

Steps to install Singularity 3.5.0 on a Virtual Machine

1. Download and install VirtualBox from <https://www.virtualbox.org/>
2. Download Centos 8 ISO from http://iso.redirect.centos.org/centos/8/isos/x86_64/CentOS-8-x86_64-1905-dvd1.iso
3. Create new VM
 - a. Launch VirtualBox
 - b. Click “New”
 - c. Name new VM “CentOS” and then click “Next”
 - d. Set desired memory size using slider and then click “Next”
 - e. Select “Create a virtual hard disk now” and then click “Create”
 - f. Select “VDI” and then click “Next”
 - g. Select “Dynamically Allocated” and then click “Next”
 - h. Select the desired size of the virtual hard disk using the slider and then click “Create”
4. Install CentOS 8 onto the VM
 - a. Click “Settings”
 - b. Click on “System” and uncheck “Floppy Disk” from boot order
 - c. Click on “Storage”
 - d. Go to “Storage Devices” and click on “Empty” under “Controller: IDE”
 - e. Click on the CD symbol under “Attributes” and set it to the CentOS ISO image downloaded earlier
 - i. If it does not appear as an available option in the dropdown menu, then click on “Choose Virtual Optical Disk File...” and navigate to the directory where you downloaded the CentOS ISO image
 - f. Click “OK”
 - g. Launch the VM and select “Install CentOS 8”
 - i. At this point you will setup CentOS to your liking (time zone, storage device, keyboard layout, etc.)
 - ii. You also be asked to setup the root user password. Make it something that you will easily remember as you will not be able to recover it later
 - iii. Also, setup a user for yourself. Be sure to make yourself an administrator as well so then you can execute sudo commands
 - iv. CentOS 8 will now take anywhere from 20 – 60 minutes to install on the VM, so be sure to get a cup of coffee and kick back and relax
 - h. Once CentOS 8 has finished installing, click the X at the top-right corner of the window, select “Power off the Machine”, and then click “OK”
5. Booting up CentOS 8 for the first time
 - a. Before launching your CentOS 8 machine, click on “Settings”
 - b. Click on “System” and uncheck “Optical” from boot order
 - c. Click “OK”
 - d. Launch your VM and then launch CentOS 8
6. Installing Singularity’s Dependencies
 - a. Once you have signed into CentOS, go to Activities and launch terminal

b. Installing system dependencies:

i. Type the following commands:

```
$ yum update -y && \  
> yum groupinstall -y 'Development Tools' && \  
> yum install -y \  
> openssl-devel \  
> libuuid-devel \  
> wget \ # Should already be installed  
> squashfs-tools \ # Should already be installed  
> cryptsetup \ # Should already be installed  
  
$ wget http://mirror.centos.org/centos/8/PowerTools/x86_64/os/Packages/libseccomp-devel-2.3.3-3.el8.x86_64.rpm && \  
> yum localinstall -y libseccomp-devel-2.3.3-3.el8.x86_64.rpm && \  
> rm -f libseccomp-devel-2.3.3-3.el8.x86_64.rpm
```

c. Installing Go:

i. Type the following commands:

```
$ export VERSION=1.13 OS=linux ARCH=amd64 && \  
> wget https://dl.google.com/go/go$VERSION.$OS-$ARCH.tar.gz && \  
> tar -C /usr/local -xzf go$VERSION.$OS-$ARCH.tar.gz && \  
> rm -f go$VERSION.$OS-$ARCH.tar.gz  
  
$ echo 'export GOPATH=${HOME}/go' >> ~/.bashrc && \  
> echo 'export PATH=/usr/local/go/bin:${PATH}:${GOPATH}/bin' >> ~/.bashrc && \  
> source ~/.bashrc
```

7. Installing and compiling Singularity

a. Type the following commands:

```
$ export VERSION=3.5.0 && \  
> wget https://github.com/sylabs/singularity/releases/download/v${VERSION}/singularity-${VERSION}.tar.gz && \  
> tar -xzf singularity-${VERSION}.tar.gz && \  
> cd singularity  
  
$ ./mconfig && \  
> make -C ./builddir && \  
> make -C ./builddir install
```

8. At this point, Singularity will now be installed on your CentOS 8 VM. Should you run into any issues or have any questions regarding the installation of Singularity please contact the ICDS i-ASK at iask@ics.psu.edu