

Installing BioLinux on Mac OS X or Windows using a virtual machine

Virtual Workshop on Spatial Genomic Data in R
16th to 20th November 2020

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Bio-Linux

Bio-Linux is a free workstation platform that facilitates running hundreds of bioinformatics tools without the corresponding installation hassles.

These guidelines will help you installing Bio-Linux from the provided flash drive on your Mac or Windows computer.

Requirements

- A computer with at least 20 GB available space on the hard drive. A minimum of 4 GB of RAM is needed.
- The installation can take 10-20 minutes excluding the download time.

Create a virtual machine using VirtualBox

To save time on installation, a Google drive is provided for the workshop. It contains the following files:

1. virtualbox-6.1_6.1.16-140961_Ubuntu_trusty_amd64.deb
2. VirtualBox-6.1.16-140961-OSX.dmg <https://drive.google.com/file/d/1MxjuzEagyNOaYrrq-yodK3xD07U-Suf5/view?usp=sharing>
3. VirtualBox-6.1.16-140961-Win.exe
<https://drive.google.com/file/d/1MxjuzEagyNOaYrrq-yodK3xD07U-Suf5/view?usp=sharing>
3. bio-linux-8-latest.ova
<https://drive.google.com/file/d/1MxjuzEagyNOaYrrq-yodK3xD07U-Suf5/view?usp=sharing>

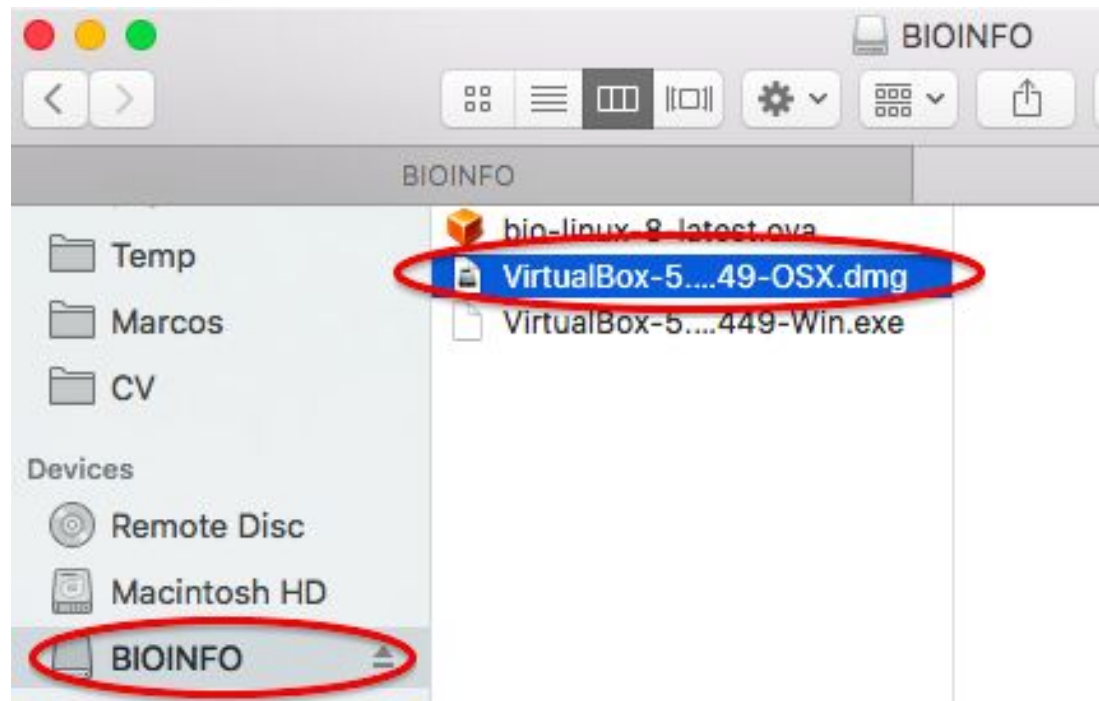
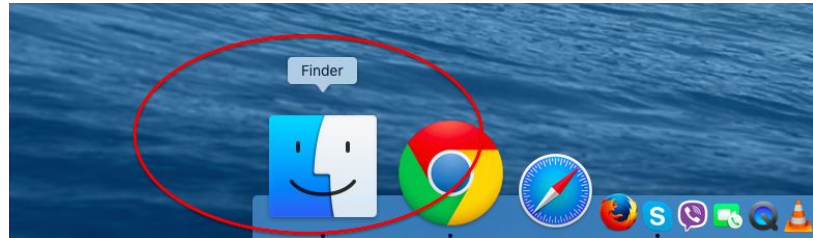
Alternatively, you can download these files from VirtualBox and Bio-Linux, which may take several hours.

Step 0: Close all your programs.

BioLinux needs extensive memory and CPU resources. Close all other programs unless you have a fast, high-performance computer.

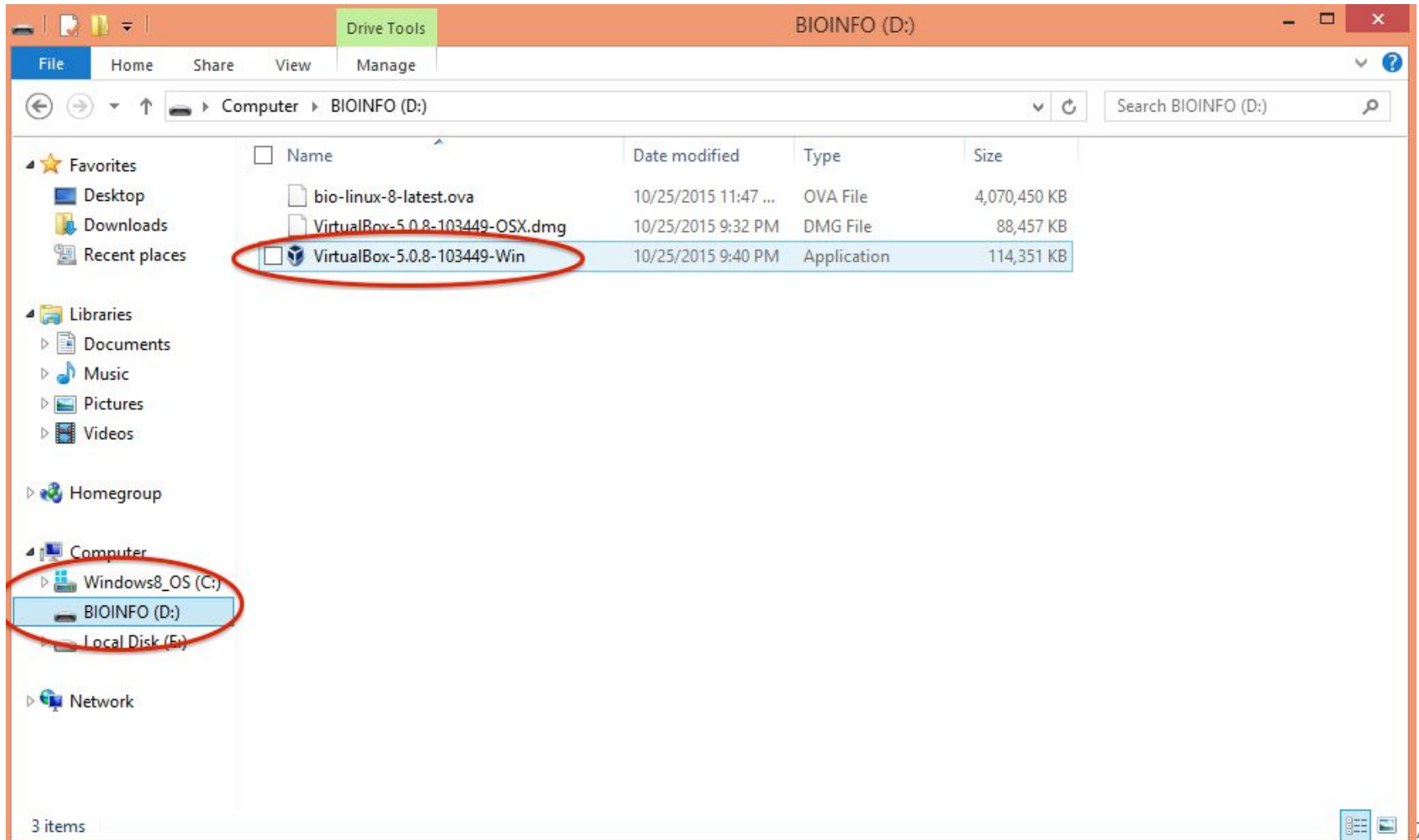
Step 1: Install VirtualBox

Mac OS X



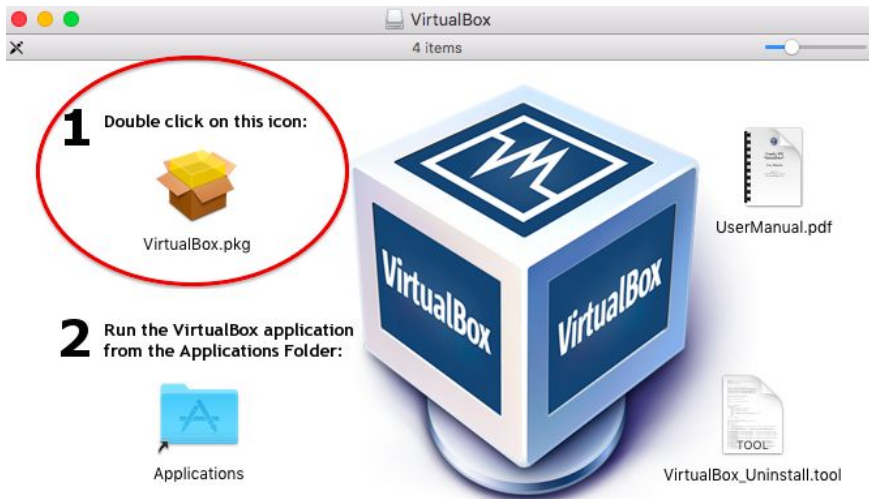
Step 1: Install VirtualBox

Windows



Step 1: Install VirtualBox

Mac OS X

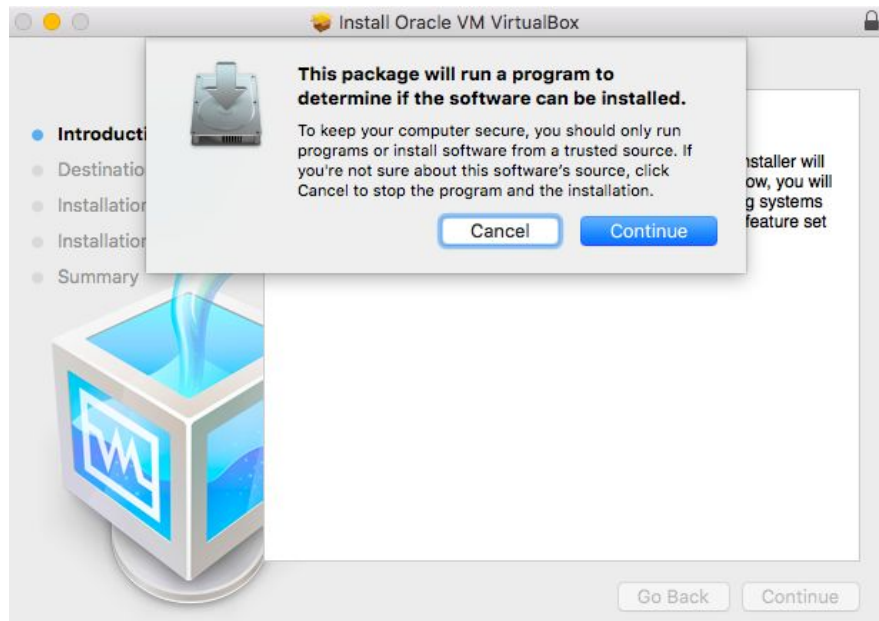


Windows

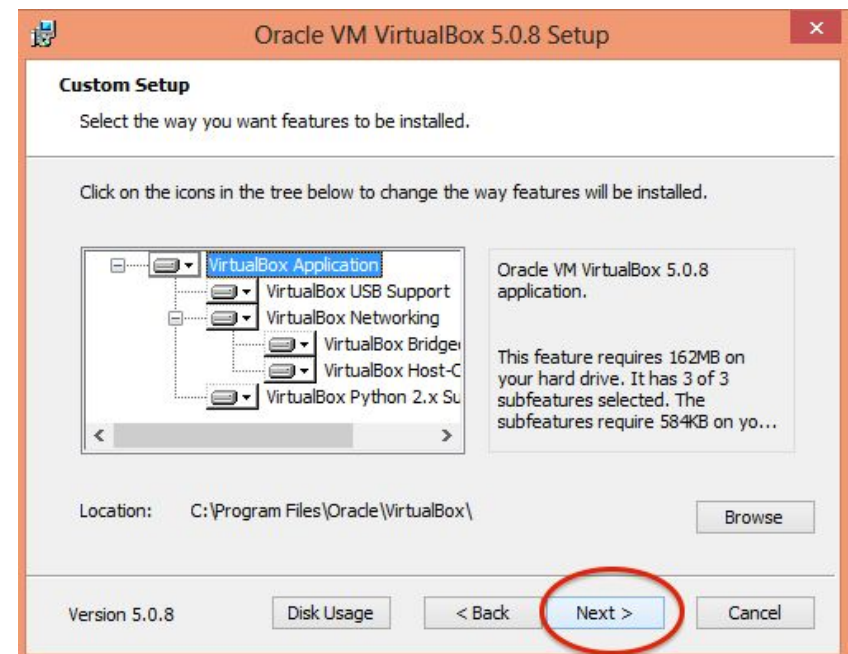


Step 1: Install VirtualBox

Mac OS X



Windows

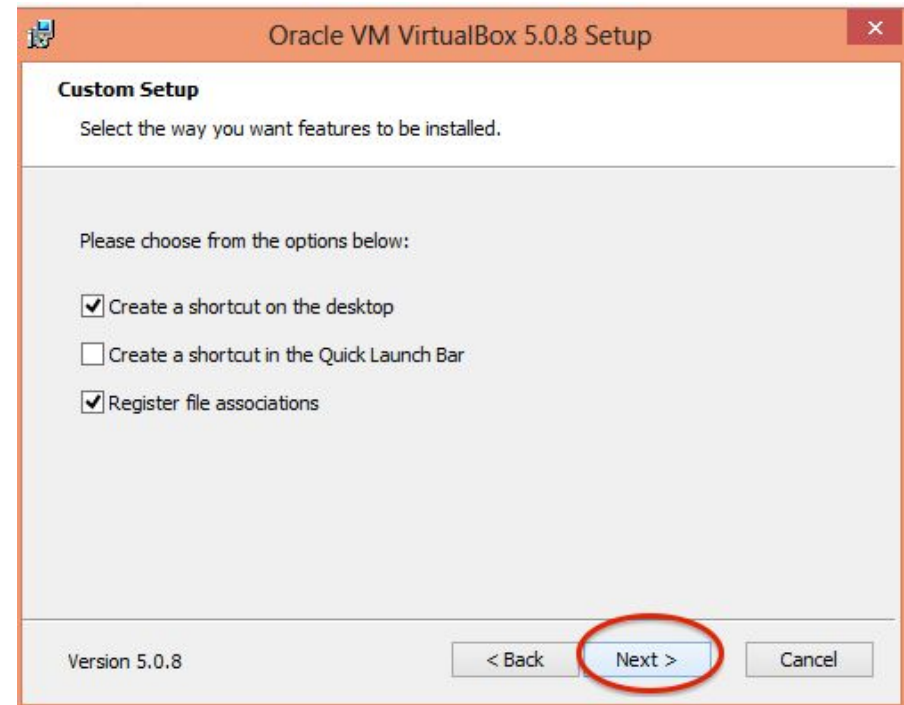


Step 1: Install VirtualBox

Mac OS X

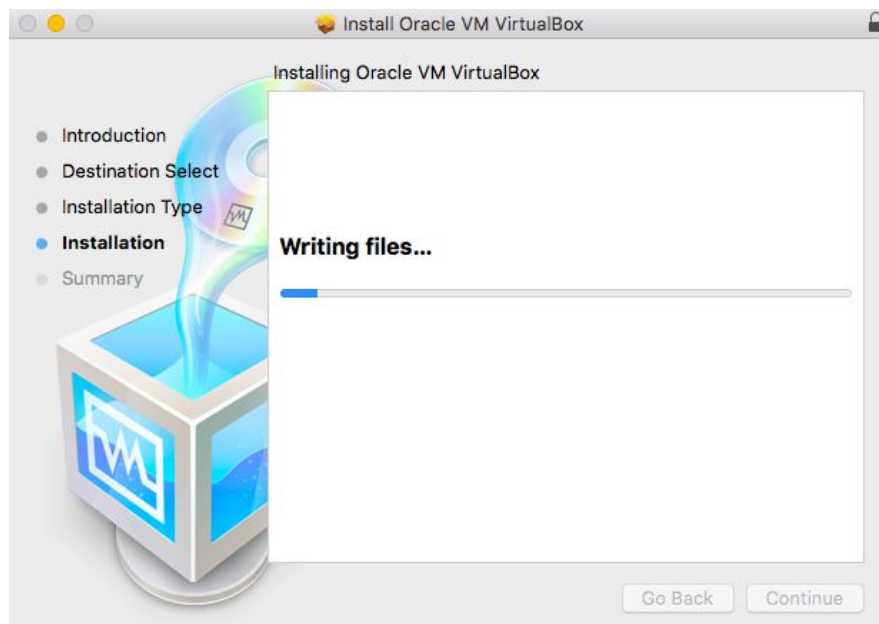


Windows



Step 1: Install VirtualBox

Mac OS X

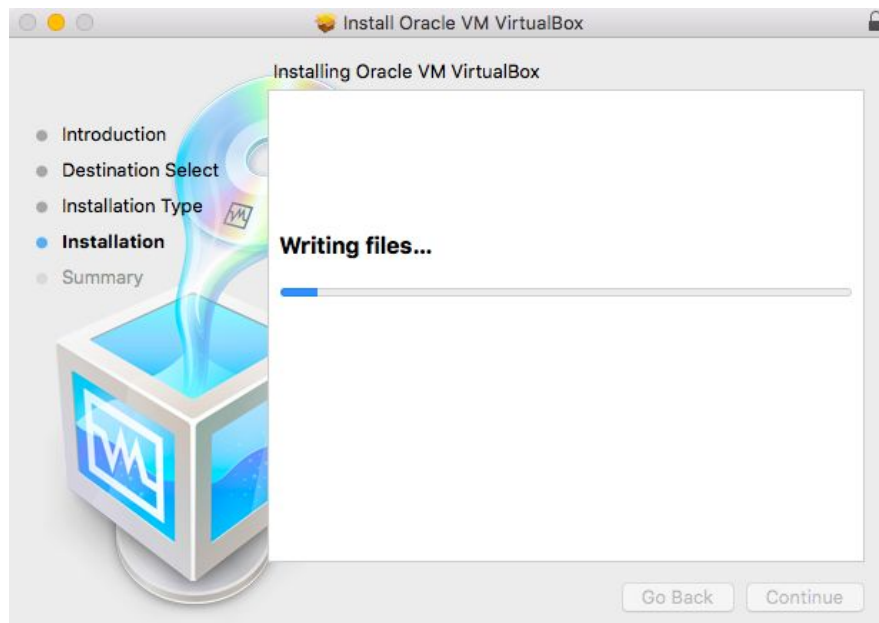


Windows

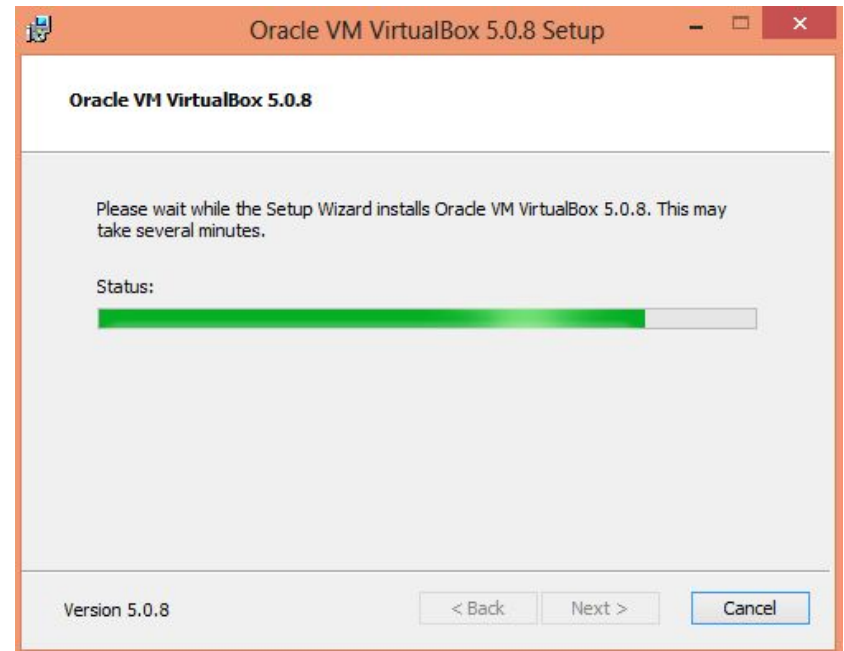


Step 1: Install VirtualBox

Mac OS X

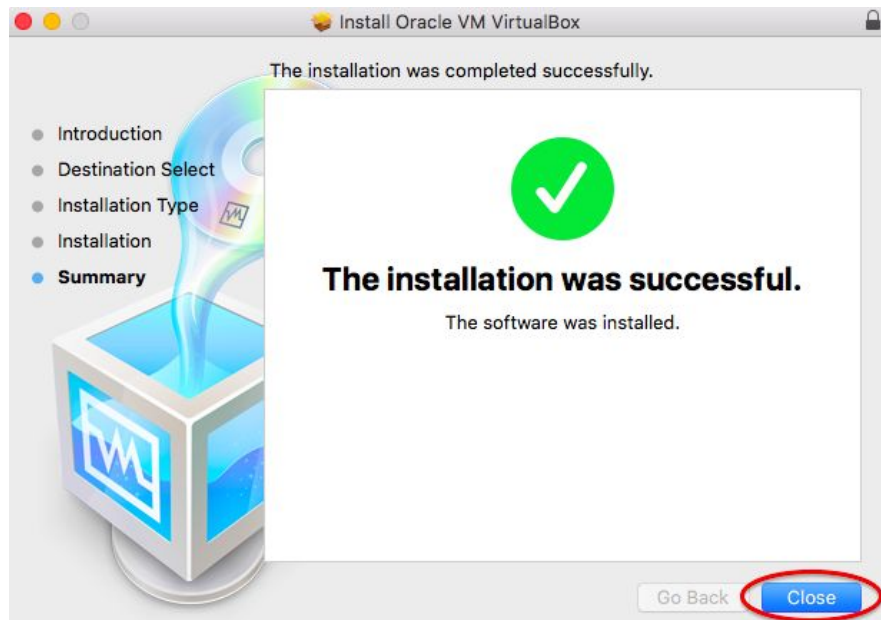


Windows



Step 1: Install VirtualBox

Mac OS X

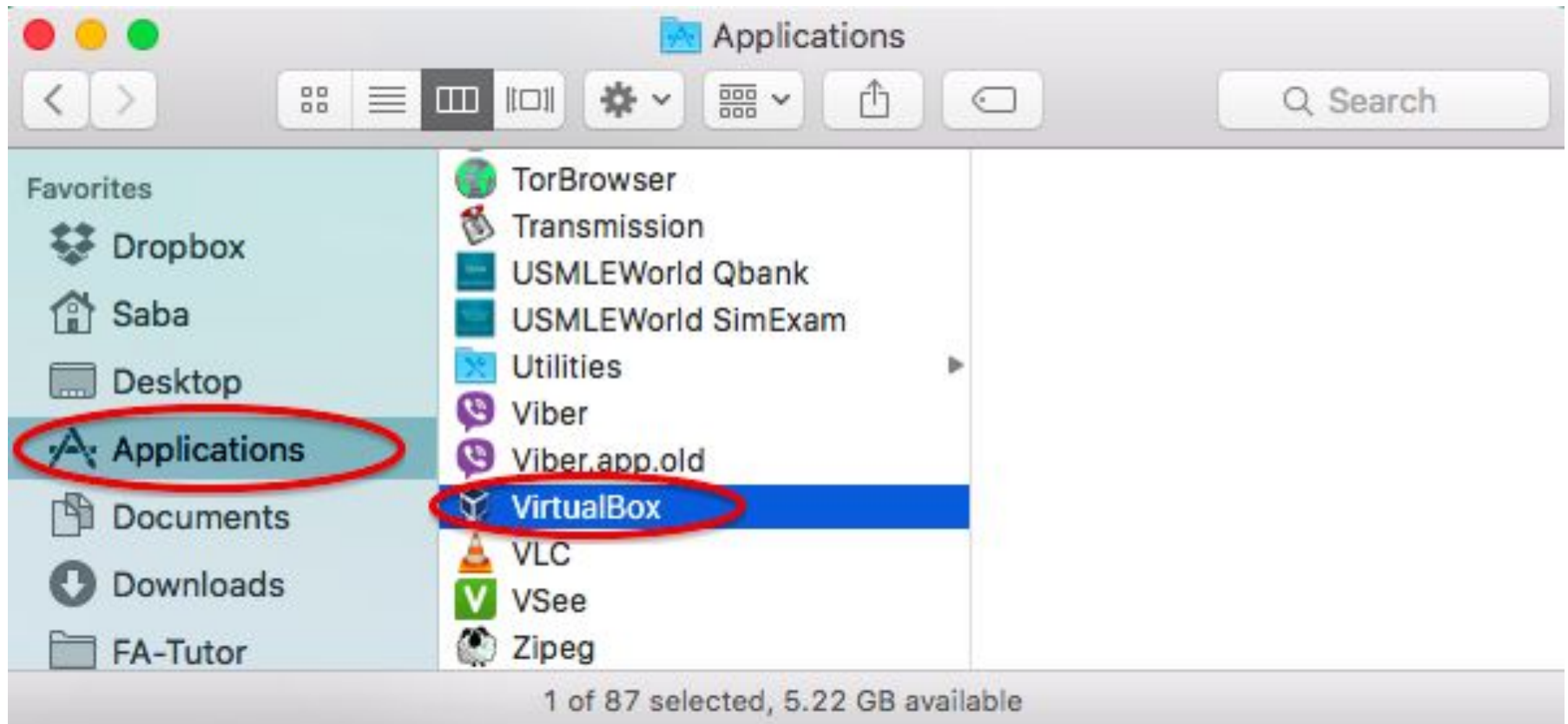


Windows



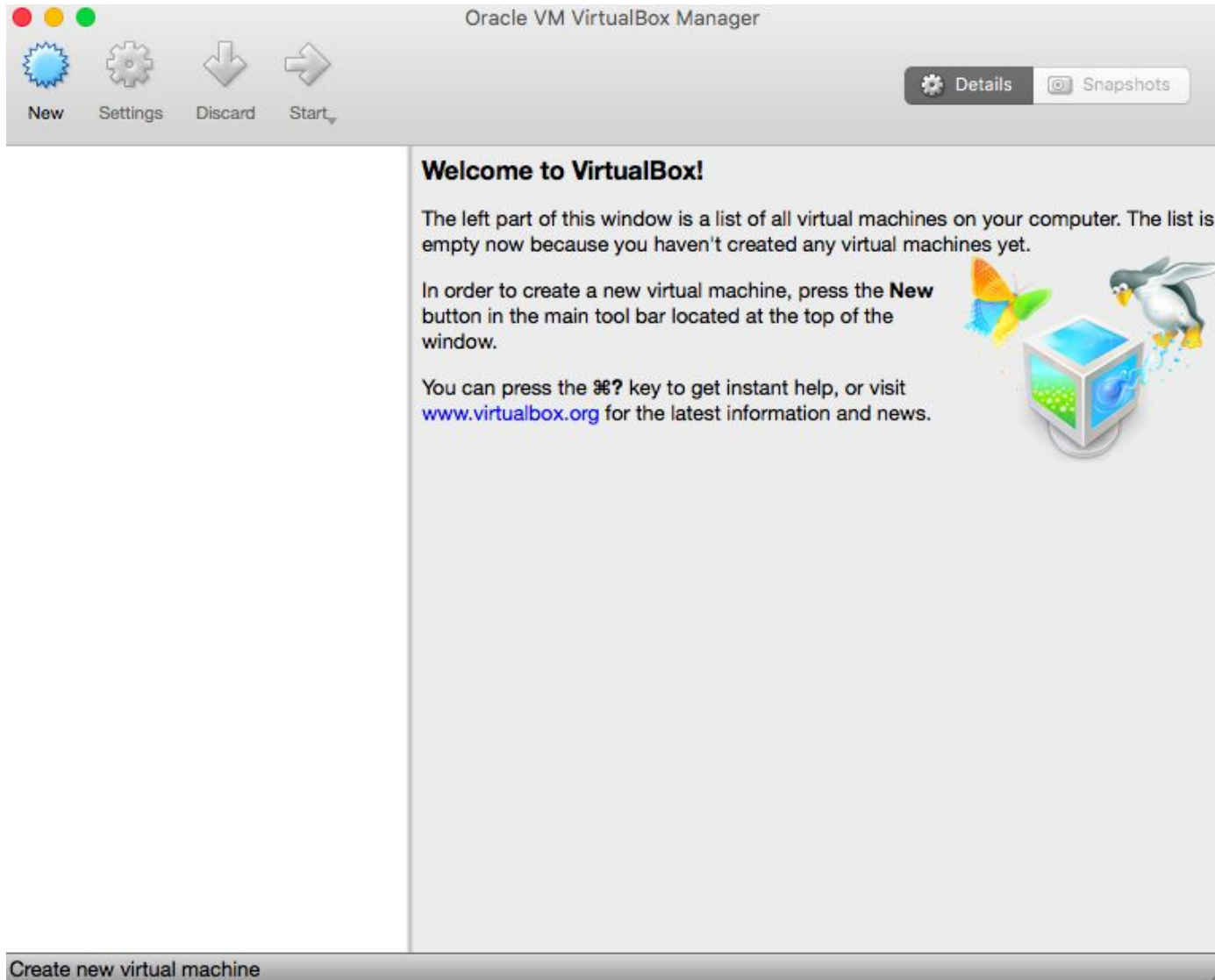
Step 2: Run VirtualBox

Mac OS X



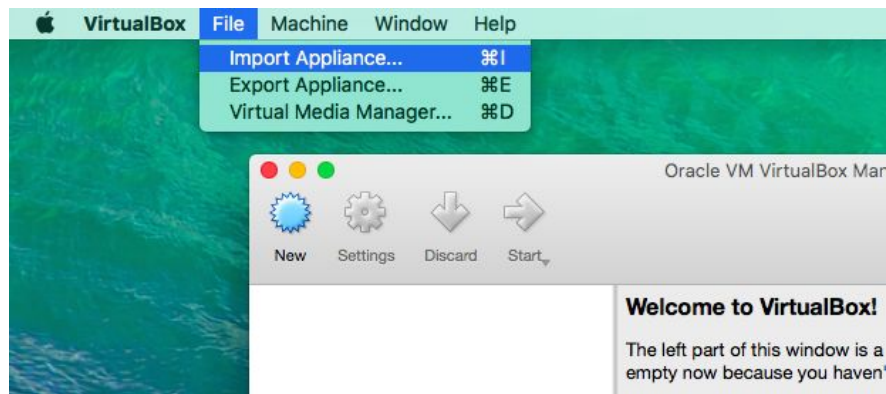
Step 2: Run VirtualBox

The first time you run VirtualBox, it looks like this:

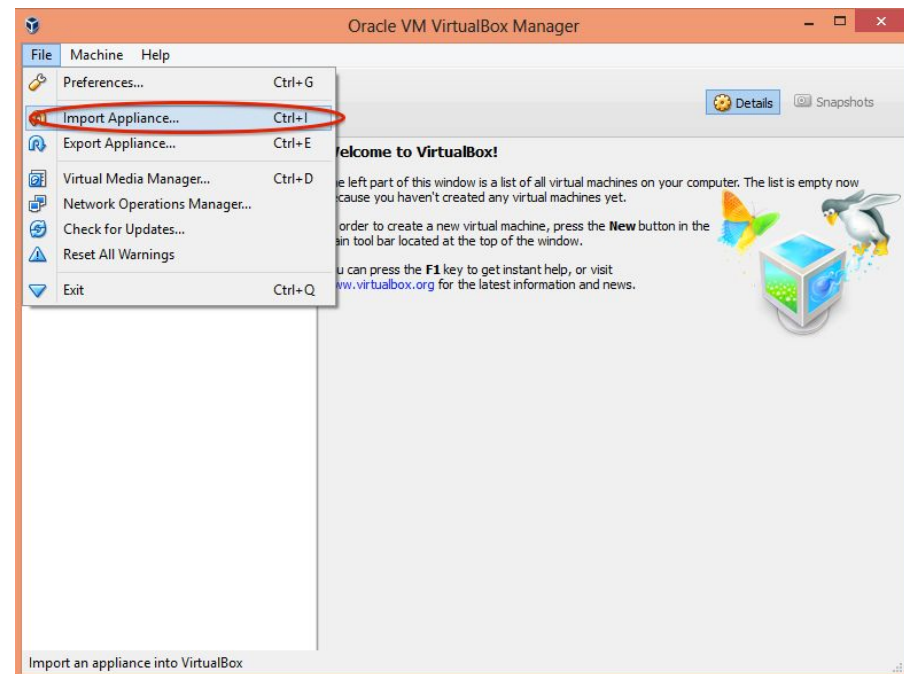


Step 3: Import BioLinux

Mac OS X



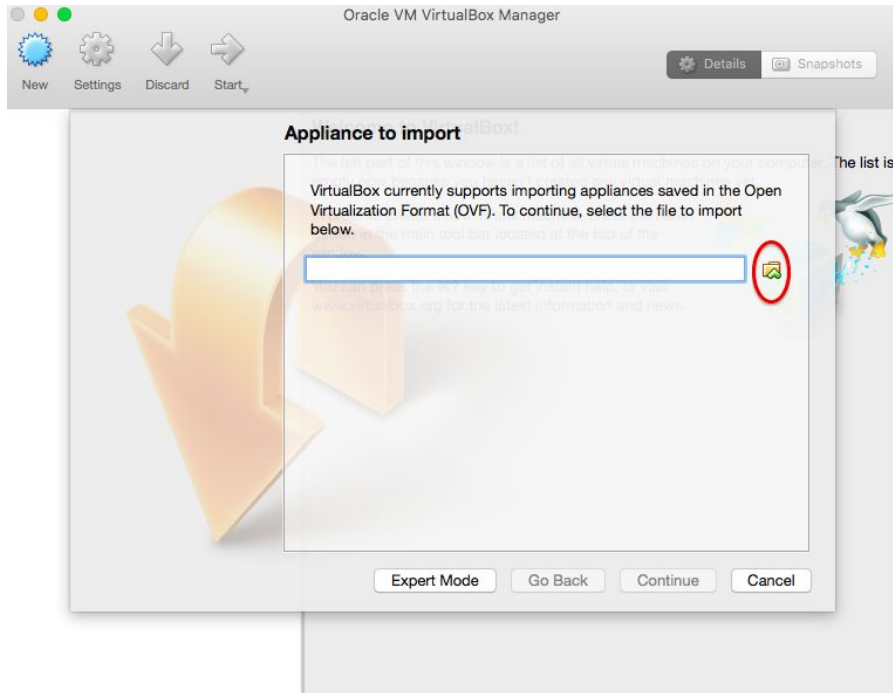
Windows



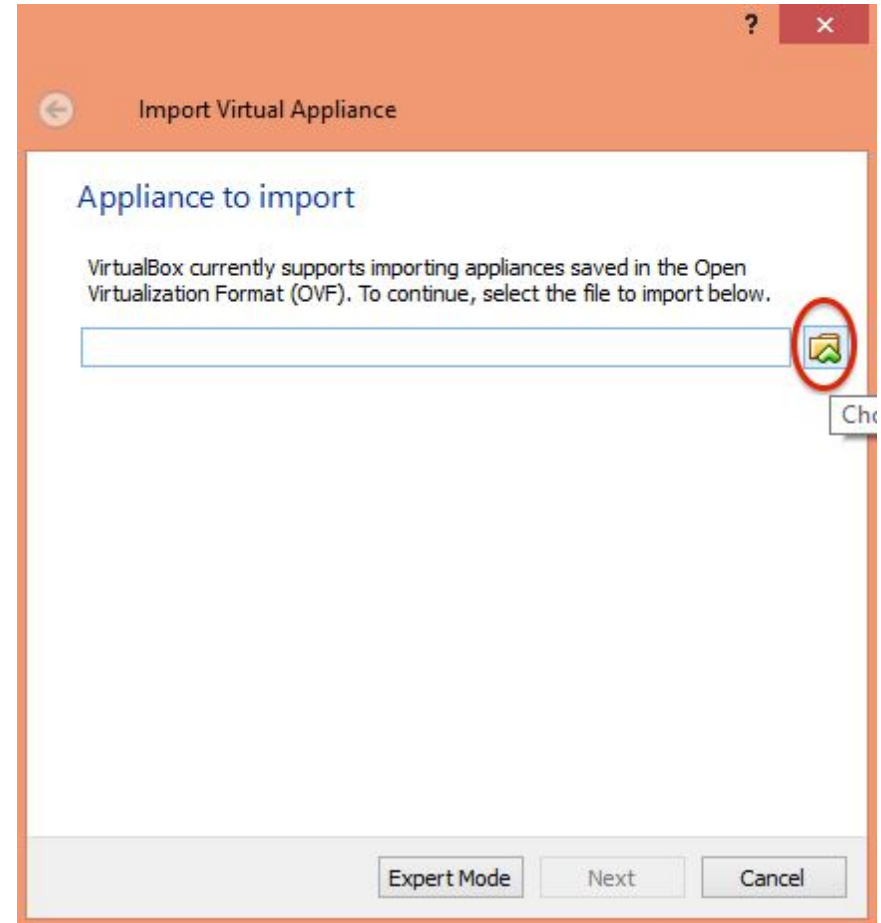
From the top menu, click on File>Import Appliance...

Step 3: Import BioLinux

Mac OS X

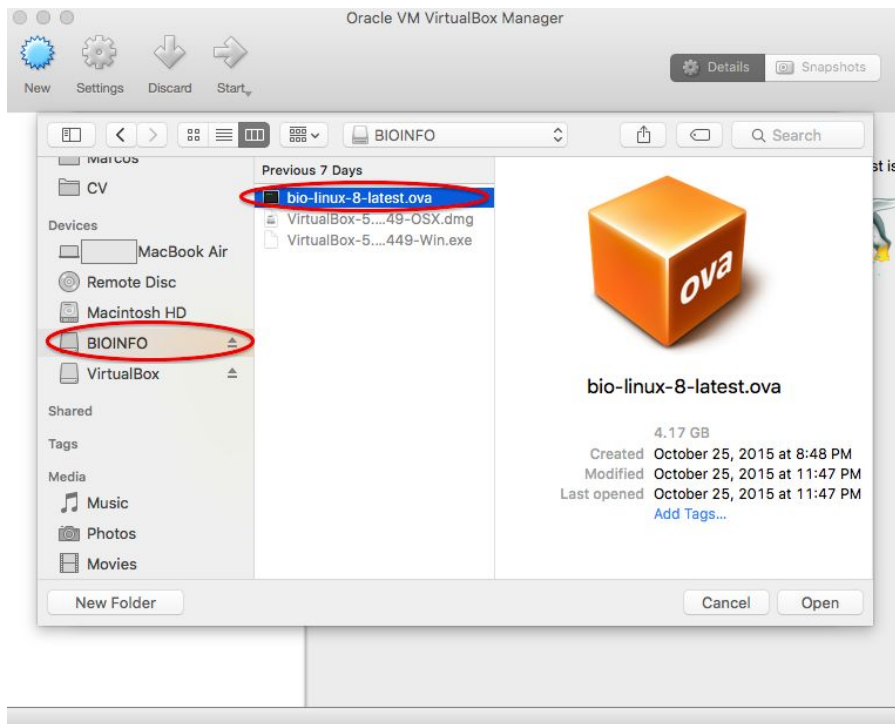


Windows

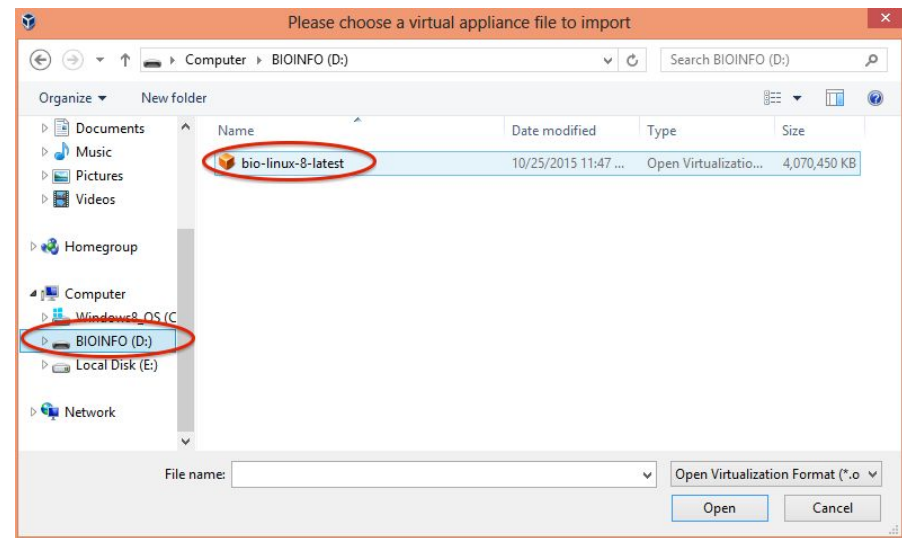


Step 3: Import BioLinux

Mac OS X



Windows



Use the **bio-linux-8-latest.ova** file from the github account.

Step 3: Import BioLinux

Mac OS X

Windows



*Both Mac OS X
and Windows*

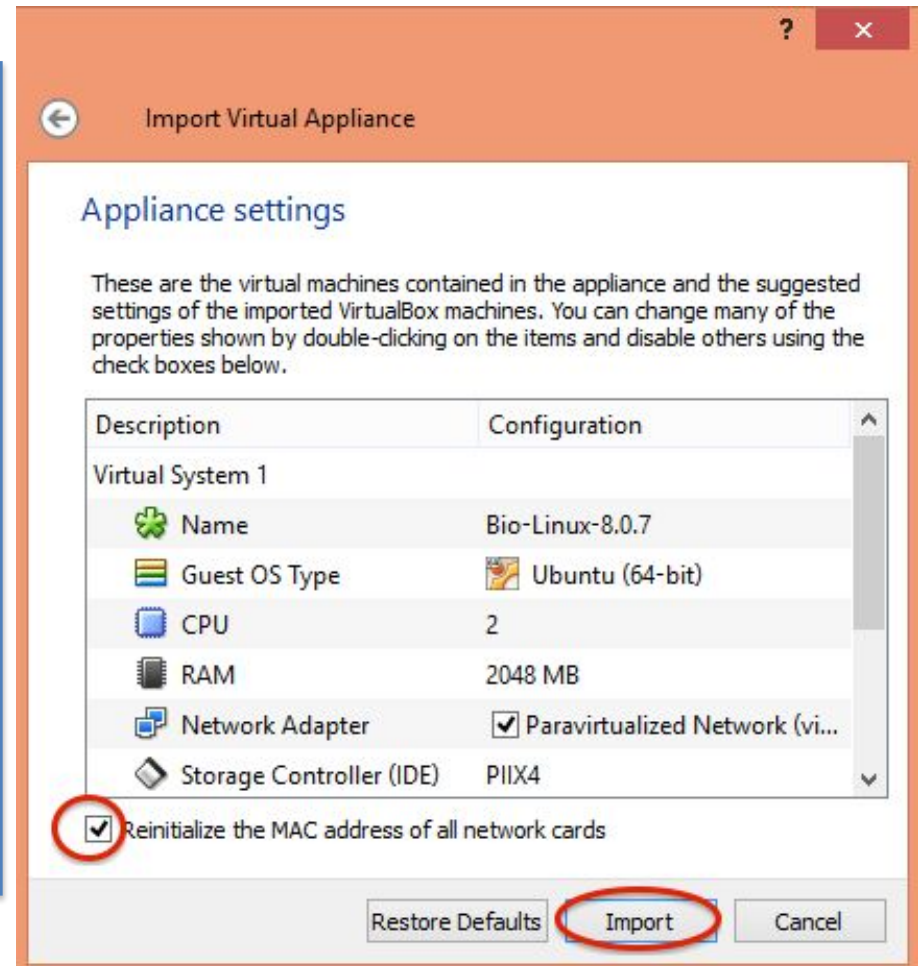
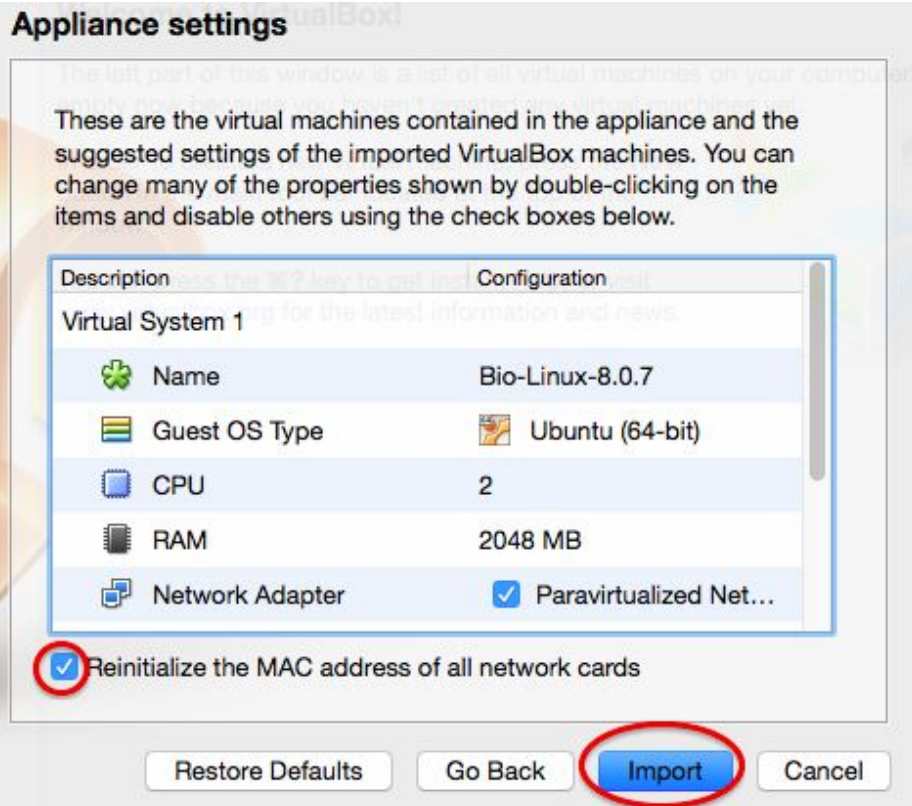
Make sure, in the next step, you will check

Reinitialize MAC address for all network cards.

Step 3: Import BioLinux

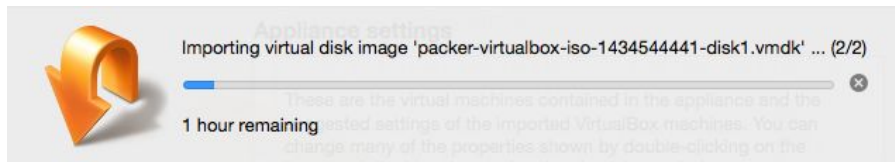
Mac OS X

Windows

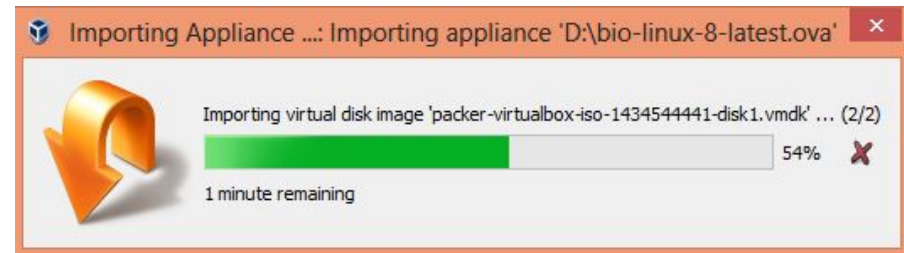


Step 3: Import BioLinux

Mac OS X



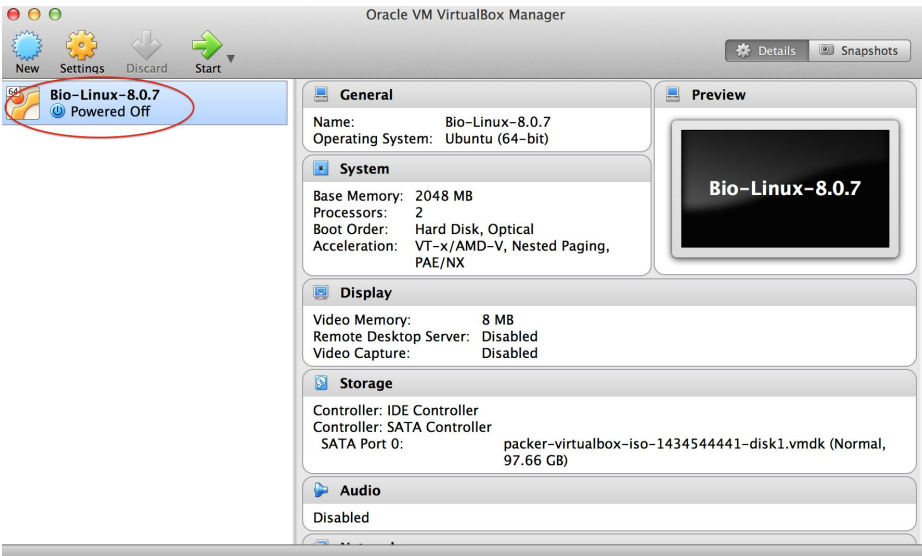
Windows



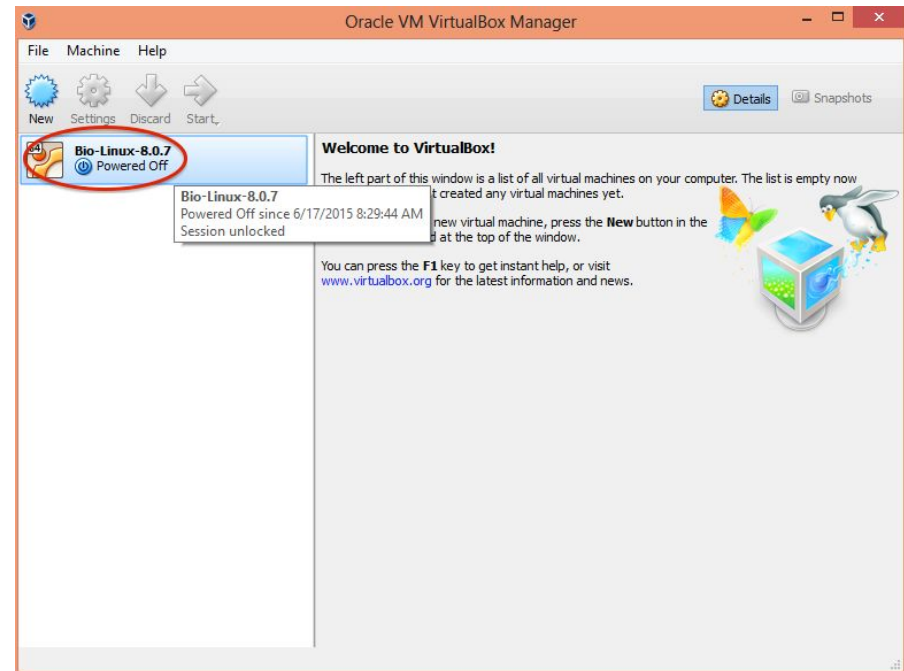
It can take 10-20 minutes

Step 4: Turn on BioLinux

Mac OS X



Windows

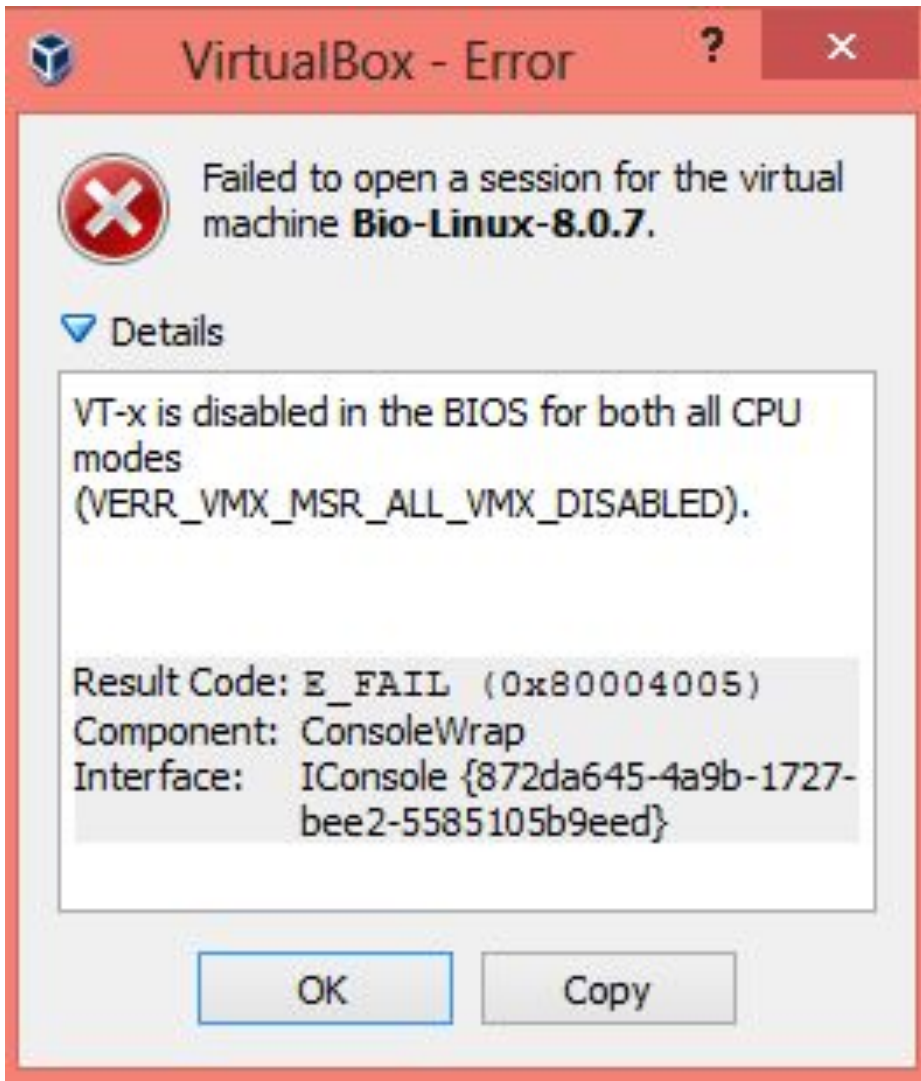


Double-click on Bio-Linux to turn it on.

Step 4.5: Enable VT-x

Windows *only*

In Windows, you may get an error like this the first time you run Bio-Linux. To fix it, you need to enable Virtualization Technology (VT-x) by modifying BIOS, which is a little technical. Restart while pressing F2, F10, F12, or DEL.



Step 4: Welcome to Linux world!

Bio-Linux should appear after a black screen.



From this point on, there is not much difference between Mac OS X and Windows.

Step 4: Welcome to Linux world!

Drag the bottom right corner of the screen to adjust it to your convenience.



You are done!

- Bio-Linux is installed, and should work properly.

Step 5: How To Install Packages on Ubuntu

Step 1: `sudo apt-get update -y`

Step 2: `sudo apt-get install -y {package_name}`

Step 3: `sudo apt-get install -y vcftools`
`sudo apt-get install -y trimmomatic`

Step 5: How To Install Packages on Ubuntu - Trimmomatic

- ❑ Trimmomatic - a flexible read trimming tool for Illumina NGS data.
- ❑ It is a Java-based tool:
 - Step 1: `which java`
 - Step 2: `sudo apt-get install -y trimmomatic`
 - Step 3: `which TrimmomaticPE`
`man TrimmomaticPE`
- ❑ To use Trimmomatic, retrieve the ADAPTERS files (fasta format):
 - Step 4: `cd /usr/local/bioinf`

Step 5: How To Install Packages on Ubuntu - Trimmomatic

Step 4: **wget**

<http://www.usadellab.org/cms/uploads/supplementary/Trimmomatic/Trimmomatic-0.36.zip>

Step 5: **sudo unzip Trimmomatic-0.36.zip**

```
Archive: Trimmomatic-0.36.zip  creating: Trimmomatic-0.36/  
inflating: Trimmomatic-0.36/LICENSE  
inflating: Trimmomatic-0.36/trimmomatic-0.36.jar  
creating: Trimmomatic-0.36/adapters/  
.....  
inflating: Trimmomatic-0.36/adapters/TruSeq3-SE.fa
```

Step 6: Run trimmomatic

```
TrimmomaticPE -phred33 sample1/sample1.raw.R1.fastq.gz sample1/sample1.raw.R2.fastq.gz  
sample1/sample1.raw.process.R1.fastq.gz sample1/sample1.raw.orphans.R1.fastq.gz  
sample1/sample1.raw.process.R2.fastq.gz sample1/sample1.raw.orphans.R2.fastq.gz  
ILLUMINACLIP:/usr/local/bioinf/Trimmomatic-0.36/adapters/NexteraPE-PE.fa:2:30:10:8:true  
LEADING:30 TRAILING:30 SLIDINGWINDOW:10:20 MINLEN:50
```

Step 6: How To Install Packages on Ubuntu - RStudio

Step 1: Install R

#Ubuntu 14.04 ships with R but it's not the latest version.

```
sudo apt-get update  
sudo apt-get install r-base
```

Step 2: Install Rstudio

```
sudo apt-get install gdebi-core  
wget https://download1.rstudio.org/rstudio-1.0.44-amd64.deb  
sudo gdebi  
https://download1.rstudio.org/desktop/trusty/amd64/rstudio-1.2.5042-amd64.deb  
rm rstudio-1.2.5042-amd64.deb
```

Step 3: Launch Rstudio from the icons

References:

- These guidelines were based on a blog post by Dave Lunt. <http://www.davelunt.net/evophylo/2011/07/bio-linux-in-a-virtualbox/>
- See the Bio-Linux website for documentation, training, and the list of supported software.
<http://environmentalomics.org/bio-linux/>
- I prepared these guidelines to facilitate the “Bioinformatics for biologists workshop” to be held on 20 Nov 2015, UTHSC – San Antonio.
<http://oncinfo.org/Bioinformatics+for+biologist+workshop>