КИИИ Лаб 6

Class Assignment / Homework

- Install your first Kubernetes cluster
  - Install kubectl
  - Install K8D
    - Or any other installer, we won't judge
  - Spin up your first Kubernetes cluster
    - 3 master nodes
    - 5 worker nodes
  - Play a bit with kubectl
    - kubectl get nodes
    - kubectl get pods --all-namespaces
  - Destroy your first Kubernetes cluster

PART 1: Kubernetes

Kubernetes

v1.29.2

☑ **Enable Kubernetes**
Start a Kubernetes single-node cluster when starting Docker Desktop.

☑ **Show system containers (advanced)**
Show Kubernetes internal containers when using Docker commands.

Reset Kubernetes Cluster

All stacks and Kubernetes resources will be deleted.

☐		awesome_heisenberg f01bdabbf17d	docker/desktop-kubernet	Created (127)	0%		▶	⋮	🗑
☐		k8s_POD_etcd-docker-de 093de4843491	registry.k8s.io/pause:3.9	Running	0%	48 minutes ago	■	⋮	🗑
☐		k8s_POD_kube-controller e131bcdf0368	registry.k8s.io/pause:3.9	Running	0%	48 minutes ago	■	⋮	🗑
☐		k8s_POD_kube-apiserver c442a8a7d5da	registry.k8s.io/pause:3.9	Running	0%	48 minutes ago	■	⋮	🗑
☐		k8s_POD_kube-scheduler a6789de78fd7	registry.k8s.io/pause:3.9	Running	0%	48 minutes ago	■	⋮	🗑
☐		k8s_kube-scheduler_kube c080e475d7eb	sha256:6fc5e6b7218c75	Running	0.27%	48 minutes ago	■	⋮	🗑
☐		k8s_etcd_etcd-docker-de 84293a09e71f	sha256:a0eed15eed4498	Running	1.49%	48 minutes ago	■	⋮	🗑
☐		k8s_kube-controller-man aab2c5fdadd6	sha256:138fb5a3a2e341	Running	1.32%	48 minutes ago	■	⋮	🗑
		k8s_kube-apiserver_kube						

PART 2: Kubectl

- `sudo apt update` - vo wsl terminal
- `sudo snap install kubectl --classic` - install kubectl komanda

```
PS C:\Users\berat> kubectl get nodes
NAME               STATUS    ROLES           AGE    VERSION
docker-desktop     Ready     control-plane   17m    v1.29.2
```

PART 3: Configure Kubectl with Docker Desktop Cluster

```
PS C:\Users\berat> wsl -d Ubuntu
berat@Citadel:/mnt/c/Users/berat$ cp C:\Users\berat\.kube\config ~/.kube/config
cp: cannot stat 'C:Usersberat.kubeconfig': No such file or directory
berat@Citadel:/mnt/c/Users/berat$ cp /mnt/c/Users/berat/.kube/config ~/.kube/config
cp: cannot create regular file '/home/berat/.kube/config': No such file or directory
berat@Citadel:/mnt/c/Users/berat$ mkdir -p ~/.kube/ && cp /mnt/c/Users/berat/.kube/config ~/.kube/conf
ig
berat@Citadel:/mnt/c/Users/berat$ cp /mnt/c/Users/berat/.kube/config ~/.kube/config
berat@Citadel:/mnt/c/Users/berat$ kubectl cluster-info
Kubernetes control plane is running at https://kubernetes.docker.internal:6443
CoreDNS is running at https://kubernetes.docker.internal:6443/api/v1/namespaces/kube-system/services/k
ube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
berat@Citadel:/mnt/c/Users/berat$
```

(Make directory and copy the config from .kube to the WSL)

```
berat@Citadel:/mnt/c/Users/berat$ kubectl get nodes
NAME               STATUS    ROLES           AGE    VERSION
docker-desktop     Ready     control-plane   63m    v1.29.2
```

PART 4: DOWNLOAD K3D (to create clusters)

```
berat@Citadel:/mnt/c/Users/berat$ curl -sLO https://raw.githubusercontent.com/k3d-io/k3d/main/install.sh
bash install.sh
Preparing to install k3d into /usr/local/bin
[sudo] password for berat:
k3d installed into /usr/local/bin/k3d
Run 'k3d --help' to see what you can do with it.
berat@Citadel:/mnt/c/Users/berat$ k3d
Usage:
  k3d [flags]
  k3d [command]

Available Commands:
  cluster      Manage cluster(s)
  completion   Generate completion scripts for [bash, zsh, fish, powershell | psh]
  config       Work with config file(s)
  help         Help about any command
  image        Handle container images.
  kubeconfig   Manage kubeconfig(s)
  node         Manage node(s)
  registry     Manage registry/registries
  version      Show k3d and default k3s version

Flags:
  -h, --help          help for k3d
      --timestamps    Enable Log timestamps
      --trace         Enable super verbose output (trace logging)
      --verbose       Enable verbose output (debug logging)
      --version       Show k3d and default k3s version

Use "k3d [command] --help" for more information about a command.
berat@Citadel:/mnt/c/Users/berat$ |
```

PART 5: Expose Daemon for WSL

☑ **Expose daemon on tcp://localhost:2375 without TLS**
Exposing daemon on TCP without TLS helps legacy clients connect to the daemon. It also makes yourself vulnerable to remote code execution attacks. Use with caution.

(Docker Desktop/General Settings)

```
Failed to start docker.service: Unit docker.service not found.
berat@Citadel:/mnt/c/Users/berat$ export DOCKER_HOST=tcp://localhost:2375
berat@Citadel:/mnt/c/Users/berat$
```

WSL komanda

PART 6: Create Clusters with 3 master nodes and 5 worker nodes

```
k3d cluster create my-cluster --api-port 6443 --agents 5 --servers 3
```

(Komanda za 5 agent workers i 3 server nodes)
Kaj mene dava error deka ne raboti docker iako raboti i go ima
DOCKER_HOST variablot cuvano i TCP portata istotaka enabled vo
docker desktop, no so komandata gore bi trebalo da raboti na normalna
okolina)

```
berat@Citadel:/mnt/c/Users/berat$ kubectl get nodes
NAME             STATUS    ROLES           AGE    VERSION
docker-desktop   Ready     control-plane   95m    v1.29.2
berat@Citadel:/mnt/c/Users/berat$
```

```
berat@Citadel:/mnt/c/Users/berat$ kubectl get pods --all-namespaces
NAMESPACE     NAME                                      READY   STATUS    RESTARTS      AGE
kube-system   coredns-76f75df574-jnjf4                  1/1     Running   2 (12m ago)   97m
kube-system   coredns-76f75df574-smjfj                  1/1     Running   2 (12m ago)   97m
kube-system   etcd-docker-desktop                       1/1     Running   6 (12m ago)   97m
kube-system   kube-apiserver-docker-desktop             1/1     Running   2 (12m ago)   97m
kube-system   kube-controller-manager-docker-desktop    1/1     Running   2 (12m ago)   97m
kube-system   kube-proxy-6s66h                          1/1     Running   2 (12m ago)   97m
kube-system   kube-scheduler-docker-desktop             1/1     Running   2 (12m ago)   97m
kube-system   storage-provisioner                       1/1     Running   4 (11m ago)   97m
kube-system   vpnkit-controller                         1/1     Running   2 (12m ago)   97m
```