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Containers.

Debian.

Document how you installed Docker and Kubernetes. Make sure you've installed them on both servers and your documentation includes instructions for installs on both distros. Target Market is someone technically inclined but unfamiliar with virtualization. Include screenshots to walk them through the install process, as well as explanations of what you're doing and any troubleshooting that was needed.

Docker installation

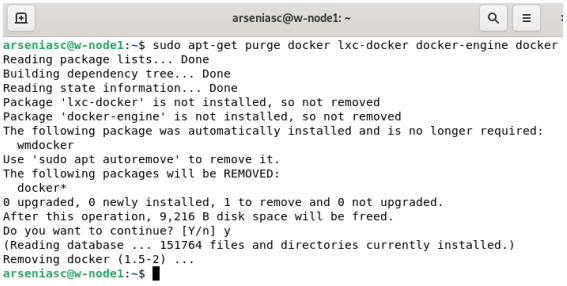
Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. Docker helps to create containers. Today we are going to learn how to install docker this useful tool.

Instructions

After you successfully have logged in on your server, follow the next steps to install docker

1. **Uninstall Default Docker Packages**

-Type the following to uninstall the old docker package **,sudo apt-get purge docker lxc-docker docker-engine docker.io.** If you skip this step, it could lead you to have some issues when running docker in the future.



-Next, update the apt package index. Type **sudo apt-get update.**

-Later, install the require packages needed to run docker. Please type **sudo apt-get install apt-transport-https ca-certificates curl gnupg2 software-properties-common.**

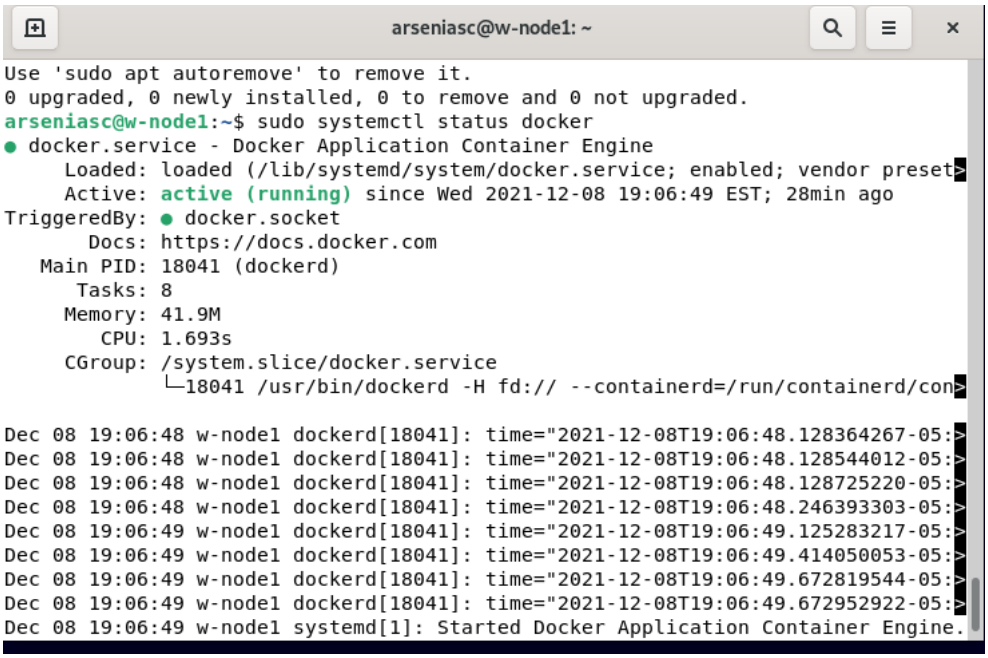
-Later, we must download the key to verify the integrity of packages before installing, type the following to install the key curl **-fsSL https://download.docker.com/linux/debian/gpg | sudo apt-key add -**

-Now, we are going to install the repository to our system, by typing the following command we will be able to do that **sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/debian buster stable"**

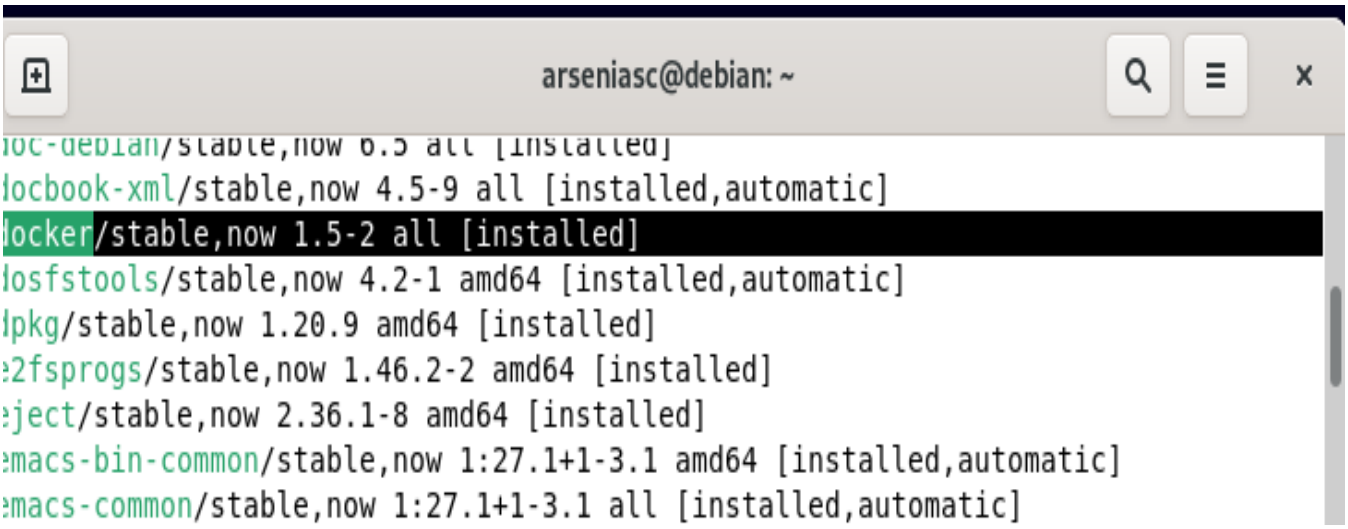
-Update the apt packages again, typing this command on the command line **sudo apt-get update**

-Later, we are going to install the docker engine type this command **sudo apt-get install docker-ce docker-ce-cli containerd.io**

-If you want to check the status of your docker type the following : **sudo systemctl status docker**



-After the system finish processing the download, you will be all set. In the image below you can see that docker is in your installed app list. To see that your installed apps you can type **apt list --installed**



Kubernetes installation

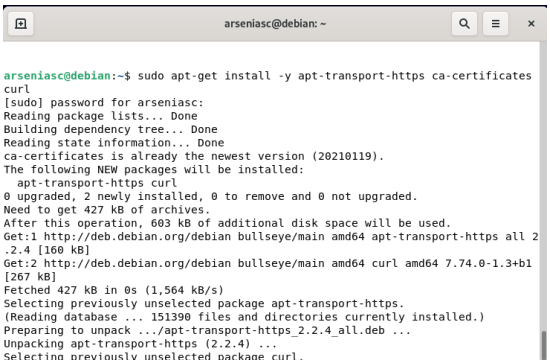
Kubernetes, also referred to as K8s, is an open-source platform used to manage Linux Containers across private, public and hybrid cloud environments. Now we are going to learn how to install Kubernetes.

Instructions :

-To install Kubernetes, we need some packages to be installed before install the Kubernetes repository.

Type the following to install the package:

sudo apt-get install -y apt-transport-https ca-certificates curl



-Also, we need to **download the Google Cloud public signing key** to download this type this command:

sudo curl -fsSLo /usr/share/keyrings/kubernetes-archive-keyring.gpg
https://packages.cloud.google.com/apt/doc/apt-key.gpg

-Now, we are going to add the Kubernetes `apt` repository

```
arseniasc@debian: ~
arseniasc@debian:~$ echo "deb [signed-by=/usr/share/keyrings/kubernetes-archive-
keyring.gpg] https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee /etc/
apt/sources.list.d/kubernetes.list
deb [signed-by=/usr/share/keyrings/kubernetes-archive-keyring.gpg] https://apt.k
ubernetes.io/ kubernetes-xenial main
arseniasc@debian:~$
```

-Them after adding the Kubernetes Repository we are going to update the app package index.

Type the following to update the apt package

-Lastly, we are going to install the Kubernetes services **kubelet, kubeadm and kubectl.** Type the following command to install them:

sudo apt-get install -y kubelet kubeadm kubectl

A small paragraph describing how the Minikube tutorial went, what gave you trouble (if anything) and how you fixed it. Include screenshots to show how it went and what steps you did. You don't need to include everything, just a small selection is fine. Likely less than 2 pages will be generated here.

Minibuke

Is a tool that lets you run Kubernetes locally

Instructions

First, update the apt packages index. Type the following command to get it done **sudo apt update** and the **sudo apt upgrade** if any update is needed.

We need some packages to enable us to execute others commands later during the installation. So, install this package with the instructions below.

sudo apt install curl wget apt-transport-https -y as you see I already has this package on my system I installed it before.

```
arseniasc@debian: ~
arseniasc@debian:~$ sudo apt install curl wget apt-transport-https -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apt-transport-https is already the newest version (2.2.4).
curl is already the newest version (7.74.0-1.3+b1).
wget is already the newest version (1.21-1+b1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
arseniasc@debian:~$
```

Now, we are going to use the wget command to download the latest Minikube library type the following command to do that :

```
arseniasc@debian: ~
arseniasc@debian:~$ wget https://storage.googleapis.com/minikube/releases/latest
/minikube-linux-amd64
--2021-12-08 15:37:23--  https://storage.googleapis.com/minikube/releases/latest
/minikube-linux-amd64
Resolving storage.googleapis.com (storage.googleapis.com)... 142.250.65.208, 142
.251.32.112, 142.251.35.176, ...
Connecting to storage.googleapis.com (storage.googleapis.com)|142.250.65.208|:44
3... connected.
HTTP request sent, awaiting response... 200 OK
Length: 69568775 (66M) [application/octet-stream]
Saving to: 'minikube-linux-amd64'

minikube-linux-amd6 100%[===================>]  66.35M  3.15MB/s    in 26s

2021-12-08 15:37:49 (2.57 MB/s) - 'minikube-linux-amd64' saved [69568775/6956877
5]

arseniasc@debian:~$
```

Next, copy the binary file to the /usr/local/bin path type the following,

sudo cp minikube-linux-amd64 /usr/local/bin/minikube

Lastly, add **execute permission to the file,** type the following to do that **sudo chmod +x /usr/local/bin/minikube.**

Now, we are going to check the Minikube version type **minikube version**

```
arseniasc@debian: ~
arseniasc@debian:~$ minikube version
minikube version: v1.24.0
commit: 76b94fb3c4e8ac5062daf70d60cf03ddcc0a741b
arseniasc@debian:~$
```

Running minibuke

When I try to run minibuke it gave me this **error** shown in the image below

```
arseniasc@w-node1: ~
arseniasc@w-node1:~$ minikube start
😄  minikube v1.24.0 on Debian 11.1
👎  Unable to pick a default driver. Here is what was considered, in preference
 order:
    ▪ docker: Not healthy: "docker version --format {{.Server.Os}}-{{.Server.Ve
rsion}}" exit status 1: Got permission denied while trying to connect to the Do
cker daemon socket at unix:///var/run/docker.sock: Get "http://%2Fvar%2Frun%2Fd
ocker.sock/v1.24/version": dial unix /var/run/docker.sock: connect: permission
denied
    ▪ docker: Suggestion: Add your user to the 'docker' group: 'sudo usermod -a
G docker $USER && newgrp docker' <https://docs.docker.com/engine/install/linux-
postinstall/>
    ▪ kvm2: Not installed: exec: "virsh": executable file not found in $PATH
    ▪ podman: Not installed: exec: "podman": executable file not found in $PATH
    ▪ vmware: Not installed: exec: "docker-machine-driver-vmware": executable f
ile not found in $PATH
    ▪ virtualbox: Not installed: unable to find VBoxManage in $PATH

❌  Exiting due to DRV_NOT_HEALTHY: Found driver(s) but none were healthy. See
above for suggestions how to fix installed drivers.

arseniasc@w-node1:~$
```

Let's fix it.

-Install some updates needed for the new version of docker.

After 2018 was implemented rootless Docker/Moby. Rootless Docker has been merged to the Docker/Moby upstream since Docker 19.03. to install those packages fallow the next steps.

-First, type the following **curl -o rootless-install.sh -fsSL https://get.docker.com/rootless**

-Later, type this to install **sh rootless-install.sh, when I typed this command and hit enter, in thew image below you can see my result**

```
arseniasc@w-node1: ~
arseniasc@w-node1:~$ curl -o rootless-install.sh -fsSL https://get.docker.com/ro
otless
arseniasc@w-node1:~$ sh rootless-install.sh
# Installing stable version 20.10.11
# Missing system requirements. Please run following commands to
# install the requirements and run this installer again.
# Alternatively iptables checks can be disabled with SKIP_IPTABLES=1

cat <<EOF | sudo sh -x
apt-get install -y uidmap
EOF
```

-The system needs additional requirements, now you are going to fallow these step to install the requirements:

Type **sudo -get install -y uidmap**

```
arseniasc@w-node1: ~
bash: EOF: command not found
arseniasc@w-node1:~$ sudo apt-get install -y uidmap
[sudo] password for arseniasc:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  wmdocker
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  uidmap
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 223 kB of archives.
After this operation, 305 kB of additional disk space will be used.
Get:1 http://deb.debian.org/debian bullseye/main amd64 uidmap amd64 1:4.8.1-1 [2
23 kB]
Fetched 223 kB in 0s (876 kB/s)
Selecting previously unselected package uidmap.
(Reading database ... 151761 files and directories currently installed.)
Preparing to unpack .../uidmap_1%3a4.8.1-1_amd64.deb ...
Unpacking uidmap (1:4.8.1-1) ...
Setting up uidmap (1:4.8.1-1) ...
Processing triggers for man-db (2.9.4-2) ...
```

-Next, we will export to PATH type this command **PATH=$HOME/bin:$PATH and hit enter.**

-Now we need to to connect to the rootless daemon, we can do that by typing this command export **DOCKER_HOST=unix://$XDG_RUNTIME_DIR/docker.sock**

-Set the driver to **Driver= docker** as default each time when you run minibuke

sudo -E minikube start --driver=docker, this one does not need root privileges. After that please add $user to docker group.

sudo usermod -aG docker $USER && newgrp docker

run minibuke again. **minikube start --driver=docker,** now should be good.

```
Activities  Terminal  Dec 8 22:35
arseniasc@Debian: ~
arseniasc@Debian:~$ sudo usermod -aG docker $USER && newgrp docker
[sudo] password for arseniasc:
arseniasc@Debian:~$ minikube start --driver=docker
😄  minikube v1.24.0 on Debian 11.1
✨  Using the docker driver based on user configuration
👍  Starting control plane node minikube in cluster minikube
🚜  Pulling base image ...
💾  Downloading Kubernetes v1.22.3 preload ...
    > preloaded-images-k8s-v13-v1...: 501.73 MiB / 501.73 MiB  100.00% 1.75 MiB
    > gcr.io/k8s-minikube/kicbase: 355.78 MiB / 355.78 MiB  100.00% 978.32 KiB
🔥  Creating docker container (CPUs=2, Memory=2200MB) ...
🐳  Preparing Kubernetes v1.22.3 on Docker 20.10.8 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" name
space by default
arseniasc@Debian:~$
```

To open minikube type the following **minikube ssh**

```
docker@minikube: ~
arseniasc@Debian:~$ minikube ssh
docker@minikube:~$ exit
logout
arseniasc@Debian:~$ minikube ssh
Last login: Thu Dec  9 03:42:37 2021 from 192.168.49.1
docker@minikube:~$
```

You are all set.

OPTIONAL: A text document including your thoughts and struggles as you went through the ansible tutorial. What worked? What didn't?

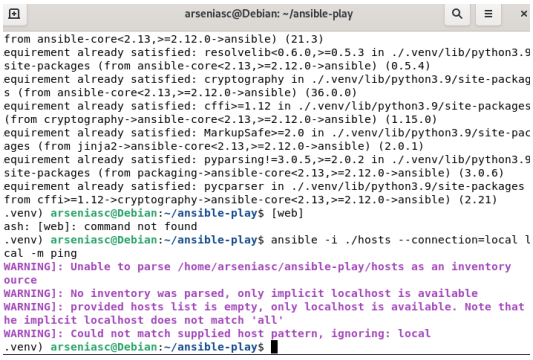
Ansible installation on Debian

What work?

It was nice the start using Ansible, it looks like ansible is a great tool to manage complex tax in an easier way. I downloaded python 3, I create the directory to play with ansible, I create the python virtual environment and enabled it. I installed ansible.

What didn't?

As I said above, I could install ansible on Virtualenv's everything was working until I started the configuration. Everything started to give errors I try to fix it in different ways, but it did not work. In the image attached below you can see an error it gave me.



CentOS

Docker installation

Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. Docker helps to create containers. Today we are going to learn how to install docker this useful tool.

Instructions

After you successfully have logged in on your server, follow the next steps to install docker

1. Uninstall Default Docker Packages

-Type the following to uninstall the old docker package , **sudo yum remove docker**

If you skip this step, it could lead you to have some issues when running docker in the future.

Update the yum package type **sudo yum update**

-Set up the repository

Install the **yum-utils** package this want will offer the configuration manager.

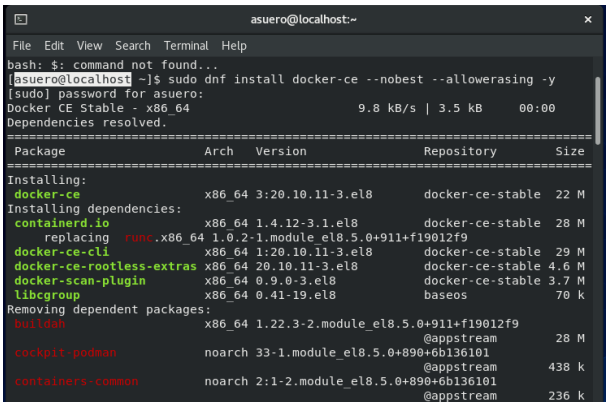
To install the utils type **sudo yum install -y yum-utils**

-Add the repository

sudo dnf config-manager --add-repo=https://download.docker.com/linux/centos/docker-ce.repo

-Later, Install Docker Engine

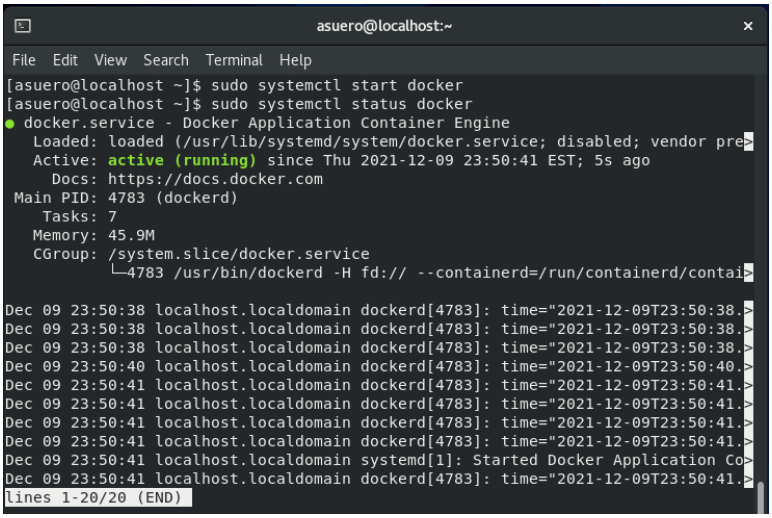
To install the newest version of docker type the following **command sudo dnf install docker-ce --nobest --allowerasing -y**



You are all set, docker is now **installed** on the server.

-Type the following command to start docker **sudo systemctl start docker**

-To see the status of docker you can run this command **sudo systemctl status docker**



Enable docker daemon to start on the system at the boot time **sudo systemctl enable docker**

Kubernetes installation

Kubernetes, also referred to as K8s, is an open-source platform used to manage Linux Containers across private, public and hybrid cloud environments. Now we are going to learn how to install Kubernetes.

Instructions :

Configure Kubernetes repository

To do the Kubernetes repo configuration please type the fallowing command exactly as is shown below.

cat <<EOF | sudo tee /etc/yum.repos.d/kubernetes.repo

[kubernetes]

name=Kubernetes

baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-\$basearch

enabled=1

gpgcheck=1

repo_gpgcheck=1

gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg
https://packages.cloud.google.com/yum/doc/rpm-package-key.gpg

exclude=kubelet kubeadm kubectl

EOF

-update the dnf type **dnf upgrade -y**

Install the kubernete services

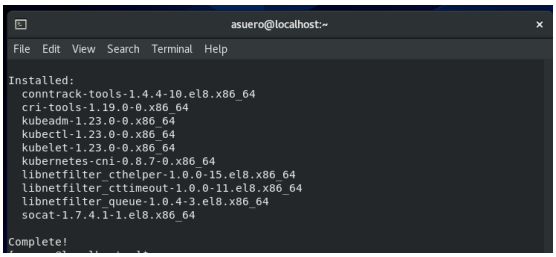
-Now, we are going to add the Kubernetes apt repository

-Them after adding the Kubernetes Repository we are going to update the app package index.

Type the following to update the apt package

-Now, we are going to install the Kubernetes services**, kubelet, kubeadm and kubectl.** Type the following command to install them:

dnf install -y kubelet kubeadm kubectl --disableexcludes=Kubernetes



-Enable Kubernetes service to do that type**, systemctl enable kubelet**

Start Kubernetes to do that type **systemctl start kubelet**

A small paragraph describing how the Minikube tutorial went, what gave you trouble (if anything) and how you fixed it. Include screenshots to show how it went and what steps you did. You don't need to include everything, just a small selection is fine. Likely less than 2 pages will be generated here.

Minibuke

Minikube is a tool that lets you run Kubernetes locally

Instructions

First, update the yum packages index. Type the following command to get it done **sudo yum update**

We need some packages to be installed before to install minikube. To install those packages, follow the instructions below

-Install epel by typing this command **sudo yum -y install epel-release**

-Install KVM hypervisor for the virtualization **sudo yum -y install libvirt qemu-kvm virt-install virt-top libguestfs-tools bridge-utils**

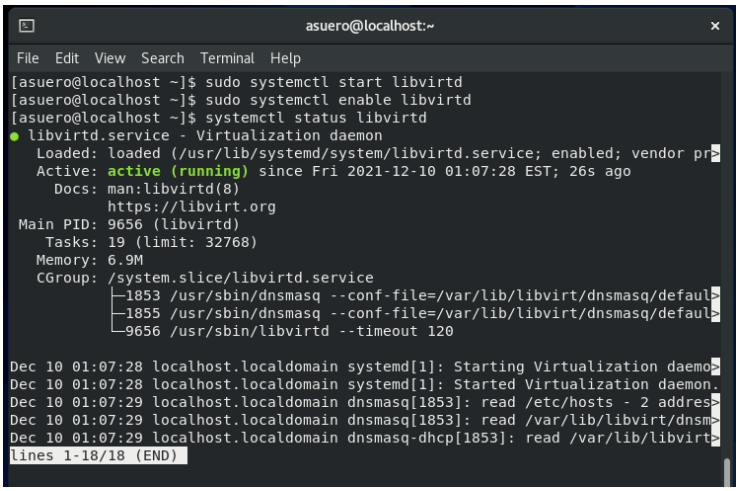
-Now, start and enable libvirtd service type

sudo systemctl start libvirtd

sudo systemctl enable libvirtd

-Check the status of libvirtd service

systemctl status libvirtd



-Add your user to libvirt group, type **sudo usermod -a -G libvirt $(whoami)**

-Restart libvirtd **sudo systemctl restart libvirtd.service**

Now we can start installing Minikube

-Install the Minikube package using wget

wget https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64

```
asuero@localhost:~
File  Edit  View  Search  Terminal  Help
[asuero@localhost ~]$ sudo vi /etc/libvirt/libvirtd.conf
[sudo] password for asuero:
[asuero@localhost ~]$ wget https://storage.googleapis.com/minikube/releases/late
st/minikube-linux-amd64
--2021-12-10 01:28:36--  https://storage.googleapis.com/minikube/releases/latest
/minikube-linux-amd64
Resolving storage.googleapis.com (storage.googleapis.com)... 142.250.81.240, 142
.251.32.112, 142.251.35.176, ...
Connecting to storage.googleapis.com (storage.googleapis.com)|142.250.81.240|:44
3... connected.
HTTP request sent, awaiting response... 200 OK
Length: 69568775 (66M) [application/octet-stream]
Saving to: 'minikube-linux-amd64'

minikube-linux-amd6 100%[===================>]  66.35M  1.99MB/s    in 19s

2021-12-10 01:28:55 (3.48 MB/s) - 'minikube-linux-amd64' saved [69568775/6956877
5]

[asuero@localhost ~]$
```

-Now**, use the chmod command to give the file execute permission:**

chmod +x minikube-linux-amd64

- Lastly**, move the file to the /usr/local/bin directory:**

sudo mv minikube-linux-amd64 /usr/local/bin/minikube

***Done**! you have minikube on your server.

-To check the status of the installation type: **minikube version**

```
asuero@localhost:~
File  Edit  View  Search  Terminal  Help
[asuero@localhost ~]$ minikube version
minikube version: v1.24.0
commit: 76b94fb3c4e8ac5062daf70d60cf03ddcc0a741b
[asuero@localhost ~]$
```

Running minibuke

When I try to run minibuke it gave me this **error** shown in the image below

```
asuero@localhost:~
File  Edit  View  Search  Terminal  Help

[asuero@localhost ~]$
[asuero@localhost ~]$ minikube start
😄  minikube v1.24.0 on Centos 8.5.2111
👎  Unable to pick a default driver. Here is what was considered, in preference
order:
    ▪ docker: Not healthy: "docker version --format {{.Server.Os}}-{{.Server.Ver
sion}}" exit status 1: Got permission denied while trying to connect to the Dock
er daemon socket at unix:///var/run/docker.sock: Get "http://%2Fvar%2Frun%2Fdock
er.sock/v1.24/version": dial unix /var/run/docker.sock: connect: permission deni
ed
    ▪ docker: Suggestion: Add your user to the 'docker' group: 'sudo usermod -aG
 docker $USER && newgrp docker' <https://docs.docker.com/engine/install/linux-po
stinstall/>
    ▪ kvm2: Not healthy: /usr/bin/virsh domcapabilities --virttype kvm failed:
error: failed to get emulator capabilities
error: invalid argument: KVM is not supported by '/usr/libexec/qemu-kvm' on this
 host
exit status 1
    ▪ kvm2: Suggestion: Follow your Linux distribution instructions for configur
ing KVM <https://minikube.sigs.k8s.io/docs/reference/drivers/kvm2/>
    ▪ vmware: Not installed: exec: "docker-machine-driver-vmware": executable fi
le not found in $PATH
    ▪ podman: Not installed: exec: "podman": executable file not found in $PATH
```

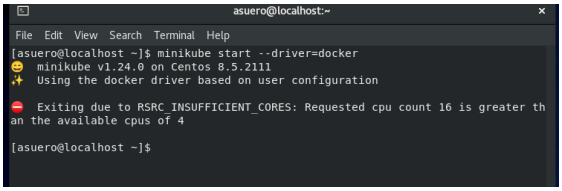
Let's fix it.

-Add my user to the docker group**, sudo usermod -aG docker $USER && newgrp docker**

-Set up docker driver to take it by default type **minikube start --driver=docker**

-Start docker service, type **sudo systemctl start docker**

I try to open minibike again, and I found a new error



To fix that set up you your minibike to 16 cores type **minikube config set cpus 16**

Even though I set up the cpus to 16 it kept saying the same thing, and do not allow me to start minikube...

Source:

https://docs.docker.com/get-started/overview/#:~:text=Docker%20is%20an%20open%20platform,ways%20you%20manage%20your%20applications.

https://searchitoperations.techtarget.com/definition/Google-Kubernetes