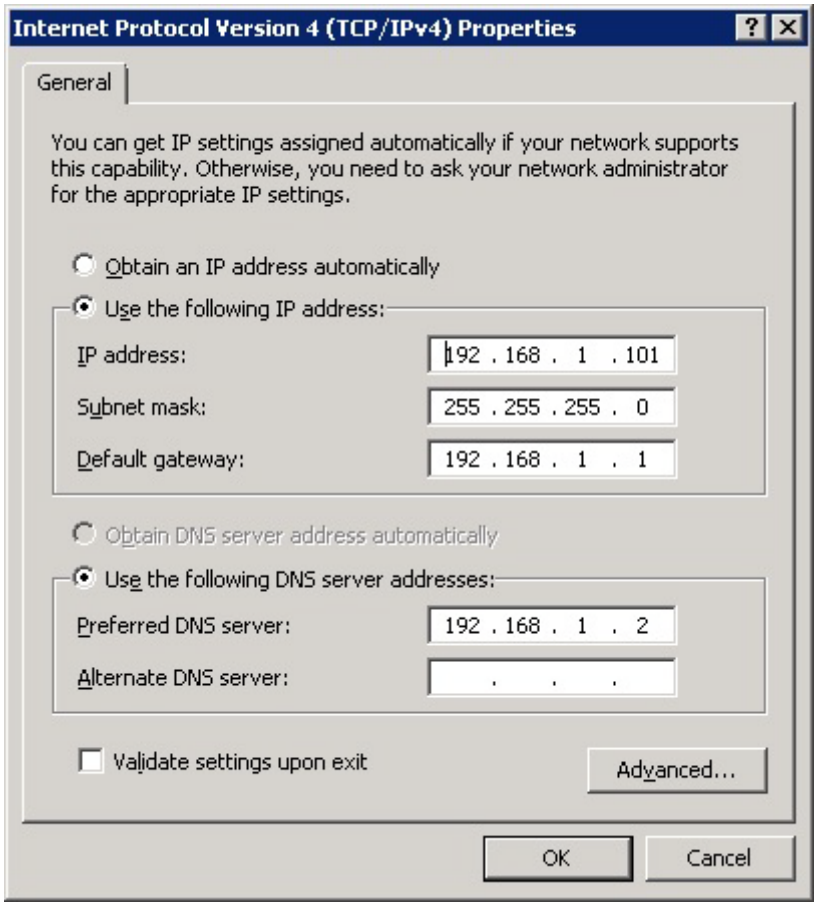

DNS Manager
File Action View Help
DNS
WIN-1FF8PP2A1HK
Global Logs
Forward Lookup Zones
_msdcs.kernsafe.cluste
kernsafe.cluster
Reverse Lookup Zones
Conditional Forwarders
Name Type Data Timestamp
_msdcs
_sites
_tcp
_udp
DomainDnsZones
ForestDnsZones
(same as parent folder) Start of Authority (SOA) [25], win-1ff8pp2a1hk.kern... static
(same as parent folder) Name Server (NS) win-1ff8pp2a1hk.kernsafe.c... static
(same as parent folder) Host (A) 192.168.1.2 1/13/2013
(same as parent folder) Host (A) 192.168.0.22 1/13/2013
(same as parent folder) Host (A) 192.168.0.222 1/13/2013
win-1ff8pp2a1hk Host (A) 192.168.1.2 static
win-1ff8pp2a1hk Host (A) 192.168.0.22 static
win-1ff8pp2a1hk Host (A) 192.168.0.222 static
ServerNode1 Host (A) 192.168.1.101
ServerNode2 Host (A) 192.168.1.102


DNS Manager
File Action View Help
DNS
WIN-1FF8PP2A1HK
Global Logs
Forward Lookup Zones
_msdcs.kernsafe.cluste
kernsafe.cluster
Reverse Lookup Zones
1.168.192.in-addr.arpa
Conditional Forwarders
Name Type Data Timestamp
(same as parent folder) Start of Authority (SOA) [3], win-1ff8pp2a1hk.kerns... static
(same as parent folder) Name Server (NS) win-1ff8pp2a1hk.kernsafe.c... static
192.168.1.101 Pointer (PTR) servernode1.kernsafe.cluster. static
192.168.1.102 Pointer (PTR) servernode2.kernsafe.cluster. static

Configuring on ServerNode1

Network Adapter

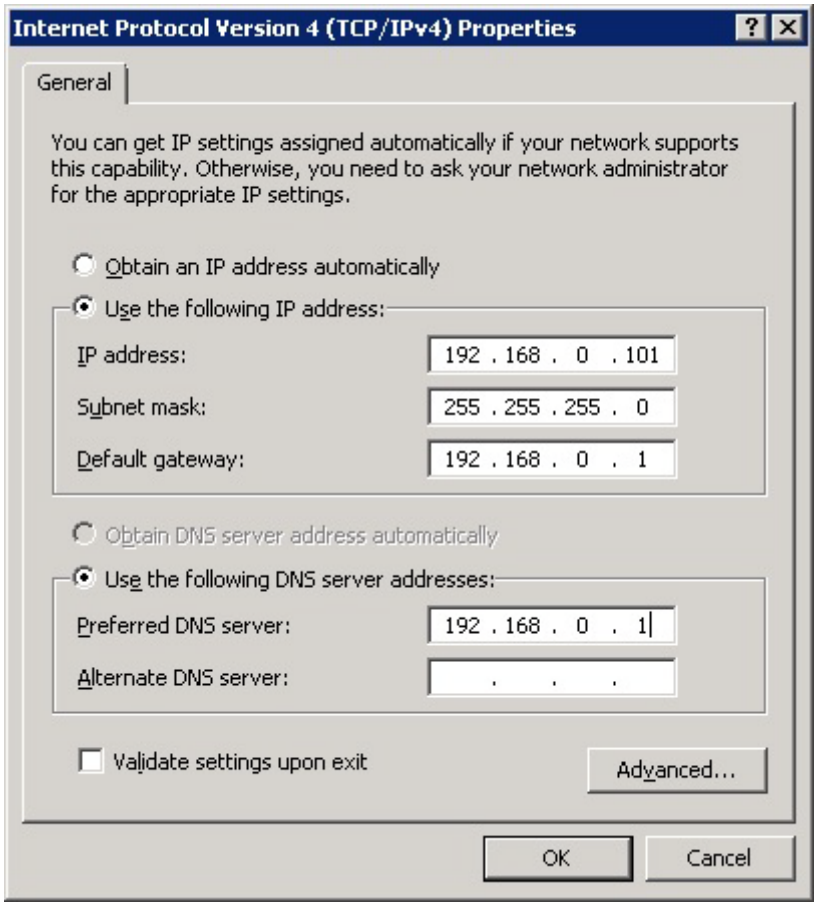
For working in clustering environment, the network adapter must be assigned a static IP address. Select the **Internet Protocol Version 4(TCP/IP4)** and then press the **Properties** button, the **Internet Protocol Version 4(TCP/IP4)** dialog is shown.
Set the first Network Adapter of ServerNode1



Type the **IP address , Subnet mask, Gateway and DNS server .**

Press the **OK** button to save change.

Set the second Network Adapter of ServerNode1

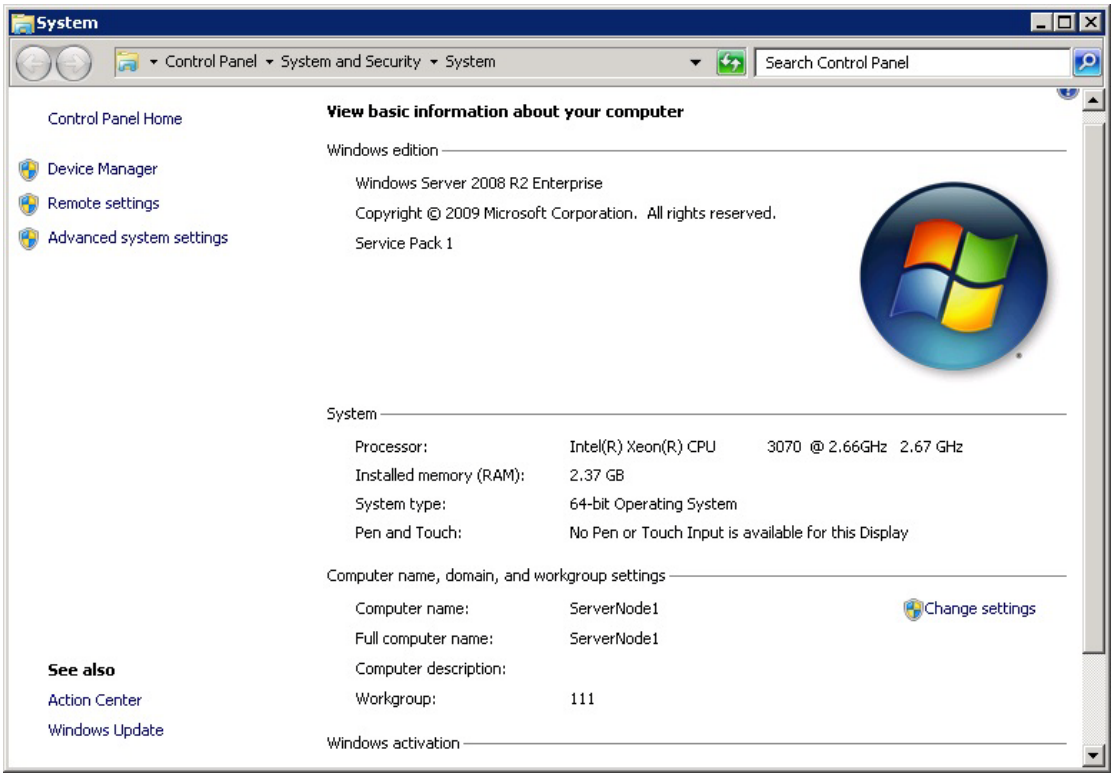


Type the **IP address, Subnet mask, Gateway and DNS server.**

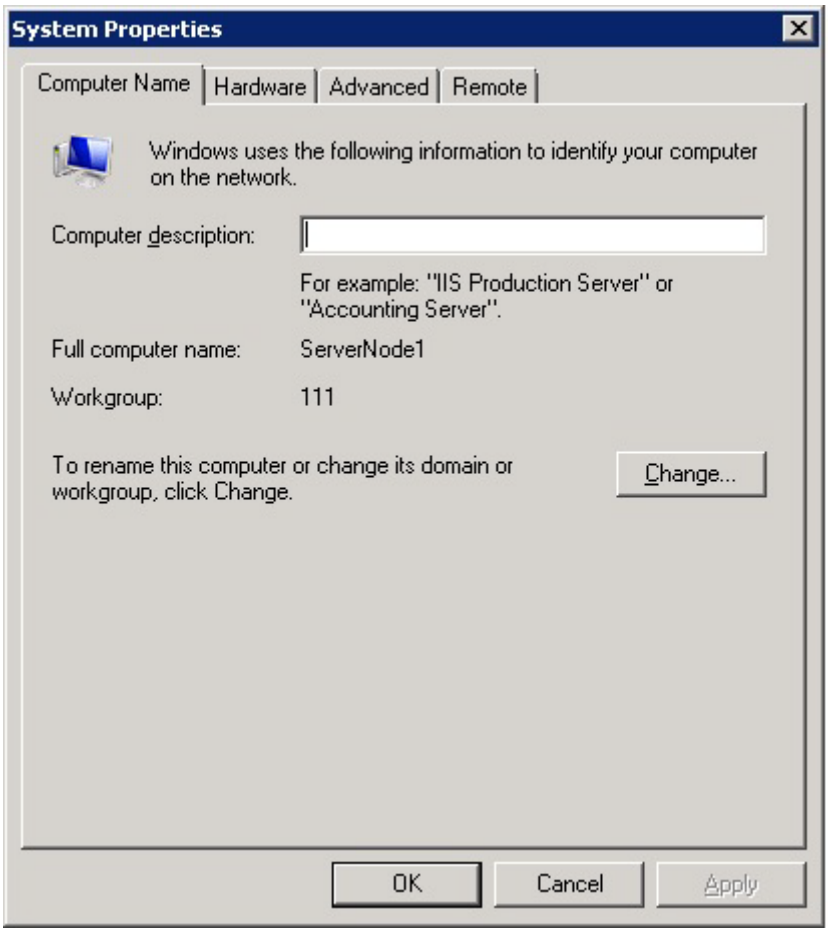
Press the **OK** button to save change.

Join to the domain

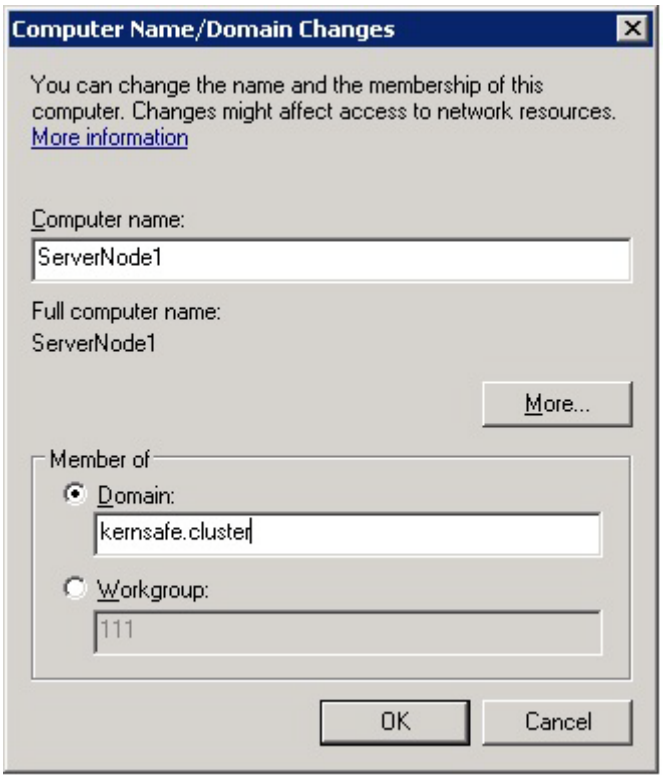
Open the System Properties page.



Click on the **Change settings** link, the **System Properties** dialog is shown.

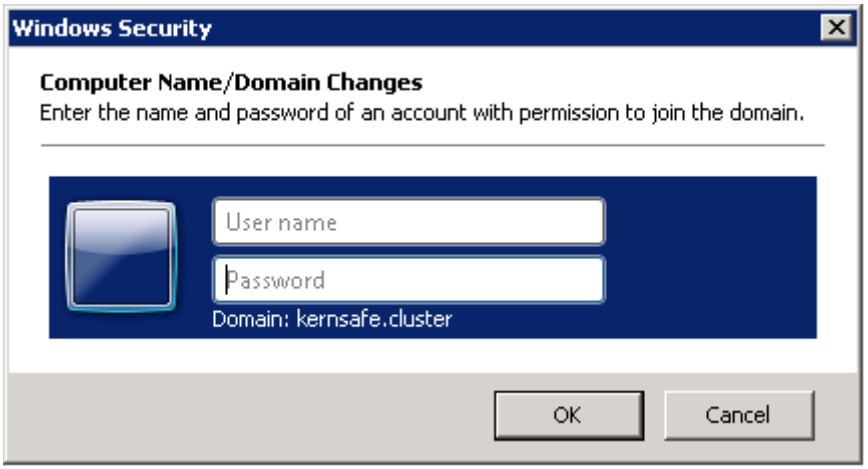


Press the **Change…** button.



Type **ServerNode1** in the **Computer name** and **kernsafe.cluster** in the **Domain.**

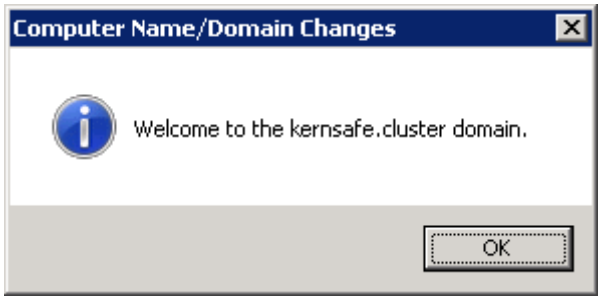
Press **OK** to save the changes



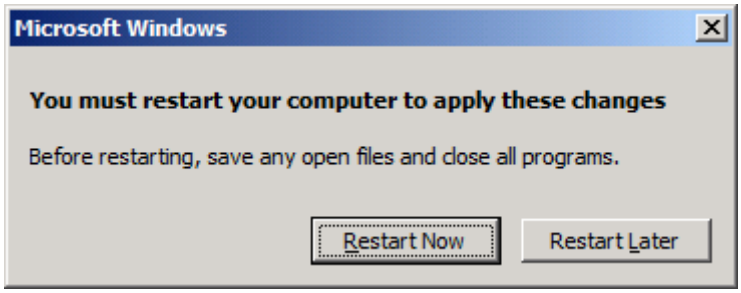
Domain controller account is required to join the domain.

Type User name and Password , then press the **OK** button to continue.

If successful, the **Computer Name/Domain Changes** notification is shown as below.



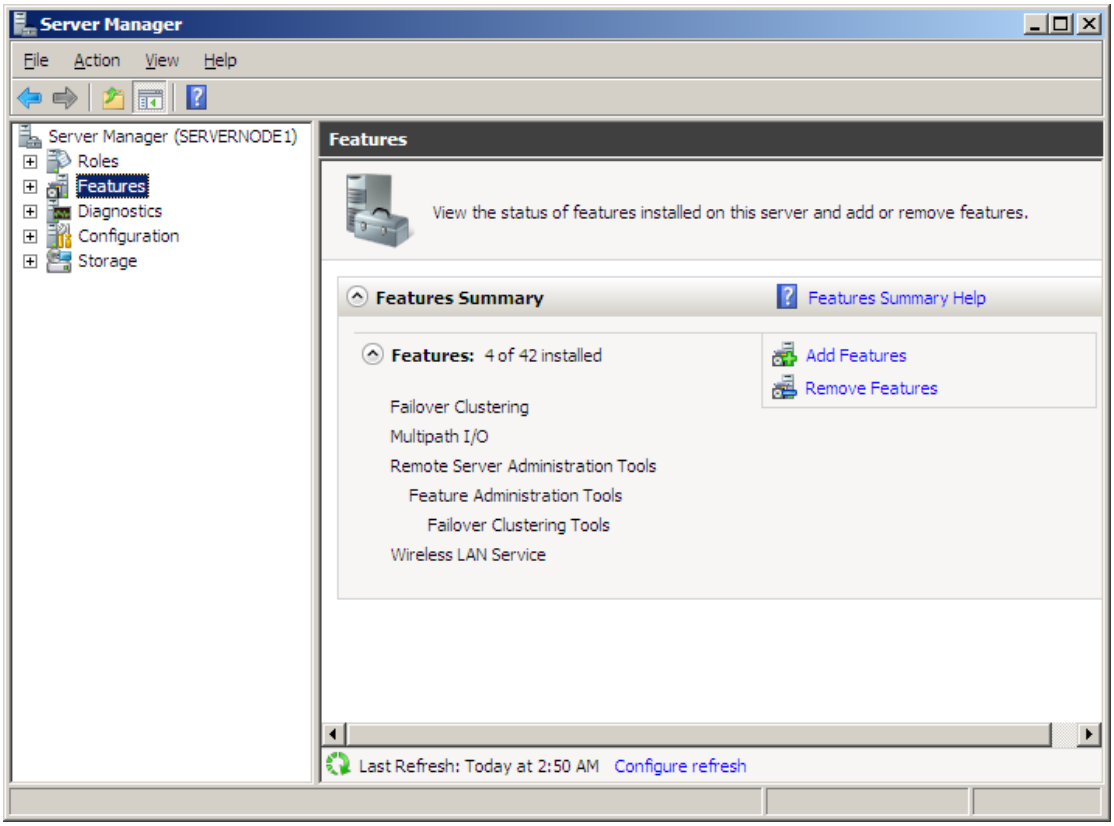
Press **OK** to continue.



Restart is required, press the **Restart Now** button to restart computer.

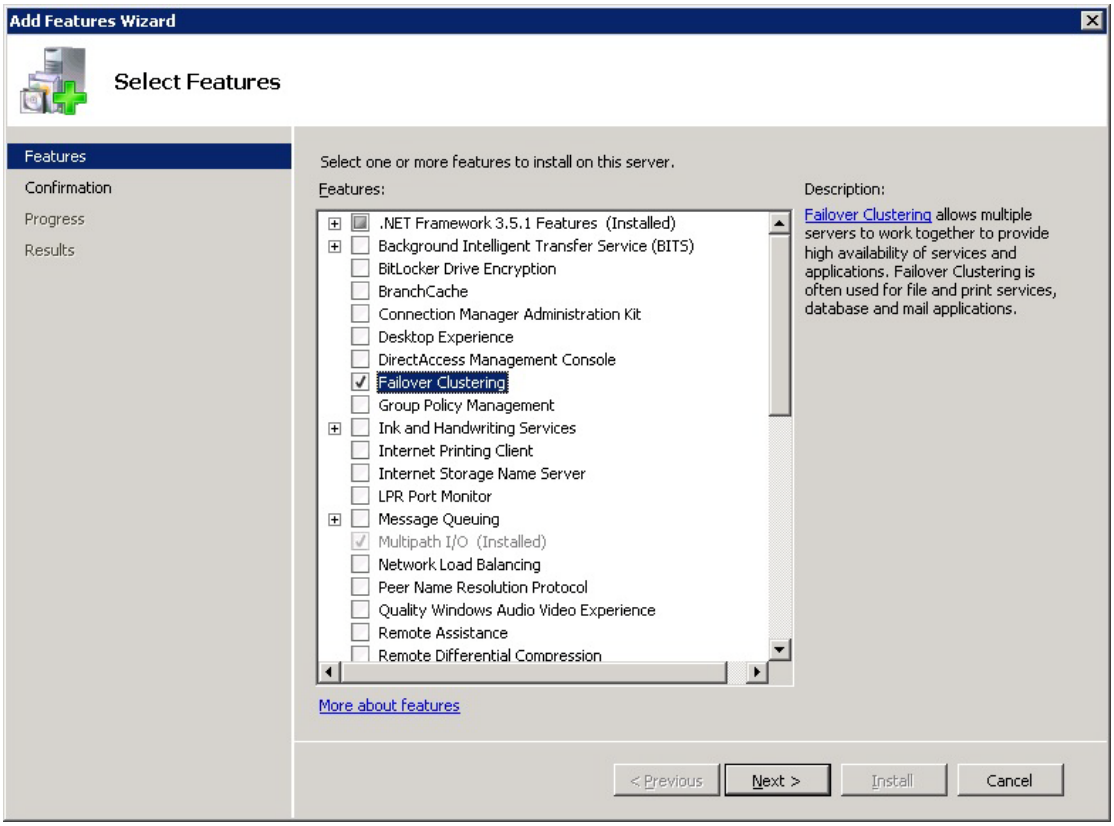
Installing Failover Cluster Service

Launch the **windows server manager Console**



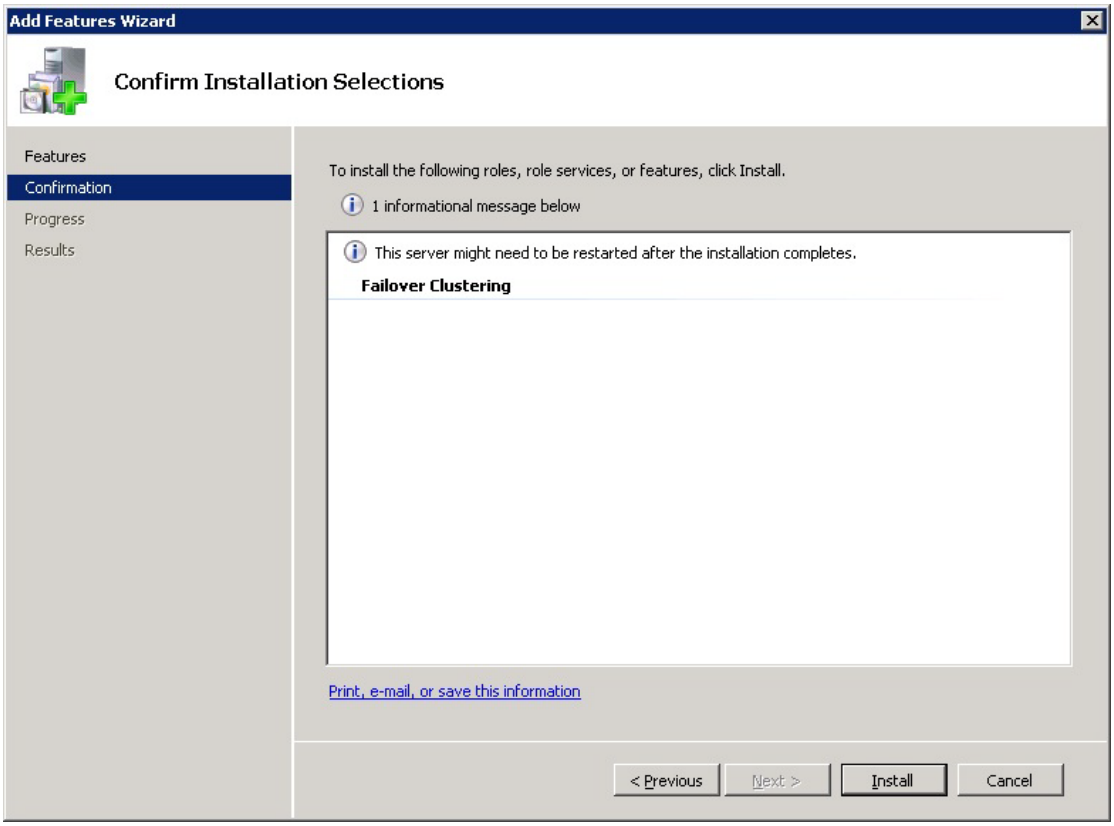
Select the **Feature** from the left tree view.

Click the **Add Features** link, the **Add Features Wizard** is shown.

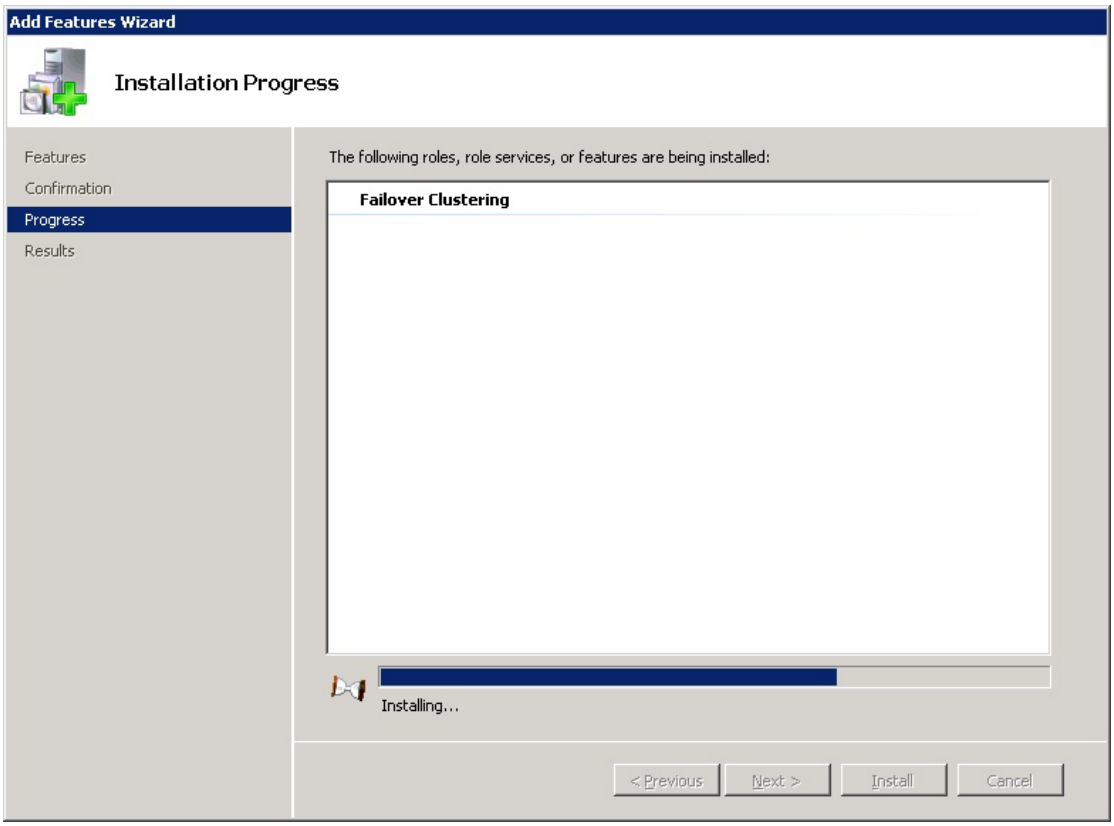


Select the **Failover Clustering.**

Press **the Next button** to continue.

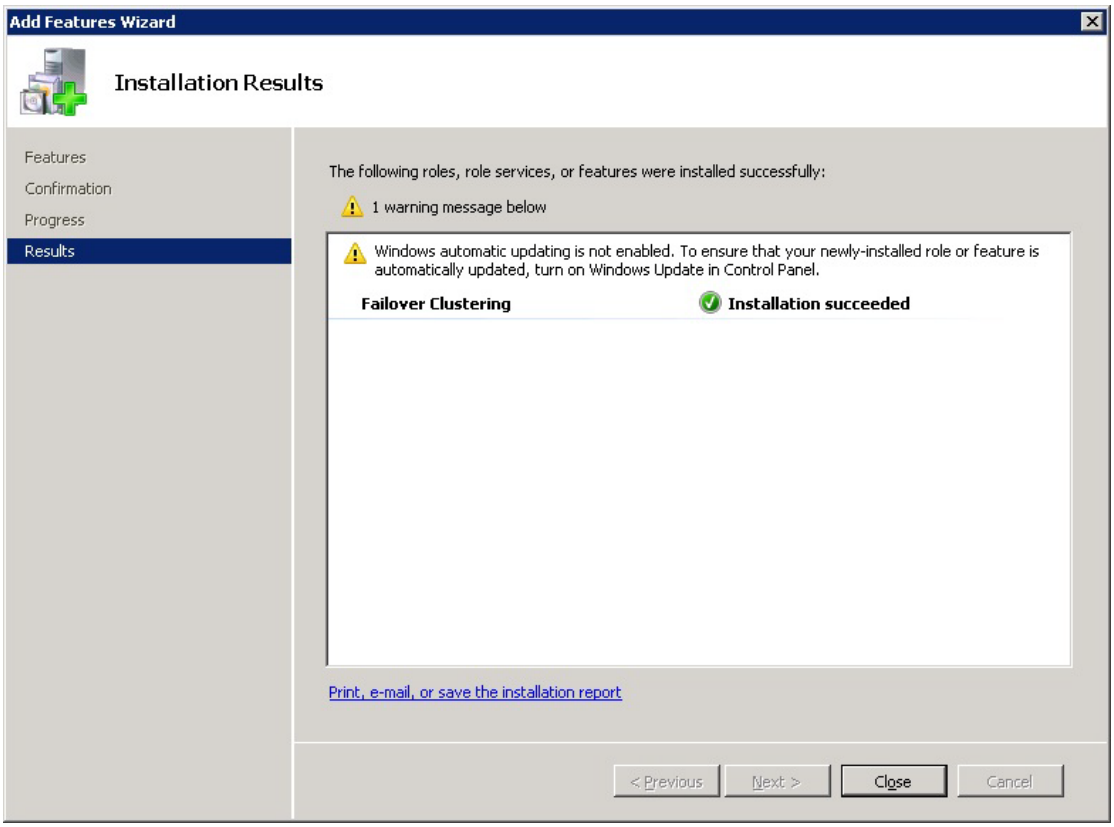


Press **Install** to continue the installation of Failover Clustering.



The installation is going on.

If successful, the wizard will complete and show the figure as below.

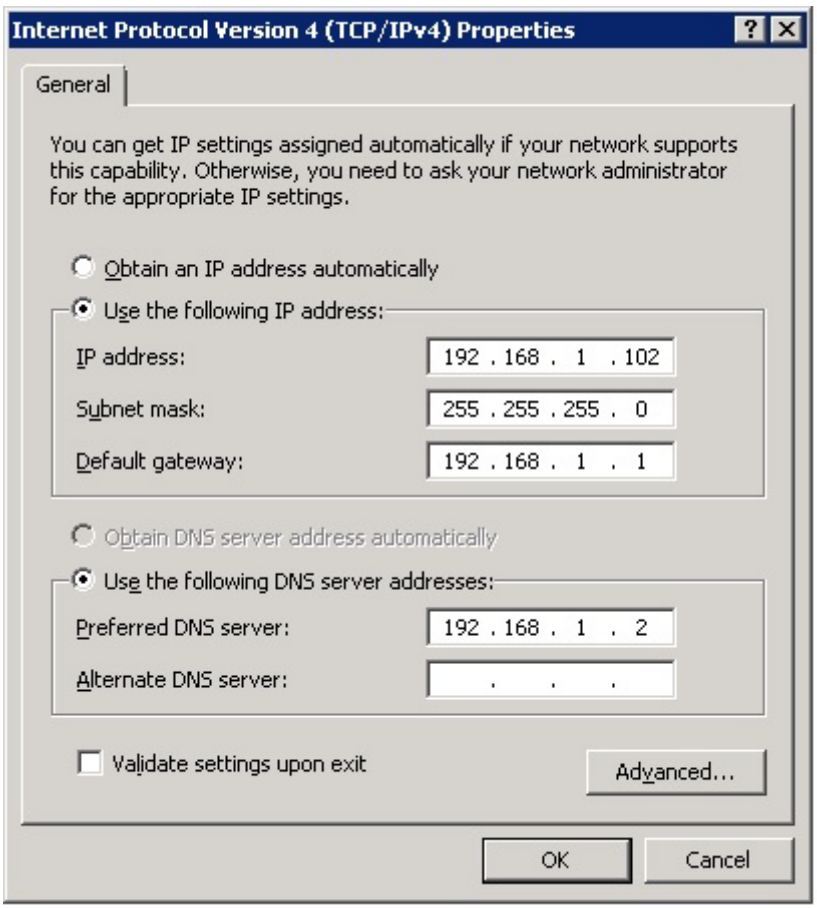


Press the **Close** button.

Configuring on ServerNode2

Network Adapters

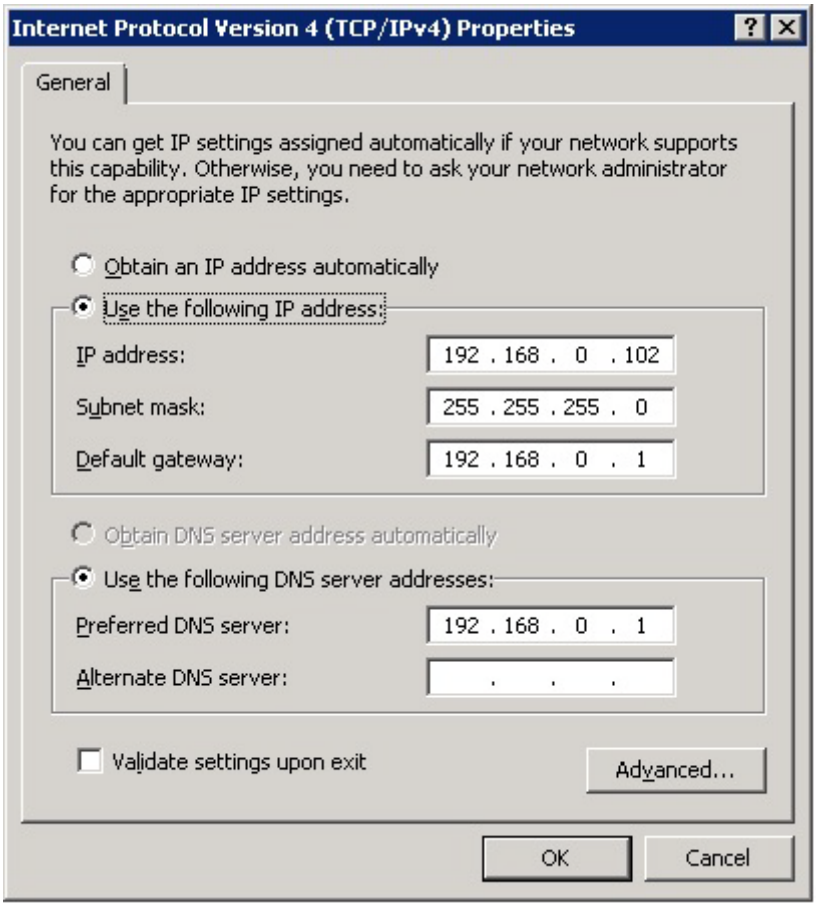
For working in clustering environment, the network adapter must be assigned a static IP address. Select the Internet Protocol Version 4(TCP/IP4) and then press the Properties button, the Internet Protocol Version 4(TCP/IP4) dialog is shown.
Set the first Network Adapter of ServerNode2



Type the **IP address ,Subnet mask, Gateway and DNS server .**

Press **OK** to save change.

Set the second Network Adapter of ServerNode2

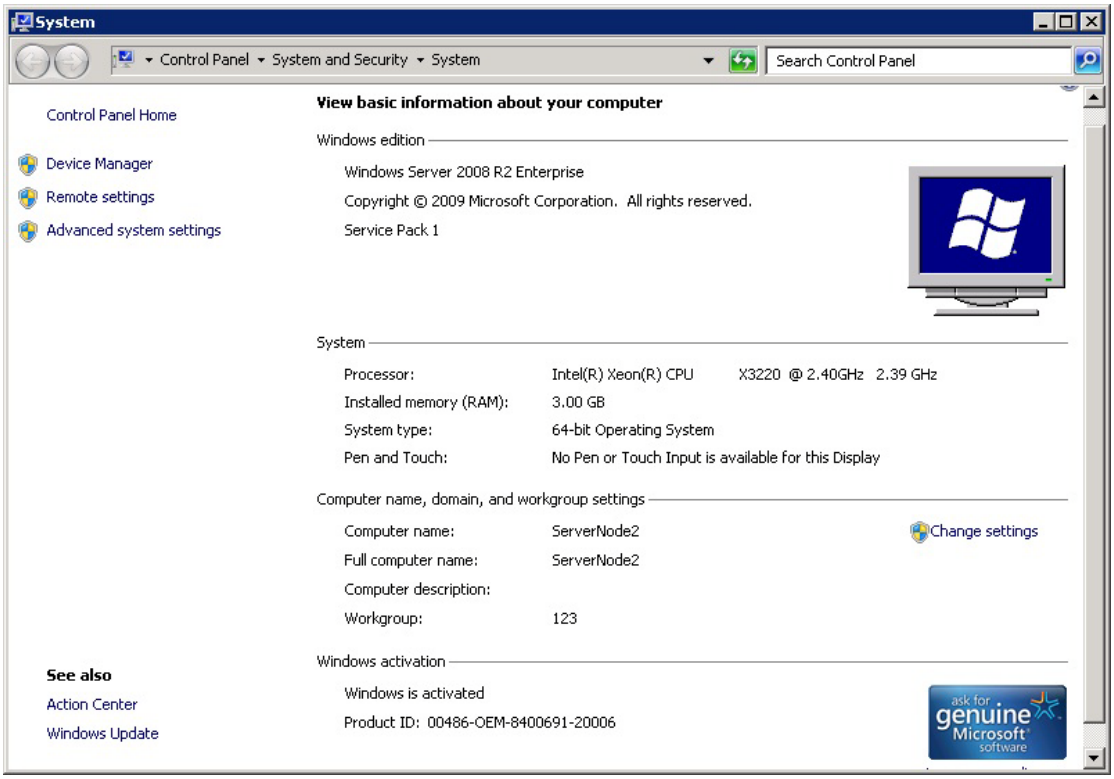


Type the **IP address, Subnet mask, Gateway and DNS server.**

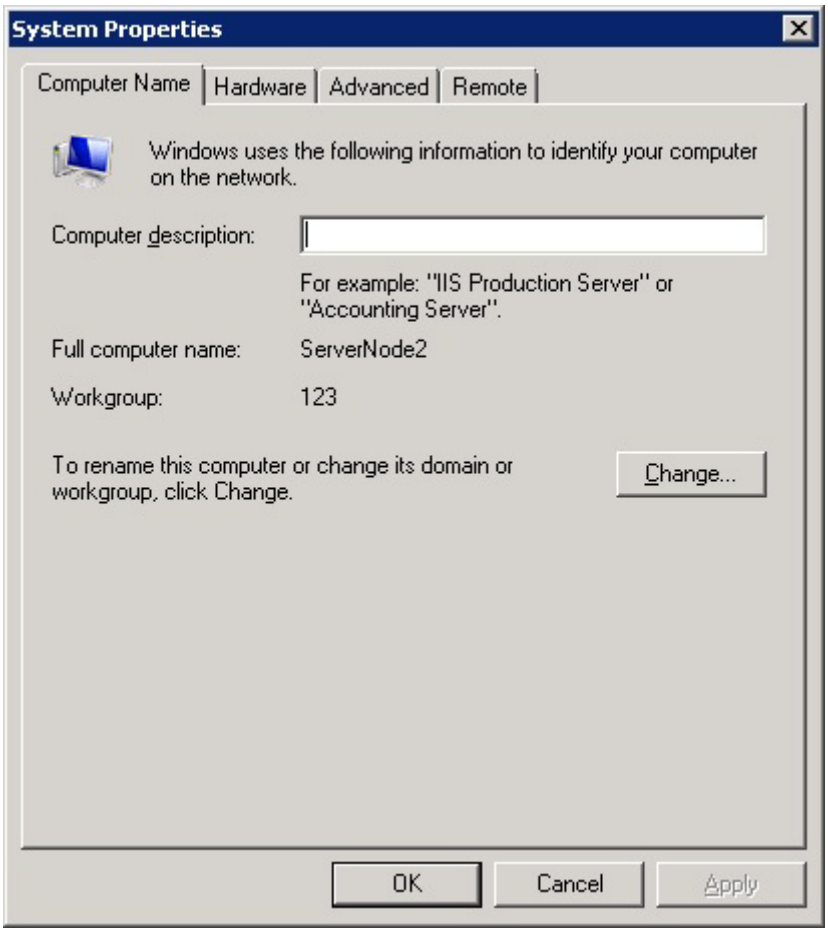
Press the **OK** button to save change.

Join to the domain

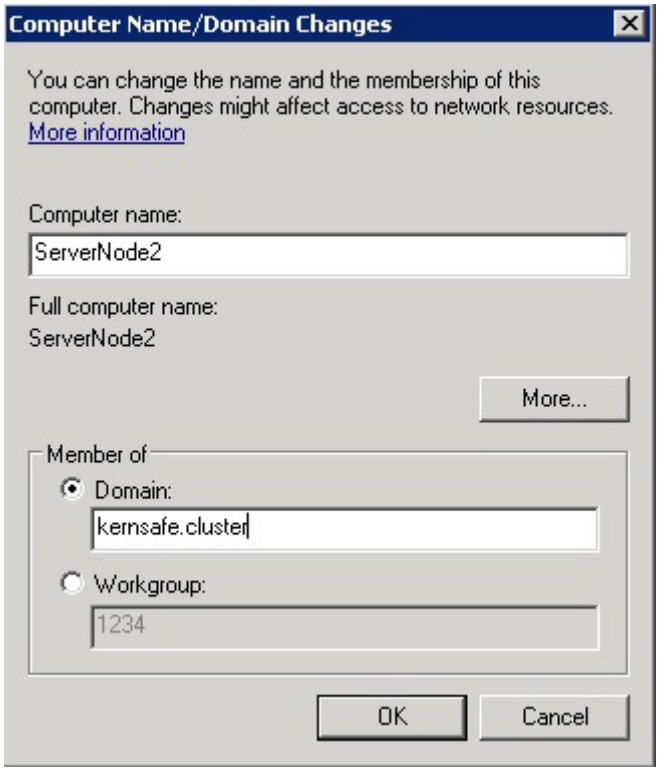
Open the System Properties page.



Click on the **Change settings** link, the **System Properties** dialog is shown.

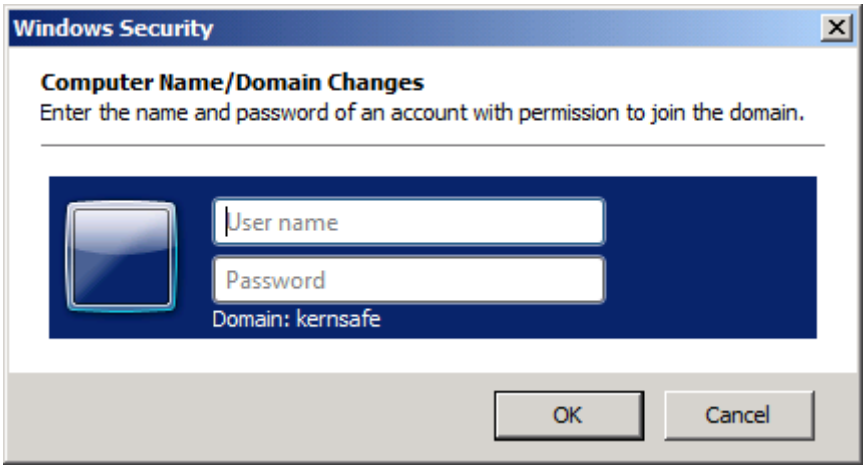


Press the **Change…** Button



Type **ServerNode1** in the **Computer name** and **kernsafe.cluster** in the **Domain**.

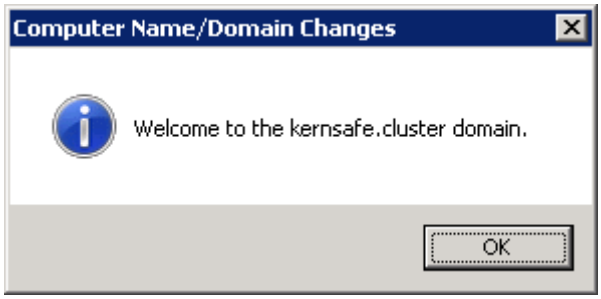
Press the **OK** button to save the changes



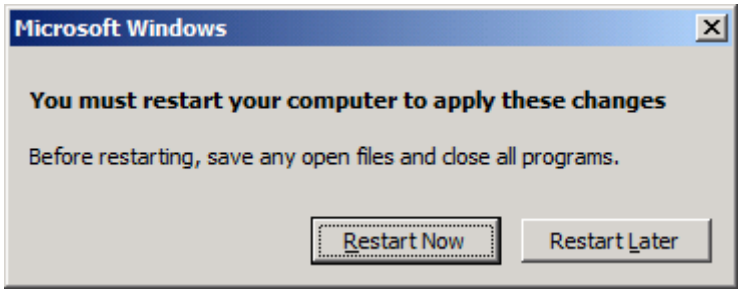
Domain controller account is required to join the domain.

Type User name and Password , then press **OK** to continue.

If successful, the **Computer Name/Domain Changes** notification is shown as below.



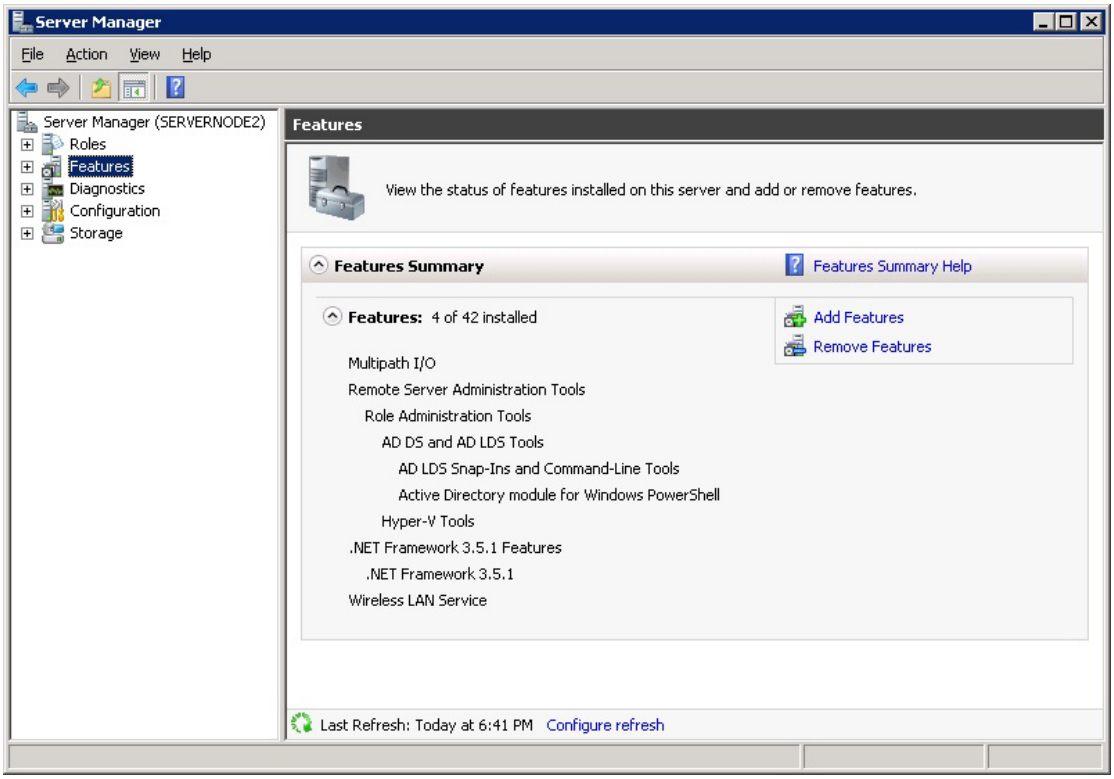
Press **OK** to continue.



Restart is required, press the **Restart Now button** to restart computer.

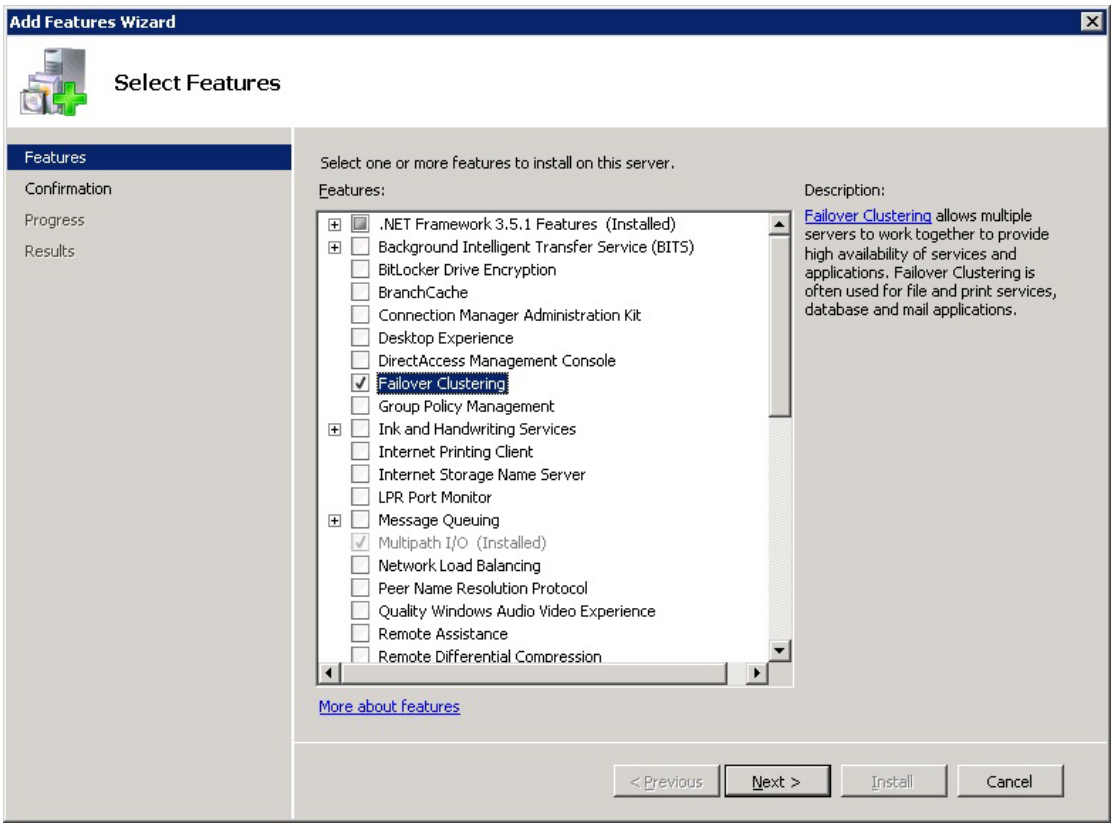
Installing Failover Cluster Service

Launch the **windows server manager** Console



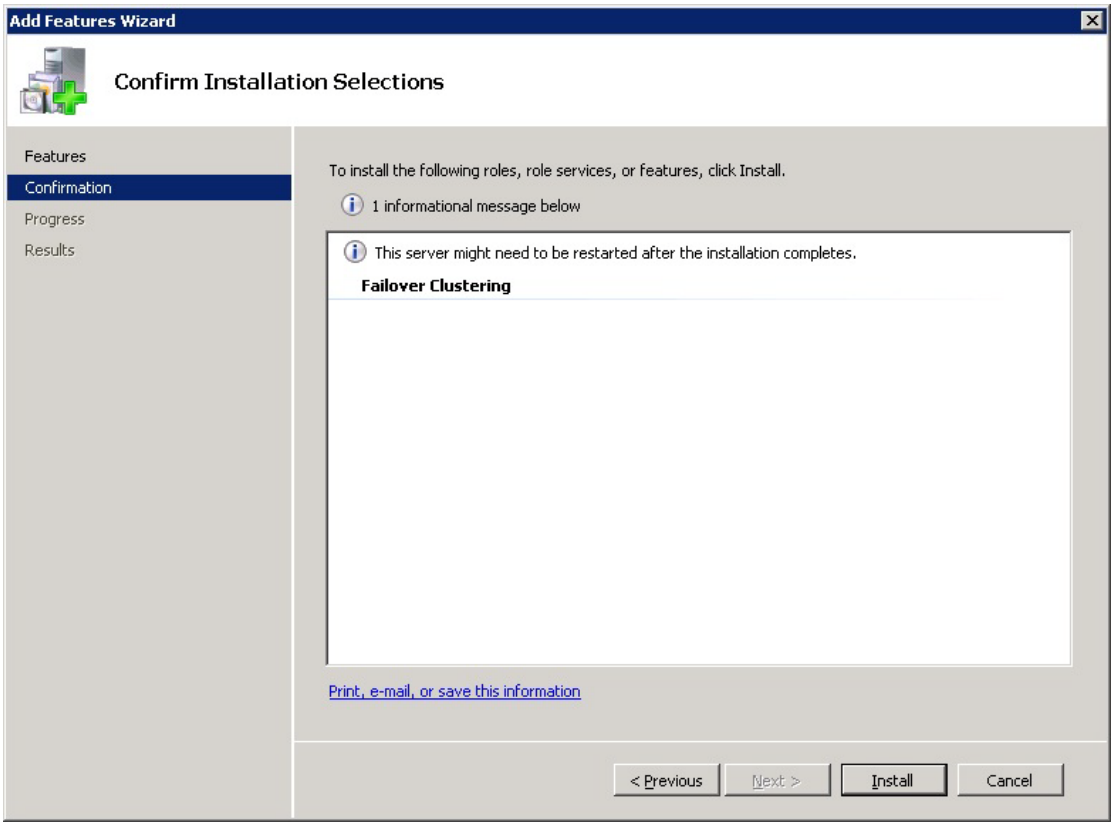
Select the **Feature** from the left tree view.

Click the **Add Features** link, the **Add Features Wizard** is shown.

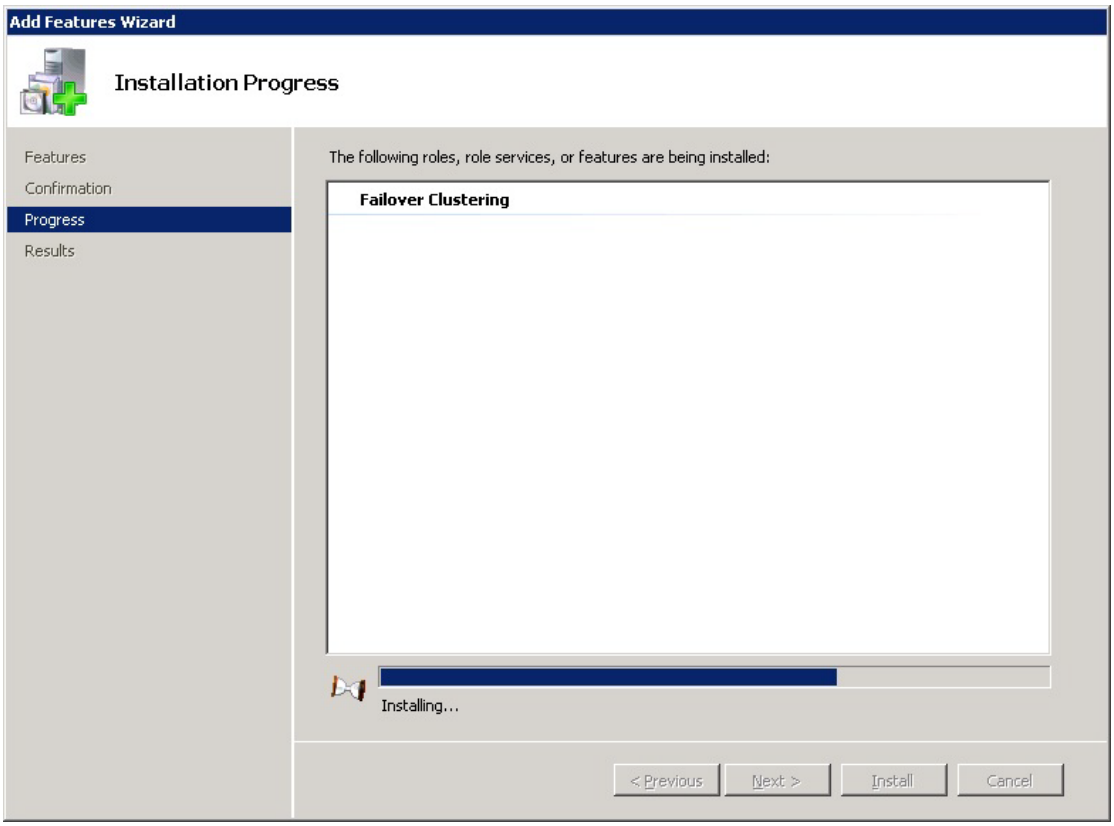


Select the **Failover Clustering.**

Press the **Next** button to continue.

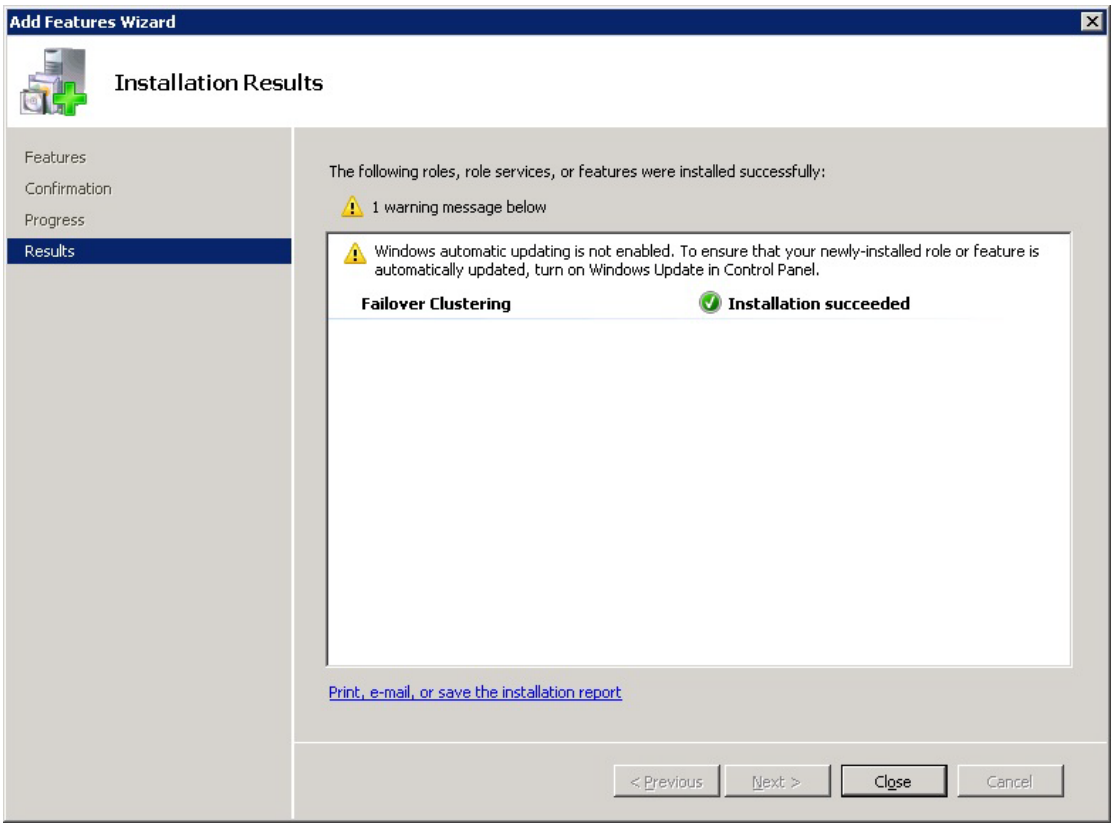


Press **Install** to continue the installation of Failover Clustering.



The installation is going on.

If successful, the wizard will complete and show as the figure below.

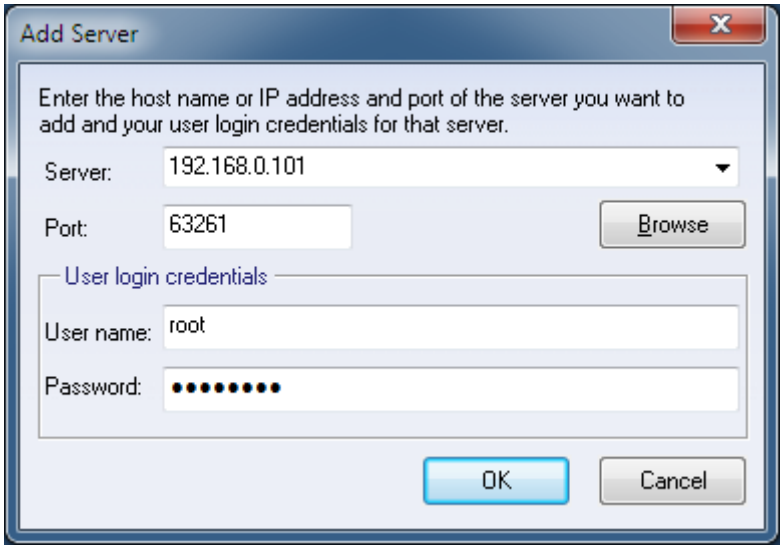


Press the **Close** button.

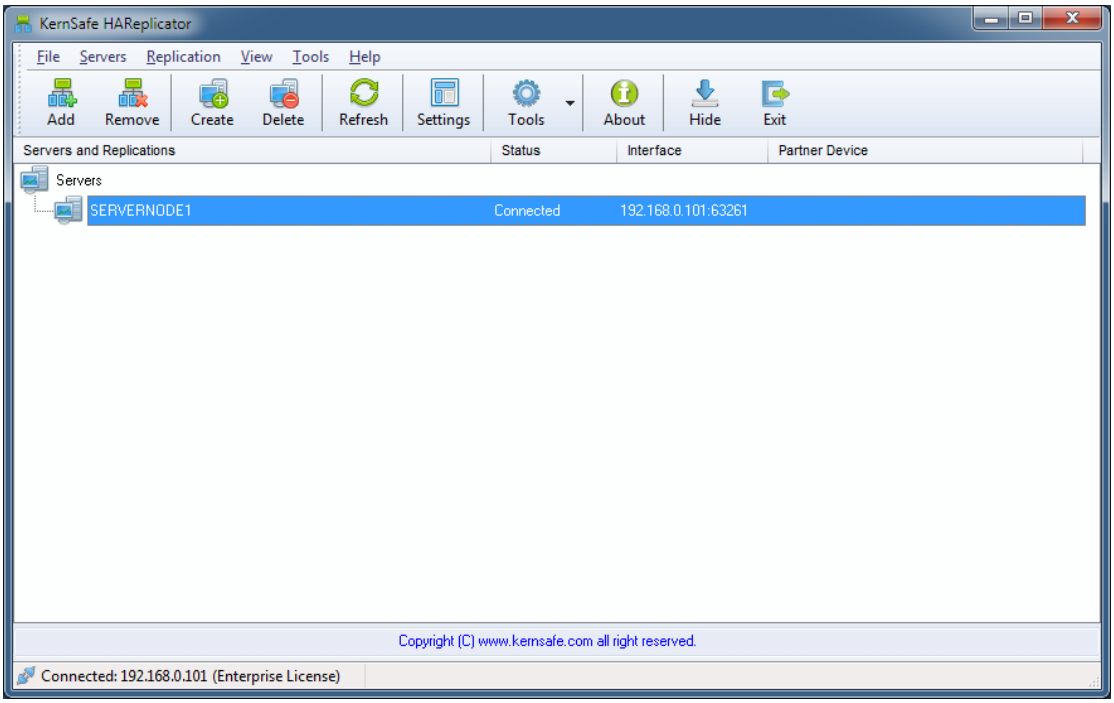
Configuring on HAReplicator

Launch the **HAReplicator management console,** press the add button on the toolbar of management console, the **add server** dialog is shown.

Fill in the ServerNode1 IP address, and leave other default.

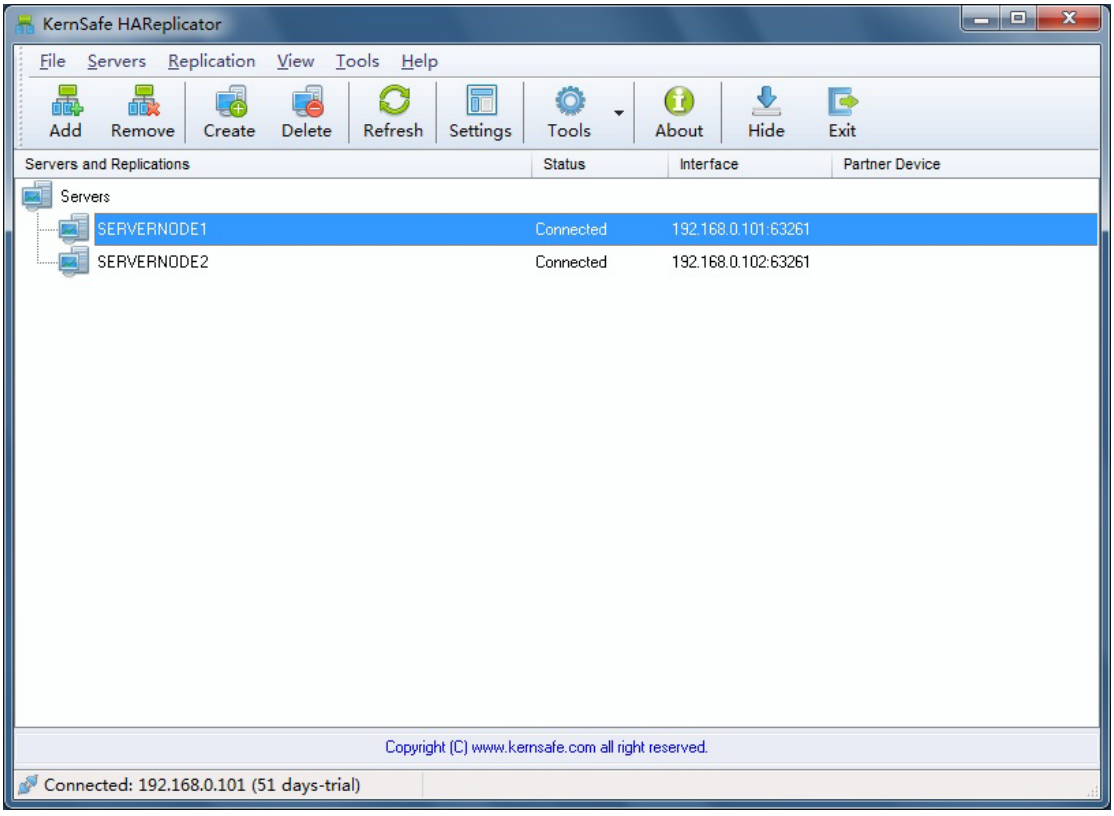


After pressing **OK** button to save setting and connect to the server, HAReplicator Management Console will be shown as below.

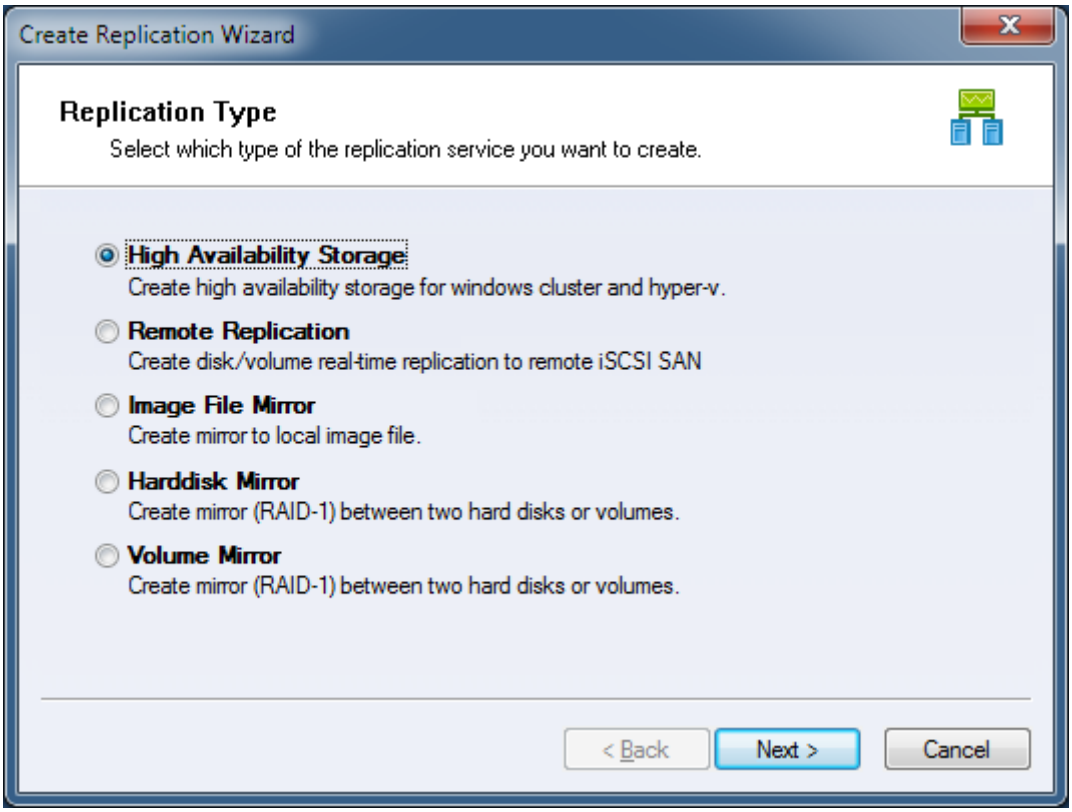


Add ServerNode2

After pressing **OK** button to save setting and connect to the server, HAReplicator Management Console will be shown as below

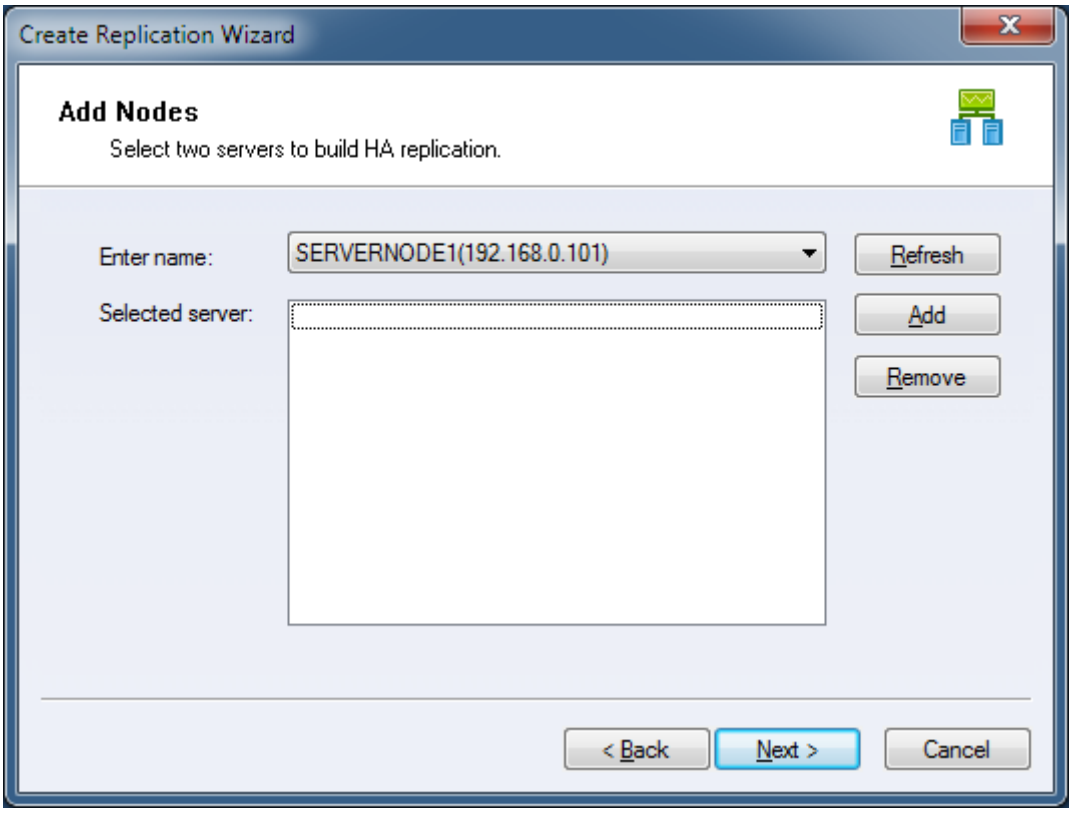


Then press the **Create** button on the toolbar of management consolle.

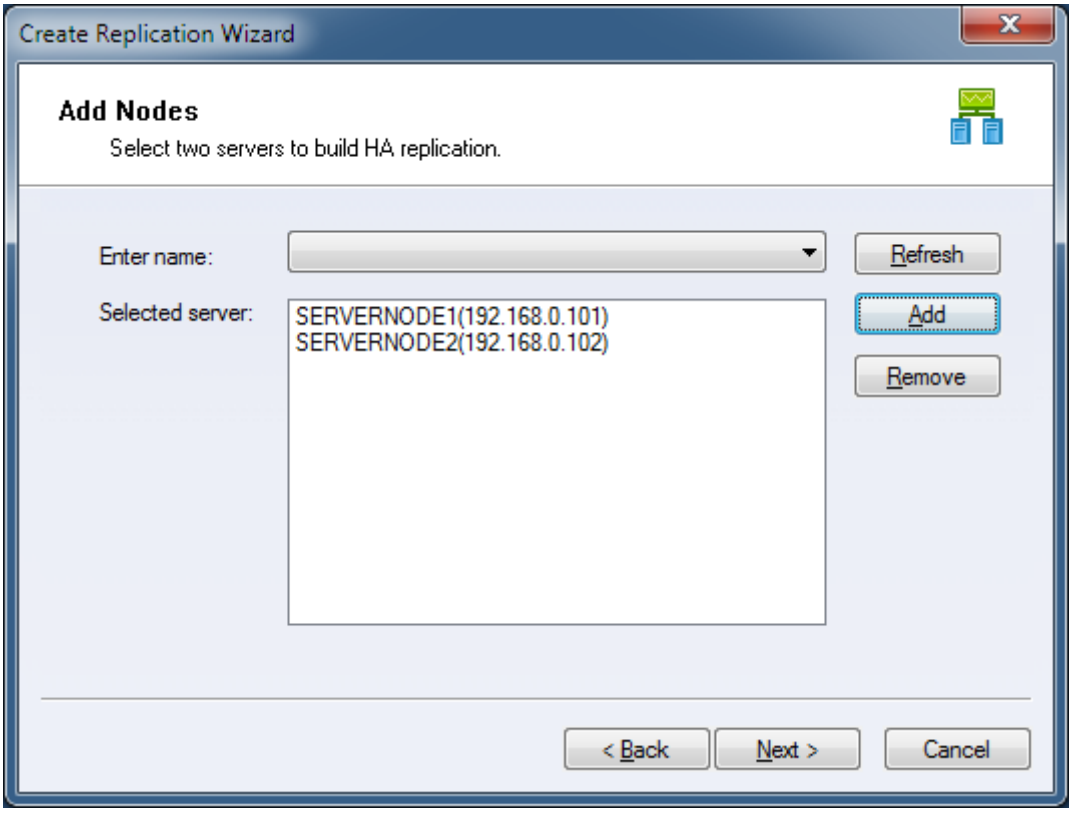


Choose **High Availability Storage** in **Replication Type** page.

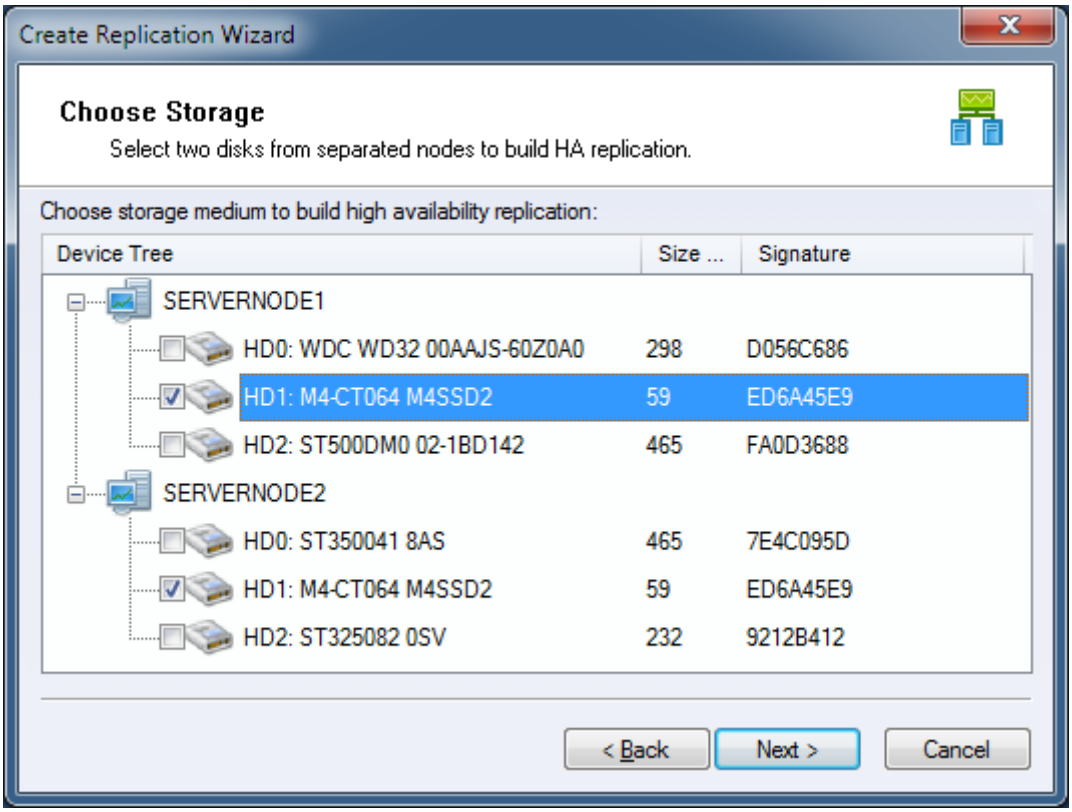
Then press the **Next** to continue.



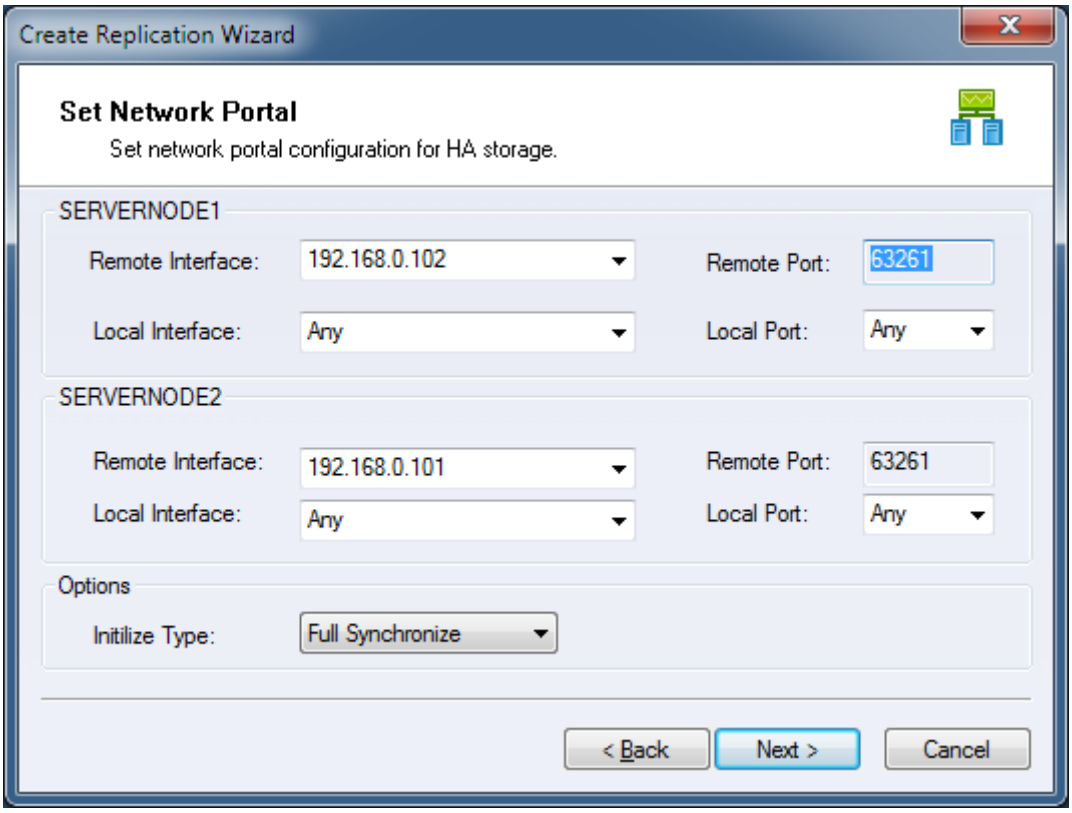
Choose servers from **Enter name** combo box. Press the **Add** button to add two servers to the **Selected server** list box.



Press the **Next** button to continue



Choose two disks with the same capacity from separated servers. Then press **Next** button.



Specify local interface, port, remote interface and port for transmitting data traffic for the both nodes.

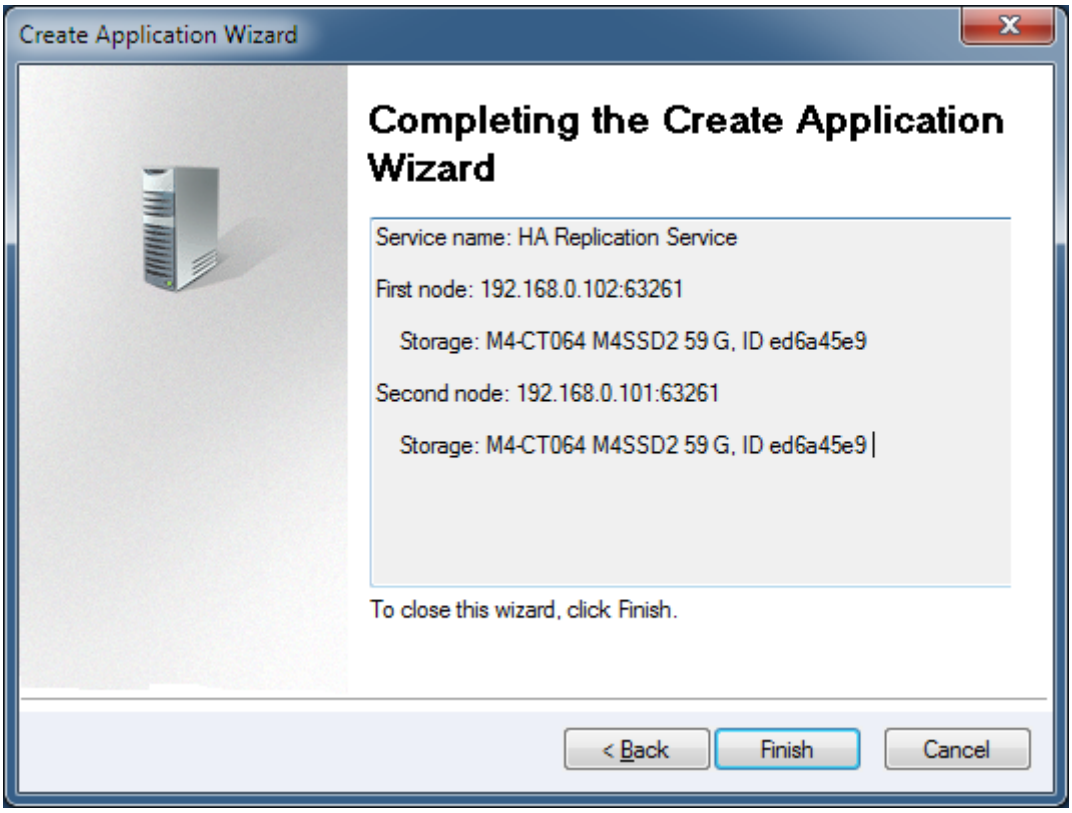
NOTE, choose **Full Synchronize** as Initialize Type, if you reach to the following conditions, you can select **Don't Synchronize** to save your time:

1. Source storage is a completely empty hard disk (even not initialized in windows disk management console).

2. The source storage and target storage was synchronized before, they are consistent already.

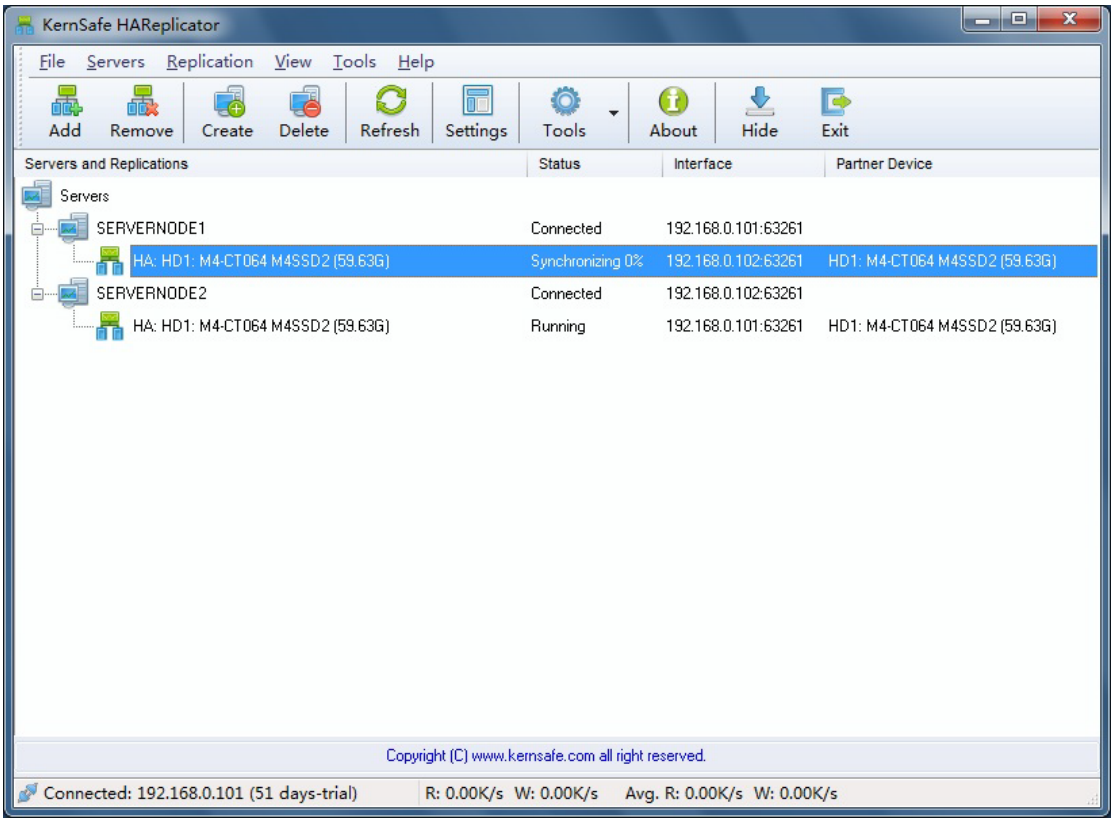
Except the above two conditions, you much select **Full Synchronize**

Then click **Next** button.

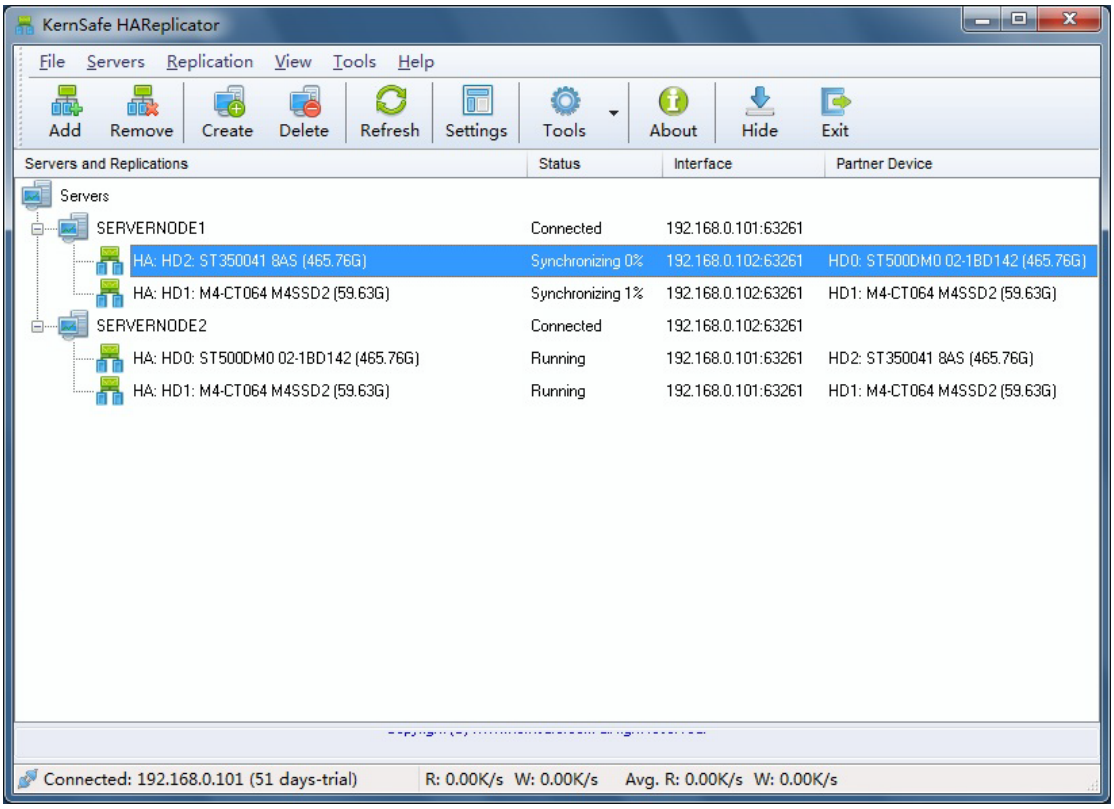


Check the information.

Click **Finish** to close the wizard. The main interface of HAReplicator will be shown as below:



Create the second **High Availability Storage** in the same way.

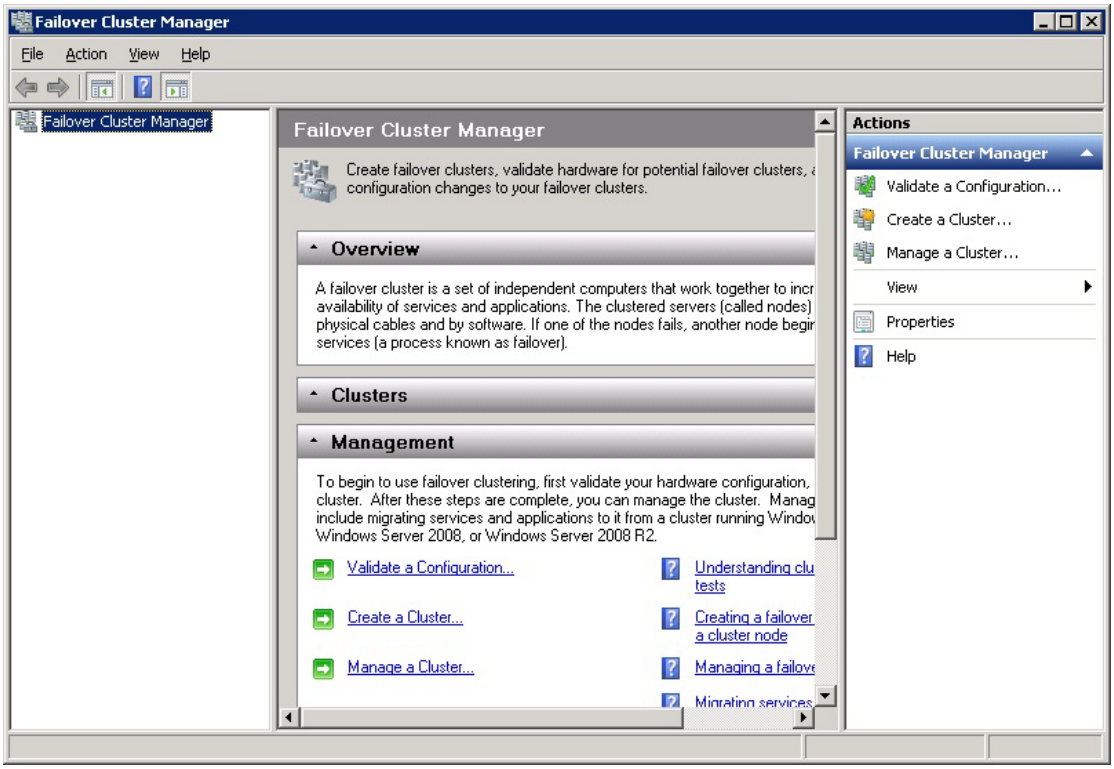


After synchronization completes, you can put the disks into MSCS.

Configuring on Failover Clustering

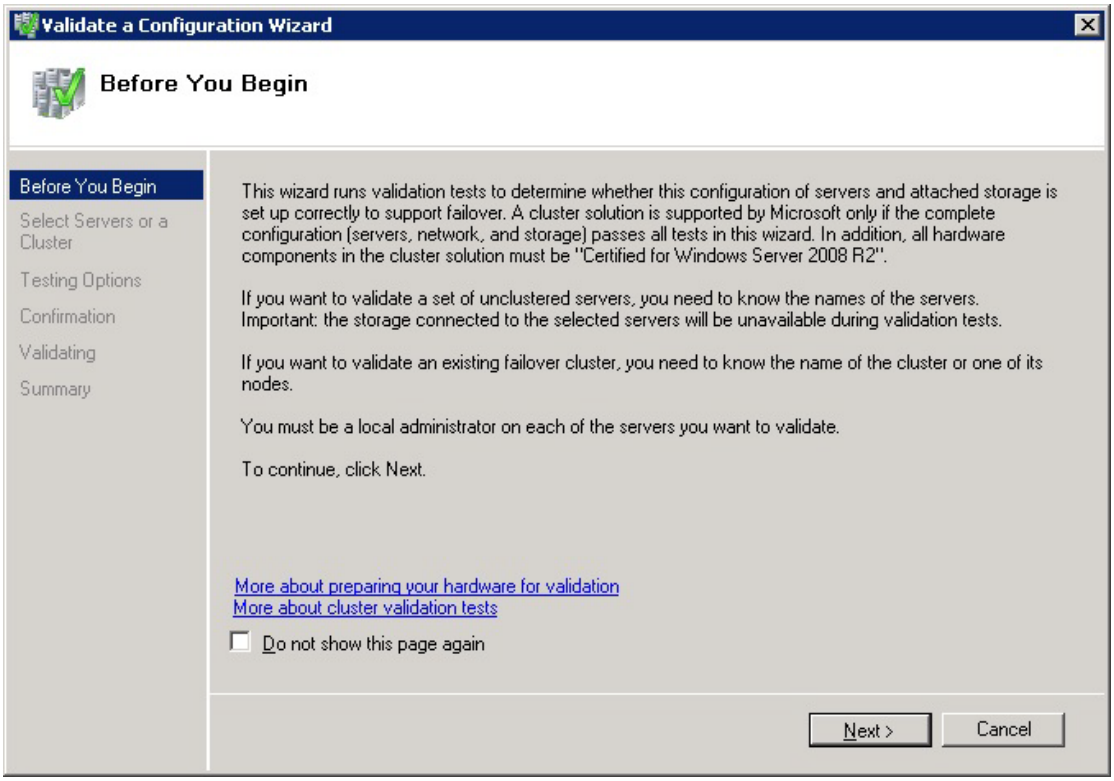
Validate a Configuration

Note that this step is not necessary for creating a cluster, but it tells that whether the configuration is suitable for creating cluster or not.
Launch to the **Windows Failover Cluster Manager** console in ServerNode1 or ServerNode2.

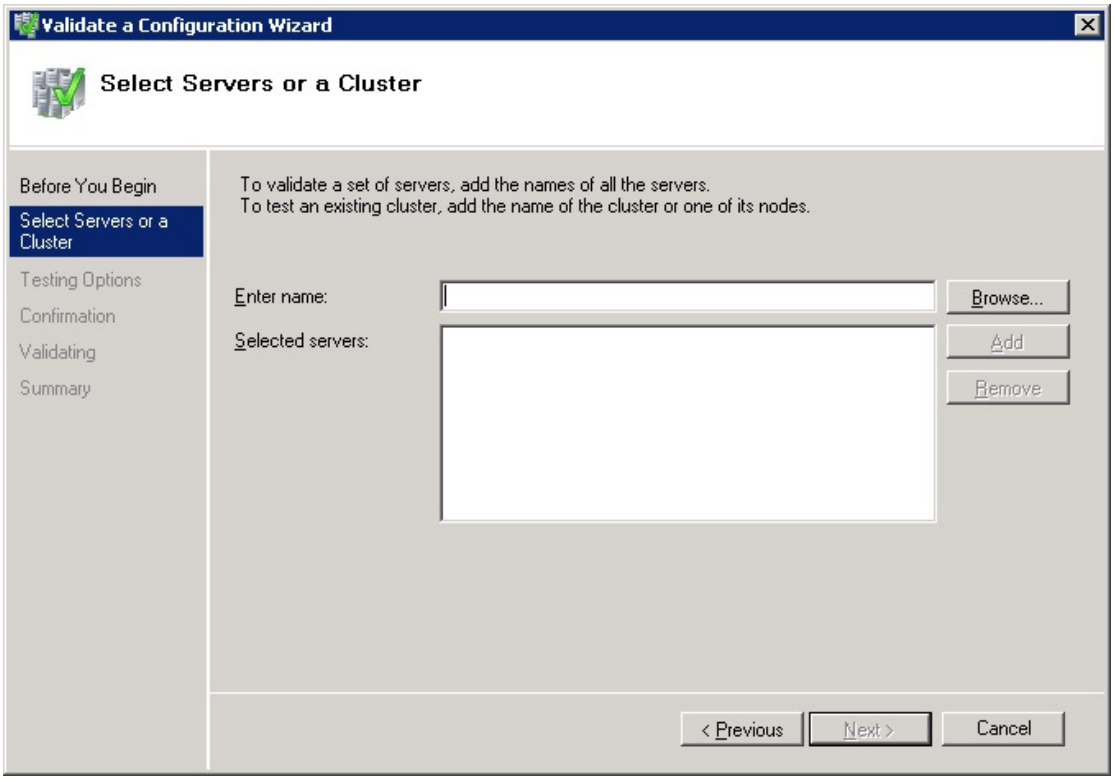


Click on the **Validate a Configuration…**link

The **Validate a Configuration Wizard** is shown.

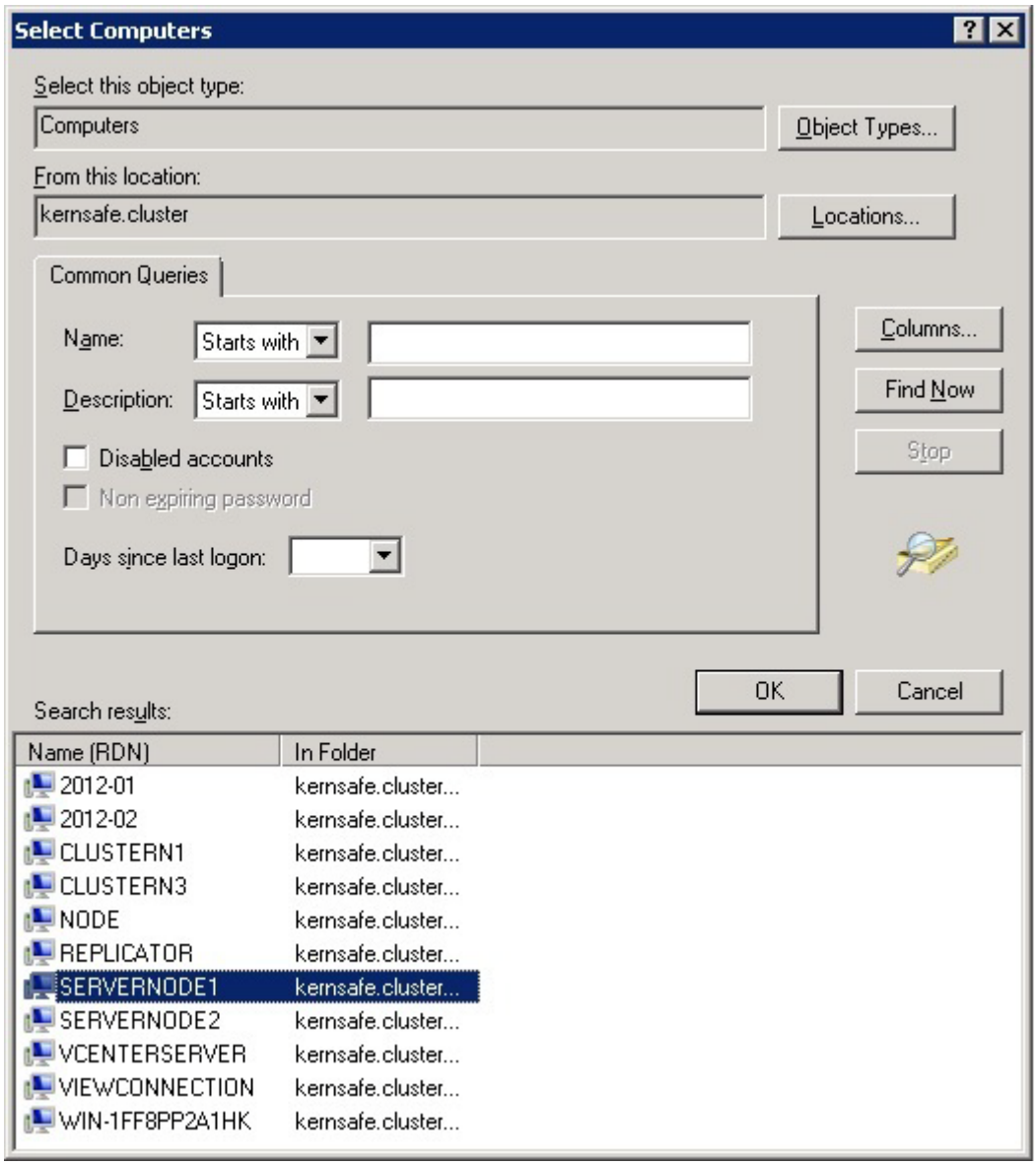


Press the **Next** button to continue.

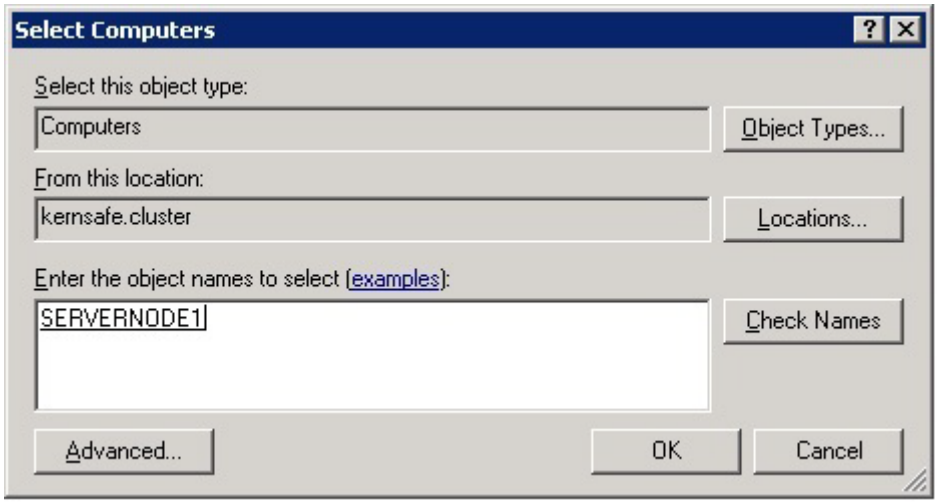


Add **ServerNode1** and **ServerNode2** to cluster.

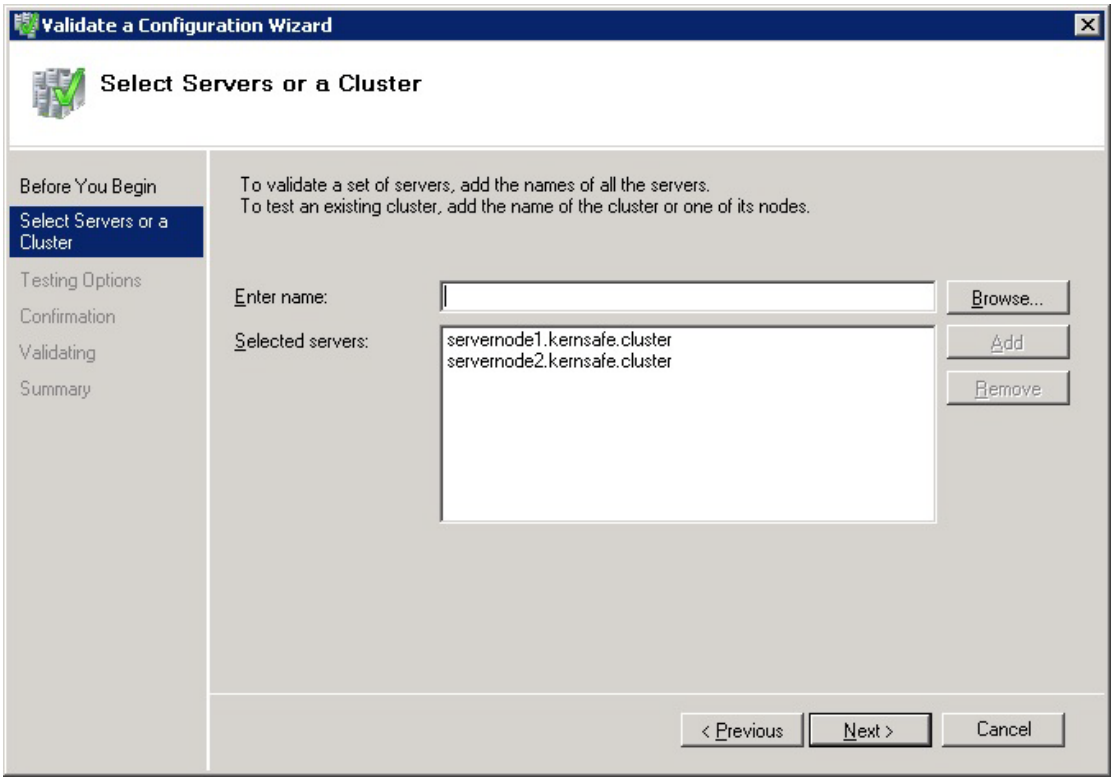
Press Browse button, the **Select Computers** dialog is shown.



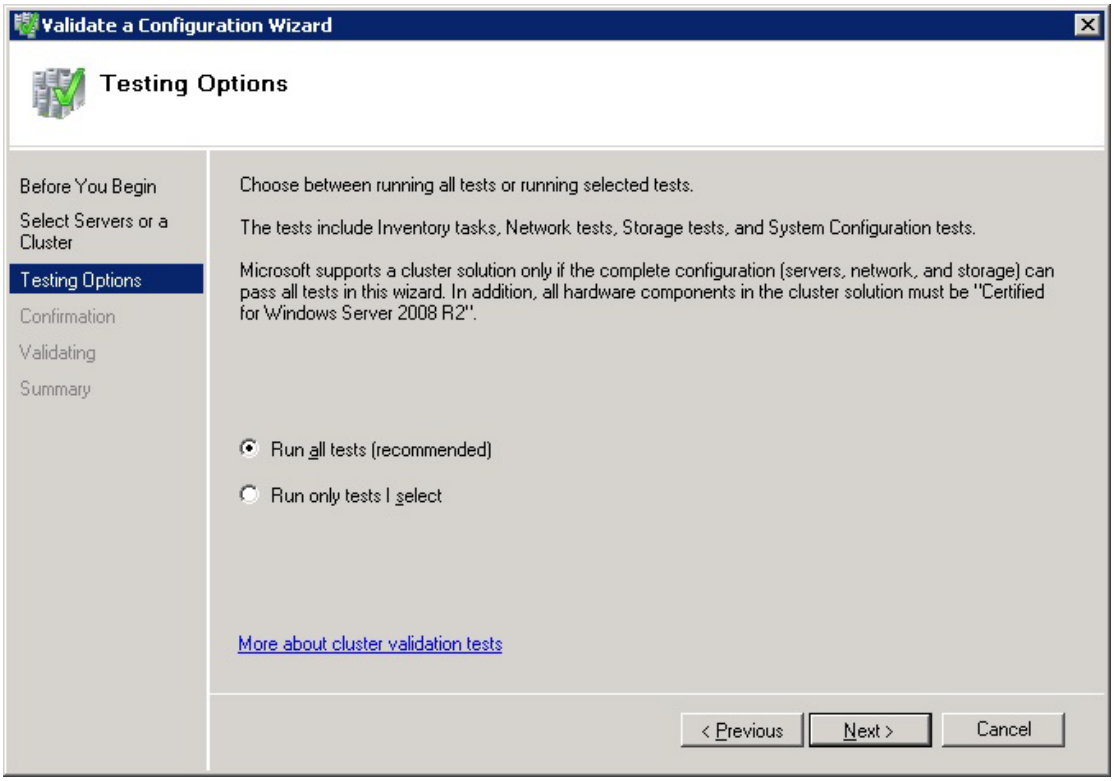
Press **Advanced…**and select ServerNode1 to add.



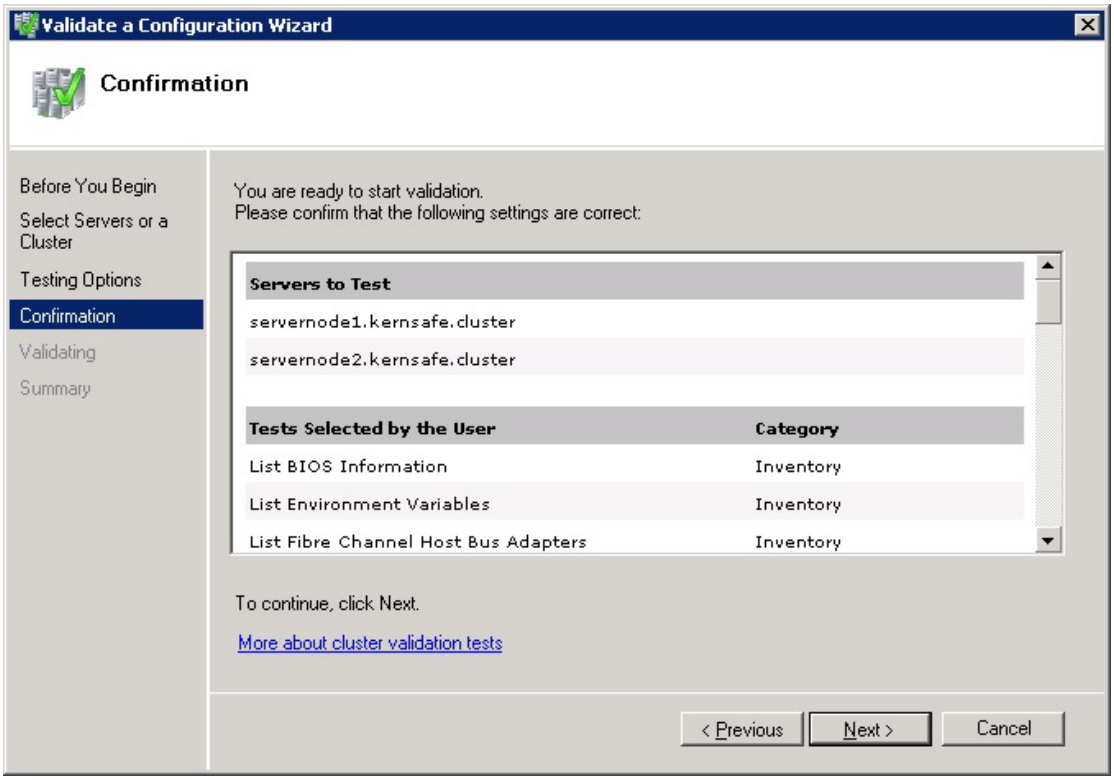
Add ServerNode2 in the same way. Press the **OK** button to continue.



Press the **Next** button to continue.

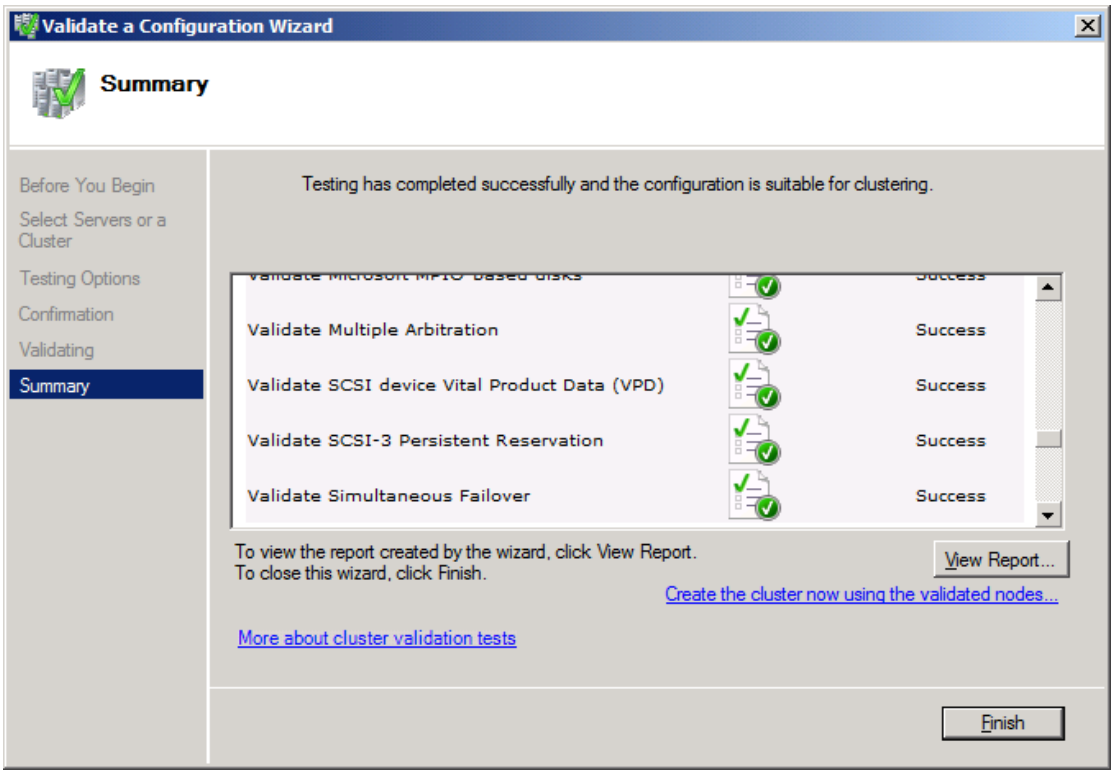


Select **Run all tests (recommended)** and Press the **Next** button to continue.



Press the **Next** button to continue.

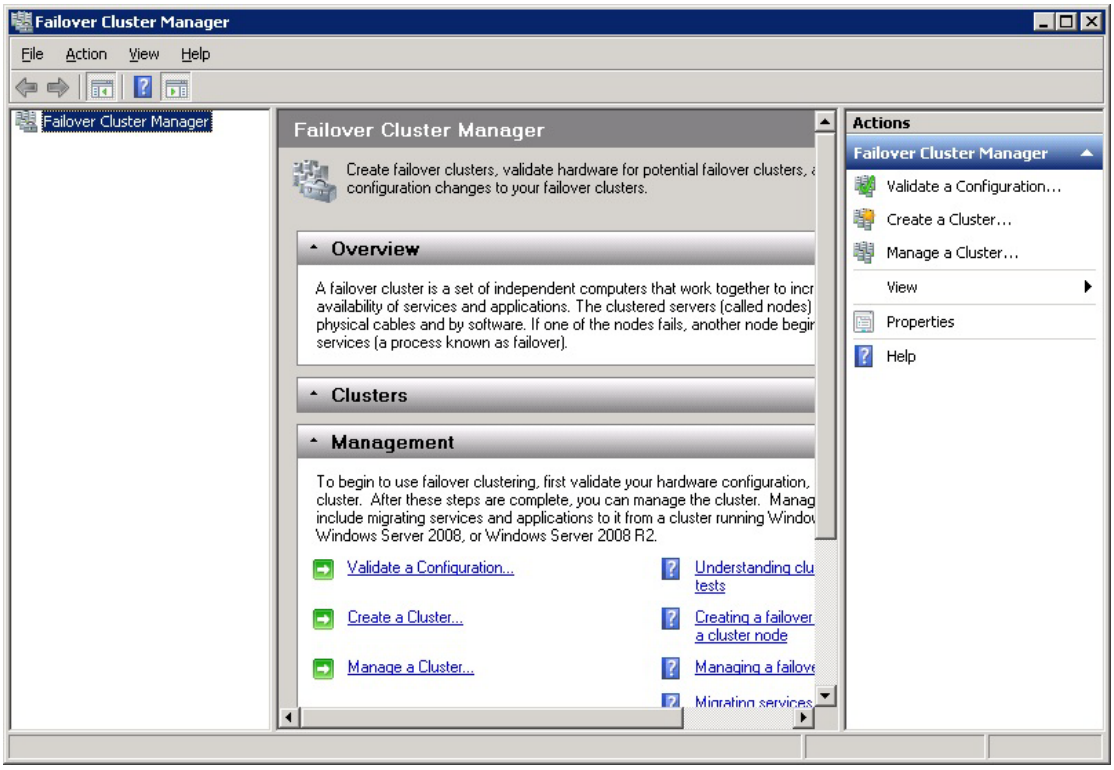
If successful, all the tests include SCSI-3 Persistent Reservation are valid and shown as the figure below.



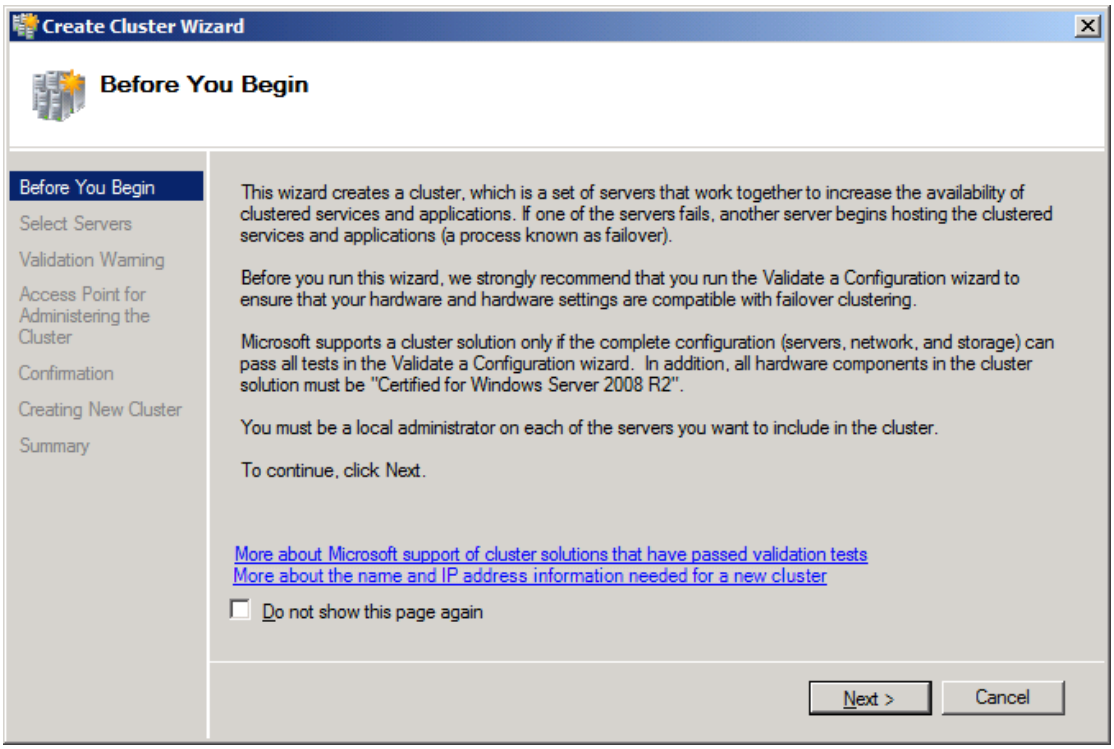
Press the **Finish** button to complete the configuration Validation.

Create a Failover Cluster

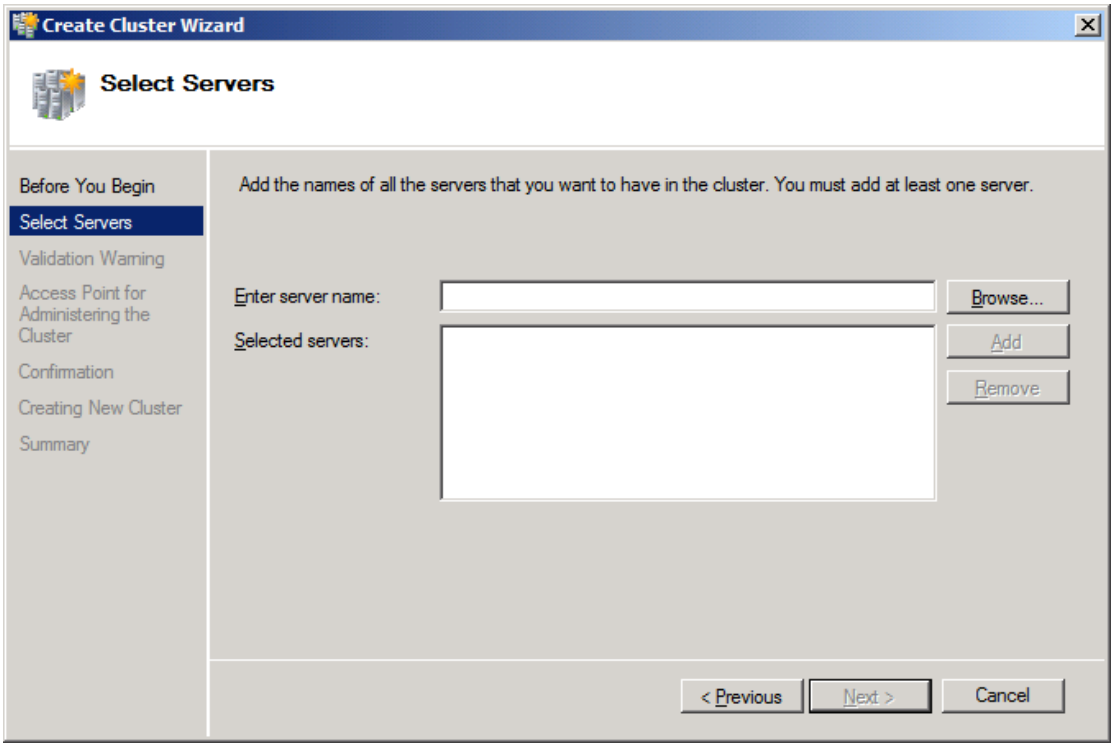
Click on the **Create a Failover Cluster…**items in the Actions panel of **Failover Cluster Manager**.



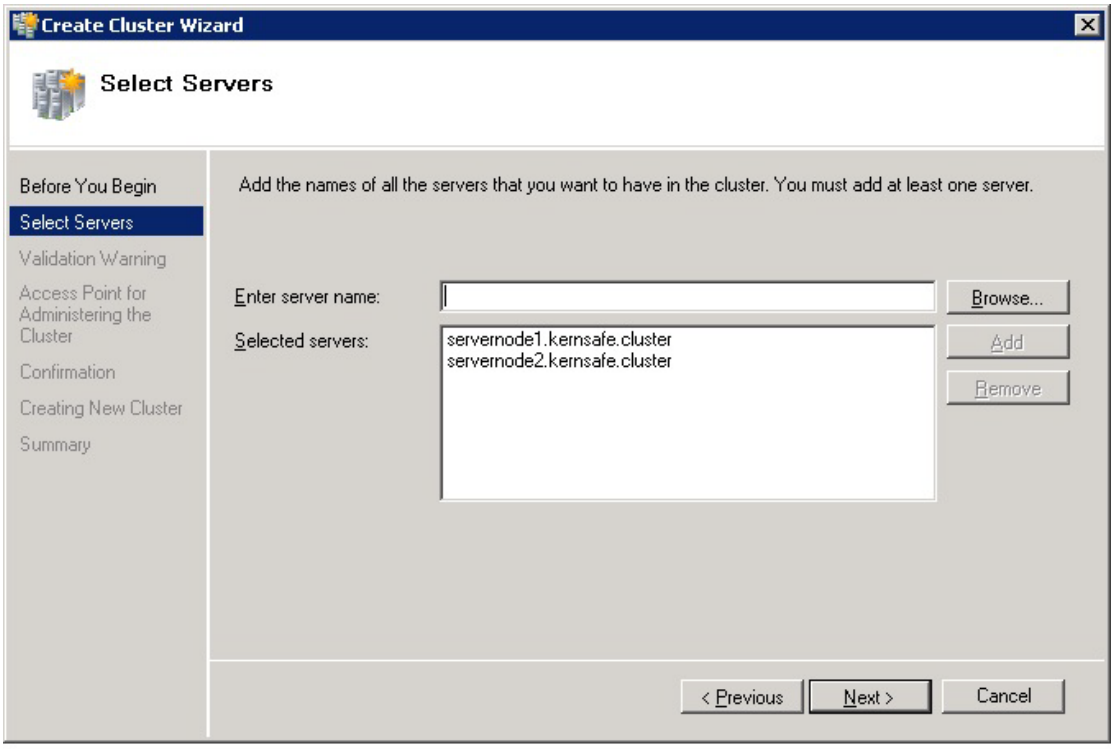
The **Create Cluster Wizard** is shown.



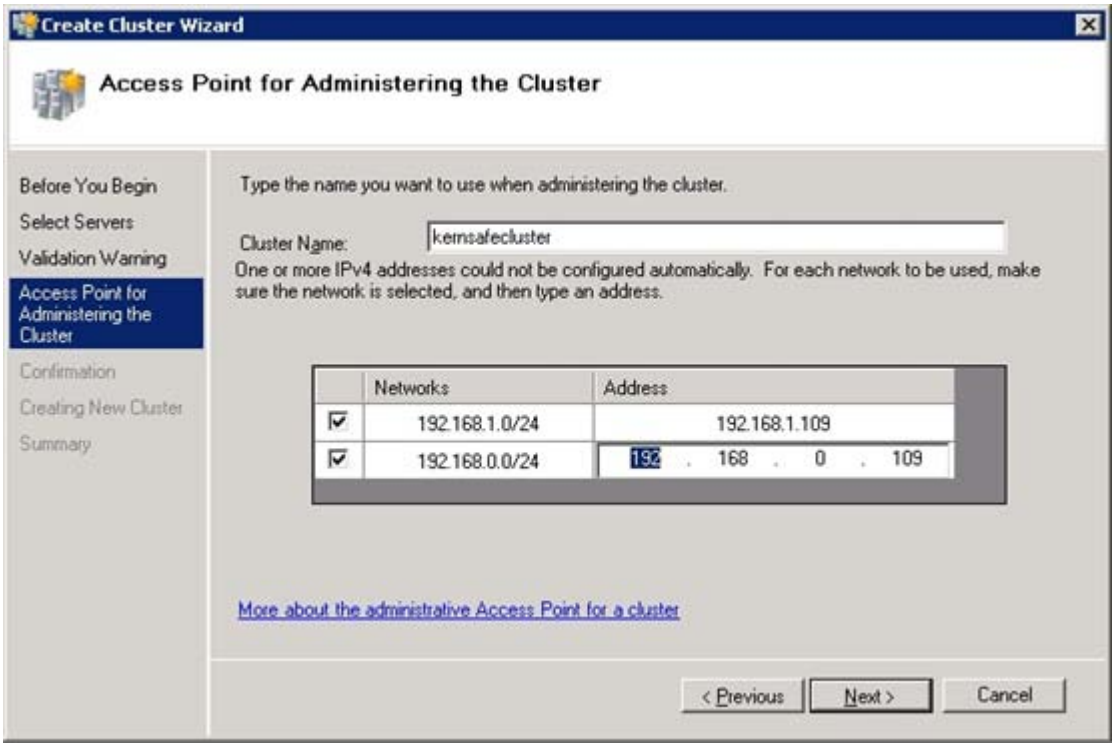
Press the **Next** button to continue.



Press the **Browse…** button and the **Add** button to add nodes to this cluster.

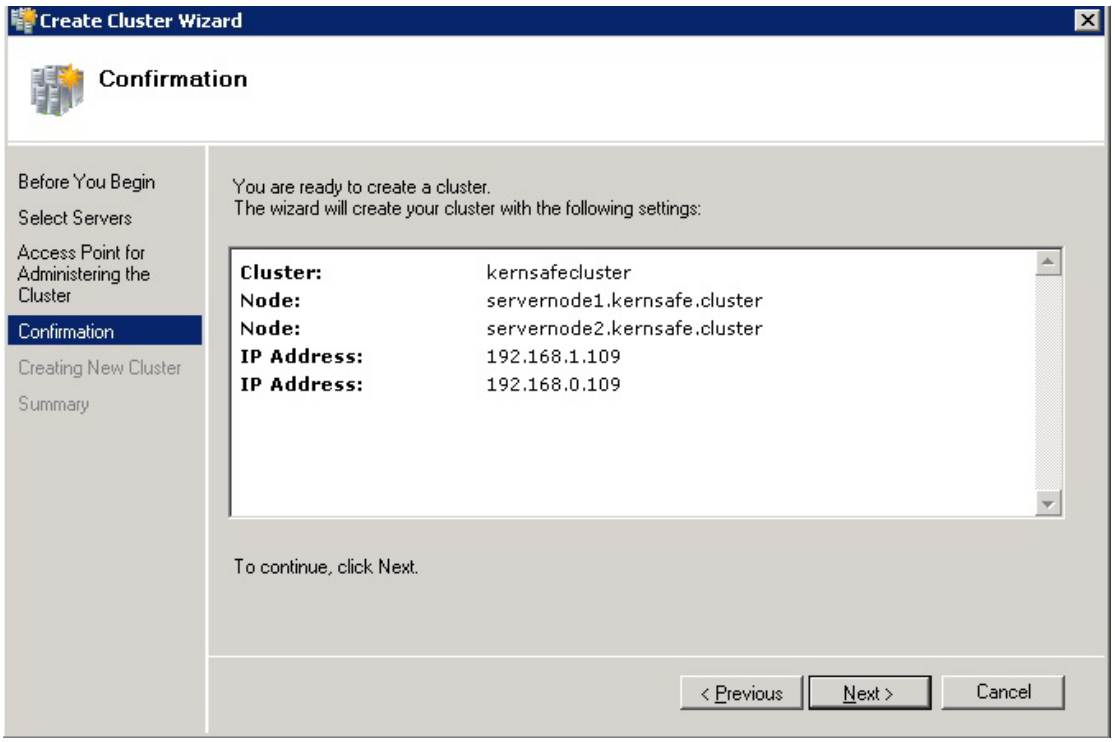


Press the **Next** button to continue.



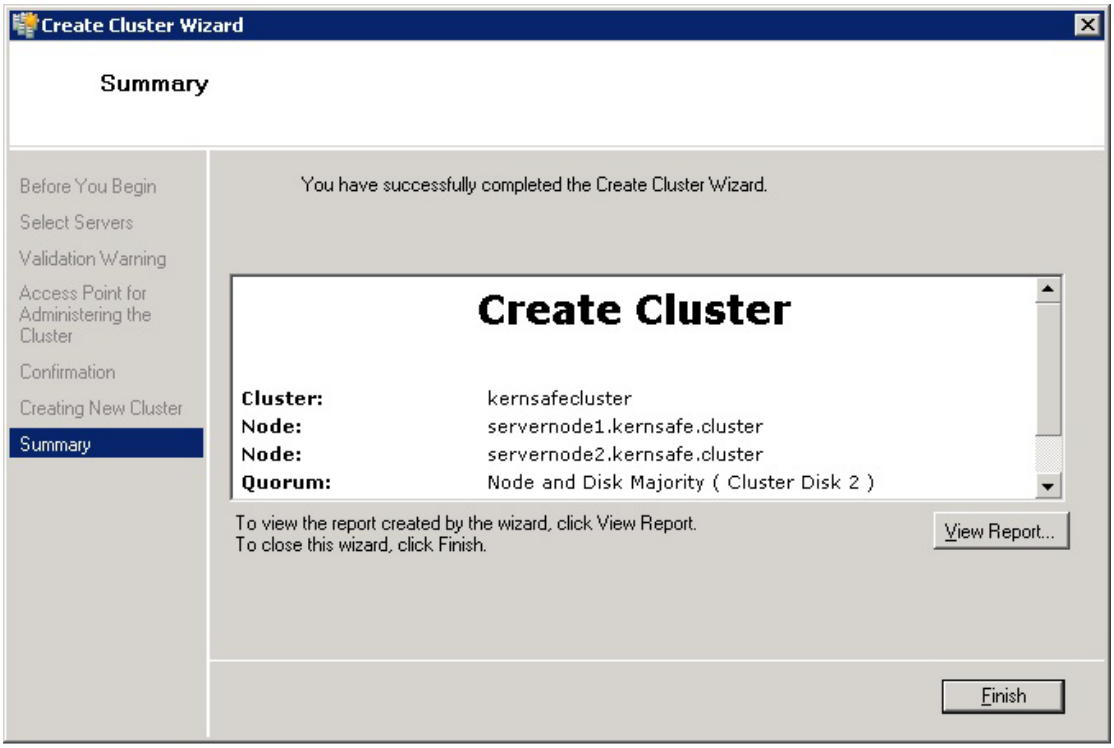
Specify IP address for this cluster.

Press the **Next** button to continue.



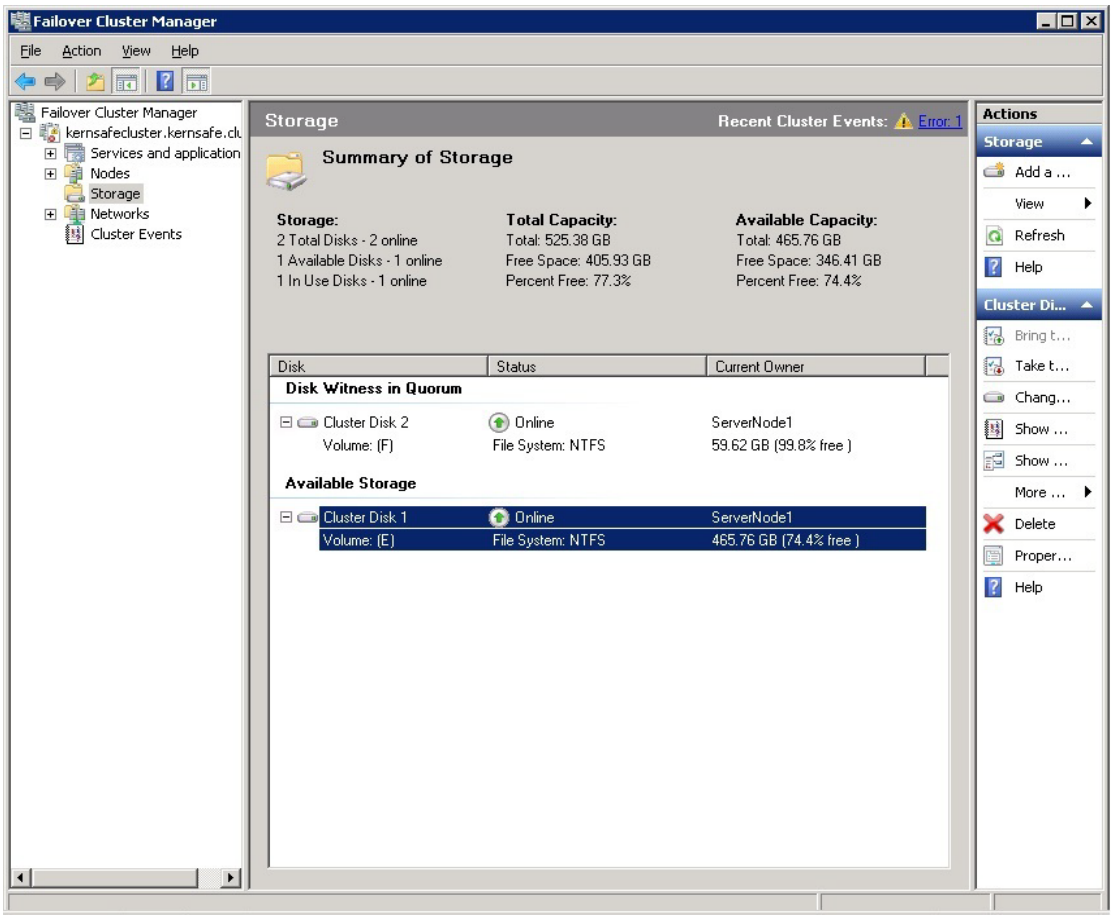
Press **Next** to continue or press the <**Previous** button if any changes are needed.

If successful, the Create Failover Wizard will complete and is shown as the figure below.



Press **Finish** to continue.

Now the creation of a cluster is completed, expand the cluster node and select the Storage node, it will show as the figure below. The disk is shown online.


Failover Cluster Manager
File Action View Help
Failover Cluster Manager
kernsafecluster.kernsafe.cl
Services and application
Nodes
Storage
Networks
Cluster Events
Storage
Recent Cluster Events: Error: 1
Summary of Storage
Storage:
2 Total Disks - 2 online
1 Available Disks - 1 online
1 In Use Disks - 1 online
Total Capacity:
Total: 525.38 GB
Free Space: 405.93 GB
Percent Free: 77.3%
Available Capacity:
Total: 465.76 GB
Free Space: 346.41 GB
Percent Free: 74.4%
Disk
Status
Current Owner
Disk Witness in Quorum
Cluster Disk 2
Online
ServerNode1
Volume: (F)
File System: NTFS
59.62 GB (99.8% free)
Available Storage
Cluster Disk 1
Online
ServerNode1
Volume: (E)
File System: NTFS
465.76 GB (74.4% free)
Actions
Storage
Add a ...
View
Refresh
Help
Cluster Di...
Bring t...
Take t...
Chang...
Show ...
Show ...
More ...
Delete
Proper...
Help

Contact

Support:	support@kernsafe.com
Sales:	sales@kernsafe.com
Marketing:	marketing@kernsafe.com
Home Page:	http://www.kernsafe.com
Product Page:	http://www.kernsafe.com/product/hareplicator.aspx
Licenses	http://www.kernsafe.com/product/ hareplicator/license-compares.aspx
Forum:	http://www.kernsafe.com/forum

KernSafe Technologies, Inc.

www.kernsafe.com