Minikube - Kubernetes Cluster
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Step-by-Step Guide to Install and Configure Minikube on RHEL 8.6

Minikube is a lightweight tool that allows you to run Kubernetes clusters locally. Follow these steps to install and configure Minikube on **RHEL 8.6**.

✅ Step 1: Update System and Install Dependencies

Before installing Minikube, ensure your system is updated and has the required packages.

Run the following commands:

```
$ sudo dnf update -y
$ sudo dnf install -y curl wget conntrack socat git
```

✅ Step 2: Install Container Runtime

Minikube requires a container runtime such as **Docker** or **Podman**.

Option 1: Install Docker (Recommended)

Add the Docker repository:

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

Install Docker:

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

Start and enable Docker:

sudo systemctl enable --now docker

Verify Docker installation:

docker --version

Option 2: Install Podman (Alternative)
If you prefer **Podman**, install it with:

sudo dnf install -y podman

Verify the installation:

podman --version

✅ Step 3: Install Minikube

Download the latest Minikube binary:

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

Move the binary to /usr/local/bin and make it executable:

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

Verify Minikube installation:

minikube version

✅ Step 4: Install kubectl (Kubernetes CLI)

To interact with the Kubernetes cluster, install kubectl:

Download the latest kubectl binary:

curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

Move kubectl to /usr/local/bin and make it executable:

sudo install kubectl /usr/local/bin/

Verify installation:

kubectl version --client

✅ Step 5: Start Minikube

Now, start Minikube with the desired driver:

If using Docker (Recommended)

minikube start --driver=docker

If using Podman

minikube start --driver=podman

Check Minikube status:

minikube status

Expected output:

host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

✅ Step 6: Verify Kubernetes Cluster

Check the Kubernetes nodes:

kubectl get nodes

Expected output:

NAME STATUS ROLES AGE VERSION
minikube Ready master 2m v1.XX.X

✅ Step 7: Enable the Kubernetes Dashboard (Optional)

To access the Kubernetes dashboard, run:

minikube dashboard --url

It will generate a URL like:

http://127.0.0.1:56789/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/

If you want to expose the dashboard on **all IPs**, use:

kubectl port-forward -n kubernetes-dashboard service/kubernetes-dashboard 0.0.0.0:30000:443 --address 0.0.0.0

Now, access it using:
http://<Minikube-IP>:30000

✅ Step 8: Deploy a Sample Application

To verify that Minikube works, deploy the **hello-minikube** application:

Create a deployment:

kubectl create deployment hello-minikube --image=kicbase/echo-server:1.0

Expose the application:

kubectl expose deployment hello-minikube --type=NodePort --port=8080

Get the Minikube IP:

minikube ip

Example output:

192.168.49.2

Get the service port:

kubectl get svc

Example output:

```
NAME             TYPE       CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
hello-minikube   NodePort   10.96.32.145    <none>        8080:32000/TCP   1m
```

Here, 32000 is the **NodePort**.

Access the application:

http://192.168.49.2:32000

✅ Step 9: Enable Minikube Auto-Start (Optional)

To ensure Minikube starts automatically on reboot, create a systemd service:

Create a new systemd service file:

sudo nano /etc/systemd/system/minikube.service
Add the following content:

```
[Unit]
Description=Minikube Service
After=network.target docker.service

[Service]
User=root
ExecStart=/usr/local/bin/minikube start --driver=docker
ExecStop=/usr/local/bin/minikube stop
Restart=always

[Install]
WantedBy=multi-user.target
```

Save the file and reload systemd:
sudo systemctl daemon-reload
Enable the service:
sudo systemctl enable minikube
Start Minikube on boot:
sudo systemctl start minikube

🎯 Conclusion

You have successfully installed and configured Minikube on **RHEL 8.6**! 🚀

- ✅ Installed dependencies
- ✅ Installed Docker or Podman
- ✅ Installed Minikube and kubectl
- ✅ Started Minikube and verified the cluster
- ✅ Enabled Kubernetes Dashboard
- ✅ Deployed a sample application😊

Note: Prepared by - K.T. Harsha . Images are taken from the web site, used only for training and understanding purpose