Minikube is a free and open-source tool that allows us to set up a single node Kubernetes cluster locally on our system. Minikube is only used for learning Kubernetes and allows developers to build their test environment locally on their system.

In this post, we will show you how to install Minikube on Rocky Linux 9 step by step. To begin its installation, make sure following system requirements are met.

- Minimal Install Rocky Linux 9
- 2 GB free RAM or more
- 2 CPUs or more
- 25 GB free disk space
- Local user with sudo admin rights
- Internet connectivity
- Docker or virtual machine manager like VirtualBox, KVM,and VMware etc.

Without any further delay, let's jump into the actual steps,

1) Enable Docker Repository

Open the terminal and run following dnf command,

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

Run following dnf command to verify whether docker registry is enabled or not.

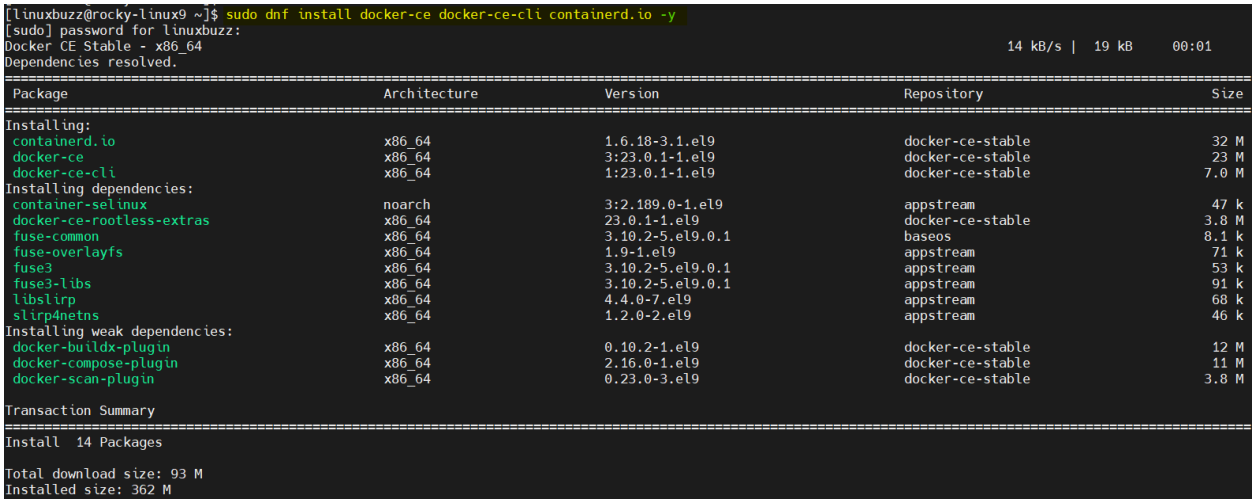
$ sudo dnf repolist

```
[linuxbuzz@rocky-linux9 ~]$ sudo dnf repolist
repo id                                                                repo name
appstream                                                              Rocky Linux 9 - AppStream
baseos                                                                 Rocky Linux 9 - BaseOS
docker-ce-stable                                                       Docker CE Stable - x86_64
extras                                                                 Rocky Linux 9 - Extras
[linuxbuzz@rocky-linux9 ~]$
```

2) Install Docker CE (Community Edition)

Install docker ce along with all dependencies using beneath command,

$ sudo dnf install docker-ce docker-ce-cli containerd.io -y



Add your local user to docker group so that it can run docker commands without sudo,

$ sudo usermod -aG docker $USER
$ newgrp docker

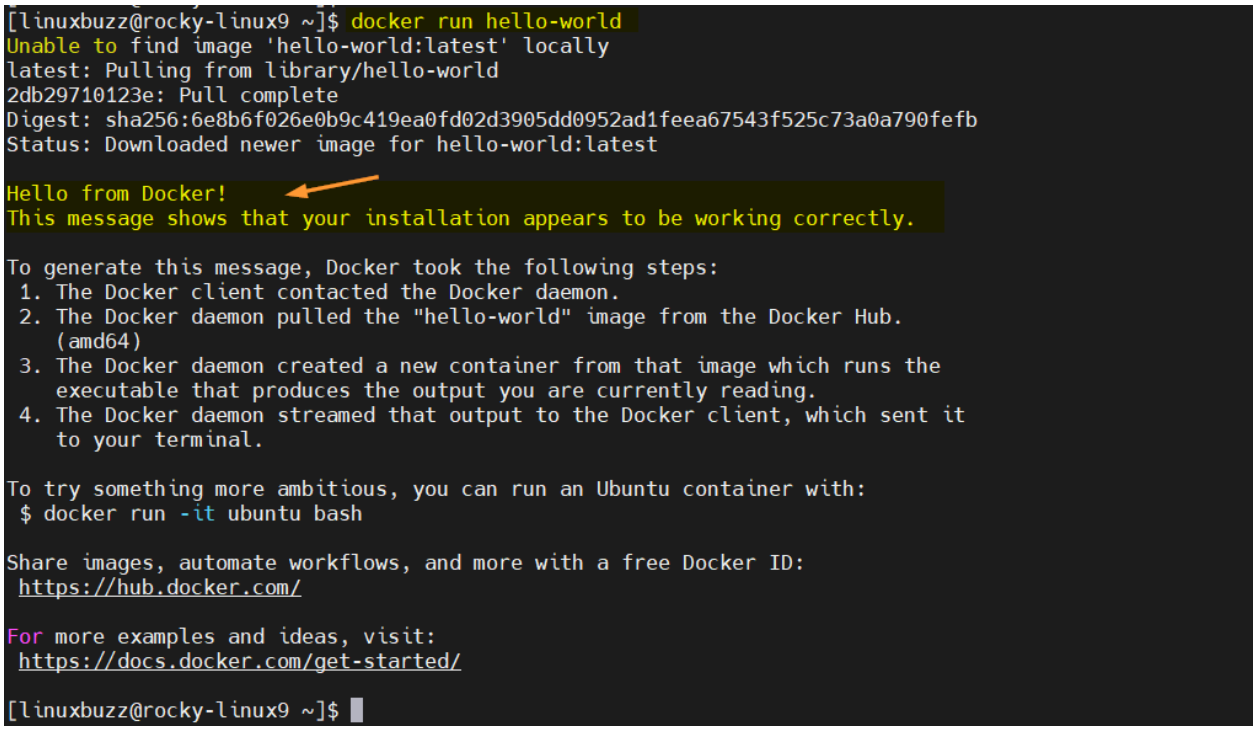
Start the docker service, run

$ sudo systemctl start docker
$ sudo systemctl enable docker

To verify the docker installation, run following docker container,

$ docker run hello-world

Output,



Output above confirms that docker has been installed successfully.

3) Download and Install Minikube and kubectl binary

To download and install minikube binary, run following commands,

$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
$ sudo install minikube-linux-amd64 /usr/local/bin/minikube

Install kubectl binary, run beneath commands,

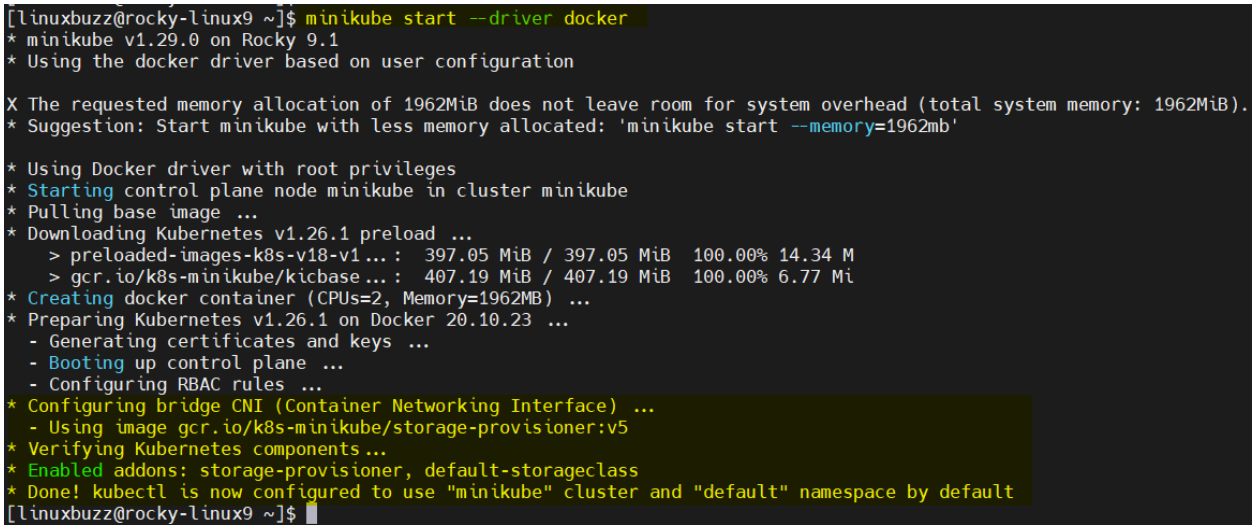
$ curl -LO "https://dl.k8s.io/release/$(curl -L -s
https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"
$ sudo cp kubectl /usr/local/bin/ && sudo chmod +x /usr/local/bin/kubectl

4) Start the minikube cluster

To start the minikube cluster with docker as driver, run

$ minikube start --driver docker

Output



Perfect, above output confirms that the minikube cluster has been started successfully. Let's try to interact with cluster and deploy sample application,

Execute the following set of commands to view minikube status, Kubernetes cluster and node info,

$ minikube status
$ kubectl cluster-info
$ kubectl get nodes

```
[linuxbuzz@rocky-linux9 ~]$ minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

[linuxbuzz@rocky-linux9 ~]$ kubectl cluster-info
Kubernetes control plane is running at https://192.168.49.2:8443
CoreDNS is running at https://192.168.49.2:8443/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
[linuxbuzz@rocky-linux9 ~]$
[linuxbuzz@rocky-linux9 ~]$ kubectl get nodes
NAME       STATUS   ROLES           AGE    VERSION
minikube   Ready    control-plane   5m4s   v1.26.1
[linuxbuzz@rocky-linux9 ~]$
[linuxbuzz@rocky-linux9 ~]$
```

5) Test Kubernetes by Deploying Sample Nginx Application

To deploy sample nginx based application, run following kubectl commands,

$ kubectl create deployment nginx-demo --image=nginx
$ kubectl expose deployment nginx-demo --type NodePort --port=80

Verify pods and service status, run

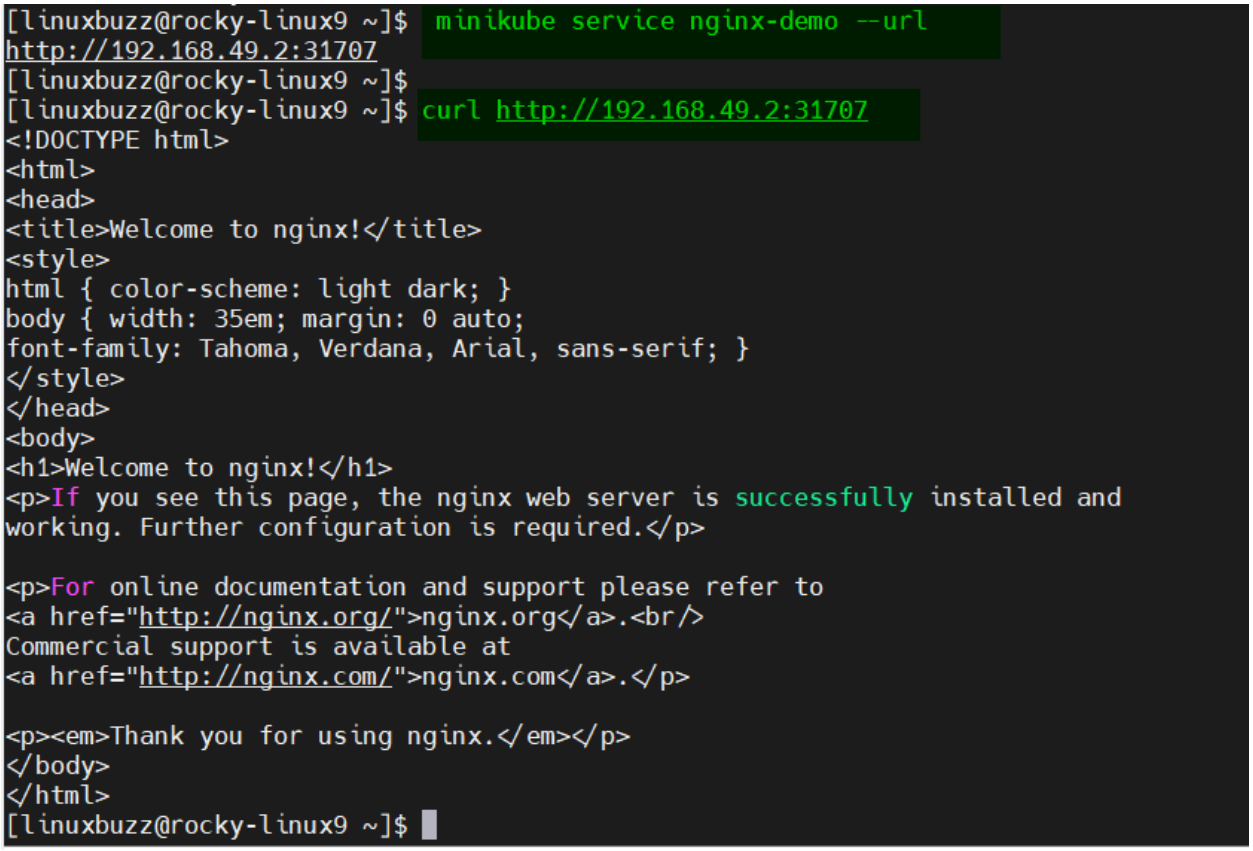
$ kubectl get pods,svc

```
[linuxbuzz@rocky-linux9 ~]$ kubectl get pods,svc
NAME                              READY   STATUS    RESTARTS   AGE
pod/nginx-demo-98c8d48ff-2p7lh    1/1     Running   0          71s

NAME                 TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)        AGE
service/kubernetes   ClusterIP   10.96.0.1        <none>        443/TCP        14m
service/nginx-demo   NodePort    10.103.219.229   <none>        80:31707/TCP   32s
[linuxbuzz@rocky-linux9 ~]$
```

Try accessing the application using following command,

$ minikube service nginx-demo --url
http://192.168.49.2:31707
$ curl http://192.168.49.2:31707



6) Managing Minikube Addons

Using minikube addons, we can enable additional functionality to our cluster like Kubernetes dashboard and nginx ingress controller. To view all available addons, run

$ minikube addons list

```
[linuxbuzz@rocky-linux9 ~]$ minikube addons list
|-----------------------------|----------|--------------|--------------------------------|
|         ADDON NAME          | PROFILE  |    STATUS    |           MAINTAINER           |
|-----------------------------|----------|--------------|--------------------------------|
| ambassador                  | minikube | disabled     | 3rd party (Ambassador)         |
| auto-pause                  | minikube | disabled     | Google                         |
| cloud-spanner               | minikube | disabled     | Google                         |
| csi-hostpath-driver         | minikube | disabled     | Kubernetes                     |
| dashboard                   | minikube | disabled     | Kubernetes                     |
| default-storageclass        | minikube | enabled ☑    | Kubernetes                     |
| efk                         | minikube | disabled     | 3rd party (Elastic)            |
| freshpod                    | minikube | disabled     | Google                         |
| gcp-auth                    | minikube | disabled     | Google                         |
| gvisor                      | minikube | disabled     | Google                         |
| headlamp                    | minikube | disabled     | 3rd party (kinvolk.io)         |
| helm-tiller                 | minikube | disabled     | 3rd party (Helm)               |
| inaccel                     | minikube | disabled     | 3rd party (InAccel             |
|                             |          |              | [info@inaccel.com])            |
| ingress                     | minikube | disabled     | Kubernetes                     |
| ingress-dns                 | minikube | disabled     | Google                         |
| istio                       | minikube | disabled     | 3rd party (Istio)              |
| istio-provisioner           | minikube | disabled     | 3rd party (Istio)              |
| kong                        | minikube | disabled     | 3rd party (Kong HQ)            |
| kubevirt                    | minikube | disabled     | 3rd party (KubeVirt)           |
| logviewer                   | minikube | disabled     | 3rd party (unknown)            |
| metallb                     | minikube | disabled     | 3rd party (MetalLB)            |
| metrics-server              | minikube | disabled     | Kubernetes                     |
| nvidia-driver-installer     | minikube | disabled     | Google                         |
| nvidia-gpu-device-plugin    | minikube | disabled     | 3rd party (Nvidia)             |
| olm                         | minikube | disabled     | 3rd party (Operator Framework) |
| pod-security-policy         | minikube | disabled     | 3rd party (unknown)            |
| portainer                   | minikube | disabled     | 3rd party (Portainer.io)       |
| registry                    | minikube | disabled     | Google                         |
| registry-aliases            | minikube | disabled     | 3rd party (unknown)            |
| registry-creds              | minikube | disabled     | 3rd party (UPMC Enterprises)   |
| storage-provisioner         | minikube | enabled ☑    | Google                         |
| storage-provisioner-gluster | minikube | disabled     | 3rd party (Gluster)            |
| volumesnapshots             | minikube | disabled     | Kubernetes                     |
|-----------------------------|----------|--------------|--------------------------------|
```

To enable addons like dashboard and ingress controller, run following minikube commands,

$ minikube addons enable dashboard
$ minikube addons enable ingress

Output,

```
[linuxbuzz@rocky-linux9 ~]$ minikube addons enable dashboard
* dashboard is an addon maintained by Kubernetes. For any concerns contact minikube on GitHub.
You can view the list of minikube maintainers at: https://github.com/kubernetes/minikube/blob/master/OWNERS
  - Using image docker.io/kubernetesui/dashboard:v2.7.0
  - Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
* Some dashboard features require the metrics-server addon. To enable all features please run:

        minikube addons enable metrics-server


* The 'dashboard' addon is enabled
[linuxbuzz@rocky-linux9 ~]$ minikube addons enable ingress
* ingress is an addon maintained by Kubernetes. For any concerns contact minikube on GitHub.
You can view the list of minikube maintainers at: https://github.com/kubernetes/minikube/blob/master/OWNERS
  - Using image registry.k8s.io/ingress-nginx/controller:v1.5.1
  - Using image registry.k8s.io/ingress-nginx/kube-webhook-certgen:v20220916-gd32f8c343
  - Using image registry.k8s.io/ingress-nginx/kube-webhook-certgen:v20220916-gd32f8c343
* Verifying ingress addon...
* The 'ingress' addon is enabled
[linuxbuzz@rocky-linux9 ~]$
```

7) Managing Minikube Cluster

Stop and start minikube cluster, run

$ minikube stop
$ minikube start

Run following command to delete minikube cluster,

$ minikube delete

Set the custom resources to minikube

$ minikube config set memory 4096
$ minikube stop && minikube start