

KUBERNETES COMMANDS DETAILED NOTES WITH REAL-TIME USE CASES



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Kubernetes Commands – Detailed Notes with Real-Time Use Cases

1 Cluster & Context Management

◆ Check Cluster Info

```
kubectl cluster-info
```

Use case:

- ✓ Verify API server & CoreDNS
- ✓ First command after accessing a new cluster

Real-time scenario:

You joined a new project → need to confirm you're connected to the correct cluster.

◆ View Nodes

```
kubectl get nodes
```

```
kubectl get nodes -o wide
```

Use case:

- ✓ Check node readiness
- ✓ Identify node IPs & OS

Real-time scenario:

Pods stuck in Pending → check if nodes are NotReady .

◆ Switch Context

```
kubectl config get-contexts  
kubectl config use-context prod-cluster
```

Use case:

✓ Avoid deploying to wrong cluster (VERY critical)

⚠ Production mistake:

Many outages happen because engineers run commands in **prod instead of staging**.

2 Namespace Management

◆ List Namespaces

```
kubectl get ns
```

◆ Work in a Namespace

```
kubectl get pods -n dev
```

◆ Set Default Namespace

```
kubectl config set-context --current --namespace=dev
```

Real-time scenario:

Microservices split across namespaces like:

- dev
- qa
- prod
- monitoring

3 Pod Management (MOST IMPORTANT)

◆ List Pods

```
kubectl get pods
```

```
kubectl get pods -o wide
```

Use case:

- ✓ Pod status
 - ✓ Node placement
-

◆ Describe Pod (DEBUGGING KING)

```
kubectl describe pod my-pod
```

Shows:

- ✓ Events
- ✓ Resource limits
- ✓ Image pull errors
- ✓ OOMKilled reason

Real-time scenario:

Pod in CrashLoopBackOff → this is your **first command**.

◆ Pod Logs

```
kubectl logs my-pod
```

Multi-container pod:

```
kubectl logs my-pod -c app
```

Previous crash:

```
kubectl logs my-pod --previous
```

Real-time scenario:

Application crashes after deployment → logs reveal config/env issues.

◆ Exec into Pod

```
kubectl exec -it my-pod -- /bin/sh
```

Use case:

- ✓ Check files
- ✓ Test DB connectivity
- ✓ Curl internal services

Production rule:

Use exec only for **debugging**, not permanent fixes.

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Deployment Management

◆ List Deployments

```
kubectl get deploy
```

◆ Describe Deployment

```
kubectl describe deploy my-app
```

- ◆ **Scale Deployment**

```
kubectl scale deploy my-app --replicas=5
```

Real-time scenario:

Traffic spike → manually scale until HPA kicks in.

- ◆ **Rollout Status**

```
kubectl rollout status deploy my-app
```

- ◆ **Rollback Deployment**

```
kubectl rollout undo deploy my-app
```

Real-time scenario:

New version breaks production → **instant rollback** saves SLA.

5 Service & Networking

- ◆ **List Services**

```
kubectl get svc
```

- ◆ **Describe Service**

```
kubectl describe svc my-service
```

Service Types:

- ClusterIP → internal
- NodePort → basic external
- LoadBalancer → cloud-managed

Real-time scenario:

Application running but not accessible → check service type & endpoints.

◆ **Check Endpoints**

```
kubectl get endpoints my-service
```

✓ Empty endpoints = selector mismatch (VERY common issue)

6 ConfigMaps & Secrets

◆ **List ConfigMaps**

```
kubectl get cm
```

◆ **View ConfigMap**

```
kubectl describe cm app-config
```

◆ **List Secrets**

```
kubectl get secrets
```

◆ **Decode Secret**

```
kubectl get secret db-secret -o yaml  
echo "encoded_value" | base64 --decode
```

Real-time scenario:

App failing DB connection → secret value mismatch.

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Resource & Performance Debugging

◆ Pod Resource Usage

```
kubectl top pod
```

◆ Node Resource Usage

```
kubectl top node
```

Requires: metrics-server

◆ OOMKilled Debug

```
kubectl describe pod my-pod
```

Look for:

```
Last State: Terminated  
Reason: OOMKilled
```

Fix:

Increase memory limits or optimize app.

8 Events & Troubleshooting

◆ View Events

```
kubectl get events --sort-by=.metadata.creationTimestamp
```

Real-time scenario:

ImagePullBackOff, FailedScheduling, Probe failures.

9 YAML & Apply Flow (GitOps Friendly)

◆ Apply YAML

```
kubectl apply -f deployment.yaml
```

◆ Dry Run

```
kubectl apply -f deployment.yaml --dry-run=client
```

◆ Delete Resource

```
kubectl delete -f deployment.yaml
```

10 Common Production Debug Flow (INTERVIEW GOLD ★)

When **Pod not running**:

```
kubectl get pods  
kubectl describe pod  
kubectl logs  
kubectl exec  
kubectl get events
```

When **Service not accessible**:

```
kubectl get svc  
kubectl get endpoints  
kubectl describe svc  
kubectl exec → curl service
```

When **High CPU/Memory**:

```
kubectl top pod  
kubectl describe pod  
Check limits & requests
```