

Kubernetes

- Create a nginx image with static content

mkdir nginx-static-site

cd nginx-static-site

```
PS C:\Users\Ivan\Desktop> mkdir nginx-static-site

Directory: C:\Users\Ivan\Desktop

Mode                LastWriteTime         Length Name
----                -
d-----          5/12/2025  10:40 PM                nginx-static-site

PS C:\Users\Ivan\Desktop> cd .\nginx-static-site\
```

echo "<h1>Hello I'm Ivan Pupinoski!</h1>" > index.html

ls

```
PS C:\Users\Ivan\Desktop\nnginx-static-site> echo "<h1>Hello I'm Ivan Pupinoski!</h1>" > index.html
PS C:\Users\Ivan\Desktop\nnginx-static-site> ls

Directory: C:\Users\Ivan\Desktop\nnginx-static-site

Mode                LastWriteTime         Length Name
----                -
-a-----          5/12/2025  10:41 PM                74 index.html
```

notepad Dockerfile

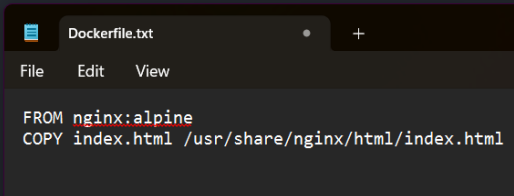
Rename-Item Dockerfile.txt Dockerfile

ls

```
PS C:\Users\Ivan\Desktop\nnginx-static-site> notepad Dockerfile
PS C:\Users\Ivan\Desktop\nnginx-static-site> Rename-Item .\Dockerfile.txt Dockerfile
PS C:\Users\Ivan\Desktop\nnginx-static-site> ls

Directory: C:\Users\Ivan\Desktop\nnginx-static-site

Mode                LastWriteTime         Length Name
----                -
-a-----          5/12/2025  10:42 PM                0 Dockerfile
-a-----          5/12/2025  10:41 PM                74 index.html
```



docker build -t ivkeex/nginx-static:latest .

```

PS C:\Users\Ivan\Desktop\nginx-static-site> docker build -t ivkeex/nginx-static:latest .
[+] Building 10.3s (8/8) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 104B
=> [internal] load metadata for docker.io/library/nginx:alpine
=> [auth] library/nginx:pull token for registry-1.docker.io
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build context
=> => transferring context: 111B
=> [1/2] FROM docker.io/library/nginx:alpine@sha256:65645c7bb6a0661892a8b03b89d0743208a18dd2f3f17a54ef4b76fb8e2f2a10
=> => resolve docker.io/library/nginx:alpine@sha256:65645c7bb6a0661892a8b03b89d0743208a18dd2f3f17a54ef4b76fb8e2f2a10
=> => sha256:d7e5070240863957ebb0b5a44a5729963c3462666baa2947d00628cb5f2d5773 955B / 955B
=> => sha256:61ca4f733c802afd9e05a32f0de0361b6d713b8b53292dc15fb093229f648674 1.79MB / 1.79MB
=> => sha256:b464cfd2a6319875aeb27359ec549790ce14d8214fcb16ef915e4530e5ed235 629B / 629B
=> => sha256:65645c7bb6a0661892a8b03b89d0743208a18dd2f3f17a54ef4b76fb8e2f2a10 10.33kB / 10.33kB
=> => sha256:62223d644a234c3a1cc785ee14242ec47a77364226f1c811d2f669f96dc2ac8 2.50kB / 2.50kB
=> => sha256:6769dc3a703c719c1d2756bd113659be28ae16cf0da58dd5fd823d6b9a059ea 10.79kB / 10.79kB
=> => sha256:81bd8ed7ec6789b0cb7f1b47ee731c522f6dba83201ec73cd6bca1350f582948 402B / 402B
=> => sha256:197eb75867ef4fcedcd4724f17b0972ab0489436860a594a9445f8eaff8155053 1.21kB / 1.21kB
=> => sha256:34a64644b756511a2e217f0508e11d1a572085d66cd6c9a555a082ad09a3102 1.40kB / 1.40kB
=> => sha256:39c2ddfd6010082a4a646e7ca44e95aca9b3f3aebc00f17f7ccc2954004f2a7d 15.52MB / 15.52MB
=> => extracting sha256:61ca4f733c802afd9e05a32f0de0361b6d713b8b53292dc15fb093229f648674
=> => extracting sha256:b464cfd2a6319875aeb27359ec549790ce14d8214fcb16ef915e4530e5ed235
=> => extracting sha256:d7e5070240863957ebb0b5a44a5729963c3462666baa2947d00628cb5f2d5773
=> => extracting sha256:81bd8ed7ec6789b0cb7f1b47ee731c522f6dba83201ec73cd6bca1350f582948
=> => extracting sha256:197eb75867ef4fcedcd4724f17b0972ab0489436860a594a9445f8eaff8155053
=> => extracting sha256:34a64644b756511a2e217f0508e11d1a572085d66cd6c9a555a082ad09a3102
=> => extracting sha256:39c2ddfd6010082a4a646e7ca44e95aca9b3f3aebc00f17f7ccc2954004f2a7d
=> [2/2] COPY index.html /usr/share/nginx/html/index.html
=> exporting to image
=> exporting layers
=> writing image sha256:9e59aade3ac7f751466be0235b990e7925f1567d398f24874018138abf25870c
=> naming to docker.io/ivkeex/nginx-static:latest

```

● Upload to Dockerhub

docker login

```

PS C:\Users\Ivan\Desktop\nginx-static-site> docker login
Authenticating with existing credentials...
Login Succeeded

```

docker push ivkeex/nginx-static:latest

```

PS C:\Users\Ivan\Desktop\nginx-static-site> docker push ivkeex/nginx-static:latest
The push refers to repository [docker.io/ivkeex/nginx-static]
5e1756bb0b0c: Pushed
0d853d50b128: Mounted from library/nginx
947e805a4ac7: Mounted from library/nginx
811a4dbbf4a5: Mounted from library/nginx
b8d7d1d22634: Mounted from library/nginx
e244aa659f61: Mounted from library/nginx
c56f134d3805: Mounted from library/nginx
d71eae0084c1: Mounted from library/nginx
08000c18d16d: Mounted from library/nginx
latest: digest: sha256:f4af4357f90e489b8d13da85e61fd005e62048f71be6f53c167c64dd43097ba5 size: 2196

```

● Create a Pod manifest that implements that image

notepad nginx-pod.yaml

ls

```

PS C:\Users\Ivan\Desktop\nginx-static-site> notepad nginx-pod.yaml
PS C:\Users\Ivan\Desktop\nginx-static-site> ls

Directory: C:\Users\Ivan\Desktop\nginx-static-site

Mode                LastWriteTime         Length Name
----                -
-a-----          5/12/2025   10:45 PM             67 Dockerfile
-a-----          5/12/2025   10:41 PM             74 index.html
-a-----          5/12/2025   10:49 PM            189 nginx-pod.yaml

PS C:\Users\Ivan\Desktop\nginx-static-site>

```

```

nginx-pod.yaml
File Edit View

apiVersion: v1
kind: Pod
metadata:
  name: nginx-static-pod
spec:
  containers:
    - name: nginx
      image: ivkeex/nginx-static:latest
      ports:
        - containerPort: 80

```

k3d cluster create mycluster --agents 5 --servers 3 --api-port 6550

```

PS C:\Users\Ivan\Desktop\nginx-static-site> k3d cluster create mycluster --agents 5 --servers 3 --api-port 6550
INFO[0000] Prep: Network
INFO[0000] Re-using existing network 'k3d-mycluster' (38aa99f5caa7e5dbd81dfb3a5376986541afd1cc8df1b068af31f32752610f2)
INFO[0000] Created image volume k3d-mycluster-images
INFO[0000] Creating initializing server node
INFO[0000] Creating node 'k3d-mycluster-server-0'
INFO[0000] Starting new tools node...
INFO[0000] Starting node 'k3d-mycluster-tools'
INFO[0001] Creating node 'k3d-mycluster-server-1'
INFO[0002] Creating node 'k3d-mycluster-server-2'
INFO[0002] Creating node 'k3d-mycluster-agent-0'
INFO[0002] Creating node 'k3d-mycluster-agent-1'
INFO[0002] Creating node 'k3d-mycluster-agent-2'
INFO[0002] Creating node 'k3d-mycluster-agent-3'
INFO[0002] Creating node 'k3d-mycluster-agent-4'
INFO[0002] Creating LoadBalancer 'k3d-mycluster-serverlb'
INFO[0002] Using the k3d-tools node to gather environment information
INFO[0002] Starting new tools node...
INFO[0003] Starting node 'k3d-mycluster-tools'
INFO[0004] Starting cluster 'mycluster'
INFO[0004] Starting the initializing server...
INFO[0004] Starting node 'k3d-mycluster-server-0'
INFO[0007] Starting servers...
INFO[0007] Starting node 'k3d-mycluster-server-1'
INFO[0026] Starting node 'k3d-mycluster-server-2'
INFO[0039] Starting agents...
INFO[0039] Starting node 'k3d-mycluster-agent-2'
INFO[0039] Starting node 'k3d-mycluster-agent-3'
INFO[0039] Starting node 'k3d-mycluster-agent-1'
INFO[0039] Starting node 'k3d-mycluster-agent-4'
INFO[0039] Starting node 'k3d-mycluster-agent-0'
INFO[0045] Starting helpers...
INFO[0045] Starting node 'k3d-mycluster-serverlb'
INFO[0052] Injecting records for hostAliases (incl. host.k3d.internal) and for 10 network members into CoreDNS configmap...
INFO[0054] You can now use it like this:
INFO[0054] Cluster 'mycluster' created successfully!
kubectrl cluster-info

```

k3d cluster list

```

PS C:\Users\Ivan\Desktop\nginx-static-site> k3d cluster list
NAME          SERVERS  AGENTS  LOADBALANCER
mycluster     3/3     5/5     true

```

Containers [Give feedback](#)

Container CPU usage ⓘ











































20.21% / 800% (8 CPUs available)

Container memory usage ⓘ

2.4GB / 7.48GB

Show charts

☐ Only show running containers

<input type="checkbox"/>	Name	Image	Status	CPU (%)	Port(s)	Last started	Actions
<input type="checkbox"/>	 k3d-mycluster-server-0 e19e662c542a 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	6.57%		15 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-server-1 88dea6c42428 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	4.9%		15 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-server-2 a4147607a183 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	3.89%		14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-agent-3 b75af3440250 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	1%		14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-agent-0 6731d0ff8449 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	0.95%		14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-agent-1 f3f1bd51b513 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	0.75%		14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-serverlb dcd24b457c30 	ghcr.io/k3d-io/k3d-proxy:5.8.3	Running	0%	6550:6443 	14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-agent-2 37b401e0704f 	docker.io/rancher/k3s:v1.31.5-k3s1	Running	0.98%		14 minutes ago	  
<input type="checkbox"/>	 k3d-mycluster-agent-4

kubectrl config set-cluster k3d-mycluster --server=https://localhost:6550 --insecure-skip-tls-verify=true

```

PS C:\Users\Ivan\Desktop\nginx-static-site> kubectrl config set-cluster k3d-mycluster --server=https://localhost:6550 --insecure-skip-tls-verify=true
Cluster "k3d-mycluster" set.

```

kubectrl get nodes

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl get nodes
```

NAME	STATUS	ROLES	AGE	VERSION
k3d-mycluster-agent-0	Ready	<none>	2m8s	v1.31.5+k3s1
k3d-mycluster-agent-1	Ready	<none>	2m9s	v1.31.5+k3s1
k3d-mycluster-agent-2	Ready	<none>	2m9s	v1.31.5+k3s1
k3d-mycluster-agent-3	Ready	<none>	2m8s	v1.31.5+k3s1
k3d-mycluster-agent-4	Ready	<none>	2m8s	v1.31.5+k3s1
k3d-mycluster-server-0	Ready	control-plane,etcd,master	2m43s	v1.31.5+k3s1
k3d-mycluster-server-1	Ready	control-plane,etcd,master	2m27s	v1.31.5+k3s1
k3d-mycluster-server-2	Ready	control-plane,etcd,master	2m12s	v1.31.5+k3s1

- Deploy the Pod to your cluster

kubectl apply -f nginx-pod.yaml

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl apply -f nginx-pod.yaml
pod/nginx-static-pod created
```

kubectl get pods

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
nginx-static-pod	1/1	Running	0	14s

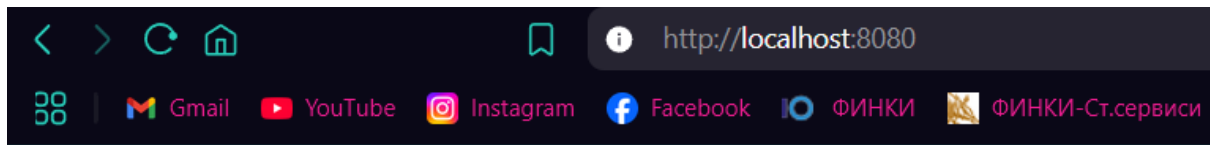
kubectl describe pod nginx-static-pod

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl describe pod nginx-static-pod
Name:          nginx-static-pod
Namespace:     default
Priority:       0
Service Account: default
Node:          k3d-mycluster-agent-3/192.168.48.7
Start Time:    Mon, 12 May 2025 23:00:36 +0200
Labels:        <none>
Annotations:   <none>
Status:        Running
IP:            10.42.5.3
IPs:           <none>
IPs:           10.42.5.3
Containers:
  nginx:
    Container ID:  containerd://a92c873358ccba327aada7b077ac68367990e2aef5a20362569939cb4077d3
    Image:         ivkeex/nginx-static:latest
    Image ID:      docker.io/ivkeex/nginx-static@sha256:f4af4357f90e489b8d13da85e61fd005e62048f71be6f53c167c64dd43097ba5
    Port:         80/TCP
    Host Port:    80/TCP
    State:        Running
      Started:    Mon, 12 May 2025 23:00:43 +0200
    Ready:        True
    Restart Count: 0
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-c989t (ro)
Conditions:
  Type              Status
  PodReadyToStartContainers  True
  Initialized        True
  Ready              True
  ContainersReady    True
  PodScheduled       True
Volumes:
  kube-api-access-c989t:
    Type:              Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:      kube-root-ca.crt
    ConfigMapOptional:  <nil>
    DownwardAPI:        true
QoS Class:           BestEffort
Node-Selectors:      <none>
Tolerations:         node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                     node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type    Reason      Age    From          Message
  ----    -
  Normal  Scheduled   43s    default-scheduler  Successfully assigned default/nginx-static-pod to k3d-mycluster-agent-3
  Normal  Pulling     43s    kubelet        Pulling image "ivkeex/nginx-static:latest"
  Normal  Pulled      36s    kubelet        Successfully pulled image "ivkeex/nginx-static:latest" in 7.2s (7.2s including waiting). Image size: 20974112 bytes.
  Normal  Created     36s    kubelet        Created container nginx
  Normal  Started     36s    kubelet        Started container nginx
```

- Watch it being deployed

kubectl port-forward pod/nginx-static-pod 8080:80

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl port-forward pod/nginx-static-pod 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
Handling connection for 8080
```



Hello I'm Ivan Pupinoski!

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl get pods --watch
NAME          READY   STATUS    RESTARTS   AGE
nginx-static-pod 1/1     Running   0           3m48s
```

kubectl get pods -o wide

```
PS C:\Users\Ivan\Desktop\nginx-static-site> kubectl get pods -o wide
NAME          READY   STATUS    RESTARTS   AGE   IP          NODE              NOMINATED NODE   READINESS GATES
nginx-static-pod 1/1     Running   0           4m25s  10.42.5.3   k3d-mycluster-agent-3 <none>           <none>
```