Singularity Installation Guide

This guide provides instructions on how to set up Singularity on Linux (CentOS, Ubuntu), Mac and Windows machines. A Linux OS is required to run Singularity natively. Please refer to the section relevant to your machine type.

Note: The Singularity version on Lawrencium is 3.2.1. For compatibility, you should install the same version of Singularity on your local Linux system.

Linux

CentOS / Red Hat Enterprise Linux

Install the dependencies:
```
$ sudo yum update -y && \
sudo yum groupinstall -y 'Development Tools' && \
sudo yum install -y openssl-devel libuuid-devel \
libseccomp-devel wget squashfs-tools cryptsetup
```

Install Go (the latest version is 1.14.3):
```
$ export VERSION=1.14.3 OS=linux ARCH=amd64 && \
  wget https://dl.google.com/go/go$VERSION.$OS-$ARCH.tar.gz && \
  sudo tar -C /usr/local -xzvf go$VERSION.$OS-$ARCH.tar.gz && \
  rm go$VERSION.$OS-$ARCH.tar.gz
$ export PATH=/usr/local/go/bin:${PATH}
```

Download Singularity v3.2.1 source code:
```
$ export VERSION=3.2.1
$ wget
https://github.com/hpcng/singularity/releases/download/v${VERSION}/singularity-${VERSION}.tar.gz
$ tar -xzf singularity-${VERSION}.tar.gz && cd singularity
```

Build and install Singularity:
```
$ ./mconfig && make -C builddir && sudo make -C builddir install
```

Ubuntu / Debian

Install the dependencies:
```
$ sudo apt-get update && sudo apt-get install -y \
    build-essential uuid-dev libgpgme-dev squashfs-tools \
    libseccomp-dev wget pkg-config git cryptsetup-bin
```

Install Go (the latest version is 1.14.3):

```
$ export VERSION=1.14.3 OS=linux ARCH=amd64 && \
    wget https://dl.google.com/go/go$VERSION.$OS-$ARCH.tar.gz && \
    sudo tar -C /usr/local -xzvf go$VERSION.$OS-$ARCH.tar.gz && \
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$ export PATH=/usr/local/go/bin:${PATH}
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Download Singularity v3.2.1 source code:

```
$ export VERSION=3.2.1
$ wget
https://github.com/hpcng/singularity/releases/download/v${VERSION}/singularity-${VERSION}.tar.gz
$ tar -xzf singularity-${VERSION}.tar.gz && cd singularity
```

Build and install Singularity:

```
$ ./mconfig && make -C builddir && sudo make -C builddir install
```

Mac

On a Mac, you'll need to spin up a Linux VM in order to run Singularity. The easiest approach is to use VirtualBox and Vagrant. You can download VirtualBox and Vagrant from their respective websites, but using Homebrew is relatively easy.

Install homebrew:
```
$ /bin/bash -c "$(curl -fsSL
https://raw.githubusercontent.com/Homebrew/install/master/install.sh)"
```

Install VirtualBox via Homebrew:
```
$ brew cask install virtualbox
```

Install Vagrant:
```
$ brew cask install vagrant
```

Spin up a ubuntu/xenial64 VM from the ubuntu/xenial64 vagrant box:
```
$ mkdir vm-singularity && cd vm-singularity
$ vagrant init ubuntu/xenial64 && vagrant up
```

Login to the VM and check OS:
```
$ vagrant ssh
```

```
$ vagrant@vagrant:~$ cat /etc/os-release
NAME="Ubuntu"
```

```
...
```

```
$ vagrant@vagrant:~$ cd /vagrant/; pwd
/vagrant
```

Tip: Your current working directory ~/vm-singularity on your Mac is mounted at /vagrant in the VM, aka files created at /vagrant inside the VM is accessible to ~/vm-singularity on your Mac.

Install dependencies within vagrant:

```
$ sudo apt-get update && sudo apt-get install -y \
    build-essential uuid-dev libssl-dev squashfs-tools \
    libseccomp-dev wget pkg-config git cryptsetup-bin
```

Install go and singularity:
Follow the instructions above for Ubuntu/Debian

Windows

On Windows machines, you'll need to spin up a Linux VM to run Singularity. There are a number of hypervisors available on Windows, including VirtualBox and Hyper-V or Subsystem for Linux 2. So pick your favorite hypervisor on Windows. Once you spin up a Linux VM on Windows, you can follow the previous instructions to install Singularity in the VM.

Reference

Installing Singularity