Cloud Computing

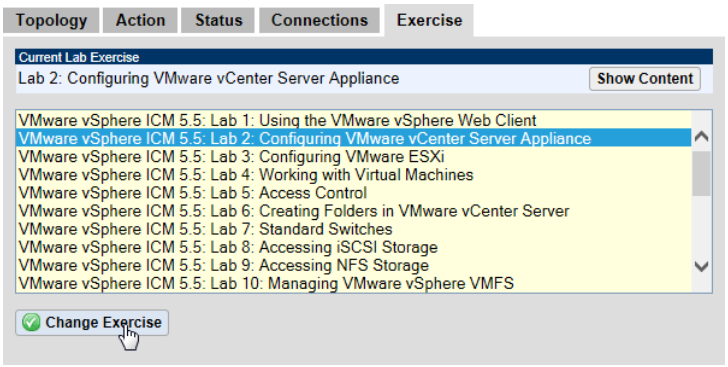
Practical 9:
Permissions, Pools, and Performance

Aims and Objectives

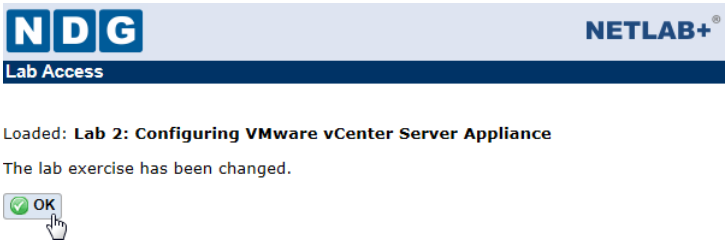
In this week's practical we continue examining how to construct cloud infrastructure, working with the VMware virtualization systems and completing practical tasks aligned with the VMware vSphere Install, Configure, and Manage certification curriculum. This week we how to configure and use role based security settings, which when combined with users and groups from Lab 5 provides fine grained control of user permissions on the vSphere system. We then examine resource pools which provides mechanisms through which we apply greater control of access to physical resources, and the facilities in vSphere for monitoring the usage of physical resources by a VM.

Changing Exercises in NetLab

If you complete the work for a lab task, you can change exercise using the Exercise tab indicated above. Changing on the Exercise tab will show you a list of available exercises for that particular POD:



Select the lab task that you wish to switch to, then click on the **Change Exercise** button. The system will then perform any necessary reconfiguration before displaying a confirmation message:



Clicking the **OK** button will return you to the topology to begin the new lab task.

Lab Tasks

In this week's practical, you are required to complete the following lab tasks:

- Lab 16: User Permissions
- Lab 17: Resource Pools
- Lab 18: Monitoring Virtual Machine Performance

Following the instructions above, start by booking in a POD to complete Lab 10. The instructions for the lab tasks can be found by clicking on the **Show Lab Content** button as explained in Practical 2.

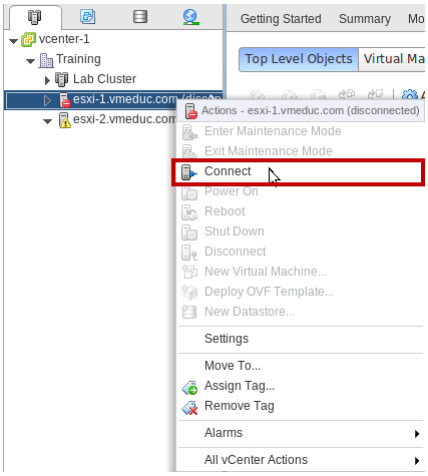
If you wish to complete multiple labs in one session, you can switch between labs using the steps shown above. Instructions for how to proceed with the next lab task can be found in the "problems" section below.

Make sure you follow the lab steps very carefully, otherwise you will encounter problems and be unable to complete the lab tasks.

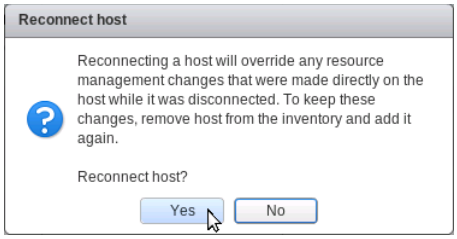
In the following pages, you will find instructions addressing possible problems you may encounter in completing each of the labs. Make sure you refer to these instructions as you complete the relevant lab tasks.

Possible Problems (General)

When the system first starts, it's possible that the infrastructure may not connect correctly. This can be identified by a red symbol appearing on the relevant infrastructure. If you encounter any problems, right click on the problem entry and click **Connect** on the pop-up menu:



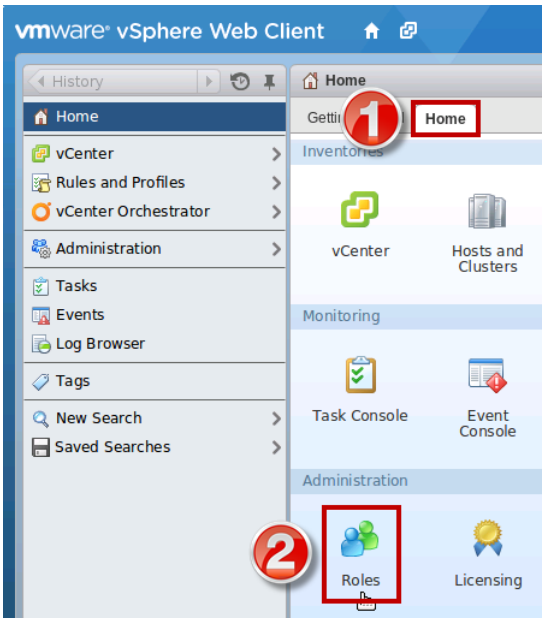
The system will then show a dialog, click **Yes** to confirm the (re-)connection:



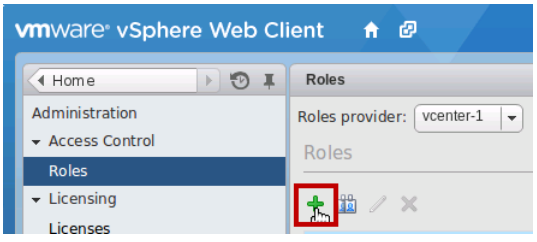
Possible Problems with Lab 16. User Permissions

Part 1. Create a Custom Role in vCenter Server

5. Click on the Roles icon in the Administration section of the main workspace area.

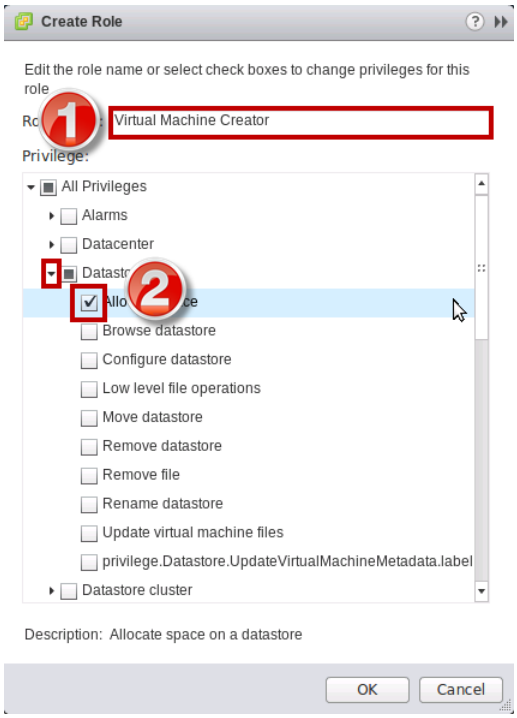


6. Click the plus sign in the main workspace to create a new role.

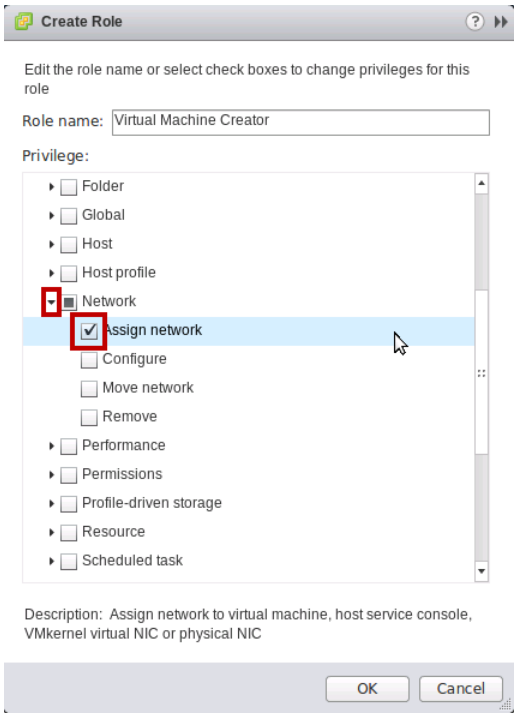


7. In the Role name text field, enter Virtual Machine Creator.

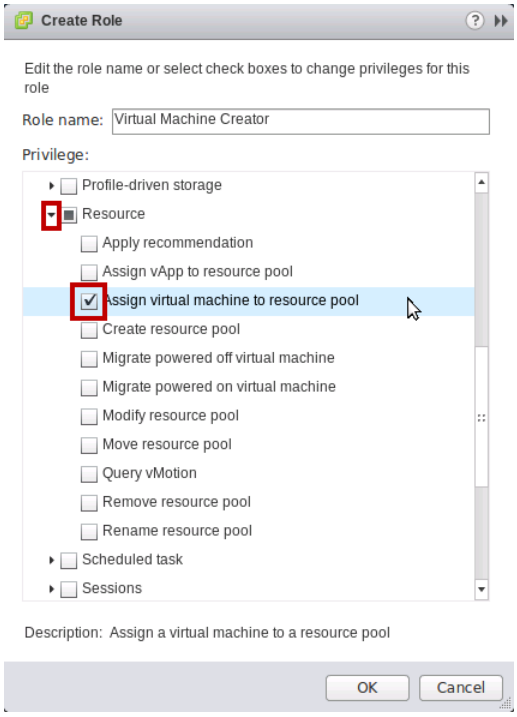
8a. Under Datastore, select Allocate Space.



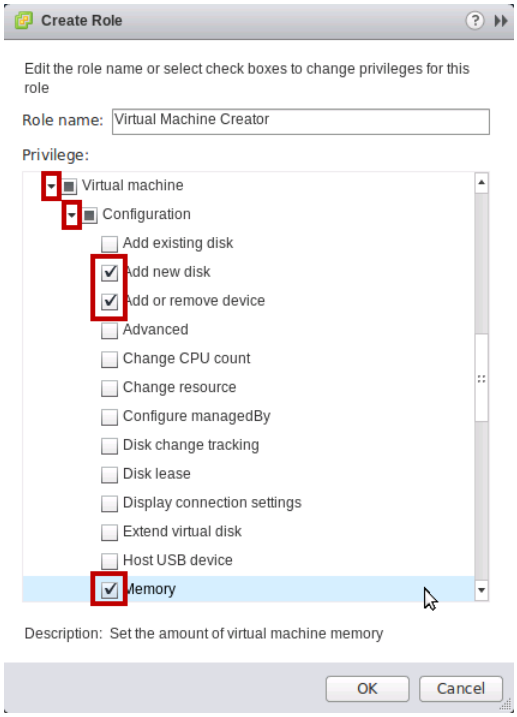
8b. Under Network, select Assign Network.



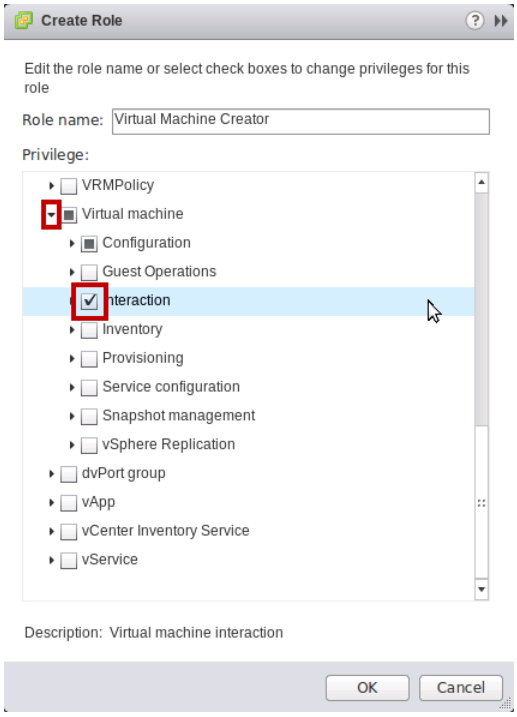
8c. Under Resource, select Assign virtual machine to resource pool.



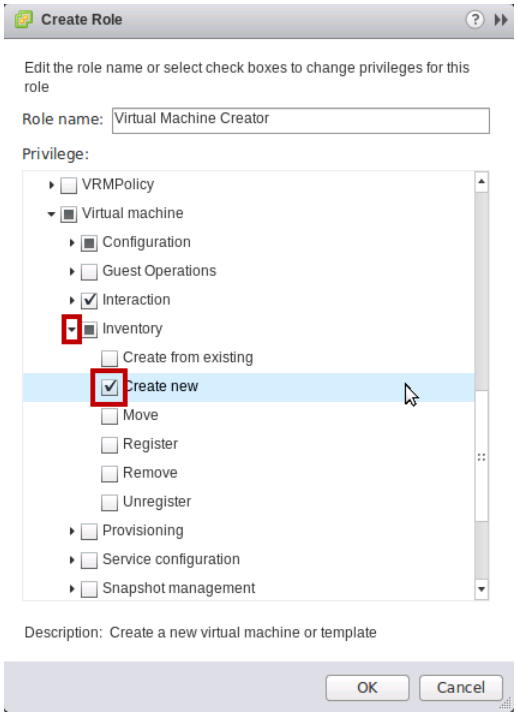
8d. Under Virtual machine > Configuration select the following: Add new disk, Add or remove device, Memory.



8e. Under Virtual machine select Interaction to include all privileges in this subcategory.

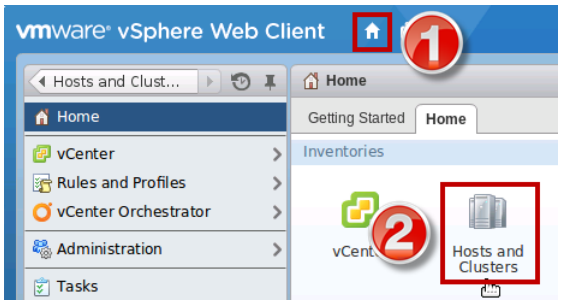


8f. Under Virtual machine > Inventory select Create new.

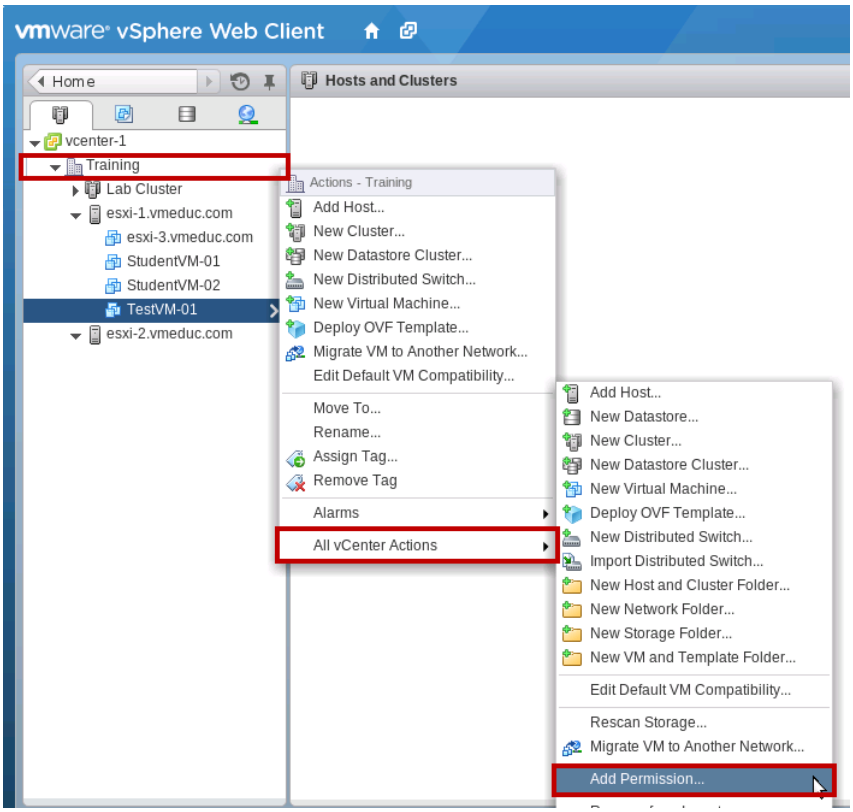


Part 2. Assign Permissions on vCenter Server Inventory Objects

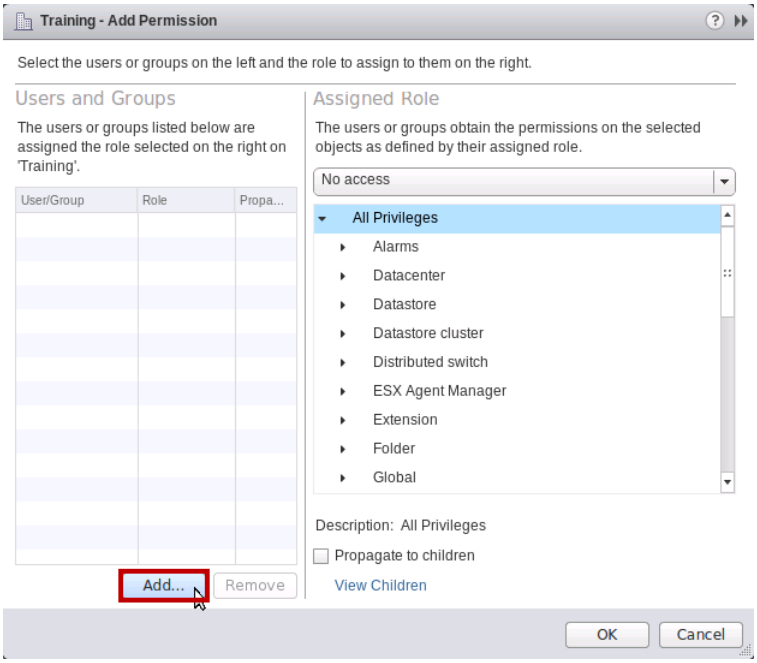
1. Click on the Home icon in the title bar and then Hosts and Clusters in the main workspace.



2. Right-click your Training datacentre in the Object Navigator pane, click All vCenter Actions and click Add Permission.

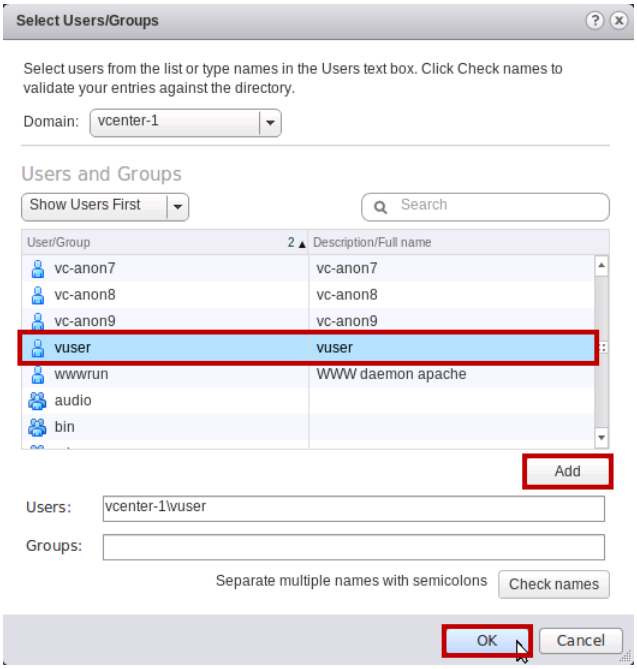


3. Click on Add... in the Users and Groups pane.



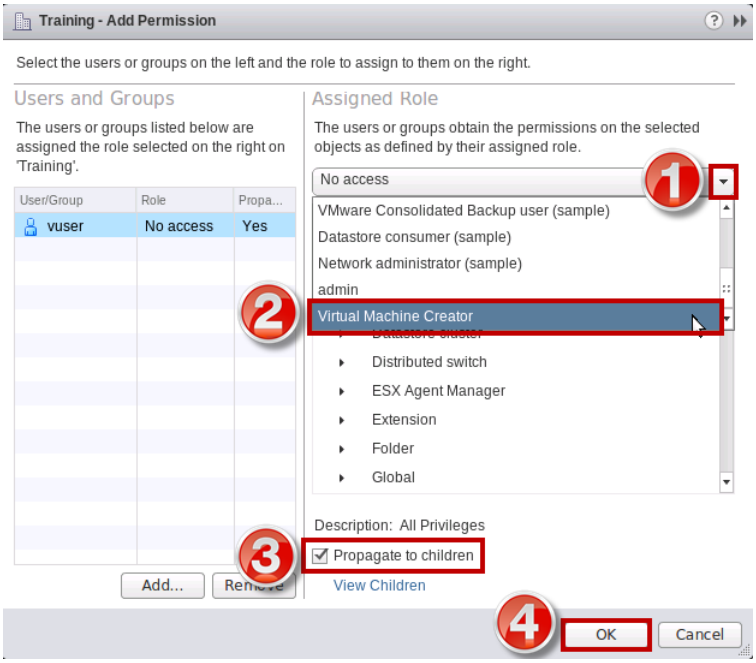
4. Select the vuser account from the list and click Add.

5. Click OK.

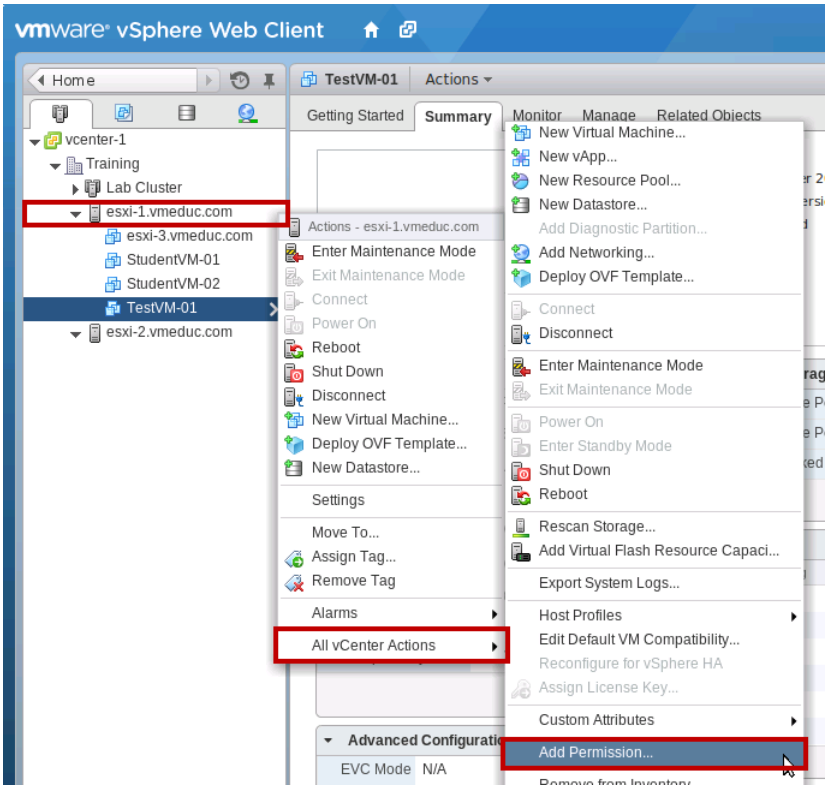


6. In the Assigned Role pane, click in the drop-down box, and select Virtual Machine Creator (you may need to scroll to the bottom to see the entry).

7. Make sure the Propagate to Children checkbox has a checkmark and click OK.



8. Right-click your esxi-1 vmeduc.com host in the Object Navigator pane, click All vCenter Actions and click Add Permission.

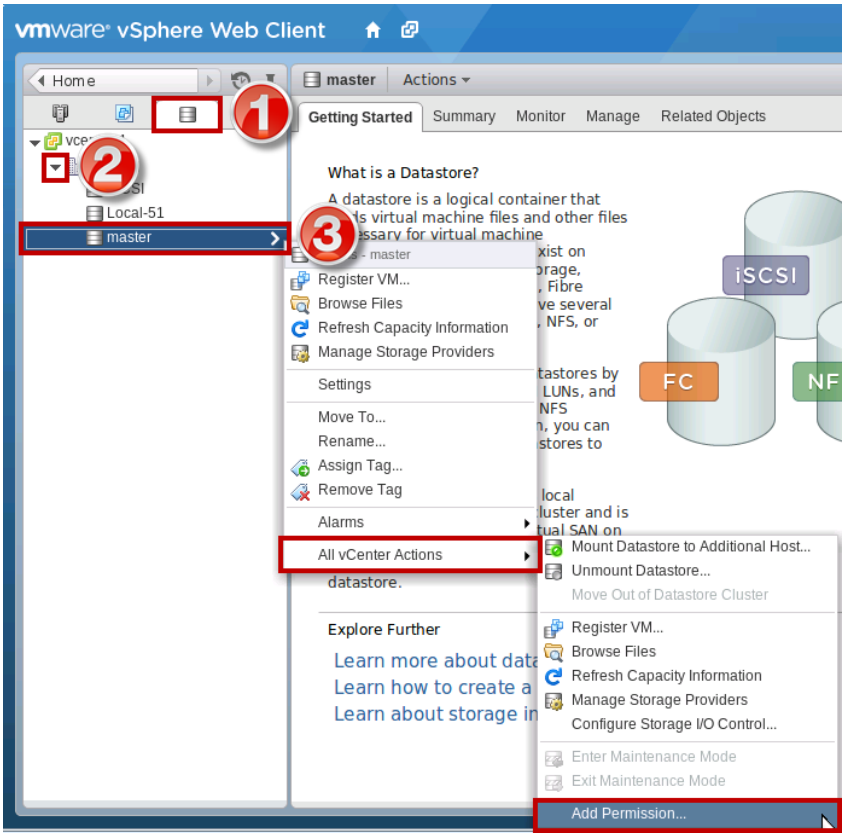


Steps 9-13.

Follow Steps 3-7 above.

14. Click on the Storage tab in the Object Navigator pane.

15. Right-click your master datastore in the Object Navigator pane, click All vCenter Actions and click Add Permission.

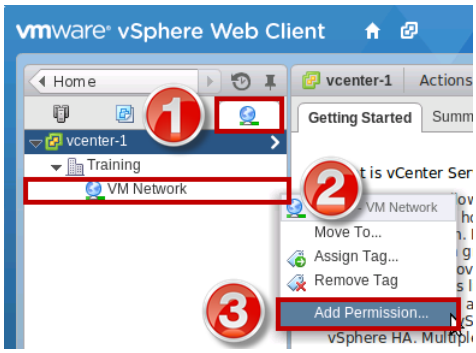


Steps 16-20.

Follow Steps 3-7 above.

21. Click on the Networks tab in the inventory pane.

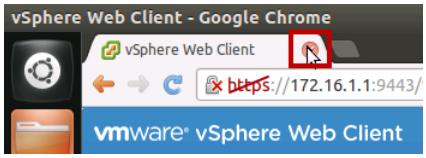
22. Right-click your VM Network network in the inventory pane and click Add Permission.



Steps 23-27.

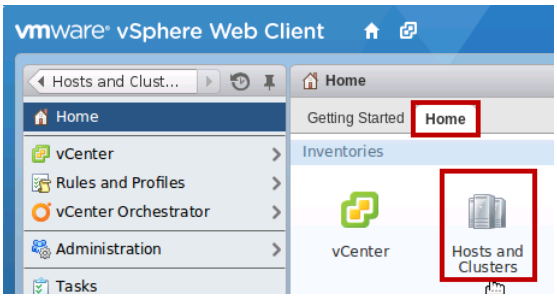
Follow Steps 3-7 above.

28. Close the VMware vSphere Web Client window.

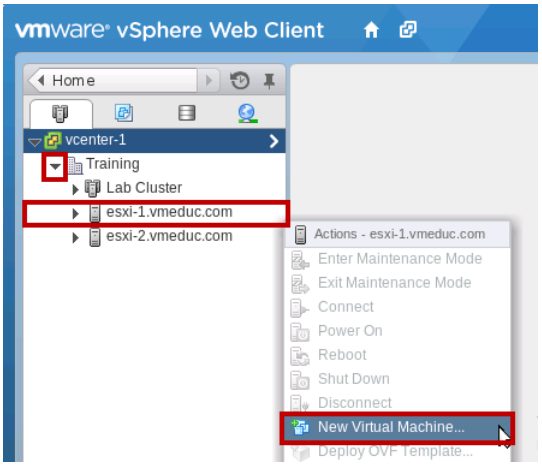


Part 3. Verify Permission Usability

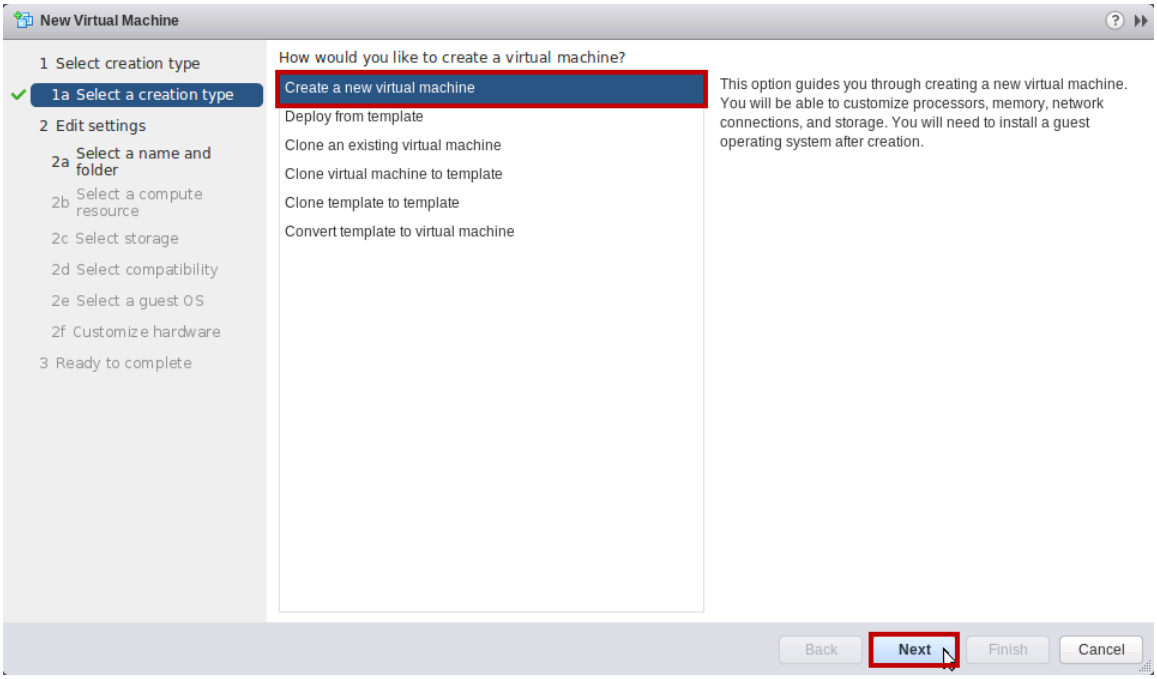
3. Under the Home tab, click on the Hosts and Clusters icon in the main workspace.



4. Right-click your esx-1.vmeduc.com host and select New Virtual Machine.

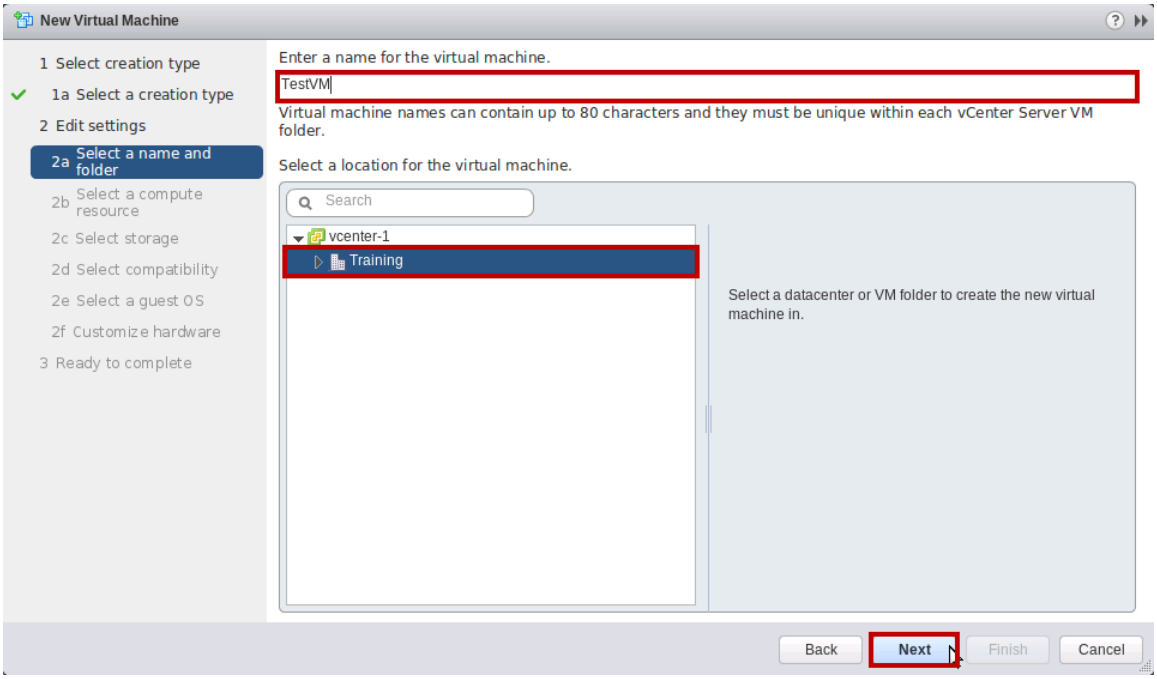


5. On the Select a creation type page, select Create New Virtual Machine and click Next.

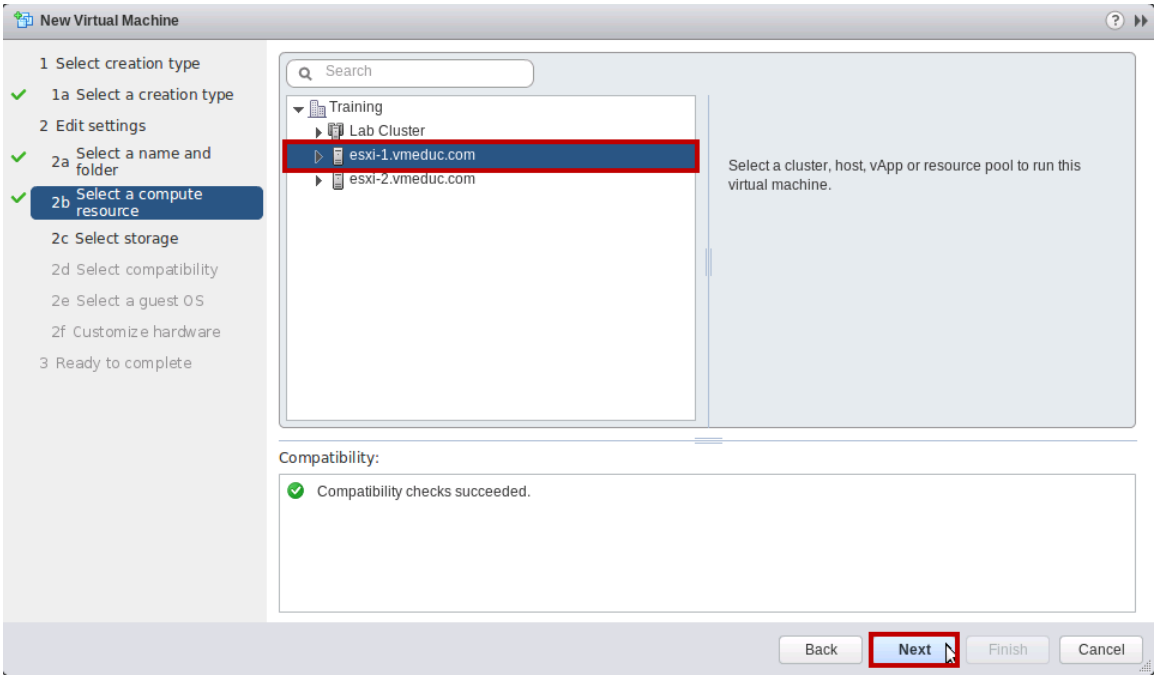


6. On the Select a name and location page enter the name TestVM.

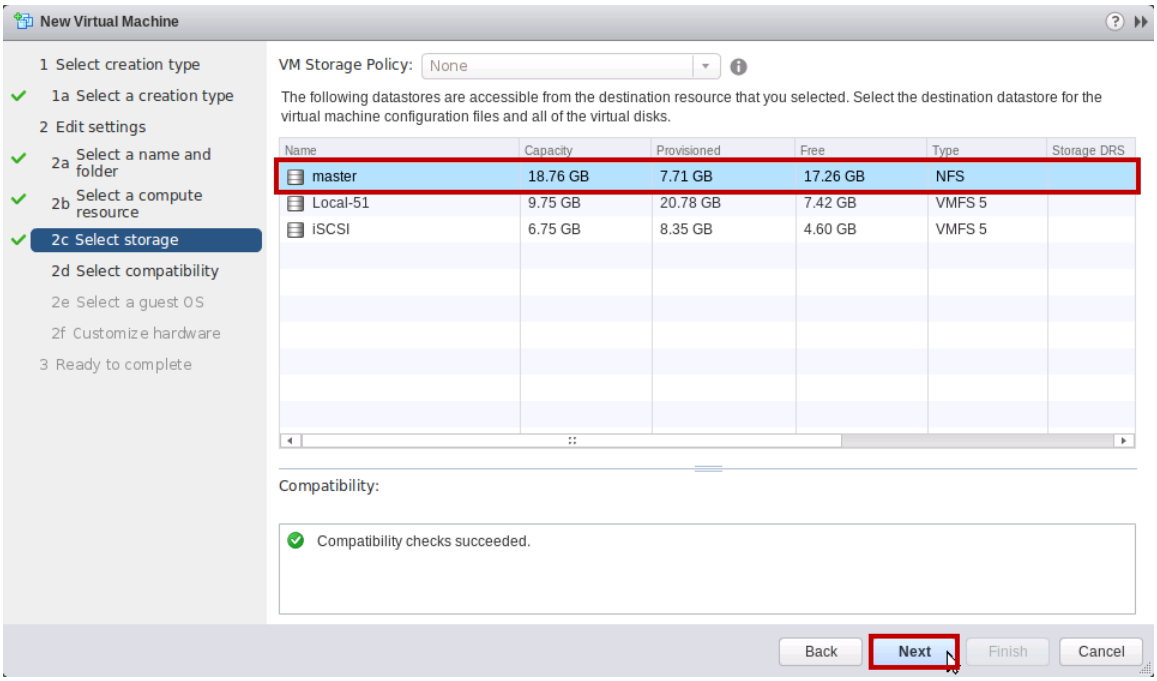
7. Click the Training datacentre and click Next.



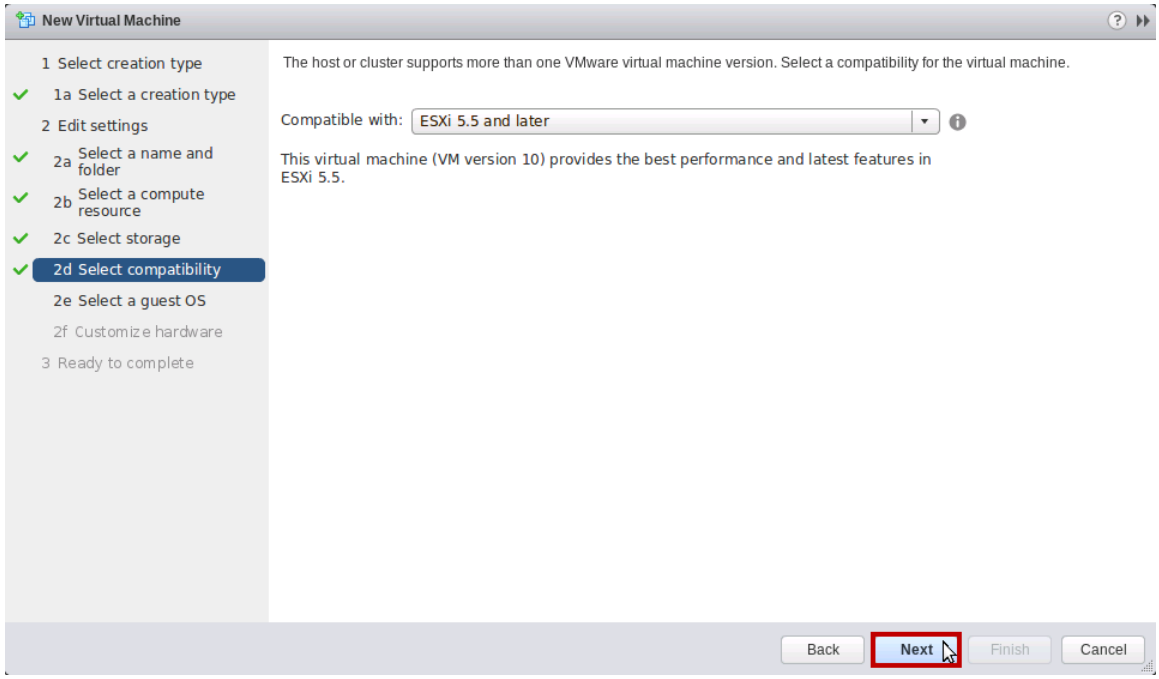
8. On the Select a compute resource page, select esxi-1.vmeduc.com and click Next.



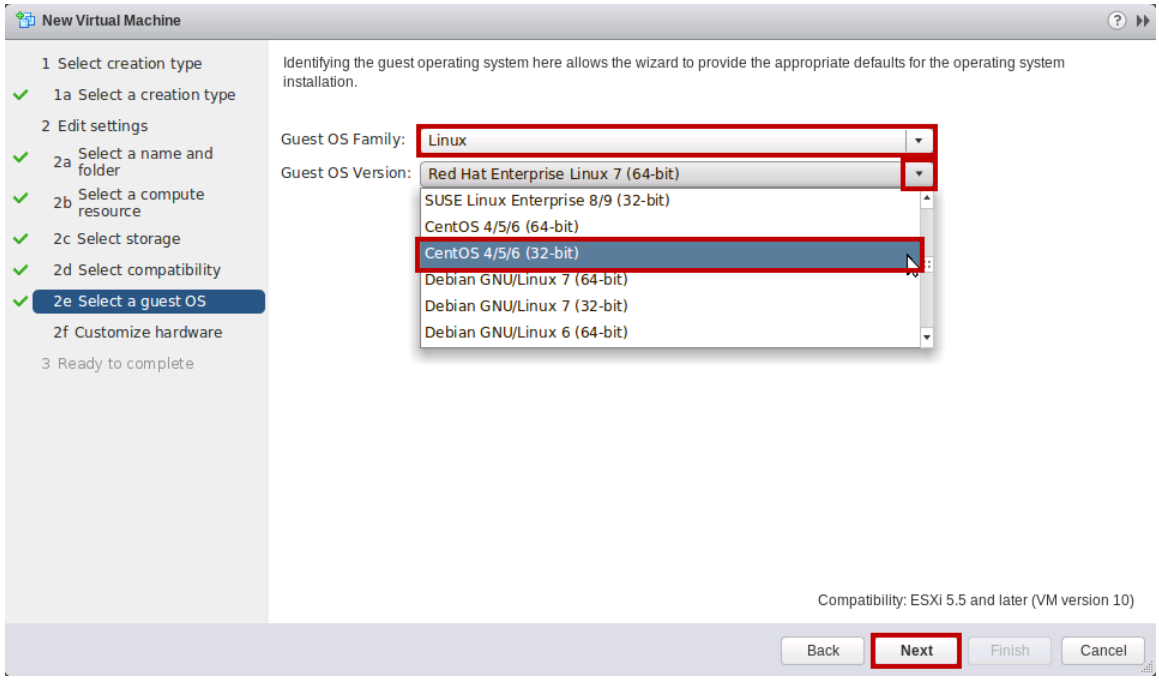
9. On the Select storage page, select master. Click next.



10. On the Select compatibility page, leave the default and click Next.

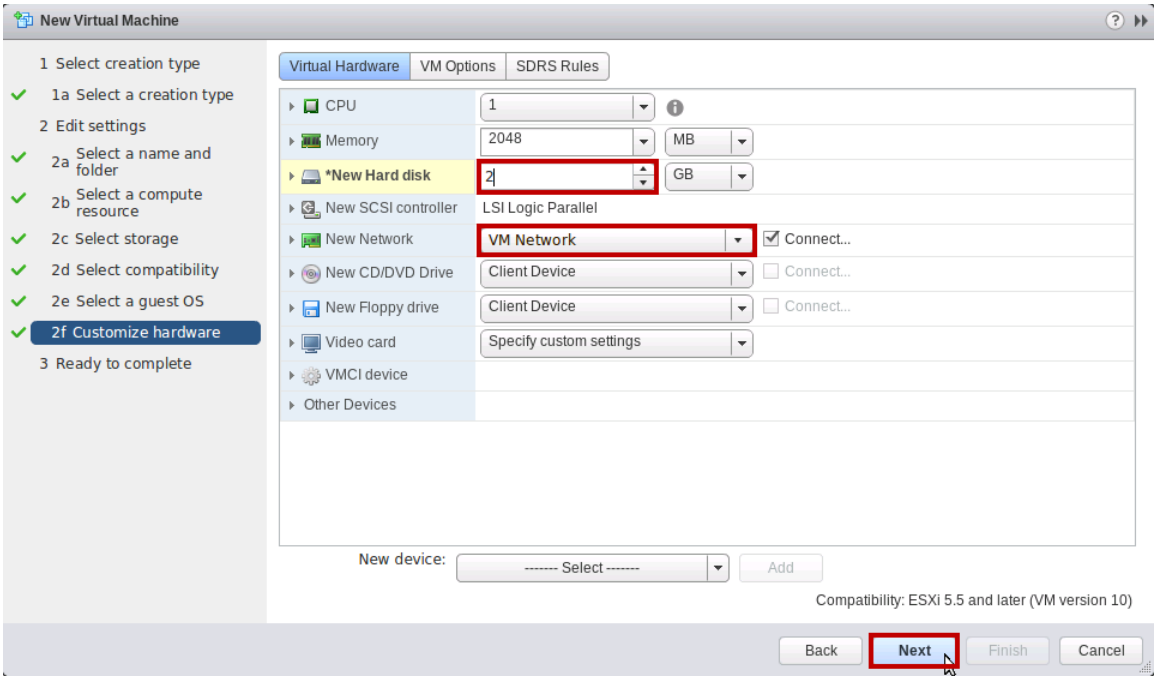


11. On the Select a guest OS page, select Linux from the Guest OS Family drop-down box, select CentOS 4/5/6 (32-bit) from the Guest OS Version drop-down box and click Next.

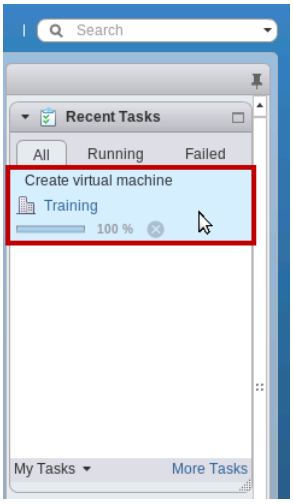


12. On the Customize hardware page, select VM Network from the drop-down menu for New Network.

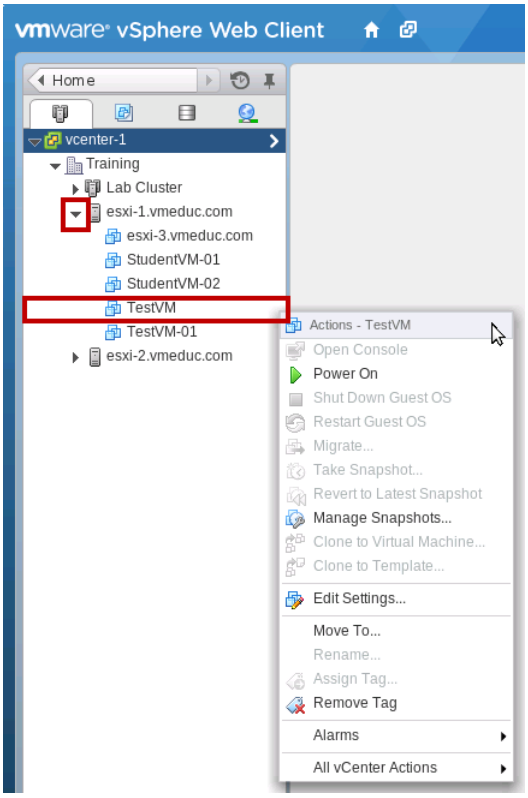
13. For the New Hard disk, change the capacity text box to 2GB. Click Next.



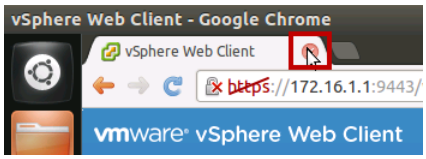
15. Monitor the progress of the task in the Recent Tasks pane.



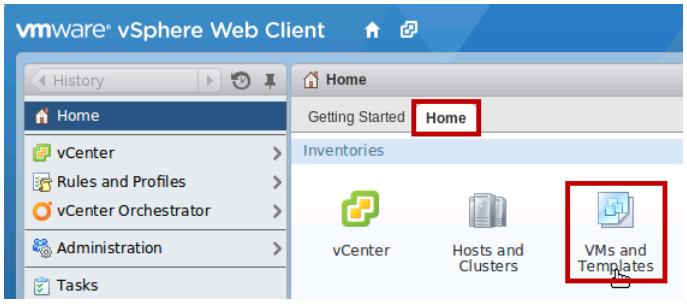
16. After the task is complete, right-click your virtual machine in the inventory.



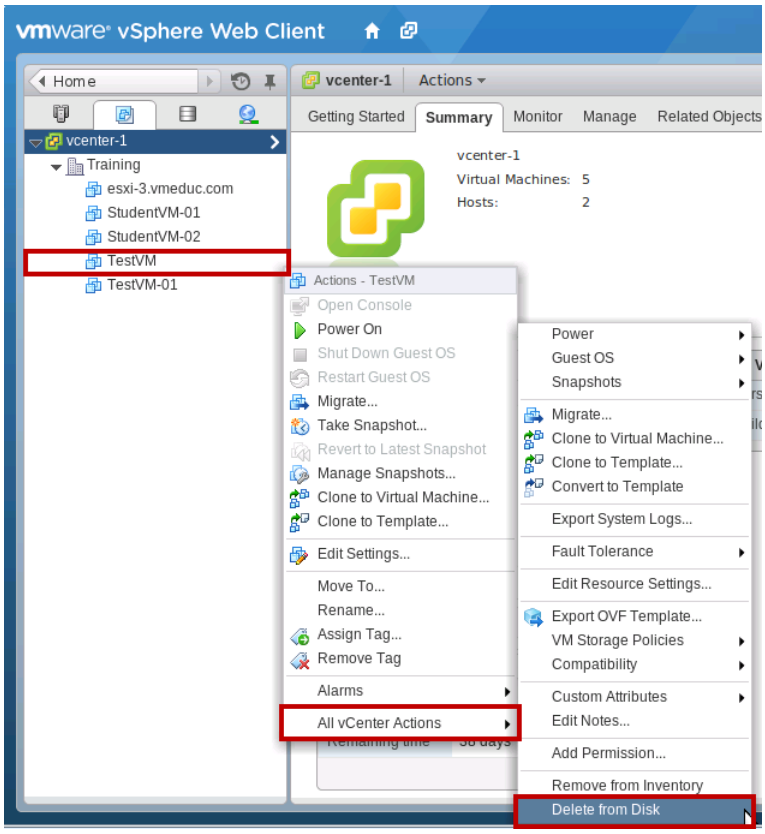
17. Close the VMware vSphere Web Client.



20. Under the Home tab, click on the VMs and Templates icon in the main workspace.



21. Right-click TestVM in the Object Navigator pane, select All vCenter Actions, and select Delete from Disk.

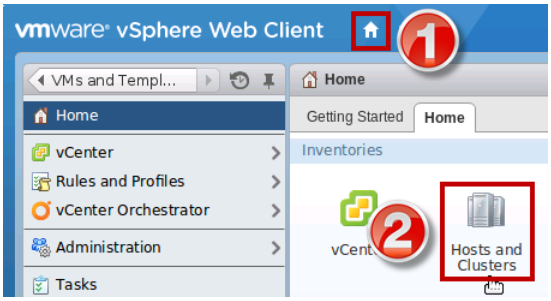


Possible Problems with Lab 17. Resource Pools

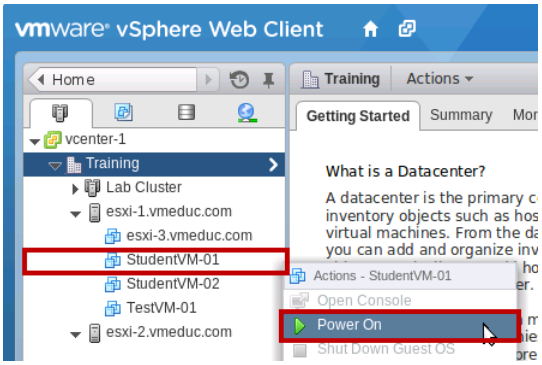
The start of this lab task assumes that you have just started an equipment POD. In this case, we already have a running POD, so begin the new lab by clicking on the Home button, then continuing the instructions from Step 5.

Part 1. Create CPU Contention

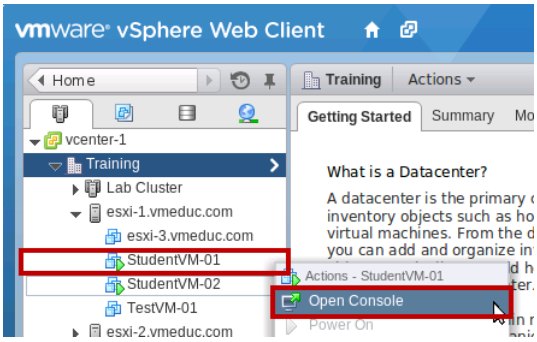
5. While on the Home tab, click on Hosts and Clusters in the Inventories section of the main workspace area.



6. Power on the StudentVM-01 and StudentVM-02 virtual machines, which should be located on the esxi-1.vmeduc.com host.

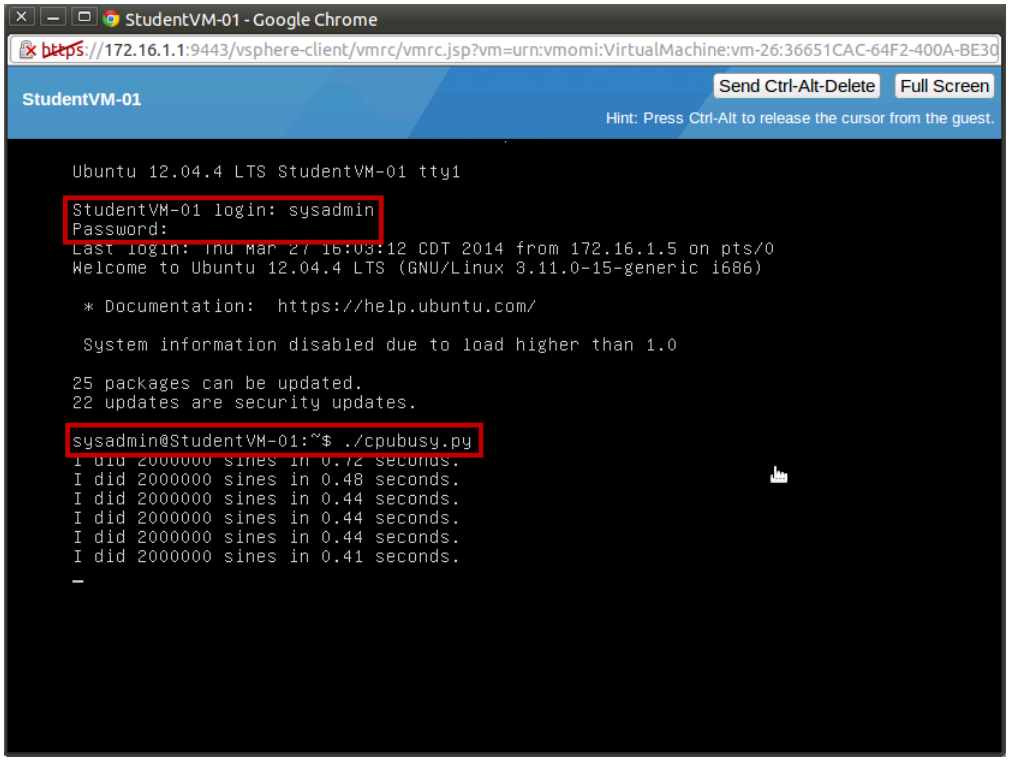


7. Open a console to each of the powered on virtual machines.



10. Login to the StudentVM-01 console with username sysadmin and password vmware123.

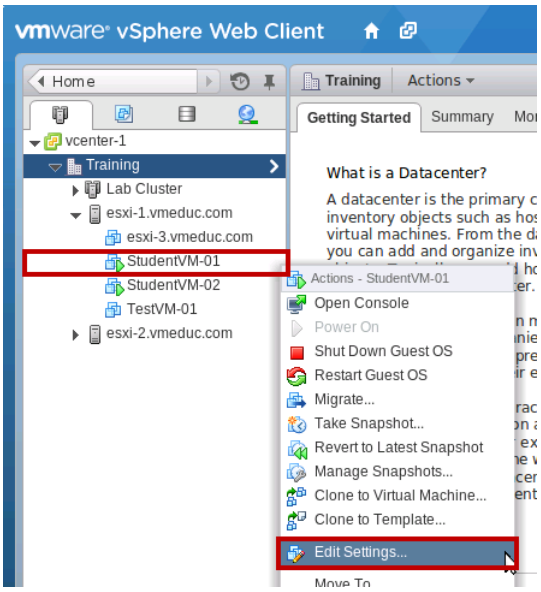
11. Type the following command and press Enter.



Step 14 and 18.

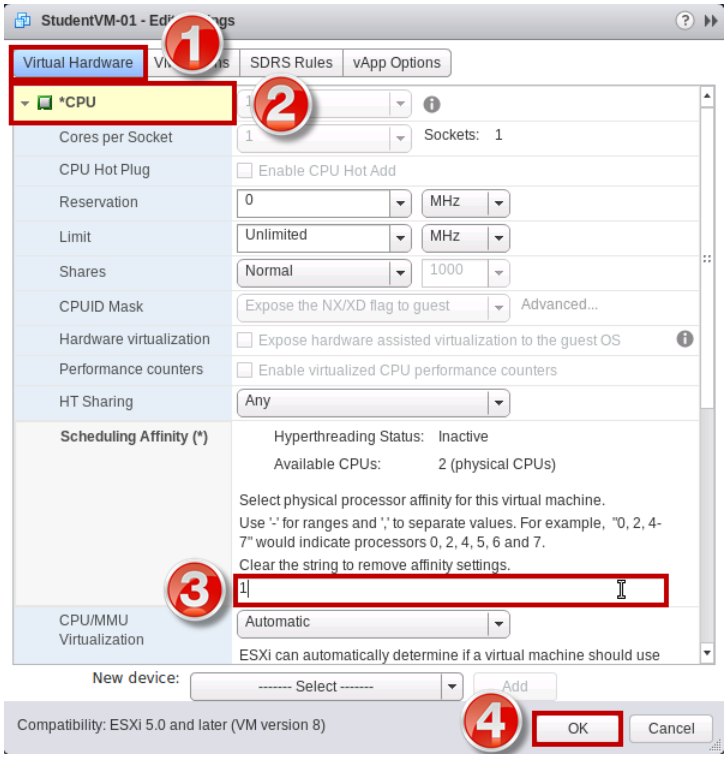
If the system is not responding to your clicks, the most likely cause is that you haven't completed Step 13 or Step 17 properly. Move your mouse into the VM window, then hold down the **CTRL** and **ALT** keys. Move the mouse outside of the VM window, while keeping it inside the vClient window. If you are still having difficulties, while holding CTRL and ALT, try clicking on the title bar for the VM window.

18. In the inventory pane, right-click the StudentVM-01 virtual machine and select Edit Settings.



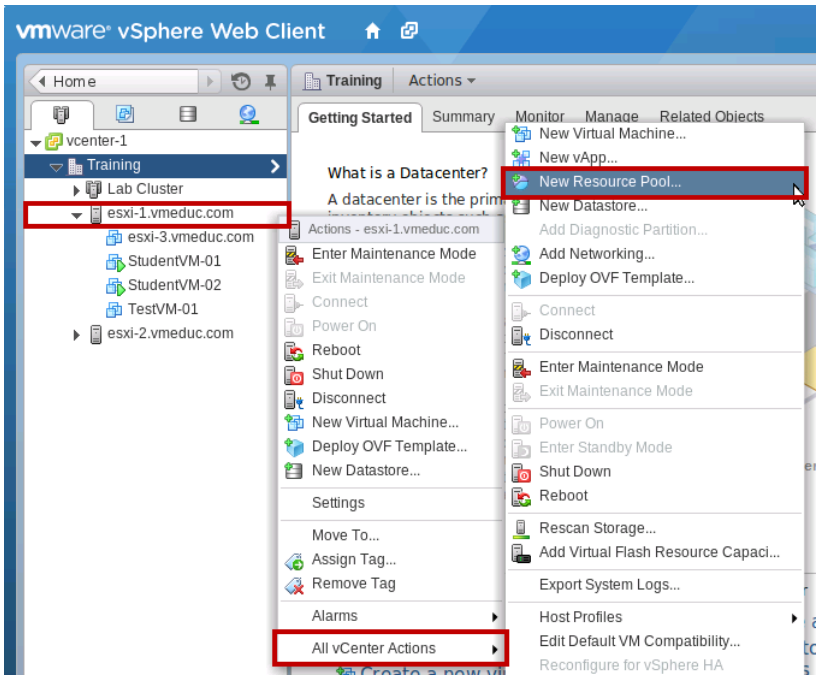
20. Click CPU on the Virtual Hardware tab to expand the CPU properties.

21. In the Scheduling Affinity text box, type 1 in the space provided. The virtual machine will run only on host processor 1. Click OK.



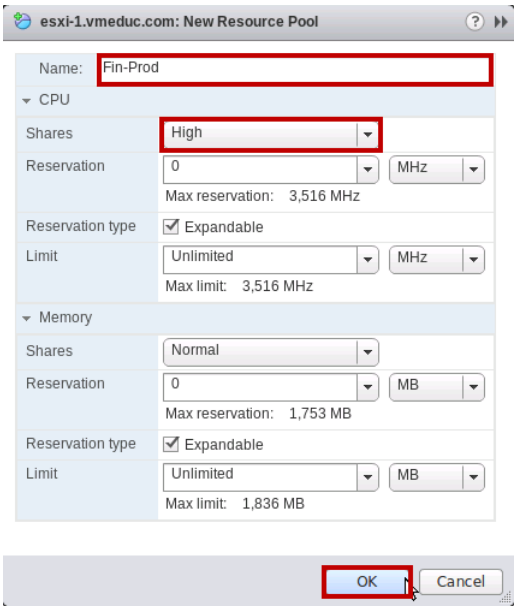
Part 2. Create a Resource Pool Named Fin-Test

1. Right-click your esxi-1 host in the inventory pane, select All vCenter Actions and then New Resource Pool.



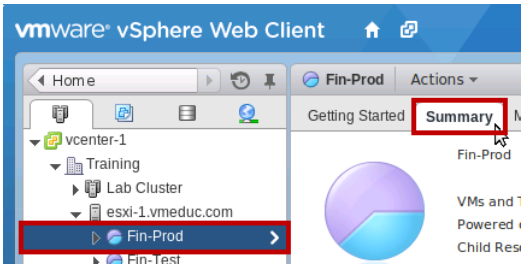
Part 3. Create a Resource Pool Named Fin-Prod

2. In the Name field, enter Fin-Prod. Under CPU, next to Shares, select High from the drop-down menu. Leave all other settings at defaults and click OK.

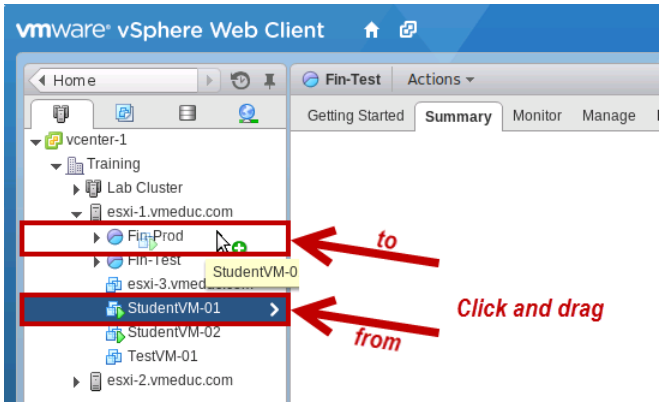


Part 4. Verify Pool Functionality

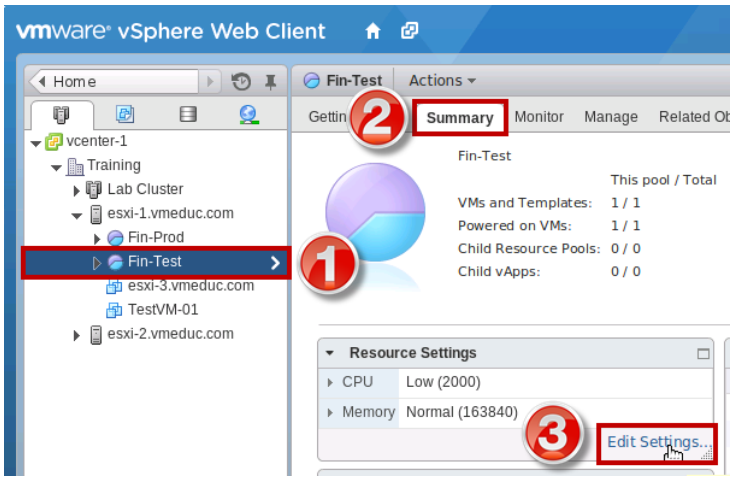
1. Click on Fin-Prod in the inventory and then click the Summary tab.



3. Drag and drop StudentVM-01 to the Fin-Prod resource pool in the Object Navigator pane.



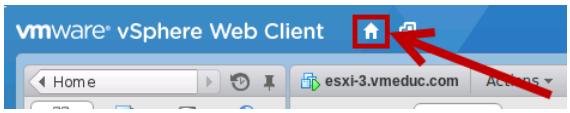
9. In the Object Navigator pane, click the Fin-Test resource pool and then click the Edit Settings link in the Resource Settings section under the Summary tab.



Possible Problems with Lab 18. Monitoring Virtual Machine Performance

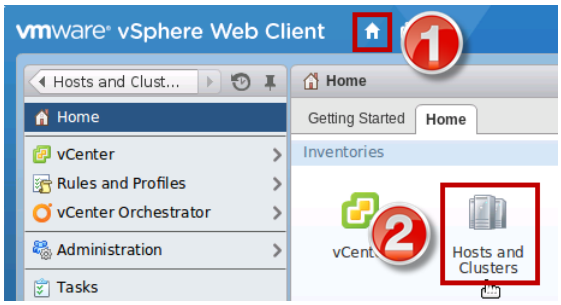
Note that this lab task already has many screenshots to illustrate what you need to do. The illustrations below are therefore mainly focused on issues that may arise due to continuing on from Lab 17.

The start of this lab task assumes that you have just started an equipment POD. In this case, we already have a running POD, so begin the new lab by clicking on the Home button, then continuing the instructions from Step 5.



Part 1. Create CPU Contention

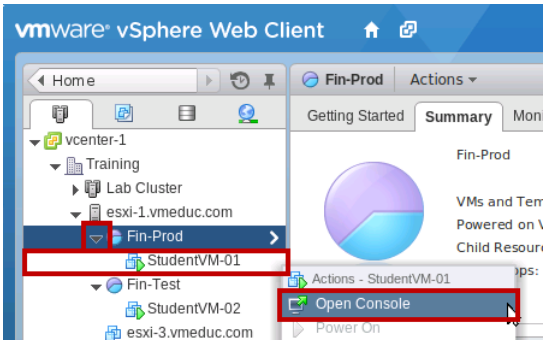
5. Click on the Hosts and Clusters in the Inventories section under the Home tab of the main workspace area.



6. Power on StudentVM-01 and StudentVM-02.

7. Open a console to StudentVM-01.

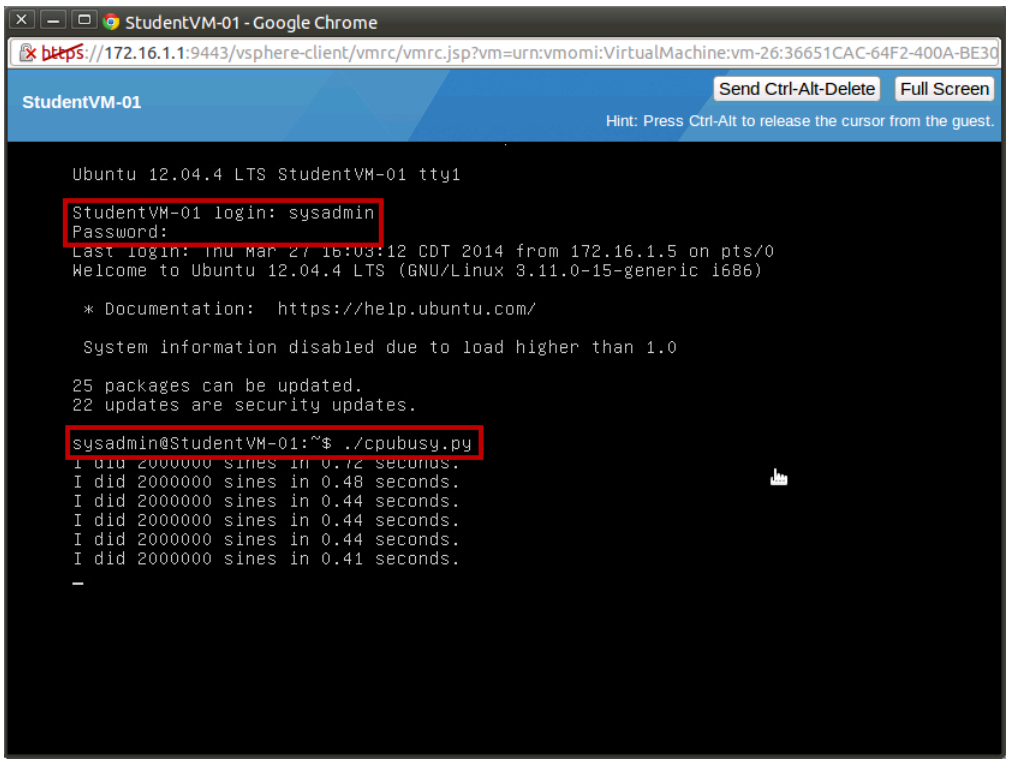
If you have continued from the previous lab, the VMs should already be powered on. If you closed the console windows at the end of the last lab, you will need to re-open a console to StudentVM-01. To do so, you will need top click the arrow next to Fin-Prod (the resource pool we created in the last lab), then right-click on the StudentVM-01 entry and click Open Console.



8. Login to the StudentVM-01 console with the username sysadmin and password vmware123.

9. Type the following command and press Enter.

If you have continued from the previous lab, the VM will already be logged in. If the screen is black, click in the screen then press the Enter key a few times and the screen should redisplay.



Part 2. Use the vSphere Web Client to Monitor CPU Utilisation

4. In the Chart Metrics pane, select CPU and verify that Real-time is showing in the Timespan drop-down box.

5. Deselect the check box for the StudentVM-01 and select the check box labelled 0 (for virtual CPU 0).

6. In the Counters pane, click the None button (above the Cancel button) to deselect all selected counters. If you click the wrong None button, you will need to reselect CPU 0 as shown in the screenshot above.

7. Scroll down and select the Ready and Used counters.

8. Click OK.