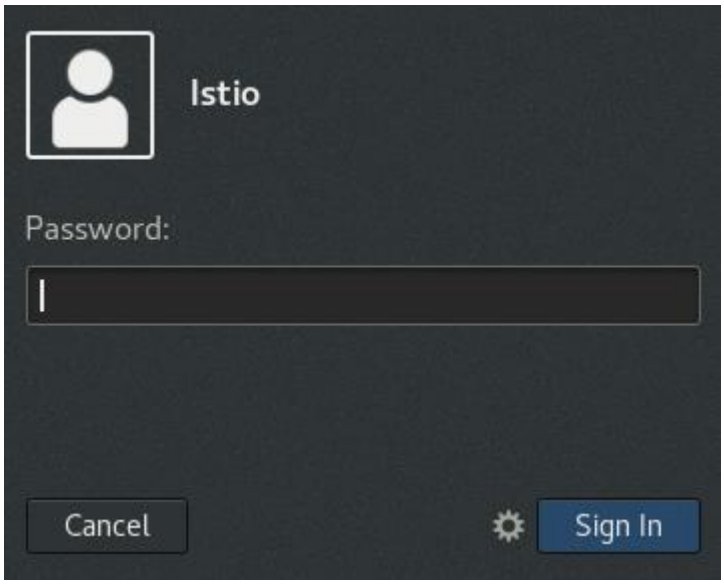
Install Docker + Kubernetes on CentOS 7.9

Install a single node of Kubernetes using minikube on CentOS 7.9. Ensure your system has a min of 2 CPUs required for Kubernetes.

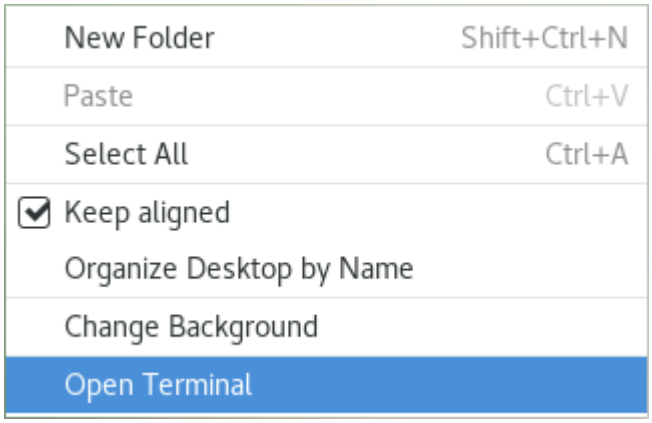
User: istio

Password: lumada



But first, let's update the package database:

Right mouse and select




```
$ sudo yum check-update
$ sudo yum -y update
```

Pre-requisites

Hostnames

Before you start, it is advised to check what your current hostname is. Type the following command in the console to find out:

```
$ hostnamectl
```

```
$ sudo nano /etc/hosts
```

Add to the 127.0.0.1 line

`bookinfo.local` and `test.bookinfo.local`

set hostname as localhost

```
$ hostnamectl set-hostname localhost
```

Later you will need to map the external loadbalancer IP address to locahost

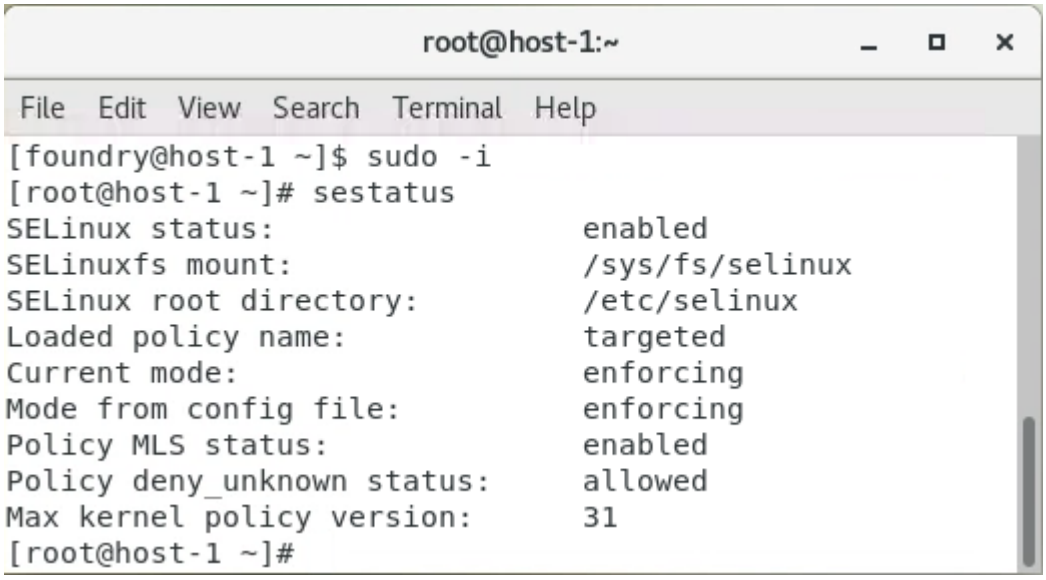
Check the SELinux Status

To view the current SELinux status and the SELinux policy that is being used on your system, use the sestatus command:

Switch to Root user

```
$ sudo -i
```

```
# sestatus
```




```
# setenforce 0
```

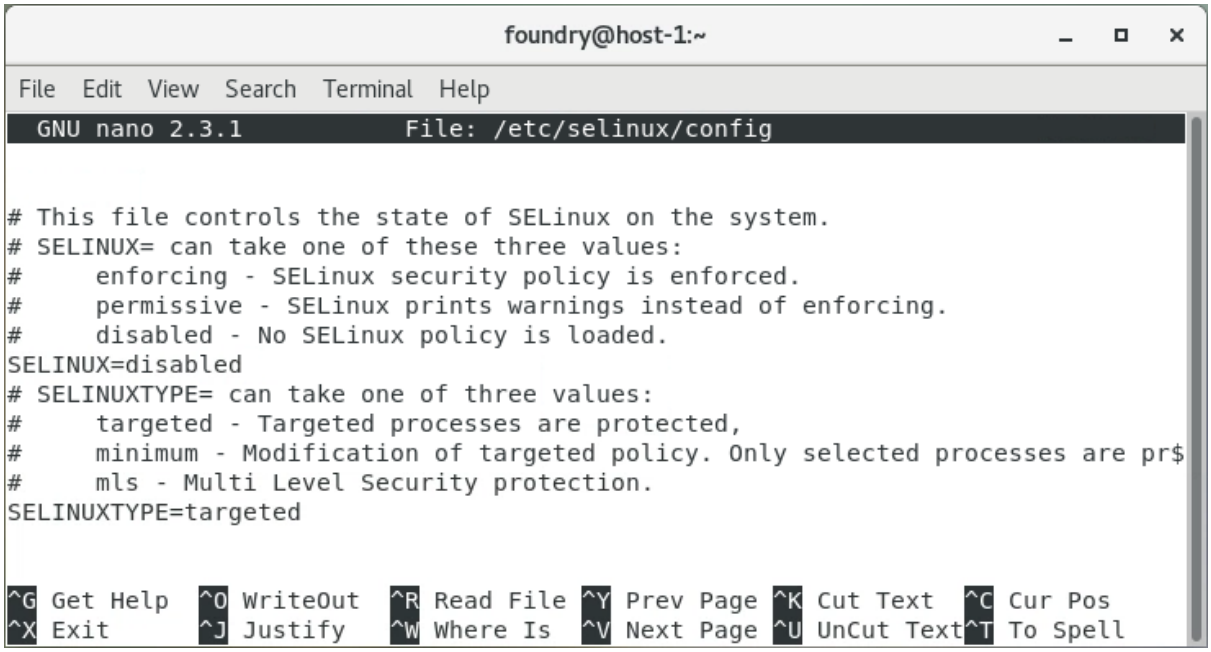
```
# sed -i --follow-symlinks 's/SELINUX=enforcing/SELINUX=disabled/g'
/etc/sysconfig/selinux
```

```
# systemctl stop firewalld
```

```
# systemctl disable firewalld
```

Open the /etc/selinux/config file and set the SELINUX mod to disabled:

```
$ sudo  nano /etc/selinux/config
```



Disable SWAP

```
$ sudo swapoff -a
```

Reboot Server

```
$ reboot
```

Install Git

You will need to install Git to access the GitHub repository

```
$ sudo yum -y install git
```

Create a directory for course-materials

```
$ sudo mkdir /opt/course-materials/Istio
```

Now that we have git installed, we need to configure it so that it links to a repository.

git config

Add name and email address for commits

root@host [~]# git config --global user.name "User Name"

root@host [~]# git config --global user.email "yourname@domain.com"

View the configuration information

root@host [~]# git config --list

exit

Install Visual Code

To install the stable 64-bit VS Code from a yum repository:

```
$ yum check-update
```

```
$ sudo yum -y update
```

```
$ sudo rpm --import
https://packages.microsoft.com/keys/microsoft.asc
```

```
$ sudo sh -c 'echo -e "[code]\nname=Visual Studio
Code\nbaseurl=https://packages.microsoft.com/yumrepos/vscode\nenable
d=1\ngpgcheck=1\ngpgkey=https://packages.microsoft.com/keys/microsof
t.asc" > /etc/yum.repos.d/vscode.repo'
```

```
$ sudo yum install code
```

```
$ code
```

Install the following extensions:

Docker 1.9.x

Kubernetes 1.2.x

vscode istio snippets 0.1.0

JWT

Install Docker

The purpose of the install script is for a convenience for quickly installing the latest Docker-CE releases on the supported Linux distros. It is not recommended for deployment to production systems.

```
$ curl -fsSL https://get.docker.com -o get-docker.sh
```

```
$ sudo sh get-docker.sh
```

After installation has completed, start the Docker daemon:

```
$ sudo systemctl start docker
```

Verify that it's running:

```
$ sudo systemctl status docker
```

The output should be like the following, showing that the service is active and running:

```
foundry@localhost:~
File  Edit  View  Search  Terminal  Help
[foundry@localhost ~]$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/usr/lib/systemd/system/docker.service; disabled; vendor pres
et: disabled)
   Active: active (running) since Sat 2020-10-31 04:43:35 GMT; 14s ago
     Docs: https://docs.docker.com
 Main PID: 11114 (dockerd)
    Tasks: 8
   Memory: 39.8M
   CGroup: /system.slice/docker.service
           └─11114 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/con...

Oct 31 04:43:34 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:34 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:34 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Oct 31 04:43:35 localhost.localdomain systemd[1]: Started Docker Application ...
Oct 31 04:43:35 localhost.localdomain dockerd[11114]: time="2020-10-31T04:43:...
Hint: Some lines were ellipsized, use -l to show in full.
[foundry@localhost ~]$ sudo systemctl enable docker
```

Lastly, make sure it starts at every server reboot:

```
$ sudo systemctl enable docker
```

Executing Docker Command Without Sudo

By default, running the docker command requires root privileges — that is, you must prefix the command with sudo. It can also be run by a user in the docker group, which is automatically created during the installation of Docker. If you attempt to run the docker command without prefixing it with sudo or without being in the docker group, you'll get an output like this:

Output

docker: Cannot connect to the Docker daemon. Is the docker daemon running on this host?.

See 'docker run --help'.

If you want to avoid typing sudo whenever you run the docker command, add your username to the docker group:

```
$ sudo usermod -aG docker $(whoami)
```

You will need to log out of the Droplet and back in as the same user to enable this change.

If you need to add a user to the docker group that you're not logged in as, declare that username explicitly using:

```
$ sudo usermod -aG docker username
```

The rest of this article assumes you are running the docker command as a user in the docker user group. If you choose not to, please prepend the commands with sudo.

Start & Stop Docker Services

`$ sudo systemctl start docker.service` ## <-- Start docker ##

`$ sudo systemctl stop docker.service` ## <-- Stop docker ##

`$ sudo systemctl restart docker.service` ## <-- Restart docker ##

`$ sudo systemctl status docker.service` ## <-- Get status of docker ##

Using the Docker Command

With Docker installed and working, now's the time to become familiar with the command line utility. Using docker consists of passing it a chain of options and subcommands followed by arguments. The syntax takes this form:

docker [option] [command] [arguments]

To view all available subcommands, type:

```
$ docker
```

Output

```
Output

    attach    Attach to a running container
    build     Build an image from a Dockerfile
    commit    Create a new image from a container's changes
    cp        Copy files/folders between a container and the local
filesystem
    create    Create a new container
    diff      Inspect changes on a container's filesystem
    events    Get real time events from the server
    exec      Run a command in a running container
    export    Export a container's filesystem as a tar archive
    history   Show the history of an image
    images    List images
    import    Import the contents from a tarball to create a filesystem
image
    info      Display system-wide information
    inspect   Return low-level information on a container or image
    kill      Kill a running container
    load      Load an image from a tar archive or STDIN
    login     Log in to a Docker registry
    logout    Log out from a Docker registry
    logs      Fetch the logs of a container
    network   Manage Docker networks
    pause     Pause all processes within a container
    port      List port mappings or a specific mapping for the CONTAINER
    ps        List containers
    pull      Pull an image or a repository from a registry
    push      Push an image or a repository to a registry
    rename    Rename a container
    restart   Restart a container
    rm        Remove one or more containers
    rmi       Remove one or more images
    run       Run a command in a new container
    save      Save one or more images to a tar archive
    search    Search the Docker Hub for images
    start     Start one or more stopped containers
    stats     Display a live stream of container(s) resource usage
statistics
    stop      Stop a running container
    tag       Tag an image into a repository
    top       Display the running processes of a container
    unpause   Unpause all processes within a container
    update    Update configuration of one or more containers
    version   Show the Docker version information
    volume    Manage Docker volumes
    wait      Block until a container stops, then print its exit code
```

Install Kubernetes

- Install kubectl
- Install minikube

Install Kubectl

```
$ curl -LO https://storage.googleapis.com/kubernetes-release/release/$(curl -s https://storage.googleapis.com/kubernetes-release/release/stable.txt)/bin/linux/amd64/kubectl
```

Make the kubectl binary executable.

```
$ chmod +x ./kubectl
```

Move the binary in to your PATH.

```
$ sudo mv ./kubectl /usr/local/bin/kubectl
```

Test to ensure the version you installed is up-to-date:

```
$ kubectl version --client
```

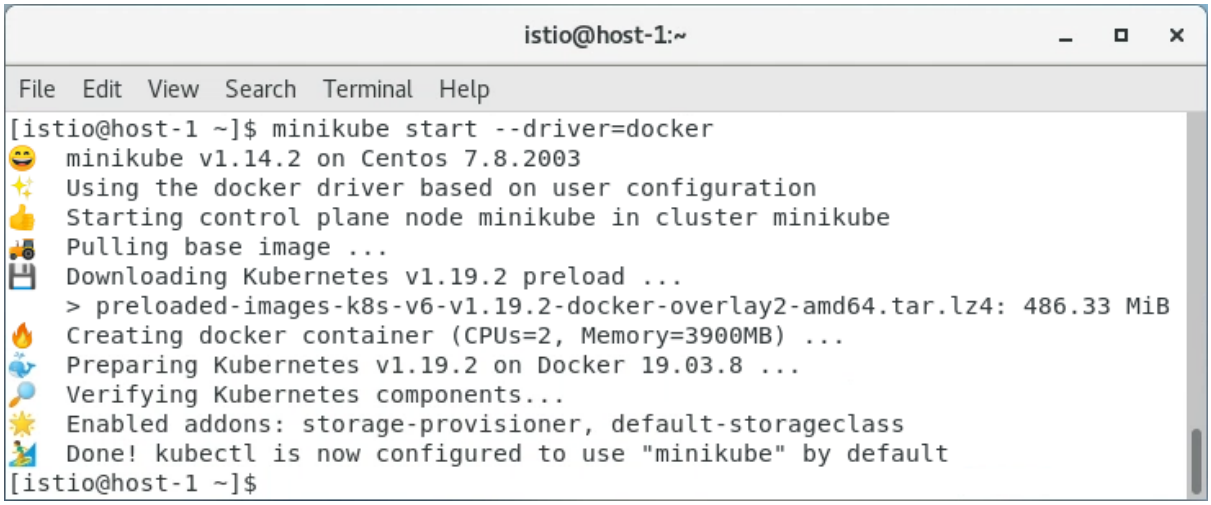
Install Kubernetes - Minikube

```
$ curl -Lo minikube https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
```

```
$ sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

```
$ sudo usermod -aG docker $USER && newgrp docker
```

```
$ minikube start --driver=docker
```



If minikube fails to start, see the drivers page for help setting up a compatible container or virtual-machine manager.

To make docker the default driver:

```
$ minikube config set driver docker
```

```
$ minikube stop
```

```
$ minikube delete
```

Ensure services are up and running:

```
$ kubectl get po -A
```

```
istio@host-1:~
File  Edit  View  Search  Terminal  Help
[istio@host-1 ~]$ kubectl get po -A
NAMESPACE     NAME                                   READY   STATUS    RESTARTS   AGE
kube-system   coredns-f9fd979d6-rjr7d                1/1     Running   0          2m35s
kube-system   etcd-minikube                          1/1     Running   0          2m40s
kube-system   kube-apiserver-minikube                1/1     Running   0          2m40s
kube-system   kube-controller-manager-minikube       1/1     Running   0          2m40s
kube-system   kube-proxy-dm5sz                       1/1     Running   0          2m35s
kube-system   kube-scheduler-minikube                1/1     Running   0          2m40s
kube-system   storage-provisioner                    1/1     Running   0          2m41s
[istio@host-1 ~]$
```

Set a loadbalancer

```
$ minikube tunnel
```

To find the routable IP, run this command and examine the EXTERNAL-IP column:

```
$ kubectl get services balanced
```

Increase the default memory limit (requires a restart):

```
$ minikube config set memory 16384
```

```
$ minikube config set cpus 4
```

Browse the catalog of easily installed Kubernetes services:

```
$ minikube addons list
```

```
$ minikube dashboard
```

For further details: https://minikube.sigs.k8s.io/docs/commands/

Install Istio

Go to the Istio release page to download the installation file for your OS, or download and extract the latest release automatically (Linux or macOS):

```
$ curl -L https://istio.io/downloadIstio | sh -
```

```
istio@host-1:~
File  Edit  View  Search  Terminal  Help
[istio@host-1 ~]$ curl -L https://istio.io/downloadIstio | sh -
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   102  100   102    0     0    140      0 --:--:-- --:--:-- --:--:--   140
100  4579  100  4579    0     0   5017      0 --:--:-- --:--:-- --:--:--  5017

Downloading istio-1.7.4 from https://github.com/istio/istio/releases/download/1.
7.4/istio-1.7.4-linux-amd64.tar.gz ...

Istio 1.7.4 Download Complete!

Istio has been successfully downloaded into the istio-1.7.4 folder on your syste
m.

Next Steps:
See https://istio.io/latest/docs/setup/install/ to add Istio to your Kubernetes
cluster.

To configure the istioctl client tool for your workstation,
add the /home/istio/istio-1.7.4/bin directory to your environment path variable
with:
         export PATH="$PATH:/home/istio/istio-1.7.4/bin"

Begin the Istio pre-installation check by running:
         istioctl x precheck

Need more information? Visit https://istio.io/latest/docs/setup/install/
[istio@host-1 ~]$ export PATH="$PATH:/home/istio/istio-1.7.4/bin"
[istio@host-1 ~]$ istioctl x precheck
```

Add the istioctl client to your path

```
$ cd istio-1.7.4

$ sudo nano ~/.bash_profile

$ export PATH=”$PATH:/home/istio/istio-1.7.4/bin”

$ source ~/.bash_profile
```

Run the check

```
$ istioctl x precheck
```

```
$ istioctl profile list
```