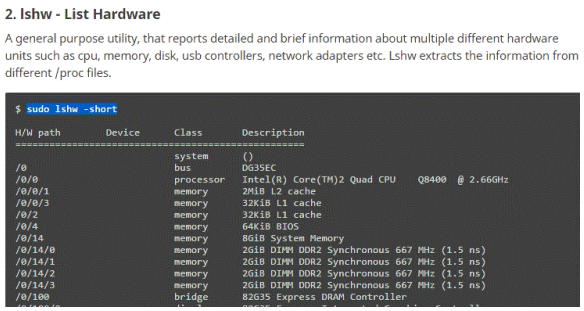
System and Networks Assignment

This document contains the steps in setting up an Ubuntu server 15.10 using Oracle Virtual Box (VM). Before you start you will need to install Oracle VM and download an ISO image of the OS you are installing. In this case Ubuntu server 15.10 for a 32bit machine. The links to obtain Oracle VM and the ISO image are located below:

http://www.ubuntu.com/download/alternative-downloads (A bit torrent may be needed here)
https://www.virtualbox.org/wiki/Downloads

Do I need a 32bit or 64bit ISO IMAGE?

To check if you have a 32bit or 64bit machine, for windows click on the start menu and then right click on “computer” or “my computer” and select “Properties”. If you are using a Linux OS you can type the following into the command line terminal “sudo lshw –short”. If you need to install this cmd use “sudo apt-get install lshw”.



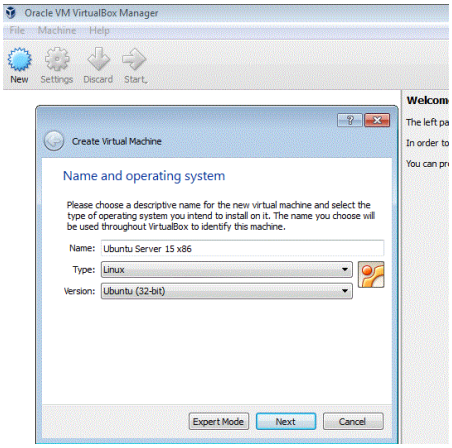
2. lshw - List Hardware

A general purpose utility, that reports detailed and brief information about multiple different hardware units such as cpu, memory, disk, usb controllers, network adapters etc. Lshw extracts the information from different /proc files.

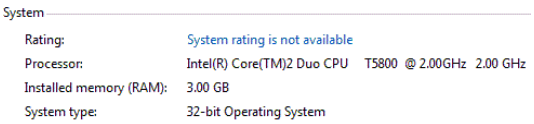
```
$ sudo lshw -short

H/W path         Device      Class       Description
=====================================================
                             system      ()
/0                           bus         DG35EC
/0/0                         processor   Intel(R) Core(TM)2 Quad CPU    Q8400  @ 2.66GHz
/0/0/1                       memory      2MiB L2 cache
/0/0/3                       memory      32KiB L1 cache
/0/2                         memory      32KiB L1 cache
/0/4                         memory      64KiB BIOS
/0/14                        memory      8GiB System Memory
/0/14/0                      memory      2GiB DIMM DDR2 Synchronous 667 MHz (1.5 ns)
/0/14/1                      memory      2GiB DIMM DDR2 Synchronous 667 MHz (1.5 ns)
/0/14/2                      memory      2GiB DIMM DDR2 Synchronous 667 MHz (1.5 ns)
/0/14/3                      memory      2GiB DIMM DDR2 Synchronous 667 MHz (1.5 ns)
/0/100                       bridge      82G35 Express DRAM Controller
```

Once you have the Oracle VM installed and the correct ISO image saved to your machine you are ready to start.

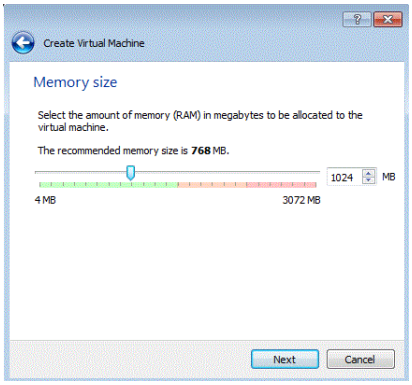
Step 1: Start up Oracle VM and select “New” on the top left to create a new virtual machine. Here you need to enter the name you want for the machine. Good practice is creating a name based on the server type. As you can see in the picture we can tell this is an Ubuntu Server v15 32bit. Set the type to Linux and version to Ubuntu (32-bit)



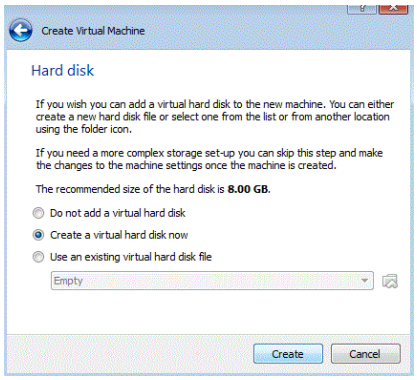
Step 2: The next step involves selecting the amount of RAM you want on your VM. Bear in mind you are restricted to the amount of RAM you can allocate to the VM by the amount of physical RAM available on your machine. Your physical RAM can also be identified in step 1; the RAM is listed as system memory. See below I have 3GB RAM on my PC.



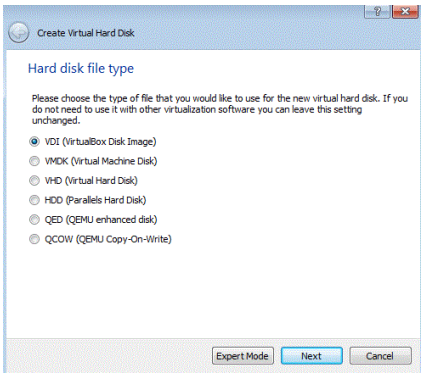
For this VM I am selecting 1024MB of RAM. You can select as low as 768MB but the machine will be very slow.



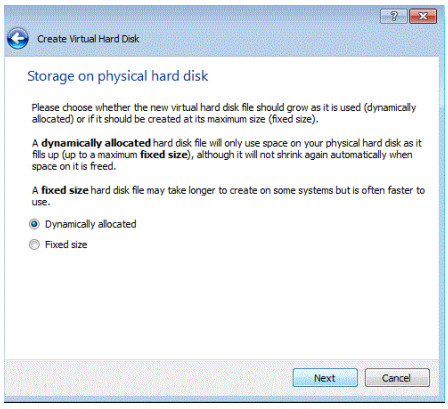
Step 3: You are now asked whether you want to create a virtual hard disk or not. As we do not have one, we need to create one.



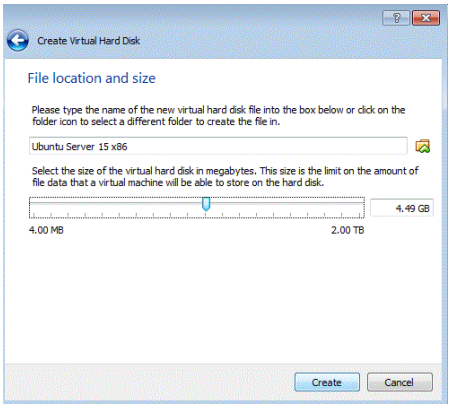
There are many options as to what type of hard drive you want. We will select VDI. You only need to worry about this if you plan to transport your virtual HD to another machine. For example VHD is a file format employed in Microsoft virtualization solution.



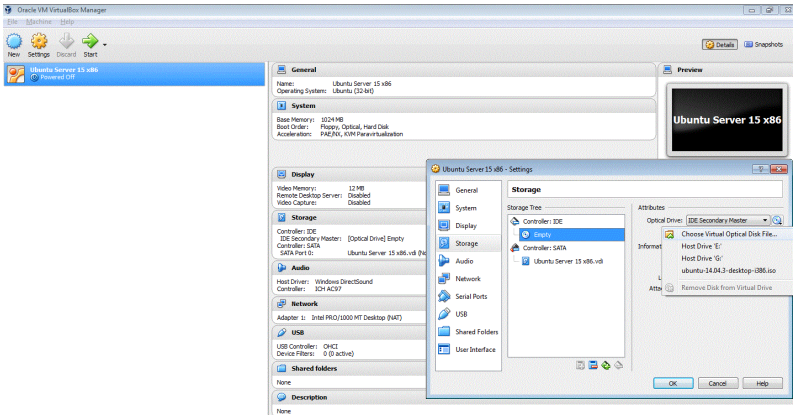
Step 4: When it comes to storing data on the VDI choose dynamically allocated. This basically means that the memory on the physical disk will only be used when needed by the VDI.

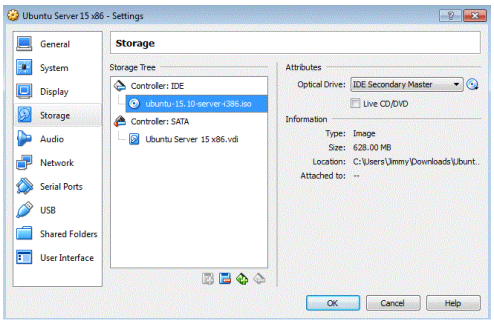


Step 5: Now we need to set a name for the VDI and allocate how much space we want. Just as with selecting the amount of RAM you need to check how much space is available on your physical machines hard drive. To check the free space on windows you need to right click on your HD in windows explorer and select properties. For Linux you can run the same CMD as when checking the RAM. I have chosen 4.49GB.

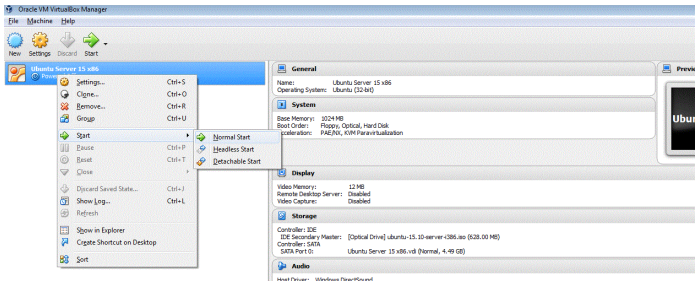


Step 6: Your VM is now setup, however we need to load the CD image for the OS you want to install before we start it up. Open the settings tab from top left and as shown below select the CD-ROM storage. To the right select optical drive and select “choose Virtual Optical Disk File...”. Navigate to the folder where you downloaded the ISO image and select it. You now have the ISO image loaded into the virtual CD drive of the VM.





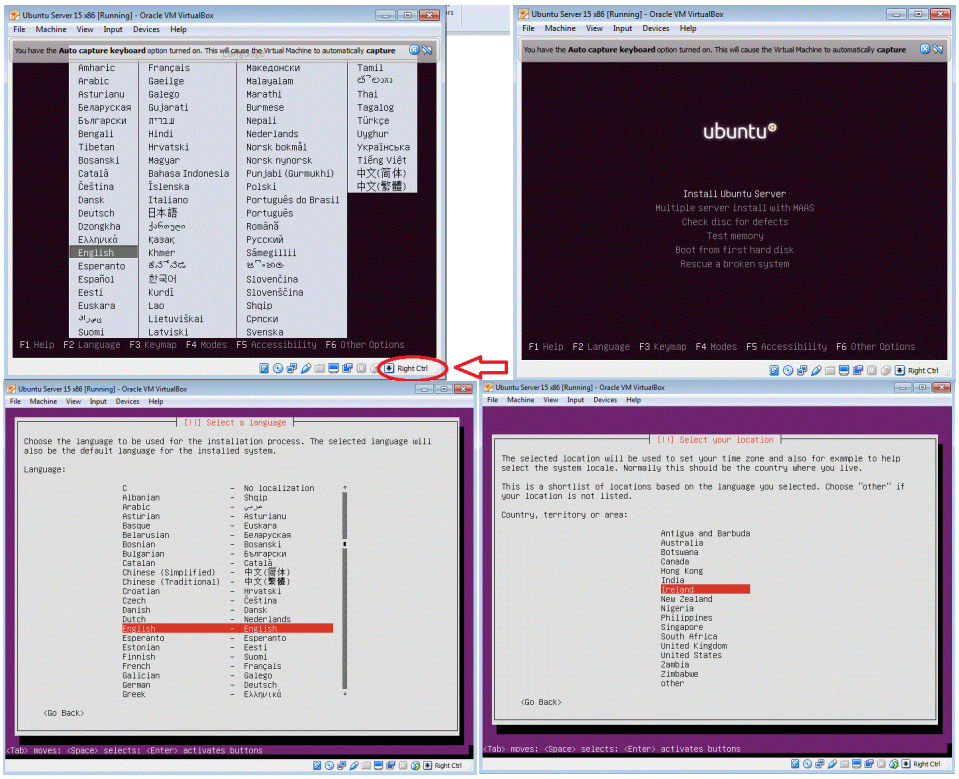
Step 7: It is now time to start the VM and install the OS. Select the VM and hit the start button from the top menu bar, or right clicking on the VM as shown below.



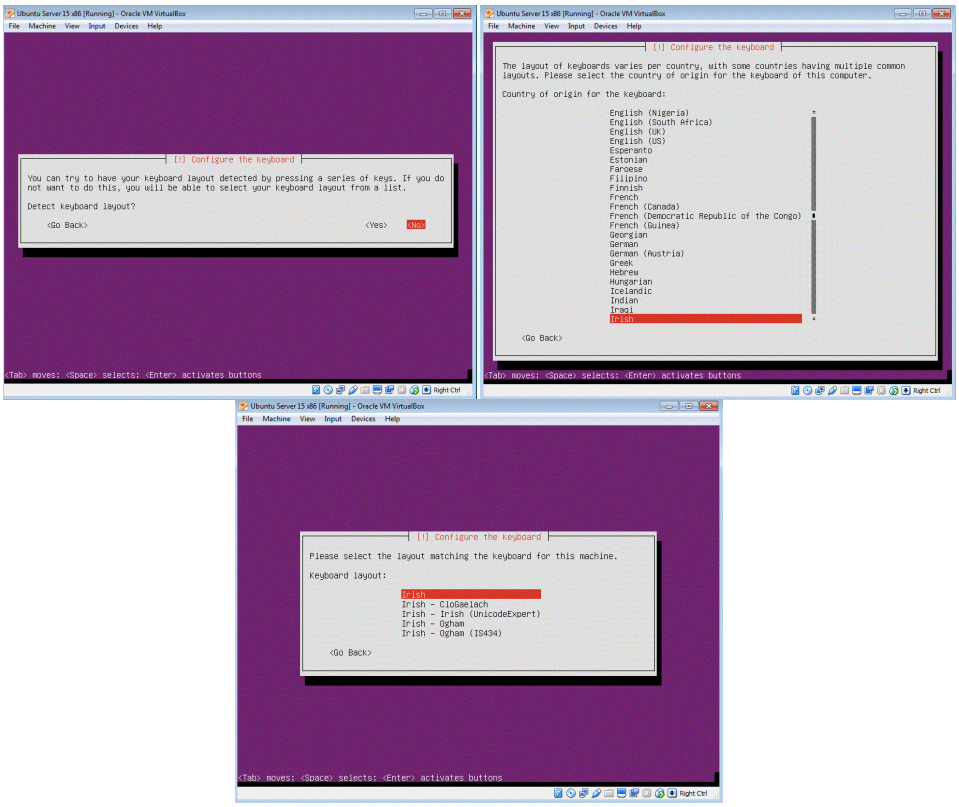
As the machine boots up it sees the IOS and starts the install wizard for Ubuntu Server 15.10. Following the options as shown below, in the first picture you can see the “right ctrl” highlighted. This allows you to switch from the VM having control of your keyboard and your physical machine.

Step 8: Ubuntu wizard to install the OS.

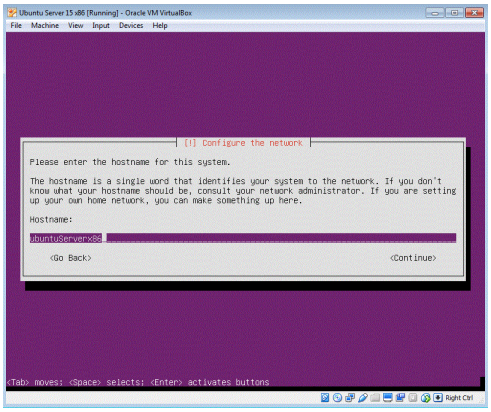
Select English, “Install Ubuntu Server”, and then the language.



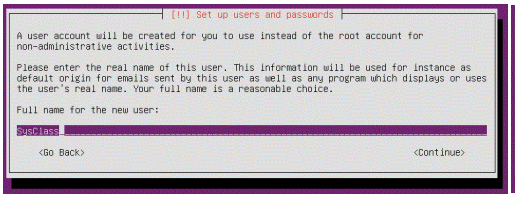
Choose to manually select your keyboard. This would be common practice as to make sure the correct keyboard is selected. Select the keyboard for you.

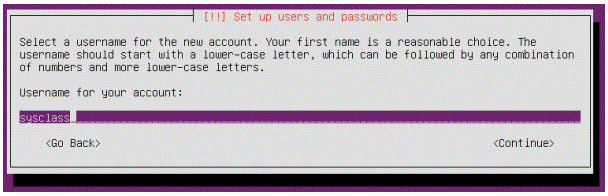


Enter the host name you want for the VM. Here I entered ubuntuServerx86

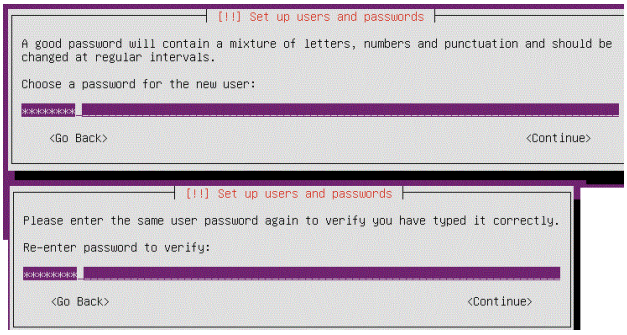


For the real name of the user account I entered “SysClass”. The username is set to “sysclass”. The username cannot have any capital letters!

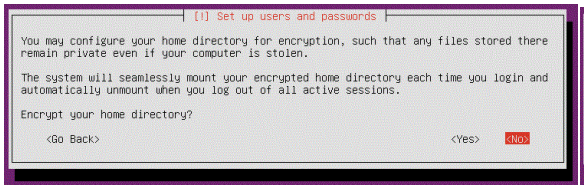


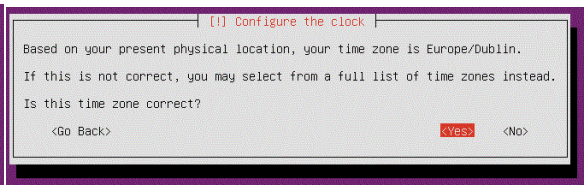


Next I set the password as “Pa$$w0rd” (This is an example Do Not Use). Enter the same again to confirm.

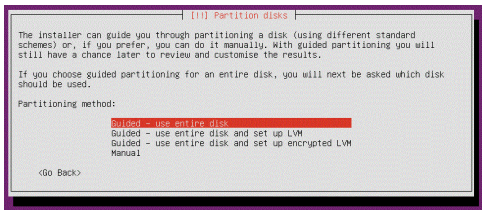


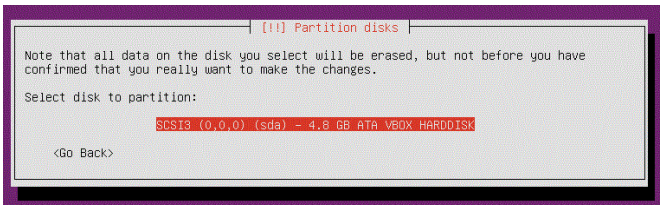
Encryption is not needed for this VM so select no. Select yes for the clock configuration as we are located in Dublin.



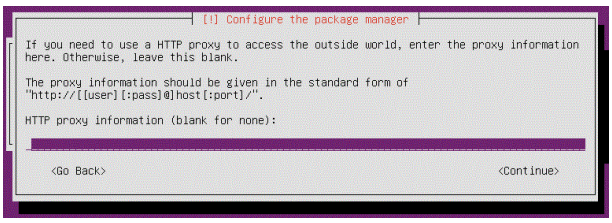


Select the first option for partitioning the disk. Select the disk to partition, there should only be one disk available which we created in Oracle VM.

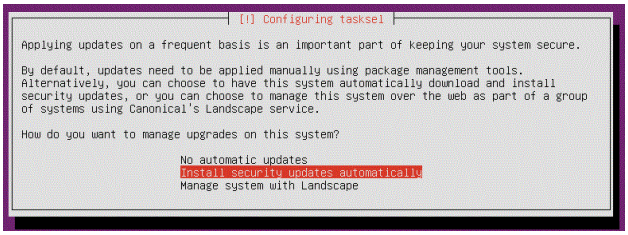




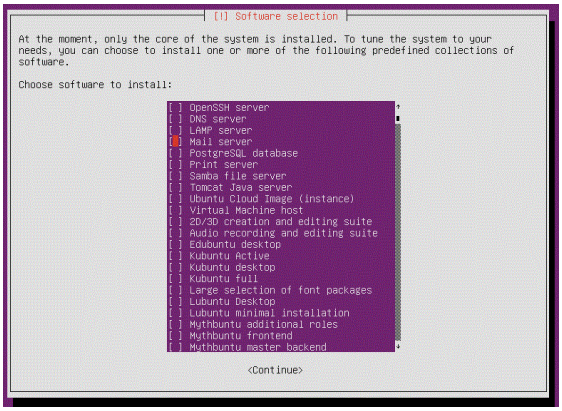
No Proxy is been used for the VM so leave blank and hit continue.



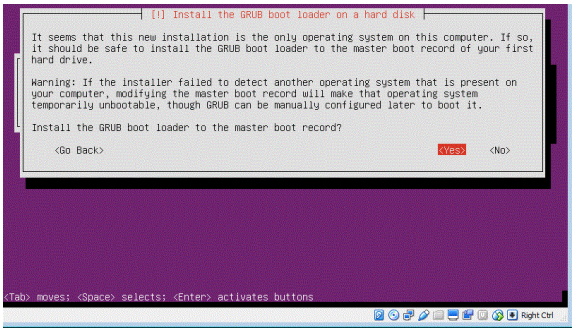
Select “install security updates automatically” to make sure our VM is always up to date.

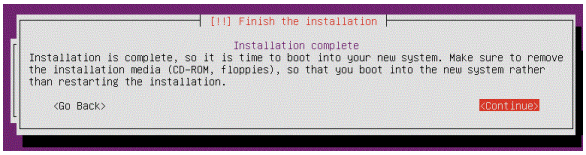


There is the option to install different software on the server. For now select none and hit continue.

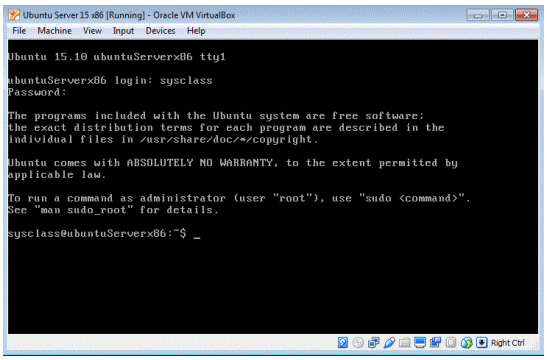


In order for the server OS to start you need to install a boot loader on the VDI. Select yes here. Now you are finished installing Ubuntu server 15.10 you can hit continue.

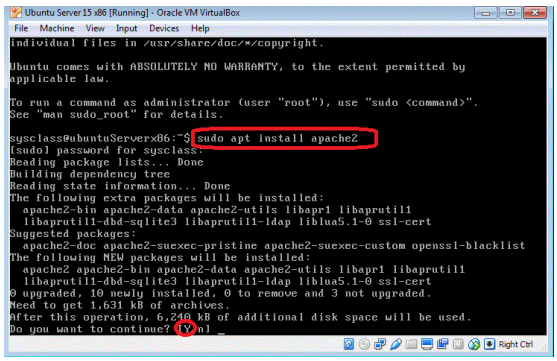




<u>Step 9</u>: The VM should boot up after you hit continue but if not you can start the VM in Oracle Virtual Box Manager making sure the ISO image is removed from the virtual CD-ROM. Below is the login screen. Enter the usname: “sysclass” and pw: “Pa$$w0rd”

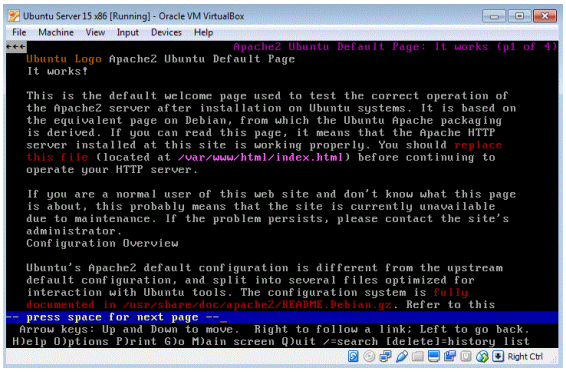


Step 10: Install Apache2 on the Ubuntu server. You can do this by entering the cmd: “sudo apt install apache2” and hit enter. You are then asked to confirm the use of the disk space. Select Y and hit enter.



To Test the Apache2 server you can install a browser and try to open the HTML file Apache created. This is located under root dir as var/www/html/index.html. Only the superuser has access to edit this file by default and we will test this later. To install a browser and test Apache run the following commands;

>> “sudo apt-get install lynx” now run >>“lynx /../var/www/html/index.html”



Congratulations. You now have a VM setup and running Ubuntu server 15.10 with apache installed.

RAM 1GB

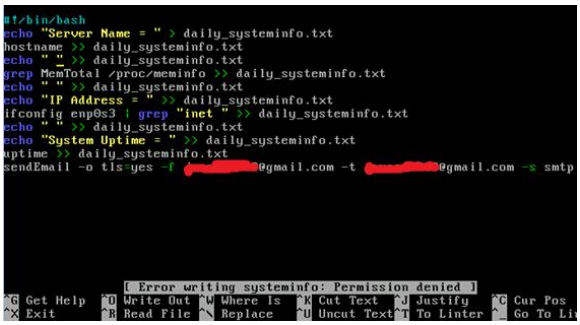
VHD (Max 4.49GB)

IP Address 10.0.2.15

Username: sysclass

Pw: Pa$$w0rd

Step 11: Create a new user called guest by entering the cmd “add user guest” after this you are prompted to enter a pw for the new account. I entered “pass” and that is it. To test, log out by entering “exit” and then log in as the new user guest. Username “guest” pw “pass”. Navigate to the path “cd /../var/www/html” and enter “sudo nano index.html”. Try to save the file after making a change and you will get an error permission denied message, see picture below. Run “ls –l index.html” and you can see the permissions setting for the file as -rw- r-- r-- which is 644. “chmod” can be used by the owner to change the permissions of a file.



Creating a batch file to send an email with system info

1: Server name “hostname”
2: Size of Ram “located in ‘/proc/meminfo’ so we use grep cmd to grab only the info for RAM”
3: IP address “ifconfig enp0s3” – enp0s3 is the name of our connection. Lo is loopback
4: Server uptime “uptime”

By using the cmd “>” and “>>” we can replace content and append content to a file.

Step 1: In the terminal of your VM enter “nano” followed by the file name you wish to create, or enter a file name you wish to edit. See below. Once finished hit left ctrl X and then save. I have created my shell script in systeminfo by entering the cmd “nano systeminfo”. This then writes to a new file called daily_systeminfo.txt

Step 2: The above is to be sent via email, with a student's name in the subject line, daily at 8am. To do this we use sendEmail as you can see I already included it in the previous pic above. The three commands below will install the sendEmail plug-in and also the TSL/SSL (secure socket layer) libraries needed to use a secure connection.

sudo ap-get install sendemail
sudo ap-get install libnet-ssleay-perl
sudo apt-get install libio-socket-ssl-perl

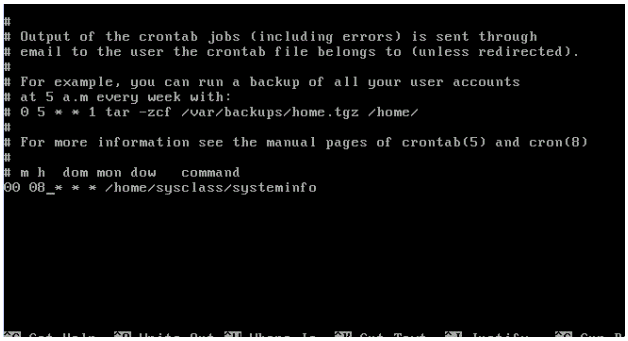
Next with the below commands we can send an email with a message containing the text from our file. Below are the options for the sendEmail command:

"-o tls=yes" Use this to require TLS for message delivery.
"-f xxxxxx " Details for the From address.
"-t xxxxxx " Details for the To address.
"-s xxxxxx:000" Details for the mailserver and port number to use.
"-xu xxxxxxx" The username to login to the mail server.
"-xp xxxxxxx" The password for the user.
"-o message-file= xxxxxxxxx" Selecting a file path to the txt file to populate in the mail.
"-u xxxxxxxxxxxxxxxx" This will populate the subject line in the email.

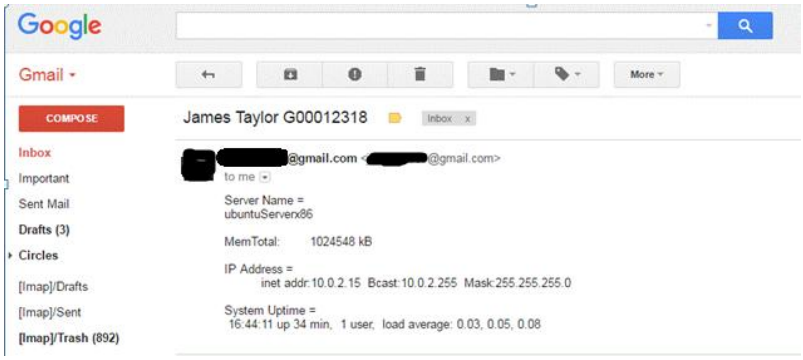
Note for Gmail you need to set "Allow less secure apps: ON" under account settings, sign-in and security!! Below is the command used in the systeminfo bash job:

sendEmail -o tls=yes -f xxxxxxxxxxxxxxxxx@gmail.com -t xxxxxxxxxxxxxx@gmail.com -s smtp.gmail.com:587 -xu xxxxxxxxxxxxxxxxx@gmail.com -xp xxxxxxxxxxx -0 message-file=/home/sysclass/daily_systemminfo.txt -u "James Taylor G00012318"

Step 3: To schedule the email to run at 8am daily. This is simply enough to do. crontab is used for this. As some of the code needs sudo access we will edit the crontab in sudo. Enter the following code "sudo crontab –e" to enter edit mode. The format to follow is;
Min(xx) Hour(xx) day of month(xx) day of week(xx) and path to the shell script.
**Important to have only one space between each entry!!
I entered the below.. "00 08 * * * /../home/sysclass/systeminfo" The * symbol means any so this will run any date, any month, and day at 08:00am.



To run the bash file enter the path to its location like so >> “/../home/sysclass/systeminfo”. You can then check the email address to which the mail was sent to check it was received. Once successful the next step is to test the scheduler in crontab. Set in crontab a time 2min from now and wait. Once the time has passed check the inbox again to confirm. As you can see in the screen of my inbox this was successful.



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