**🎯 What is a Multi-Container Pod?**

A **multi-container pod** is a Kubernetes pod that runs **two or more containers** sharing:

* **The same network namespace**
* **Same volumes**
* Can communicate via localhost

**Think of it like roommates in the same apartment: sharing a kitchen (volume), same address (IP), and they can talk freely (localhost).**

**🧠 Real-Life Analogy**

**Imagine a shared hostel room (the pod) with two roommates:**

* **NGINX: The front desk manager**
* **Tomcat: The backend guy doing actual work**

**They live at the same address (IP) and share common resources (volume, network).**

**We want to:**

* **Run NGINX as a reverse proxy (on port 80)**
* **Run Tomcat (on port 8080)**
* **NGINX forwards requests to Tomcat**
* **Both run inside the same pod**

**🧩 Basic Multi-Container Pod YAML (NGINX + Tomcat)**

apiVersion: v1

kind: Pod

metadata:

name: nginx-tomcat

spec:

containers:

- name: tomcat

image: tomcat:9.0

ports:

- containerPort: 8080

- name: nginx

image: nginx

ports:

- containerPort: 80

volumeMounts:

- name: nginx-config

mountPath: /etc/nginx/conf.d/

volumes:

- name: nginx-config

configMap:

name: nginx-tomcat-config

apiVersion: v1

kind: Service

metadata:

name: nginx-tomcat-svc

spec:

selector:

app: nginx-tomcat

ports:

- protocol: TCP

port: 80 # External port (what users hit)

targetPort: 80 # Container port in NGINX

type: LoadBalancer

**🛠 Create the ConfigMap for NGINX to Proxy to Tomcat**

apiVersion: v1

kind: ConfigMap

metadata:

name: nginx-tomcat-config

data:

default.conf: |

server {

listen 80;

location / {

proxy\_pass http://localhost:8080;

}

}

**🔍 Recap of Architecture**

[Internet] → [Azure Load Balancer (port 80)]

→ [NGINX container] (port 80)

→ [Tomcat container] (via localhost:8080)

**To test this pods separately , login into new container**

**Kubectl exec -it <pod name> -- sh**

**curl http://podip:8080**

**curl http://podip:80**

**✅ Real-Time Use Cases (with AKS alignment)**

**1. Sidecar Pattern (Logging / Monitoring)**

* Primary container: NGINX
* Sidecar container: Fluent Bit or Filebeat sends logs to Azure Log Analytics
* Why? Keeps logging logic decoupled from main app.

**[nginx:80] ──writes──▶ /var/log/nginx/access.log ◀──reads── [fluent-bit]**