SIT113 Cloud Computing and Virtualisation

Practical 1:
Introduction to NetLab+ VE

Aims and Objectives

In this week's practical you will be working with the "NetLab+ VE" virtualization system and using one of the labs from the VMware vSphere Install, Configure, and Manage certification curriculum (VMware vSphere ICM version 6).

In particular you will:

1. Learn how to login to the vSphere Web Client, required for future practicals.
   This is in the section below called **Using NetLab+ VE**, pages 2 to 10.
2. Create a Datacentre, a Cluster, a Virtual Machine (VM), a template of this VM; and create VMs from this template.
   This is in the section below called **Practical Tasks**, pages 11 to 24.

Background

Virtualization technologies have been used in the information technology fields for many years and their origins can be traced back many years to mainframe computer operating systems such as the CP/CMS and IBM VM operating systems of the 1960s and 1970s. The progressive miniaturization and commoditization of computing technologies led to cheaper and more powerful computing options than mainframe computers, such as the introduction of the IBM Personal Computer in 1981 and the rapid development of such computers that followed.

In the 1990s, virtualization technologies started to regain prominence, providing the ability to run multiple operating systems on a single computer which was useful for providing access to other platforms, e.g., running Windows on top of a Linux operating system or vice-versa, and the ability to experiment which was particularly useful in testing software development projects and testing deployment of applications software in a managed desktop environment.

The late 1990s saw the foundations being laid for what would eventually become modern virtualization and cloud computing technologies, including the first release of VMware Workstation providing a widely available and accessible virtualization environment; the release of the Seti@Home application, which popularized the concept of service based computing; the GRID computing project, evolving distributed computing research projects to focus on making computing power available similar to electricity power from a utility company; and the introduction of various web-based technologies including XML allowing structured data to be exchanged over web connections.

The 2000s saw virtualization become widely used in data centres throughout the world, providing major cost savings. Previously, data centres would use multiple powerful computers/servers when deploying services within an organization and to the Internet, including databases, email services, web services, and so on. The consolidation of physical computers/servers in this manner provided many advantages including power savings and increased flexibility in managing IT infrastructure.

The above has focused on the technologies relevant to virtualization and cloud computing, however there were also a number of business services that demonstrated the ideas of modern cloud computing. The popularization of the Internet that occurred with the introduction of the web in the early 1990s led to the introduction of colocation centres, effectively large data centres where you can rent space to host your own infrastructure, with various service levels provided for monitoring and managing that infrastructure. Some of the management services offered by colocation facilities are also seen in the Infrastructure as a Service approach to cloud computing.

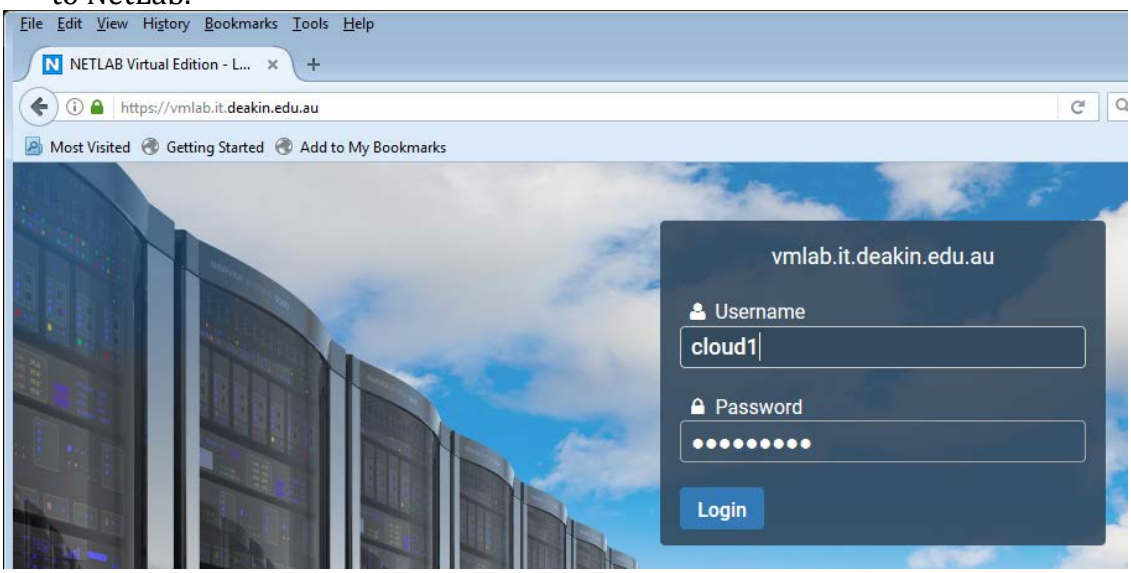
The 1990s also saw the introduction of virtual web hosts, organizations providing platforms for deploying web sites and associated functionality (server side scripting, databases, and so on). Virtual web hosting can be seen as an early form of the Platform as a Service approach to cloud computing. The 2000s also saw the popularization of software products being delivered over the web, such as the introduction of Google Apps products including email, calendar, and document/spreadsheet editing. Such software products can be seen as an early form of the Software as a Service approach to cloud computing.

Clearly, virtualization and cloud computing concepts and technologies have existed and been evolving for many years. Only with the development of the ability to deliver such platforms over the Internet (via the web) have we seen what is now often referred as a revolution, the introduction of delivery information technology as a service, rather than a product.

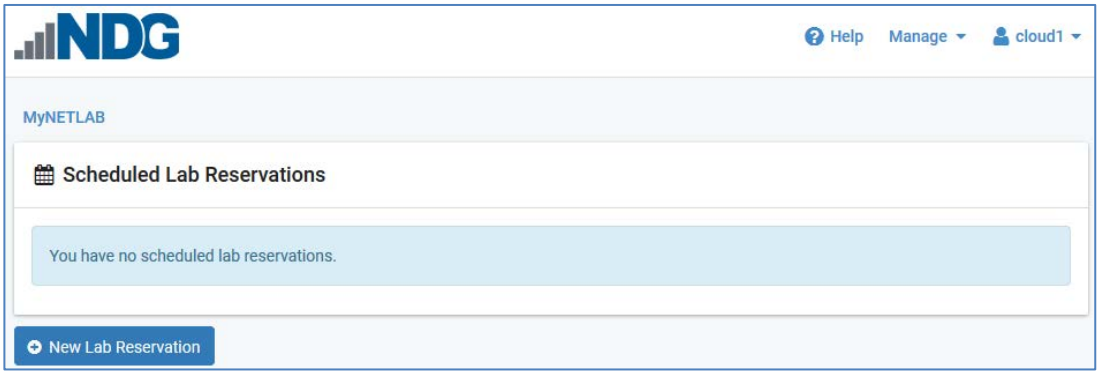
Using NetLab+ VE

The **vSphere Web Client** is the interface to managing datacentres, clusters, VMs and on. But before you get to the vSphere Web Client, you need to follow these steps.

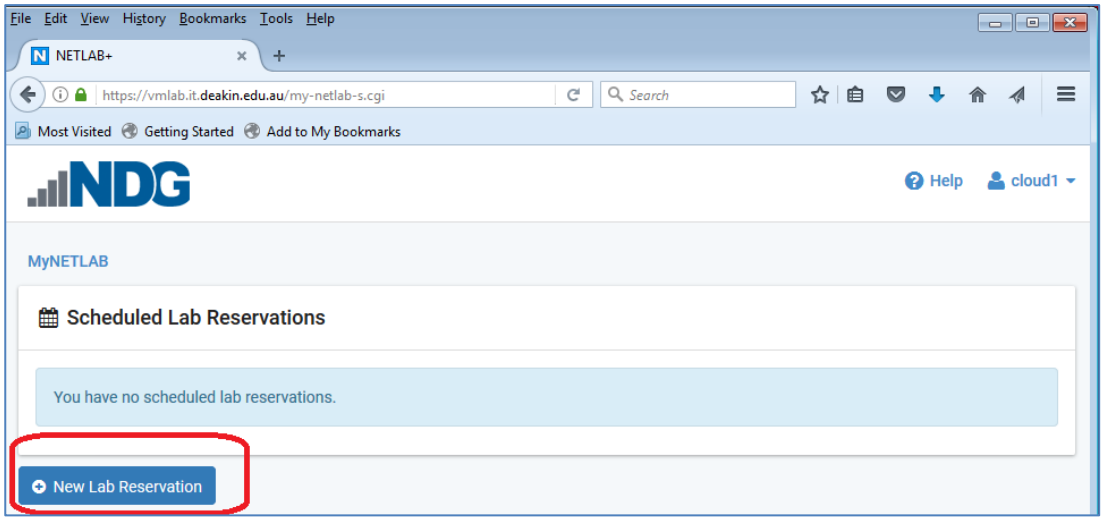
1. Login to NetLab
   - You will be using the School's NetLab infrastructure (based on NetLab+ VE) which can be accessed via https://vmlab.it.deakin.edu.au/
   - You should have received an email containing the information you require to login to NetLab.



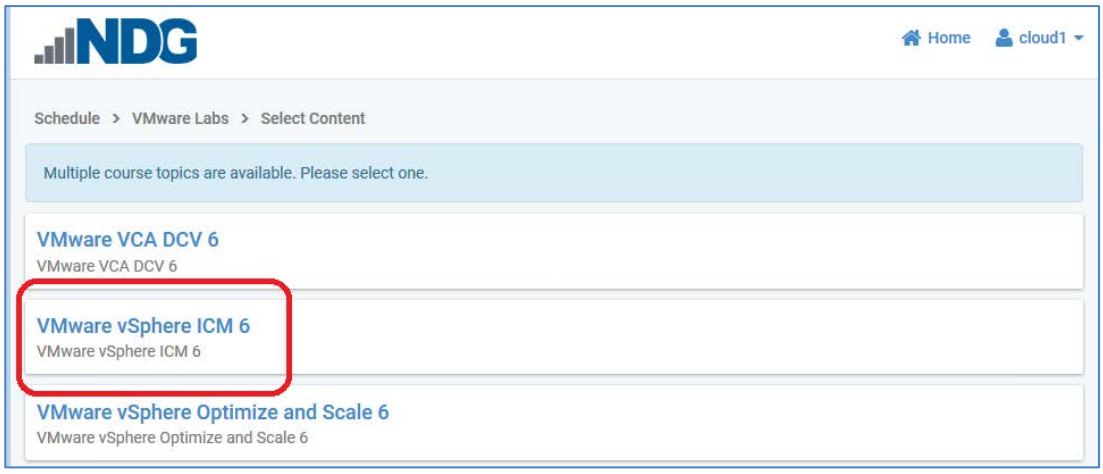
You should see something like the following after login. Notice that there are no lab reservations.



2. Reserve a Lab
   - Once you have logged in, to schedule a particular lab, click on the **New Lab Reservations** button.

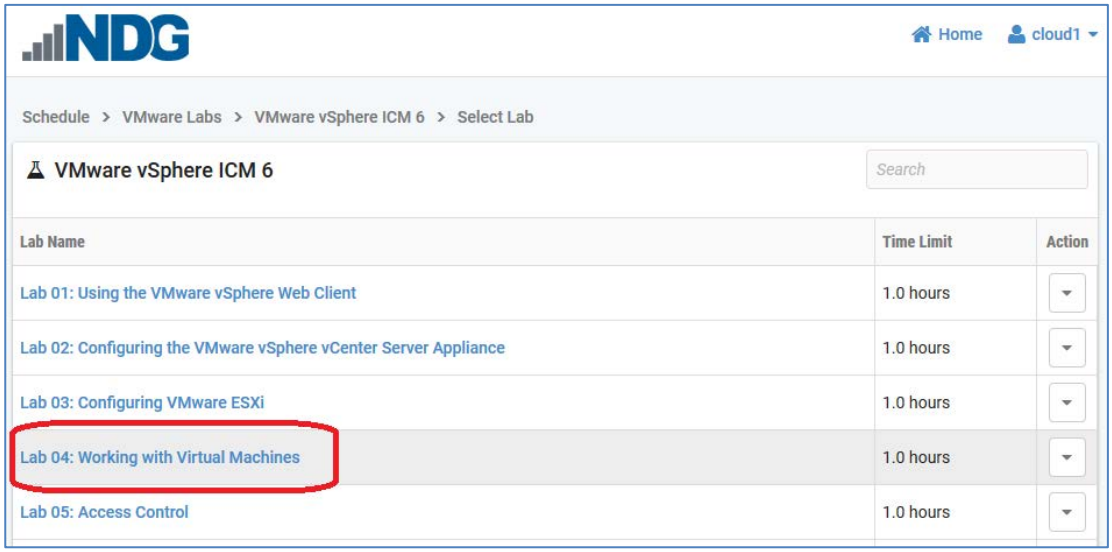


3. Select the **VMware vSphere ICM 6** course
   - Some NetLab accounts are associated with several VMware courses.
   - You need to select the **VMware vSphere ICM 6** course (or you might already be at the next step to select a Lab).

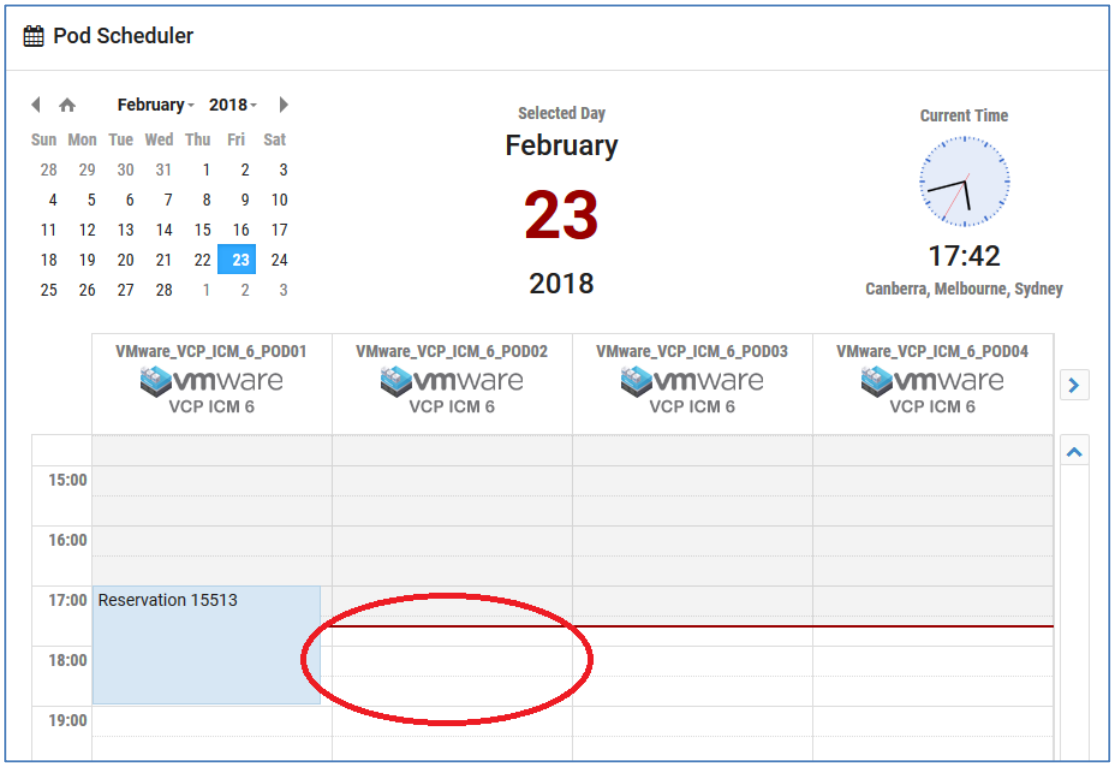


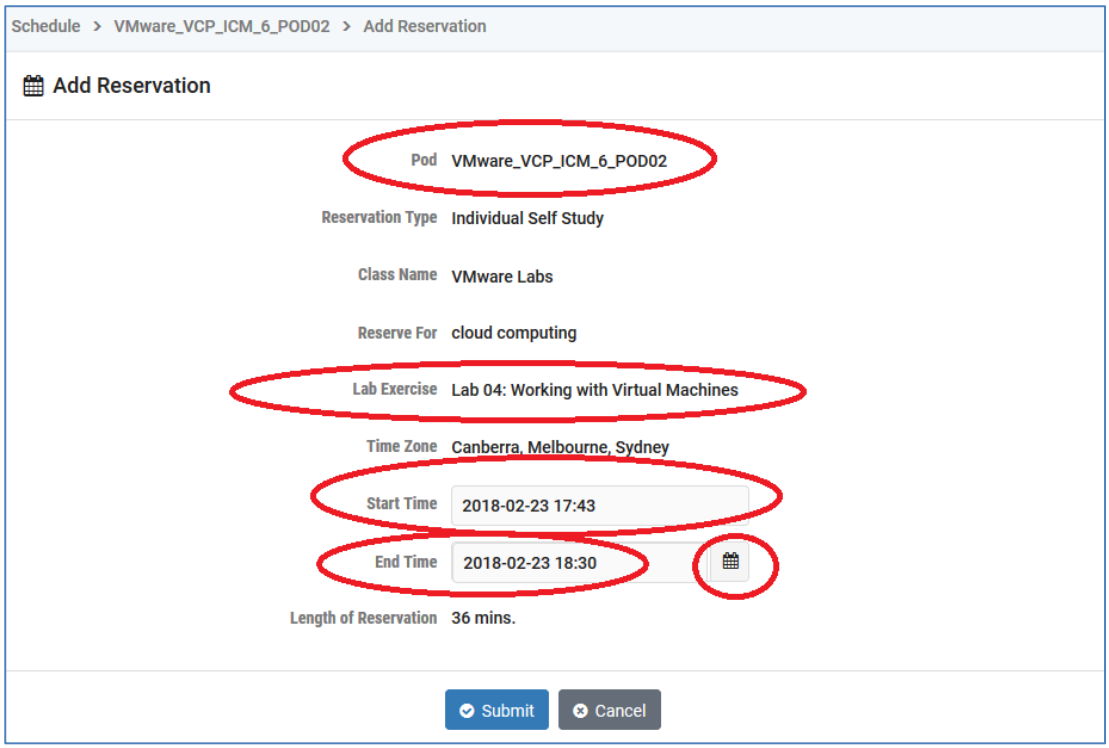
4. Select a Lab
   - The **VMware vSphere ICM 6** course consists of many Labs. As this first practical is about creating VMs and familiarising yourself with the Web Client, you should select **Lab 4 Working with Virtual Machines**.

     NOTE: you are not required to completing **Lab 4 Working with Virtual Machines** for this practical. Selecting Lab 4 provides an environment that allows us to create VMs, etc., that is required in the **Practical Tasks** section, pages 11 to 24.

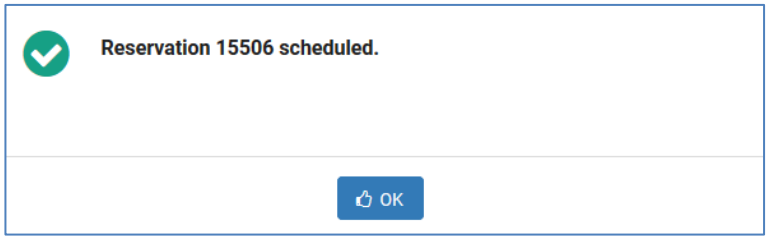


5. Select a Pod and Start Time and End Time
   - At this stage you are ready to select the start and end times for reserving a Pod.
   - You'll need to select a Pod that is not reserved by another person, and select the start and end times.

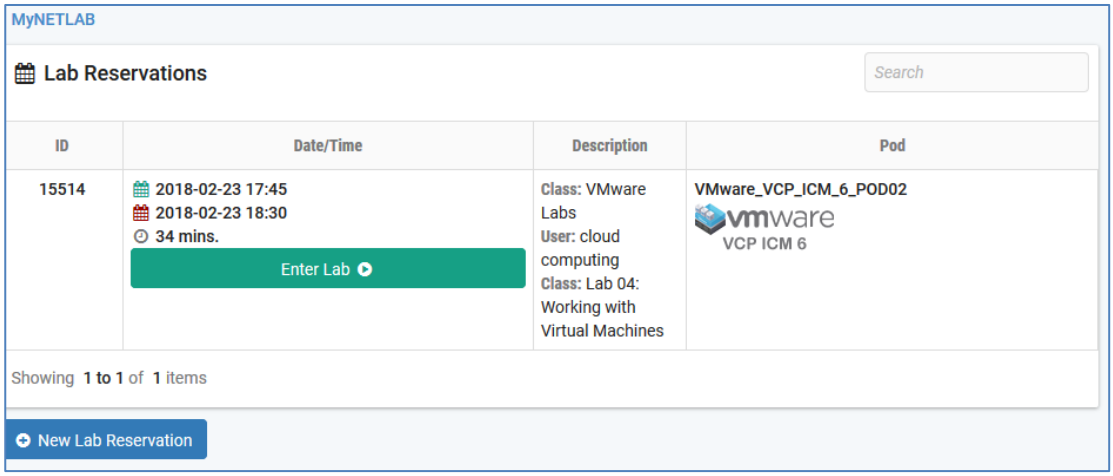




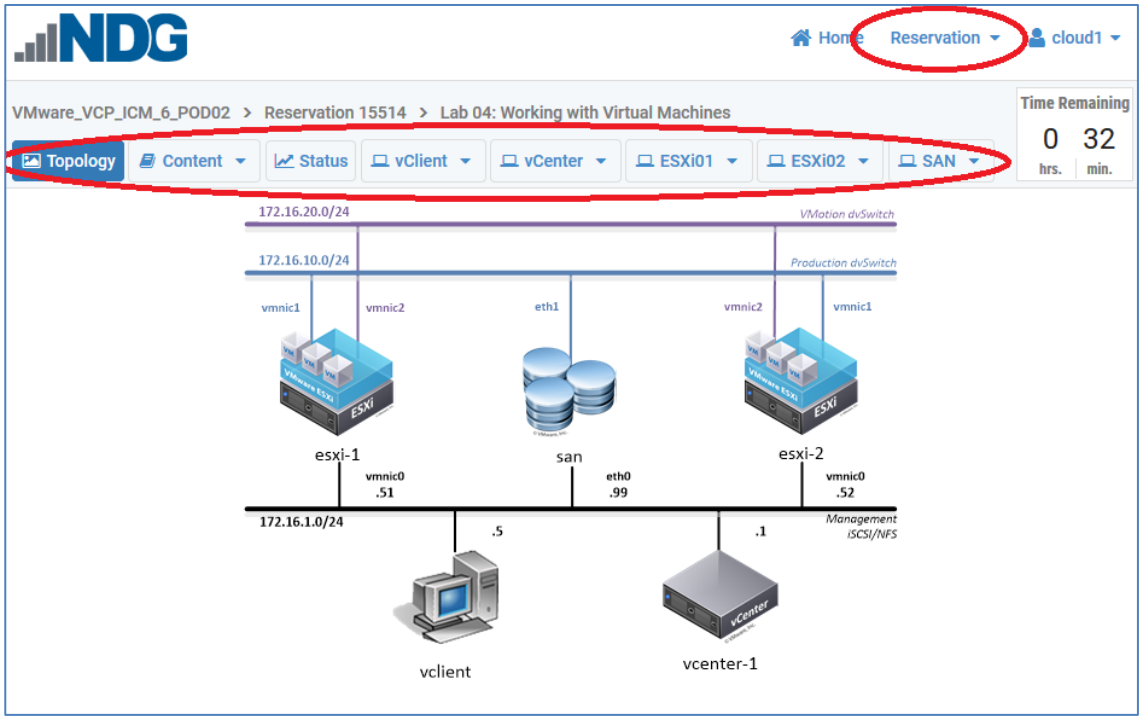
- Click the **OK** button on the confirmation dialog:



- The system will now return you to your home page, which shows the lab booking that was just created (and any other existing bookings).



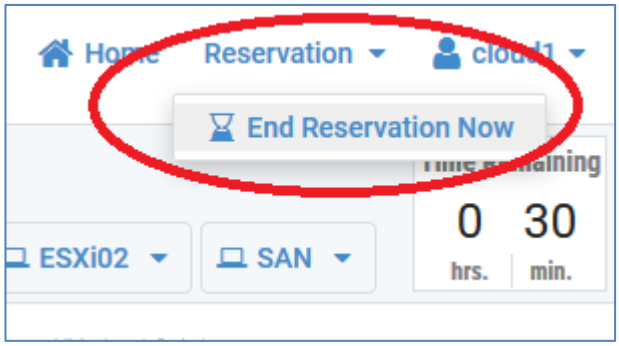
6. Enter the Lab
   - When a booking time starts, the system will add a button called **Enter Lab** which is used to start/access that lab.
   - Click on the **Enter Lab** button to begin work. You'll most likely need to wait while the Pod initialised. After *Pod Initialisation*, you will be shown the virtual machines and networks (the POD topology) associated with this lab you have chosen to complete:



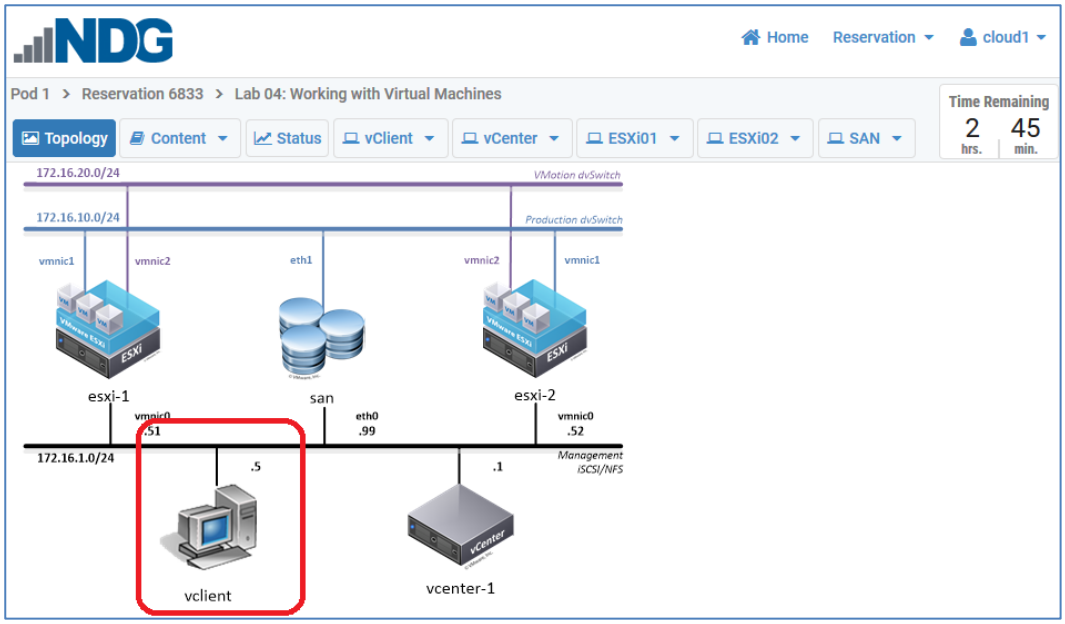
There are a number of important elements on this screen:

- Clicking the **Reservation > End Reservation Now** menu-item is used when you have completed working on the lab task and will end your booking, freeing the equipment POD for others to book and use;
- Clicking the **Content > Open In A New Window** menu-item will open a new window containing instructions for completing this lab; and
- Clicking on a menu (**vClient, vCenter, ESXi01, ESXi02,** or **SAN**) will open a new window for you to control that particular device/VM. You can also click on the device icons within the topology diagram.

Once you have completed all work on a Pod, ensure you click on the **Reservation > End Reservation Now** menu-item to release the Pod's resources for others to use.

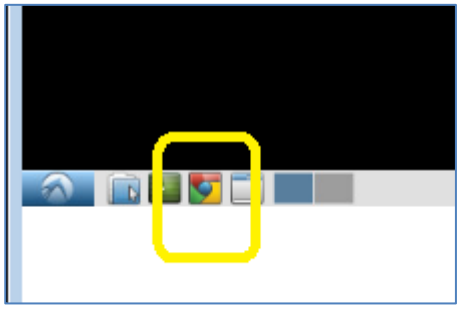


7. Select and login to the **vclient** VM

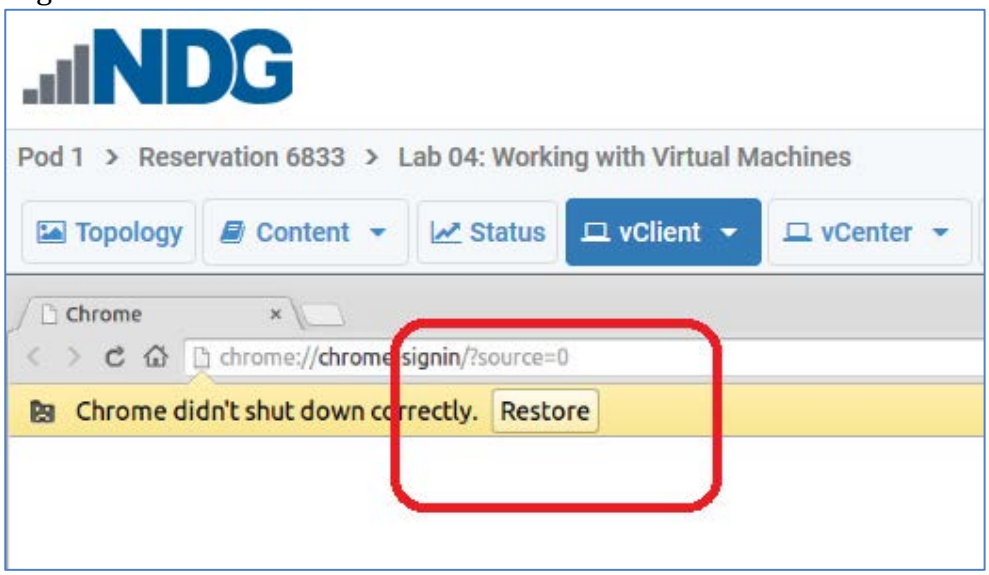


- username **vclient**
- password **vmware123**

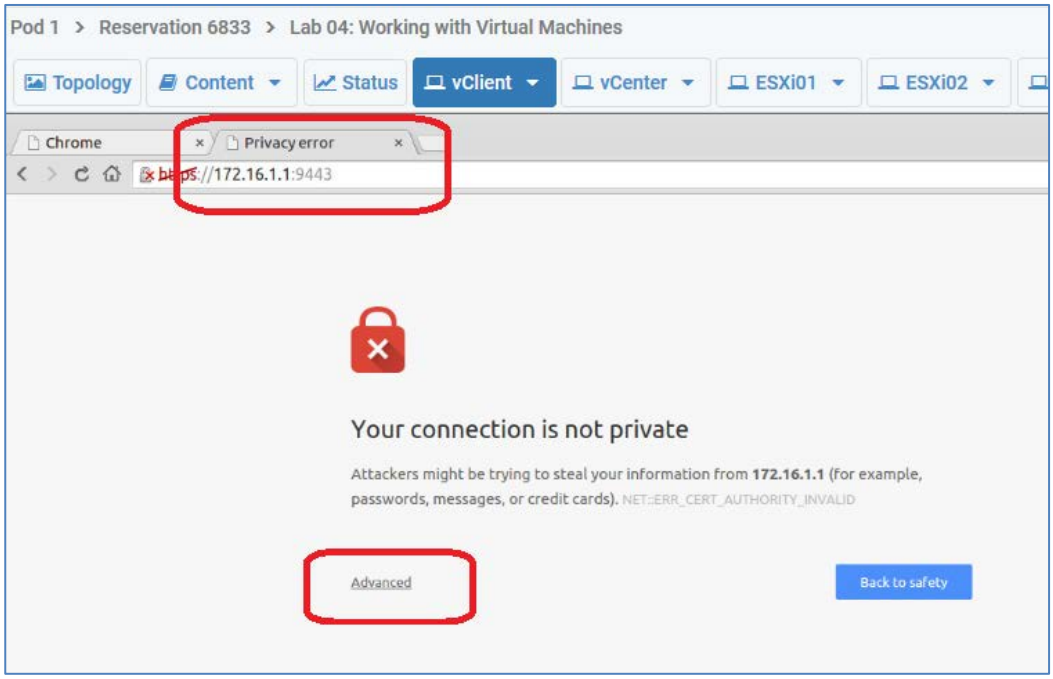
8. Select the Chrome browser in the **vclient VM** which will take you to another site.



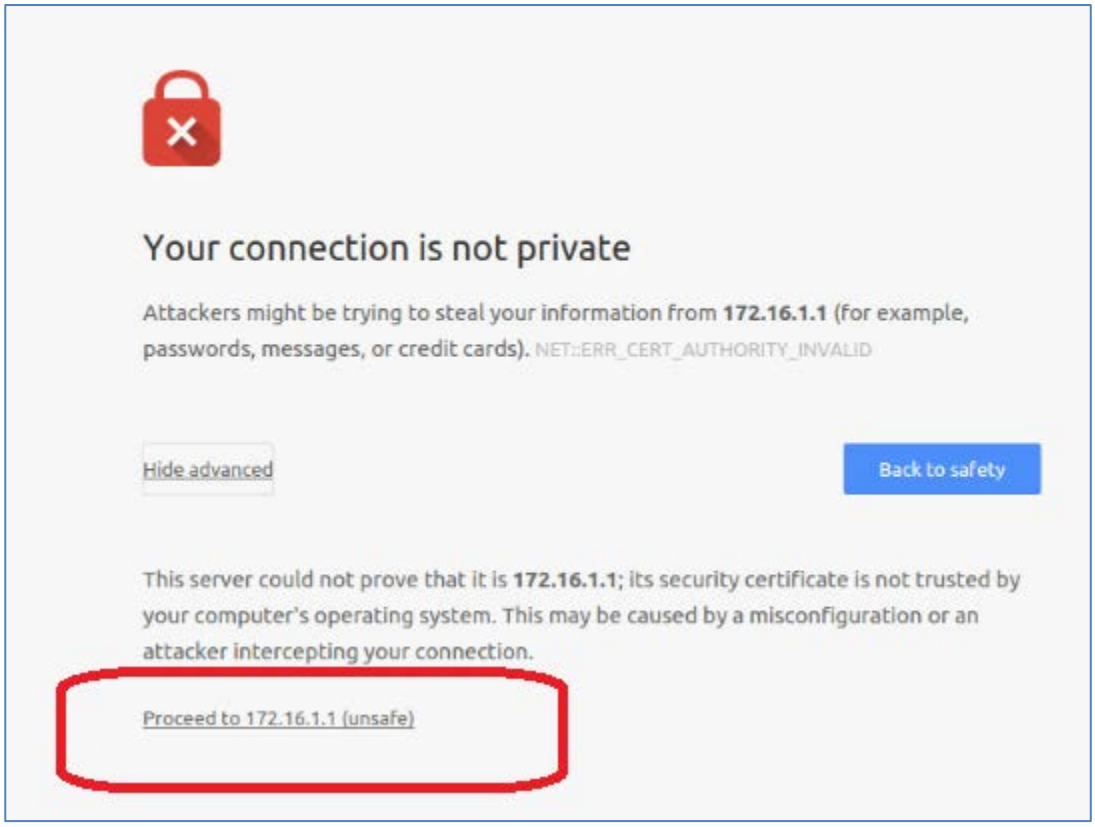
9. Login to the VMware vCenter



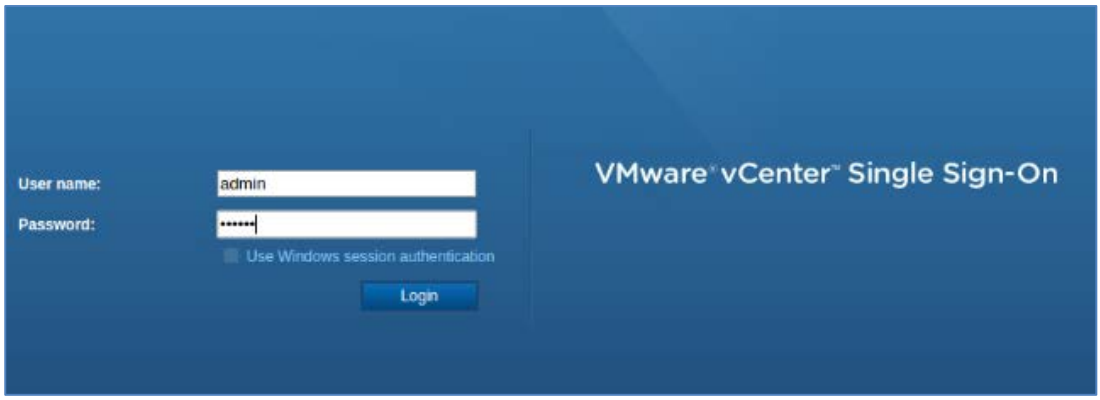
- Select **the 2nd Tab, and select Advanced**



- Select **Proceed to 172.16.1.1 (unsafe)**

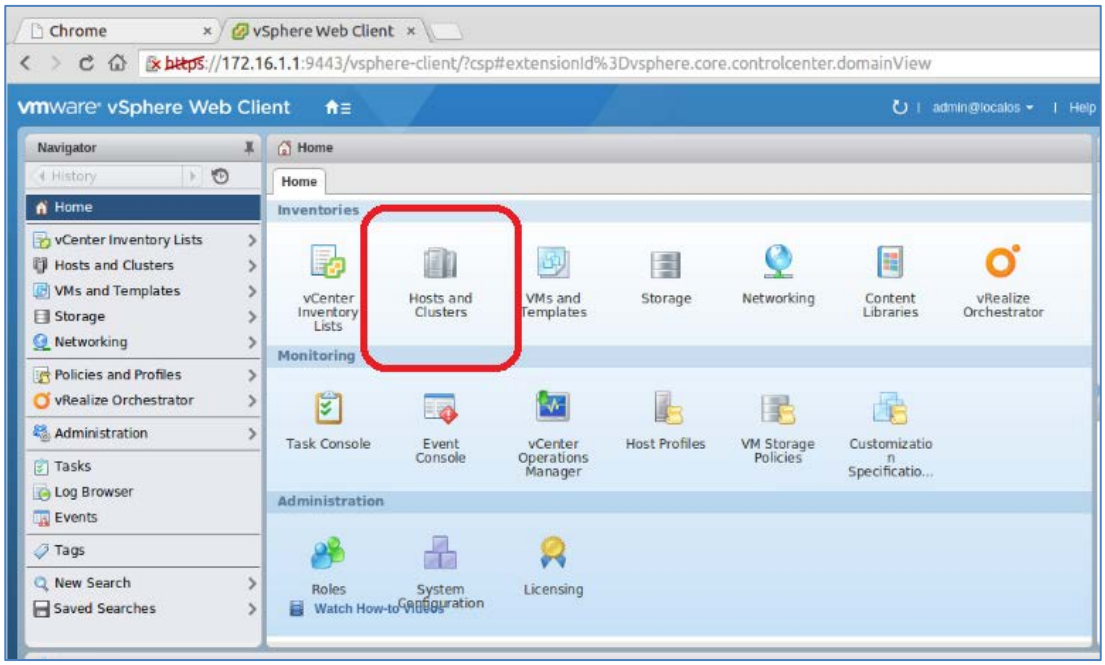


- Login to **VMware vCentre**
  username **admin**
  password **vmware**



10. Now you should see the **vSphere Web Client**

- Select **Hosts and Clusters**



- You've made it … awesome, cool ☺

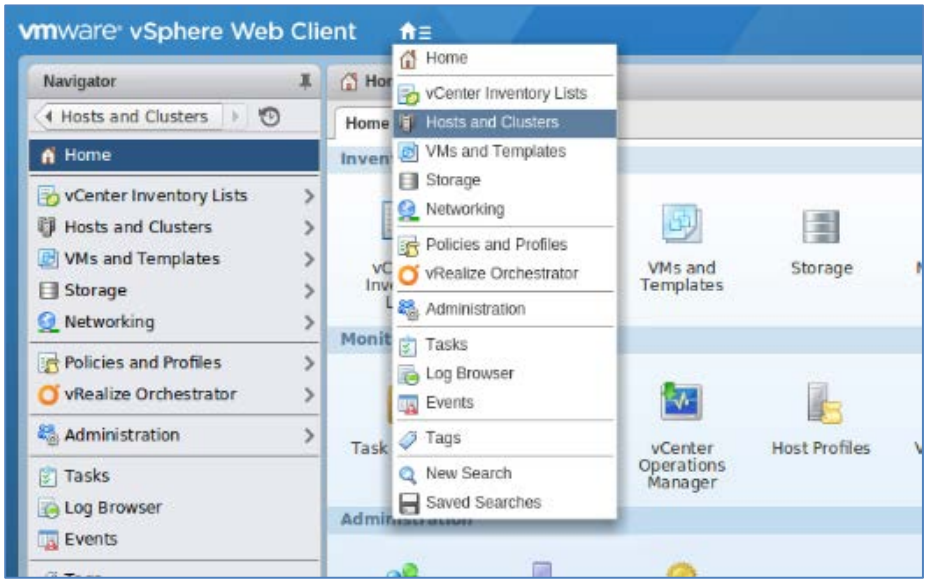
Practical Tasks

For this week's practical class, you are required to complete the following 5 Tasks.

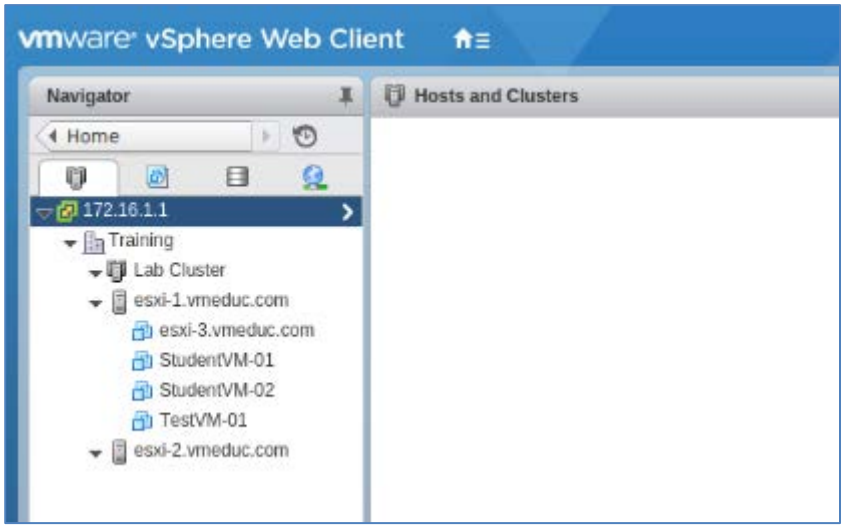
1. Create a Datacentre;
2. Create a Cluster;
3. Create a Virtual Machine (VM);
4. Create a template of this VM; and
5. Create VMs from this template.

Task 1. Creating a Datacentre

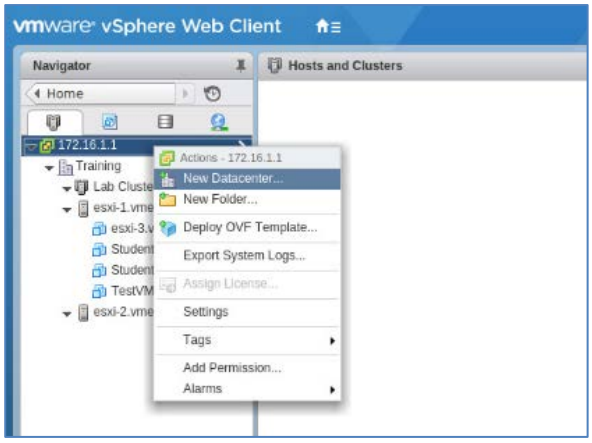
1. Hover on Home, and select **Hosts and Clusters**



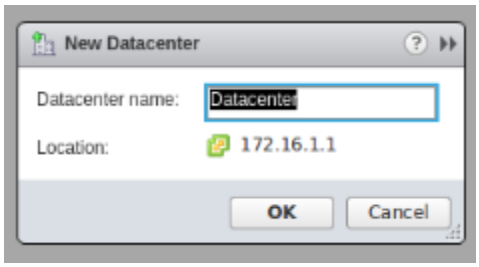
2. Select **172.16.1.1** (a vCentre Server), and expand if necessary.



3. Right button click on **172.16.1.1** and select **New DataCenter**



4. Select **OK** (leave the default values)

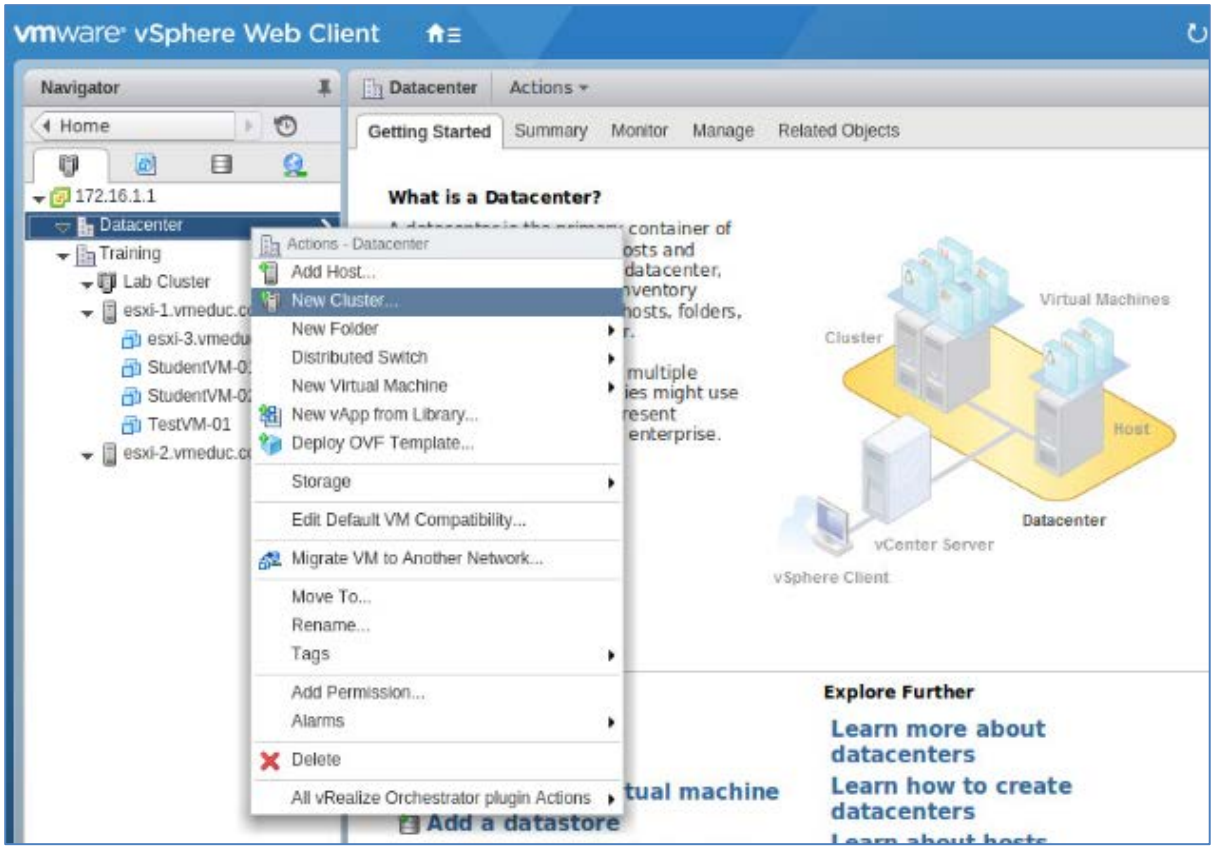


5. Cool, you've created a datacentre (but it's empty ☹)

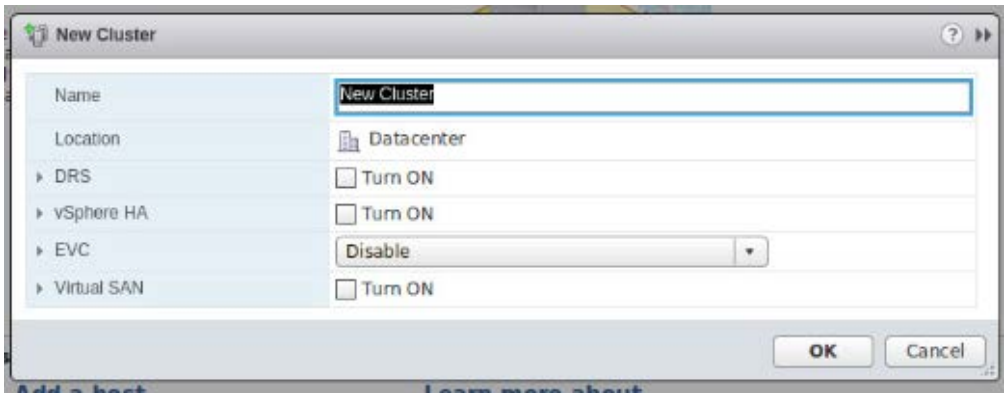
Task 2. Creating Clusters

1. Select your new **Datacentre**.

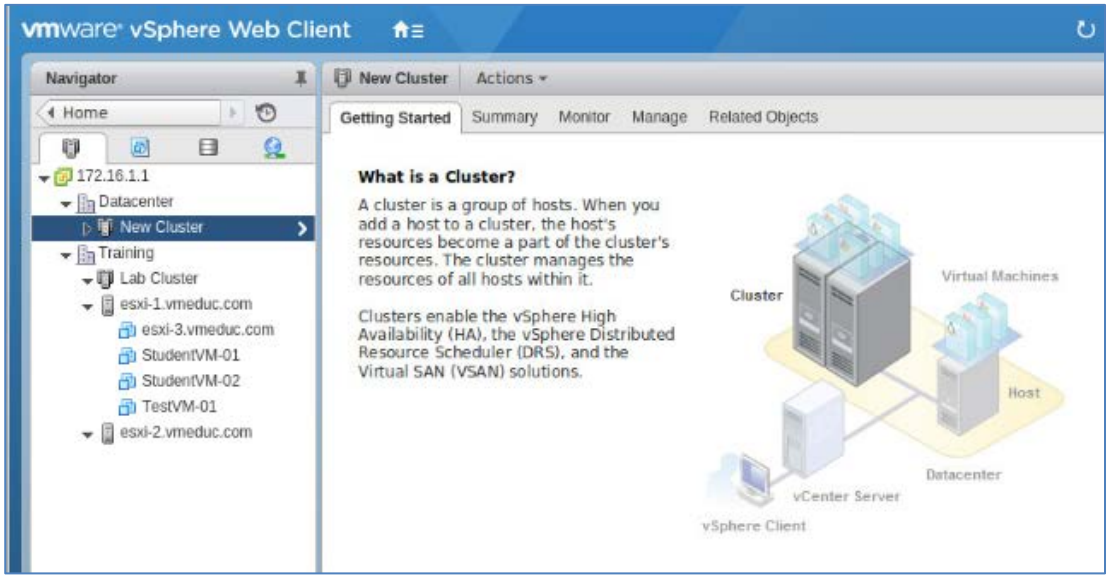
2. **Right button click** on your new datacenter, and select **New Cluster**.



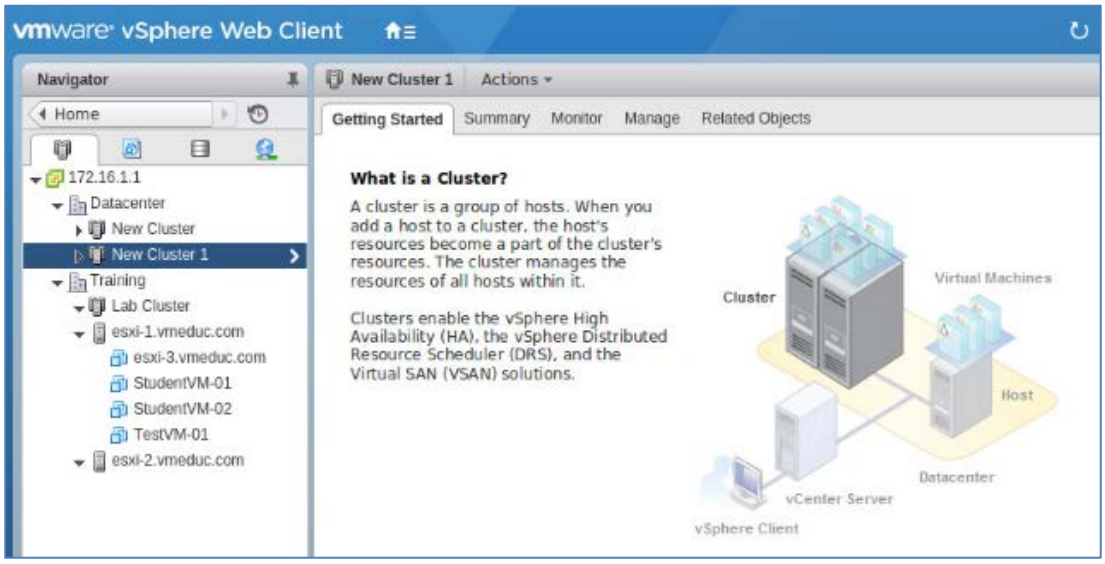
3. Select **OK** (leave the default values)



4. Cool, you've created a new cluster (but it's empty ☹).

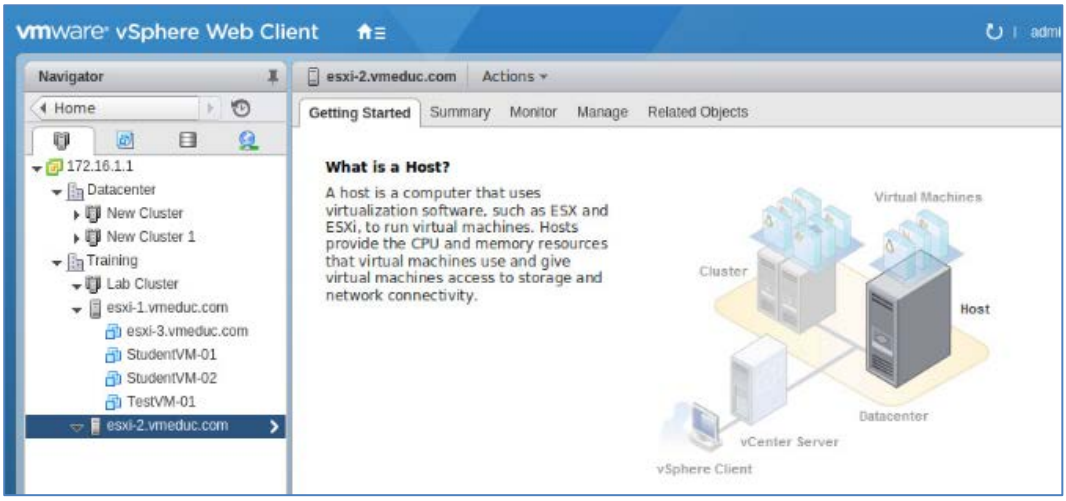


5. Create another empty cluster in your new datacentre.

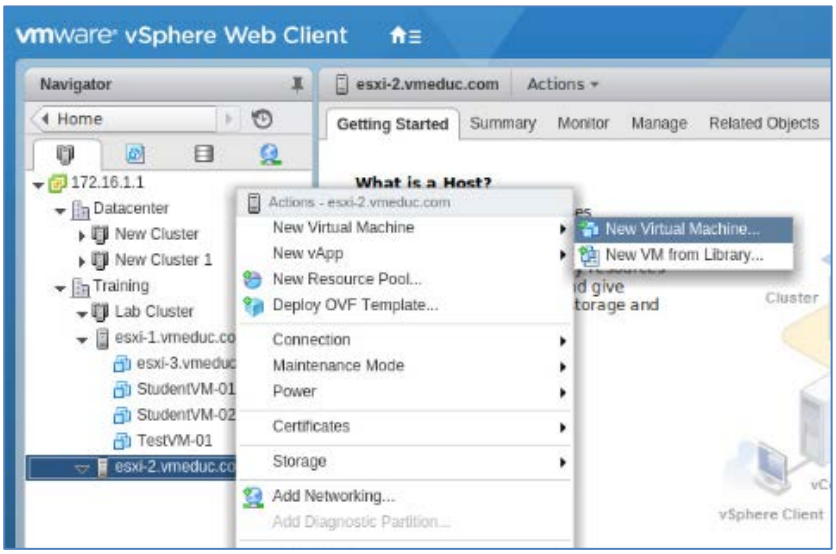


Task 3. Creating a Virtual Machine

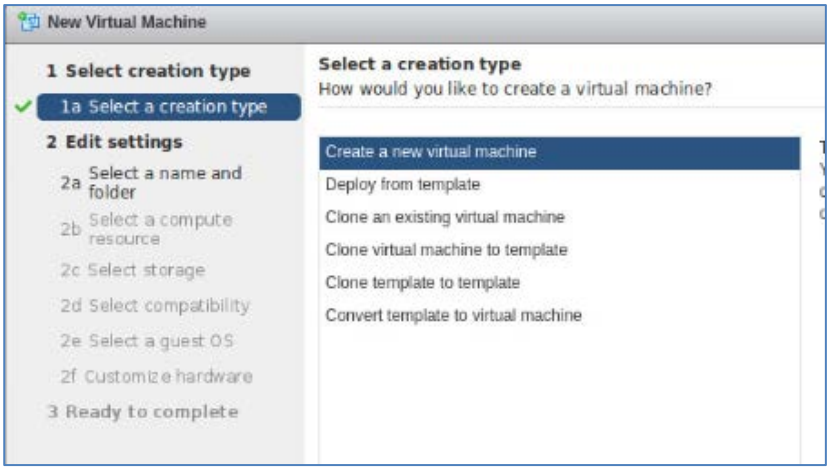
1. Select **esxi-2.vmedu.c.com** as you'll place a new VM on a host.



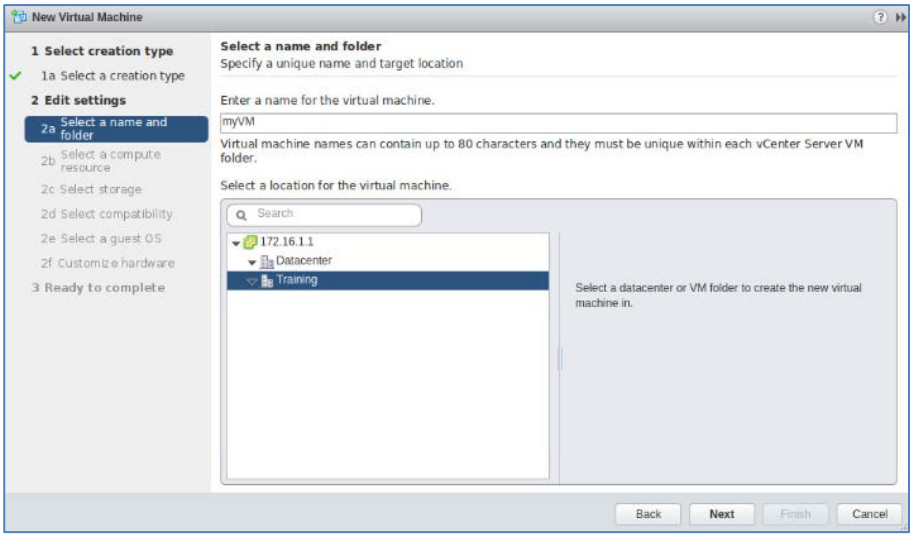
2. Right button click on esxi-2.vmedu.c.com and select New Virtual Machine, and New Virtual Machine …



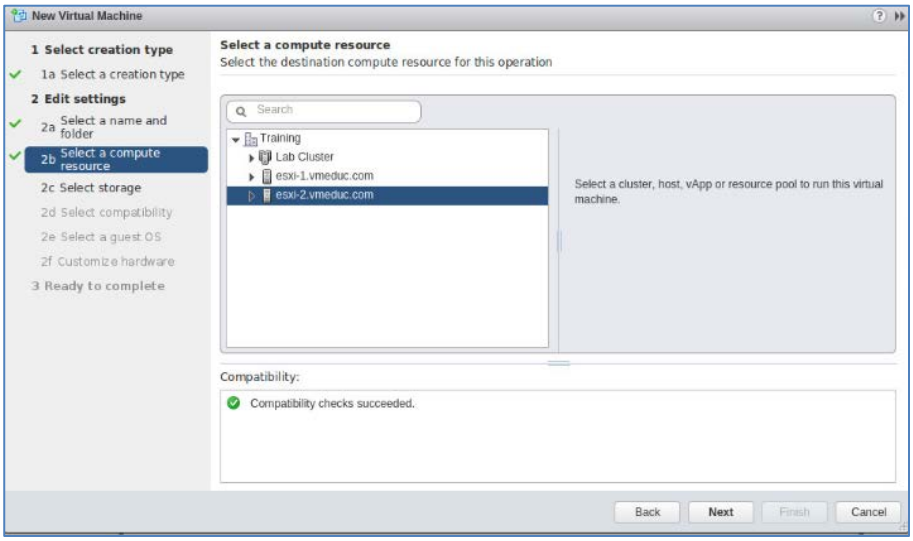
3. Select Create a New Virtual Machine, and select Next



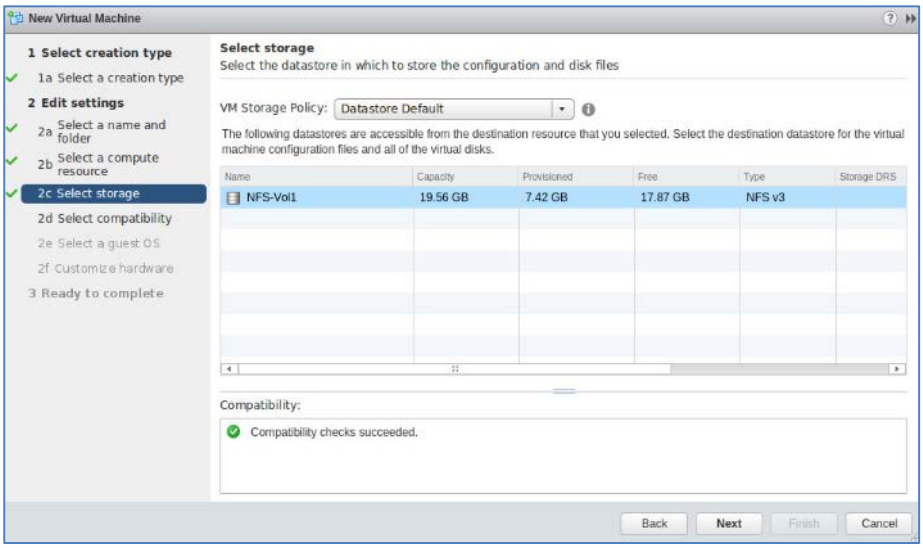
4. Type a VM name such as myVM, select the Training datacentre, and select Next



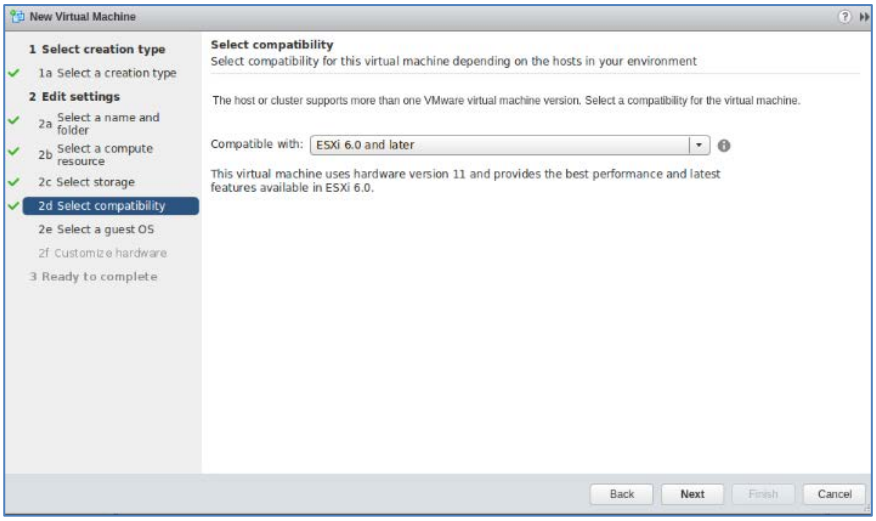
5. Select **esxi-2.vmeduc.com**, and select **Next**



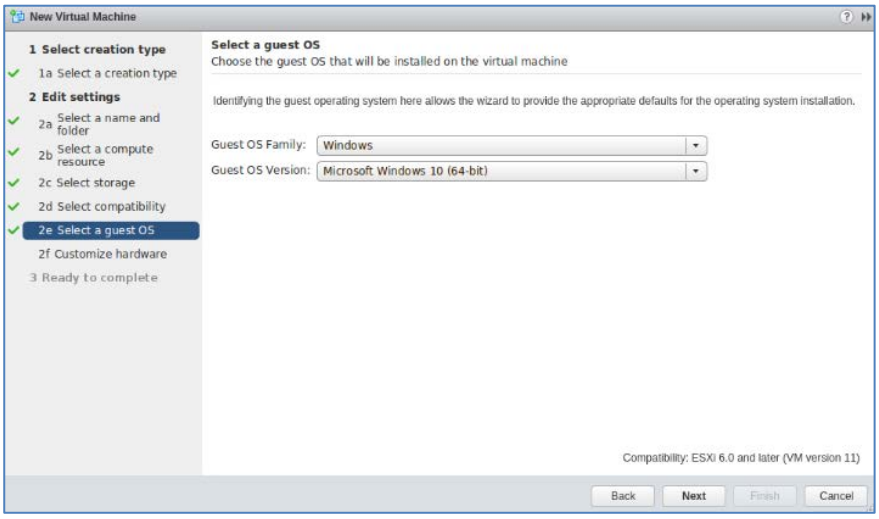
6. Select the storage NFS-Vol1, and select Next



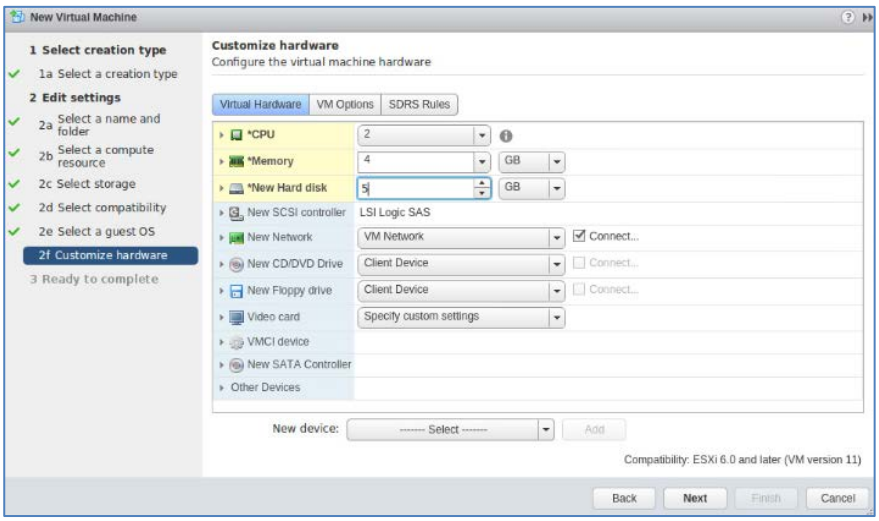
7. Select ESXi 6.0 and later, and select Next



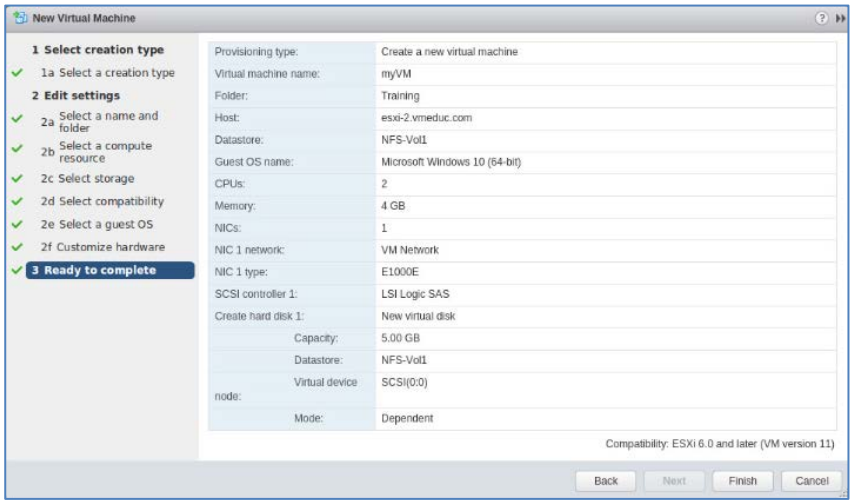
8. Select Microsoft Windows 10 (64 bit) - cool ☺, select Next



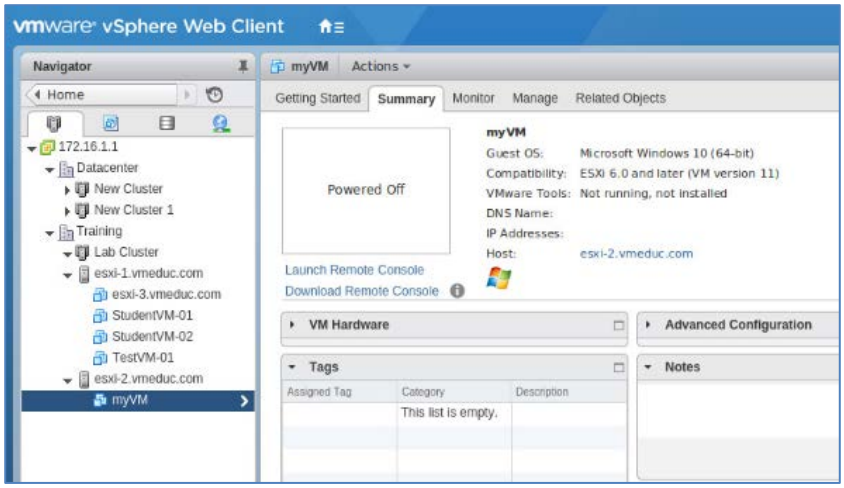
9. Select 2 core for the CPU, select 4 GB for the memory, select 5 GB for the hard disk, and select Next



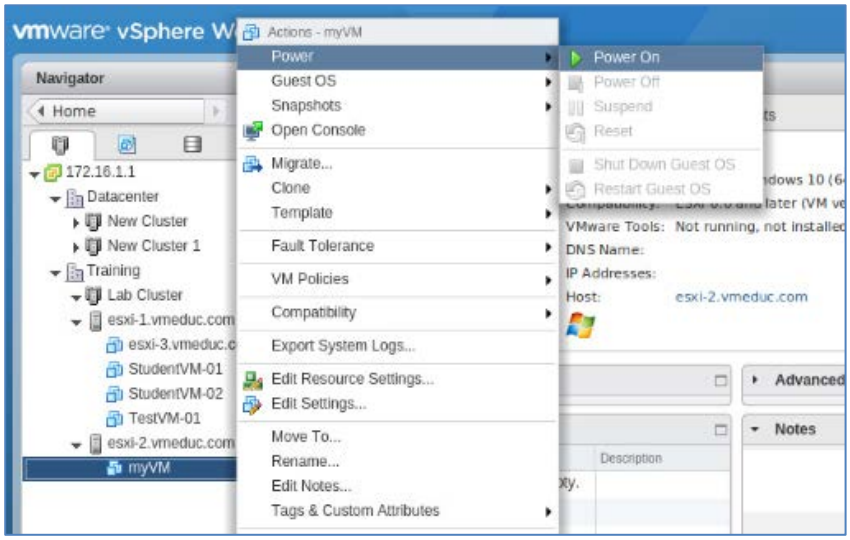
10. Select Finish on the Ready to complete page. It might take several seconds to complete this task.



11. Awesome, you made a VM

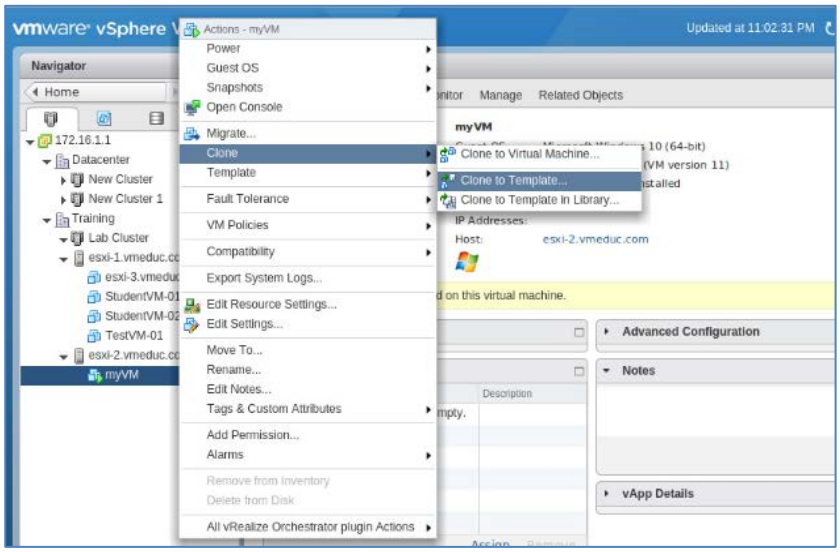


12. Check that your VM has Windows 10 on the summary tab.
13. Turn on your VM by select right button, Power, and then Power On

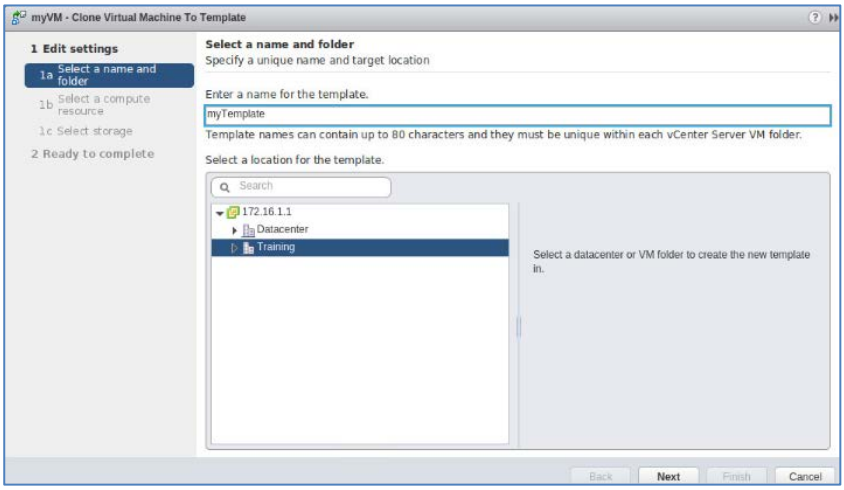


Task 4. Creating a Template of a Virtual Machine

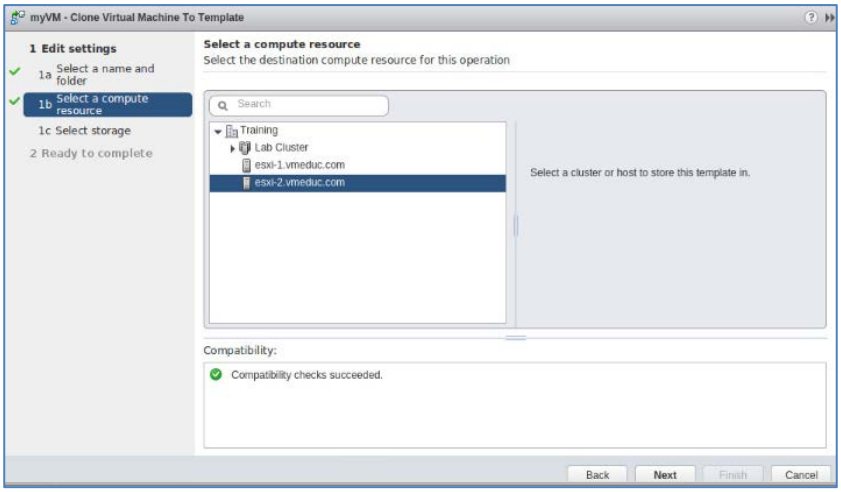
1. Right button click on your **VM, such as myVM,** and select **Clone**, and then select **Clone to Template**



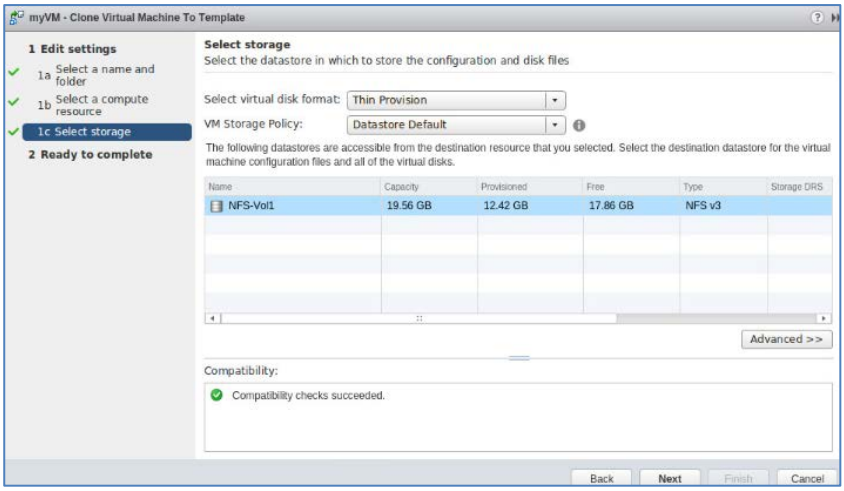
2. Type a name for your template such as **myTemplate**, select **Training**, and select **Next**



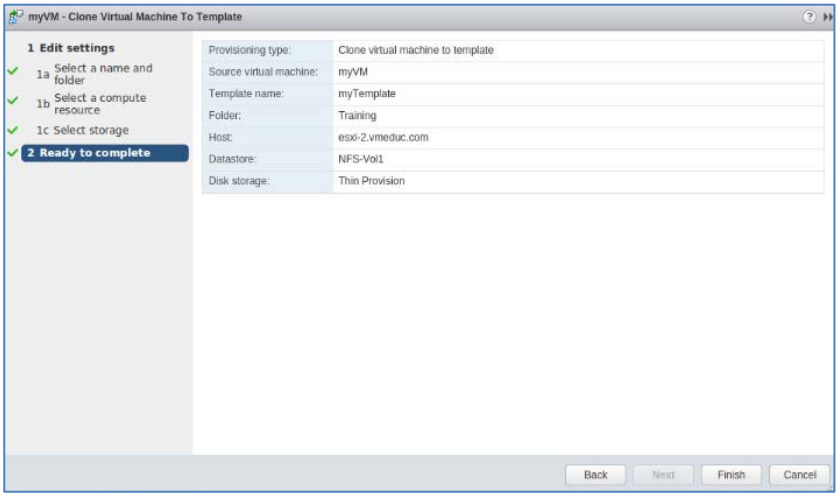
3. Select **esxi2.vmeduc.com**, and select **Next**



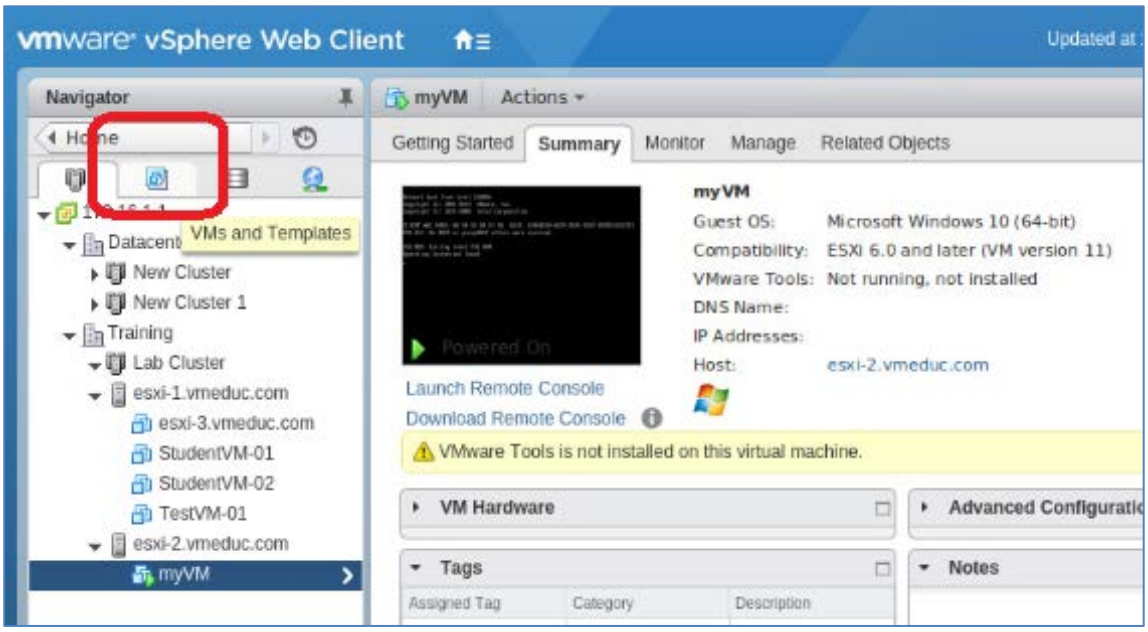
4. Select the storage **NFS-Vol1**, and **Next**



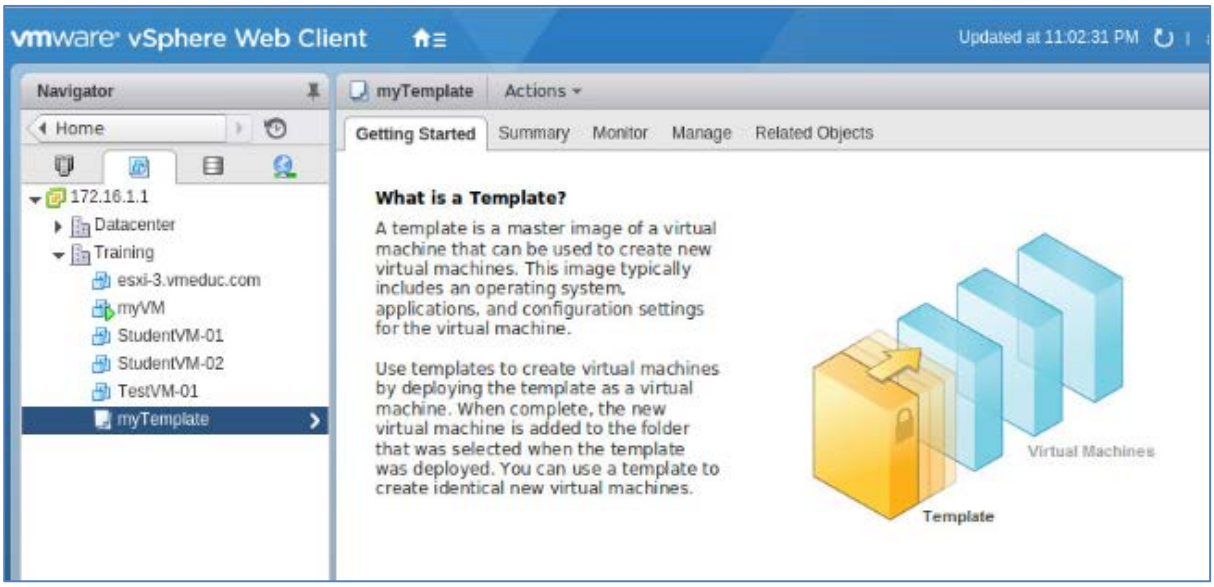
5. Select **Finish.** It might take several seconds to complete this task.



6. Select the **VM and Template** button to display your new template

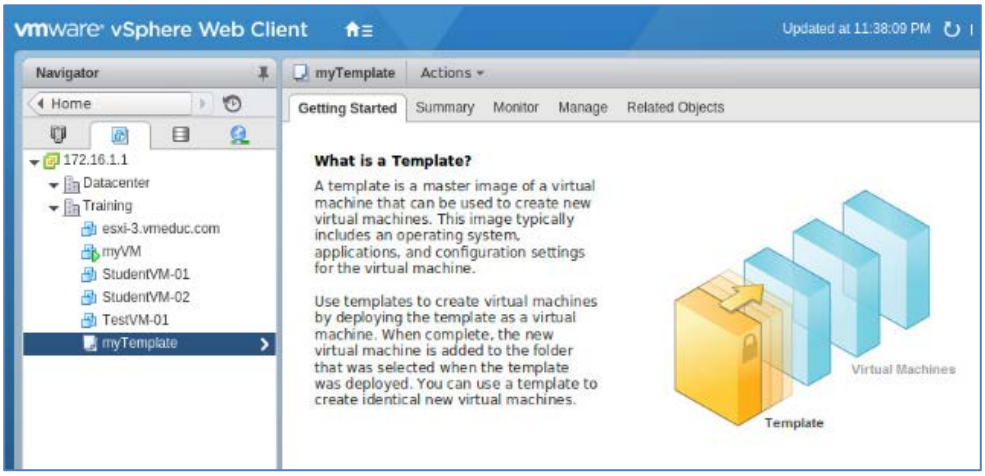


7. Cool, now you've got a new VM template.
   You can use this template to create other VMs that are just like that original VM.

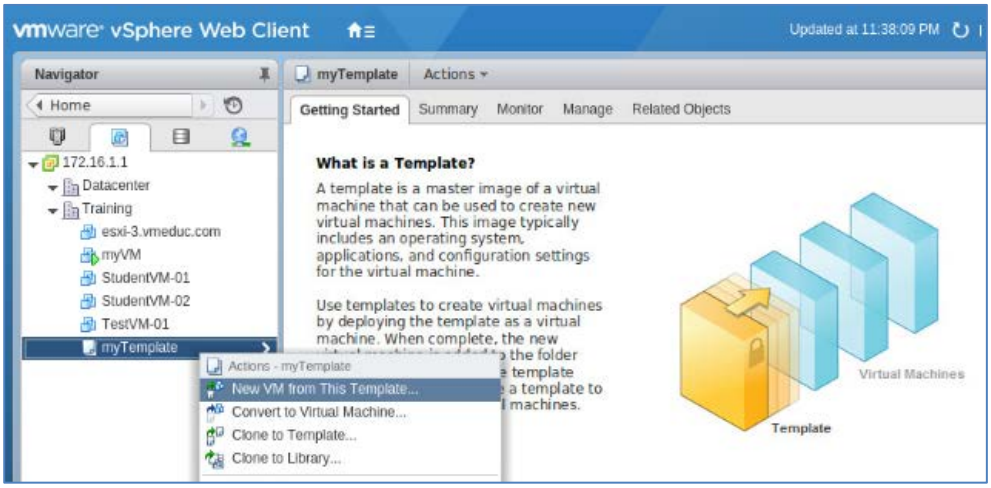


Task 5. Creating a new VM using a your template

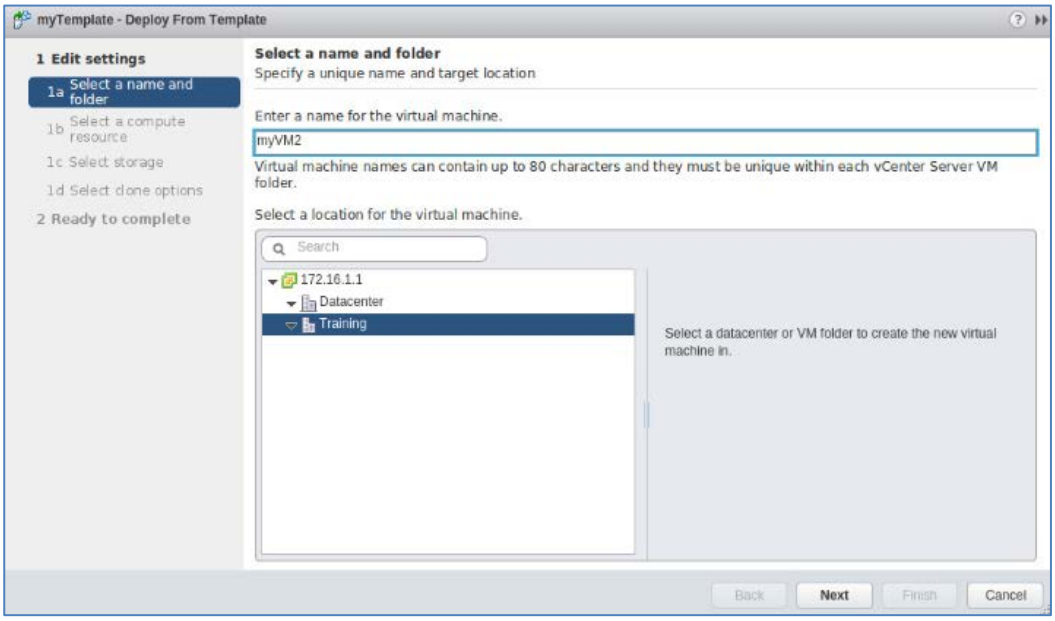
1. Select your VM template.



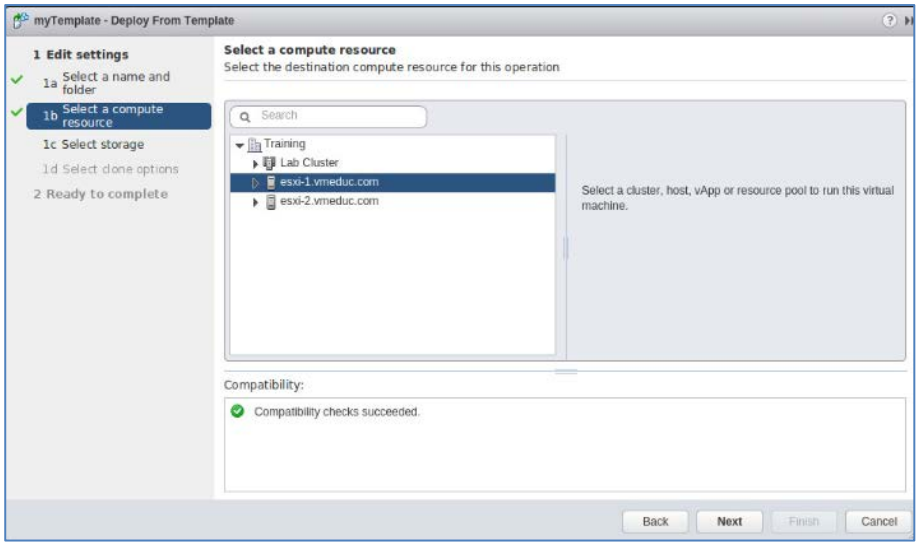
2. Right button click on your template, and select **New VM from This Template**



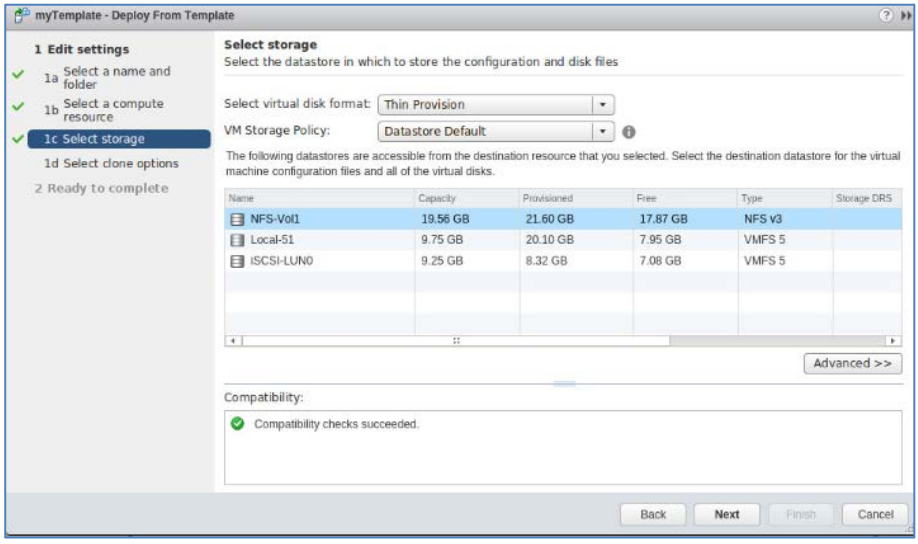
3. Type a name for your new VM such as **myVM2**, select **Training,** and select **Next**



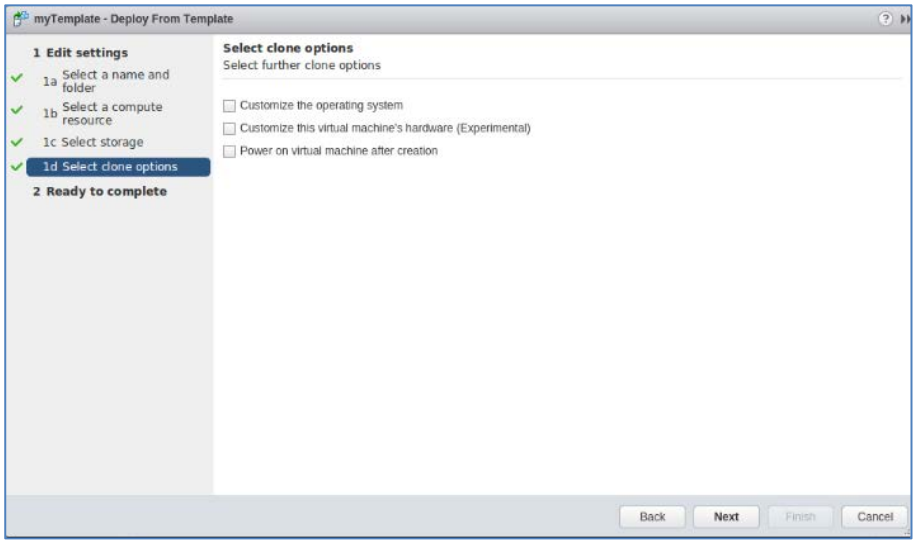
4. Select the other host, **esxi-1.vmeduc.com**, and select **Next**



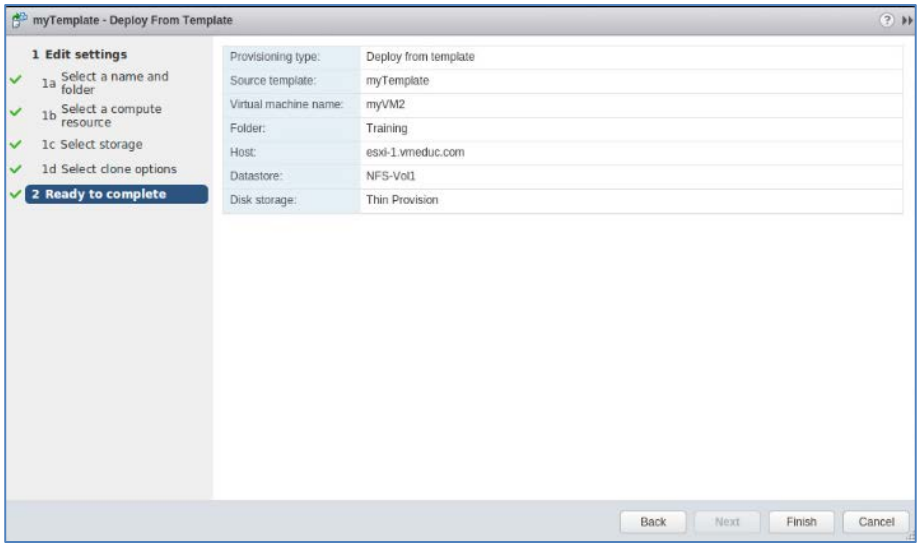
5. Select the storage **NFS-Vol1**, and select **Next**



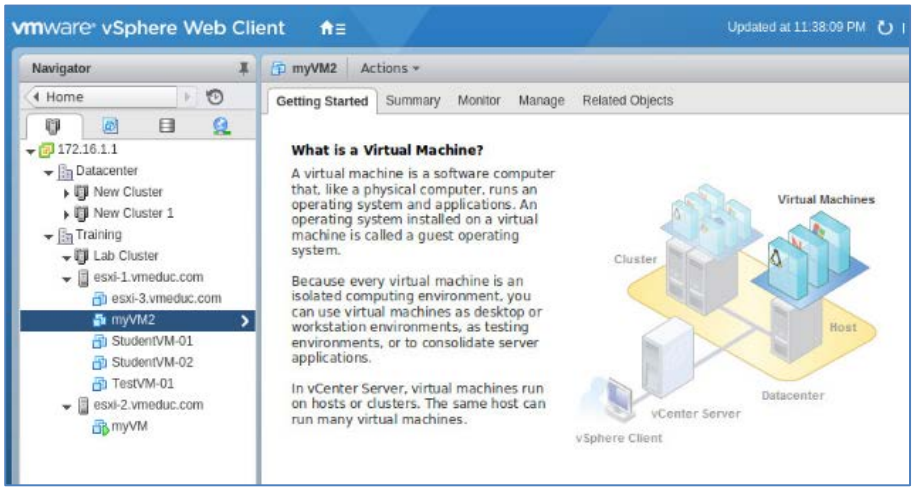
6. Select **Next**



7. Select **Finish**. It will take a few seconds to create your new Windows 10 virtual machine.



8. Select the **Hosts and Clusters** button to find your new VM.
   Your new VM, such as myVM2, should be on the host called **esxi-1.vmeduc.com**



9. Cool. So myVM2 is a copy of myVM
10. myTemplate can be used to create many copies of myVM ☺