Getting Started with Linux Development

VB-Linux on your Laptop

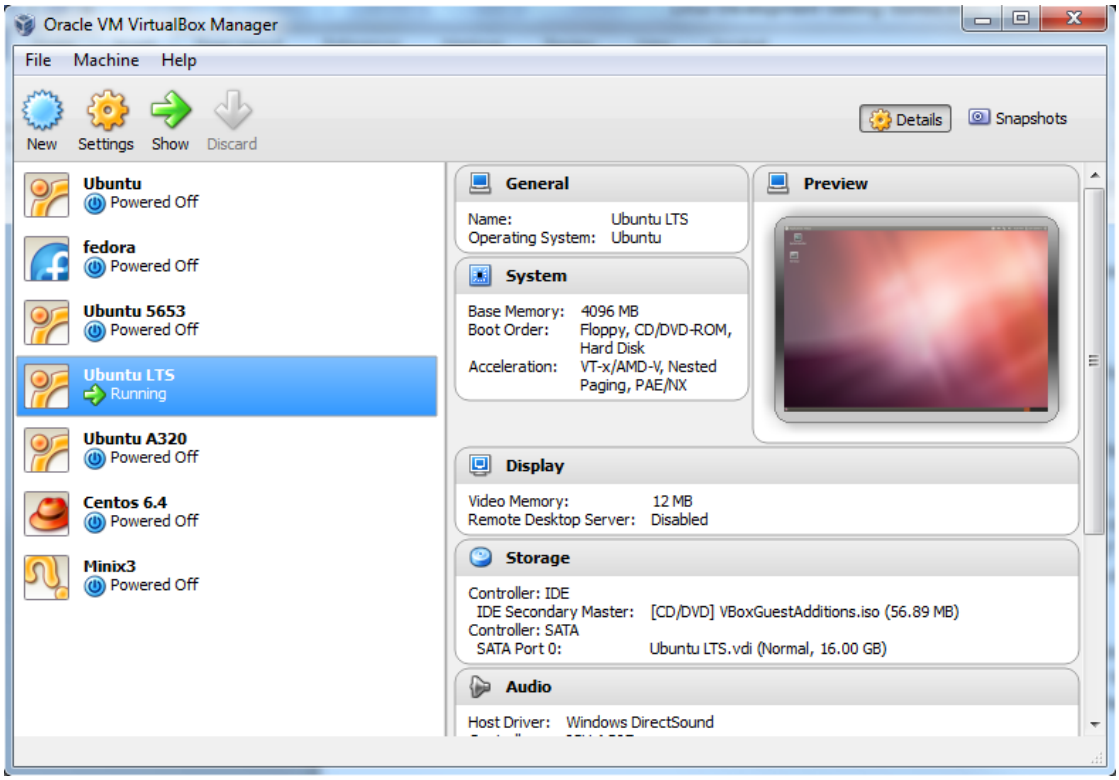
First, on your Windows or Mac OS-X laptop, install Oracle Virtual-Box as follows:

First, download Ubuntu Linux distribution 12.04.1, or newer from here:

1. http://www.ubuntu.com/download/desktop
2. Or you can download and install the exact same version I run on VB from here - http://math.uaa.alaska.edu/~ssiewert/linux_dvd_iso/

To install Ubuntu Linux on Virtual Box, then you'll also need to download Virtual Box here - https://www.virtualbox.org/wiki/Downloads
If you want to do a native installation, I recommend you do a full backup first, and then either install on a second hard-disk, or on an un-used partition of your primary hard-disk, but do be careful either way. Virtual Box is fairly easy and you can most easily install the Ubuntu "guest OS" by installing VB (Virtual Box) and then installing Linux as a new machine from the DVD ISO image you downloaded from the Ubuntu download web site.

Virtual Box gives you a way to install multiple guest Operating Systems like Linux distributions, Minix OS to go with Tanenbaum's text, or any other OS you might want to run on your Windows or Mac OS-X machine that you normally use, with far less risk than a dual-boot system. The VB manager looks like this:



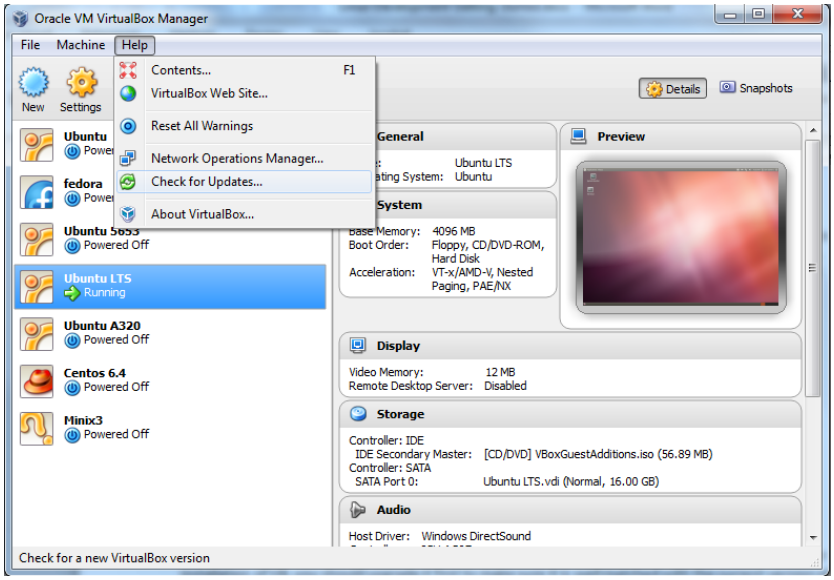
If you run into problems with a VB installation or any configuration of VB, see me during office hours.

Virtual Box Extensions

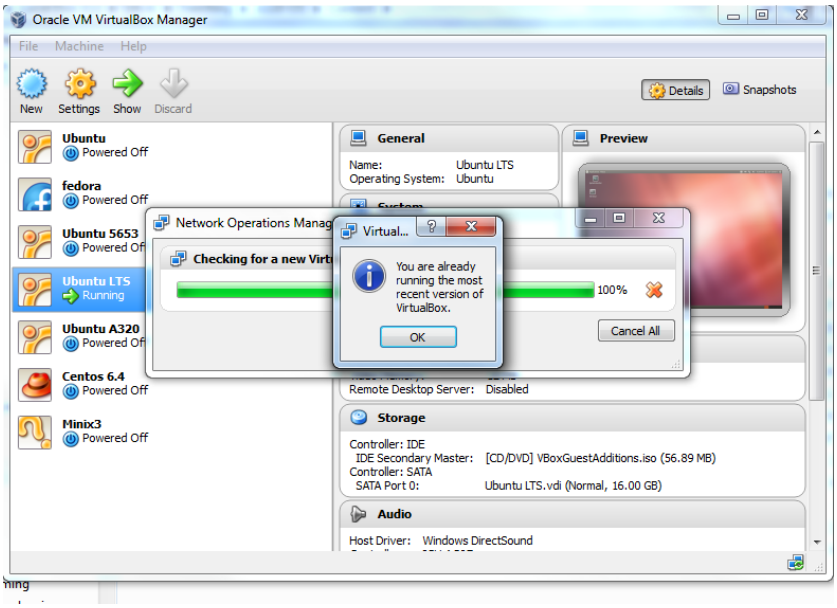
The VB Extensions can be installed after you have VB and you Linux distribution installed to provide:

1) Expansion of your desktop to full screen
2) Mounting of Windows folders inside your Linux guest OS
3) Cut and paste between your guest OS and Windows

So, first, install the VB Extensions per current instructions from Oracle (carefully!). If you have an older installation of VB, you should upgrade it first to make sure it is well matched with the current version of the extensions available for download (this is critical, so check carefully). It is best to download the extensions at the same time you download VB. If you already have VB installed, upgrade to the latest:

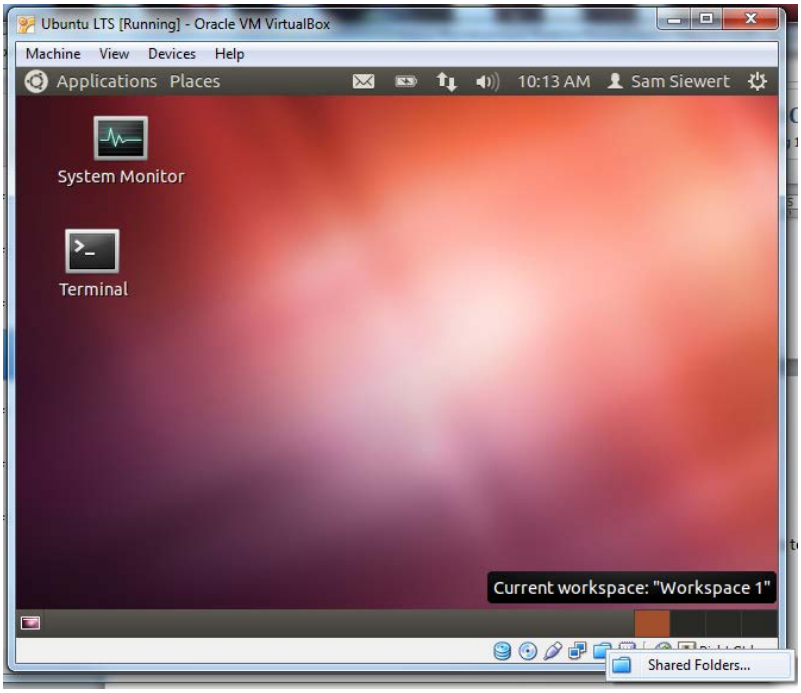


In my case, I was already up to date:

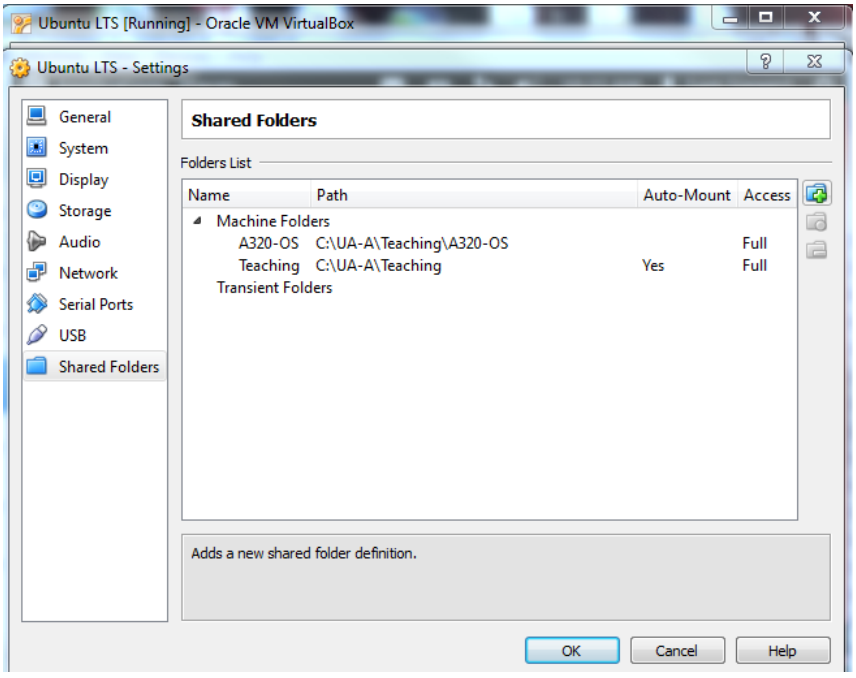


Sharing Files with Windows Using VB Extensions

Once you have the latest VB manager running and you install the VB extensions to go with it, then, you can for example set up file sharing with Windows as follows. First, access the shared folder icon that you will see in the lower RIGHT corner of your guest OS VM:



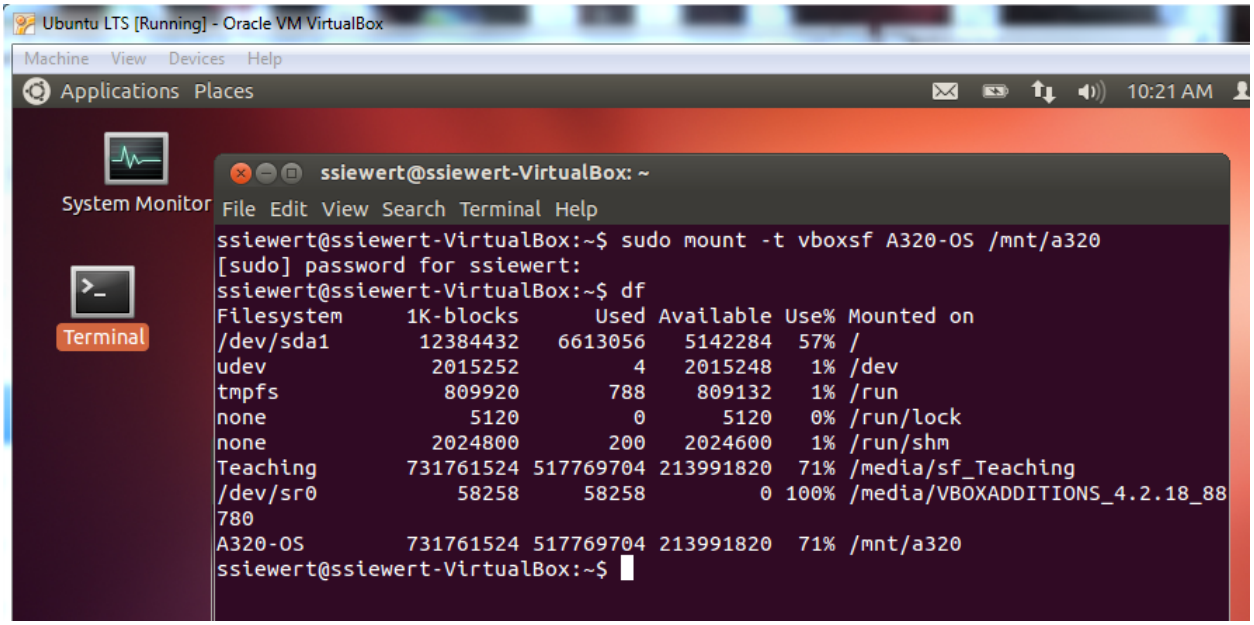
Click on the +Folder icon and browse to the Windows folder you want to share as I have done for A320-OS or Teaching:



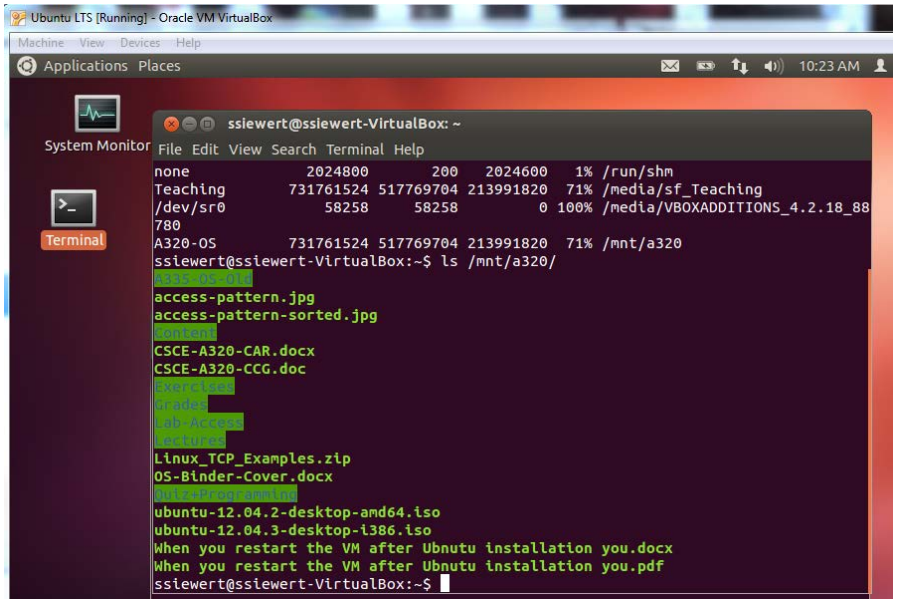
Once you have shared the Windows folders you want, then the rest is simple. As the instructions tell you when you hover over your Shared Folders, just use the following command inside your Linux guest OS instance (e.g. for my A320-OS shared folder):

If you have not established a mount point, first do "***sudo mkdir /mnt/A320OS***", then "***sudo mount –t vboxsf A320-OS /mnt/a320***".

That's it, now just access the files in Linux like any other file system. Here's my shared folder mount as shown using the Linux df command:



Now I can list, copy files, etc. as I would with any other Linux filesystem with this Windows shared mount:



Development Tools for VB-Linux

If you're new to Linux and/or just don't like command line type development, here's some recommendations for the course:

1. On VB-Linux – try the Eclipse C development environment for a full IDE and/or use ***nano***, ***make***, and ***ddd (sudo apt-get install ddd)***, or better yet, for full compatibility with Beagle, use ***nano***, ***make***, and ***nemiver*** (***sudo apt-get install nemiver***).

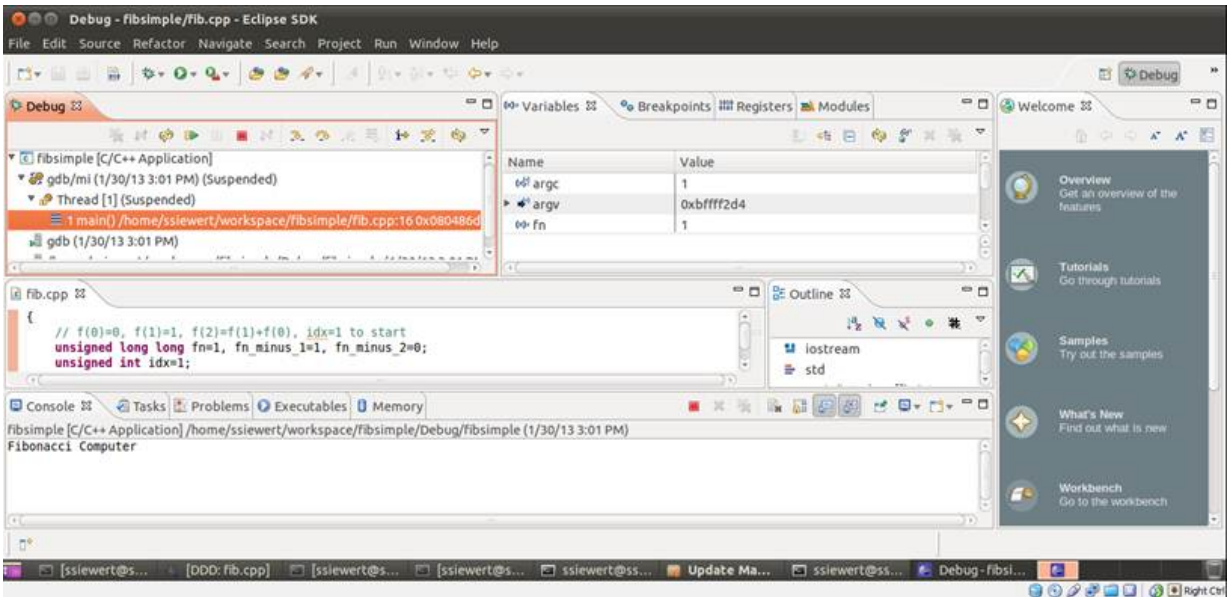
2. For a less integrated, but smaller install – use use ***nano***, ***make***, and ***nemiver*** (***sudo apt-get install nemiver***).

Here are the details on how to get going:

For those new to Linux, if you want an IDE that is similar to Visual Studio, you can install eclipse-cdt (on VB-Linux ONLY) as follows:

sudo apt-get install eclipse-cdt

After it installs, run it (type in ***eclipse***) you can import the fibsimple for example (File, Import …, type file in filter, select File System, browse to downloaded fibonacci code, Finish) and you should see:

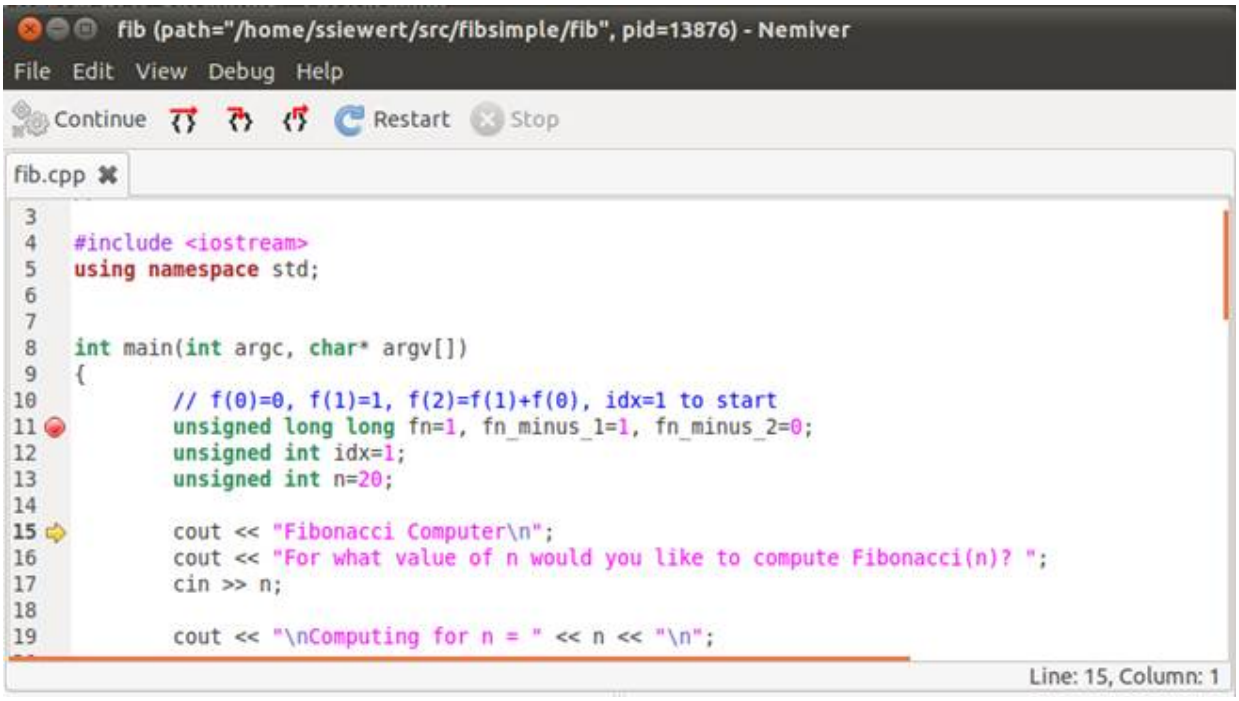


You can set breakpoints, do builds, edit (with an editor that is more like VS), so you may find this more friendly than nano and Makefile with an external debugger, but we will also learn how to use an external debugger.

So, I recommend that you also install nmiver on BOTH your Beagle xM and VB-Linux with:

sudo apt-get install nemiver

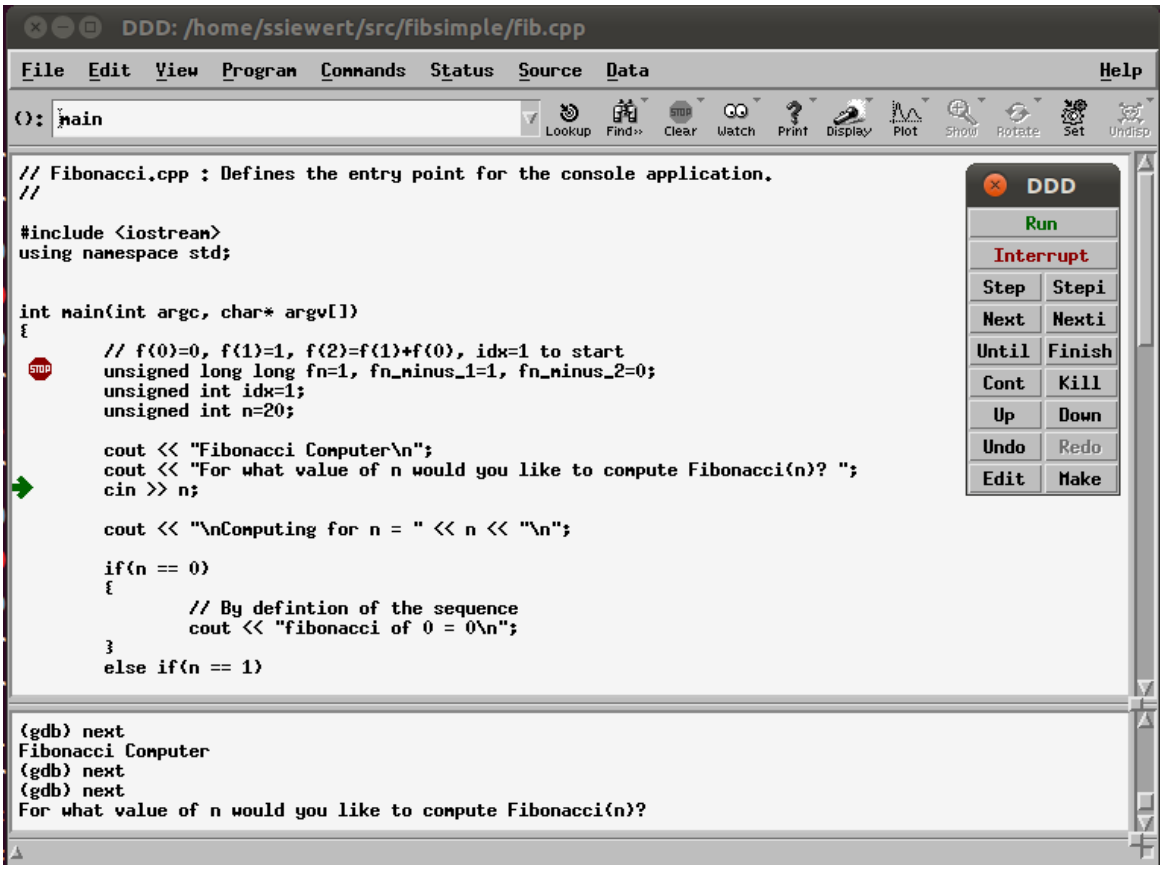
This is a debugger only and you can load and run code with ***nemiver fib*** for example after your code is built using ***make***. It runs nicely on smaller Linux systems (E.g. an Andorid-class Linux system such as the Beagle xM or Raspberry Pi, but also on VB-Linux).



Hopefully this helps all out a bit more with some nice development and debug tools that go beyond command line.

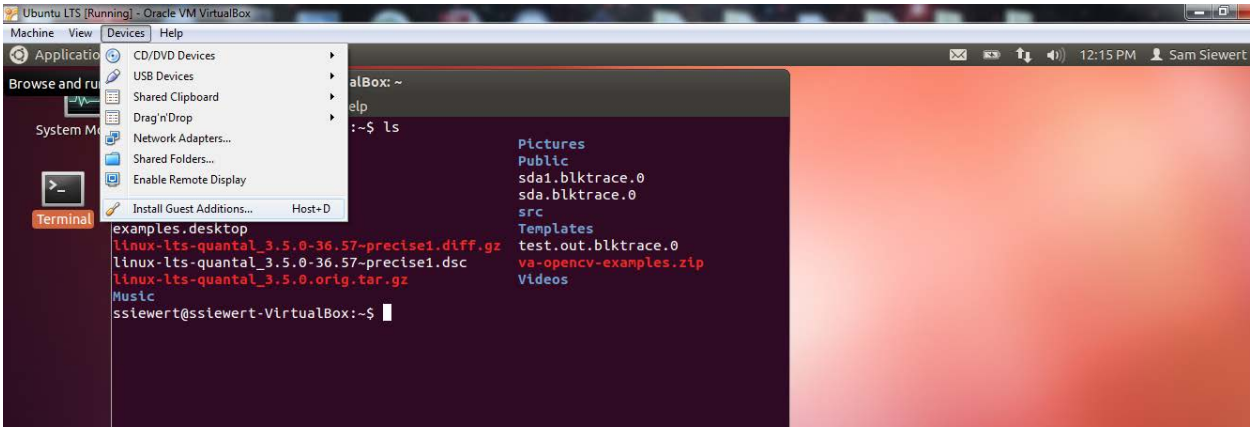
There are other stand-alone debuggers that run nicely on VB-Linux if you're interested ("ddd" and "xxgdb"), but nemiver runs well on both VB-Linux and small scale systems.

In case you're curious or want to use it on VB-Linux, here's what it looks like:

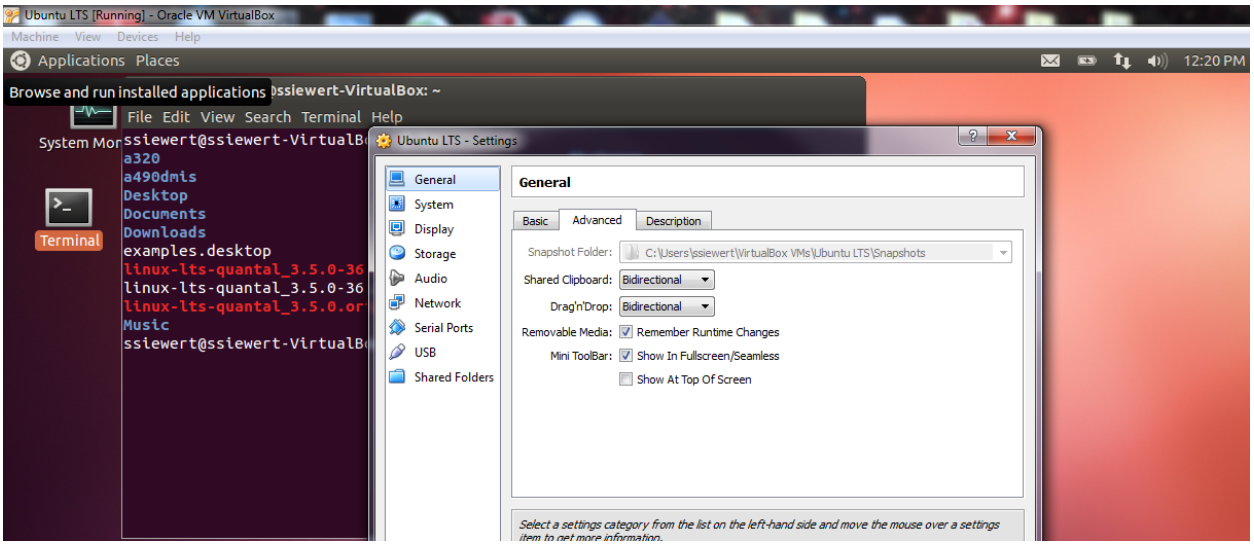

DDD: /home/ssiewert/src/fibsimple/fib.cpp
File Edit View Program Commands Status Source Data Help
(): main
Lookup Find»» Clear Watch Print Display Plot Show Rotate Set Undisp
// Fibonacci.cpp : Defines the entry point for the console application.
//
#include <iostream>
using namespace std;
int main(int argc, char* argv[])
{
// f(0)=0, f(1)=1, f(2)=f(1)+f(0), idx=1 to start
unsigned long long fn=1, fn_minus_1=1, fn_minus_2=0;
unsigned int idx=1;
unsigned int n=20;
cout << "Fibonacci Computer\n";
cout << "For what value of n would you like to compute Fibonacci(n)? ";
cin >> n;
cout << "\nComputing for n = " << n << "\n";
if(n == 0)
{
// By defintion of the sequence
cout << "fibonacci of 0 = 0\n";
}
else if(n == 1)
DDD
Run
Interrupt
Step Stepi
Next Nexti
Until Finish
Cont Kill
Up Down
Undo Redo
Edit Make
(gdb) next
Fibonacci Computer
(gdb) next
(gdb) next
For what value of n would you like to compute Fibonacci(n)?

Some helpful suggestions for configuring your VB-Linux VM:

Once you have Linux installed (e.g. Ubuntu 12.04 LTS) on your VM in Virtual Box, I would suggest installing the Guest additions as follows (make sure you have downloaded them with version that matches your VB - https://www.virtualbox.org/wiki/Downloads):

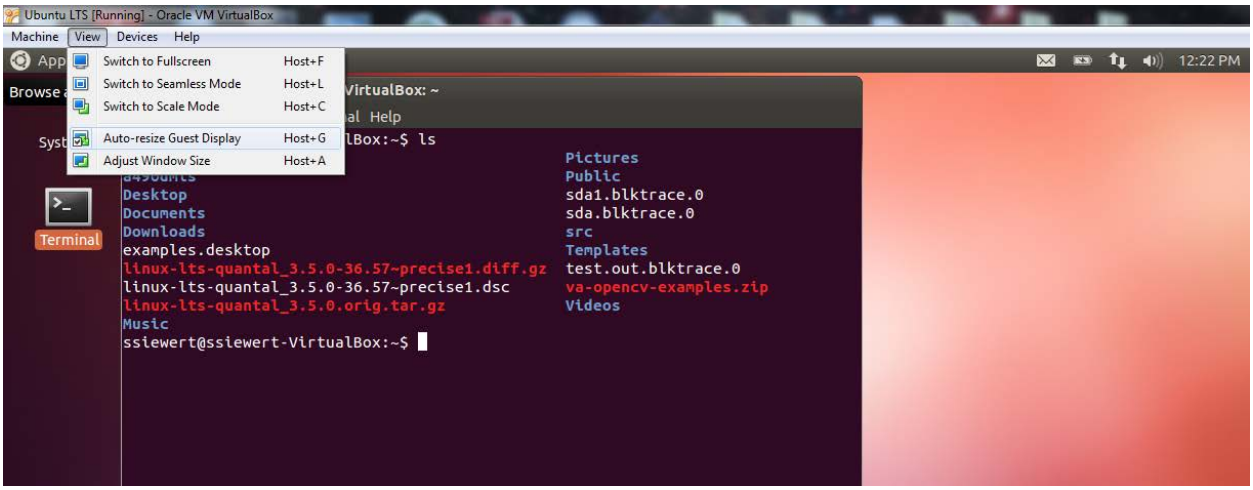


Once the guest additions have installed, you can set up a number of useful VB to host features. First, how about **cut and paste** (use Machine, Settings… and then set up bidirectional clipboard):

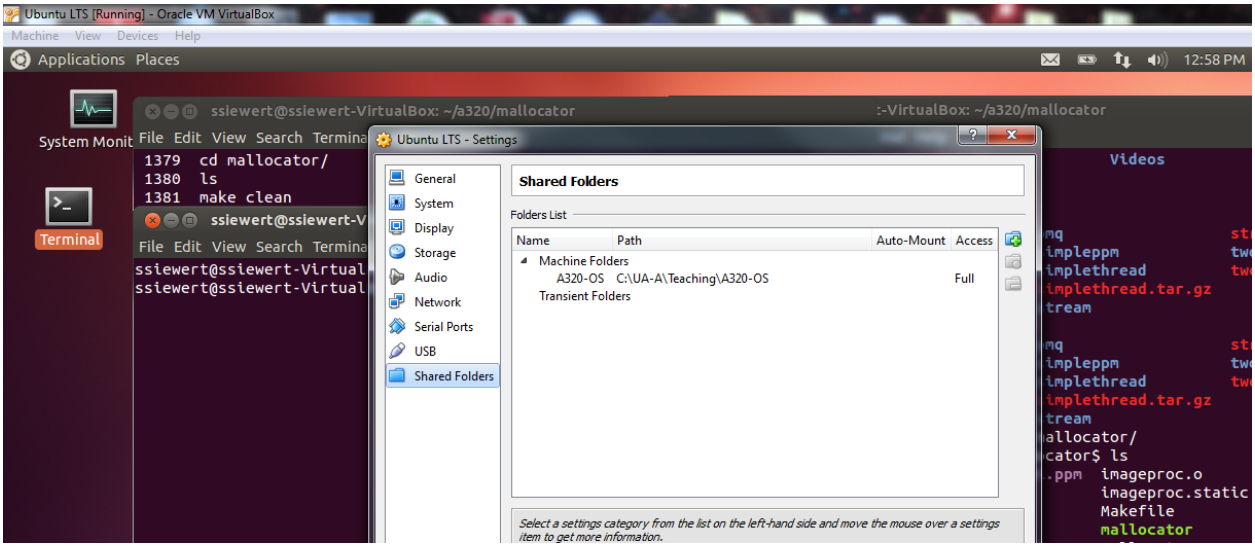


Now you can copy text from shell output and paste it into your reports as well as doing screen-dumps. Screen-dumps are just fine, but sometimes you may want to cut and paste from an external web browser or any number of host tools into your guest OS as well.

Without Guest Additions, you can't resize your VB window and the guest OS desktop. So, second, it's real nice if your **VB window and desktop can be resized**:



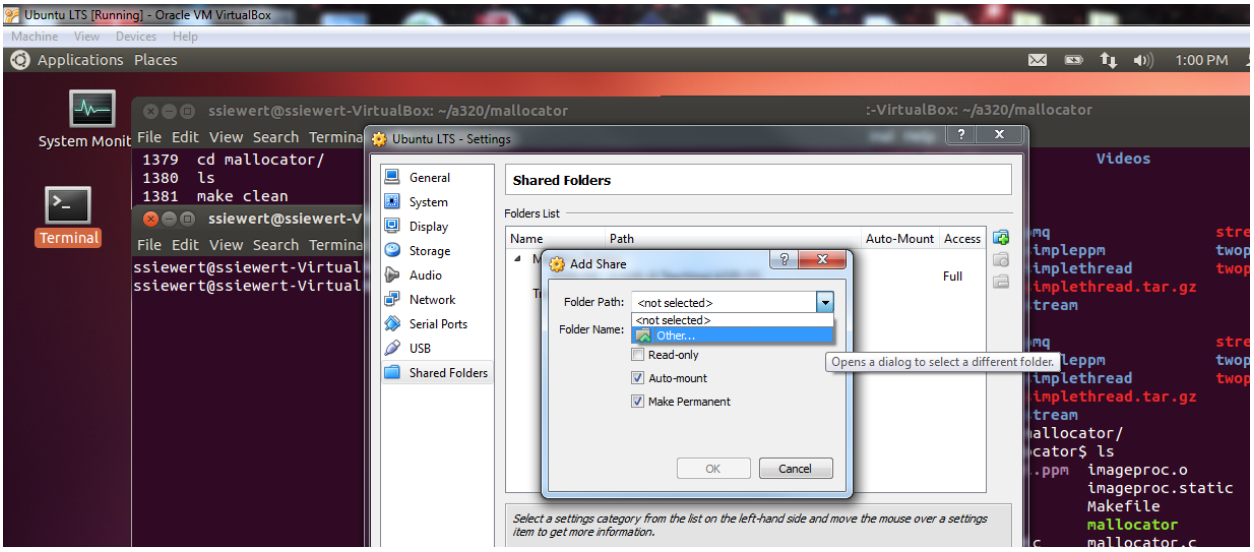
One final option I use quite a bit is the ability to mount a Windows file-system inside my guest OS. You can do this as follows (note I set up C:\UA-A\Teaching\A320-OS already):



For this existing shared folder, I set it up to be manually mounted as follows:

```
ssiewert@ssiewert-VirtualBox:~$ sudo mount -t vboxsf A320-OS /mnt/a320
[sudo] password for ssiewert:
ssiewert@ssiewert-VirtualBox:~$ df
Filesystem     1K-blocks      Used Available Use% Mounted on
/dev/sda1       12384432   4889280   6866060  42% /
udev             2015456         4   2015452   1% /dev
tmpfs             809920       780    809140   1% /run
none                5120         0      5120   0% /run/lock
none             2024800       200   2024600   1% /run/shm
/dev/sr0           58258     58258         0 100%
/media/VBOXADDITIONS_4.2.18_88780
A320-OS        731761524 490036428 241725096  67% /mnt/a320
ssiewert@ssiewert-VirtualBox:~$
```

But, let me add C:\UA-A\Teaching now using the +Folder icon …



For first time mounting, you may need to do manually:

```
ssiewert@ssiewert-VirtualBox:~$ sudo mkdir /mnt/Teaching
ssiewert@ssiewert-VirtualBox:~$ sudo mount -t vboxsf Teaching
/mnt/Teaching
ssiewert@ssiewert-VirtualBox:~$ df
Filesystem     1K-blocks      Used Available Use% Mounted on
/dev/sda1       12384432   4889300   6866040  42% /
udev             2015456         4   2015452   1% /dev
tmpfs             809920       780    809140   1% /run
none                5120         0      5120   0% /run/lock
none             2024800       200   2024600   1% /run/shm
/dev/sr0           58258     58258         0 100%
/media/VBOXADDITIONS_4.2.18_88780
A320-OS        731761524 490036940 241724584  67% /mnt/a320
Teaching       731761524 490036940 241724584  67% /mnt/Teaching
ssiewert@ssiewert-VirtualBox:~$
```

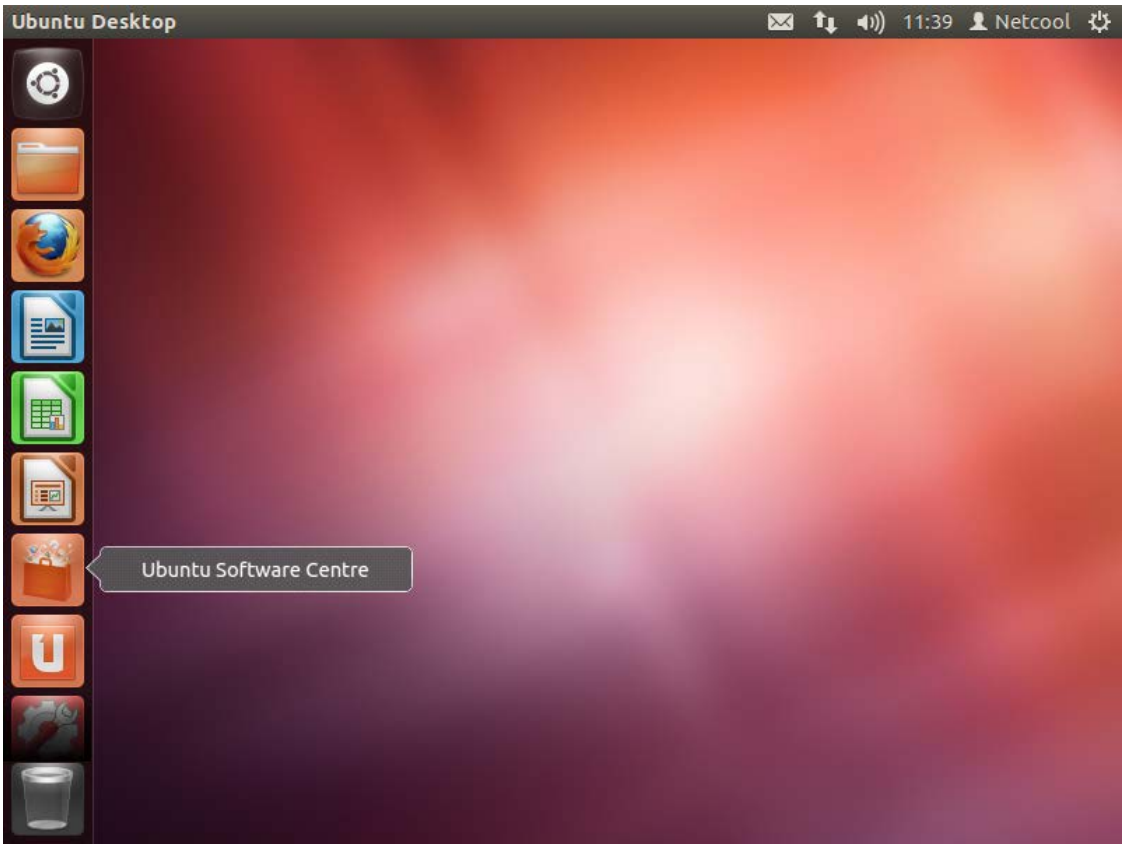
Finally, depending on what style of window manager you prefer, you may want the Gnome sidebar or not. I don't like it, so I use classic Gnome, which can be set up as follows on the next page. If you like the side-bar, then please do use it as it installs.

Yulei.Liu.AU | Apr 26 2012 | Tags: gnome 12.04 precise ubuntu classic | 60,520 Visits

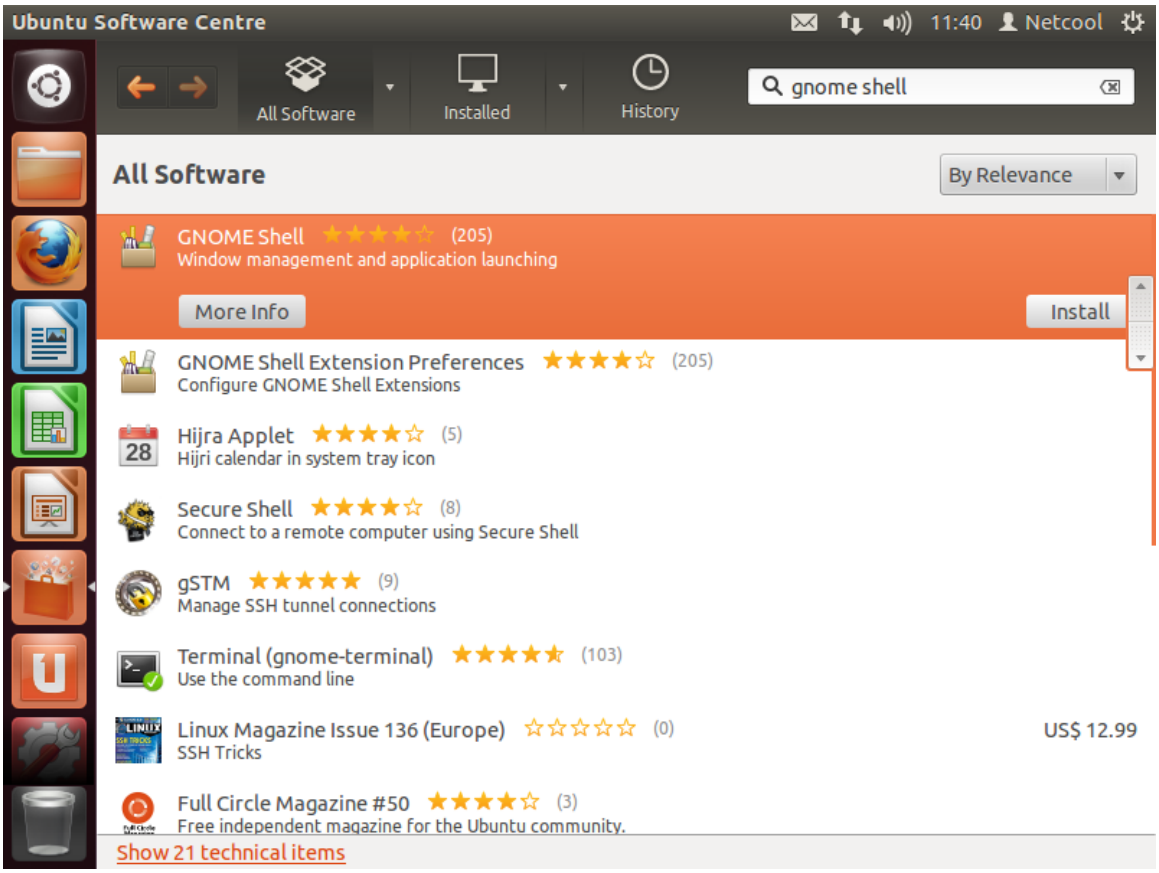
Ubuntu 12.04 LTS is released, unfortunately Unity is still the default interface, if you want to go back to classic Gnome as I do, below is how to:

Gnome session package name has changed from 11.04 to 12.04, the new package name is gnome-shell.

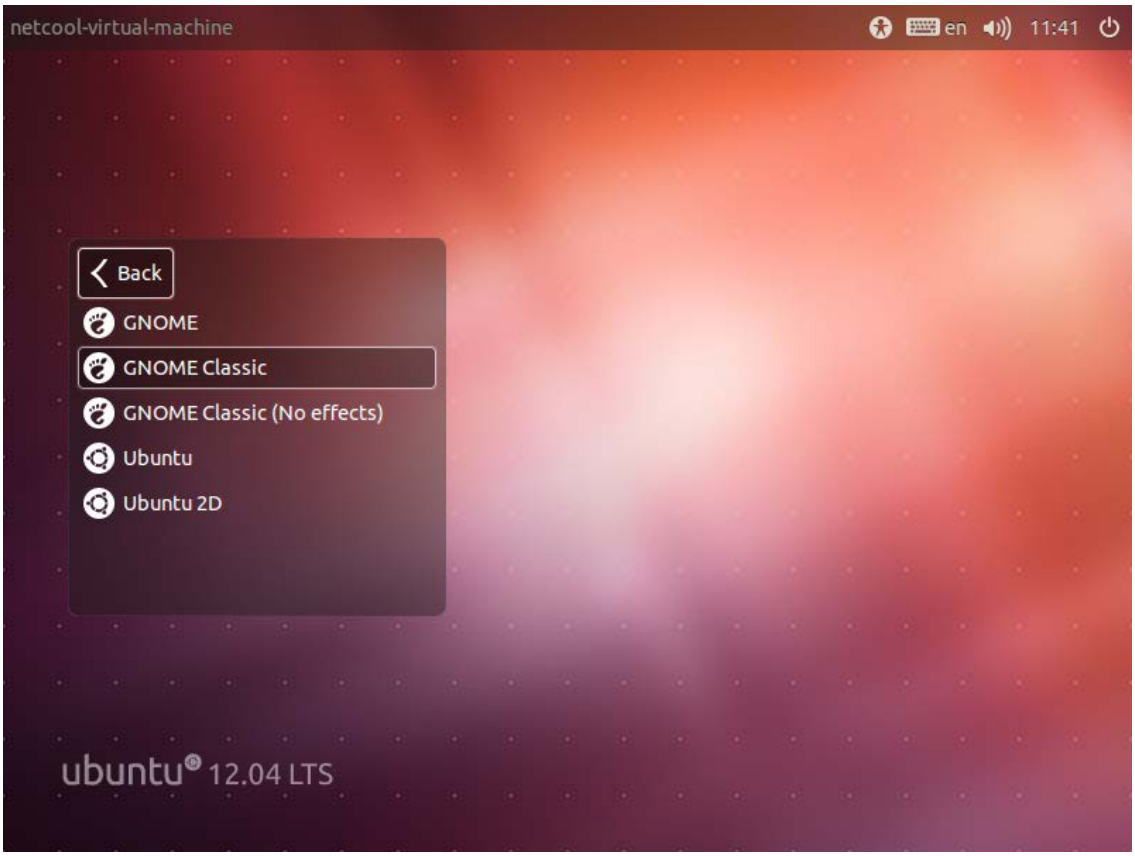
First, start Ubuntu software center as below:



then type "gnome shell" in the search bar, then install GNOME Shell.



Logout then login, you can now select Gnome Classic in the login screen:


netcool-virtual-machine
en
11:41
Back
GNOME
GNOME Classic
GNOME Classic (No effects)
Ubuntu
Ubuntu 2D
ubuntu® 12.04 LTS