Core Concepts (S2)

Cluster Architecture

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

ETCD for beginners

- Simple key value store
- Information stored as documents/pages for each entry (YAML, JSON, …)
- *./etcdctl set <key> <value>*
- *./etcdctl get <key>*

ETCD in Kubernetes

- Stores information about Nodes, PODs, Configs, Secrets, …
- Kubeadm does the installation for you and creates an etcd POD
- Multiple etcds should be connected to each other

Kube-API-Server

- Primary management component
- Kubectl commands work over the api server using POST and GET requests
- Responsible for:
    - Authenticate user
    - Validate request
    - Retrieve data
    - Update etcd
    - Scheduler
    - Kubelet
- Kubeadm deploys it as POD
    - Options under */etc/kubernetes/manifests/kube-apiserver.yaml*
- *Non kubeadm setup:*
    - */etc/sysdemd/system/kube-apiserver.service*
    - *ps –aux | grep kube-apiserver*

Kube Controller Manager

- Manages controllers in kubernetes
- Process that continuously monitors state of components of system and keeps system in desired state
- A lot of different types of controllers
    - All get installed with kubernetes Controller Manager
- Kubeadm deploys it as POD
    - Options under */etc/kubernetes/manifests/kube-controller-manager.yaml*
- *Non kubeadm setup:*
    - */etc/sysdemd/system/kube-controller-manager.service*
    - *ps –aux | grep kube-controller-manager*

Kube Scheduler

- Deciding which POD goes on which node and selects best Node
  - Depending on resource requirements, etc.
  - Can be customized
- Kubeadm deploys it as POD
  - Options under */etc/kubernetes/manifests/kube-scheduler.yaml*
- *Non kubeadm setup:*
  - */etc/sysdemd/system/kube-scheduler.service*
  - *ps –aux | grep kube-scheduler*

Kubelet

- create, delete containers on nodes with help of container runtime
- send information to master
- kubeadm does not install it automatically
  - *ps –aux | grep kubelet*

Kube Proxy

- service is virtual component only in kubernetes memory
- kubeproxy runs on each node and looks for new services and creates appropriate rules for network forwarding
- Kubeadm deploys it as POD on each node
  - Options under */etc/kubernetes/manifests/kube-proxy.yaml*
- *Non kubeadm setup:*
  - */etc/sysdemd/system/kube-proxy.service*
  - *ps –aux | grep kube-proxy*
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POD's

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

PODS with YAML

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

Demo POD's with YAML

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/tree/master/Section%206

Recap ReplicaSets

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

Deployments

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

Namespaces

- Every namespace has its own resources and policies
- To reach other namespace you have to append namespace to the pod name
- Kubectl get pods –namespace=<namespace>
    - Kubectl get pods –all-namespace
- Kubectl create -f <yaml-file> –namespace=<namespace>
    - Or add namespace to metadata
- Create namespace with definition file and kubectl create
    - Or kubectl create namespace <namespace>
- Change default namespace:
    - Kubectl config set-context $(kubectl config current-context) –namespace=<namespace>
- Resource quota to limit resources in namespace
    - With definition yaml file

Services

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf

Services Cluster IP

- https://github.com/BennyTheSen/kubernetes_absolute_beginners_course/blob/master/Kubernetes%20for%20beginners.pdf