Cheatography

Kubernetes (k8s) Cheat Sheet

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Basics

Define :it is a container management technology developed by GOOGLE (later made open source in 2015) to manage containerized application(orchestration).

Why

1.Service discovery and load balancing 1.Service discovery and load balancing	2.Automated rollbacks
3.Self-healing	4.Auto Scaling
5.Canary updates and Rolling updates	6.Open source & Community driven
7.High Availability	

Kubernetes Concepts

Node	machine in the cluster
Docker	helps in creation of containers that includes apps and its binaries.
Pods	A Pod is the basic building block of Kubernetes–the smallest and simplest unit in the Kubernetes object model that you create or deploy,is also a group of containers (1 or more).Only containers of same pod can share shared storage.
Service	is an abstraction which defines a logical set of Pods and a policy by which to access them.
Jobs	Creates pod(s) and ensures that a specified number successfully completed.When a specified number of successful run of pods is completed, then the job is considered complete.
Cronjob	job scheduler in K8s
Repli-casets	ensures how many replica of pod should be running.

Kubernetes Concepts (cont)

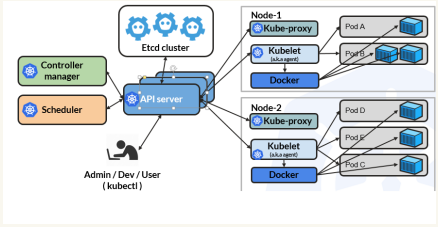
Names-paces	Logical seperation between teams and thier enviro-nments.It allows various teams(Dev,Prod) to share k8s cluster by providing isolated workspace.
Deployment	Desired state of pods for declarative updates
daemonset	ensures a particular pod to be run on some or all nodes
persistent-volume	Persistent storage in the cluster with an independent lifecycle.
persistent-volum-eclaim	Request for storage (for a PersistentVolume) by a user
ingress	An Ingress is a collection of rules that allow inbound connections to reach the cluster services.

Namespaces

kubectl get all --all-namespaces	shows all objects of all namespaces
kubectl get pods --all-nam-espaces	shows pods of all namespaces
kubectl get pods -n <name space>	shows pods of a namespace eg.kubectl get all -n kube-system :shows objects of system name space

kubectl get namespaces (show all namspaces)
default:default name spaces of user
kube-public:Namespace for resources that are publicly available/re-adable by all
kube-system:Namespace for objects/resources created by Kubernetes systems

Components Architecture Diagram



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Components Basic

Components in Manager Nodes:
Controller manager: Runs various controllers to help move running state to desired state.
Node Controller: Responsible for noticing and responding when nodes go down.
Replication Controller: Responsible for maintaining the correct number of pods for every replication controller object in the system.
Endpoints Controller: Populates the Endpoints object (i.e, joins Services & Pods).
Service Account & Token Controllers: Create default accounts and API access tokens for new namespaces.
Scheduler: Watches newly created pods that have no node assigned, and selects a node for them to run on.
Api Server:The front-end for the Kubernetes control plane. It is designed to scale horizontally.Every other component contact with this to communicate.
Etcd Cluster: key/value backing store for cluster data,it stores state of the cluster (what nodes exist in the cluster, what pods should be running, which nodes they are running on, and a whole lot more) at any given point of time.
Components in Worker Nodes:
Kubelet:Agent that continuously watches API server. It makes sure that containers are running in a pod.
Kube-proxy: a proxy service that runs on each worker node to deal with individual host subnetting and expose services to the external world. It performs request forwarding to the correct pods/containers across the various isolated networks in a cluster.

Various Ways of installing K8s

minikube	single node cluster
kubeadm	multinode cluster(doesn't support kubenet, hence require CNI[container network interface] plugin eg. flannel.
GKE	multi node

Important: The network must be deployed before any applications. Also, CoreDNS will not start up before a network is installed. kubeadm only supports Container Network Interface (CNI) based networks (and does not support kubenet).

Output format in get

-o wide	width wise details output
-o yaml	details output in yaml format
-o json	details output in json format