

Comparative Bacterial Genomics

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1 Set up CMG-biotools

IMPORTANT:

- NOTE! It is possible to use the system on Note/Netbooks, but it is not recommended!
- NOTE! Your computer should have a minimum of 5 GB memory free!

2 Set up CMG-biotools

For this course you will use a virtual computer that works almost like a normal computer. Hopefully you have already installed the "Virtual Box" program that will allow you to run this virtual computer. You will install a program that will allow you to run this virtual computer. You will import a setup for the computer, a so-called *virtual hard-disk file*, that will hold all the tools you will need for a basic comparative genomics analysis.

Create a virtual computer on your local hard-drive.

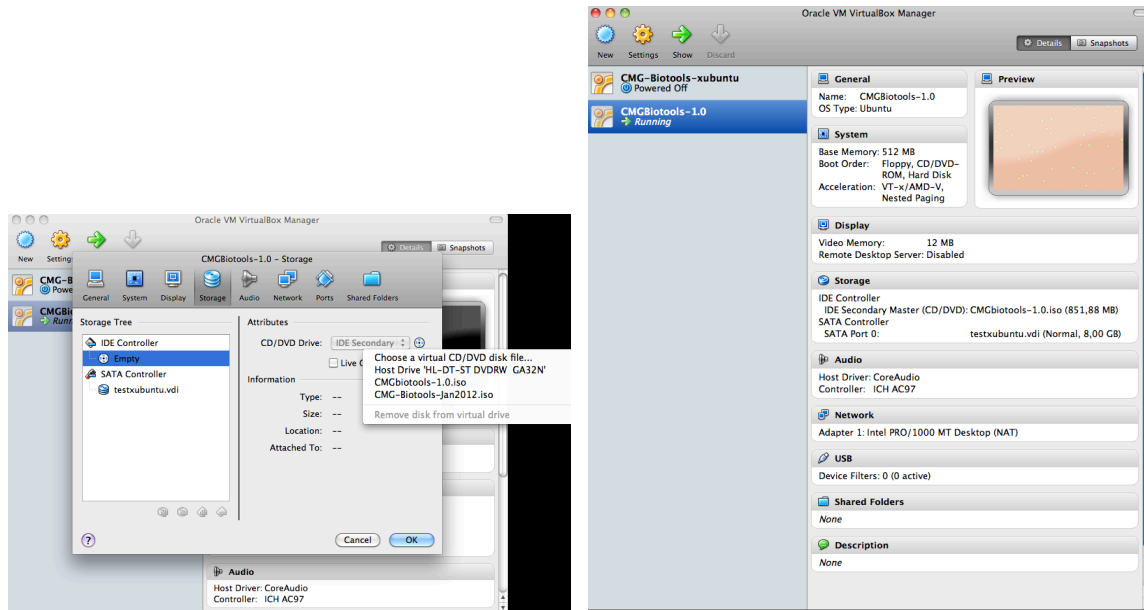
- Download the program *virtualbox* from this link: <http://www.virtualbox.org/wiki/Downloads> (version: select the one that fits your computer).
- Install the program *VirtualBox* following the installation steps.
- Start the *VirtualBox*
- Click new (the blue icon on the left of the tool bar).
- Type *CMG – biotools* in the VM name dialog box
- Select *linux* (Operating system) and *ubuntu* (Version) in the *Create New Virtual Machine* dialog.
- Leave the *Memory* as default, if you are expecting to do very heavy computations set this as high as allowed (within the green area of the bar)
- Create a new hard disk
- Leave virtual disk creation wizard settings unchanged: file type = VDI
- Set memory allocation as dynamic
- Click create in the *Summary* dialog
- Click the **Settings** icon for the computer. Under the **General** tab, select **Advanced**. In the menu **Shared Clipboard** select **Bidirectional** and click OK (Figure ??).

The virtual computer has now been created and can access part of the physical computer. The next step is to read the disc image, this process is equivalent to inserting a CD into the physical computer.

- Click the *Settings* tab of the CMG-biotools computer
- Click the tab *Storage*
- Part of this window is dedicated to the *Storage Tree* in which there will be a branch called *IDE Controller* Under this branch there should be a CD icon and the text *Empty*
- Select the *Empty* branch and click the CD icon to the right of the *CD/DVD Drive*(Figure 1(a))
- Click the "Choose a virtual CD/DVD disk file..." and find the folder where the CMG-biotools-version.iso is stored
- Click *OK*

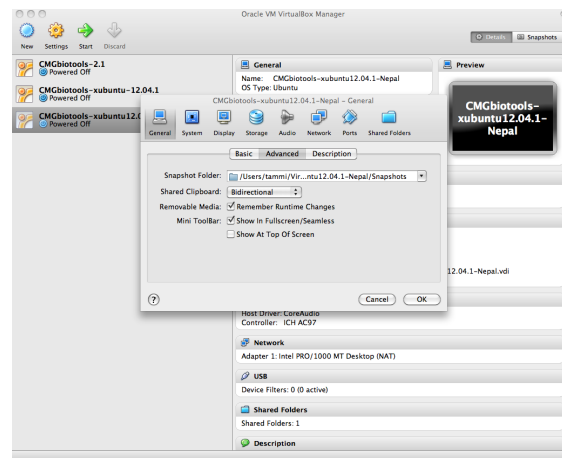
The computer now knows which file to read when booting. Figure 1(b) shows how the computer is represented in the VirtualBox window To open the computer, click the *Start* button. When given the option, select "*install*

- *start the installer directly*". When the desktop appears, click the *Install* icon on the desktop and follow the instructions. Create a user and a password that you can remember. Restart the computer when asked and then you should be done.



(a) VirtualBox reading in the disc image

(b) VirtualBox representation of computer

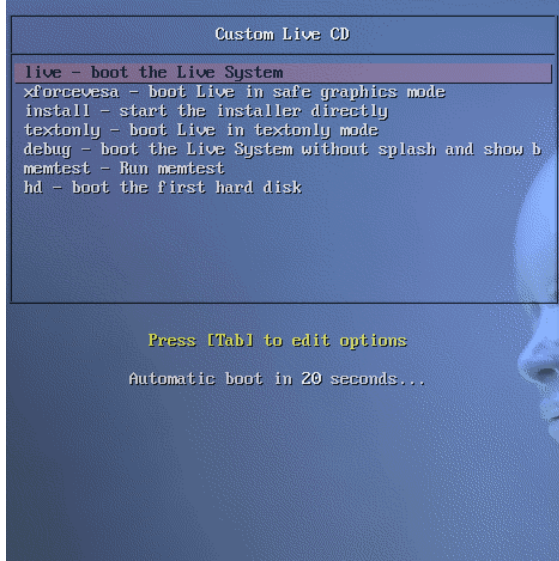


(c)

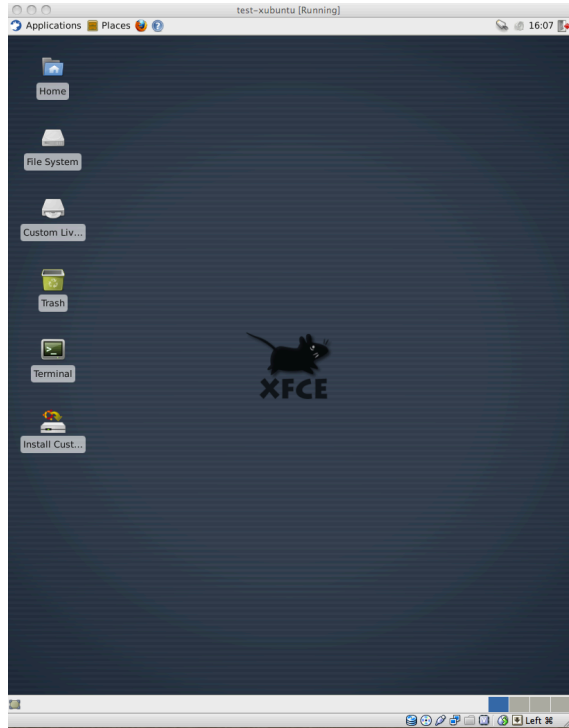
Figure 1: Create a virtual computer on your local hard-drive using *VirtualBox*.

2.1 Set up a shared folder

The virtual computer runs as a independent computer on your hardware which means that it does not have access to the data which is on your local computer. It is possible to set up folders that the virtual computer



(a) Booting operating system from disc image



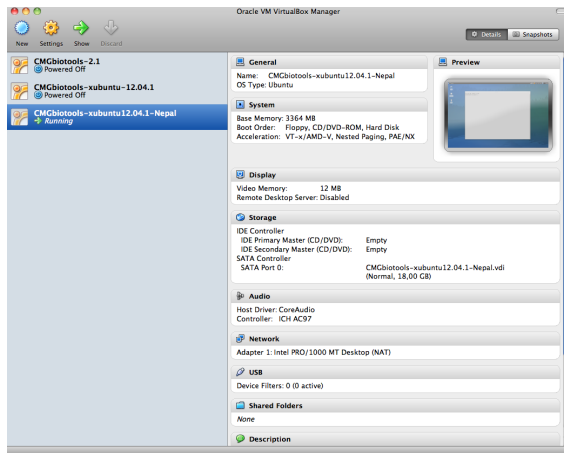
(b) CMG-biotools operating system desktop

Figure 2: Installing CMG-biotools on a virtual computer using *VirtualBox*.

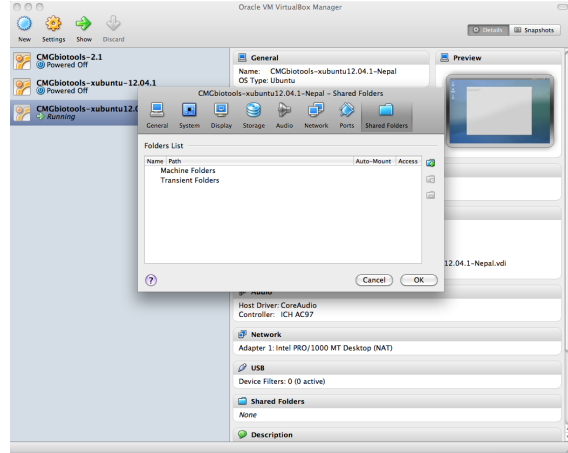
can access, these are called **shared folders**. Keeping data in these folders, takes up less of the virtual computer space, making it possible to run a small virtual computer (4GB) while still having a large data set. Setting up a shared folder is a two step process. First, the folder is set up in the Virtualbox program.

- In the Virtualbox window, click the **Settings** tab for the CMGbiotools computer (Figure 3(a)).
- In the new window, click the **Shared folders** (Figure 3(b)).
- Click the little folder icon with a green plus on it (Figure 3(b)).
- Select a folder on the local computer, create a dedicated folder for this and do not use the **Desktop** or **Documents**(Figure 3(c)).
- The **Folder Name** is automatically set to be the same as the folder you selected (Figure 3(c)). Manually set the name to **Vboxshare**
- Make the shared folder *Auto-mount* and **Make Permanent**, click OK (Figure 3(c)).
- The folder is now listed under the **Machine folders**, click OK (Figure 3(d)) and return to the Virtual computer by clicking the green arrow **Show**.

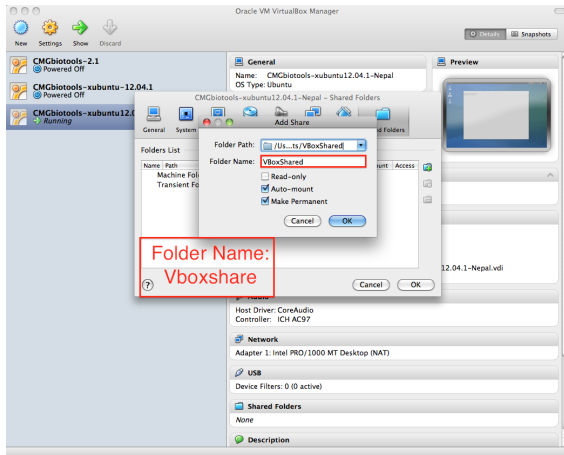
Next, the folder is set up in the virtual computer running the operating system **CMG-biotools**. Note, in the lower right corner of the virtual computer there is now a little blue folder icon. If no shared folder has been specified, this icon is grey.



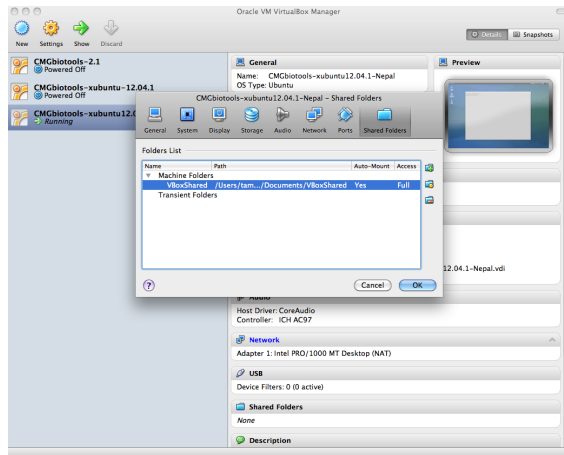
(a)



(b)



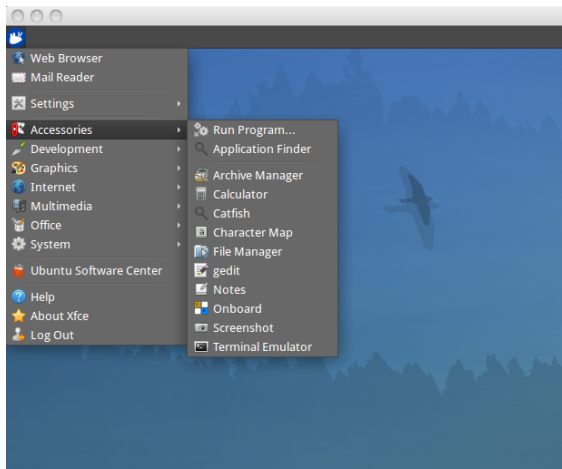
(c)



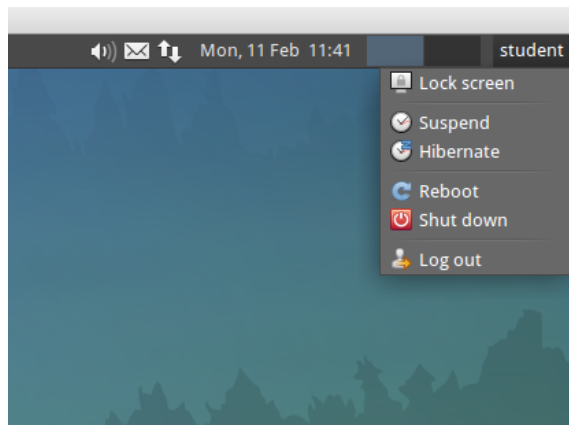
(d)

Figure 3: Setting up a shared folder between the local and virtual computer in *VirtualBox*.

- Open the **Terminal Emulator** from the **Applications** menu (Figure 4(a)).
- In the terminal window, type the following command `sudo /etc/rc.local`
- Reboot the computer (Figure 4(b))



(a)



(b)

Figure 4: Setting up a shared folder between the "host" and "guest" computer in *VirtualBox*.