

# Minikube

## Pod Workload

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# PersistentVolumeClaim (PVC)

## What it is:

A request for storage by a Pod.

- Binds to a **PersistentVolume** (PV)
- Abstracts storage details from developers
- Supports access modes like:
  - `ReadWriteOnce`
  - `ReadOnlyMany`

## Use Case:

Ensure data survives Pod restarts or re-creation.

# ConfigMap

## What it is:

Stores **non-sensitive** configuration data.

- Key-value pairs
- Used to inject env vars or config files

```
apiVersion: v1
kind: ConfigMap
data:
  LOG_LEVEL: debug
```

## Use Case:

Keep config separate from image code — make apps 12-Factor friendly.

# Secret

## What it is:

Stores **sensitive data** such as:

- API keys
- Passwords
- TLS certificates

```
apiVersion: v1
kind: Secret
stringData:
  API_KEY: abc123
```

## Use Case:

Inject secrets safely into env vars or as volume-mounted files.

# Using Them in a Pod

## ConfigMap via Environment:

```
env:  
- name: MODE  
  valueFrom:  
    configMapKeyRef:  
      name: my-config  
      key: LOG_LEVEL
```

## Secret via Environment:

```
env:  
- name: API_KEY  
  valueFrom:  
    secretKeyRef:  
      name: my-secret  
      key: API_KEY
```

## PVC via Volume:

```
volumes:  
- name: data  
  persistentVolumeClaim:  
    claimName: my-pvc
```

# Summary

Resource	Purpose	Sensitive?	Mounted As
<b>PVC</b>	Persistent file storage	✗	volumeMounts
<b>ConfigMap</b>	App config (env/files)	✗	env or volume
<b>Secret</b>	Sensitive data storage	✓	env or volume

