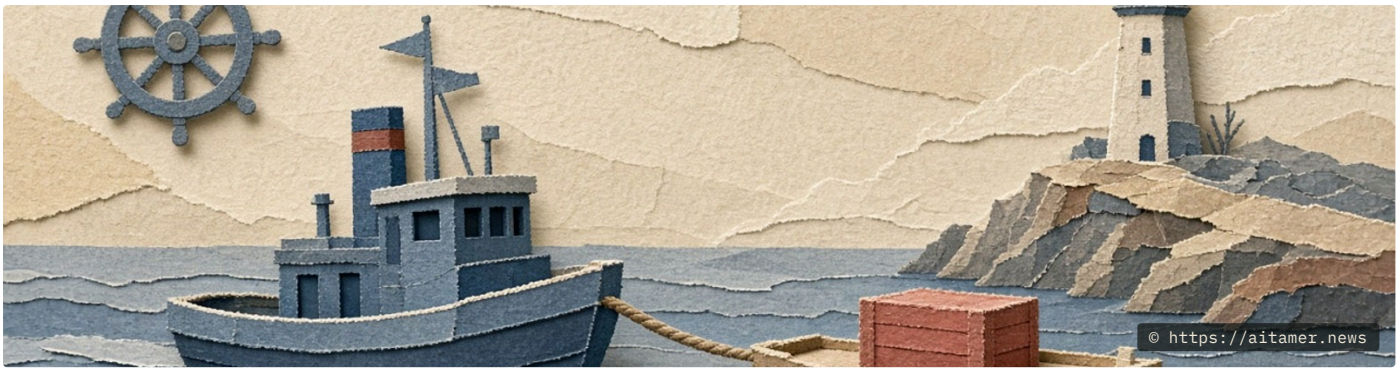

KUBERNETES FROM ZERO · FOUNDATIONS 12 OF 12 · LESSON 12 · LESSON KIT · CHEAT SHEET

Kubernetes from Zero, part 12: checkpoint lab 1, a two-tier app on kind

The checkpoint lab's objects, and the commands from Lesson 12.

Built, broke and graded the full solution on kind v0.33.0, node v1.37.0, kubectl v1.37.2, 10 Nov 2026. Cluster: kind, from part 3.

THE ONE RULE

If you can build this app from an empty namespace in 45 minutes and every check passes, you have the foundations; if a check fails, the table tells you which part to reread.

What the lab builds

from the recap and the cheat sheet

PIECE	WHAT THE LESSON SAYS	THE CHECK THAT CARES
Secret redis-auth	Created from a literal. The key is `password`.	create it before the redis Pod
Deployment redis	One ready replica, image `redis:8.10-alpine`, a readiness probe, Guaranteed QoS.	`./check.sh`
ConfigMap web-files	`index.html` and the CGI script `hits`, mounted so `hits` is mode 0755.	without the mode, httpd will not run the script
Deployment web	2 replicas of `busybox:1.37`, readiness on `/index.html`, a TCP liveness probe, preStop of 5 seconds, Burstable.	restart is one at a time
Service web	Port 80 targets 8080. The short name `http://web` works in the same namespace.	ready endpoints only
client	`kubectl run client --image=busybox:1.37 -- sleep 3600`, then wget from it.	same namespace as the Service

Failures the lesson hit on purpose

each one names the fix

1	**Secret missing**	Applying `redis.yaml` before the Secret leaves the Pod in `CreateContainerConfigError`: `secret "redis-auth" not found`. Create the Secret. The kubelet retries, and the Pod was Running about 20 seconds later.
2	**CGI mode**	Leaving out `mode: 0755` mounts the script as `-rw-r--r--`. busybox httpd will not run it, so `/cgi-bin/hits` returns 404 while `index.html` works. The Pods stay ready, because the readiness probe only checks `index.html`.
3	**timeout**	`nc` without `-w 2` hung for minutes while Redis was replaced. With `-w 2` the same situation returns within seconds.
4	**restart**	Readiness and graceful shutdown together gave zero failed requests during a full rolling restart in the lab. The counter vanished when Redis restarted, because nothing in arc 1 keeps data outside a container.

Key commands

commands verbatim from the lesson

Build and grade

```
kubectl create secret generic redis-auth -n k8s-from-zero \
  --from-literal=password=change-me-123
```
key password

```
kubectl run client --image=busybox:1.37 -- sleep 3600
```
then kubectl exec client -- wget

```
kubectl rollout restart deployment/web
```
one at a time, per the rollout strategy

```
./check.sh
```
NS=other ./check.sh for another namespace

SCAN FOR THE LESSON

Lesson: **Kubernetes from Zero, part 12: checkpoint lab 1, a two-tier app on kind**

https://aitamer.news/posts/k8s-from-zero-12-checkpoint-lab-1/?utm_source=lessonkit&utm_medium=pdf&utm_campaign=k8s-12&utm_content=cheatsheet

NEXT IN THE SERIES **Next: Lesson 13, volumes, PersistentVolumes and StorageClasses.** Volumes, PersistentVolumes and StorageClasses, the start of arc 2, where your Pods get storage that outlives them. Lesson page

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