Referensi Cepat Kubernetes

kubectl, pod, deployment, service, config, debugging

Dasar kubectl

Info Cluster

```
kubectl cluster-info
kubectl get nodes
kubectl config current-context
kubectl config use-context my-cluster
```

Perintah Utama

kubectl get <resource>	Tampilkan daftar resource
kubectl describe <resource> <name>	Info detail resource
kubectl create -f file.yaml	Buat resource dari file
kubectl apply -f file.yaml	Buat atau perbarui resource
kubectl delete -f file.yaml	Hapus resource dari file
kubectl edit <resource> <name>	Edit resource di tempat
kubectl api-resources	Tampilkan semua tipe resource

Format Output

-o wide	Kolom tambahan (IP, node)
-o yaml	Output YAML lengkap
-o json	Output JSON lengkap
-o jsonpath='{.spec}'	Ekstrak field tertentu
--sort-by=.metadata.name	Urutkan output berdasarkan field

Pod

Operasi Pod

```
kubectl get pods
kubectl get pods -A                 # all namespaces
kubectl run nginx --image=nginx     # quick pod
kubectl delete pod nginx
```

YAML Pod

```
apiVersion: v1
kind: Pod
metadata:
  name: myapp
  labels: { app: myapp }
spec:
  containers:
    - name: app
      image: nginx:1.27
      ports:
        - containerPort: 80
```

Nilai Status Pod

Running	Semua container sudah berjalan
Pending	Menunggu penjadwalan atau pull image
CrashLoopBackOff	Container terus crash dan restart
ImagePullBackOff	Gagal mengunduh image container
Completed	Selesai berjalan (Jobs)

Deployment

YAML Deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: web
spec:
  replicas: 3
  selector:
    matchLabels: { app: web }
  template:
    metadata:
      labels: { app: web }
    spec:
      containers:
        - name: web
          image: nginx:1.27
          ports:
            - containerPort: 80
```

Perintah Deployment

kubectl get deploy	Tampilkan deployment
kubectl scale deploy web --replicas=5	Skala replica
kubectl set image deploy/web web=nginx:1.28	Update image (rolling)
kubectl rollout status deploy/web	Pantau progres rollout
kubectl rollout undo deploy/web	Rollback ke revisi sebelumnya
kubectl rollout history deploy/web	Lihat riwayat revisi

Service

Jenis Service

ClusterIP	Internal saja (default)
NodePort	Ekspos di IP setiap node pada port statis
LoadBalancer	Load balancer eksternal (cloud)
ExternalName	Alias DNS ke layanan eksternal

YAML Service

```
apiVersion: v1
kind: Service
metadata:
  name: web-svc
spec:
  type: ClusterIP
  selector: { app: web }
  ports:
    - port: 80
      targetPort: 80
```

Ekspos Cepat

```
kubectl expose deploy web --port=80 --type=ClusterIP
kubectl expose deploy web --port=80 --type=NodePort
kubectl get svc
```

ConfigMap & Secret

ConfigMap

```
kubectl create configmap app-cfg \
  --from-literal=DB_HOST=db.example.com \
  --from-file=config.ini
```

Secret

```
kubectl create secret generic db-creds \
  --from-literal=username=admin \
  --from-literal=password=s3cret
```

Penggunaan dalam Pod

```
# As environment variables
envFrom:
  - configMapRef: { name: app-cfg }
  - secretRef:    { name: db-creds }

# As volume mount
volumes:
  - name: cfg
    configMap: { name: app-cfg }
```

Perintah

kubectl get cm	Tampilkan ConfigMap
kubectl get secret	Tampilkan Secret
kubectl describe cm app-cfg	Tampilkan data ConfigMap
kubectl get secret db-creds -o yaml	Tampilkan Secret (base64-encoded)

Namespace

Perintah Namespace

kubectl get ns	Tampilkan namespace
kubectl create ns staging	Buat namespace
kubectl delete ns staging	Hapus namespace dan semua resource
kubectl get pods -n staging	Tampilkan pod di namespace
kubectl get pods -A	Tampilkan pod di semua namespace

Atur Namespace Default

```
kubectl config set-context --current \
  --namespace=staging
```

Volume

PersistentVolumeClaim

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: data-pvc
spec:
  accessModes: [ReadWriteOnce]
  resources:
    requests: { storage: 10Gi }
```

Mount dalam Pod

```
volumes:
  - name: data
    persistentVolumeClaim:
      claimName: data-pvc
containers:
  - volumeMounts:
      - name: data
        mountPath: /app/data
```

Jenis Volume

emptyDir	Direktori sementara, dihapus bersama pod
hostPath	Mount path filesystem host
persistentVolumeClaim	Penyimpanan persisten (PVC)
configMap	Mount ConfigMap sebagai file
secret	Mount Secret sebagai file

Referensi Cepat Kubernetes

Ingress

YAML Ingress

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: web-ingress
spec:
  rules:
    - host: app.example.com
      http:
        paths:
          - path: /
            pathType: Prefix
            backend:
              service:
                name: web-svc
                port: { number: 80 }
```

Catatan Ingress

`Ingress Controller`	Wajib ada (nginx-ingress, traefik, dll.)
`pathType: Prefix`	Cocokkan awalan URL
`pathType: Exact`	Cocokkan path URL tepat
`TLS`	Tambahkan bagian **`tls:`** dengan nama secret

Debugging

Perintah Diagnostik

`kubectl logs <pod>`	stdout/stderr container
`kubectl logs <pod> -c <ctr>`	Log container tertentu
`kubectl logs <pod> --previous`	Log dari container yang crash
`kubectl describe pod <pod>`	Event, kondisi, status
`kubectl exec -it <pod> -- sh`	Masuk shell ke container
`kubectl port-forward <pod> 8080:80`	Forward port lokal ke pod
`kubectl top pods`	Penggunaan CPU/memori (metrics-server)
`kubectl get events --sort-by=.lastTimestamp`	Timeline event cluster

Pod Debug

```
kubectl run debug --rm -it --image=busybox -- sh
# or attach ephemeral container
kubectl debug -it <pod> --image=busybox
```

Pola Umum

Label & Selector

```
kubectl get pods -l app=web
kubectl get pods -l 'env in (prod,staging)'
kubectl label pod myapp env=prod
```

Batas Resource

```
resources:
  requests: { cpu: 100m, memory: 128Mi }
  limits:   { cpu: 500m, memory: 256Mi }
```

Liveness & Readiness

```
livenessProbe:
  httpGet: { path: /healthz, port: 8080 }
  initialDelaySeconds: 5
  periodSeconds: 10
readinessProbe:
  httpGet: { path: /ready, port: 8080 }
```

Resep Cepat

`Dry run`	**`kubectl apply -f file.yaml --dry-run=client`**
`Generate YAML`	**`kubectl create deploy web --image=nginx --dry-run=client -o yaml`**
`Watch`	**`kubectl get pods -w`**
`Copy file`	**`kubectl cp file.txt pod:/tmp/`**
`Restart deploy`	**`kubectl rollout restart deploy/web`**