

Windows and Mac Users

You will need a laptop with at least **8GB RAM** and **25GB** of contiguous local storage.

Installation instructions:

- Please download and install [Oracle VM VirtualBox](#) management software to your training machine for your respective OS (Windows host or OS X host)
- Once installed, start the application and click on **File->Preferences...** to display the preferences. On the **General** pane, ensure that the **"Default Machine Folder"** points to a folder on the drive with the available free space. This is where VirtualBox will create/manage the files for VMs.
- A pre-configured Linux Ubuntu 16.04 LTS 64-bit VM has been created that you will copy to your local machine and import into your instance of VirtualBox that will be used for the training. Download the SERVIR-VIC Training OVA file from the following link:
- Once VirtualBox is installed and configured, you can simply double-click on the local OVA file (or click on **File->Import Appliance** and browse to the OVA file) and the application will begin the import process to load the VM. Just take the default options. It may take up to 30 minutes to import the VM. When the import is complete, the "Ubuntu-VICTraining" VM should be listed in the VirtualBox pane.

Ubuntu-VICTraining Login Information:

- Username: SERVIR-VIC
- Password: servir1234!

Linux Users

These installation instructions are for installing and building some of the required programs from source code on Linux OS needed for the SERVIR VIC Training. The following is a list of required open source software needed for compiling, setup, running, and post processing/visualization of the VIC model. Software set up begins at step 1.

Required Software:

- i. Linus OS (preferably Ubuntu 2.14 or greater)
- ii. gfortran
- iii. zlib
- iv. curl
- v. Java
- vi. HDF5
- vii. NetCDF4
- viii. Panoply
- ix. QGIS (2.14 or greater)
- x. Python 2.7
 - x.i. NumPy
 - x.ii. SciPy
 - x.iii. XArray
 - x.iv. xlrd
 - x.v. pandas
 - x.vi. matplotlib
 - x.vii. PyProj
 - x.viii. netCDF4
 - x.ix. Basemap
 - x.x. RVIC

1. Installing supporting programs:

- Open Terminal
- gfortran: `$ sudo apt-get install gfortran`
 - Note: using the “sudo” command will prompt you for your password
- zlib: `$ sudo apt-get install libpnd-dev`
`$ sudo apt-get install --reinstall zlibc zlib1g zlib1g-dev`
- curl: `$ sudo apt-get install curl`
- geos-dev tools: `$ sudo apt-get install libgeos-dev`

- m4: `$ sudo apt-get install m4`
- Java: `$ sudo apt-get update`
`$ sudo apt-get install default-jre`
`$ sudo apt-get install default-jdk`
- HDF5 from source code:
 - Run command: `$ wget https://support.hdfgroup.org/ftp/HDF5/current/src/hdf5-1.10.0-patch1.tar.gz`
 - Run command: `$ tar -xf hdf5-1.10.0-patch1.tar.gz`
 - Navigate to the “hdf5-1.10.0-patch1” directory
 - Run commands: `$./configure --prefix=/usr/local --enable-shared --enable-hl`
`$ make`
`$ sudo make install`
`$ sudo ldconfig`
- NetCDF4 from source code:
 - Run command: `$ wget ftp://ftp.unidata.ucar.edu/pub/netcdf/netcdf-4.4.1.tar.gz`
 - Run command: `$ tar -xf netcdf-4.4.1.tar.gz`
 - Navigate to the “netcdf-4.4.1” directory
 - Run commands: `$ LDFLAGS=-L/usr/local/lib CPPFLAGS=-I/usr/local/include ./configure --enable-netcdf-4 --enable-dap --enable-shared --prefix=/usr/local`
`$ make`
`$ sudo make install`
`$ sudo ldconfig`
- Python dev tools: `$ sudo apt-get install build-essential python-dev`
- Python PIP package: `$ sudo apt-get install python-pip`

2. *Installing Python packages:*

- Run the following commands: `$ sudo pip install numpy==1.11.0`
`$ sudo pip install xlrd`
`$ sudo pip install pandas`
`$ sudo pip install xarray`
`$ sudo pip install matplotlib`
`$ sudo pip install netcdf4`
`$ sudo pip install pyproj`
`$ sudo pip install scipy`
`$ sudo pip install pillow`
`$ sudo pip install rvc`
- Install Basemap python package from source:

- Run command: `$ wget http://download.osgeo.org/geos/geos-3.6.1.tar.bz2`
- Run command: `$ tar -xf geos-3.6.1.tar.bz2`
- Navigate to the “geos-3.6.1” directory
- Run commands: `$./configure --prefix=$GEOS_DIR`
`$ make`
`$ sudo make install`
`$ sudo ldconfig`
- Run command: `$ wget https://sourceforge.net/projects/matplotlib/files/matplotlib-toolkits/basemap-1.0.7/basemap-1.0.7.tar.gz`
- Run command: `$ tar -xf basemap-1.0.7.tar.gz`
- Navigate to the “basemap.1.0.7” directory
- Run command: `$ sudo python setup.py install`

3. Installing visualization/GIS software:

- Installing Panoply:
 - Run command: `$ wget https://www.giss.nasa.gov/tools/panoply/download/PanoplyJ-4.6.2.tgz`
 - Run command: `$ tar -xf PanoplyJ-4.6.2.tgz`
 - Navigate to the “PanoplyJ” directory
 - Run command: `$ chmod +x panoply.sh`
- Installing QGIS:
 - Run command: `$ sudo apt-get install qgis python-qgis`
 - Navigate to the “/etc/apt/” directory
 - Run command: `$ sudo nano sources.list`
 - Insert these three lines at the end of the file:


```
deb http://qgis.org/ubuntuqgis xenial main
deb-src http://qgis.org/ubuntuqgis xenial main
deb http://ppa.launchpad.net/ubuntuqgis/ubuntuqgis-unstable/ubuntu xenial main
```
 - Close/save the file: “Ctrl-X”, then enter “Y”
 - Run commands: `$ sudo apt-get update`
`$ sudo apt-get upgrade`
`$ sudo apt-get install qgis`