

Setup a build environment

This guide shows the steps required for creating a complete deployment of the OpenCMT software for development and tests.

Setup for CentOS 8 (Deprecated)

System setup

The basic requirement for the next recipe is working on a clean Virtual Machine with CentOS 8 operating system. These steps must be executed by root:

1. Be sure to have an updated version of the system, with the EPEL extension enabled

```
sudo yum -y update
sudo yum -y install epel-release yum-utils wget
sudo yum-config-manager --set-enabled powertools
sudo yum-config-manager --set-enabled appstream
```

2. Install the CA certificate required by the internal software repositories

```
sudo wget -O /etc/yum.repos.d/EGI-trustanchors.repo http://repository.egi.eu/sw/production/cas/1
/current/repo-files/EGI-trustanchors.repo
sudo yum -y install ca-policy-egi-core
sudo ln -s /etc/grid-security/certificates/USERTrustRSACertificationAuthority.pem /etc/pki/ca-trust
/source/anchors/
sudo ln -s /etc/grid-security/certificates/GEANTeScienceSSLCA4.pem /etc/pki/ca-trust/source/anchors/
sudo wget -O /etc/pki/ca-trust/source/anchors/GEANT-0V-RSA-CA-4.pem https://pandora.infn.it/public
/483fb5/dL/GEANT-0V-RSA-CA-4.pem
sudo update-ca-trust extract
```

3. Install the metadata for the internal software repositories (GEANT4, and CMT)

```
sudo wget -O /etc/yum.repos.d/root.repo https://nexus.pd.infn.it/artifacts/repository/repo-files/root-
c17.repo
sudo wget -O /etc/yum.repos.d/muotom.repo https://nexus.pd.infn.it/artifacts/repository/muotom-repo-
files/muotom.repo
```

4. Install the tools and libraries required by the CMT software

```
sudo yum install git gcc-c++ make cmake doxygen geant4-vmc-mt-devel cmt-ulib-devel root-graf3d-eve
xorg-x11-xauth mesa-dri-drivers pcl-devel vim-enhanced rpm-build
```

5. Since the GEANT4 package does not contain the particle data sets, download the required files from central repository

```
sudo geant4-dataset-download
```

VNC server setup

If it is necessary to install a VNC server on the virtual machine the steps required are the following:

1. Install the graphic environment

```
sudo yum -y check-update
sudo yum -y groupinstall "Server with GUI"
sudo systemctl set-default graphical
```

2. Reboot the virtual machine

```
sudo reboot
```

3. Install the VNC server

```
sudo yum -y install tigervnc-server
```

4. Register the current user, for example centos, in the users configuration file (/etc/tigervnc/vncserver.users). Just add the following line:

```
:1=centos
```

5. Create a password for accessing the VNC server

```
vncpasswd
```

and set the same password for the current user

6. Configure the VNC server (file \$HOME/.vnc/config), this is a basic setup:

```
# securitytypes=vncauth,tlsvnc
# desktop=sandbox
geometry=1920x1080
# localhost
# alwaysshared
bs
```

7. Activate the service

```
sudo systemctl enable vncserver@:1.service
sudo systemctl start vncserver@:1.service
```

Setup for Alma Linux 9

System setup

The basic requirement for the next recipe is working on a clean Virtual Machine with Alma Linux 9 operating system. These steps must be executed by root:

1. Be sure to have an updated version of the system, with the EPEL extension enabled:

```
sudo yum -y update
sudo yum -y install epel-release yum-utils wget
sudo yum-config-manager --set-enabled appstream crb extras plus
```

2. Install the metadata for the internal software repositories (GEANT4, and CMT):

```
sudo wget -O /etc/yum.repos.d/muotom.repo https://nexus.pd.infn.it/artifacts/repository/repo-files/muotom.repo
```

3. Install the tools and libraries required by the CMT software:

```
sudo yum install git gcc-c++ make cmake doxygen geant4-vmc-devel root-graf3d-eve root-geom-builder
root-geom-painter root-geom-webviewer xorg-x11-xauth mesa-dri-drivers pcl-devel
```

4. Since the GEANT4 package does not contain the particle data sets, download the required files from central repository:

```
sudo geant4-dataset-download
```

Storage setup

The data for tests are available via NFS, add this row to the file /etc/fstab

```
cld-storage-01.pd.infn.it:/data/brickOpenstack/muon-steel/sdb /mnt/muotom-data nfs defaults 0 0
```

then create the directory and mount the endpoint

```
sudo mkdir -p /mnt/muotom-data  
sudo chmod a+rx /mnt/muotom-data  
sudo mount -a
```



Virtual Machines with AlmaLinux 9 are available in the [Cloud Veneto](#) infrastructure, within project **Muon Tomography**.

If the activity requires a considerable amount of resources, the project grants access to dedicated flavors: muon_CPU-12_RAM-64GB and muon_48cores500GB25GB.