Lab - Ephemeral Containers

Troubleshooting with Ephemeral Containers

Lab 1: Using Ephemeral Containers to Debug a Pod

🎯 Objective:

- Use an ephemeral container to troubleshoot a Pod that lacks debugging tools (e.g., `nslookup`, `curl`).

🛠️ Steps

1. **Create a Pod using YAML with an explicitly named container:**

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
spec:
  containers:
  - name: nginx  # ✅ This must match --target=nginx in kubectl debug
    image: nginx
```

Save this as `nginx-pod.yaml` and apply it:

```
kubectl apply -f nginx-pod.yaml
```

2. **Verify the container name (Critical Fix Step):**

```
kubectl get pod nginx-pod -o jsonpath="{.spec.containers[*].name}"
```

Expected output: `nginx`

If you don't see `nginx`, or get an error like:

```
The Pod "nginx-pod" is invalid: spec.ephemeralContainers[0].targetContainerName: Not found: "nginx"
```

✅ **Fix:** Update your YAML to explicitly define:

```
- name: nginx
```

Then re-apply it:

```
kubectl delete pod nginx-pod --ignore-not-found
kubectl apply -f nginx-pod.yaml
```

3. **Try to exec into the Pod — shell works, but tools are missing:**

```
kubectl exec -it nginx-pod -- sh
```

Try commands like:

```
nslookup kubernetes.default
curl http://localhost
```

They will fail because the image lacks those tools.

4. **Use an ephemeral container to troubleshoot:**

```
kubectl debug -it nginx-pod --image=busybox --target=nginx
```

5. **Inside the ephemeral container, run diagnostics:**

```
nslookup kubernetes.default
wget -O- localhost
```

6. **View ephemeral containers in the Pod:**

```
kubectl get pod nginx-pod -o json | jq '.spec.ephemeralContainers'
```

7. **Clean up:**

```
kubectl delete pod nginx-pod
```