Manage Kubernetes Resources via Terraform - macOs

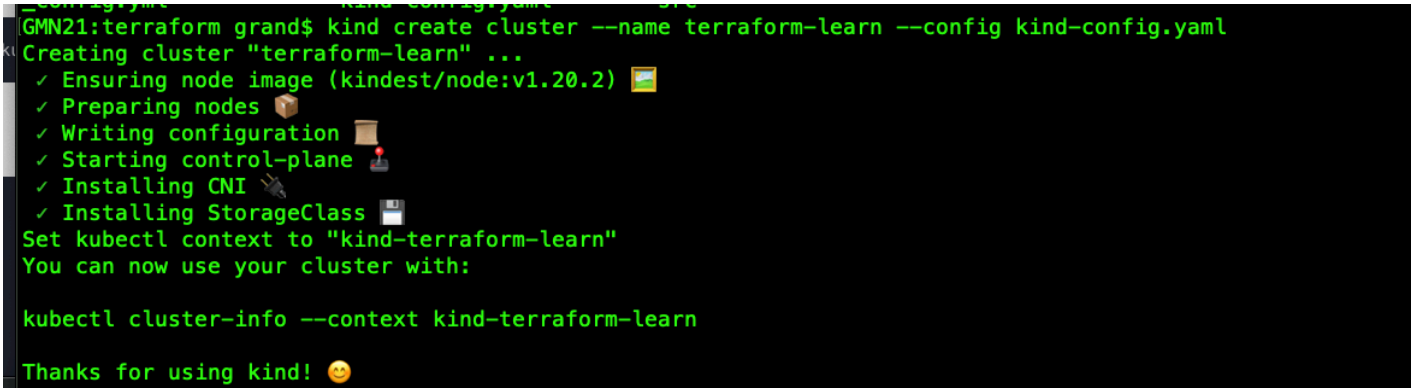
- `install/open docker`
- `install kubectl/minikube`

```
brew install kind
```

- `touch kind-config.yaml` and put the following config file in it

```
kind: Cluster
apiVersion: kind.x-k8s.io/v1alpha4
nodes:
- role: control-plane
  extraPortMappings:
  - containerPort: 30201
    hostPort: 30201
    listenAddress: "0.0.0.0"
```

- `curl https://raw.githubusercontent.com/hashicorp/learn-terraform-deploy-nginx-kubernetes-provider/master/kind-config.yaml --output`



- `kind get clusters`

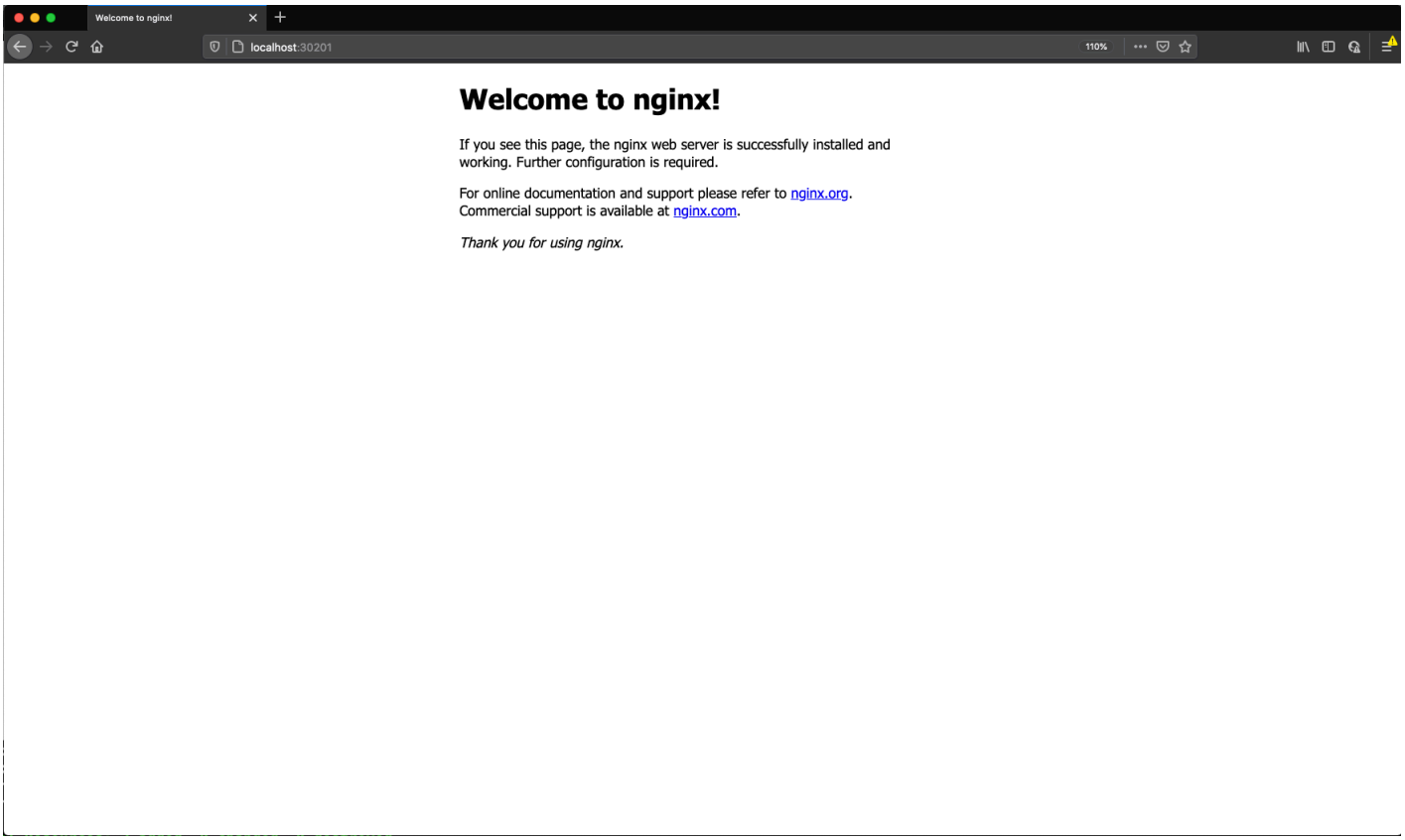
- `mkdir learn-terraform-deploy-nginx-kubernetes`
- `cd learn-terraform-deploy-nginx-kubernetes`

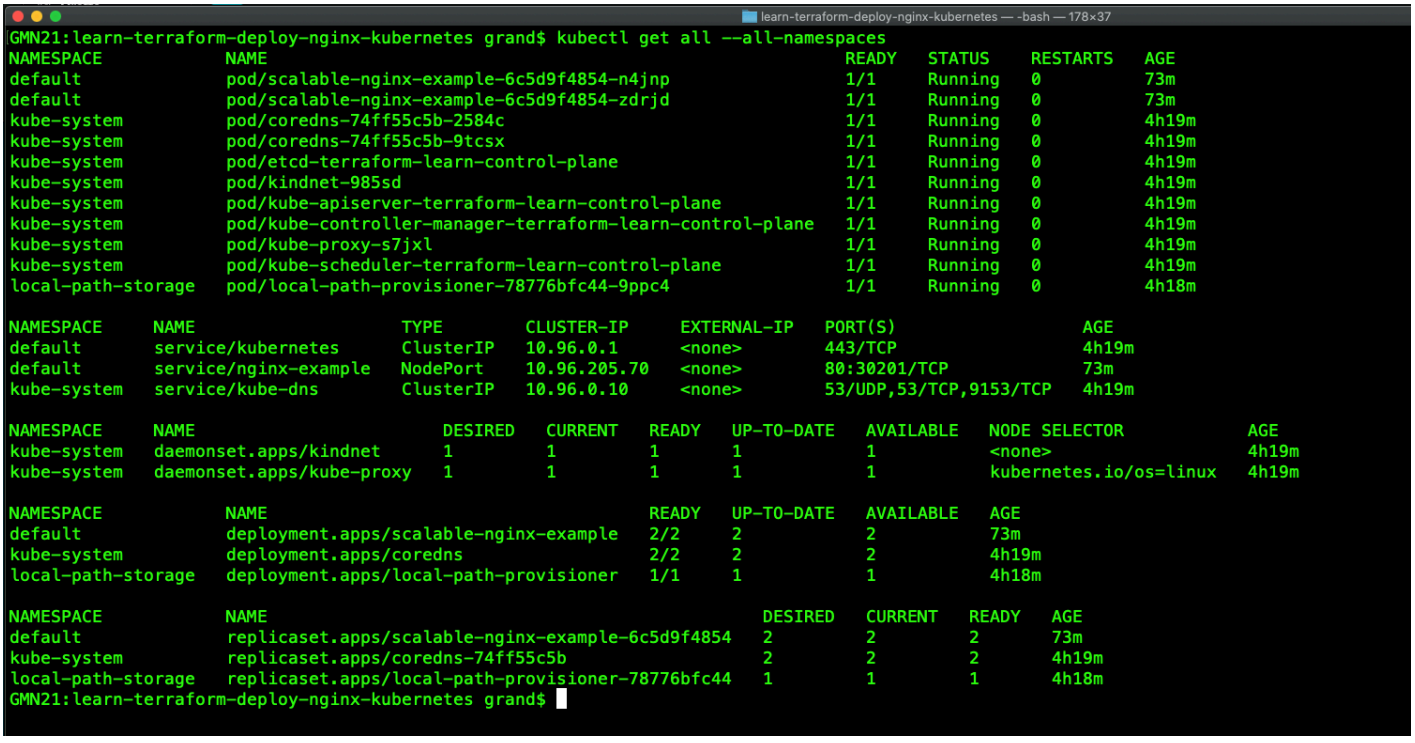
```
touch kubernetes.tf  add the following config file

    terraform {
      required_providers {
        kubernetes = {
          source = "hashicorp/kubernetes"
        }
      }
    }
    provider "kubernetes" {
      config_path = "~/.kube/config"
    }
```

- `touch terraform.tfvars/ vim terraform.tfvars`
- `terraform init`
- Add the following to a file `kubernetes.tf`

```
  resource "kubernetes_deployment" "nginx" {
  metadata {
    name = "scalable-nginx-example"
    labels = {
      App = "ScalableNginxExample"
    }
  }
  spec {
    replicas = 2
    selector {
      match_labels = {
        App = "ScalableNginxExample"
      }
    }
    template {
      metadata {
        labels = {
          App = "ScalableNginxExample"
        }
      }
      spec {
        container {
          image = "nginx:1.7.8"
          name  = "example"
          port {
            container_port = 80
          }
          resources {
            limits = {
              cpu    = "0.5"
              memory = "512Mi"
            }
            requests = {
              cpu    = "250m"
              memory = "128Mi"
            }
          }
        }
      }
    }
  }
}
resource "kubernetes_service" "nginx" {
  metadata {
    name = "nginx-example"
  }
  spec {
    selector = {
      App = kubernetes_deployment.nginx.spec.0.template.0.metadata[0].labels.App
    }
    port {
      node_port   = 30201
      port        = 80
      target_port = 80
    }
    type = "NodePort"
  }
}
```

- `terraform apply`
- `http://localhost:30201/`





Scale the deployment replica = 4

`terraform apply`

```
GMN21:learn-terraform-deploy-nginx-kubernetes grand$ terraform apply
kubernetes_deployment.nginx: Refreshing state... [id=default/scalable-nginx-example]
kubernetes_service.nginx: Refreshing state... [id=default/nginx-example]

An execution plan has been generated and is shown below.
Resource actions are indicated with the following symbols:
  ~ update in-place

Terraform will perform the following actions:

  # kubernetes_deployment.nginx will be updated in-place
  ~ resource "kubernetes_deployment" "nginx" {
        id               = "default/scalable-nginx-example"
        # (1 unchanged attribute hidden)


      ~ spec {
          ~ replicas                  = "2" -> "4"
            # (4 unchanged attributes hidden)



            # (3 unchanged blocks hidden)
        }
        # (1 unchanged block hidden)
    }

Plan: 0 to add, 1 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value:
```

```
GMN21:learn-terraform-deploy-nginx-kubernetes grand$ kubectl get all --all-namespaces
NAMESPACE            NAME                                                       READY   STATUS    RESTARTS   AGE
default              pod/scalable-nginx-example-6c5d9f4854-f4c2r                1/1     Running   0          23s
default              pod/scalable-nginx-example-6c5d9f4854-n4jnp                1/1     Running   0          95m
default              pod/scalable-nginx-example-6c5d9f4854-t2trl                1/1     Running   0          23s
default              pod/scalable-nginx-example-6c5d9f4854-zdrjd                1/1     Running   0          95m
kube-system          pod/coredns-74ff55c5b-2584c                                1/1     Running   0          4h41m
kube-system          pod/coredns-74ff55c5b-9tcsx                                1/1     Running   0          4h41m
kube-system          pod/etcd-terraform-learn-control-plane                     1/1     Running   0          4h41m
kube-system          pod/kindnet-985sd                                          1/1     Running   0          4h41m
kube-system          pod/kube-apiserver-terraform-learn-control-plane           1/1     Running   0          4h41m
kube-system          pod/kube-controller-manager-terraform-learn-control-plane  1/1     Running   0          4h41m
kube-system          pod/kube-proxy-s7jxl                                       1/1     Running   0          4h41m
kube-system          pod/kube-scheduler-terraform-learn-control-plane           1/1     Running   0          4h41m
local-path-storage   pod/local-path-provisioner-78776bfc44-9ppc4                1/1     Running   0          4h41m

NAMESPACE     NAME                 TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)                  AGE
default       service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP                  4h41m
default       service/nginx-example   NodePort    10.96.205.70   <none>        80:30201/TCP             95m
kube-system   service/kube-dns     ClusterIP   10.96.0.10     <none>        53/UDP,53/TCP,9153/TCP   4h41m

NAMESPACE     NAME                        DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR            AGE
kube-system   daemonset.apps/kindnet      1         1         1       1            1           <none>                   4h41m
kube-system   daemonset.apps/kube-proxy   1         1         1       1            1           kubernetes.io/os=linux   4h41m

NAMESPACE            NAME                                    READY   UP-TO-DATE   AVAILABLE   AGE
default              deployment.apps/scalable-nginx-example   4/4     4            4           95m
kube-system          deployment.apps/coredns                  2/2     2            2           4h41m
local-path-storage   deployment.apps/local-path-provisioner   1/1     1            1           4h41m

NAMESPACE            NAME                                                 DESIRED   CURRENT   READY   AGE
default              replicaset.apps/scalable-nginx-example-6c5d9f4854    4         4         4       95m
kube-system          replicaset.apps/coredns-74ff55c5b                    2         2         2       4h41m
local-path-storage   replicaset.apps/local-path-provisioner-78776bfc44    1         1         1       4h41m
GMN21:learn-terraform-deploy-nginx-kubernetes grand$
```

```
GMN21:learn-terraform-deploy-nginx-kubernetes grand$ kubectl get events --sort-by=.metadata.creationTimestamp
LAST SEEN   TYPE     REASON              OBJECT                                      MESSAGE
38m         Normal   SuccessfulCreate    replicaset/scalable-nginx-example-6c5d9f4854   Created pod: scalable-nginx-example-6c5d9f4854-t2trl
38m         Normal   ScalingReplicaSet   deployment/scalable-nginx-example           Scaled up replica set scalable-nginx-example-6c5d9f4854 to 4
38m         Normal   Scheduled           pod/scalable-nginx-example-6c5d9f4854-f4c2r   Successfully assigned default/scalable-nginx-example-6c5d9f4854-f4c2r to terraform-learn-control-plane
38m         Normal   SuccessfulCreate    replicaset/scalable-nginx-example-6c5d9f4854   Created pod: scalable-nginx-example-6c5d9f4854-f4c2r
38m         Normal   Pulled              pod/scalable-nginx-example-6c5d9f4854-t2trl   Container image "nginx:1.7.8" already present on machine
38m         Normal   Scheduled           pod/scalable-nginx-example-6c5d9f4854-t2trl   Successfully assigned default/scalable-nginx-example-6c5d9f4854-t2trl to terraform-learn-control-plane
38m         Normal   Pulled              pod/scalable-nginx-example-6c5d9f4854-f4c2r   Container image "nginx:1.7.8" already present on machine
38m         Normal   Created             pod/scalable-nginx-example-6c5d9f4854-t2trl   Created container example
38m         Normal   Started             pod/scalable-nginx-example-6c5d9f4854-t2trl   Started container example
38m         Normal   Created             pod/scalable-nginx-example-6c5d9f4854-f4c2r   Created container example
38m         Normal   Started             pod/scalable-nginx-example-6c5d9f4854-f4c2r   Started container example
```

- `terraform destroy`
- `kind delete cluster --name terraform-learn`

Wallah! you have successfully managed kubernetes resources via Terraform!