Kubernetes

1. Problem without Kubernetes

- If there is more than one container of application its hard to manage
- Containers could not communicate with each other
- The container had to be deployed appropriately
- The container had to manage carefully
- Autoscaling was not possible
- Distributing traffic was still challenging

2. Kubernetes Introduction

- Kubernetes is an open-source Container Management tool that automates container deployment, container (de)scaling & container load balancing
- Benefit: Works brilliantly with all cloud vendors: public, hybrid & on-premises
- Written on golang,it has a huge community because it was first developed by Google & later donated to CNCF
- Can group 'n' no of containers into one logical unit for managing & deploying them easily

3. Features of Kubernetes

- Automatic Bin Packing
- Service Discovery & Load Balancing
- Storage Orchestration
- Self Healing
- Secret & Configuration Management
- Batch Execution
- Horizontal Scaling
- Automatic Rollbacks & Rollouts

4. Kubernetes Myth

- **Kubernetes "is not"**

  >It's not the same as Docker
  >It's not for application with simple architecture
  > it's not for containerizing apps

- **Kubernetes "is"**

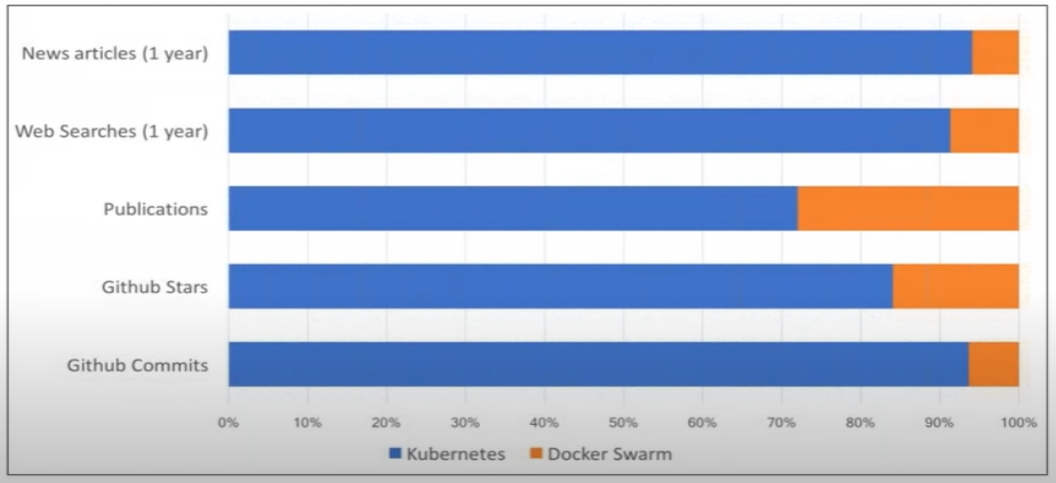
  >Robust & Reliable
  >Best soln. For scaling up Containers
  >A container Orchestration platform
  >Backed by a huge community

5. Difference B/W Kubernetes and Docker Swarm

Kubernetes vs. Docker Swarm

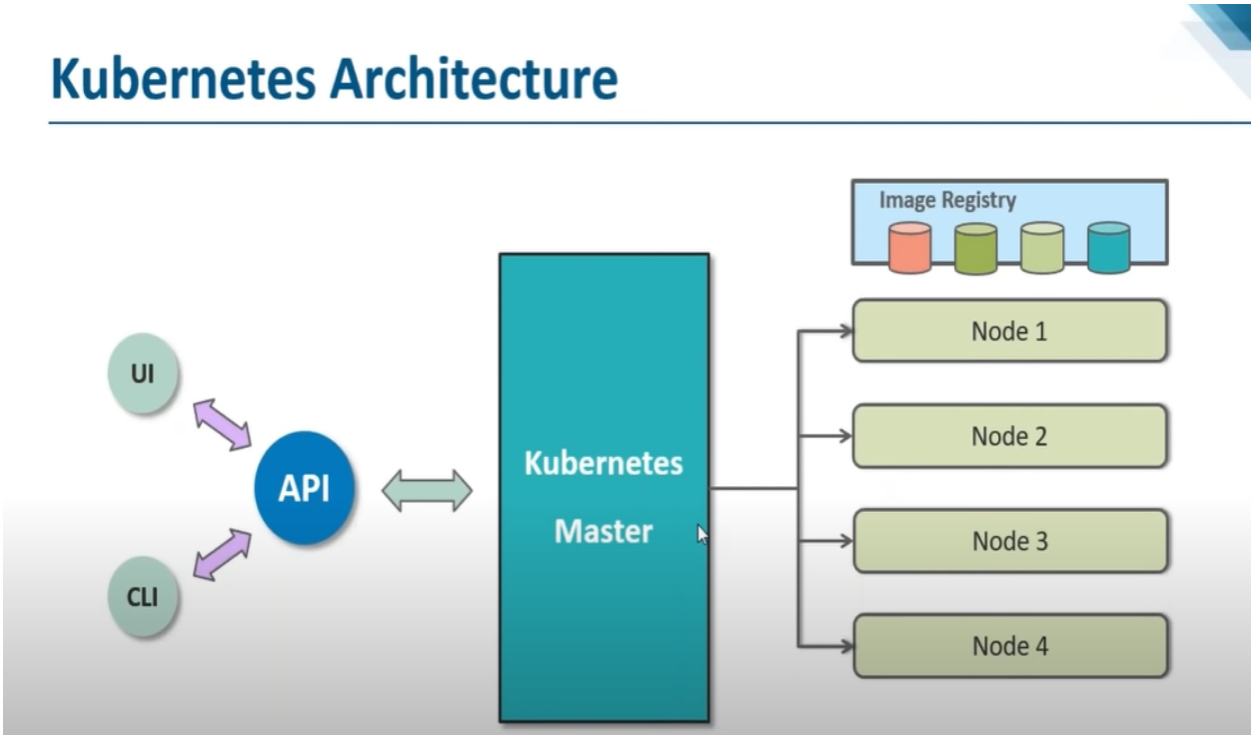
FEATURES	Kubernetes	Docker Swarm
Installation & Cluster configuration	Complicated & time consuming	Easy & fast
GUI	GUI available	GUI not available
Scalability	Scaling up is slow compared to Swarm; but guarantees stronger cluster state	Scaling up is faster than K8S; but cluster strength not as robust
Load Balancing	Load balancing requires manual service configuration	Provides built in load balancing technique
Updates & Rollbacks	Process scheduling to maintain services while updating	Progressive updates and service health monitoring throughout the update
Data Volumes	Only shared with containers in same Pod	Can be shared with any other container
Logging & Monitoring	Inbuilt logging & monitoring tools	Only 3rd party logging & monitoring tools

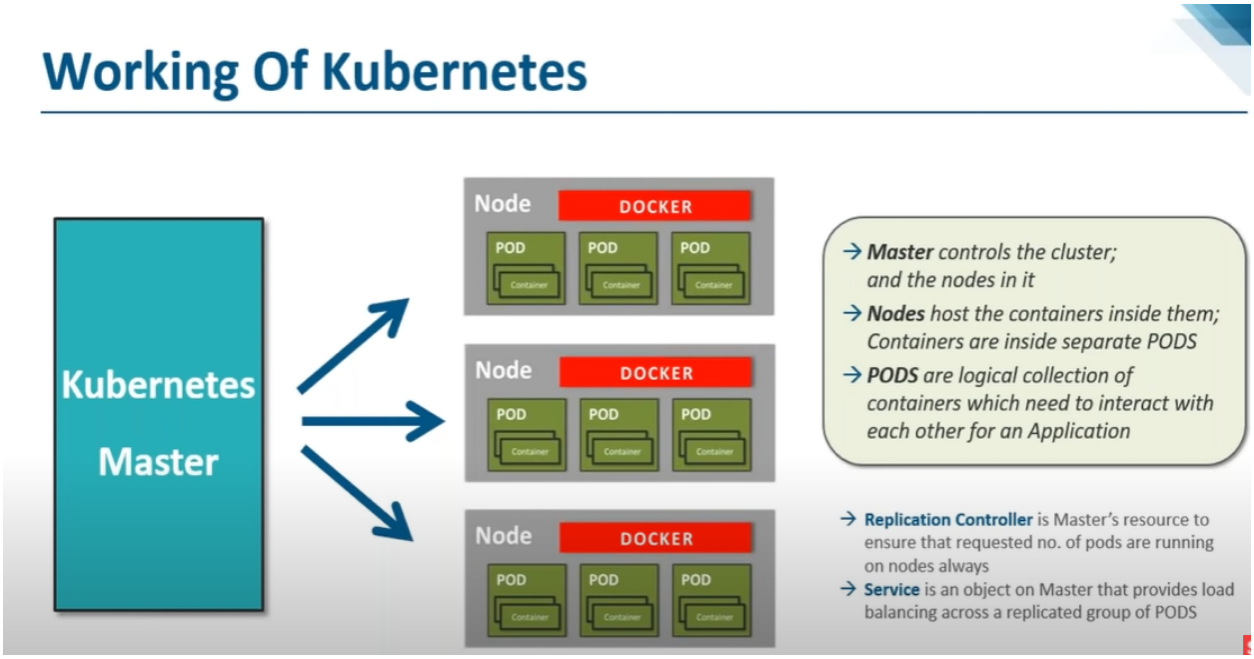
Kubernetes vs. Docker Swarm Mindshare



Reference: https://platform9.com/blog/kubernetes-docker-swarm-compared/

6. Kubernetes Architecture





7. Hands-ON Kubernetes

-follow these link
-https://www.edureka.co/blog/install-kubernetes-on-ubuntu
-https://phoenixnap.com/kb/install-kubernetes-on-ubuntu
Extra points-
-Add this in kubeadm init command in last
--ignore-preflight-errors=NumCPU
-for status check
systemctl status kubelet
-for pod
kubectl apply -f "https://cloud.weave.works/k8s/net?k8s-version=$(kubectl version | base64 | tr -d '\n')"
-for source list
sudo -H gedit /etc/apt/sources.list
-dashboard command
kubectl apply -f https://raw.githubusercontent.com/kubernetes/dashboard/v2.0.0/aio/deploy/recommended.yaml
http://localhost:8001/api/v1/namespaces/kube-system/services/https:kubernetes-dashboard:/proxy/
kubectl describe secret $(kubectl get secret | grep cluster-admin | awk '{print $1}')