



SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

**Enterprise Standards and Best Practices for IT Infrastructure
4th Year 2nd Semester 2016**

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Practical Session: WE Tuesday
Practical Number : Vmotion Lab
Date of submission : 2016/09/09**

vMotion

vMotion means the live migration of a running virtual machine from one physical server to another physical server with zero downtime (no downtime) or without losing service.

In here the two physical servers are the two ESXi hosts where the virtual machines are created. So a running virtual machine can be migrated from one host to another.

1. vMotion Requirements

- Virtual machine must not have a connection to a virtual device such as a CD-ROM with a logical image mounted. if they are connected to a host, that will block the Motion migration. Solution stores those devices in a shared data store.
- Need to make sure to have storage between ESXi servers- iSCSI, CF, NFS (shared storage) so the both hosts can see the VM files from the shared storage.
- Each host must have the Gigabit Ethernet network connection.
- Host must be plugged into the same physical network.
- vMotion works with standard switches or distributed virtual switches.
- Should have CPU compatibility. Otherwise we can't do the migration. Following is happen when there is no CPU compatibility. it says that the vMotion is blocking because, there is a CD-ROM is attached to the data store that is not accessible to the host.

Pros and Cons of vMotion

Pros

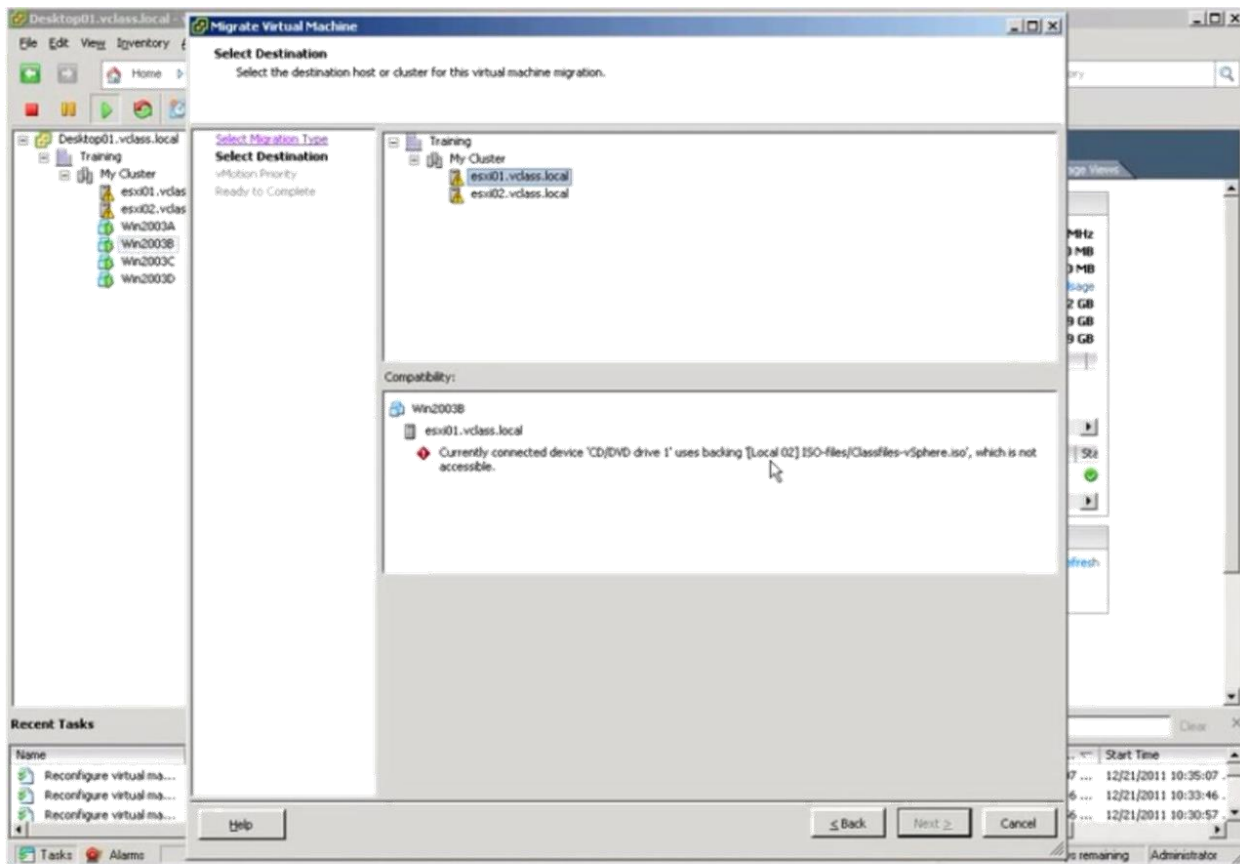
1. Zero downtime (no downtime)
2. Continuous service availability
3. Useful when performing maintenance on the ESXi host
4. Maximum hardware utilization and availability.
5. Load balancing

Cons

1. Does not allow migration with vMotion between Intel and AMD processors.
2. BIOS settings of the hosts need to enable hardware virtualization and execute protection.

Steps of doing vMotion on VMware

1. Power on the ESXi hosts and connect using VMware vSphere client software.
2. Create a virtual machine on the host and power on it.
3. Select the host and go to 'Configuration' tab.
4. Go to 'Networking' and click on 'Add Networking' to create the vSwitch.
5. Choose 'VMkernel' on ADD Network Wizard and click on Next.
6. Choose 'Create a vSphere standard switch' and click on Next.
7. Provide a network label and set 'Use this port group for vMotion'.
8. Set the IP settings (IP address and subnet mask) and click on Next.
9. Click on Finish.
10. Go to 'Networking' tab and click on 'Add Networking'.
11. Perform the same steps from step 4 to step 8. (When providing an IP in IP settings provide a different IP than the earlier one)
12. Click on next and finish
13. Right click on a virtual machine and click on migrate
14. Select 'Change host' and click on Next.
15. Select the target server where to move the virtual machine and click on Next.
16. Select the vMotion priority as 'High priority' and click on Next.
17. Click on Next from the 'Ready to Complete' tab.
18. Click on Finish to start the migration. It will take 60 seconds (approx.) to complete the migration process



```

Random_Init: Using random seed: 2044292605 (0x79d96dfd)
Reporting CPUID for 2 logical CPUs...

All CPUs are identical

Family: 06 Model: 17 Stepping: 6

ID1ECX  ID1EDX  ID81ECX  ID81EDX
0x00002201 0x0febfbff 0x00000001 0x20100000

Vendor      : Intel
Brand String : "Intel(R) Xeon(R) CPU           X5482  @ 3.20GHz"
SSE Support : SSE1, SSE2, SSE3, SSSE3, SSE4.1
Supports NX / XD : Yes
Supports CMPXCHG16B : Yes
Supports RDTSCP : No
Hyperthreading : No
Supports Flex Migration : Yes
Supports 64-bit Longmode : Yes
Supports 64-bit UMware : No
Supported EUC modes : None

PASS: Test 56903: CPUID
Press any key to reboot.

```

One way to identify CPU characteristics is to use the VMware CPU identification utility.

2. Benefits of vMotion.

- Automatically optimize and allocate entire pools of resources.

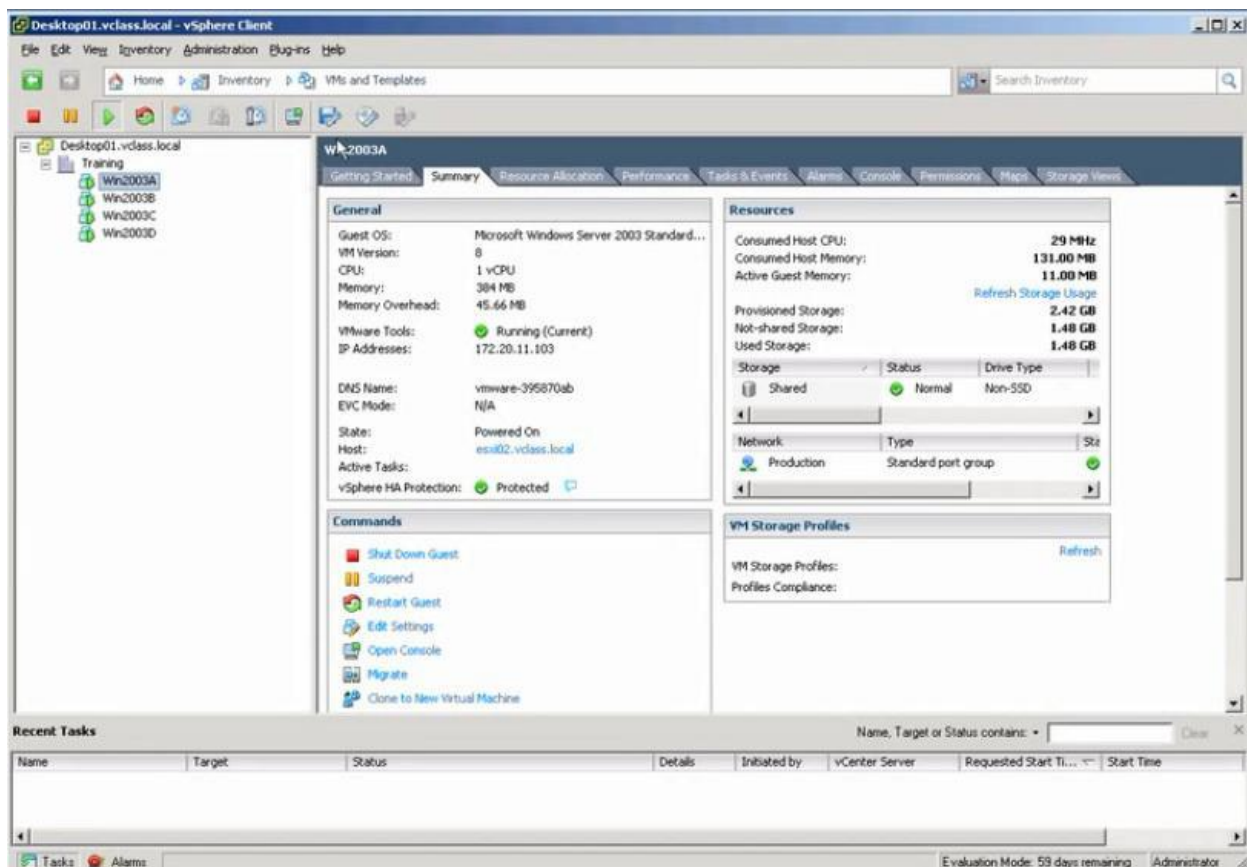
By having all your server and/or desktops virtualized you can move VM's from one physical host to another, which is done rapidly over a high speed network connection, the original host and destination host stay in sync until the transfer is complete leaving the user unaware of the move. This allows network administrators to easily select resource pools to assign to the different VMs

- minimize the scheduled downtime

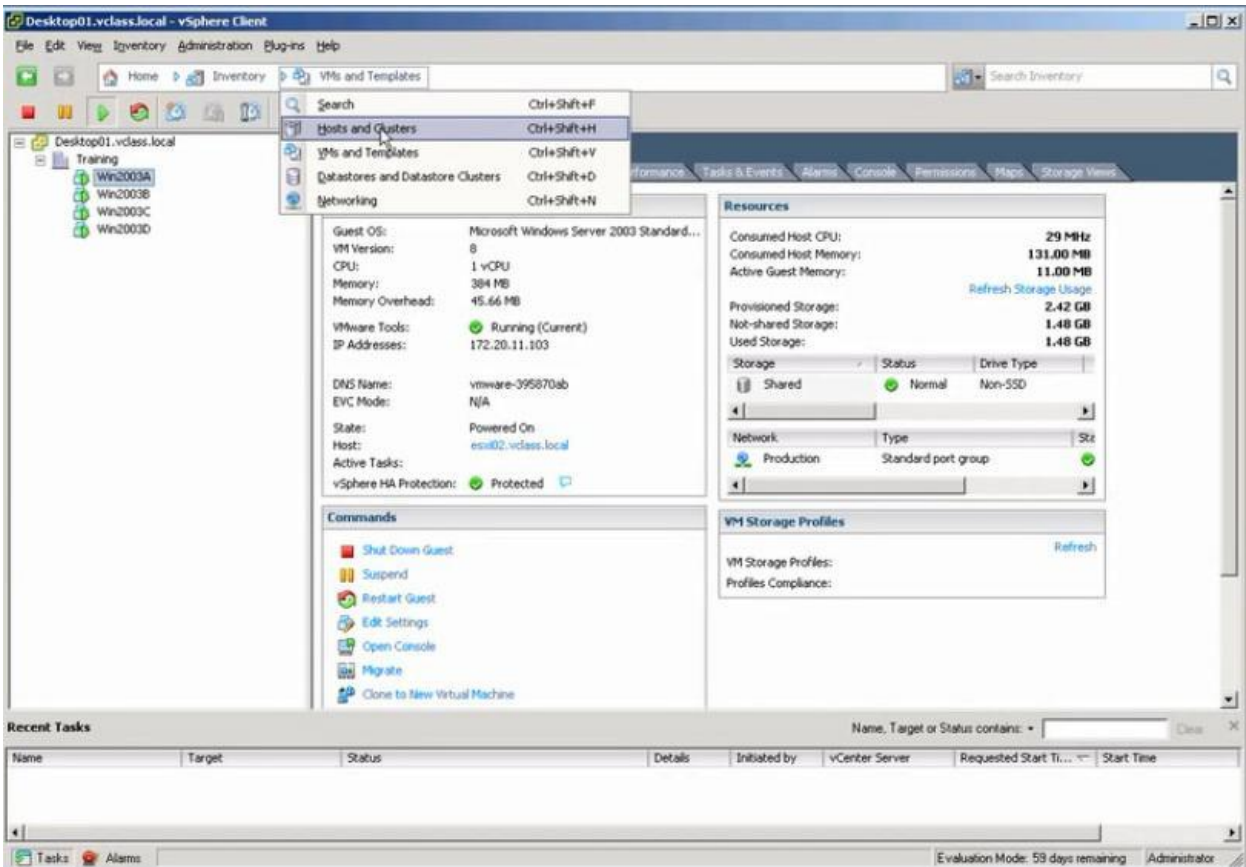
only have to move the VM to another physical host, creating zero downtime for the users and allowing administrators to perform maintenance at any time

3. How to configure hosts to do the vMotion.

first make sure the virtual machines are resides inside a shared storage.

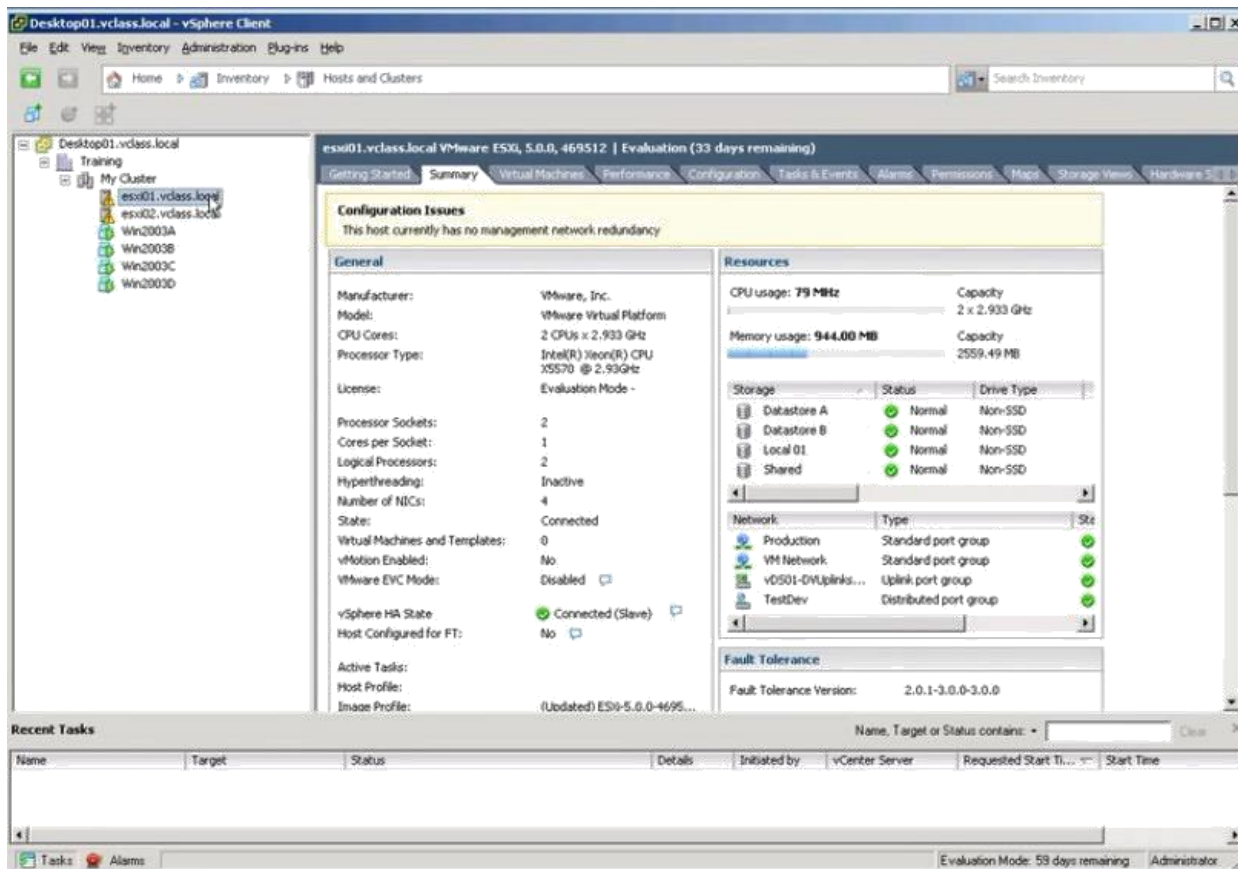


change VMs to the **hosts and clusters**.

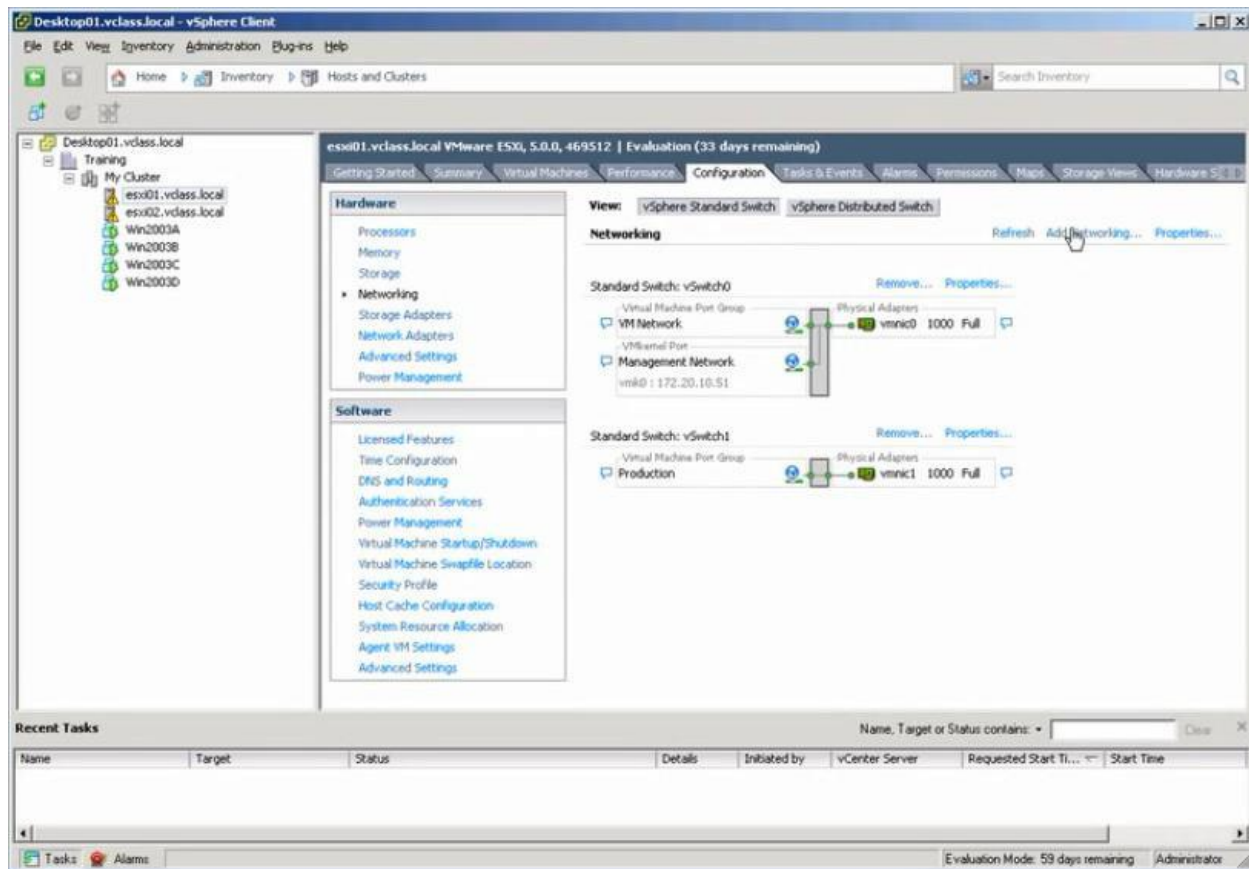


Then create VM kernel port on each host.

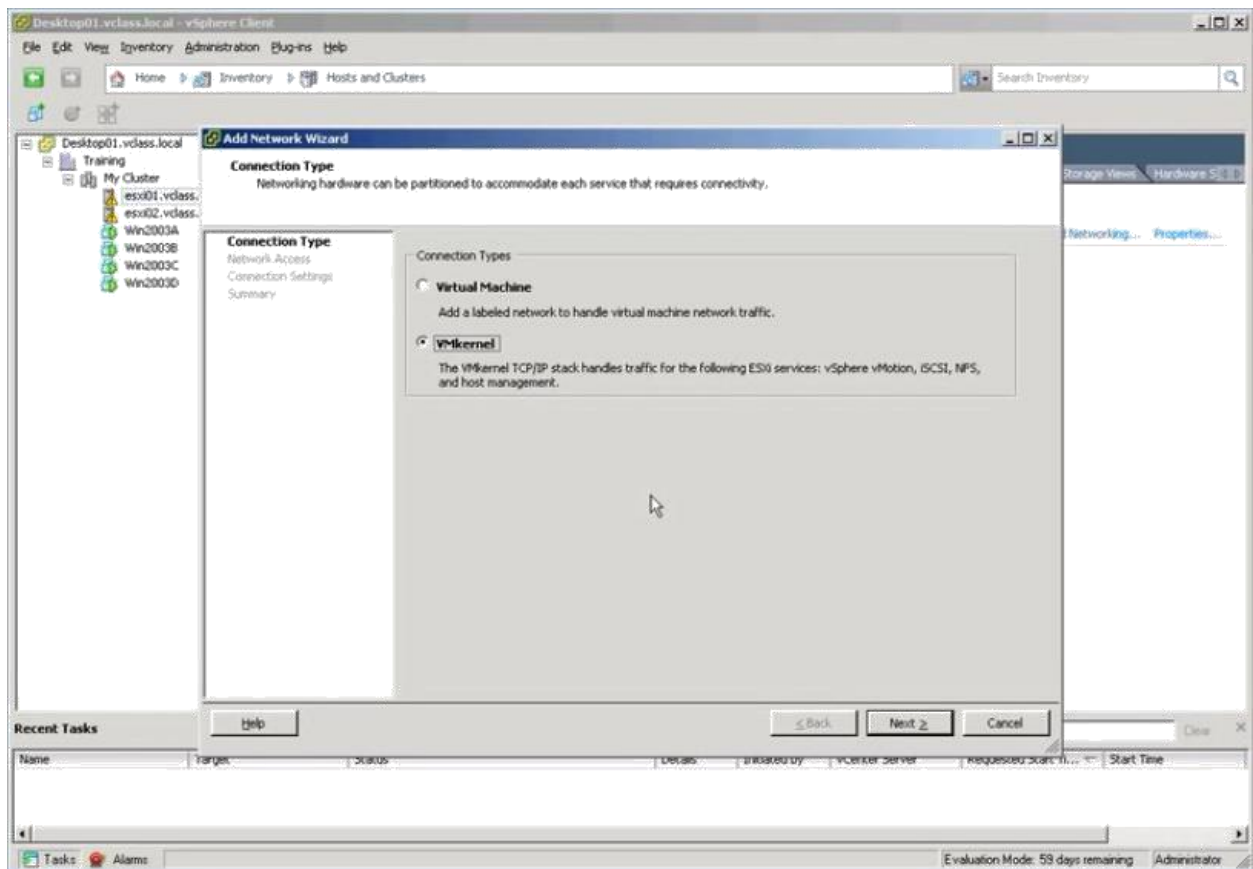
Select the **1st ESXi host** and go to the **configuration tab --> networking**.



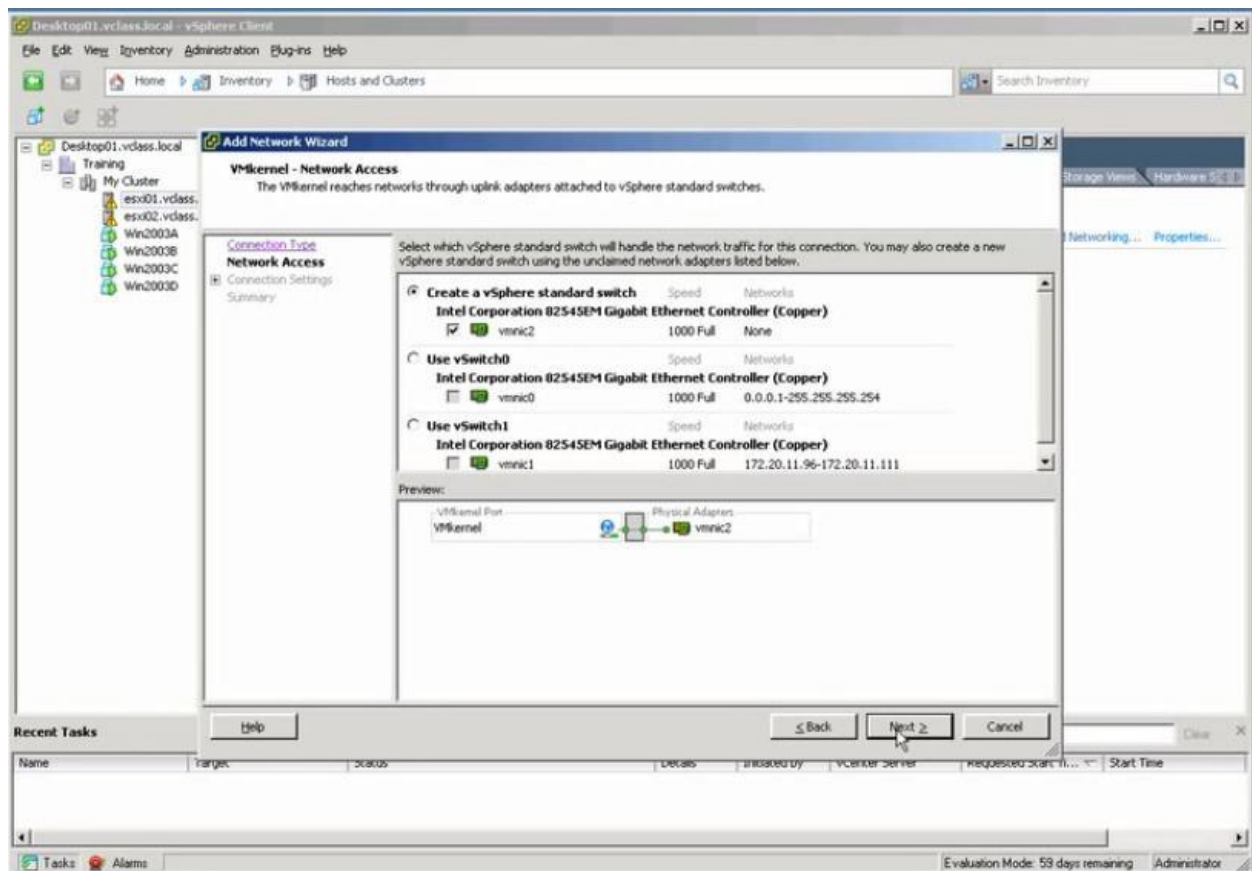
then select **Add networking**.



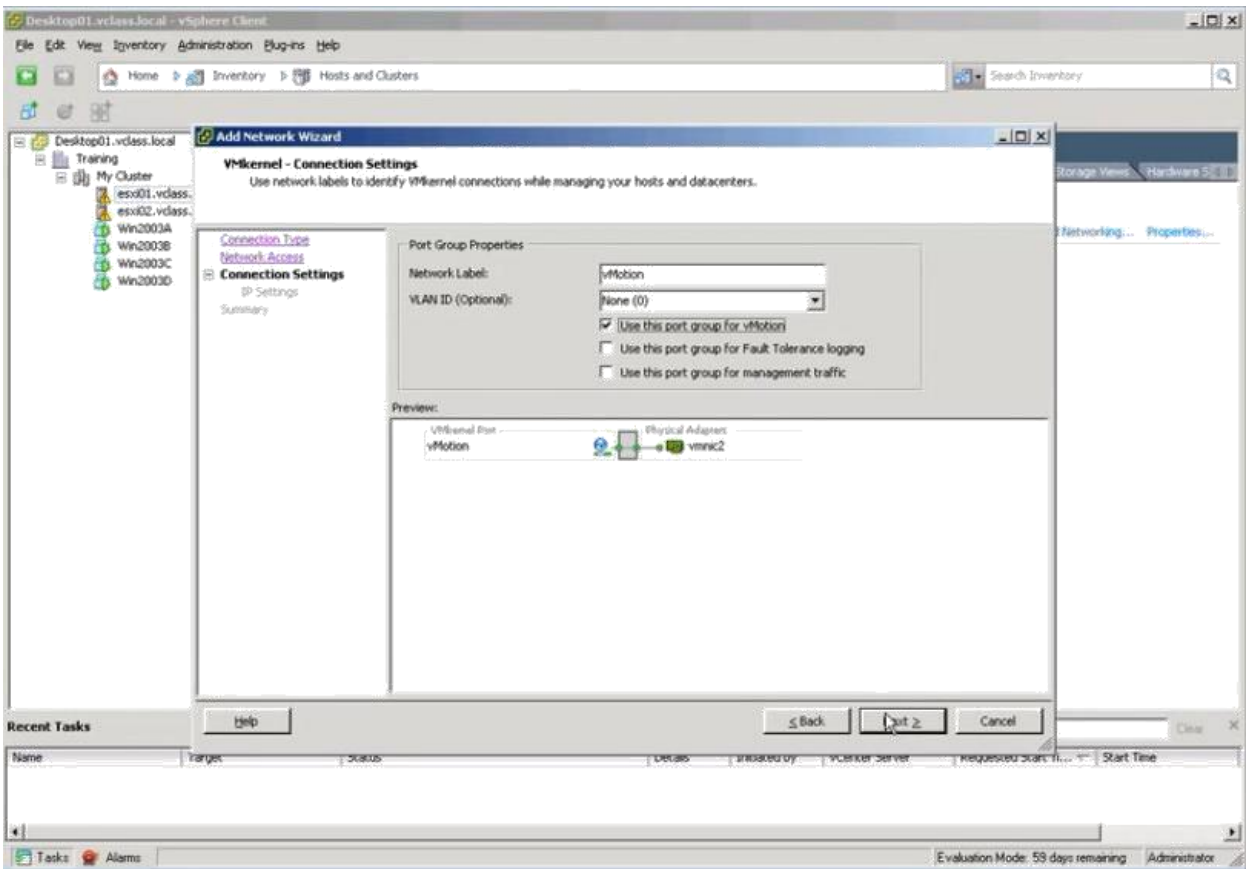
Select the **VM kernel** and go **next**.



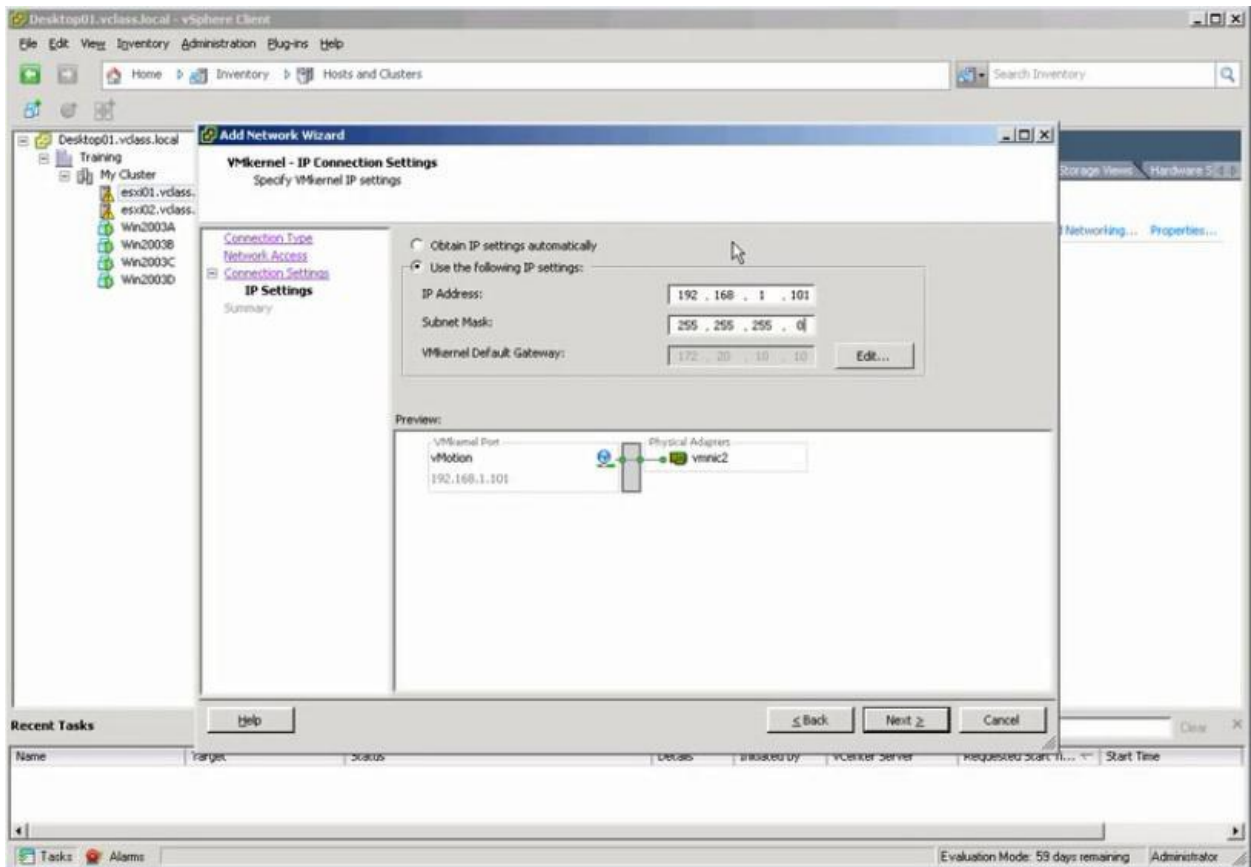
specify which physical network the vMotion traffic will be transmitted through.



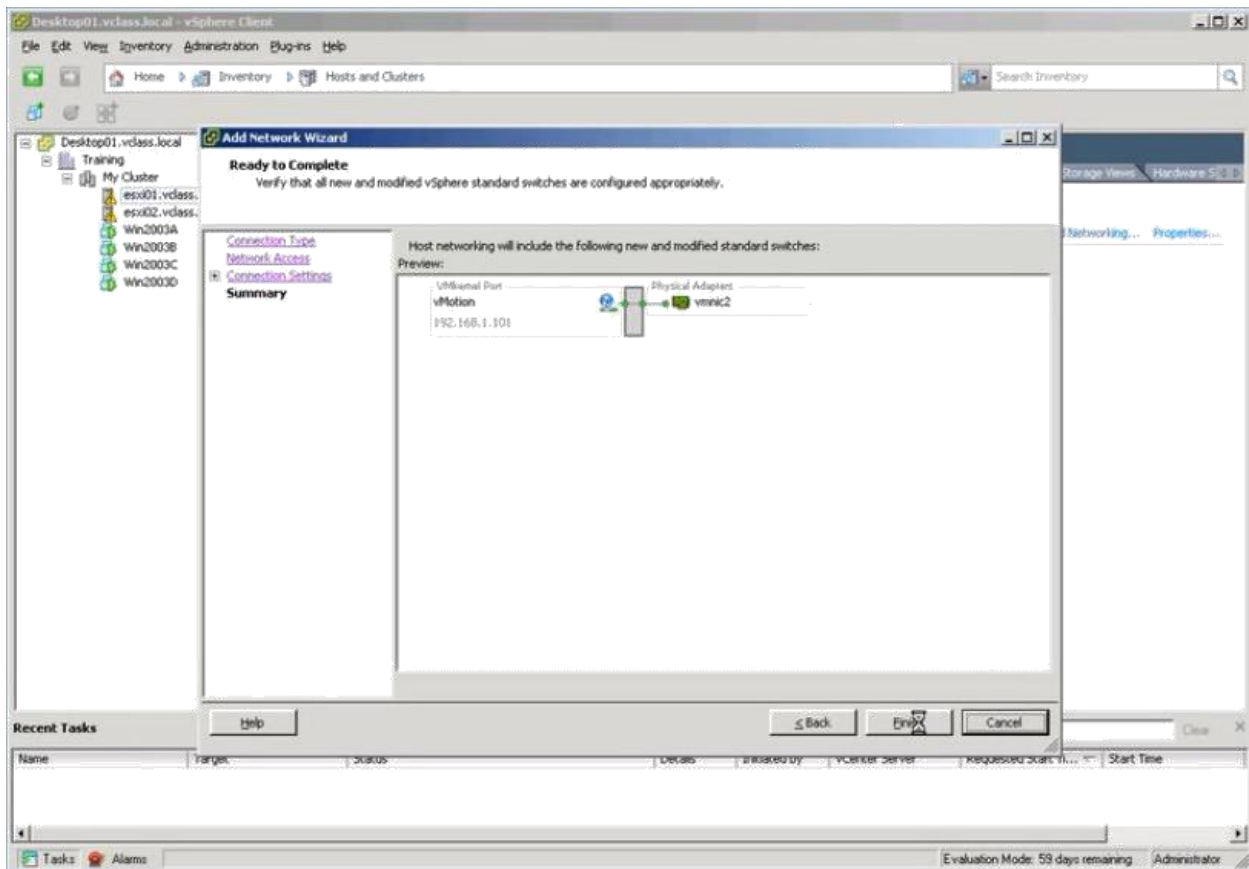
Then click **next**.



port group for vMotion and click **next**.

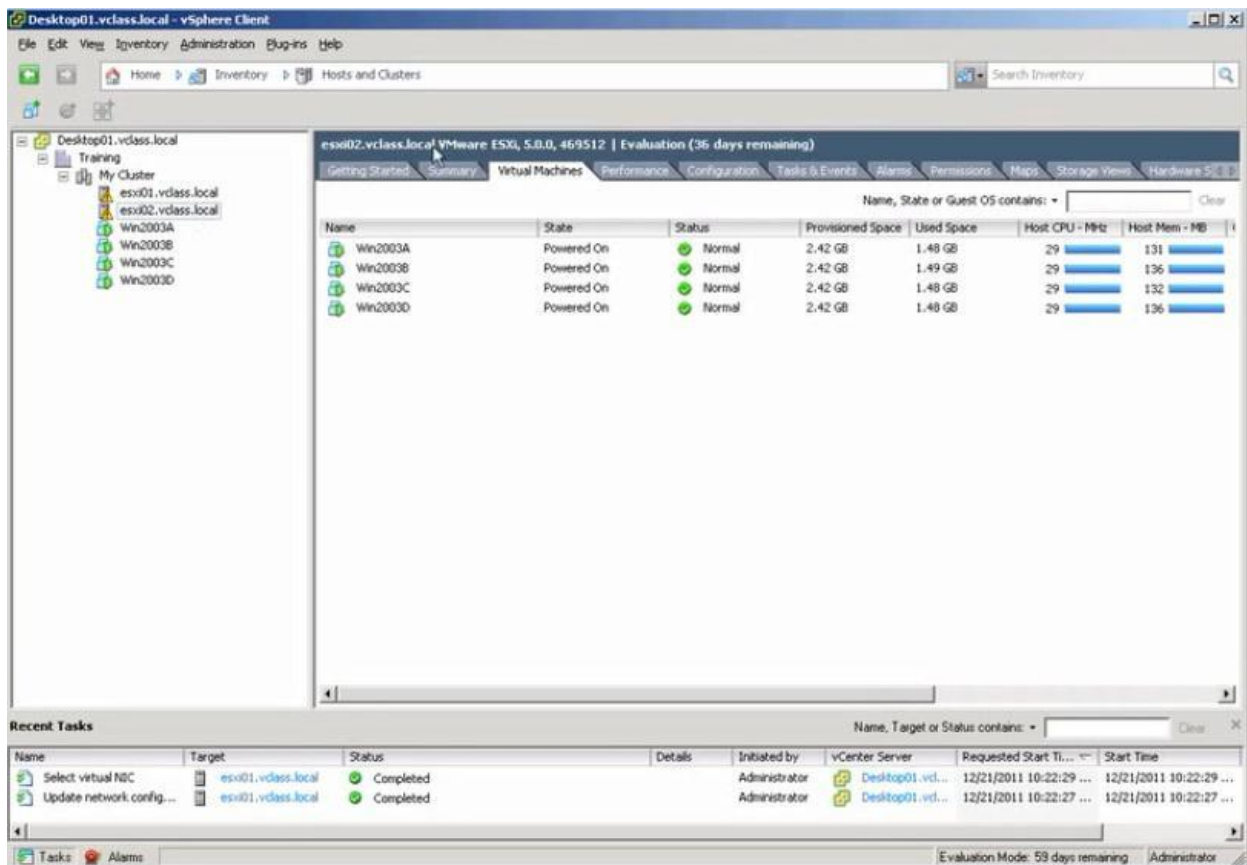


specify the **ip address** (198.168.1.101) and the **subnet mask**. and then click **next**.

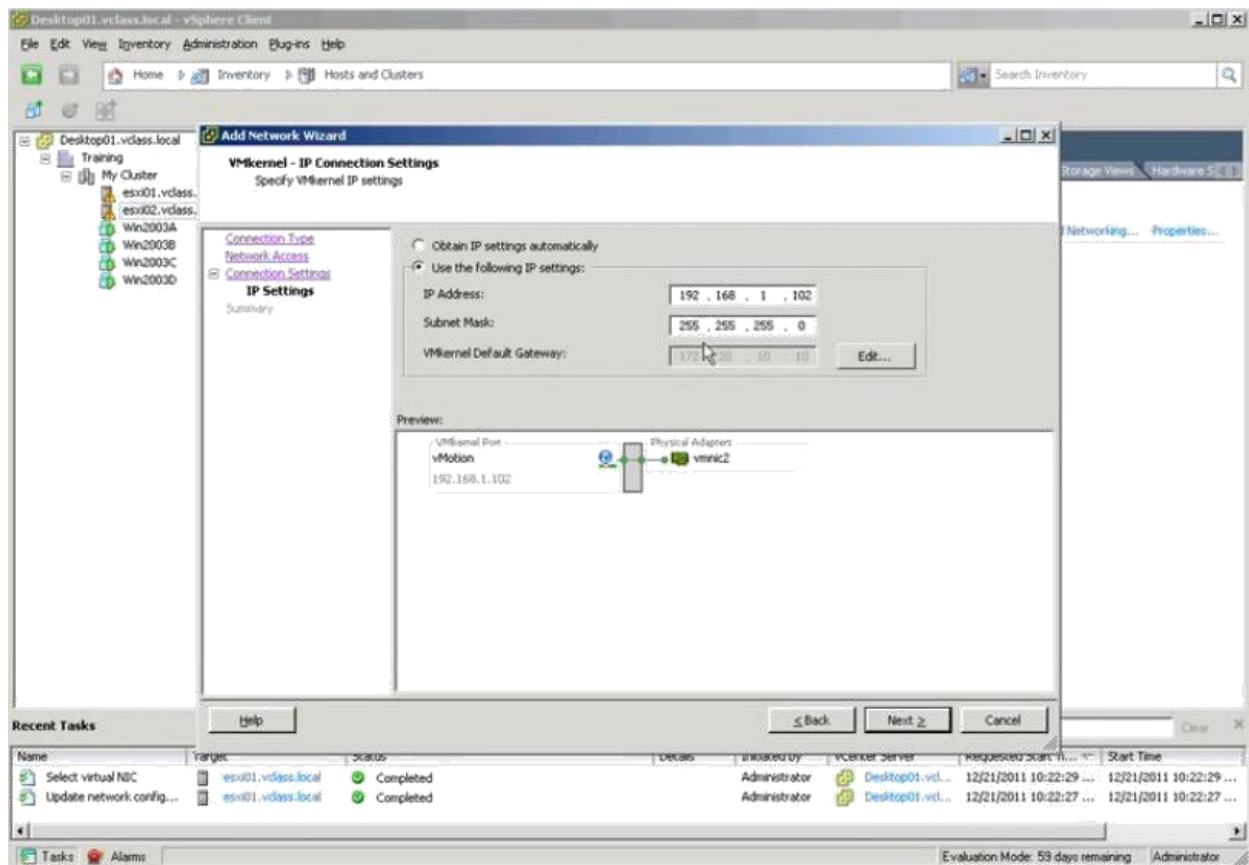


then click **finish**.

then again do the same to the **2nd host**.



give the IP as 198.168.1.102

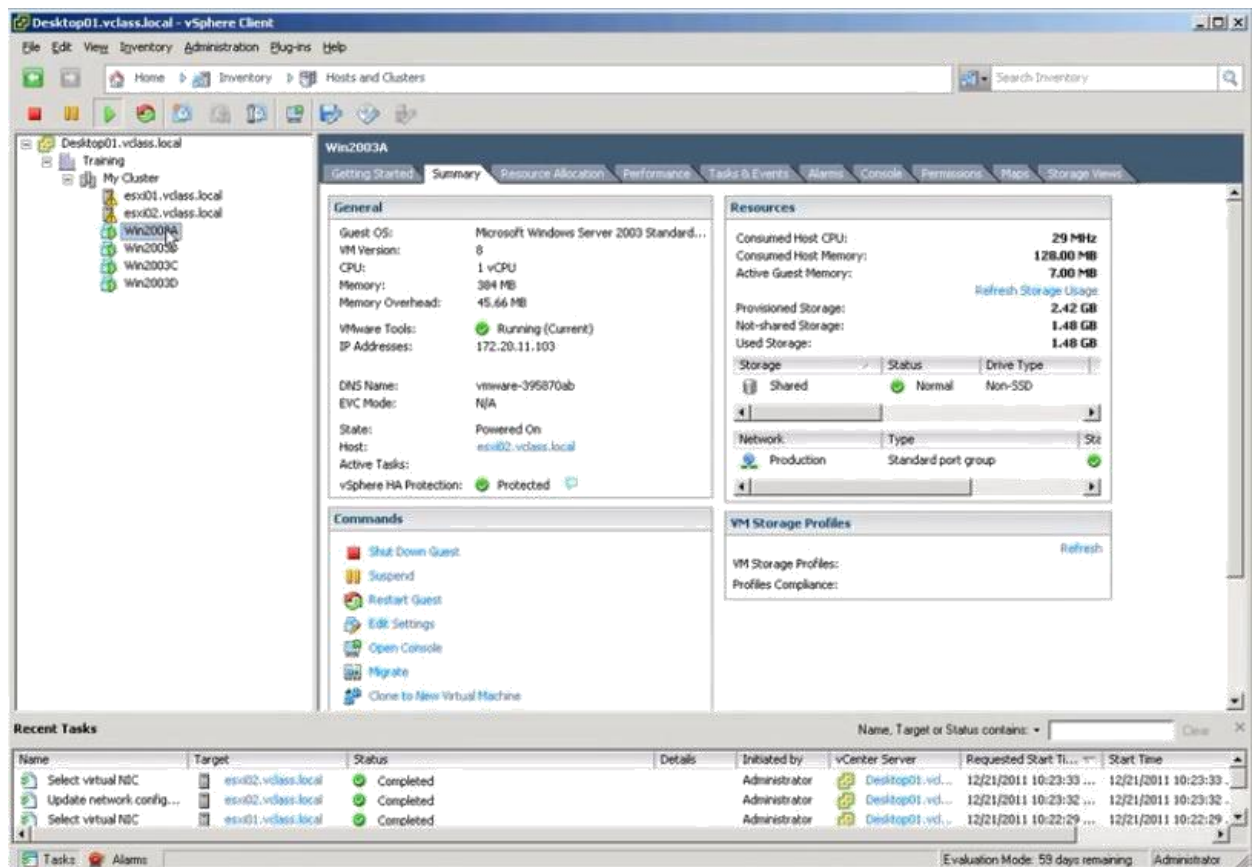


the created virtual switch below for the 2nd host.

The screenshot displays the vSphere Client interface for a host named `esx02.vclass.local`. The left sidebar shows a tree view with `Desktop01.vclass.local` expanded, containing `My Cluster` and several virtual machines (`Win2003A`, `Win2003B`, `Win2003C`, `Win2003D`). The main pane shows the `Configuration` tab for the host, with the `Networking` section selected. It displays three standard switches: `vSwitch0`, `vSwitch1`, and `vSwitch2`. `vSwitch0` is connected to `VM Network` and `Management Network`. `vSwitch1` is connected to `Production` and lists four virtual machines. `vSwitch2` is connected to `vMotion`. The bottom section shows a `Recent Tasks` table with three completed tasks.

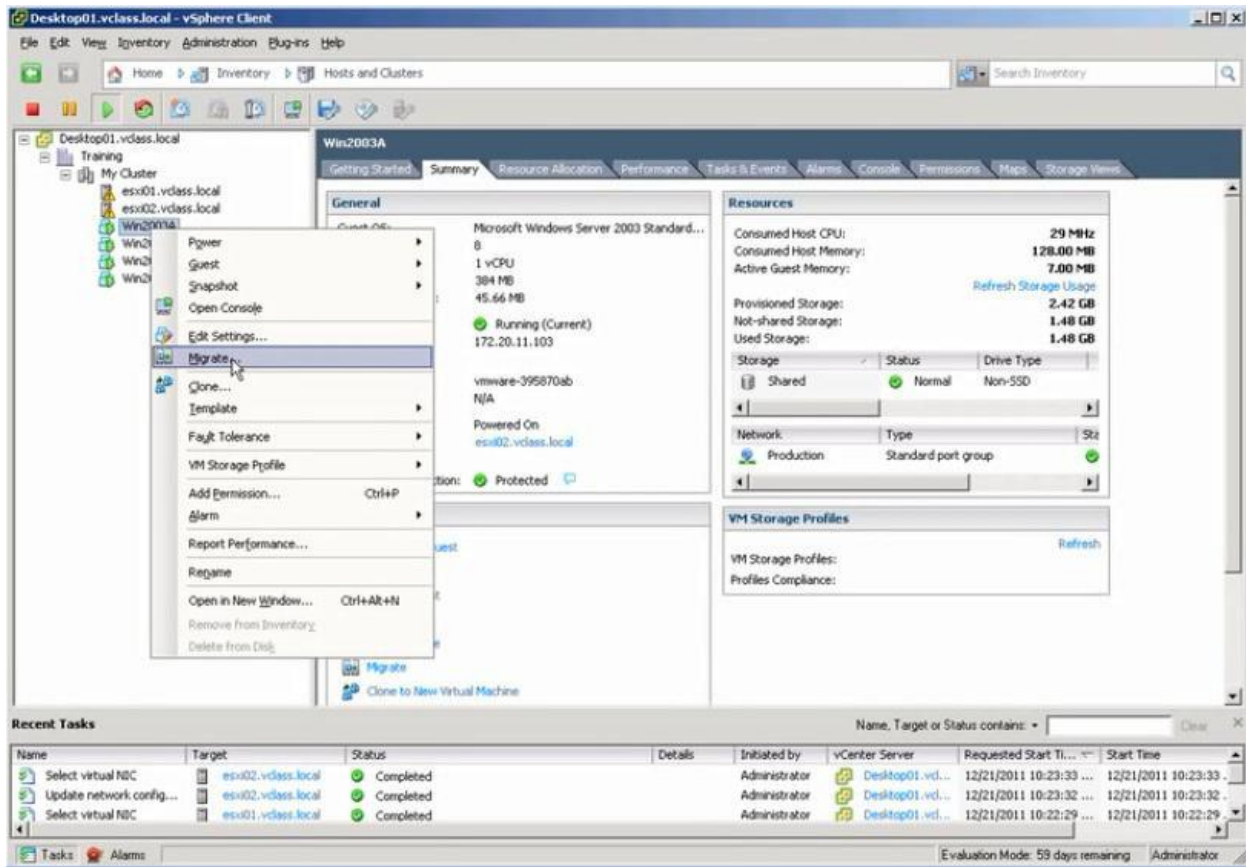
Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time
Select virtual NIC	esx02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:33 ...	12/21/2011 10:23:33 ...
Update network config...	esx02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:32 ...	12/21/2011 10:23:32 ...
Select virtual NIC	esx01.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:22:29 ...	12/21/2011 10:22:29 ...

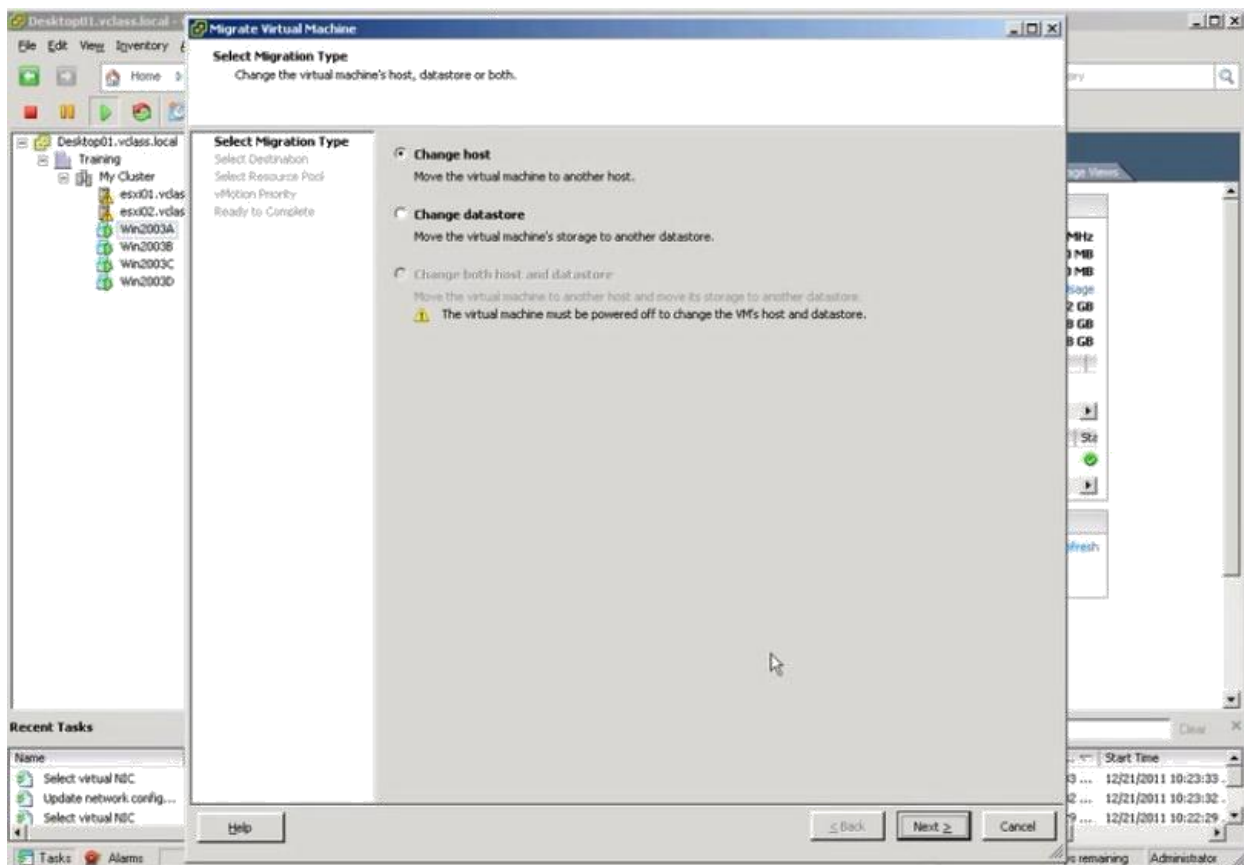
after configuring the 2 hosts we can migrate one virtual machine to another. First pick a virtual machine, which wants to migrate.



this particular virtual machine is currently running on the host 2. and migrate this virtual machine to host 1.

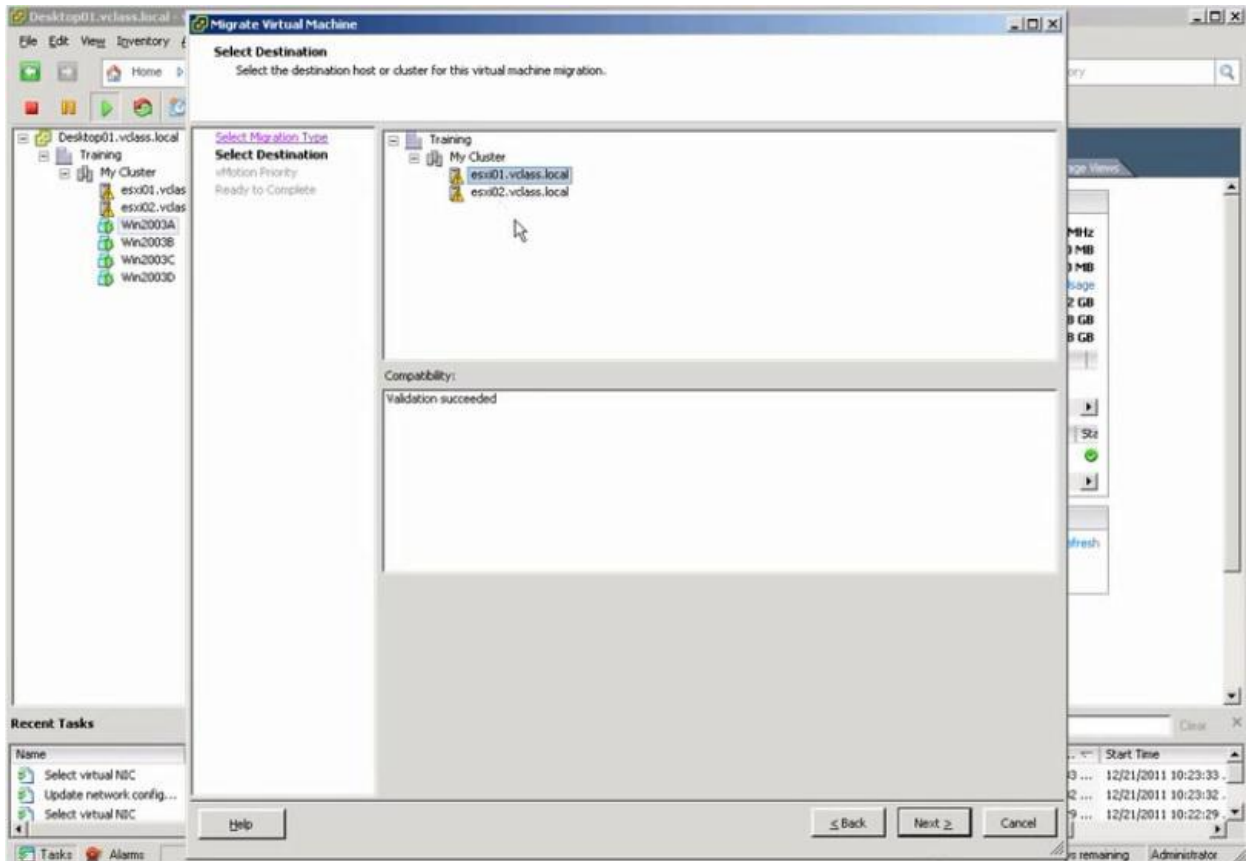
right click on the virtual machine and click **migrate**.



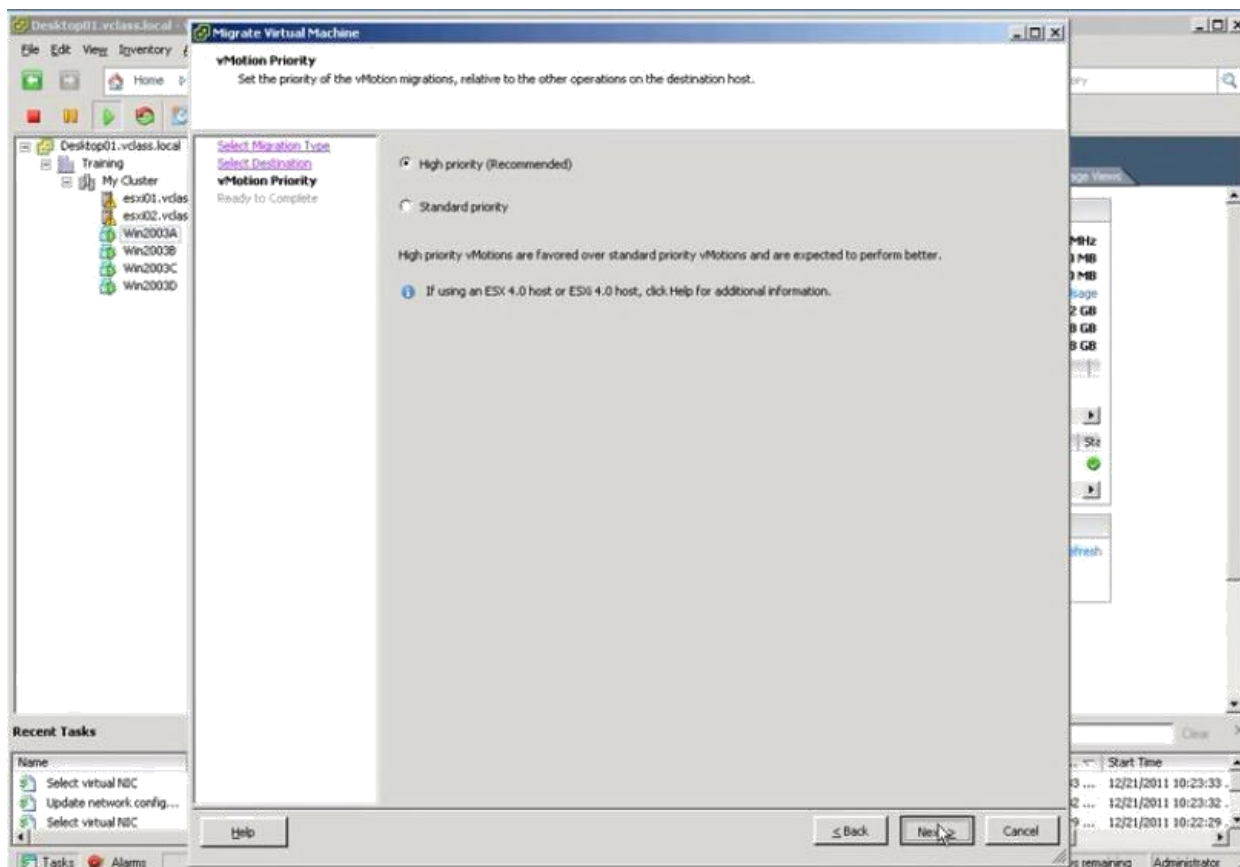


click **next**.

then specify the which ESXi server to migrate the virtual machine. select the **ESXi1**.

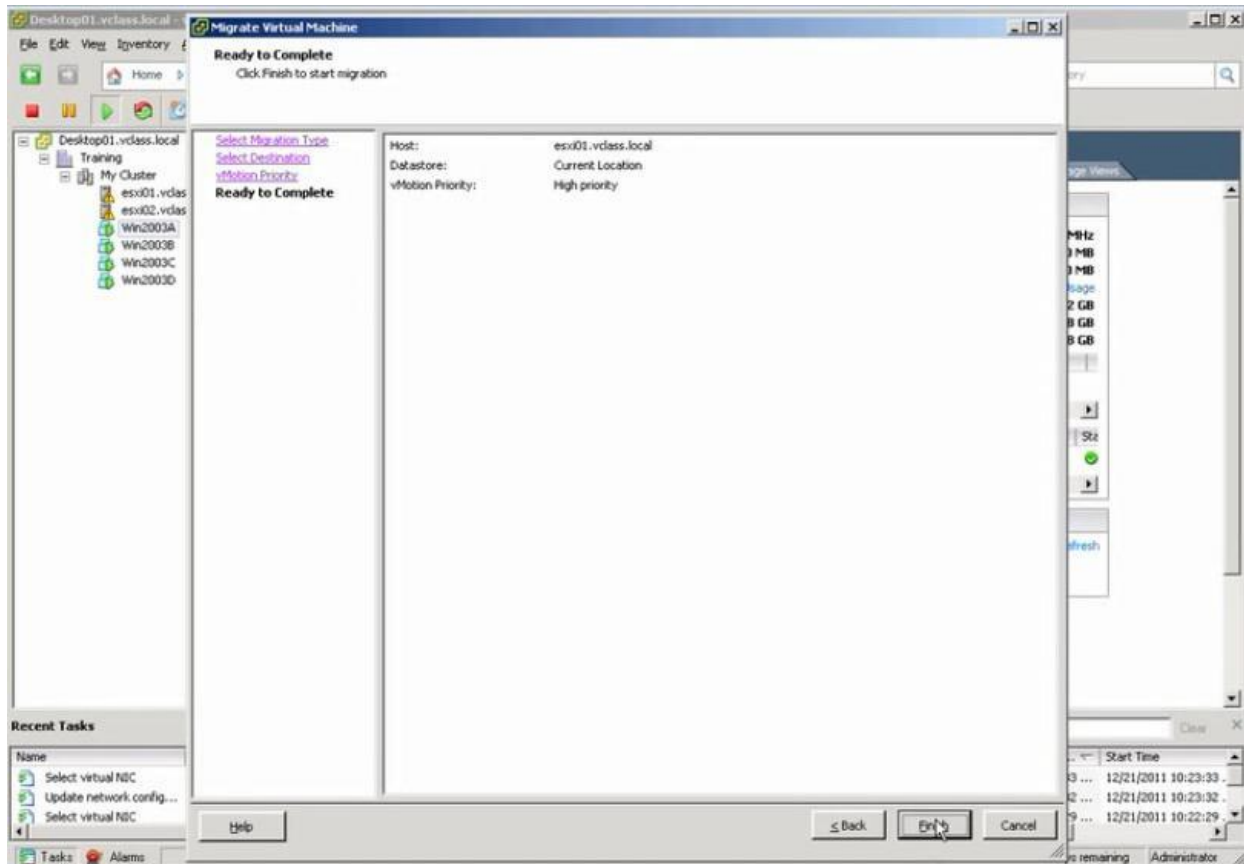


in compatibility there are no issues at the moment. and then click **next**.



tick the **high priority**. and click **next**.

the summary report.



then click **finish**.

after that the **migration** begin as the following.



Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time
Migrate virtual machine	Win2003A	66%	Migrating t...	Administrator	Desktop01.vd...	12/21/2011 10:25:31 ...	12/21/2011 10:25:31 ...
Select virtual NIC	esxi02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:33 ...	12/21/2011 10:23:33 ...
Update network config...	esxi02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:32 ...	12/21/2011 10:23:32 ...

Tasks: Alarms

Evaluation Mode: 59 days remaining Administrator

when we look at the **summary tab**, the virtual machine is now running on the **ESXi2** server.

Desktop01.vclass.local - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory Hosts and Clusters

Search Inventory

Desktop01.vclass.local

Training

My Cluster

esxi01.vclass.local

esxi02.vclass.local

Win2003A

Win2003B

Win2003C

Win2003D

Win2003A

Getting Started Summary Resource Allocation Performance Tasks & Events Alarm Console Permissions Maps Storage Views

General

Resources

Commands

VM Storage Profiles

Guest OS:

8

VM Version:

1 vCPU

CPU:

384 MB

Memory:

36.18 MB

Memory Overhead:

36.18 MB

VMware Tools:

Running (Current)

IP Addresses:

172.20.11.103

DNS Name:

N/A

EVC Mode:

N/A

State:

Powered On

Host:

esxi01.vclass.local

Active Tasks:

vSphere HA Protection:

Protected

Shut Down Guest

Suspend

Restart Guest

Edit Settings

Open Console

Migrate

Clone to New Virtual Machine

Consumed Host CPU:

29 MB/s

Consumed Host Memory:

128.00 MB

Active Guest Memory:

7.00 MB

Provisioned Storage:

2.42 GB

Not-shared Storage:

1.48 GB

Used Storage:

1.48 GB

Storage

Status

Drive Type

Shared

Normal

Non-SSD

Network

Type

Size

Production

Standard port group

512

VM Storage Profiles

Refresh

VM Storage Profiles:

Profiles Compliance:

Recent Tasks

Name, Target or Status contains:

Clear

Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time
Migrate virtual machine	Win2003A	Completed		Administrator	Desktop01.vd...	12/21/2011 10:25:31 ...	12/21/2011 10:25:31 ...
Select virtual NIC	esxi02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:33 ...	12/21/2011 10:23:33 ...
Update network config...	esxi02.vclass.local	Completed		Administrator	Desktop01.vd...	12/21/2011 10:23:32 ...	12/21/2011 10:23:32 ...

Tasks

Alarms

Evaluation Mode: 59 days remaining

Administrator