

KUBERNETES FROM ZERO · FOUNDATIONS 4 OF 12 · LESSON 4 · LESSON KIT · ANSWER KEY

Kubernetes from Zero, part 4: Your first Pod

The answers to the homework sheet, matched by exercise number. Every answer comes from the lesson. Names with random suffixes will differ on your cluster.

Every command ran on a kind v0.33.0 cluster (node v1.37.0, kubectl v1.37.2) on 10 Nov 2026. Cluster: k8s-ep04.

Recall

1. What is a Pod, in the docs' words as the lesson quotes them?

> A group of one or more containers with shared storage and network resources, and a specification for how to run the containers. You never ask Kubernetes to run a bare container.

2. Name the three properties the lesson says follow from that, and say where the IP lives.

> One network identity: the IP belongs to the Pod, and containers in the same Pod talk on `localhost`. One hostname: containers see the Pod name. One place: all of the Pod's containers run on the same node.

3. Name the four required top-level fields, and the fifth field you see when you read an object back. Who writes the fifth?

> `apiVersion`, `kind`, `metadata` and `spec`. The fifth is `status`, and the cluster writes it. You never put `status` in your file.

4. What does `containerPort` do, and what is the default pull policy for a tag other than `latest`?

> `containerPort` is documentation. It tells readers and tools which port the process listens on. It does not open or block anything by itself. With a tag other than `latest`, the default pull policy is `IfNotPresent`: the node pulls the image once and reuses it.

5. Name the five Pod phases, and the three container states.

> Phases: `Pending`, `Running`, `Succeeded`, `Failed`, `Unknown`. Container states: `Waiting`, `Running`, `Terminated`. The STATUS column is a friendly mix of both, and the lifecycle docs warn you not to confuse it with the phase.

6. What are the three `restartPolicy` values, and how does the restart wait grow?

> `Always` (the default), `OnFailure`, or `Never`. The kubelet waits 10 seconds, then 20, then 40, doubling up to a cap of 5 minutes, and resets the timer once a container has run for 10 minutes without trouble.

SCAN FOR THE LESSON

Lesson: **Kubernetes from Zero, part 4: Your first Pod**

https://aitamer.news/posts/k8s-from-zero-04-your-first-pod/?utm_source=lessonkit&utm_medium=pdf&utm_campaign=k8s-04&utm_content=answer-key

NEXT IN THE SERIES Next: Lesson 5, kubectl essentials. Kubernetes from Zero, part 5, kubectl essentials. Lesson page

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Run this and explain

7 Apply `pod.yaml` and run `kubectl get pods -n k8s-from-zero` at once, then again a few seconds later. What STATUS values does the lesson show, and what does `READY 1/1` mean?

> First `ContainerCreating` with `READY 0/1`, then `Running` with `READY 1/1`. `1/1` means one of one containers is ready. Without `-n`, kubectl looks in `default` and finds nothing.

8 Read `kubectl describe pod hello -n k8s-from-zero` from the events upward. Which four reasons does the lesson list, in order?

> `Scheduled` (the scheduler picked a node), then `Pulled`, `Created` and `Started` from the kubelet. On the lab the pull event says the image was already present. On your machine you see `Pulling` and then `Successfully pulled image`.

9 Run the three `kubectl exec` commands from step 6. What three facts do they confirm?

> `nginx -v` prints the nginx version (the lesson shows nginx/1.29.8). `cat /etc/hostname` prints `hello`, the Pod name. `wget` of `http://localhost:80` returns the nginx welcome page. This image is Alpine-based, so it has `sh` and no `bash`.

10 Forward `8080:80` and curl the local port. What does the first terminal print when the curl arrives, and how do you stop the tunnel?

> The first terminal prints `Handling connection for 8080`. The curl output includes `<title>Welcome to nginx!</title>`. Press Ctrl+C in the first terminal. Port-forward is a debugging tool for you alone.

11 Run the `grep -E` command from step 8, and the jsonpath that prints `.status.phase`. What five keys come back, and what is the phase?

> The keys are `apiVersion`, `kind`, `metadata`, `spec` and `status`. The phase is `Running`.

12 Apply `once.yaml`, `crash.yaml` and `typo.yaml`. After about a minute, what STATUS does each show in the lesson, and what phase is underneath `once`, `crash` and `typo`?

> `once` is `Completed` and its phase is `Succeeded`. `crash` is `Error` (or `CrashLoopBackOff` while the kubelet waits) and its phase stays `Running`. `typo` is `ImagePullBackOff` and its phase is `Pending`, waiting reason `ImagePullBackOff`.

13 Run `kubectl logs crash -n k8s-from-zero --previous`. What two lines does the lesson show?

> `starting` and `cannot find config`. `--previous` reads the log of the run that crashed, once the container has been restarted.

Predict the outcome

14 You write a heading into the container's `index.html`, delete the Pod, and apply `pod.yaml` again. What does a fetch of the page show, and why?

> The original nginx title. The new Pod has the same name and a fresh container from the image, so the edit is gone. Anything you want to keep belongs in the image, in configuration, or on a volume.

15 Apply a Pod whose namespace is spelled `k8s-form-zero`. What error does the lesson quote?

> `Error from server (NotFound): error when creating "pod.yaml": namespaces "k8s-form-zero" not found`. The cluster will not create a namespace for you. Fix the spelling, or create it with `kubectl create namespace`.

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16 The manifest says `spec.contianers`. What does kubectl do, and which command looks up the real field name?

> It rejects the file: `strict decoding error: unknown field "spec.contianers"`. kubectl validates strictly by default. Check spelling with `kubectl explain pod.spec.containers`.

17 `kubectl exec` of `bash` prints `exec: "bash": executable file not found in $PATH`. What does the lesson tell you to try?

> Small images ship `sh` or nothing. Try `sh`. For an interactive shell the lesson uses `kubectl exec -it hello -n k8s-from-zero -- sh`.

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