

Kubernetes Terminology

Cluster: A group of connected computers (nodes) that run applications.

Node: A single computer in a cluster that runs applications.

Pod: The smallest unit in Kubernetes that can run one or more containers.

Namespace: A way to divide resources in a cluster for different projects or teams.

Deployment: Manages a set of identical pods to ensure the correct number are running.

ReplicaSet: Ensures a specified number of pod copies are running at all times.

DaemonSet: Ensures a pod runs on all or some nodes.

StatefulSet: Manages stateful applications, keeping track of each pod's identity.

Job: Runs a task until it completes successfully.

CronJob: Runs tasks on a scheduled basis, like a cron job in Unix.

Service: Exposes a set of pods as a network service.

Ingress: Manages external access to services, usually HTTP.

ConfigMap: Stores configuration data as key-value pairs.

Secret: Stores sensitive data, like passwords and tokens.

Volume: Provides storage for containers.

PersistentVolume (PV): A piece of storage that an administrator sets up.

PersistentVolumeClaim (PVC): A request for storage by a user.

Kubelet: The agent that runs on each node to manage pods.

Kube-Proxy: Manages network rules on nodes.

Controller Manager: Manages controllers that regulate the state of the cluster.

Scheduler: Decides which nodes will run new pods.

Etcd: A key-value store that stores all cluster data.

Kubectl: The command-line tool to interact with the Kubernetes API.

Helm: A package manager for Kubernetes applications.

Label: Key-value pairs attached to objects for organizing and selecting them.

Annotation: Metadata attached to objects to provide additional information.

Taints: Prevents specific pods from running on certain nodes.

Tolerations: Allows pods to run on nodes with specific taints.

Affinity/Anti-Affinity: Rules that specify which nodes can or cannot run specific pods.

Role-Based Access Control (RBAC): Manages who can do what in the cluster.

ServiceAccount: An identity for processes running in pods to interact with the Kubernetes API.

ClusterRole: Defines permissions that apply across the entire cluster.

Role: Defines permissions within a specific namespace.

NetworkPolicy: Controls the traffic between pods in the cluster.

PodSecurityPolicy: Defines security rules that pods must follow.

PodDisruptionBudget (PDB): Limits the number of pods that can be unavailable during maintenance.

Ingress Controller: Manages Ingress resources to provide HTTP and HTTPS routing.

CoreDNS: A DNS server for the cluster, providing name resolution for services.

StorageClass: Describes different types of storage available in the cluster.

Init Containers: Special containers that run before the main containers in a pod start.

Sidecar Container: A helper container that runs alongside the main container in a pod.

Readiness Probe: Checks if a container is ready to start accepting traffic.

Liveness Probe: Checks if a container is still running and should be restarted if not.

Headless Service: A service without a cluster IP, used to directly access pods.

LoadBalancer Service: Exposes a service externally using a cloud provider's load balancer.

ClusterIP Service: Exposes a service internally within the cluster.

NodePort Service: Exposes a service on a static port on each node.

Endpoints: A list of IP addresses and ports that a service forwards traffic to.

Resource Quotas: Limits the amount of resources a namespace can use.

LimitRange: Defines resource usage limits for containers in a namespace.

Finalizer: Ensures that specific cleanup steps are completed before an object is deleted.

Horizontal Pod Autoscaler (HPA): Automatically scales the number of pods based on CPU/memory usage.

Vertical Pod Autoscaler (VPA): Adjusts the resource limits and requests for running pods.

Cluster Autoscaler: Automatically adjusts the size of the Kubernetes cluster by adding or removing nodes.

Affinity Rules: Specify rules about which nodes can host a pod.

Anti-Affinity Rules: Specify rules about which nodes should not host a pod.

Init Containers: Special containers that run before the main containers in a pod start.

Sidecar Containers: Helper containers that run alongside the main container in a pod.

Resource Requests: Specify the minimum amount of resources a container needs.

Resource Limits: Specify the maximum amount of resources a container can use.

PersistentVolumeClaim (PVC): A request for storage by a user.

EmptyDir: A temporary directory that is created when a pod is assigned to a node.

Security Context: Defines security settings for a pod or container.

ServiceAccount: Provides an identity for processes running in pods.

ClusterRoleBinding: Binds a ClusterRole to a user or group for the entire cluster.

RoleBinding: Binds a Role to a user or group within a namespace.

Pod Preset: Injects certain information, like secrets or volume mounts, into pods at creation.

Priority Class: Specifies the priority of pods to influence their scheduling.

Self-healing: Automatically replaces and reschedules failed containers.

Secrets Management: Manages sensitive information like passwords and API keys.

Default Namespace: The default namespace for Kubernetes objects without a specified namespace.

Master Node: Controls and manages the Kubernetes cluster.

Worker Node: Runs applications and workloads in pods.

Helm Chart: Pre-configured Kubernetes resources packaged for easy deployment.

Kustomize: Tool for customizing Kubernetes YAML configurations.

Admission Controller: Intercepts requests to the Kubernetes API for validation and mutation.

Custom Resource Definition (CRD): Extends Kubernetes by defining custom resources.

Operator: Custom controllers for managing complex applications.

Kubeadm: Tool for initializing and managing Kubernetes clusters.

Minikube: Tool for running a single-node Kubernetes cluster locally for testing and development.