Kubernetes

What is Kubernetes? 🚀

Kubernetes (K8s) is an open-source container orchestration platform designed to automate the deployment, scaling, and management of containerized applications. It ensures applications run efficiently across different environments, from on-premises data centers to the cloud.

Why Kubernetes? 🤔

🔹 Automated Scaling – Adjusts the number of running containers based on demand.
🔹 Self-Healing – Detects and restarts failed containers automatically.
🔹 Load Balancing – Distributes network traffic efficiently across containers.
🔹 Rolling Updates & Rollbacks – Deploy new versions of applications without downtime.
🔹 Multi-Cloud Compatibility – Works across AWS, Azure, Google Cloud, and on-premises.
🔹 Efficient Resource Management – Optimizes CPU & memory usage for cost efficiency.

Key Kubernetes Components 🏗️

📌 Pods – The smallest unit that runs containers.
📌 Nodes – Machines that run containers (Worker Nodes & Master Nodes).
📌 Deployments – Ensures the correct number of container replicas run.
📌 Services – Expose applications within and outside the cluster.
📌 Ingress – Manages external traffic to services.

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Complete List of Kubernetes Commands 🏗️🚀

Kubernetes (K8s) provides a powerful CLI tool, kubectl, to manage clusters, deploy applications, and perform maintenance tasks. Below is a comprehensive list of Kubernetes commands along with their syntax and examples.

1️⃣ Basic Kubernetes Commands

Command	Description	Example
kubectl version	Check the installed Kubernetes version.	kubectl version --short
kubectl cluster-info	Display cluster information.	kubectl cluster-info
kubectl get nodes	List all worker nodes in the cluster.	kubectl get nodes -o wide
kubectl get pod	List all running pods in the cluster.	kubectl get pods -A
kubectl get namespaces	List all namespaces in the cluster.	kubectl get namespaces
kubectl config view	View current Kubernetes config settings.	kubectl config view

2 Pod Management Commands

Command	Description	Example
kubectl run	Create a new pod.	kubectl run nginx --image=nginx
kubectl delete pod	Delete a pod.	kubectl delete pod my-pod
kubectl describe pod	Get detailed information about a pod.	kubectl describe pod my-pod
kubectl logs	View logs of a pod.	kubectl logs my-pod
kubectl exec	Execute a command inside a running pod.	kubectl exec -it my-pod -- /bin/bash

3 Deployment Commands

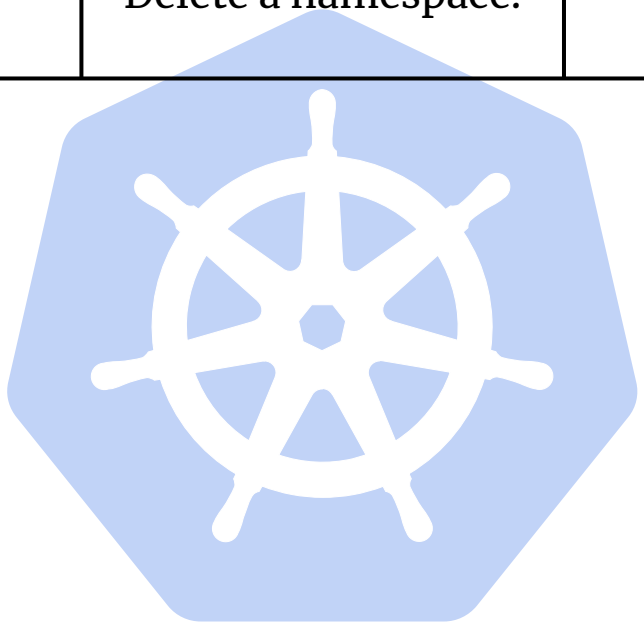
Command	Description	Example
kubectl create deployment	Create a new deployment.	kubectl create deployment my-deployment --image=nginx
kubectl get deployments	List all deployments.	kubectl get deployments
kubectl describe deployment	Get details of a deployment.	kubectl describe deployment my-deployment
kubectl delete deployment	Delete a deployment.	kubectl delete deployment my-deployment
kubectl scale deployment	Scale a deployment.	kubectl scale deployment my-deployment --replicas=5
kubectl rollout restart deployment	Restart a deployment.	kubectl rollout restart deployment my-deployment
kubectl rollout status deployment	Check deployment rollout status.	kubectl rollout status deployment my-deployment

4 Service & Networking Commands

Command	Description	Example
kubectl expose pod	Expose a pod as a service.	kubectl expose pod my-pod --type=NodePort --port=80
kubectl get services	List all services.	kubectl get services
kubectl delete service	Delete a service.	kubectl delete service my-service
kubectl port-forward	Forward a port to a local machine.	kubectl port-forward my-pod 8080:80
kubectl apply -f service.yaml	Apply a service configuration from a YAML file.	kubectl apply -f my-service.yaml

5 Namespace Management Commands

Command	Description	Example
kubectl create namespace	Create a new namespace.	kubectl create namespace dev
kubectl get namespace	List all namespaces.	kubectl get namespaces
kubectl delete namespace	Delete a namespace.	kubectl delete namespace dev



6 ConfigMap & Secret Commands

Command	Description	Example
kubectl create configmap	Create a ConfigMap.	kubectl create configmap my-config --from-literal=key=value
kubectl get configmap	List all ConfigMaps.	kubectl get configmaps
kubectl delete configmap	Delete a ConfigMap.	kubectl delete configmap my-config
kubectl create secret	Create a secret.	kubectl create secret generic my-secret --from-literal=password=12345
kubectl get secrets	List all secrets.	kubectl get secrets
kubectl delete secret	Delete a secret.	kubectl delete secret my-secret

7 StatefulSet Commands

Command	Description	Example
kubectl get statefulsets	List all StatefulSets.	kubectl get statefulsets
kubectl describe statefulset	Get details of a StatefulSet.	kubectl describe statefulset my-statefulset
kubectl delete statefulset	Delete a StatefulSet.	kubectl delete statefulset my-statefulset

8 Persistent Volume & Storage Commands

Command	Description	Example
kubectl get pv	List all Persistent Volumes.	kubectl get pv
kubectl get pvc	List all Persistent Volume Claims.	kubectl get pvc
kubectl describe pvc	Get details of a PVC.	kubectl describe pvc my-pvc
kubectl delete pvc	Delete a Persistent Volume Claim.	kubectl delete pvc my-pvc

9 Node Management Commands

Command	Description	Example
kubectl get nodes	List all nodes in the cluster.	kubectl get nodes -o wide
kubectl describe node	Get details of a node.	kubectl describe node worker-node-1
kubectl drain node	Safely evict all pods from a node.	kubectl drain worker-node-1
kubectl delete node	Remove a node from the cluster.	kubectl delete node worker-node-1

🔟 Debugging & Troubleshooting Commands

Command	Description	Example
kubectl logs	View logs of a pod.	kubectl logs my-pod -f
kubectl describe	Get detailed information about a resource.	kubectl describe pod my-pod
kubectl events	View cluster events.	kubectl get events --sort-by=.metadata.creationTimestamp
kubectl top pods	Show resource usage of pods.	kubectl top pods
kubectl top nodes	Show resource usage of nodes.	kubectl top nodes