

# **SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY**

## **Enterprise Standards and Best Practices for IT Infrastructure**

4<sup>th</sup> Year 2<sup>nd</sup> Semester 2016

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Practical Session: WD

Practical Number: 4

## **What is Vmotion?**

VMware has many powerful features to provide virtual infrastructures high availability with zero down time. In this document, we will discuss about one of the main features provided in VMware. VMotion provides the VMware admins to manage their virtual machine with high availability and zero down time. And VMotion provides the live migration of virtual machine of transfer the running live virtual machine from one physical service to another physical service.

## **How it works**

First, the entire state of a virtual machine is encapsulated by a set of files stored on shared storage. VMware's clustered Virtual Machine File System (VMFS) allows multiple installations of ESX Server to access the same virtual machine files concurrently.

Second, the active memory and precise execution state of the virtual machine is rapidly transferred over a high speed network. This allows the virtual machine to instantaneously switch from running on the source ESX Server to the destination ESX Server. VMotion keeps the transfer period imperceptible to users by keeping track of on-going memory transactions in a bitmap. Once the entire memory and system state has been copied over to the target ESX Server, VMotion suspends the source virtual machine, copies the bitmap to the target ESX Server, and resumes the virtual machine on the target ESX Server. This entire process takes less than two seconds on a Gigabit Ethernet network.

Third, the networks used by the virtual machine are also virtualized by the underlying ESX Server. This ensures that even after the migration, the virtual machine network identity and network connections are preserved. VMotion manages the virtual MAC address as part of the process. Once the destination machine is activated, VMotion pings the network router to ensure that it is aware of the new physical location of the virtual MAC address. Since the migration of a virtual machine with VMotion preserves the precise execution state, the network identity, and the active network connections, the result is zero downtime and no disruption to users.

### **What are the Limitations of VMware vMotion?**

- Virtual machines configured with the Raw Device Mapping(RDM) for clustering features using vMotion
- VM cannot be connected to a CD-ROM or floppy drive that is using an ISO or floppy image stored on a drive that is local to the host server. The device should be disconnected before initiating the vMotion.
- Virtual Machine cannot be migrated with VMotion unless the destination swap file location is the same as the source swap file location. As a best practice, Place the virtual machine swap files with the virtual machine configuration file.
- Virtual Machine affinity must not be set (aka, bound to physical CPUs).

## 1. Configure the Networking adapter

Servidor 1 VMware ESXi, 5.0.0, 623860

Summary Virtual Machines Performance Configuration Tasks & Events Alarms Permissions Maps Storage Views Hardware Status

**Hardware**

- Processors
- Memory
- Storage
- Networking
- Storage Adapters
- Network Adapters
- Advanced Settings
- Power Management

**Software**

- Licensed Features
- Time Configuration
- DNS and Routing
- Authentication Services
- Power Management
- Virtual Machine Startup/Shutdown
- Virtual Machine Swapfile Location
- Security Profile
- Host Cache Configuration
- System Resource Allocation
- Agent VM Settings
- Advanced Settings

**Network Adapters**

Device	Speed	Configured	Switch	MAC Address	Observed
<b>Broadcom Corporation Broadcom NetXtreme II BCM5709 1000Base-T</b>					
vmnic1	100 Full	Negotiate	vSwitch1	00:1a:64:dc:be:86	10.56.
vmnic0	1000 Full	Negotiate	vSwitch0	00:1a:64:dc:be:84	10.56.
<b>Intel Corporation 82571EB Gigabit Ethernet Controller (Copper)</b>					
vmnic9	1000 Full	Negotiate	None	00:15:17:ba:ba:0e	None
vmnic8	Down	Negotiate	None	00:15:17:ba:ba:0f	None
vmnic7	Down	Negotiate	None	00:15:17:ba:ba:0c	None
vmnic6	Down	Negotiate	None	00:15:17:ba:ba:0d	None
vmnic5	1000 Full	Negotiate	vSwitch0	00:15:17:ba:bb:aa	10.56.
vmnic4	Down	Negotiate	None	00:15:17:ba:bb:ab	None
vmnic3	Down	Negotiate	None	00:15:17:ba:bb:a8	None
vmnic2	1000 Full	Negotiate	vSwitch1	00:15:17:ba:bb:a9	10.56.

## 2. create the vSphere standard switch.

Servidor 1 VMware ESXi, 5.0.0, 623860

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**View:** vSphere Standard Switch vSphere Distributed Switch

**Networking** Refresh Add Networking... Properties...

Standard Switch: vSwitch0 Remove... Properties...

Virtual Machine Port Group

- Management
- VMkernel Port
- Management Network
- vmk0 :

Physical Adapters

- vmnic5 1000 Full
- vmnic0 1000 Full

Standard Switch: vSwitch1 Remove... Properties...

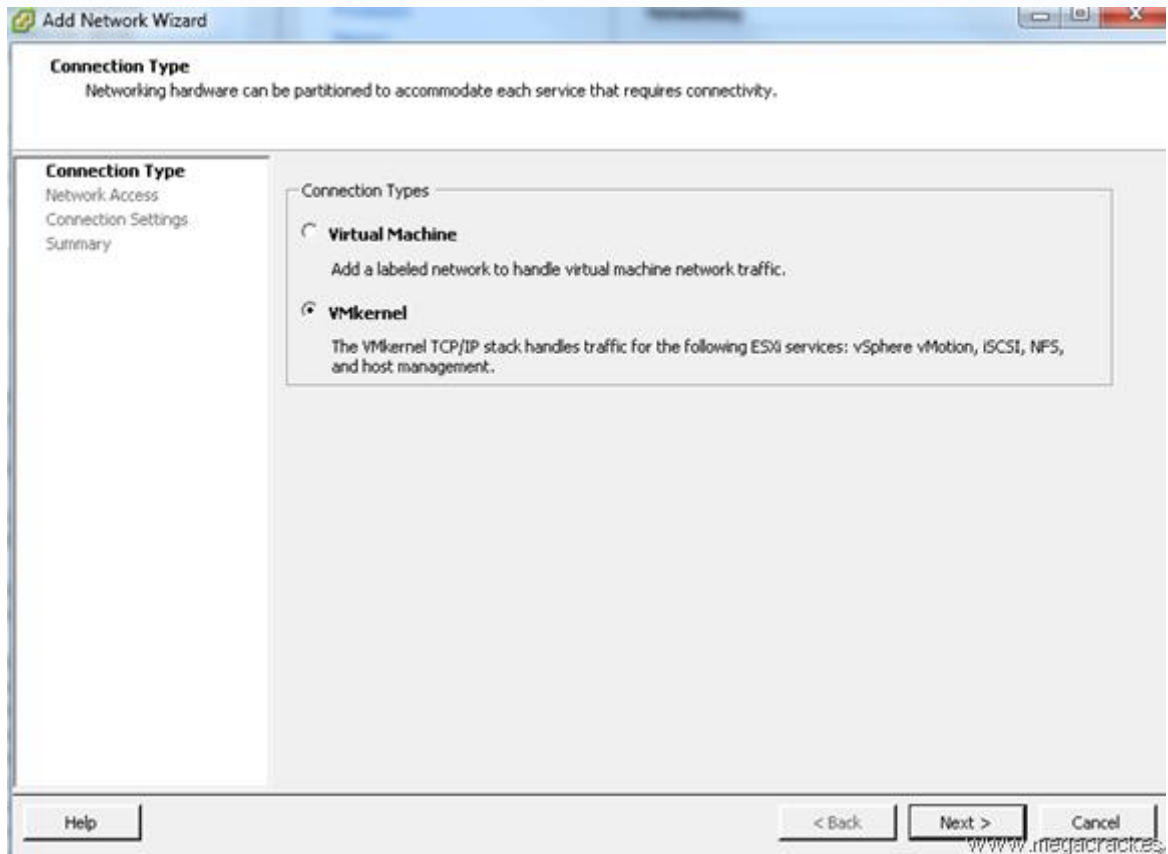
Virtual Machine Port Group

- VLAN 4 Servers I
- 7 virtual machine(s)

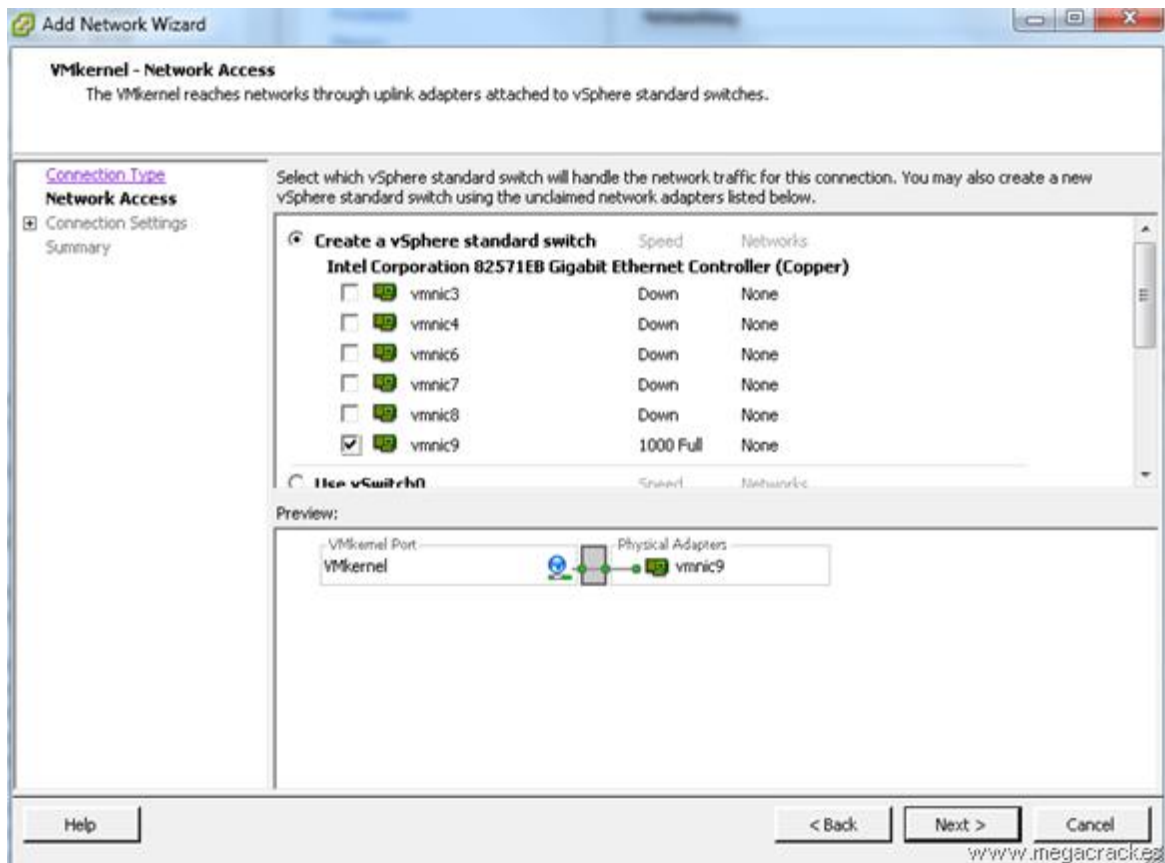
Physical Adapters

- vmnic2 1000 Full
- vmnic1 100 Full

### 3. add network wizard and VMkernel

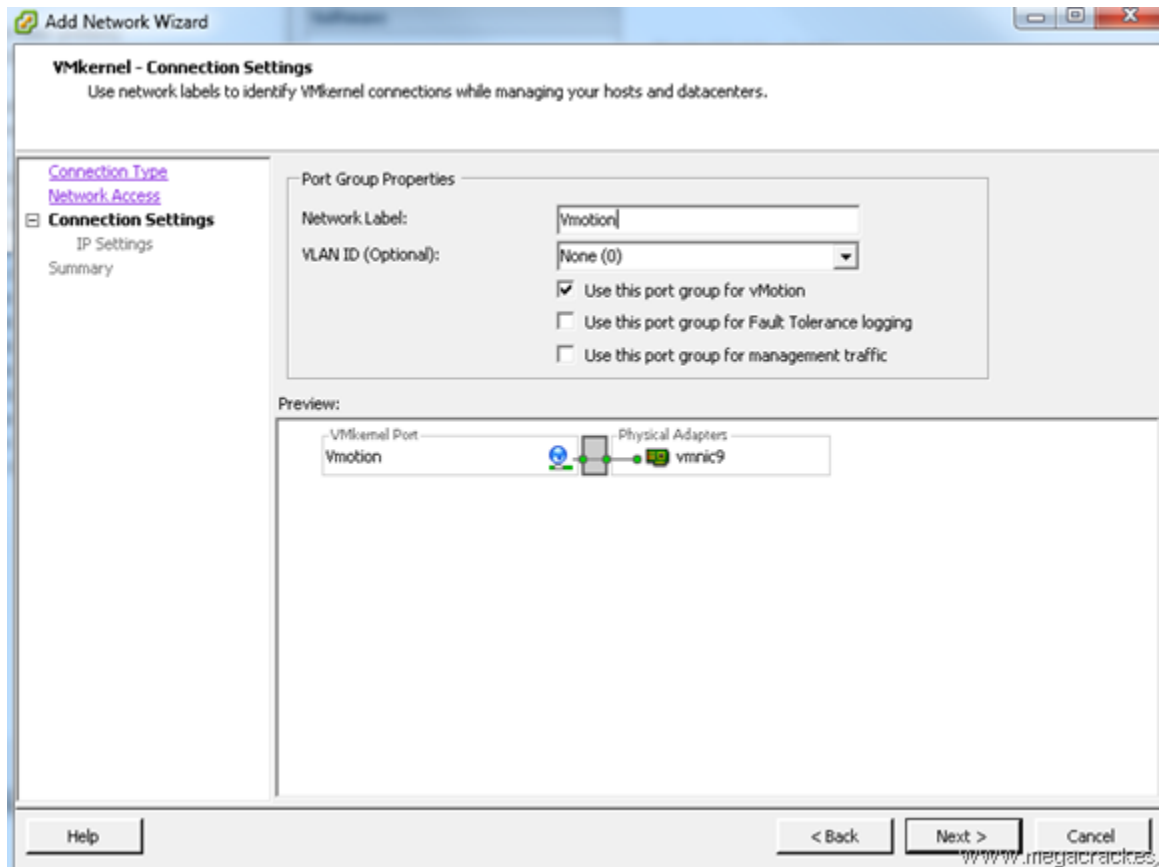


#### 4. add network wizard and get network access



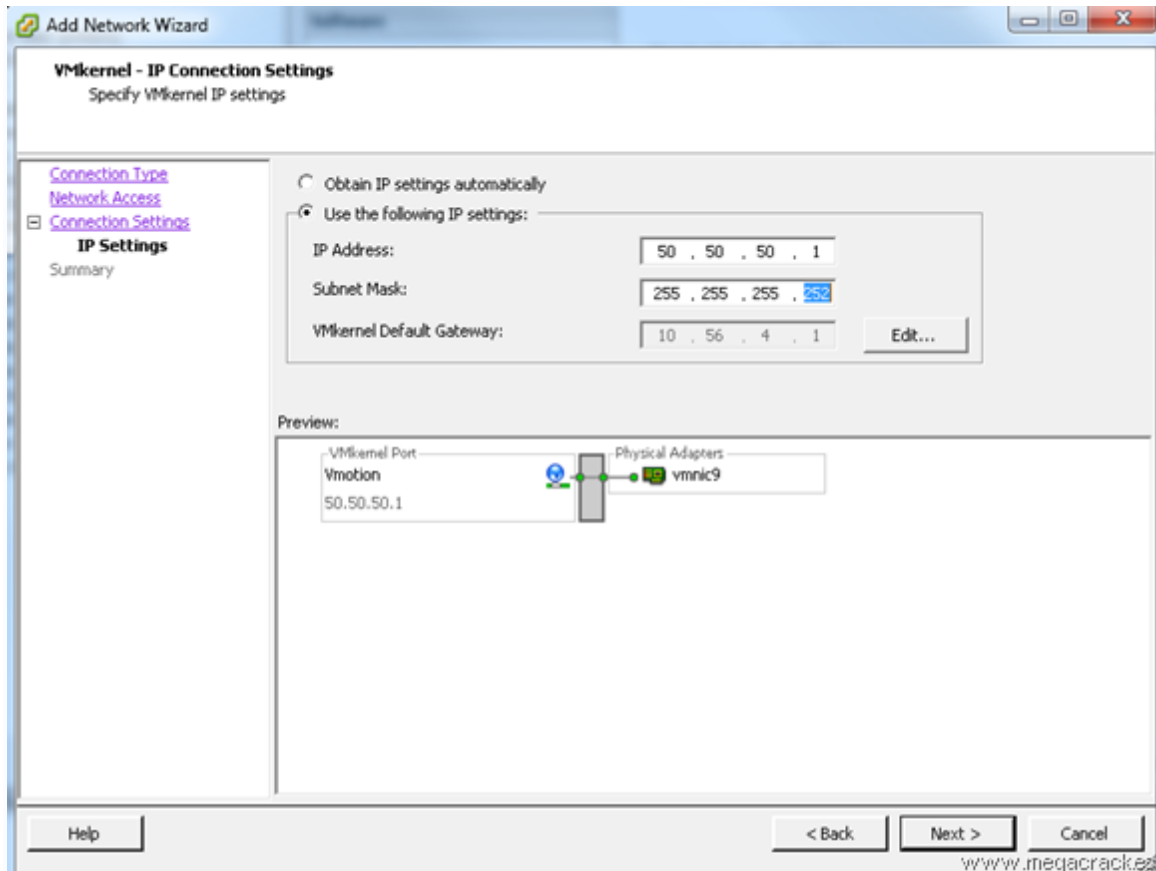
## 5. VMKernel – connection settings.

- Use network label to identify



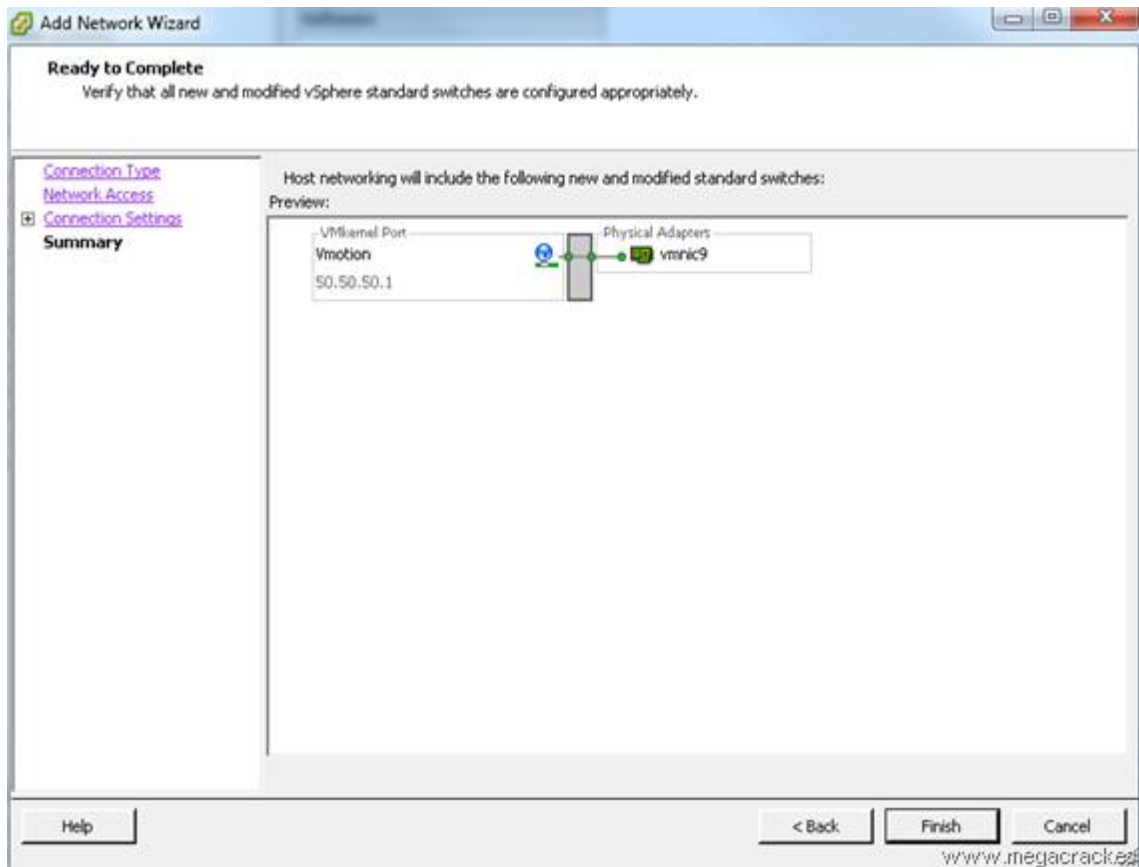
## 1. Specify VMKernel IP

- IP Address: 50.50.50.1





## 6. Verify vSphere standard switch are configured appropriately



## 7. visibility of the new connections.

Servidor 2 VMware ESXi, 5.0.0, 623860

Summary Virtual Machines Performance **Configuration** Tasks & Events Alarms Permissions Maps Storage Views Hardware Status

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  - Network Adapters
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**View:** vSphere Standard Switch vSphere Distributed Switch

**Networking** Refresh Add Networking... Properties...

**Standard Switch: vSwitch0** Remove... Properties...

Virtual Machine Port Group  
Management

VMkernel Port  
Management Network  
vmlk0 :

Physical Adapters  
vmlnk5 1000 Full  
vmlnk0 1000 Full

**Standard Switch: vSwitch1** Remove... Properties...

Virtual Machine Port Group  
VLAN 4 Servers I

7 virtual machine(s)

Physical Adapters  
vmlnk2 1000 Full  
vmlnk1 100 Full

**Standard Switch: vSwitch2** Remove... Properties...

VMkernel Port  
Vmotion  
vmlk1 : 50.50.50.1

Physical Adapters  
vmlnk9 1000 Full

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## 8. Configured and available network

Servidor 2 VMware ESXi, 5.0.0, 623860

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**Software**

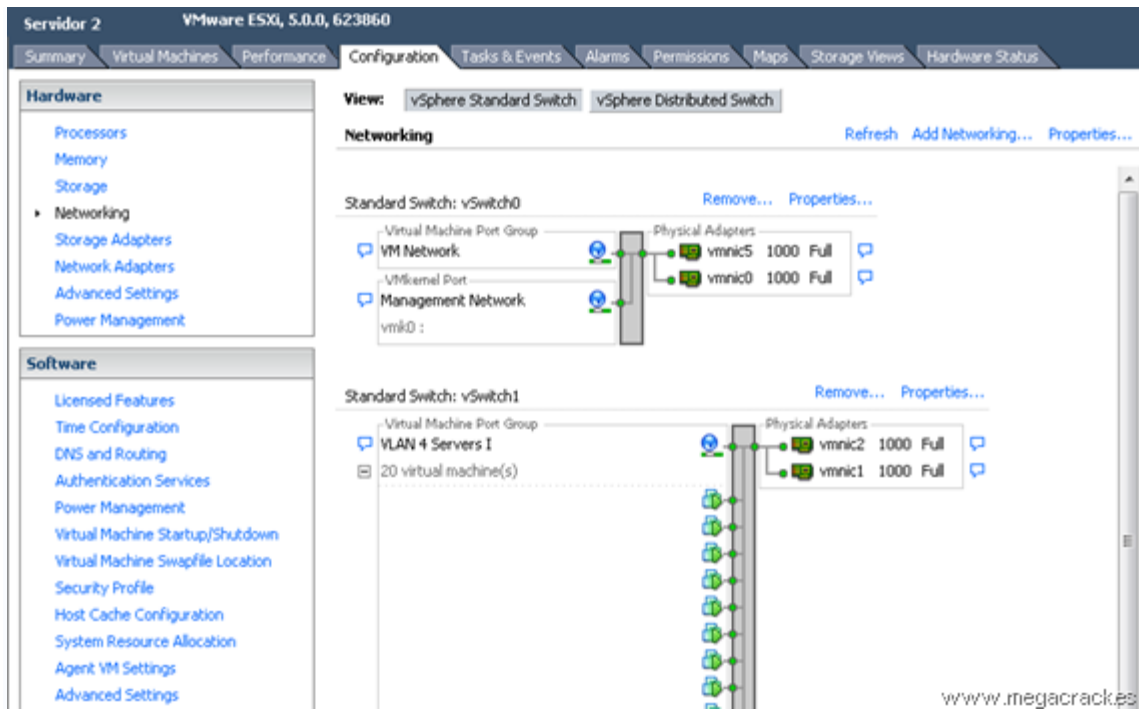
- Licensed Features
- Time Configuration
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**Network Adapters**

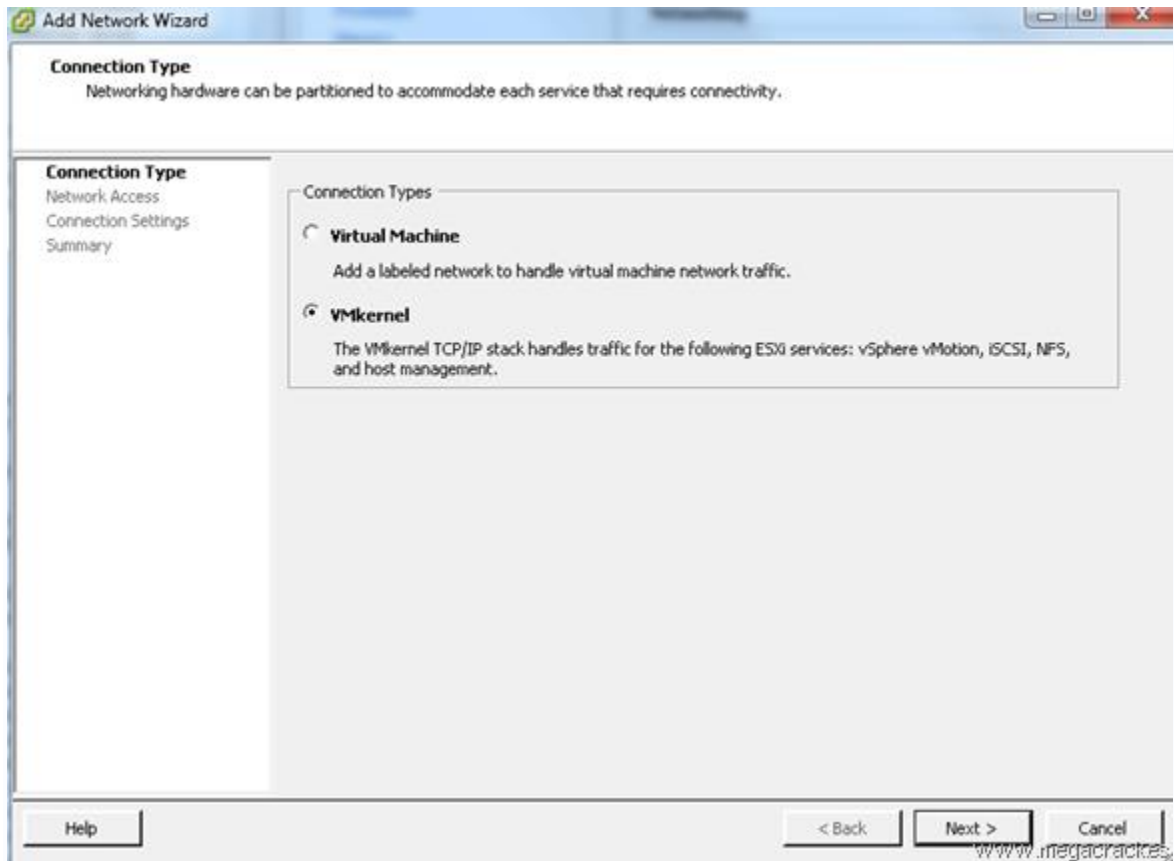
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vmnic1	1000 Full	Negotiate	vSwitch1	00:1a:64:dc:c4:92	10.56.
vmnic0	1000 Full	Negotiate	vSwitch0	00:1a:64:dc:c4:90	10.56.
<b>Intel Corporation 82571EB Gigabit Ethernet Controller (Copper)</b>					
vmnic9	1000 Full	Negotiate	None	00:15:17:ba:bd:ea	None
vmnic8	Down	Negotiate	None	00:15:17:ba:bd:eb	None
vmnic7	Down	Negotiate	None	00:15:17:ba:bd:e8	None
vmnic6	Down	Negotiate	None	00:15:17:ba:bd:e9	None
vmnic5	1000 Full	Negotiate	vSwitch0	00:15:17:ba:bb:b2	10.56.
vmnic4	Down	Negotiate	None	00:15:17:ba:bb:b3	None
vmnic3	Down	Negotiate	None	00:15:17:ba:bb:b0	None
vmnic2	1000 Full	Negotiate	vSwitch1	00:15:17:ba:bb:b1	10.56.

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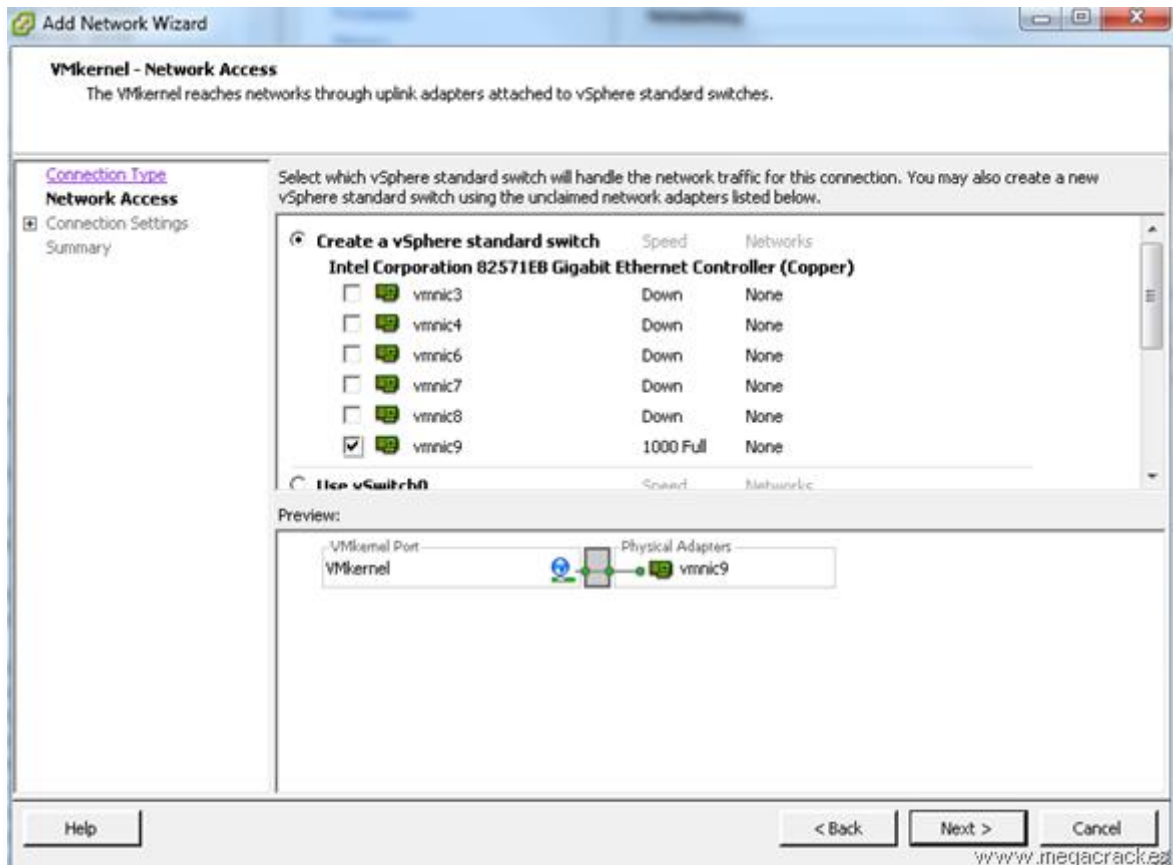
## 9. Check available Networking and create the vSwitch.



## 10. Select VMKernel connection type



## 11. Use this port group for VMotion.



Add Network Wizard

### VMkernel - Connection Settings

Use network labels to identify VMkernel connections while managing your hosts and datacenters.

[Connection Type](#)  
[Network Access](#)  
**Connection Settings**  
IP Settings  
Summary

Port Group Properties

Network Label:

VLAN ID (Optional):

☒ Use this port group for vMotion

☐ Use this port group for Fault Tolerance logging

☐ Use this port group for management traffic

Preview:

The diagram shows a 'VMkernel Port' box labeled 'Vmotion' connected by a green line to a 'Physical Adapters' box labeled 'vmnic9'. A small blue icon with a plus sign is located between the two boxes.

Help

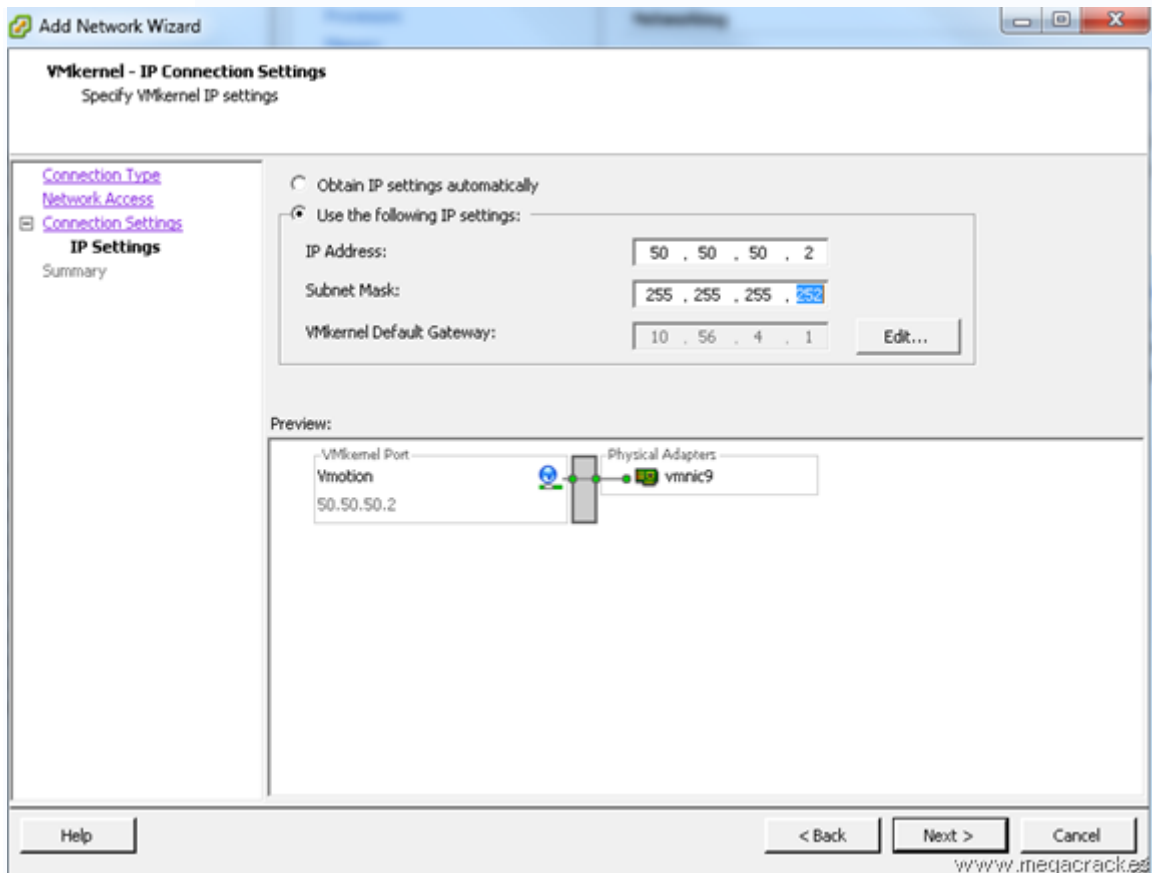
< Back

Next >

Cancel

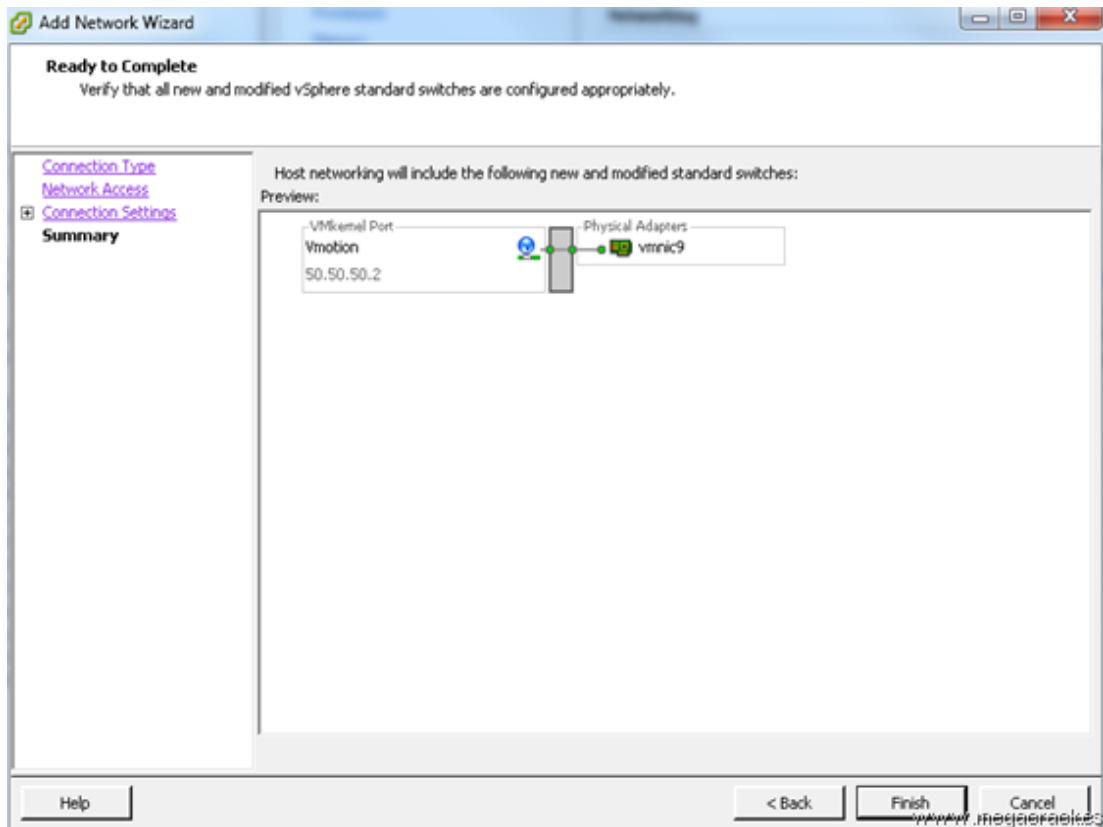
## 12. VMKernel - ip connection settings

- IP Address: 50.50.50.2



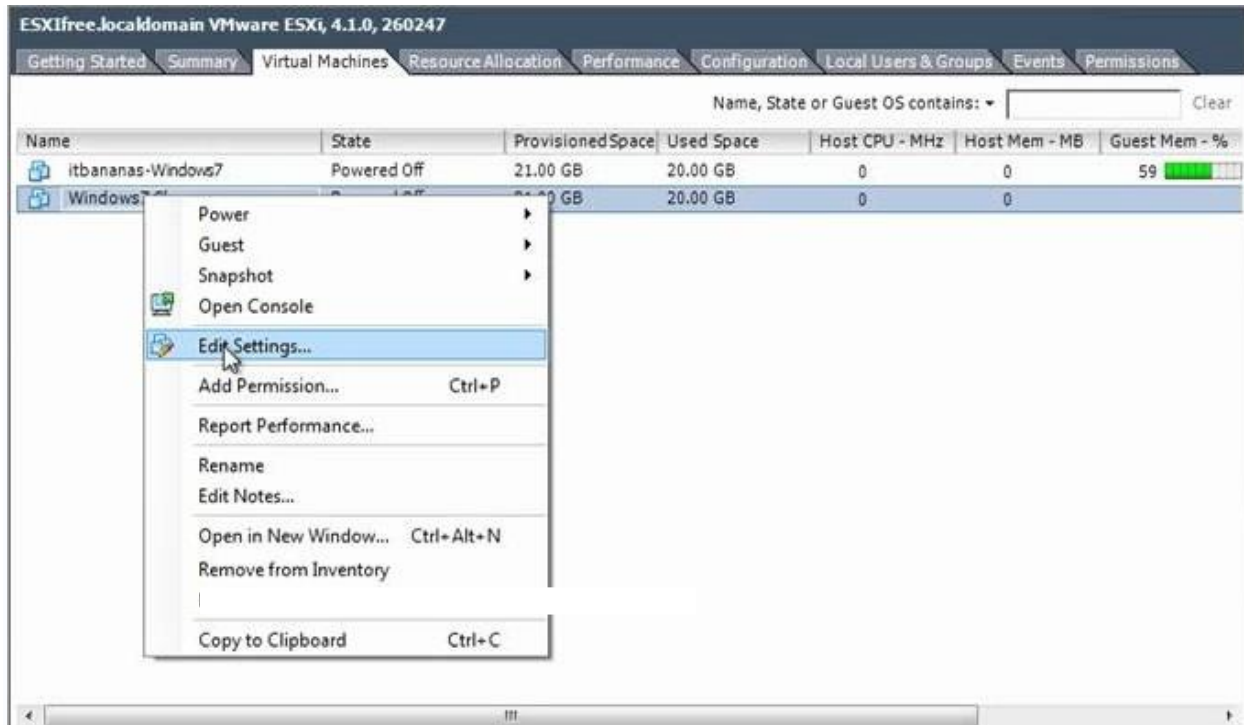


### 13. Complete the creation VM

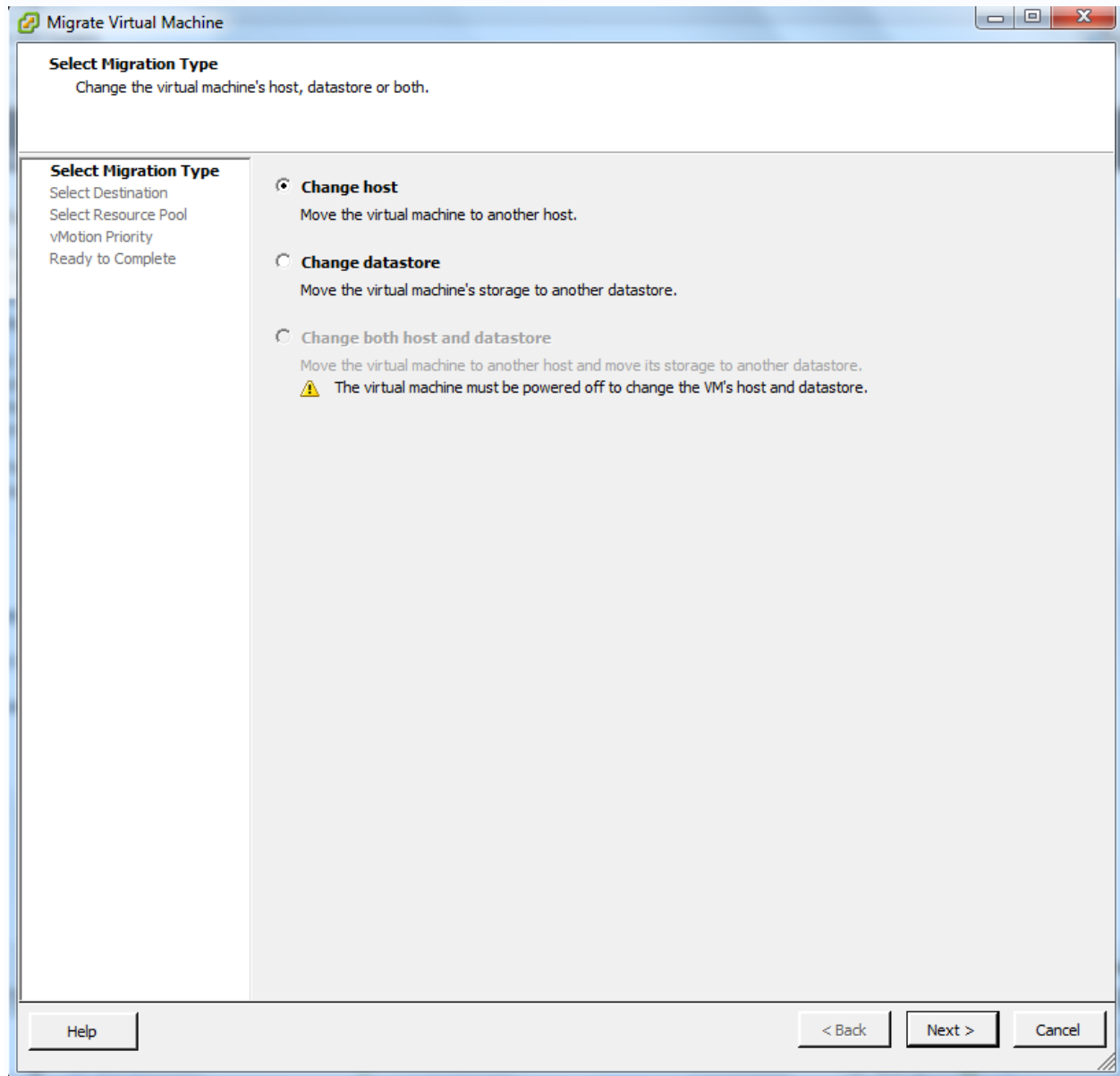


Now what we will do to ensure that the entire system is working properly migrate a VM from one ESXi to the other using Vmotion functionality you just configured.

## 14. Edit the settings



## 15. Change the virtual machine host




The screenshot shows a window titled "Migrate Virtual Machine" with standard Windows window controls (minimize, maximize, close). The main content area is titled "Select Migration Type" with the instruction "Change the virtual machine's host, datastore or both." Below this, there is a sidebar on the left with the heading "Select Migration Type" and a list of steps: "Select Destination", "Select Resource Pool", "vMotion Priority", and "Ready to Complete". The main area contains three radio button options: "Change host" (selected), "Change datastore", and "Change both host and datastore". Each option has a descriptive text below it. The "Change both host and datastore" option includes a yellow warning icon and a note that the VM must be powered off. At the bottom of the window, there are three buttons: "Help", "< Back", and "Next >", followed by a "Cancel" button.

**Migrate Virtual Machine**

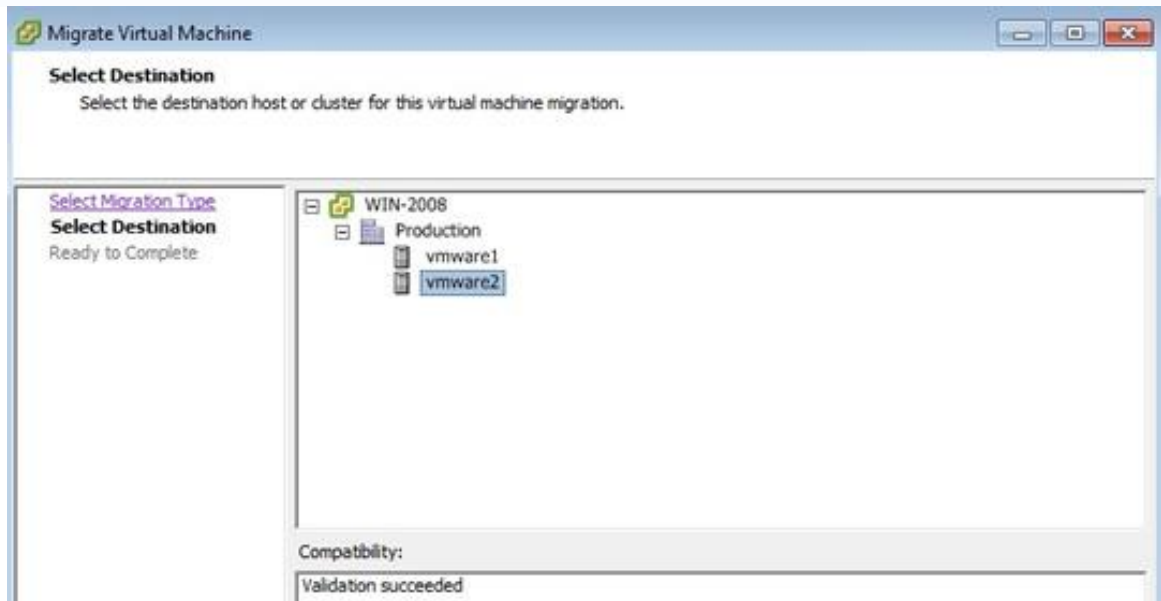
**Select Migration Type**  
Change the virtual machine's host, datastore or both.

**Select Migration Type**  
Select Destination  
Select Resource Pool  
vMotion Priority  
Ready to Complete

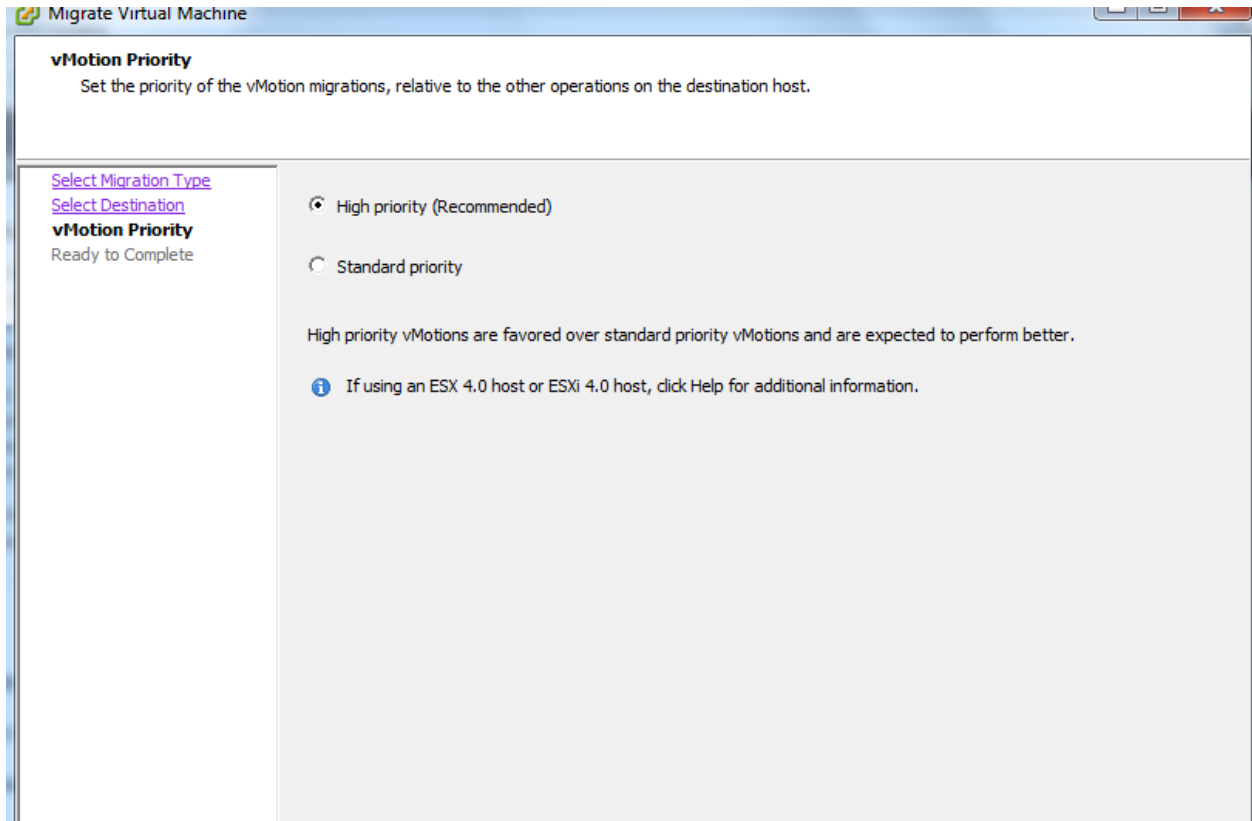
- ☒ **Change host**  
Move the virtual machine to another host.
- ☐ **Change datastore**  
Move the virtual machine's storage to another datastore.
- ☐ **Change both host and datastore**  
Move the virtual machine to another host and move its storage to another datastore.  
 The virtual machine must be powered off to change the VM's host and datastore.

Help      < Back      Next >      Cancel

## 16. Select the destination or cluster



## 17. Give the vMotion priority



The screenshot shows the 'Migrate Virtual Machine' wizard window. The title bar reads 'Migrate Virtual Machine'. The main heading is 'vMotion Priority', followed by the instruction: 'Set the priority of the vMotion migrations, relative to the other operations on the destination host.' On the left side, there is a sidebar with three links: 'Select Migration Type', 'Select Destination', and 'vMotion Priority'. The 'vMotion Priority' link is selected and bolded, with the status 'Ready to Complete' below it. The main content area on the right contains two radio button options: 'High priority (Recommended)' (which is selected) and 'Standard priority'. Below these options, a text line states: 'High priority vMotions are favored over standard priority vMotions and are expected to perform better.' At the bottom, there is an information icon (i) followed by the text: 'If using an ESX 4.0 host or ESXi 4.0 host, click Help for additional information.'

**Migrate Virtual Machine**

**vMotion Priority**  
Set the priority of the vMotion migrations, relative to the other operations on the destination host.

[Select Migration Type](#)  
[Select Destination](#)  
**vMotion Priority**  
Ready to Complete

☒ High priority (Recommended)  
☐ Standard priority

High priority vMotions are favored over standard priority vMotions and are expected to perform better.

**i** If using an ESX 4.0 host or ESXi 4.0 host, click Help for additional information.

## 18. Complete the vMotion process

