Using Virtual Machines

We will use VMs in CIT 130 so that you can access both a Windows 7 and a Linux machine. You will be able to access these from on and off campus (off campus access will require that you install vSphere Client on your computer – vSphere Client currently only runs in Windows, you will not be able to access the VMs from off campus in either Mac OS X or Linux).

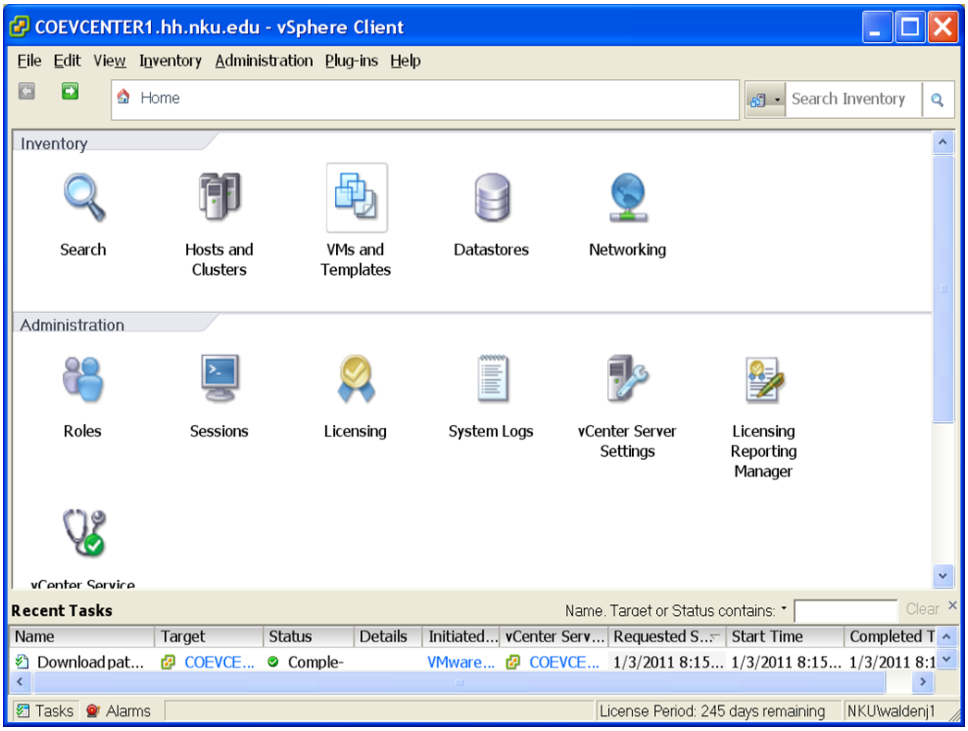
vSphere Client is available for you to install on your home computers for academic use.

1. Make a VPN connection with NKU.
2. In your web browser, go to the NKU vSphere Center.
3. Accept the SSL certificate to allow the untrusted connection to continue.
4. Click on the "Download vSphere client" link.
5. Run the downloaded executable and follow the prompts to install it.

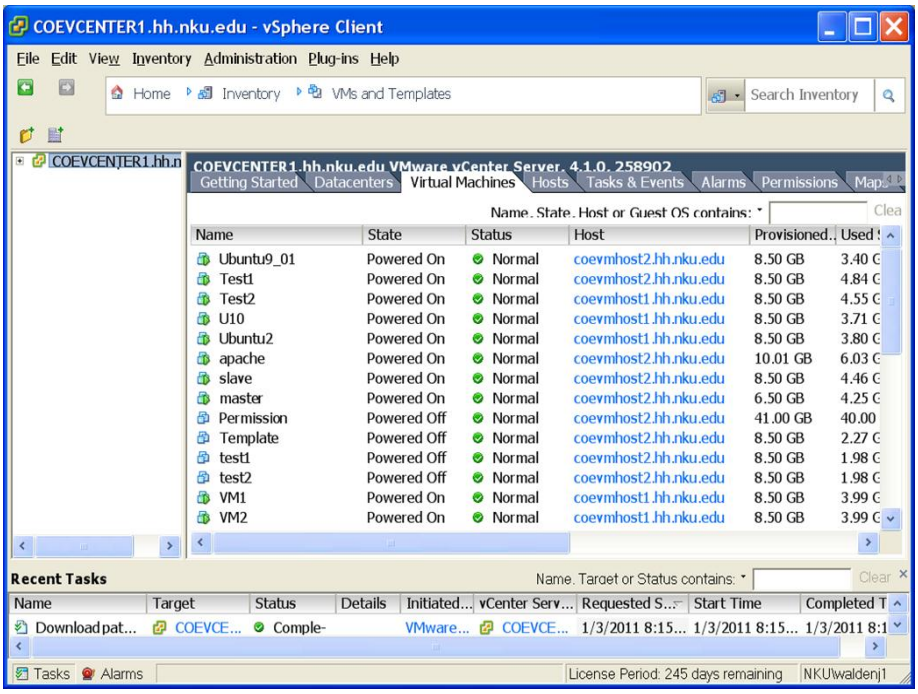
If you have trouble installing or accessing your VM, you can contact NKU's IT department for assistance: http://it.nku.edu. Click on "Service".

Finding your VM in vSphere Client

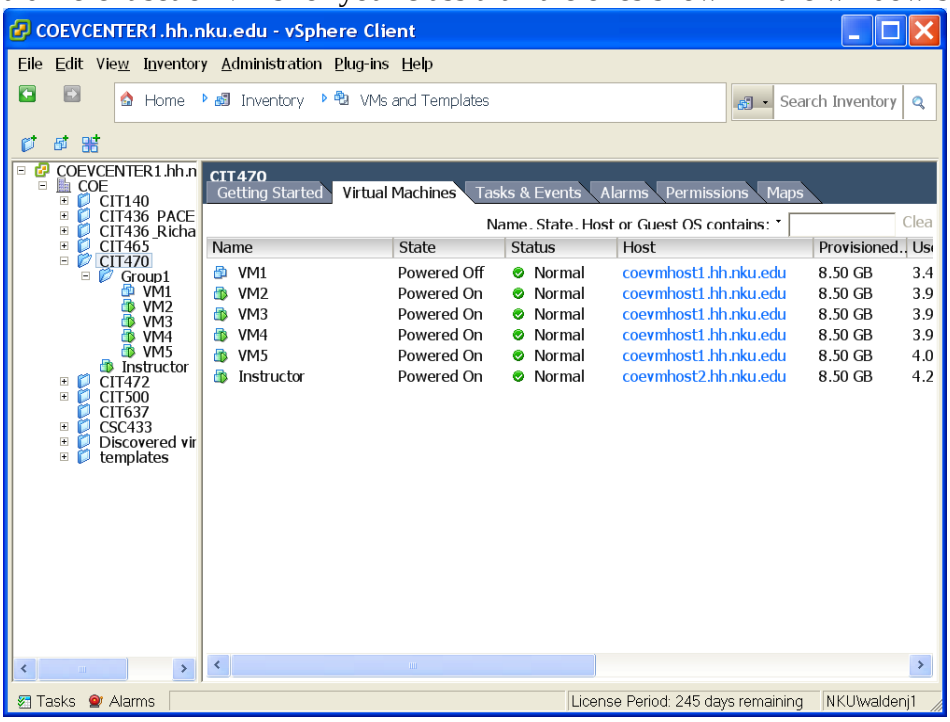
Start vSphere Client by double-clicking on its icon or by selecting it from the Start menu. When it brings up a login window, set the hostname to coevcenter1.hh.nku.edu, then login with your NKU Windows user account and password. vSphere should bring up with a window that looks like the one below.



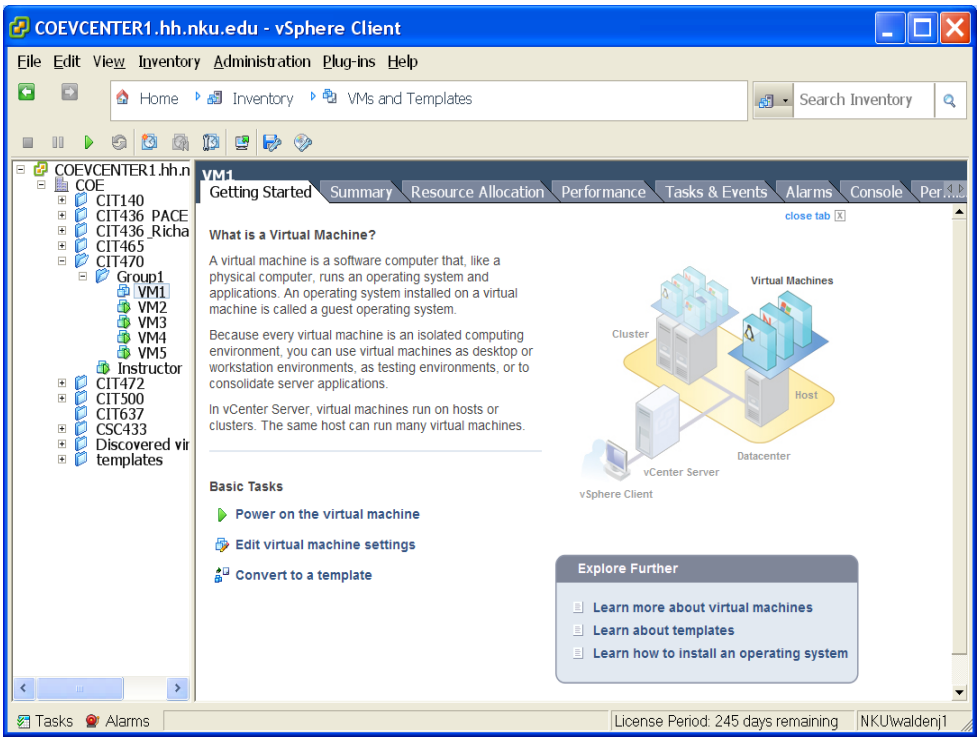
Click on VMs and Templates in this window to bring up a list. In the pane on the left, click on COEVCENTER1.hh.nku.edu to open that list, then click on COE to open the list below it.



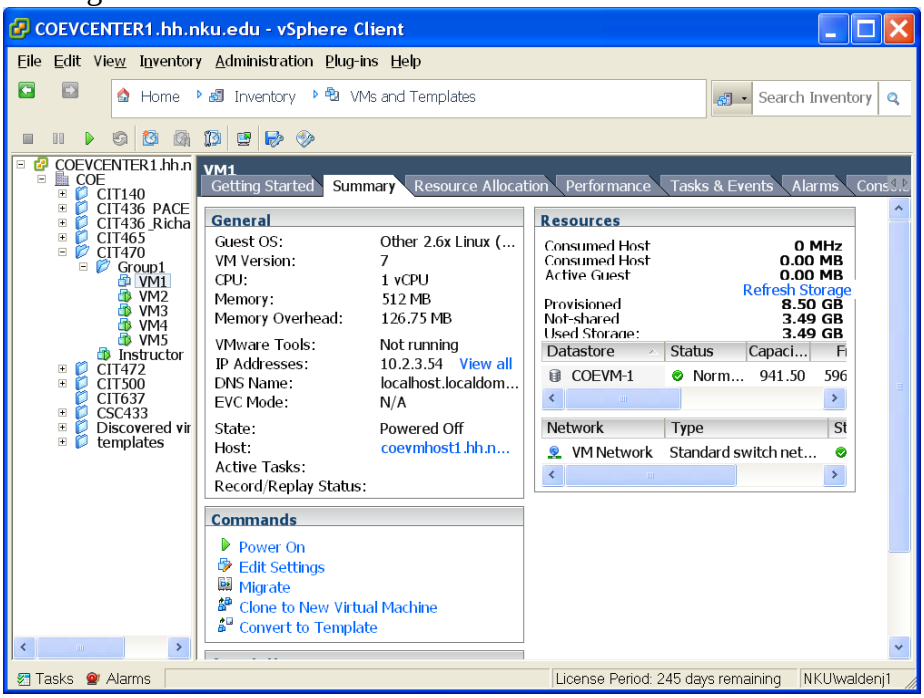
Next, click on your course number to open the list of VMs available for your class. There may be a different set of VMs for your class than the ones shown in the window below.



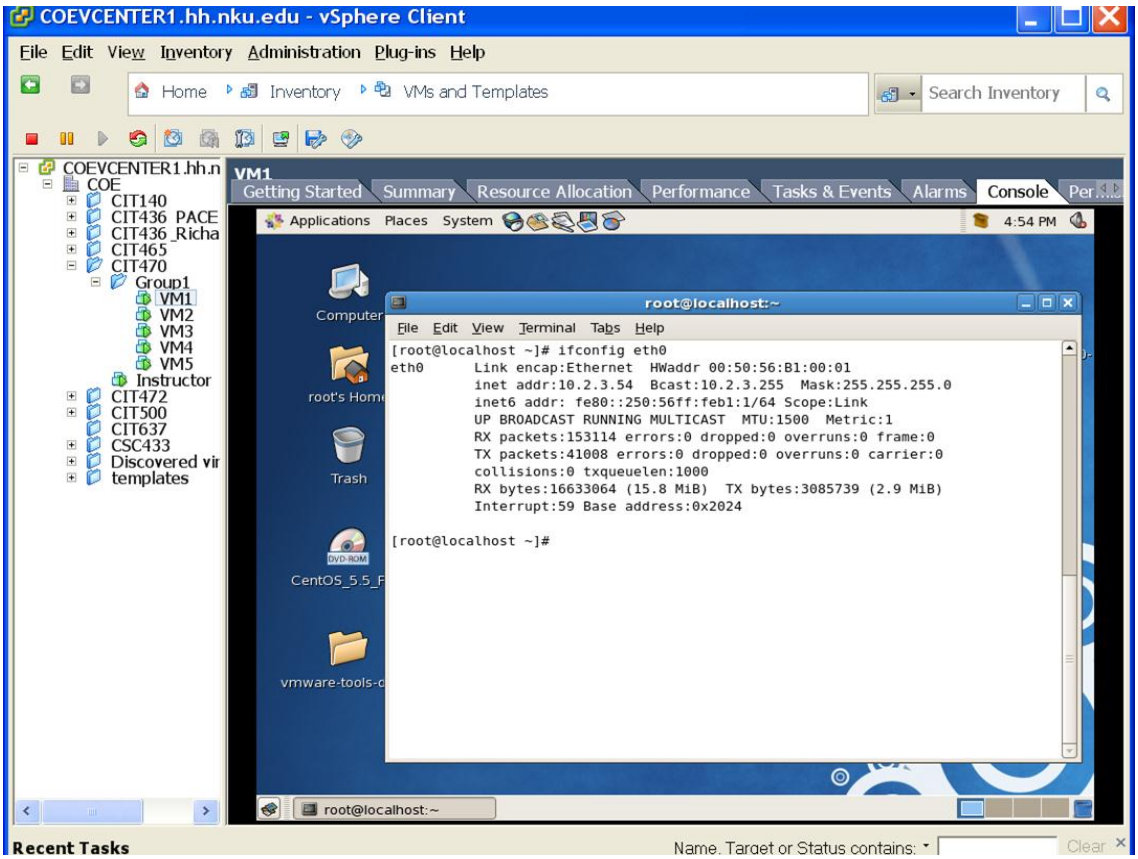
Select your VM from the list. The VM name will contain your name, your NKU username, or have another identifier assigned to you be your instructor. Once you select the VM, you'll see the window below with the Getting Started tab selected. This window is where you'll perform most actions with your VM, either using controls in the various tabs or by using controls in the toolbar above the tabs. This is where you can power on your VM.



The Summary tab will show the status and resources used by your machine. It will also list the IP address of your machine, which you can use to access your VM directly without vSphere if it is running an ssh server or web server.



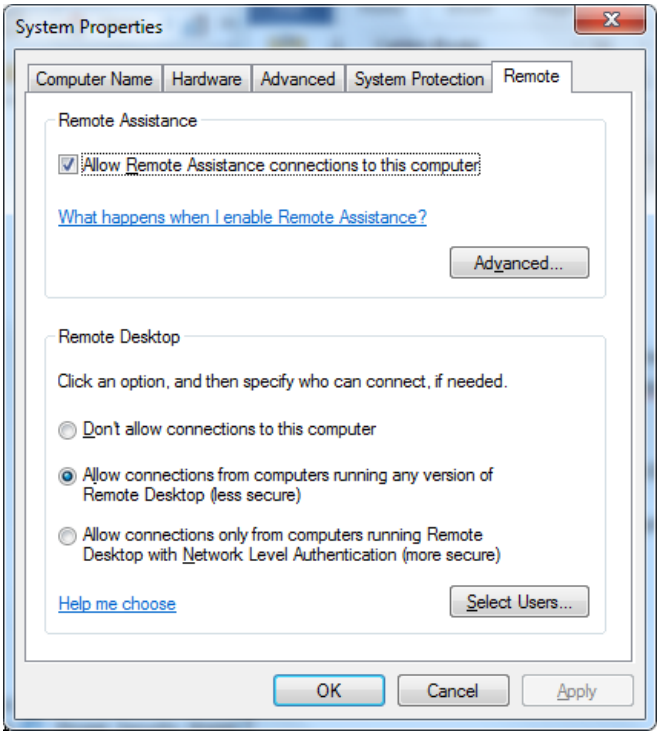
The Console tab provides a graphical console through which you can login to your VM and use it. In the example below, the user is already logged in and has started a Gnome Terminal application, in which the ifconfig command was just executed.



When you start using vSphere Client to connect to your VMs, you will probably find that the mouse cursor tracks slowly. You will get much better mouse and keyboard performance with your VM by using a *remote desktop connection*. It will also help conserve resources on our vSphere servers. This document provides information on how to use remote desktop connection. You will be able to use this to access both your Windows VM and your CentOS VM.

On your Windows VM, enable Remote Desktop

1. Go to **Start – Control Panel – System and Security – Remote settings**. You can also get here via **Start – Computer – System properties – Remote settings**.
2. Under Remote Desktop, select **Allow connections from computers running any version of Remote Desktop (less secure)** and then select OK.



3. Determine your VM's IP address. To do this, start a command window. Click Start or use the Windows hot key. Then type in cmd.exe into the search box and hit enter. When your command window opens, type ipconfig which will display your IPv4 address. Write that down.

On your CentOS VM, enable Remote Desktop

The steps here are similar to those in Windows 7. In your CentOS VM, go to the System menu and select Preferences > Remote Desktop. You will see the following pop-up window:

Check the box Allow other users to view your desktop. This will open up the remainder of the boxes. Check the box Allow other users to control your desktop and Require the user to enter this password. In the password box, enter a password that you will remember (you can use cit130 if you wish) and then click on Close.

Next, in a terminal window in your VM, su to root and enter the command /sbin/ifconfig to obtain your VM's IP address.

Finally, in your VM, go to the System menu and select Administration > Security Level and Firewall and from the pop-up window, select the Firewall Options tab (if it is not already selected). Near the bottom of the window is a selection for Other ports. Click on the text and you can now add ports. Remote desktop access is over port 5900. Click Add and from the new pop-up window, enter 5900 and click OK. Finally click on OK to close the Security Level Configuration window.

Connect to your VMs via Remote Desktop from Windows

Now that your VMs are set up, you can access either of them from your Windows 7 environment. There are separate instructions based on whether you want to access your Windows 7 VM or your CentOS VM.

From a Windows machine to your Windows VM:

1. On your local Windows system, start Remote Desktop Connection. You can find the Remote Desktop Connection program under **Start – All Programs – Accessories** (the exact sequence here may differ depending on what version of Windows you are running).
2. Enter your VM's IP address (the one you wrote down earlier) and click on Options.
3. Enter the user name for your VM which should be the same as your NKU network ID (assuming you followed your Windows installation instructions correctly.
4. Enter your password when prompted. This should be cit130.
5. Click Yes on the security warning. You can also choose to not receive security warnings for this connection in the future. That's optional.
6. At this point, if everything went well, you should be placed on the desktop for your Windows VM, except on this one your mouse and keyboard function normally.

From a Windows machine to your CentOS VM:

1. To VNC Viewer: select the Start button menu and then All Programs > RealVNC > VNC Viewer 4 > Run VNC Viewer.
2. A small pop-up window appears asking for the server, enter the IP address of your CentOS VM and click OK.
3. If you established a password, you will be asked to enter it. Once done, your VM's GUI should appear.

Once you get Remote Desktop working, you should no longer need to use the vSphere Client Console tab. The only time you should need to use the vSphere client is to start your VM. Once your VM is started, exit out of vSphere client. Access either VM from Windows 7 using the instructions above. NOTE: this works from off campus as well as long as you VPN in to NKU's network first.

By using Remote Desktop instead of vSphere, you will conserve vSphere resources which will allow more people to use vSphere and will make your own session with vSphere better. Your VM will continue to run and you will still be able to connect to it via Remote Desktop until you shut it down or it is shut down for you.

Stopping your VM is a different story. You don't normally want to stop your VM from the vSphere client. That is like hitting the power off key on your computer. You want to do a graceful shutdown. But you will probably notice that the Shutdown option is missing from the Start menu. To do a shutdown on Remote Desktop, click anywhere on the desktop and then press Alt-F4. Then select Shutdown from the dropdown list. That will gracefully shut down your VM.

Another helpful thing to know about remote desktop is that you can't hit Ctrl-Alt-Del. Your local computer will pick that up. Instead, in your Remote Desktop, you can hit Ctrl-Alt-End. This, incidentally, is another way to gracefully shut down your VM.