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VMWARE VSphere 6.5: INSTALL, CONFIGURE, MANAGE



Lab 19: Using vSphere HA

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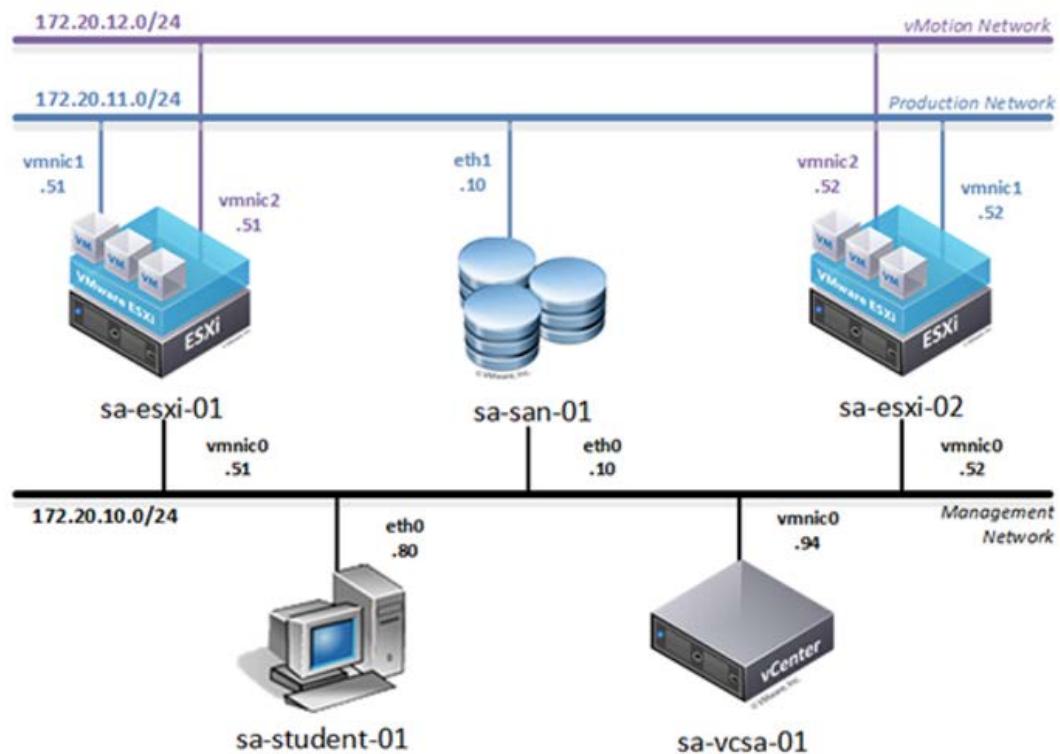
Introduction

In this lab, you will use *vSphere HA* functionality.

Objectives

- Prepare the lab environment
- Create a cluster enabled for *vSphere HA*
- Add your *ESXi* host to the cluster
- Test *vSphere HA* functionality
- View the *vSphere HA* cluster resource usage
- Manage *vSphere HA* slot size
- Configure a *vSphere HA* cluster with strict admission control

Lab Topology



Lab Settings

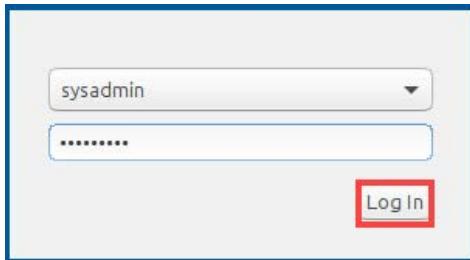
The information in the table below will be needed in order to complete the lab. The task sections below provide details on the use of this information.

Virtual Machine	IP Address	Account	Password
sa-esxi-01	eth0: 172.20.10.51	root	Training\$
sa-esxi-02	eth0: 172.20.10.52	root	Training\$
sa-san-01	eth0: 172.20.10.10	sysadmin	vmware123
sa-student-01	eth0: 172.20.10.80	sysadmin	vmware123
sa-vcsa-01	eth0: 172.20.10.94	admin@class.local	vmware123

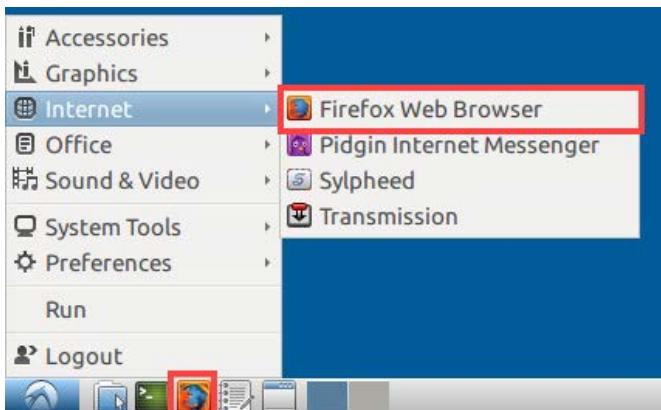
1 Prepare the Lab Environment

In this task, you will attach a shared datastore and migrate virtual machines.

1. Launch the **sa-student-01** virtual machine to access the graphical login screen.
2. Log in as **sysadmin** using the password **vmware123**.



3. Launch the **Mozilla Firefox** web browser by either clicking on the icon shortcut found on the bottom toolbar or by navigating to **Start Menu > Internet > Firefox Web Browser**.



4. Notice the homepage is automatically configured to load the URL address of the *VMware vCenter Server Appliance* (*sa-vcsa-01* virtual machine). Click on the **vSphere Web Client (Flash)** hyperlink to launch the web-based *vSphere* client.

Welcome to VMware v... +

https://sa-vcsa-01.vclass.local

vmware

Getting Started

To access vSphere, log in to:

vSphere Web Client (Flash) [Red Box]

vSphere Client (HTML5) - partial functionality

For help, see:

vSphere Documentation

Supported Functionality in vSphere Client (HTML5)

vCenter Servers



If you cannot successfully load the *VMware Getting Started* webpage, then please **wait an additional 3-4 minutes** and refresh the page to continue. During this time, the *vCSA* is still booting up and requires extra time to initialize.

5. In the *User name* text field, type **admin@vclass.local** and in the *Password* text field, type **vmware123**. Click on **Login**.

User name: admin@vclass.local

Password:
 Use Windows session authentication

Login

VMware vCenter Single Sign-On

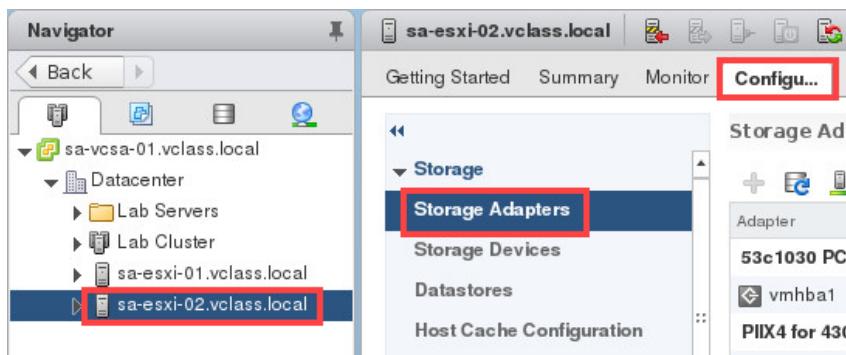
Please
Note

You may ignore the “*browser-OS combination*” warning message presented on the *VMware vCenter Single Sign-On* page and continue moving forward with the lab.

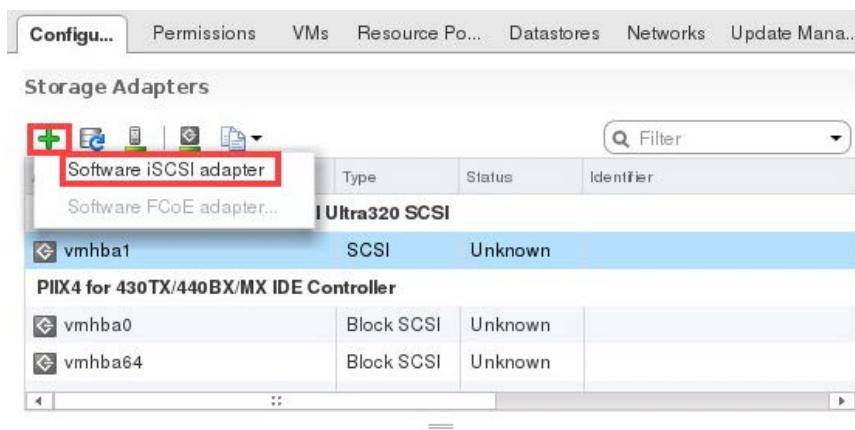
6. In the navigator pane, ensure that the **Hosts and Clusters** tab is selected and expand the **Datacenter** object.



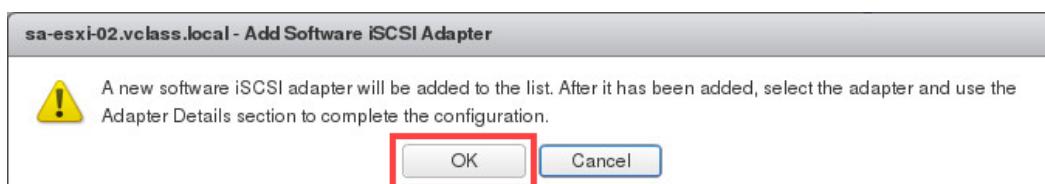
7. Select **sa-esxi-02.vclass.local** from the navigator pane, click the **Configure** tab and then select **Storage Adapters**.



8. Click on the **Add new storage adapter** icon, followed by selecting **Software iSCSI adapter**.



9. When the *Add Software iSCSI Adapter* message appears, click **OK** to continue.



10. In the *Storage Adapters* list, scroll down and select the newly created *iSCSI* software adapter (**vmhba65**).

Adapter	Type	Status	Identifier
PIIX4 for 430TX/440BX/MX IDE Controller			
vmhba0	Block SCSI	Unknown	
vmhba64	Block SCSI	Unknown	
vmhba65	iSCSI	Online	iqn.1998-01.com.vmware:s...

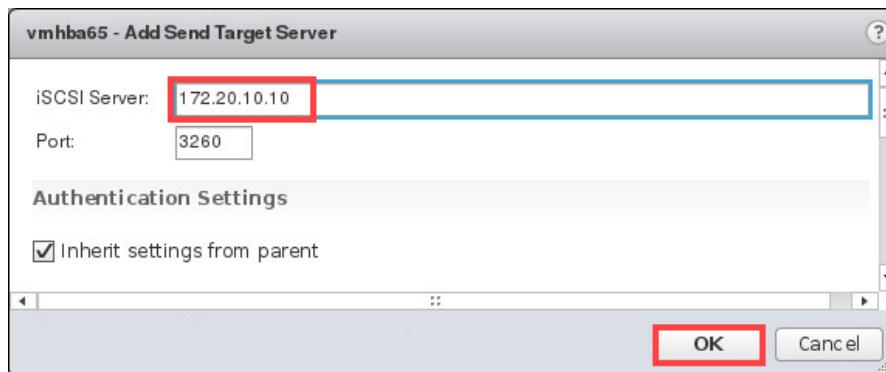
11. In the *Adapter Details* pane, click the **Targets** tab.

Port Group	VMkernel Ad...	Port Group Policy	Path Status	Physical Netw...
IP Storage (vSwitch...)	vmk1	Compliant	Not used	vmnic1

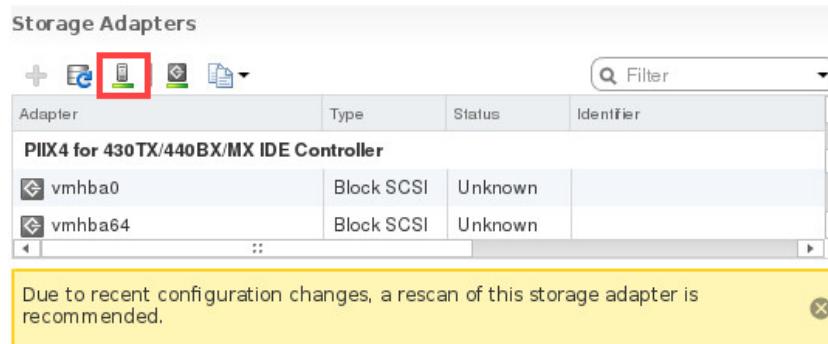
12. Click **Dynamic Discovery**, followed by clicking **Add...**.

Properties	Devices	Paths	Targets	Network Port Binding	Advanced Options
<div style="border: 1px solid #ccc; padding: 5px;"> Dynamic Discovery Static Discovery Add... Remove Authentication... Advanced... </div>					
<div style="border: 1px solid #ccc; padding: 5px;"> iSCSI server This list is empty. </div>					

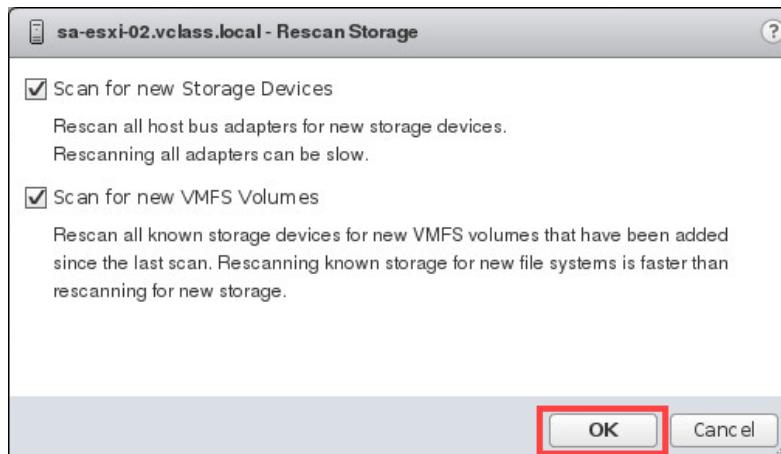
13. In the *Add Send Target Server* window, type **172.20.10.10** for the *iSCSI* server name in the *iSCSI Server* text box and click **OK**.



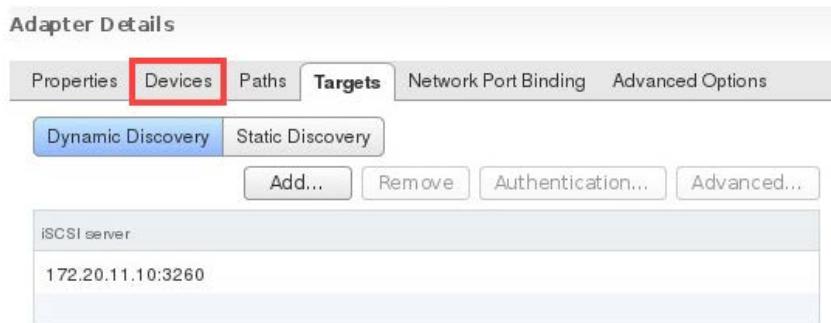
14. Monitor the *Recent Tasks* pane. Once completed, click the **Rescan all storage adapters** icon.



15. In the *Rescan Storage* window, click **OK** and wait for the task to complete.

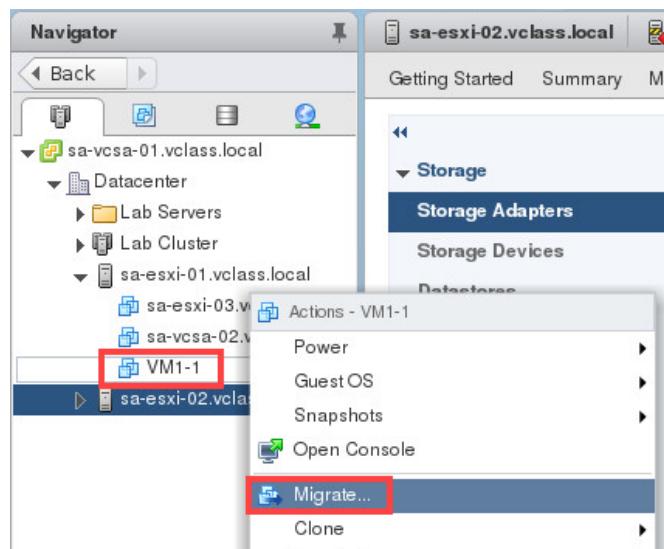


16. In the *Adapter Details* pane, click the **Devices** tab.

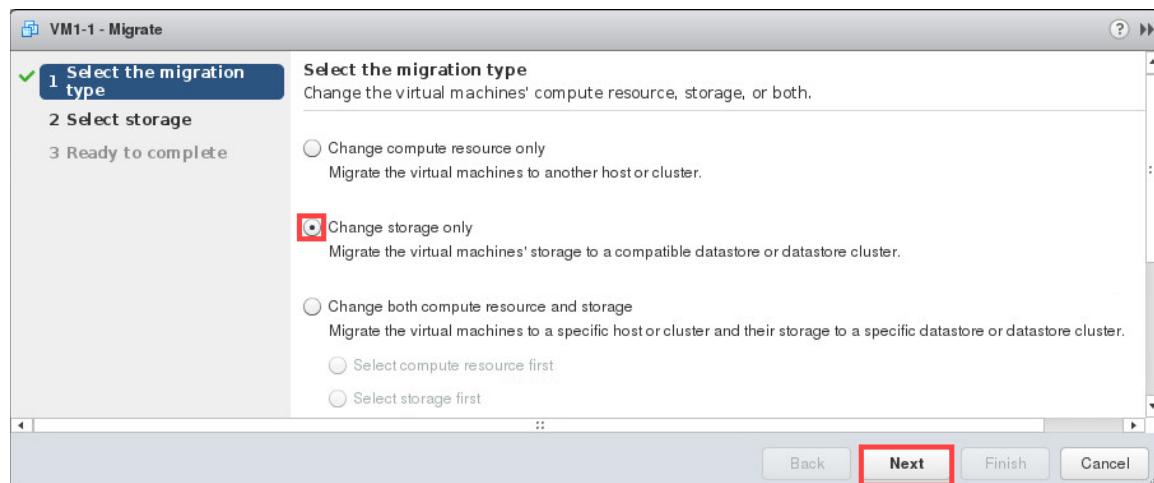


17. Verify that one or more *LUNs* appear. Notice the *LUN* number, capacity, operational state, and hardware acceleration information.

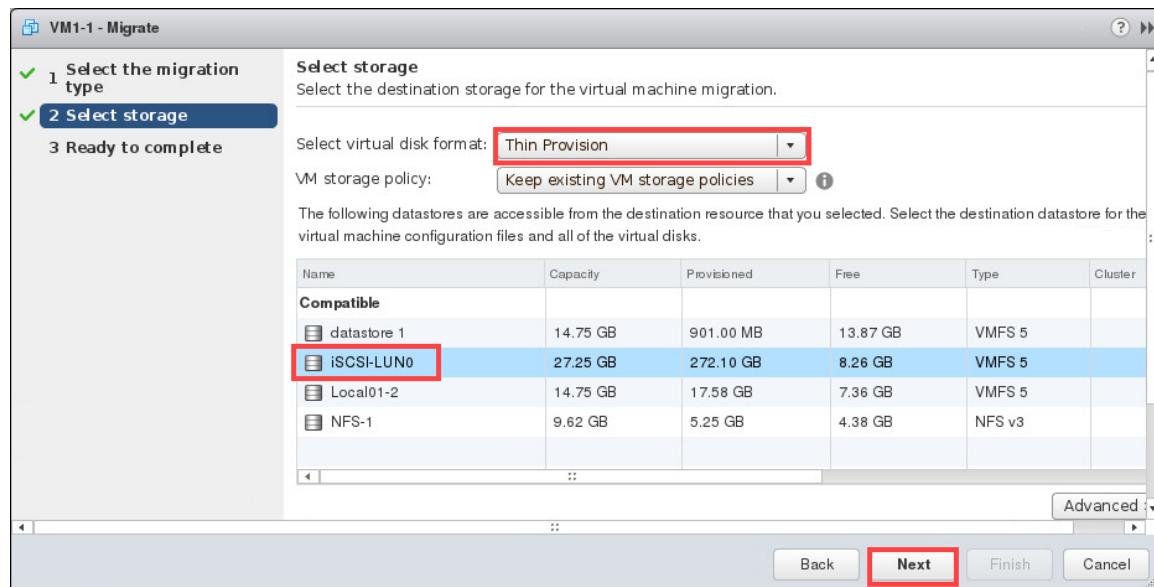
18. Expand the **sa-esxi-01.vclass.local** host object, right-click **VM1-1** and select **Migrate**.



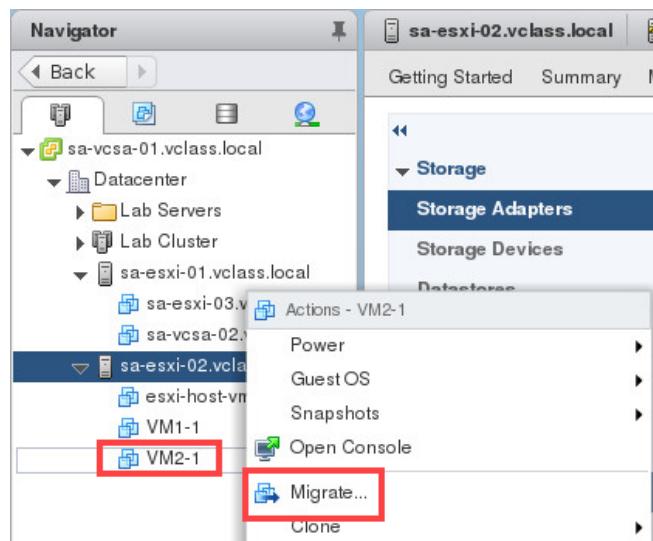
19. In the *Migrate* window, on the *Select the migration type* step, choose **Change storage only**. Click **Next**.



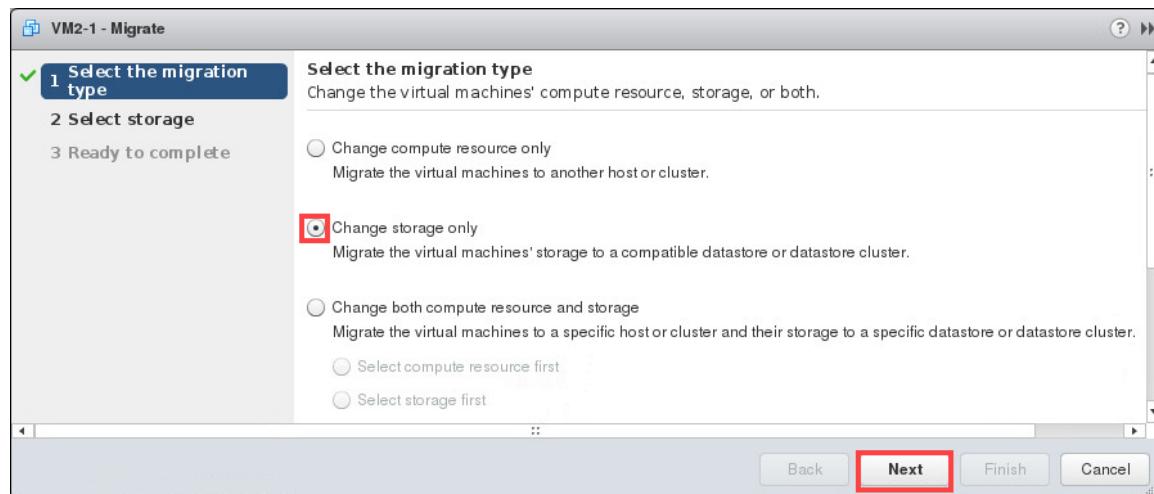
20. On the *Select storage* step, select **iSCSI-LUN0** and select **Thin Provision** as the virtual disk format. Click **Next**.



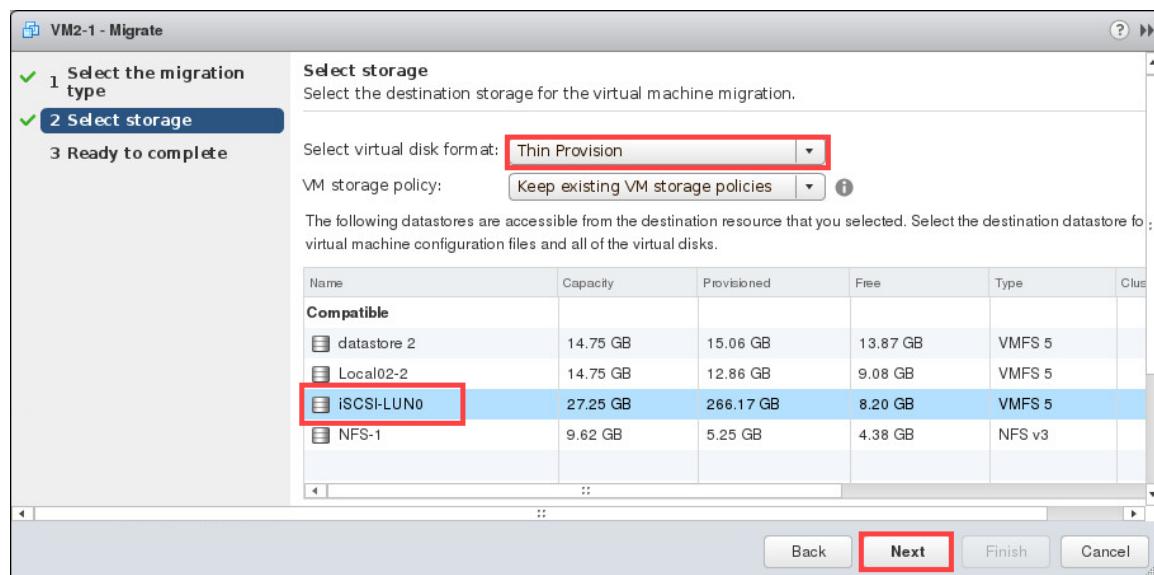
21. On the *Ready to complete* step, review the information and click **Finish**.
 22. In the navigator pane, expand **esxi-02.vclass.local**, right click **VM2-1** and select **Migrate**.



23. In the *Migrate* window, on the *Select the migration type* step, choose **Change storage only** and click **Next**.



24. On the *Select storage* step, select **iSCSI-LUN0** and choose **Thin Provision** as the virtual disk format. Click **Next**.

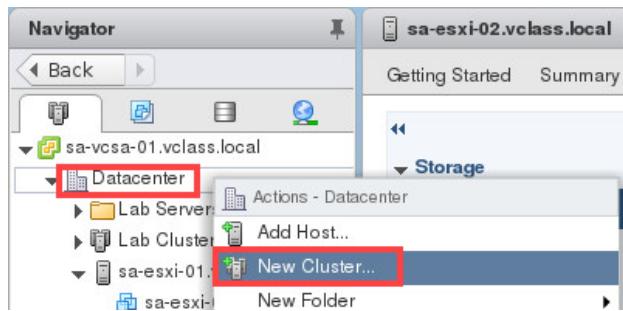


25. On the *Ready to complete* step, review the information and click **Finish**.
 26. Leave **vSphere Web Client** open to continue with the next task.

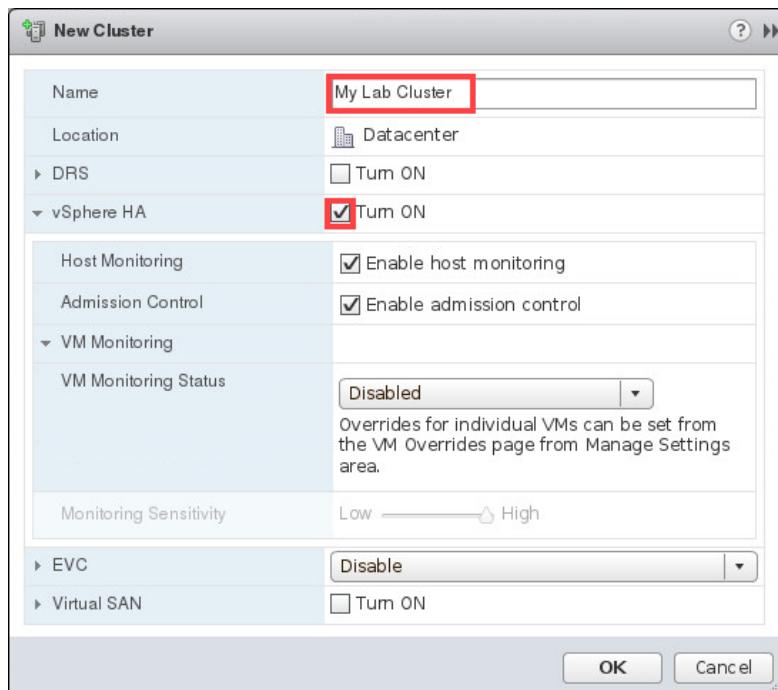
2 Create a Cluster Enabled for vSphere HA

In this task, you will create a *VMware vSphere High Availability* cluster to group multiple *ESXi* hosts together, to achieve higher levels of virtual machine availability than each *ESXi* host can provide individually.

1. On the *vSphere Web Client* homepage, ensure that you are viewing the **Hosts and Clusters** tab in the navigator pane. Right-click the **Datacenter** object and select **New Cluster**.



2. In the *New Cluster* window, configure the new cluster with the settings provided below:
 - a. **Name:** Enter **My Lab Cluster**
 - b. **DRS:** Leave the check box **deselected**
 - c. **vSphere HA:** Select the **Turn on** check box
 - d. Leave the default settings for the other options and click **OK**.

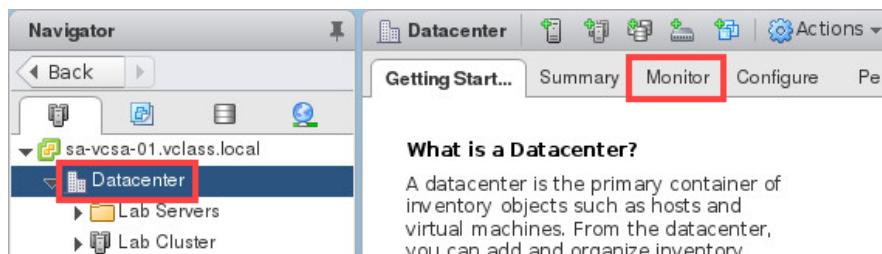


3. In the *Recent Tasks* pane, monitor the progress as the cluster is created.
4. Leave *vSphere Web Client* open to continue with the next task.

3 Add Your ESXi Host to the Cluster

In this task, you will plan the resources and networking architecture of your cluster, add hosts to it, and specify the *vSphere HA* settings.

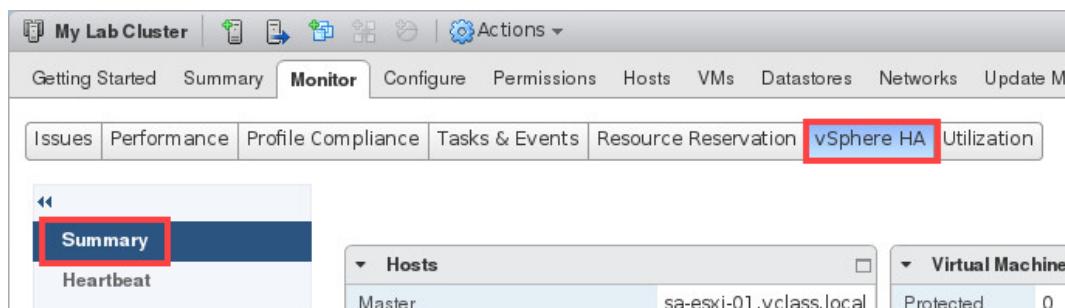
1. While in the *vSphere Web Client*, drag both **ESXi hosts** to the **My Lab Cluster** inventory object.



2. Monitor the *Recent Tasks* pane and wait for the *Configuring vSphere HA* task to complete.
3. Select **My Lab Cluster** in the navigator pane and click the **Monitor** tab.



4. Click the **vSphere HA** button, followed by clicking on **Summary** in the middle pane.



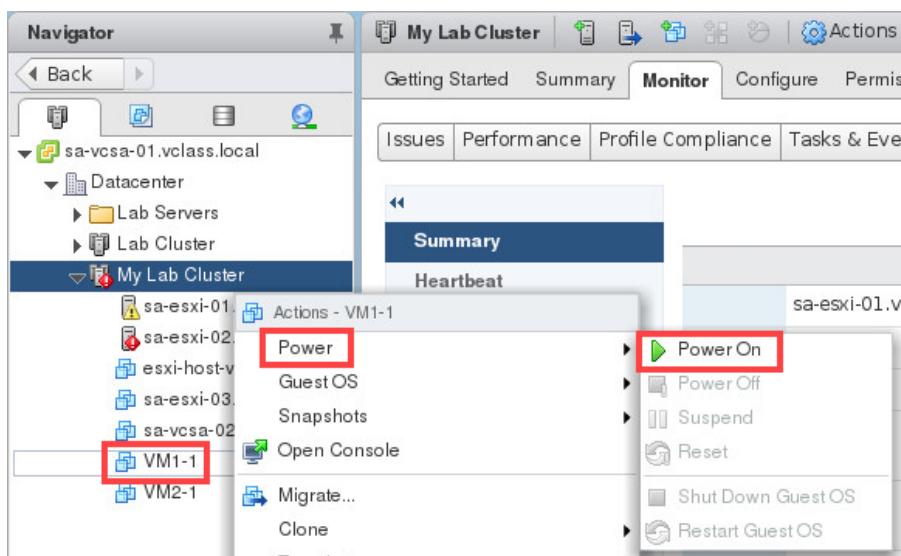
5. Notice the name of the *master host* in the *Hosts* pane.

Hosts	
Master	sa-esxi-01.vclass.local
Hosts connected to master	0
Hosts not connected to master	1
vSphere HA agent not reachable	0
vSphere HA agent configuration error	0

6. Notice the number of protected virtual machines in the *Virtual Machines* pane.

Virtual Machines	
Protected	0
Unprotected	0

7. Expand the **My Lab Cluster** inventory objects in the navigator pan, right-click **VM1-1** and select **Power > Power On**.



If a question dialog box appears upon bootup, select **I Copied It** as the answer to proceed.

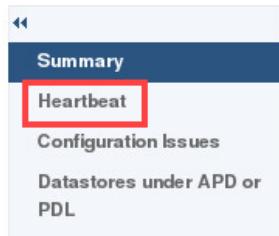
8. Click the Refresh icon.



9. Notice the number of protected virtual machines after powering on a virtual machine in the cluster.

Virtual Machines	
Protected	1
Unprotected	0

10. Select **Heartbeat** in the middle pane.



11. Notice how many datastores are used to monitor heartbeat.

Datastores used for heartbeating

Name	Datastore Cluster	Hosts Mounting Datastore
NFS-1	N/A	2
iSCSI-LUN0	N/A	2

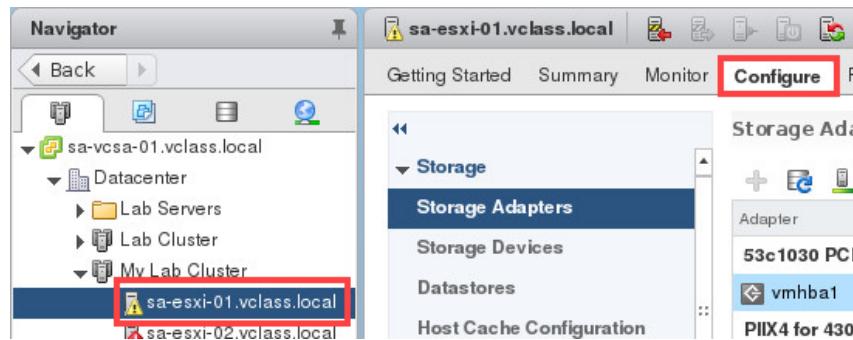
12. Select **Configuration Issues** in the middle pane and review the errors that are displayed.

Entity	Role	vSphere HA Issue
sa-esxi-02.vclass.local	Sl...	⚠ Host sa-esxi-02.vclass.local in cluster My Lab Cluster ...
sa-esxi-02.vclass.local	Sl...	⚠ vSphere HA detected that host sa-esxi-02.vclass.local...
sa-esxi-01.vclass.local	M...	⚠ Host sa-esxi-01.vclass.local in cluster My Lab Cluster ...



At this point, each *ESXi* host has a single management network port for redundancy. *vSphere HA* still works if an *ESXi* host is configured with one management network port, but a second management network port is necessary for redundancy.

13. Select **sa-esxi-01.vclass.local** in the navigator pane and click the **Configure** tab.



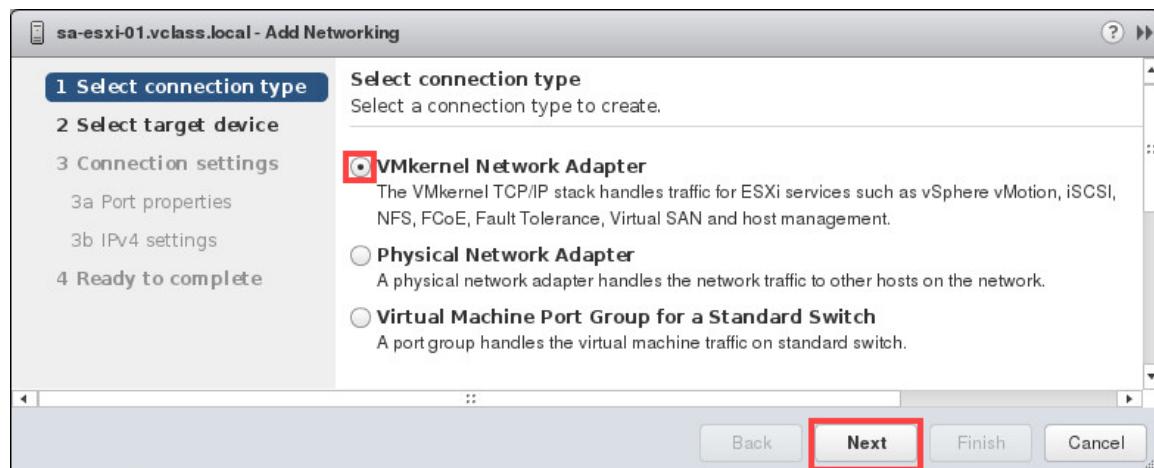
14. In the middle pane, select **Virtual switches** under *Networking*.



15. Click the **Add Host Networking** icon.



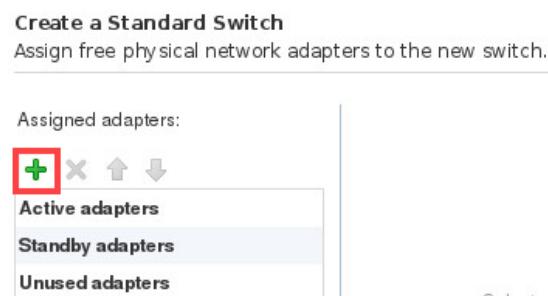
16. In the *Add Networking* window, on the *Selection connection type* step, click **VMkernel Network Adapter** and click **Next**.



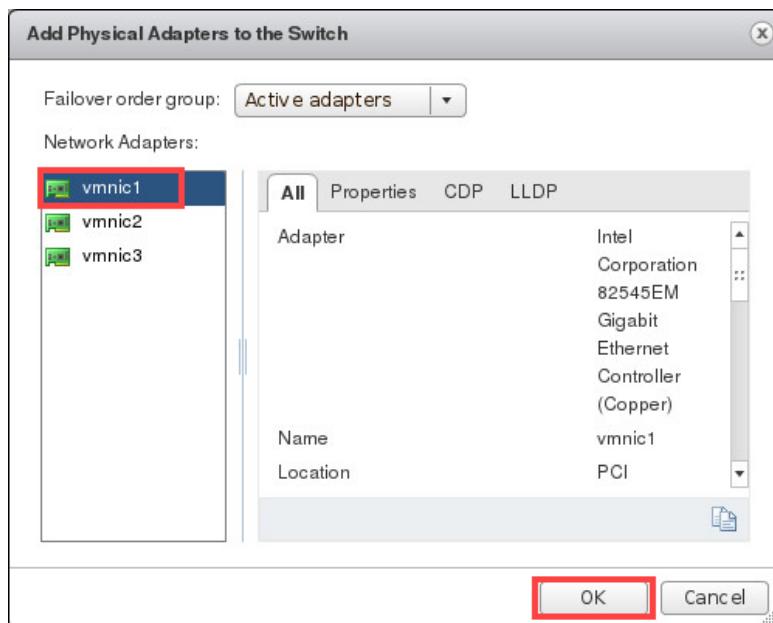
17. On the *Select target device* step, click **New standard switch** and click **Next**.



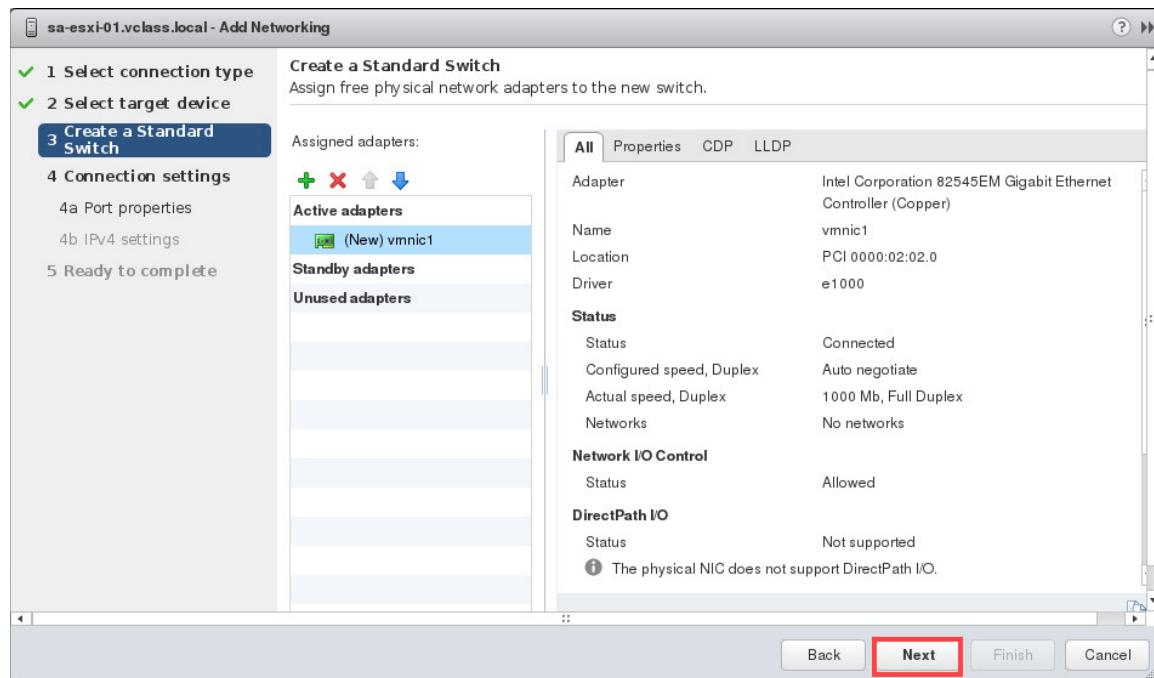
18. On the *Create a Standard Switch* step, click the green + sign to add a physical adapter to the switch.



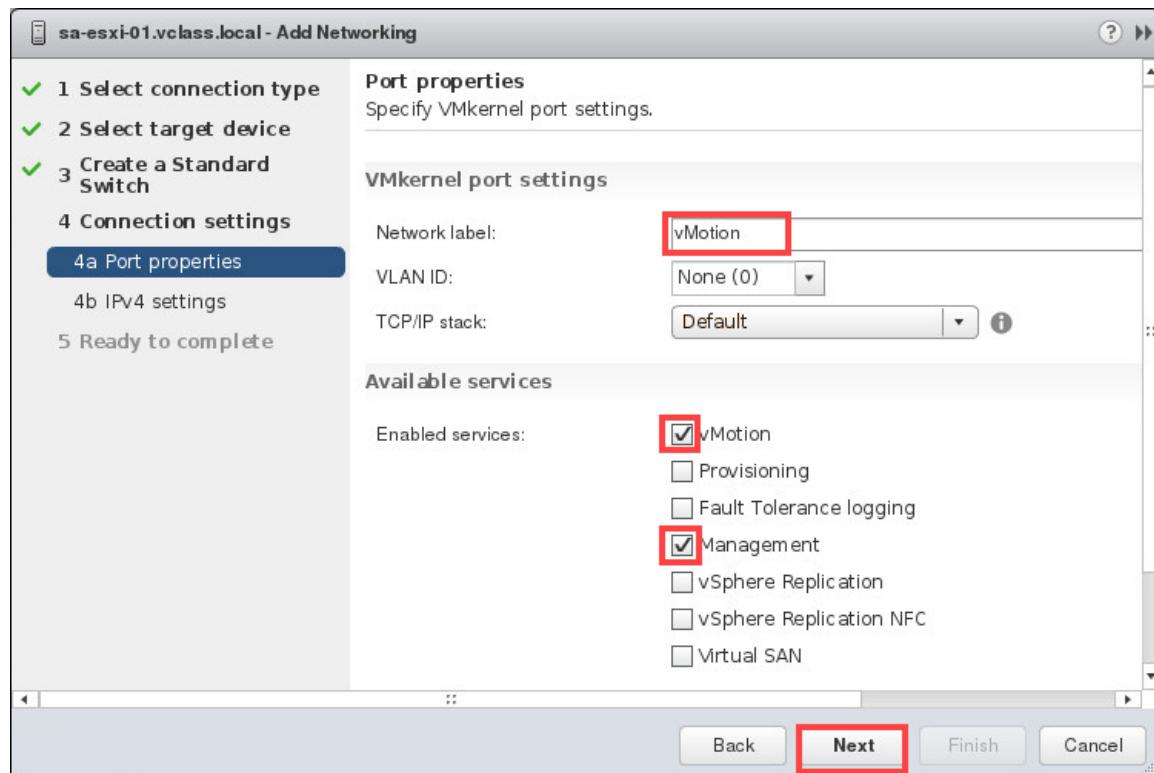
19. Select **vmnic1** as the *vmnic* for the *vSphere vMotion* network and click **OK**.



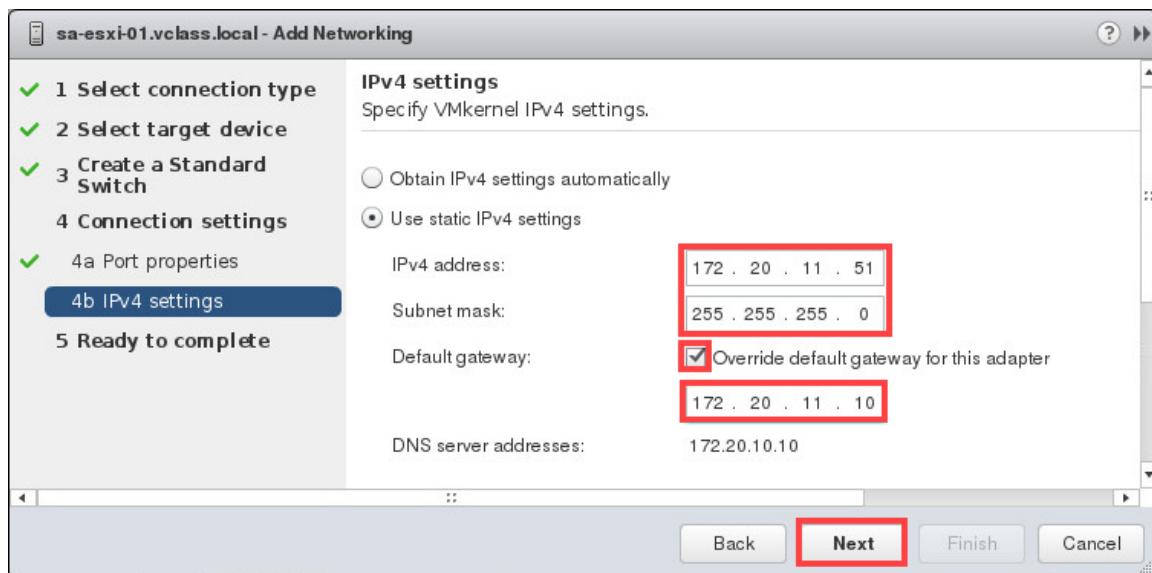
20. Back on the *Add Networking* window, review the information, ensure that **vmnic1** appears underneath **Active adapters**, and click **Next**.



21. On the *Port properties* step, enter **vMotion** in the *Network label* text box. Select the **vMotion** and **Management** check boxes and click **Next**.



22. On the *IPv4 settings* step, select to **Use static IPv4 settings** and use the information below to make configurations:
- IPv4 address: 172. 20. 11. 51*
 - Subnet mask: 255. 255. 255. 0*
 - Default Gateway:* Check the **Override default gateway for this adapter** check box and enter **172. 20. 11. 10**
 - Click **Next**.

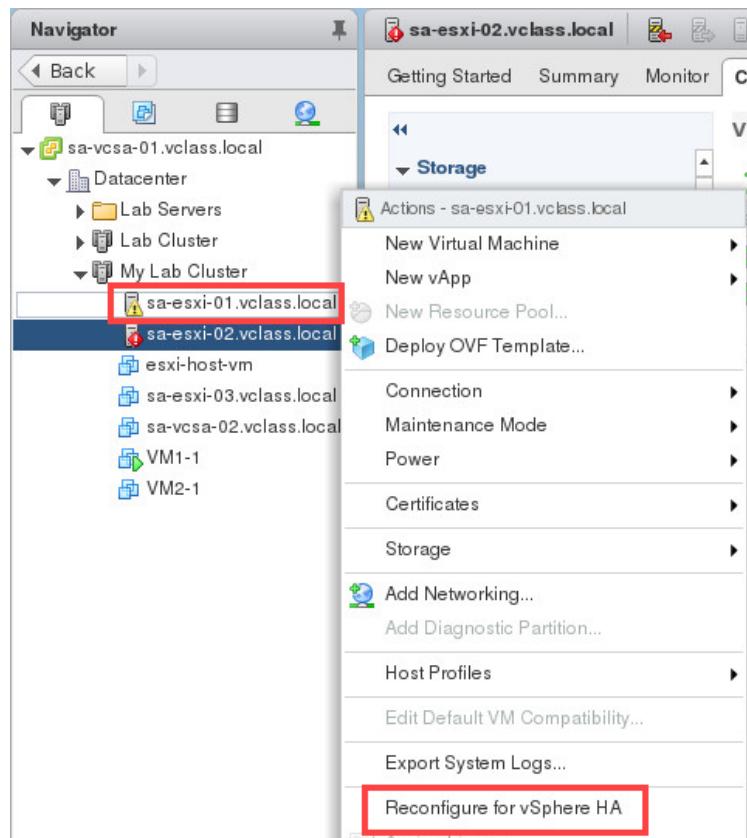


23. On the *Ready to complete* step, review the information and click **Finish**.
24. In the *Virtual switches* pane, verify that the new virtual switch for *vSphere vMotion* migration is listed.

Virtual switches	
Switch	Discovered Issues
vSwitch0	--
vSwitch1	--

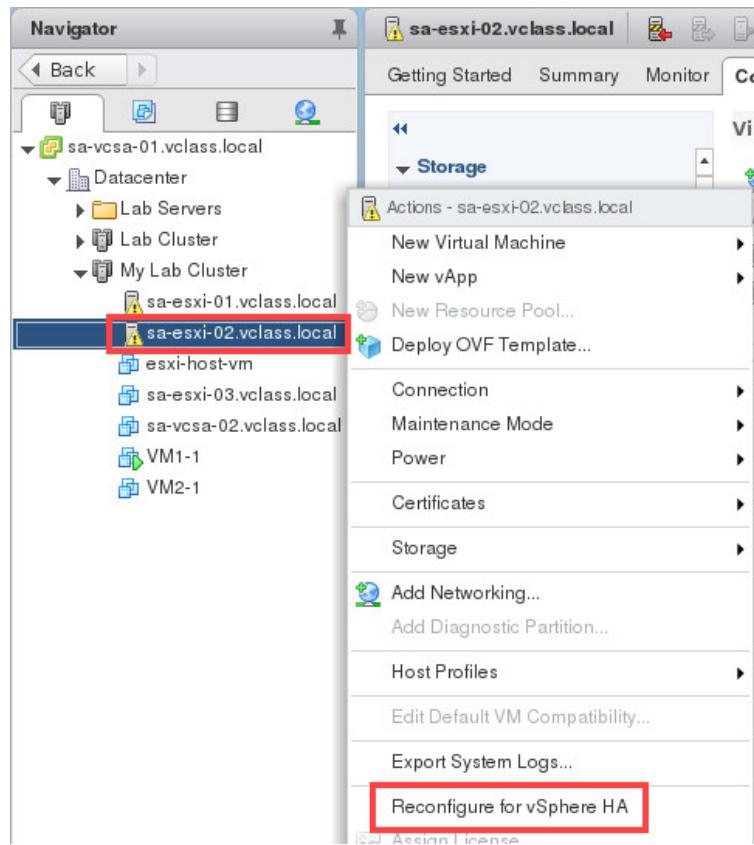
25. Repeat steps 13-24 for **sa-esxi-02.vclass.local** using the *vMotion VMkernel* port IPv4 address for *sa-esxi-02* as **172.20.11.52**. All other steps remain the same.

26. Right-click **sa-esxi-01.vclass.local** in the navigator pane and select **Reconfigure for vSphere HA**.

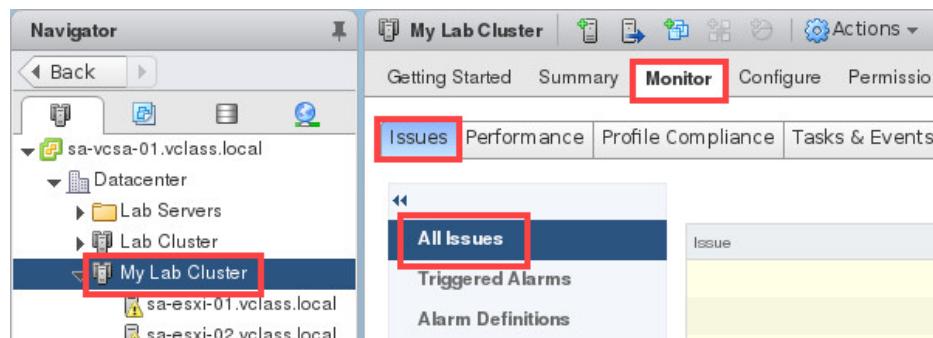


You might need to refresh *vSphere Web Client* to eliminate any obsolete alarm boxes.

27. Right-click **sa-esxi-02.vclass.local** and select **Reconfigure for vSphere HA**.



28. Select **My Lab Cluster** from the navigator pane and select the **Monitor** tab. Click the **Issues** button, followed by selecting **All Issues** from the middle pane.

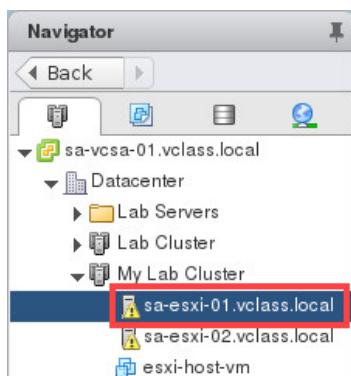


29. Notice the previous management configuration issues are no longer displayed.
 30. Leave **vSphere Web Client** open to continue with the next task.

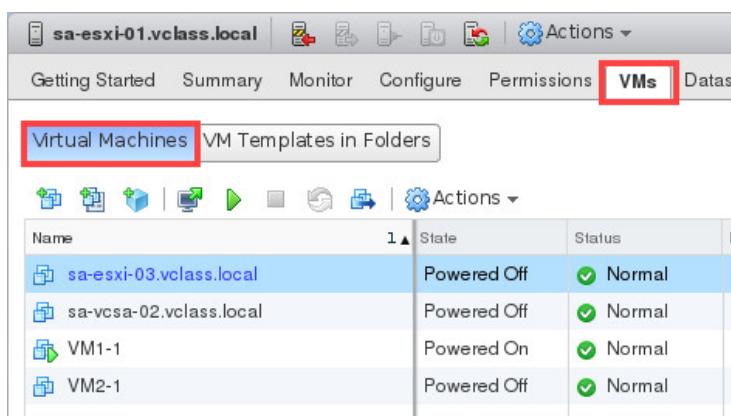
4 Test vSphere HA Functionality

In this task, you will set up *vSphere HA* to monitor the cluster environment and detect hardware failures. When an *ESXi* host outage is detected, *vSphere HA* automatically restarts virtual machines on other *ESXi* hosts in the cluster.

1. While in the *vSphere Web Client*, select the **master ESXi** from **task 3, step 5**. In this case, it is **sa-esxi-01.vclass.local**.

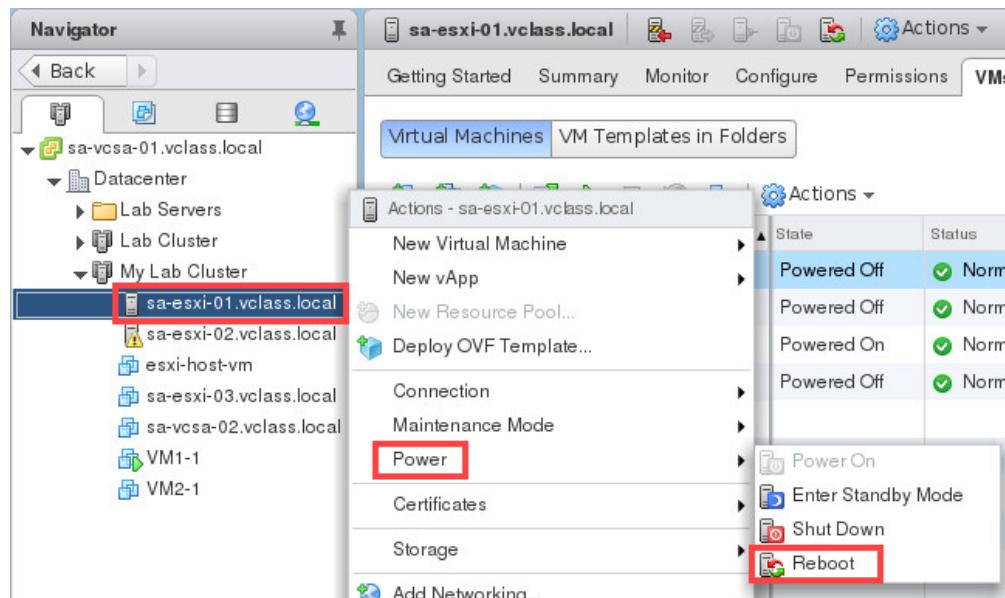


2. Click the **VMs** tab in the main workspace and ensure that the **Virtual Machines** is clicked.

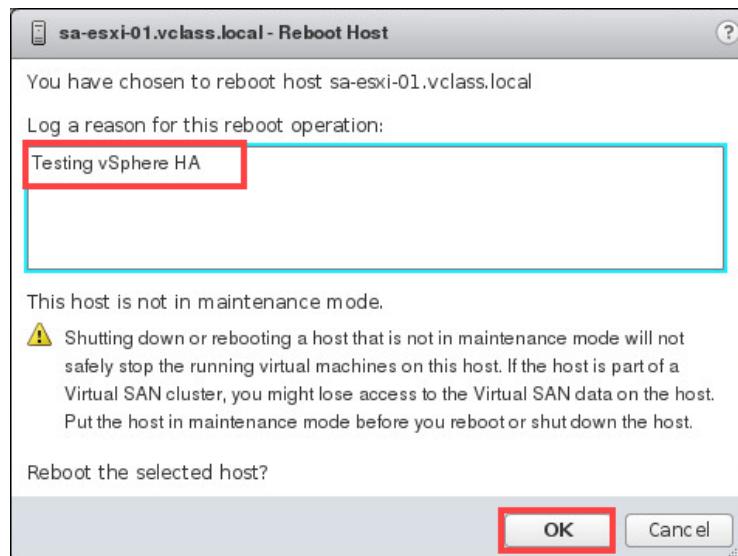


Name	State	Status
sa-esxi-03.vclass.local	Powered Off	Normal
sa-vcsa-02.vclass.local	Powered Off	Normal
VM1-1	Powered On	Normal
VM2-1	Powered Off	Normal

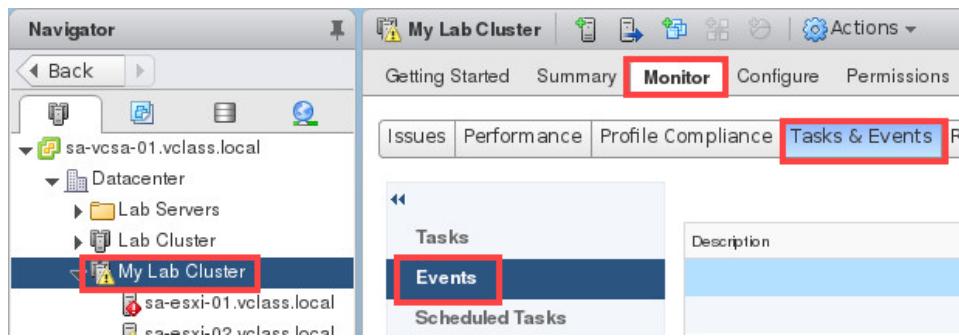
3. Simulate a host failure by rebooting one of the hosts in the cluster. Right-click the **master ESXI** host in the navigator pane and select **Power > Reboot**.



4. Enter **Testing vSphere HA** as the reason for rebooting and click **OK**.



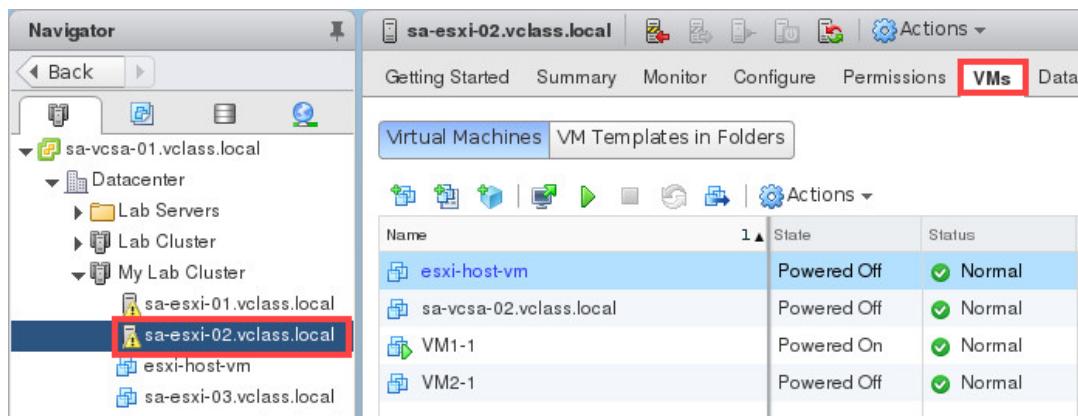
5. In the navigator pane, select **My Lab Cluster** and click the **Monitor** tab. Click **Tasks & Events** and select **Events** in the middle pane.



6. Notice the cluster entries are sorted by time and that the entries that appear when the host failure was detected. The initial messages from the hosts might show failures. These messages indicate that the virtual machines on the downed host have failed. The virtual machines take 1 to 2 minutes to successfully restart on the new host.

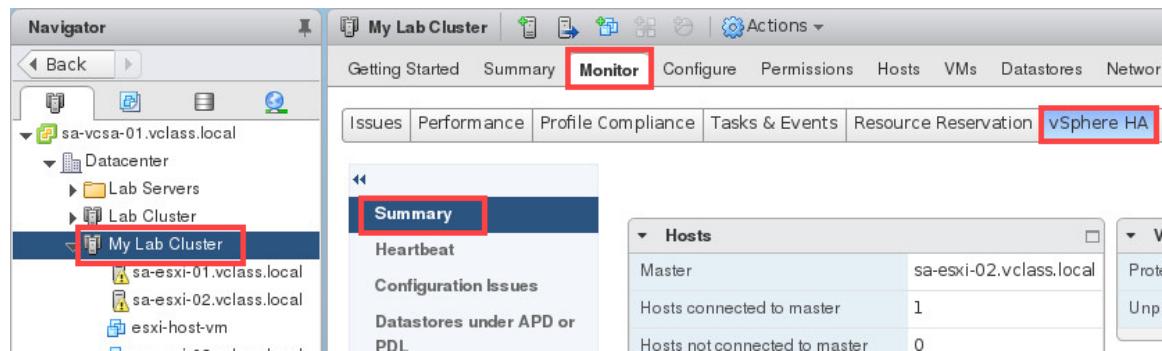
Description	Type	Date Time
vSphere HA restarted virtual machine VM1-1 on host ...	Warning	12/01/2017 12:00:00
Message on VM1-1 on sa-esxi-02.vclass.local in Data...	Information	12/01/2017 12:00:00
Message on VM1-1 on sa-esxi-02.vclass.local in Data...	Information	12/01/2017 12:00:00
Alarm vSphere HA failover in progress' on My Lab Cl...	Information	12/01/2017 12:00:00
vSphere HA initiated a failover action on 1 virtual mac...	Warning	12/01/2017 12:00:00
Alarm vSphere HA host status' on sa-esxi-01.vclass.lo...	Information	12/01/2017 12:00:00

7. In the navigator pane, select the **slave ESXi** host, in this case it is **sa-esxi-02.vclass.local** and click the **VMs** tab.



8. Notice that VM1-1 has successfully migrated over to the slave ESXi host and powered on properly.

9. Select **My Lab Cluster** in the inventory and click the **Monitor** tab. Click the **vSphere HA** button, followed by selecting **Summary** from the middle pane.



10. Notice the *master ESXi host* changed.
11. Monitor the original *master ESXi host* in the navigator pane until it is fully running again.
12. Leave **vSphere Web Client** open to continue with the next task.

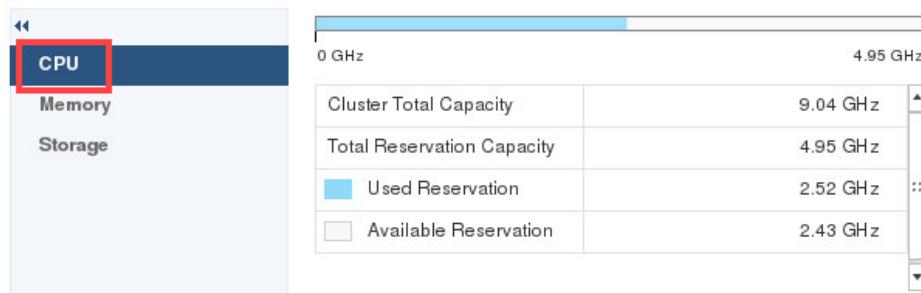
5 View the vSphere HA Cluster Resource Usage

In this task, you will examine the *CPU*, memory, and storage *I/O* resource usage information of the cluster.

1. While in the *vSphere Web Client*, select **My Lab Cluster** in the navigator pane, click the **Monitor** tab, and click **Resource Reservation**.

The screenshot shows the vSphere Web Client interface. The left pane is the Navigator, showing a tree structure with 'sa-vcsa-01.vclass.local' expanded, revealing 'Datacenter', 'Lab Servers', 'Lab Cluster', and 'My Lab Cluster'. 'My Lab Cluster' is selected and highlighted with a red box. The top navigation bar has tabs: 'Getting Started', 'Summary', 'Monitor' (which is selected and highlighted with a red box), 'Configure', 'Permissions', 'Hosts', 'VMs', and 'Datastore'. Below the tabs is a sub-navigation bar with tabs: 'Issues', 'Performance', 'Profile Compliance', 'Tasks & Events', and 'Resource Reservation' (which is also highlighted with a red box). The main content area is titled 'CPU' and displays resource usage statistics: '0 GHz' (Cluster Total Capacity), 'Cluster Total Capacity' (9.04 GHz), 'Total Reservation Capacity' (4.95 GHz), 'Used Reservation' (2.52 GHz), and 'Available Reservation' (2.43 GHz).

2. Select **CPU** from the middle pane and review the information for the cluster such as, *Total Reservation Capacity*, *Used Reservation*, and *Available Reservation*.



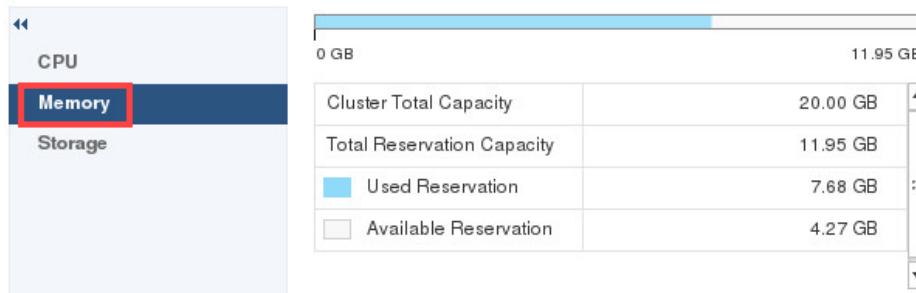
3. In the virtual machines pane, verify that the *CPU* reservation is not set on the virtual machines. The *Reservation* column should show *0 (MHz)*.

The screenshot shows a table of virtual machine resource reservations. The columns are: Name, Reservation (MHz), Limit (MHz), and Type. The data is as follows:

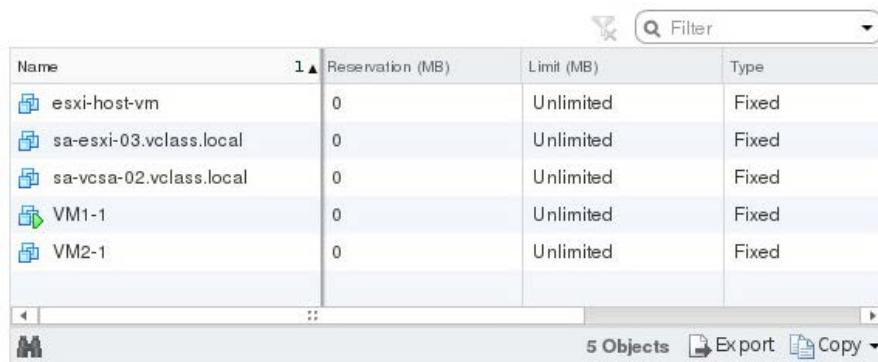
Name	Reservation (MHz)	Limit (MHz)	Type
esxi-host-vm	0	Unlimited	Fixed
sa-esxi-03.vclass.local	0	Unlimited	Fixed
sa-vcsa-02.vclass.local	0	Unlimited	Fixed
VM1-1	0	Unlimited	Fixed
VM2-1	0	Unlimited	Fixed

At the bottom of the table, it says '5 Objects' and has buttons for 'Export' and 'Copy'.

4. Select **Memory** in the middle pane and review the information for the cluster such as, *Total Reservation Capacity*, *Used Reservation*, and *Available Reservation*.



5. In the virtual machines pane, verify that the memory reservation is not set on the virtual machines. The *Reservation* column should show *0 (MB)*.



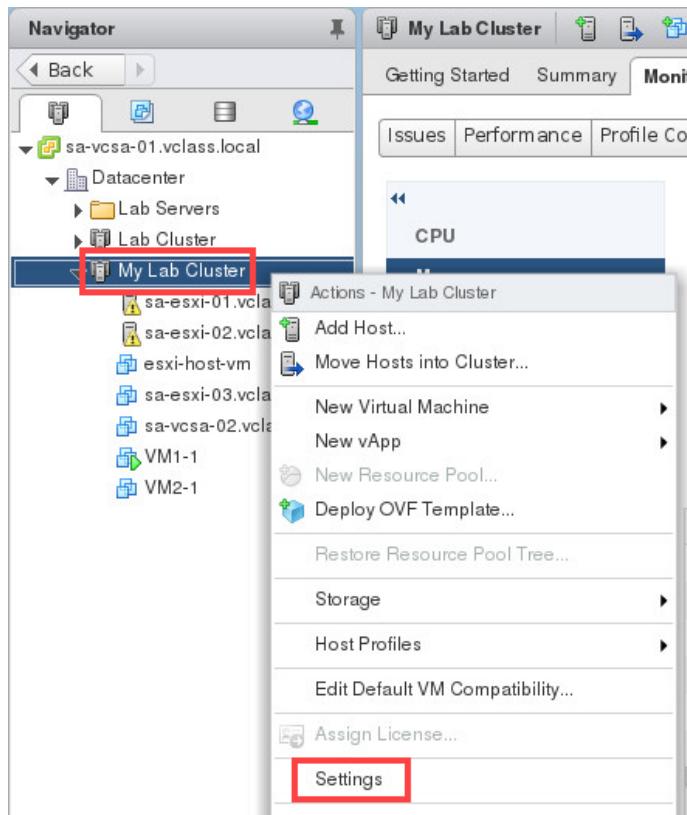
Name	1 Reservation (MB)	Limit (MB)	Type
esxi-host-vm	0	Unlimited	Fixed
sa-esxi-03.vclass.local	0	Unlimited	Fixed
sa-vcsa-02.vclass.local	0	Unlimited	Fixed
VM1-1	0	Unlimited	Fixed
VM2-1	0	Unlimited	Fixed

6. Leave **vSphere Web Client** open to continue with the next task.

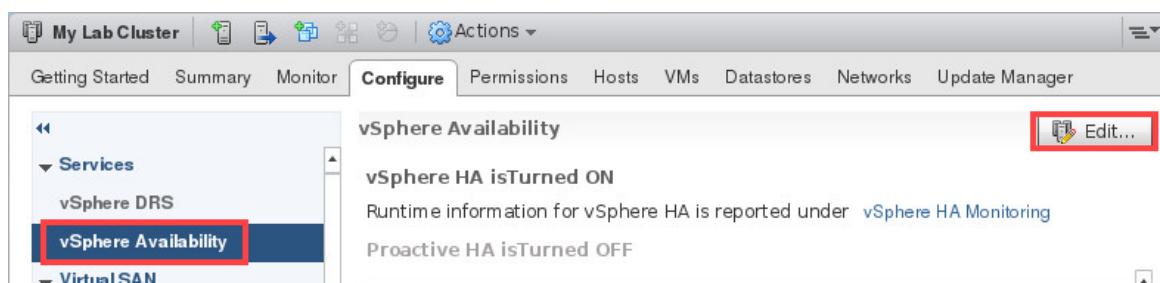
6 Manage vSphere HA Slot Size

In this task, you will configure admission control to ensure that sufficient resources are available in a cluster to provide failover protection and to ensure that the virtual machine resource reservations are respected.

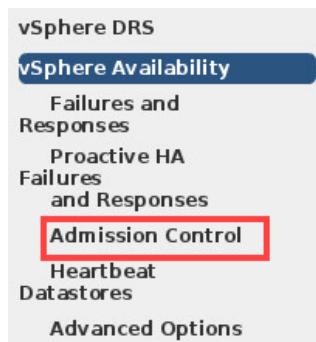
1. While in the *vSphere Web Client*, right-click **My Lab Cluster** and select **Settings**.



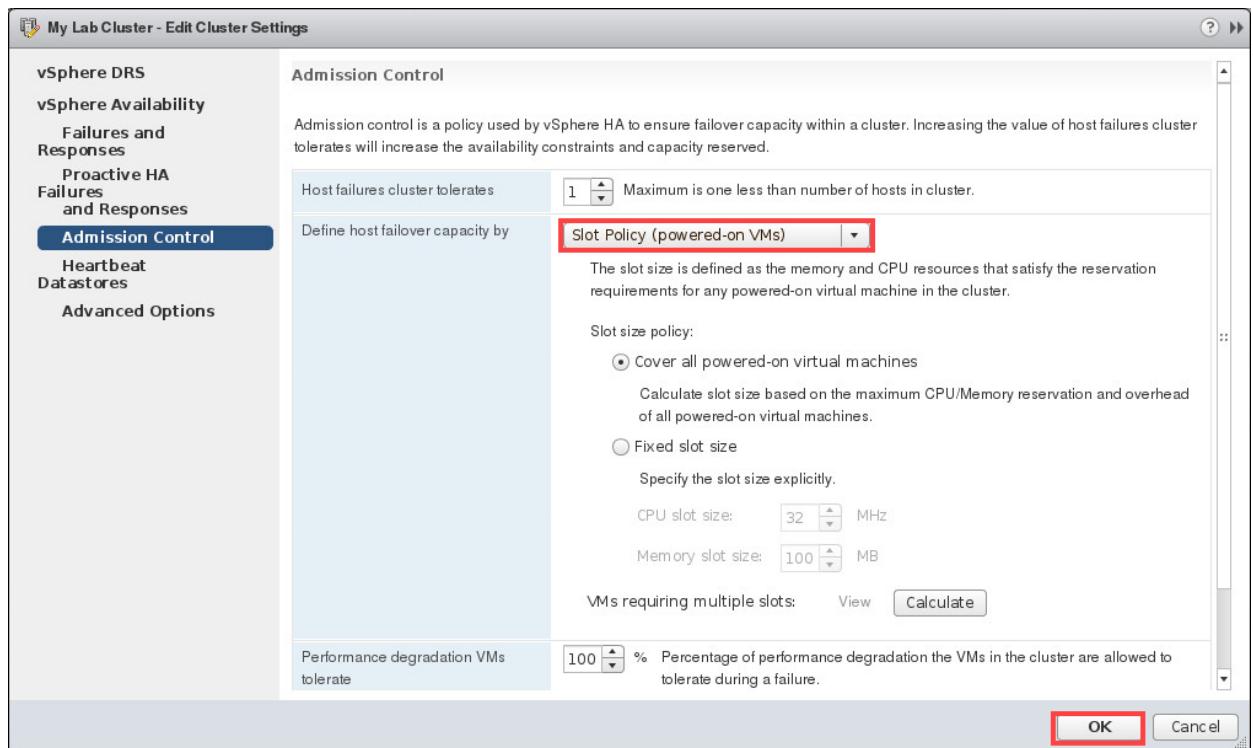
2. In the main workspace, select **vSphere Availability** under *Services* and click **Edit**.



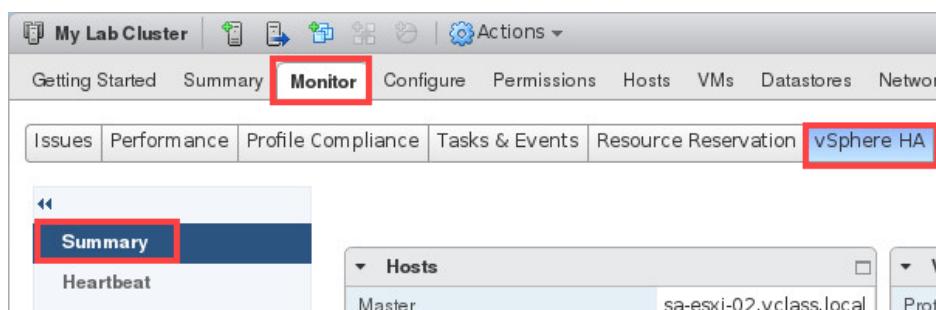
3. In the *Edit Cluster Settings* window, select **Admission Control** in the navigation pane.



4. In the *Define host failover capacity* by pane, select **Slot Policy (powered-on VMs)** and click **OK**.



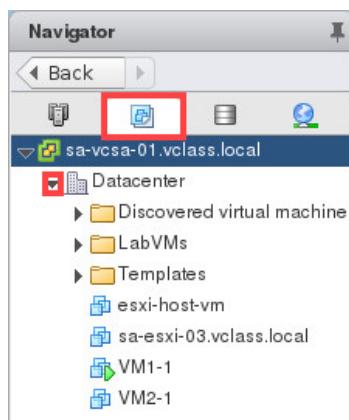
5. In the main workspace, click the **Monitor** tab, click the **vSphere HA** button, and select **Summary** from the middle pane.



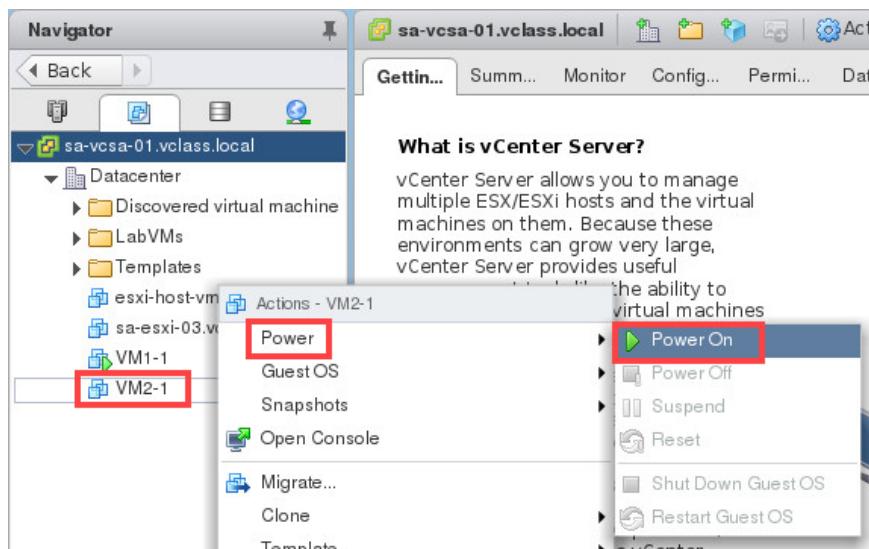
6. Scroll down to the **Advanced Runtime Info** pane and review the information for this cluster. Notice the *CPU Slot Size*, *Memory Slot Size*, *Totals slots in cluster*, *Used slots*, *Available slots*, and *Failover slots*.

Advanced Runtime Info	
Slot size	32 MHz 30 MB
Total slots in cluster	154
Used slots	1
Available slots	74
Failover slots	79
Total powered-on virtual machines in cluster	1
Total hosts in cluster	2
Total good hosts in cluster	2

7. In the navigator pane, click the **VMs and Templates** tab and expand the view.



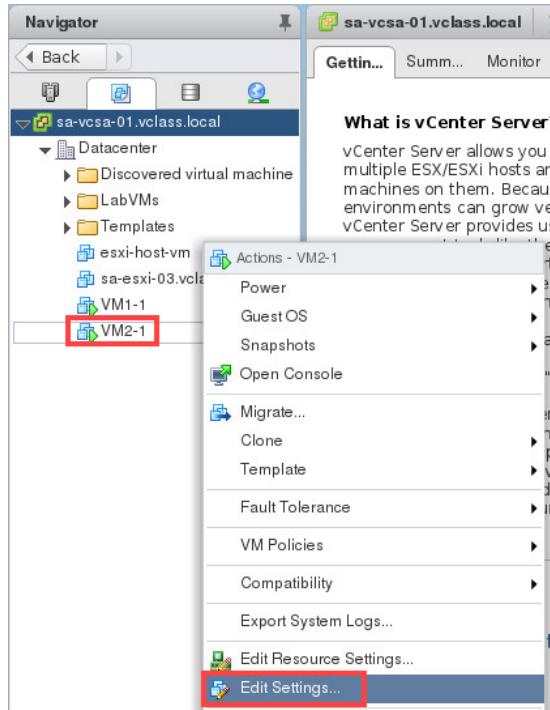
8. Right-click **VM2-1** and select **Power > Power On**.



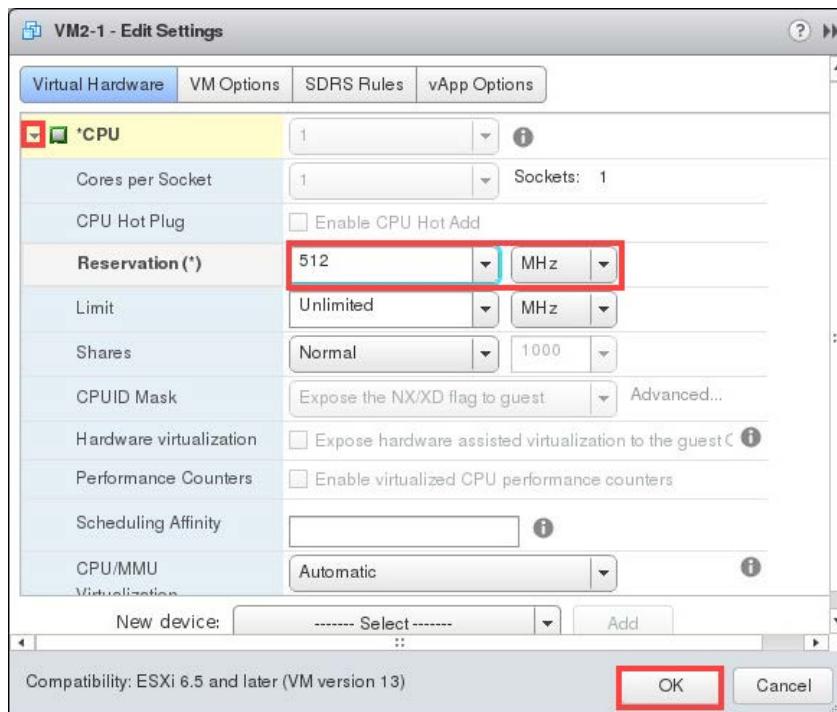
Please Note

If a question dialog box appears upon bootup, select **I Copied It** as the answer to proceed.

- Right-click the **VM2-1** virtual machine and select **Edit Settings**.



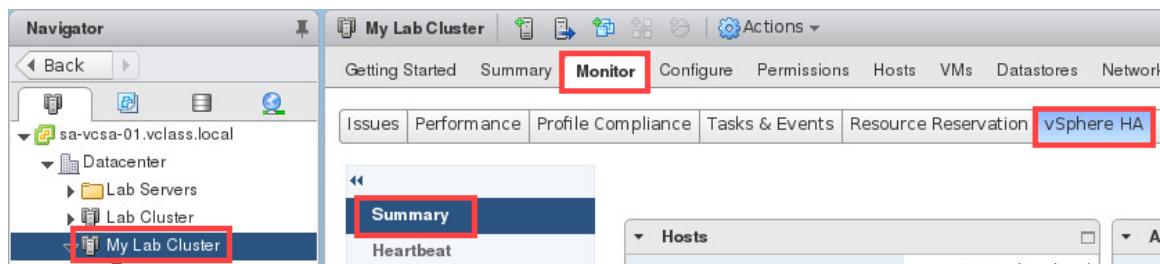
- In the *Edit Settings* window, click the arrow next to **CPU** to expand the view. In the *Reservation* text box, enter **512** (MHz) and click **OK**.



11. In the navigator pane, click the **Hosts and Clusters** tab.



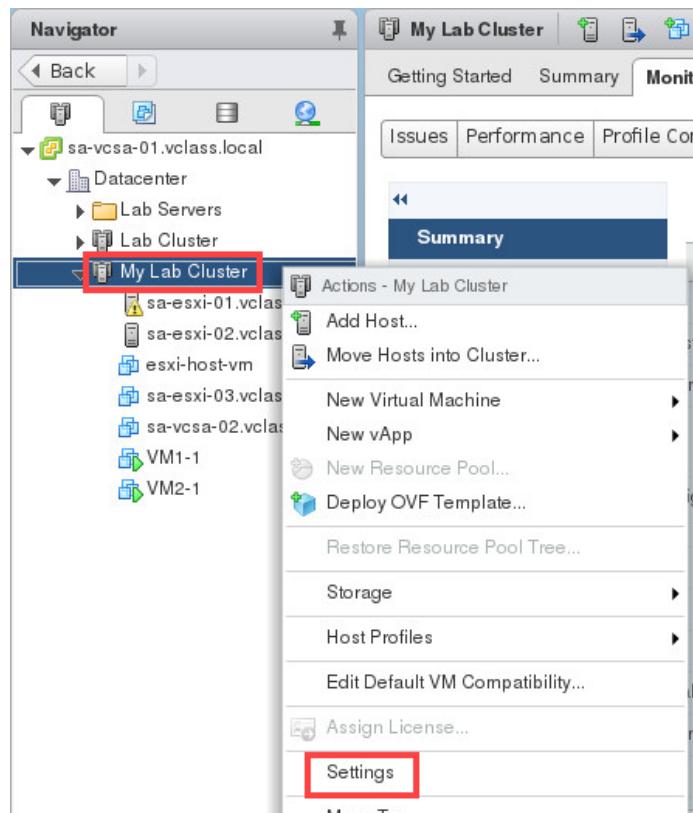
12. Select **My Lab Cluster** from the inventory, click the **Monitor** tab, and click the **vSphere HA** button. Select **Summary** in the middle pane.



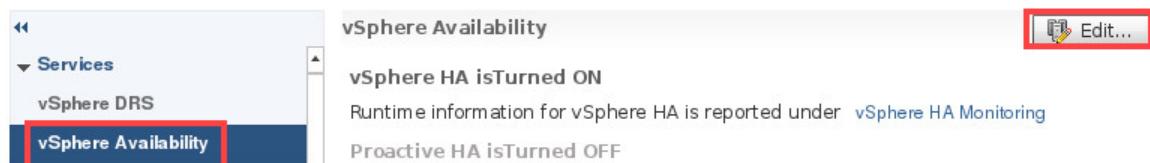
13. View the slot information for this cluster. In the *Advanced Runtime Info* pane, verify that the slot size for *CPU* changed from the value in step 6.

Advanced Runtime Info	
Slot size	512 MHz 30 MB
Total slots in cluster	8
Used slots	2
Available slots	2
Failover slots	4
Total powered-on virtual machines in cluster	2
Total hosts in cluster	2
Total good hosts in cluster	2

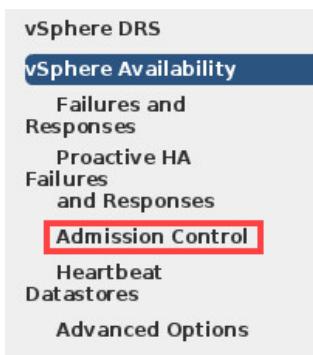
14. Use the *vSphere HA* slot size policy to enforce a slot size. Right-click **My Lab Cluster** in the inventory and select **Settings**.



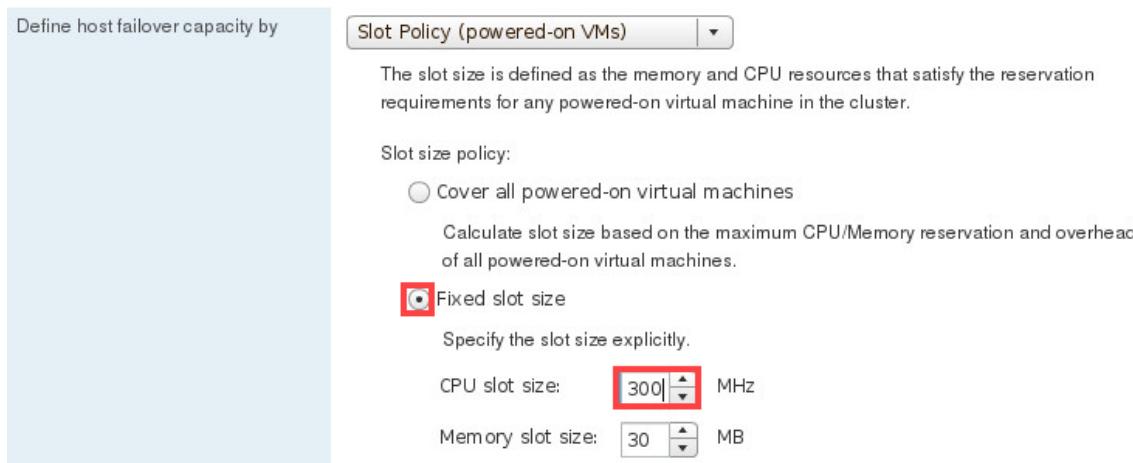
15. Select **vSphere Availability** in the middle pane and click on the **Edit** button.



16. In the *Edit Cluster Settings* window, select **Admission Control** in the left pane.



17. Under *Define host failover capacity by*, click the **Fixed slot size** in the right pane. In the *CPU slot size* text box, enter **300 (MHz)** to change the **CPU slot size**.



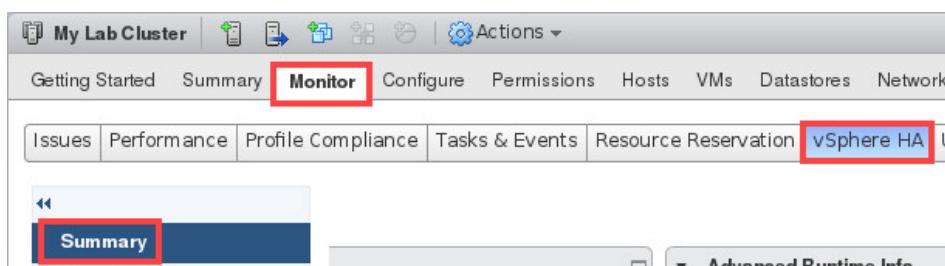
18. Click **Calculate** next to *VMs requiring multiple slots* and click the **View** link.

VMs requiring multiple slots: 1/2 **View** **Calculate**

19. Notice the *Required Slots* value for the *VM2-1* virtual machine. Because the *CPU* slot size has a fixed value of *300 MHz*, the *VM2-1* virtual machine with the *512 MHz* CPU reservation uses two slots to power on. Click **Close**.

VMs Requiring Multiple Slots	
These virtual machines are not guaranteed to have unfragmented failover capacity	
Virtual Machine	Required Slots
VM2-1	2

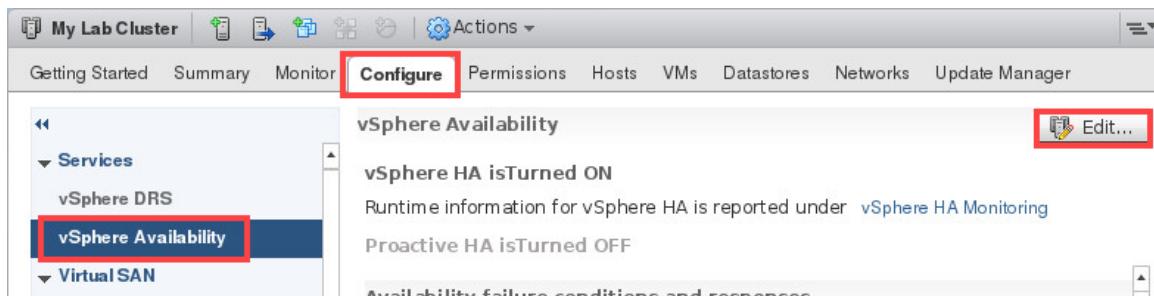
20. Click **OK** to exit the *Edit Cluster Settings* window.
 21. In the main workspace, click the **Monitor** tab, click the **vSphere HA** button, followed by selecting **Summary** from the middle pane.



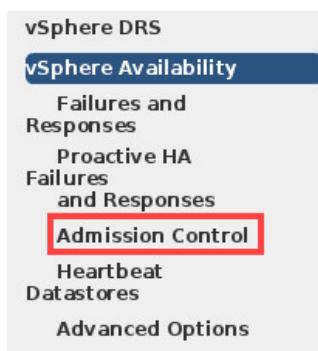
22. In the *Advanced Runtime Info* pane, review the information shown in the *Slot size* text box and compare with the values from **step 13**.

Advanced Runtime Info	
Slot size	300 MHz 30 MB
Total slots in cluster	16
Used slots	3
Available slots	5
Failover slots	8
Total powered-on virtual machines in cluster	2
Total hosts in cluster	2
Total good hosts in cluster	2

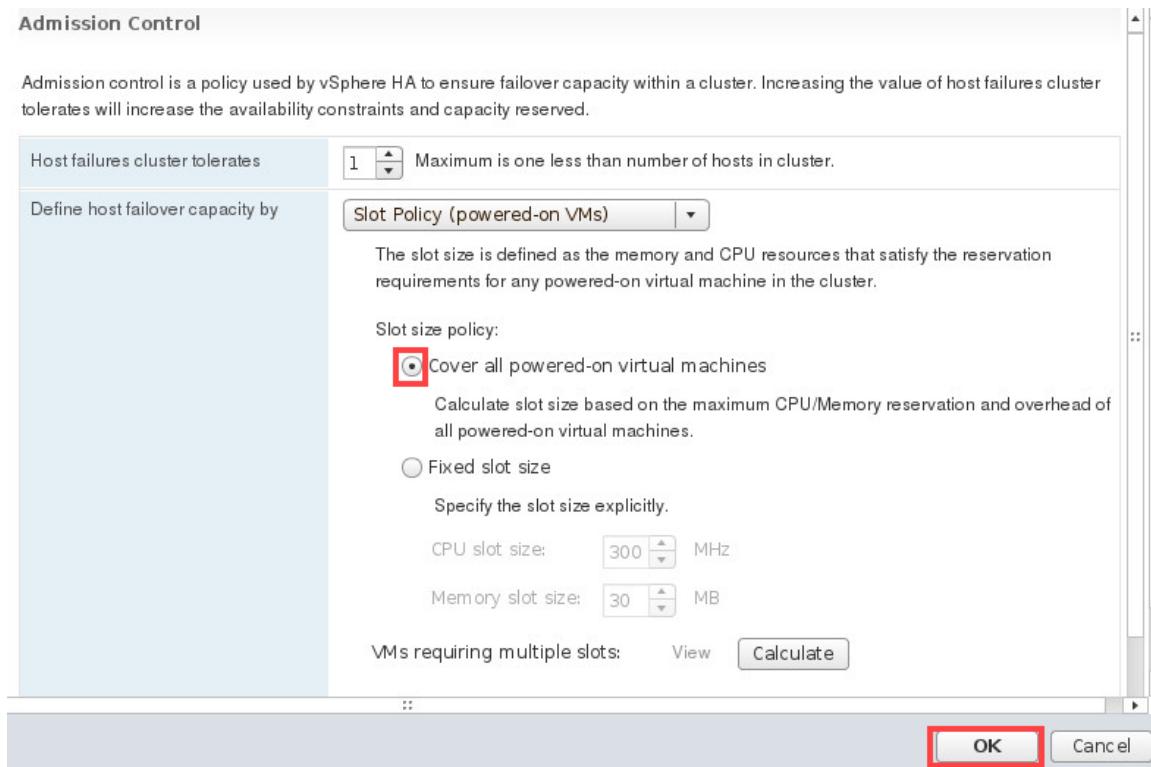
23. In the main workspace, click on the **Configure** tab, select **vSphere Availability** and click **Edit**.



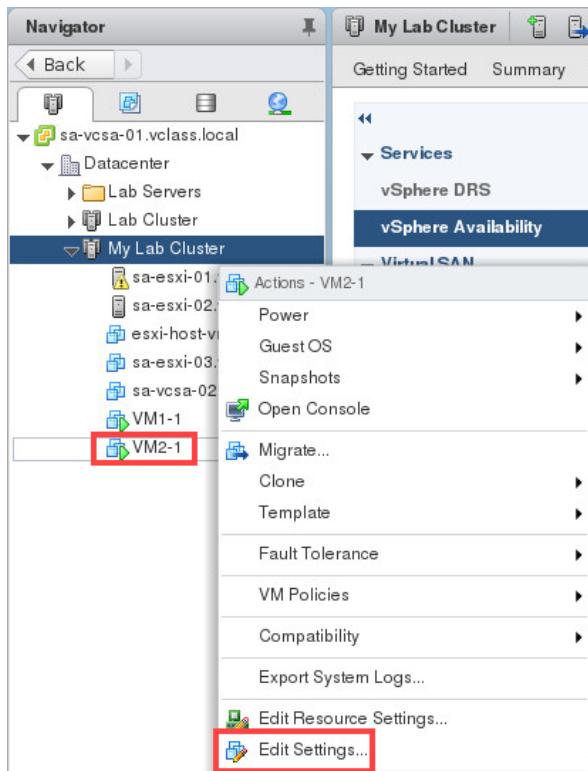
24. In the *Edit Cluster Settings* window, select **Admission Control**.



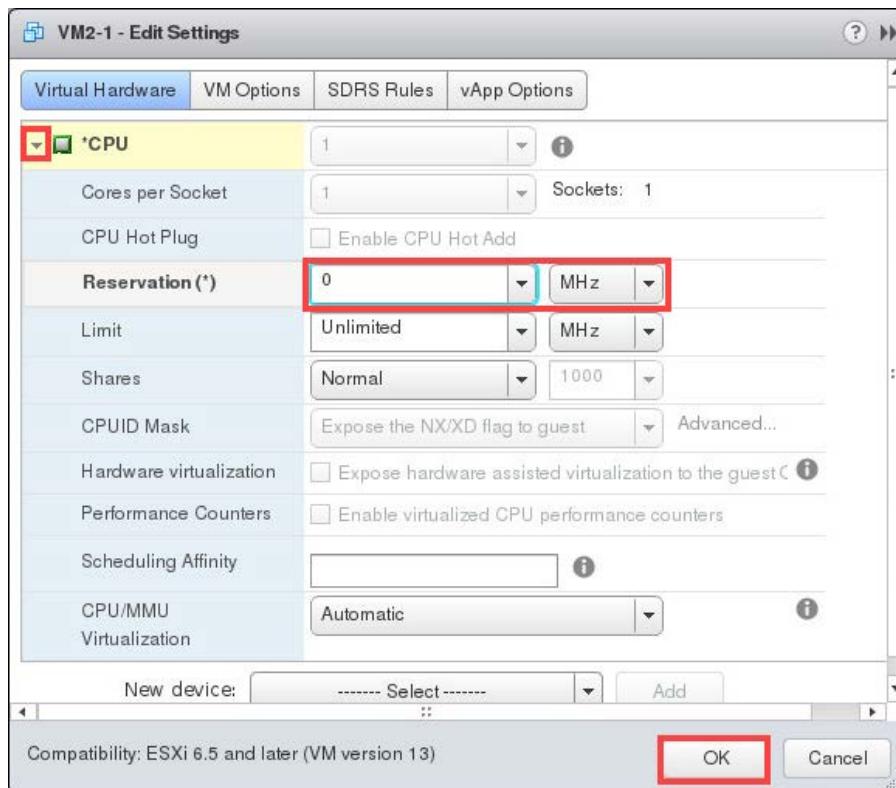
25. Under **Define host failover capacity by**, click **Cover all powered-on virtual machines** for the slot size policy. Click **OK**.



26. Right-click the **VM2-1** virtual machine in the navigator pane and select **Edit Settings**.



27. In the *Edit Settings* window, click the **arrow** next to **CPU** to expand the view. Enter **0 (MHz)** in the *Reservation* text box and click **OK**.



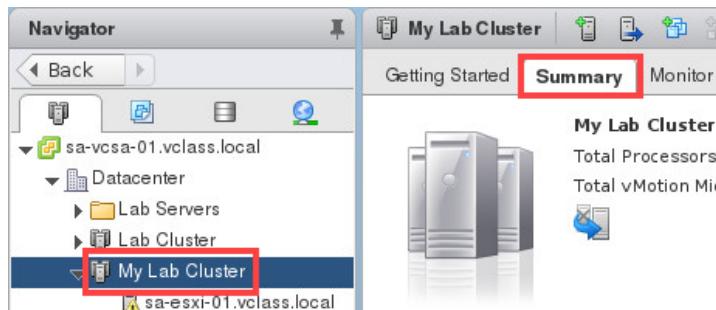
28. Leave **vSphere Web Client** open to continue with the next task.

7 Configure a vSphere HA Cluster with Strict Admission Control

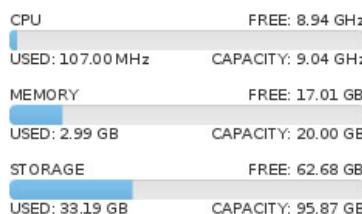
In this task, you will use admission control to impose constraints on resource usage and ensure that sufficient resources are available in a cluster to provide failover protection. Any actions violating the constraints are not permitted.

In the previous task, when you configured the cluster under *Define host failover capacity*, you configured vSphere HA to calculate slots. vSphere HA calculated the space for a virtual machine to run, based on the largest CPU and memory reservation across all powered-on virtual machines in the cluster. This feature is called strict admission control.

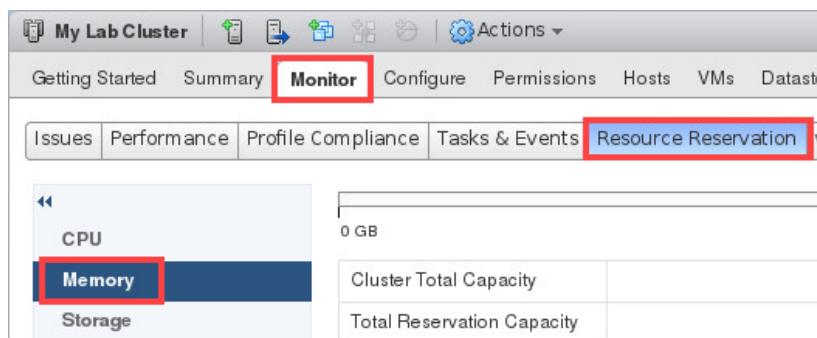
1. While in the *vSphere Web Client*, shut down both **VM1-1** and **VM2-1** virtual machines.
2. Select **My Lab Cluster** in the navigator pane and click the **Summary** tab.



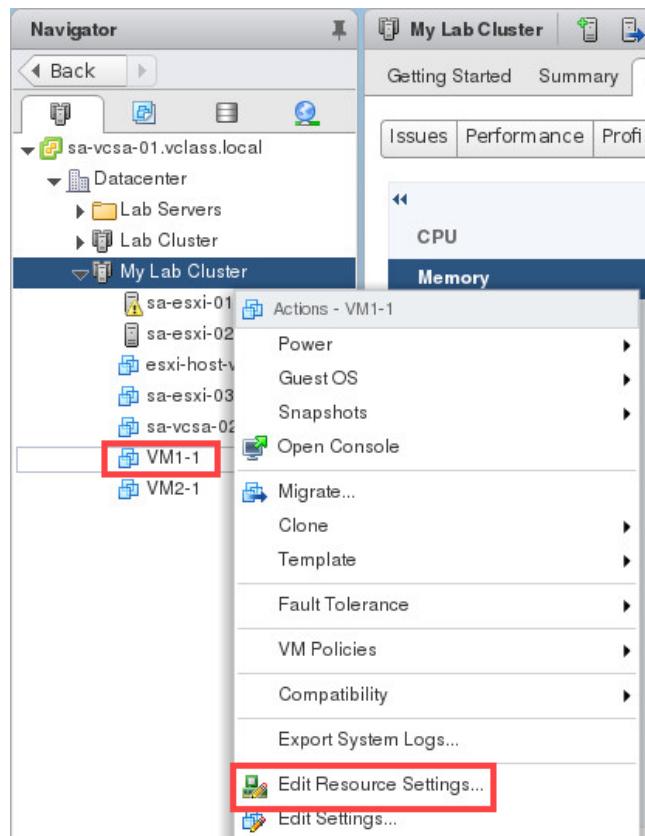
3. Notice the memory information for this cluster, such as the *memory capacity*, *used memory*, and *free memory*.



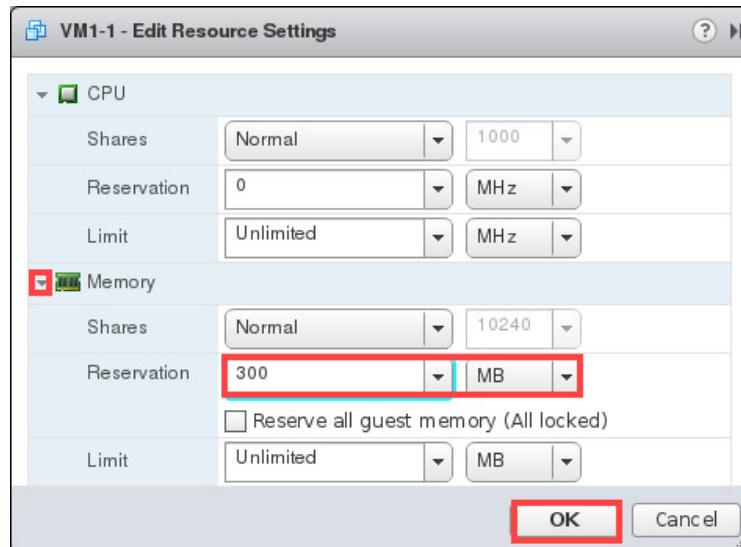
4. Click the **Monitor** tab, click **Resource Reservation**, and select **Memory** in the middle pane.



5. In the lower pane, right-click the **VM1-1** virtual machine and select **Edit Resource Settings**.

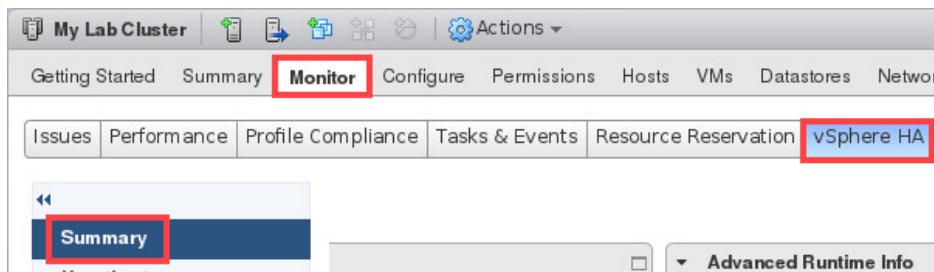


6. In the *Edit Resource Settings* window, click the arrow next to **Memory** to expand the view. Enter **300 (MB)** in the *Reservation* text box and click **OK**.



7. Repeat **steps 5-6** to set the memory reservation on the **VM2-1** virtual machine.

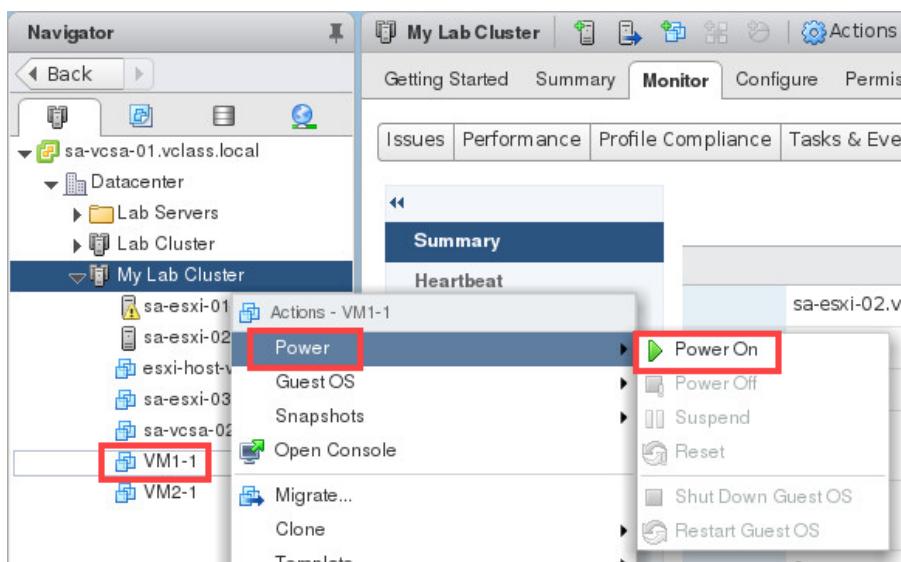
8. While having **My Lab Cluster** selected, click the **Monitor** tab, click the **vSphere HA** button and select **Summary** from the middle pane.



9. In the *Advanced Runtime Info* pane, notice the values shown in the **Total slots in cluster** text box.

Advanced Runtime Info	
Slot size	0 MHz 0 MB
Total slots in cluster	N/A
Used slots	0
Available slots	0
Failover slots	0
Total powered-on virtual machines in cluster	0
Total hosts in cluster	2
Total good hosts in cluster	2

10. Right-click **VM1-1** in the navigator pane and select **Power > Power On**.



11. Return to the **Advanced Runtime Info** pane of *My Lab Cluster* and click the **Refresh** link in the lower-right corner of the pane.

Advanced Runtime Info	
Slot size	0 MHz 0 MB
Total slots in cluster	N/A
Used slots	0
Available slots	0
Failover slots	0
Total powered-on virtual machines in cluster	0
Total hosts in cluster	2
Total good hosts in cluster	2
Refresh	

12. Notice the effect that powering on this virtual machine has on your cluster.

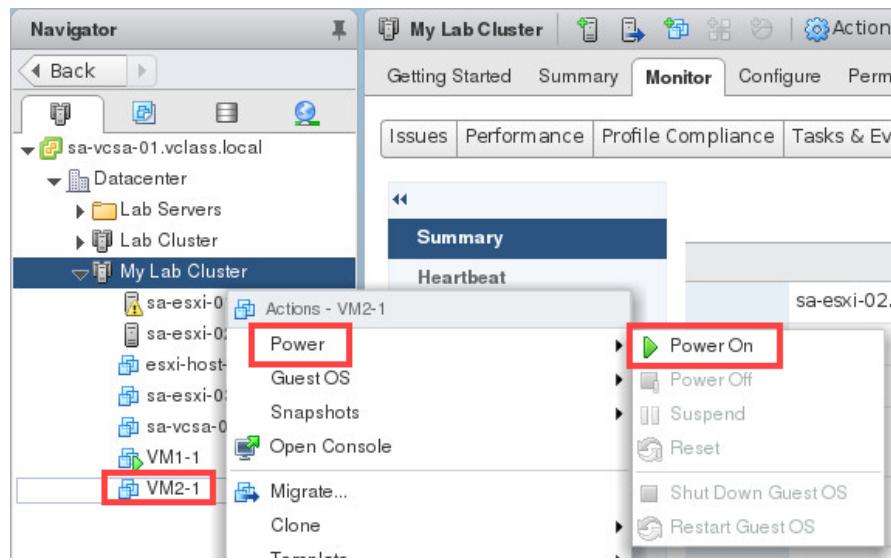
Advanced Runtime Info	
Slot size	32 MHz 327 MB
Total slots in cluster	36
Used slots	1
Available slots	11
Failover slots	24
Total powered-on virtual machines in cluster	1
Total hosts in cluster	2
Total good hosts in cluster	2
Refresh	



The *Advanced Runtime Info* pane might display a smaller number of available slots in the cluster than you expect.

Slot size is calculated using the largest reservations plus the memory overhead of any powered on virtual machines in the cluster. However, *vSphere HA* admission control considers only the resources on a host that are available for virtual machines. This amount is less than the total amount of physical resources on the host, because there is some overhead.

13. Right-click the **VM2-1** virtual machine from the navigator pane and select **Power > Power On**.



14. Return to the **Advanced Runtime Info** pane of *My Lab Cluster* and click **Refresh**.

Advanced Runtime Info	
Slot size	32 MHz 330 MB
Total slots in cluster	36
Used slots	1
Available slots	11
Failover slots	24
Total powered-on virtual machines in cluster	1
Total hosts in cluster	2
Total good hosts in cluster	2
Refresh	

15. Notice the values now presented in the slot information such as the number of used slots and the number of available slots.

Advanced Runtime Info	
Slot size	32 MHz 330 MB
Total slots in cluster	36
Used slots	2
Available slots	10
Failover slots	24
Total powered-on virtual machines in cluster	2
Total hosts in cluster	2
Total good hosts in cluster	2

16. The lab is now complete, you may end the reservation.