# Installation of CentOS with Virtual Box / CANTERA\_AVBP / ARCANE

Installation tested for CentOS 7, CentOS 8.

To get CentOS : <https://www.centos.org/>

To get Virtual Box : [Oracle VM VirtualBox](https://www.virtualbox.org/)

## Set the Linux environment

Many tutorials are available on the web to succeed at installing CentOS :

Base sur le début d’installation :

<https://laptop.ninja/how-to-setup-centos-in-virtualbox/>

Le plus complet :

<https://www.youtube.com/watch?v=UrNe0_rW9qY&list=LLxBjKjxH2Hs3k0mJwAdaUeA&index=10>

Complémentaire :

<https://www.youtube.com/watch?v=31Xfju-yCHw&list=LLxBjKjxH2Hs3k0mJwAdaUeA&index=12&t=555s>

* Machine > Create
	+ Name your environment: Specify the path for the virtual machine
	+ Memory size: Allow some RAM (depends on your computer specs)
	+ Hard Disk: Create a virtual hard disk now
	+ Hard Disk file type: VDI (Virtual Disk Image)
	+ Storage on physical hard disk: Dynamically allocated (then, allow some ROM)
* Settings
	+ Storage: Empty IDE > Select a disk file .. (choose the CentOS ISO downloaded)
	+ System: Pointing Device > Select USB tablet
* Start the environment
	+ Select language
	+ Installation Destination: click done since ROM is already allocated
	+ User Settings: set a password
	+ Start installation
	+ Reboot
	+ IF boot loop, go to storage > change boot order (first : hard drive, disk, floppy disk)
	+ While the machine is down, settings > Display > Video memory to the max (128 Mb)
* Start again the environment
	+ Configure it (user, password..)

Now we use a terminal in the freshly installed environment, but in a small window so let’s make it fullscreen:

* Check is the internet connection is enabled! (it sets itself off every restart)

If you are not able to connect to internet: <https://www.youtube.com/watch?v=UUkCys309xA&list=LLxBjKjxH2Hs3k0mJwAdaUeA&index=11&t=127s>

* Here is a list of commands to finish the installation of CentOS :

*sudo yum update kernel\**

*sudo yum -y install gcc*

*sudo yum install make perl*

*sudo yum -y install kernel-devel-$(uname -r)*

**You might need to reboot CentOS if the previous command fails**

*sudo yum install elfutils-libelf-devel*

From the guest file explorer, unmount the disk “VBox\_Gas\_...”

From the top panel > Devices > Insert Guest Additions CD Image.. > Run with password

**Reboot the OS**

Now you should be able to go fullscreen from top panel > View > Fullscreen !

## Create a shared folder

The idea is to be able to communicate files between host OS and guest OS.

* Create a folder in the host file explorer, copy the path
* In the Virtual BOX manager
	+ - Settings > Advanced > Select bi-directional for both
		- In shared folder > Add folder > paste the path, select Auto-mount
	+ 
* In the terminal
	+ - Give yourself some rights:

*sudo usermod -aG vboxsf yourusername*

* Reboot !

## CANTERA and ARCANE (requirements + git clone)

*sudo yum install gcc-c++*

*sudo yum install gcc-gfortran*

*sudo yum update -y*

Now let’s get Python (+Pip) installed:

Python3.7 (<https://tecadmin.net/install-python-3-7-on-centos/> 🡪 Be careful ! Python 3.6 won’t work with CANTERA. You can do the installation from sources with <https://www.liquidweb.com/kb/how-to-install-python-3-on-centos-7/> )
DO NOT USE ALTINSTALL but INSTALL so Python3 is in the default directory usr/bin/python3

Here are the commands used:

*yum install gcc openssl-devel bzip2-devel libffi-devel zlib-devel*

*cd /opt*

*wget https://www.python.org/ftp/python/3.7.9/Python-3.7.9.tgz*

*tar xzf Python-3.7.9.tgz*

*cd Python-3.7.9*

*./configure --enable-optimizations*

*make install*

*rm /usr/src/Python-3.7.9.tgz*

*python3.7 -V*

**This should return Python 3.7.9**



Python3.7 is installed in usr/local/bin but it’s ok since the python path is in PATH (picture above), the installation can be continued !

Now we must install other libraries to work with python:

*Pip3 install Cython*

*Pip3 install Numpy*

*Pip3 install Matplotlib*

*Pip3 install pyqt5*

Then you must download “boost”, put in in desktop and extract it here. Only its path matters for next installations.

*cd Desktop*

*wget* [*https://dl.bintray.com/boostorg/release/1.65.1/source/boost\_1\_65\_1.tar.gz*](https://dl.bintray.com/boostorg/release/1.65.1/source/boost_1_65_1.tar.gz)

*tar -xvf boost\_1\_65\_1.tar.gz*

*pwd*

**Keep the path close to you since it is needed for cantera.**

*sudo yum install git*

*sudo yum install emacs*

*pip3 install scons*

*pip3 install scipy*

*pip3 install networkx*

*cd Desktop*

*git clone* [*https://gitlab.com/cerfacs/chemistry/cantera-avbp.git*](https://gitlab.com/cerfacs/chemistry/cantera-avbp.git)

(<https://gitlab.com/cerfacs/chemistry/cantera-avbp>)

*cd cantera-avbp*

*emacs cantera.conf*

In this config file: paste the path of “boost”



*scons build (if fails, use scons clean and check previous steps..)*

*scons install*

*From scons install, a path to load the CANTERA environment is given, copy it.*

CANTERA is installed, congrats!

* Now we make sure Cantera is loaded each time you open a terminal :

If emacs is installed:

*emacs ~/.bashrc*

*otherwise: vi ~/.bashrc*

**Write the following source:**

*#CANTERA AVBP*

*source /home/xxxx/Desktop/cantera-avbp/INSTALL\_DIR/bin/setup\_cantera*

*(the path from scons install)*

* To get ARCANE, you do a git clone as for CANTERA
* Test your freshly installed Cantera ! : <https://cantera.org/examples/python/>