Understand Multi-container Pod Design Patterns

Nigel Poulton
Author & Trainer

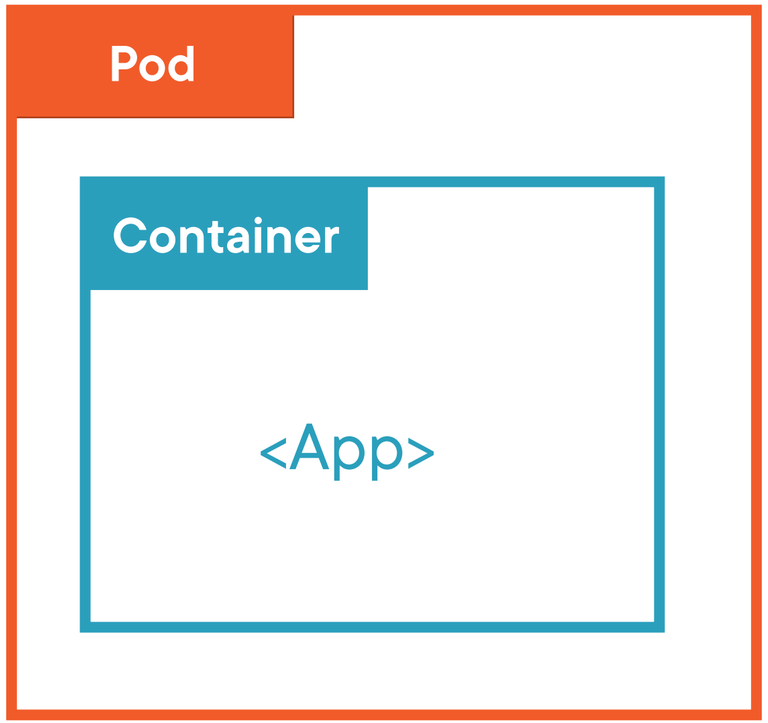
@nigelpoulton nigelpoulton.com

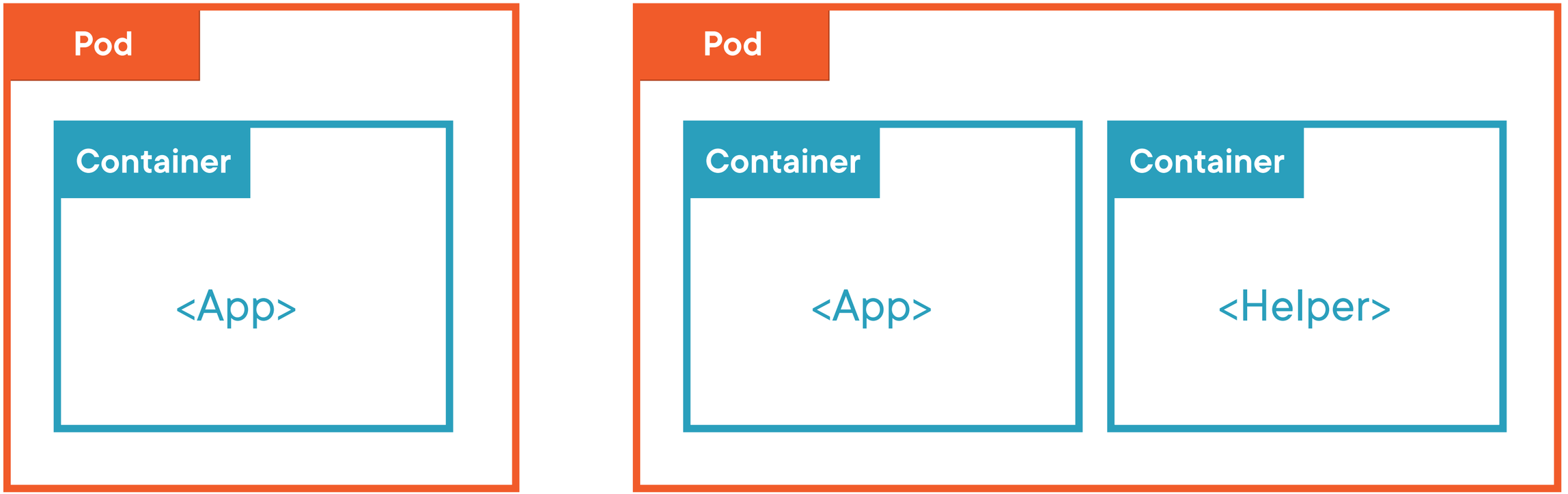
Agenda

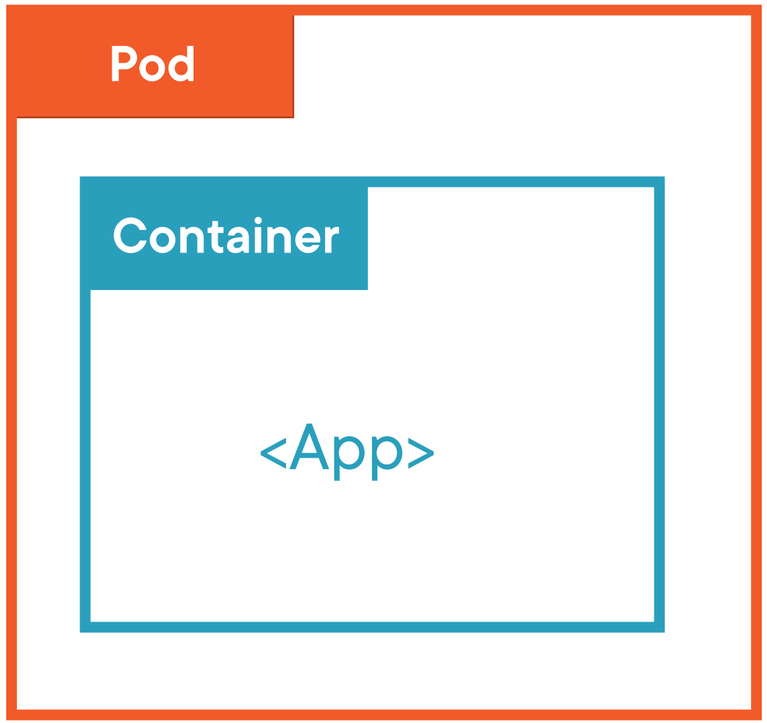
- Understanding Multi-container Pods
- Working with Multi-container Pods
- Exam Scenarios
- Recap and Test Yourself

Understanding Multi-container Pods

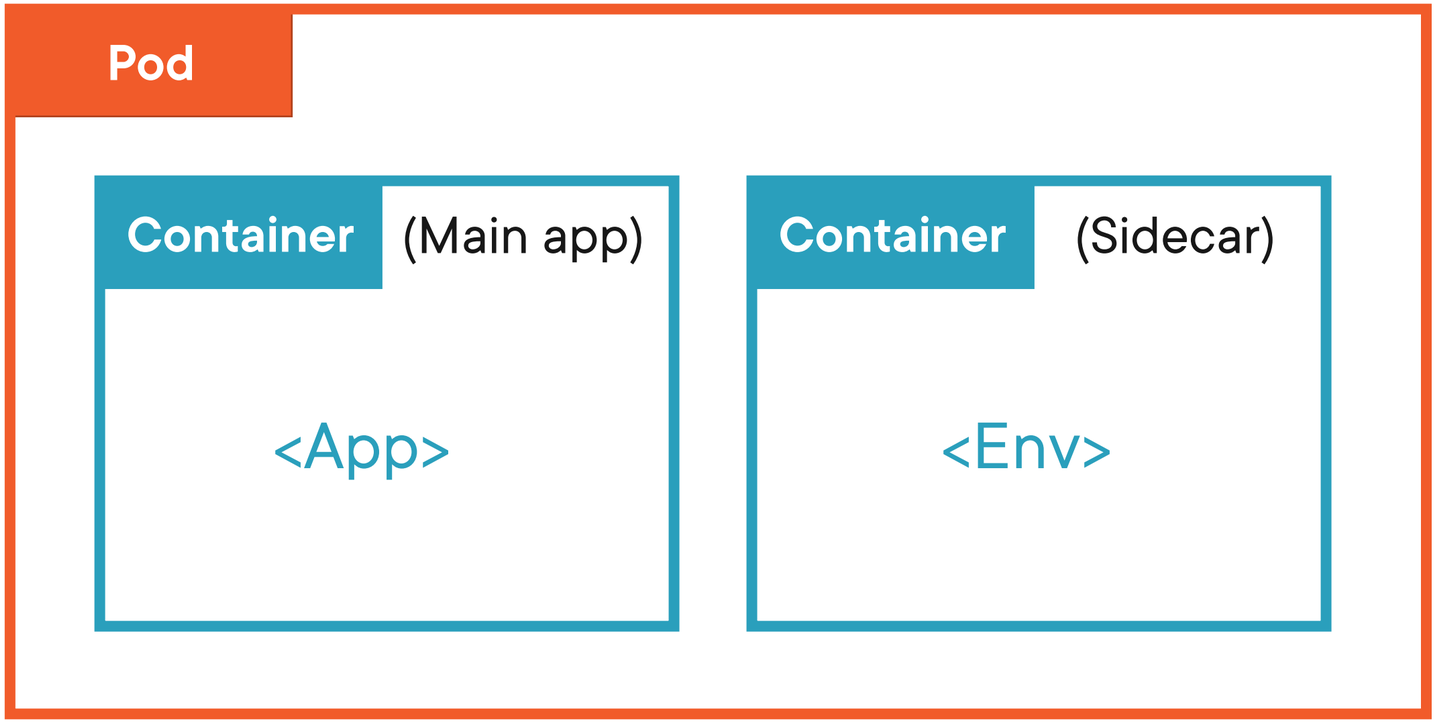
Containers must run inside Pods


Pod
Container
<App>


Pod
Container
<App>
Pod
Container
<App>
Container
<Helper>

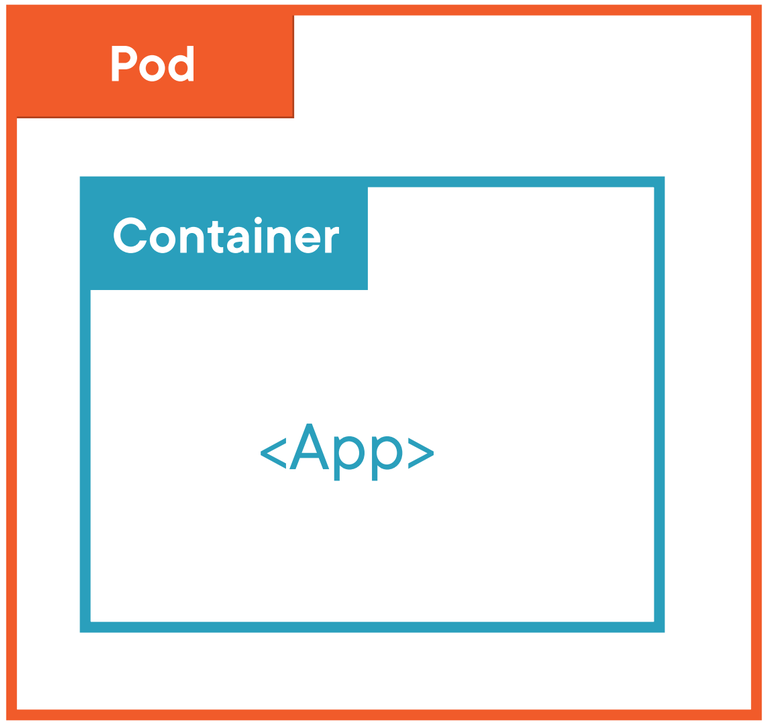


Separation of concerns: Every container only does one thing.

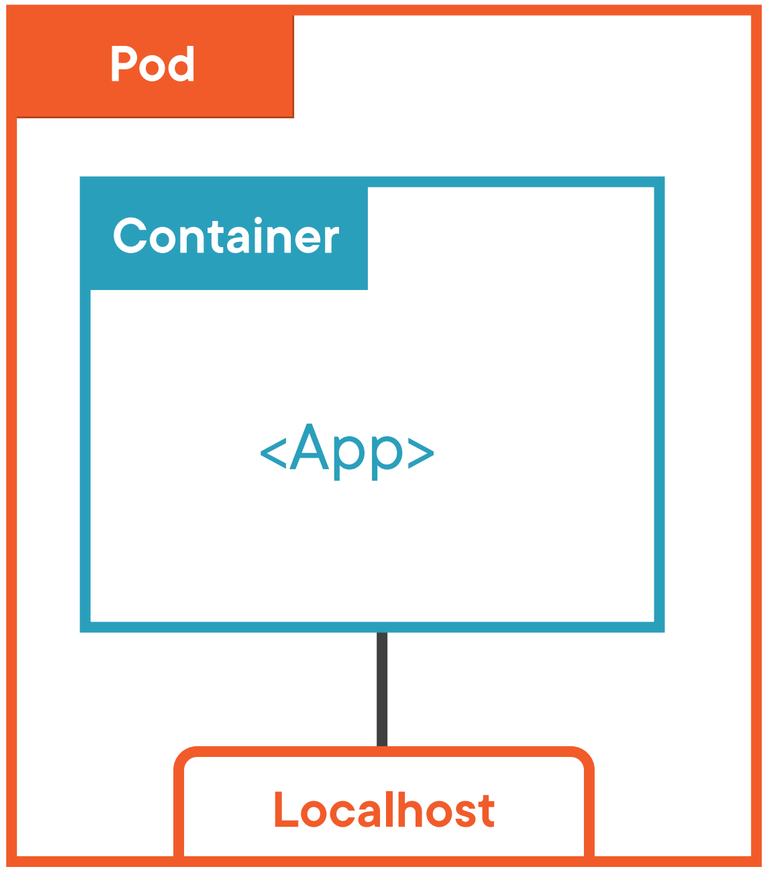


Separation of concerns: Every container only does one thing.

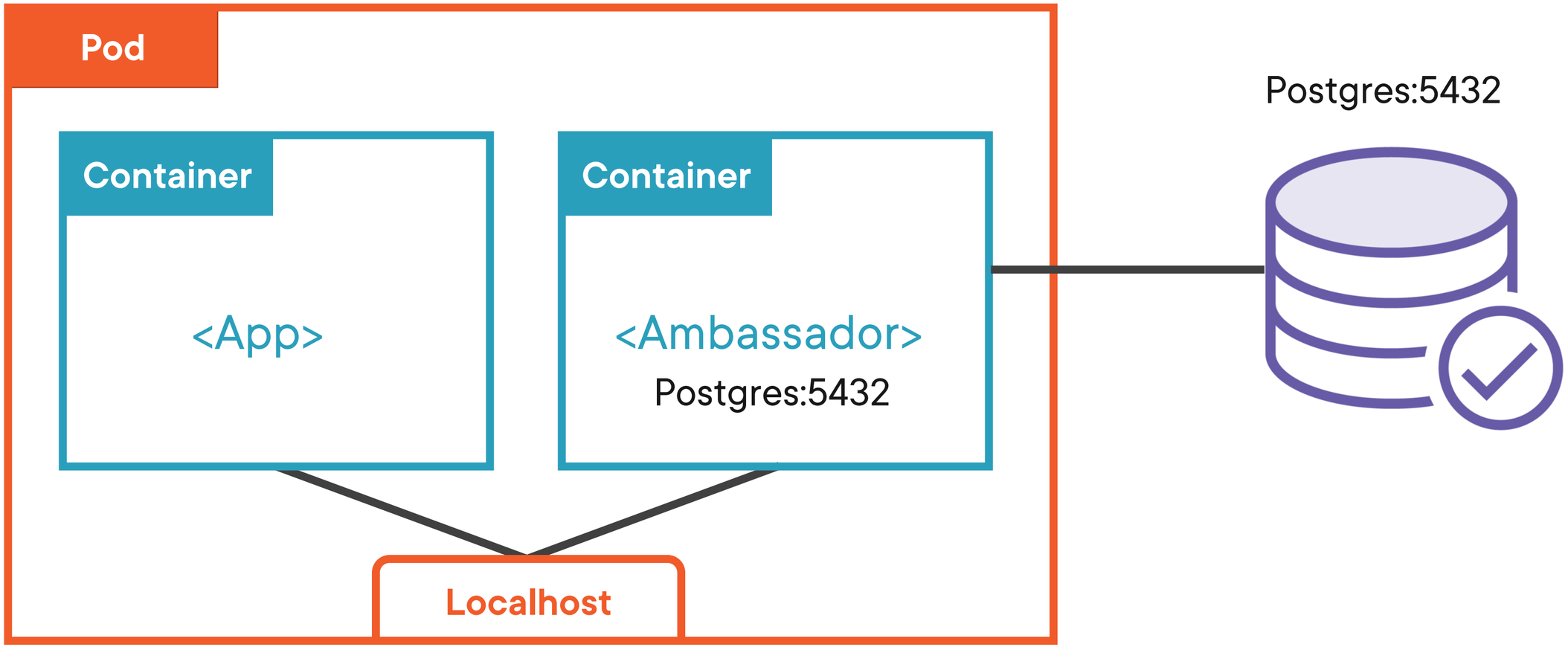
Ambassador Pattern



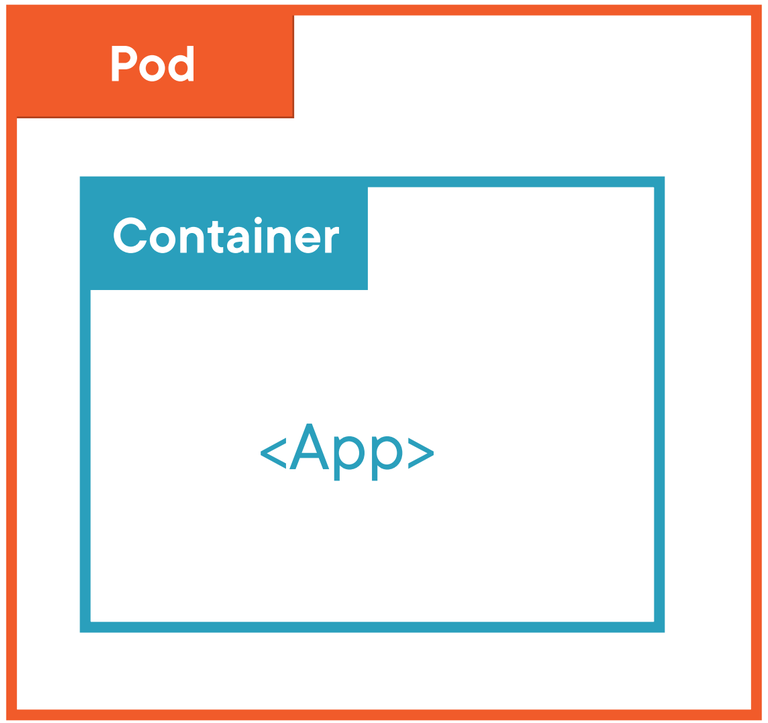
Postgres:5432

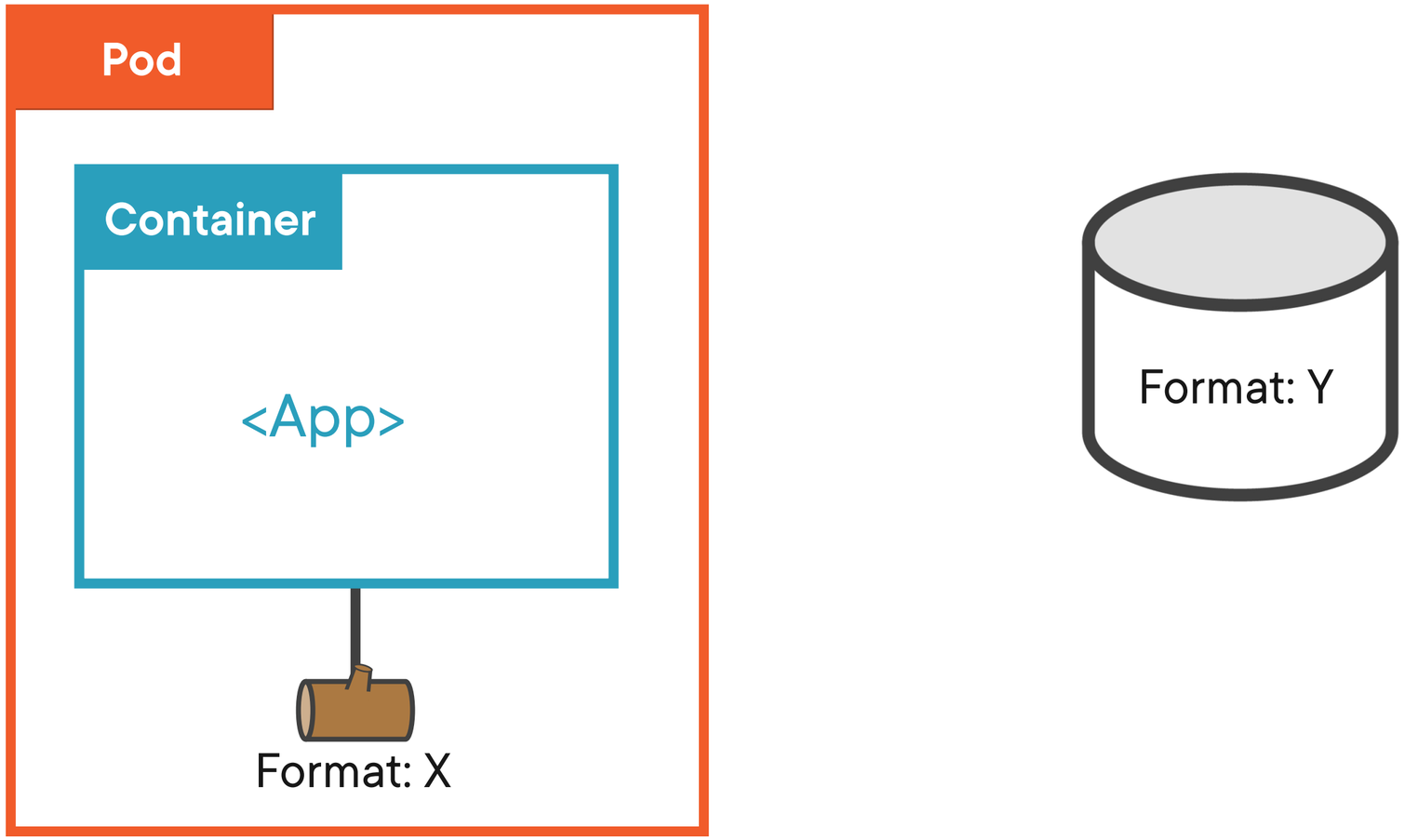


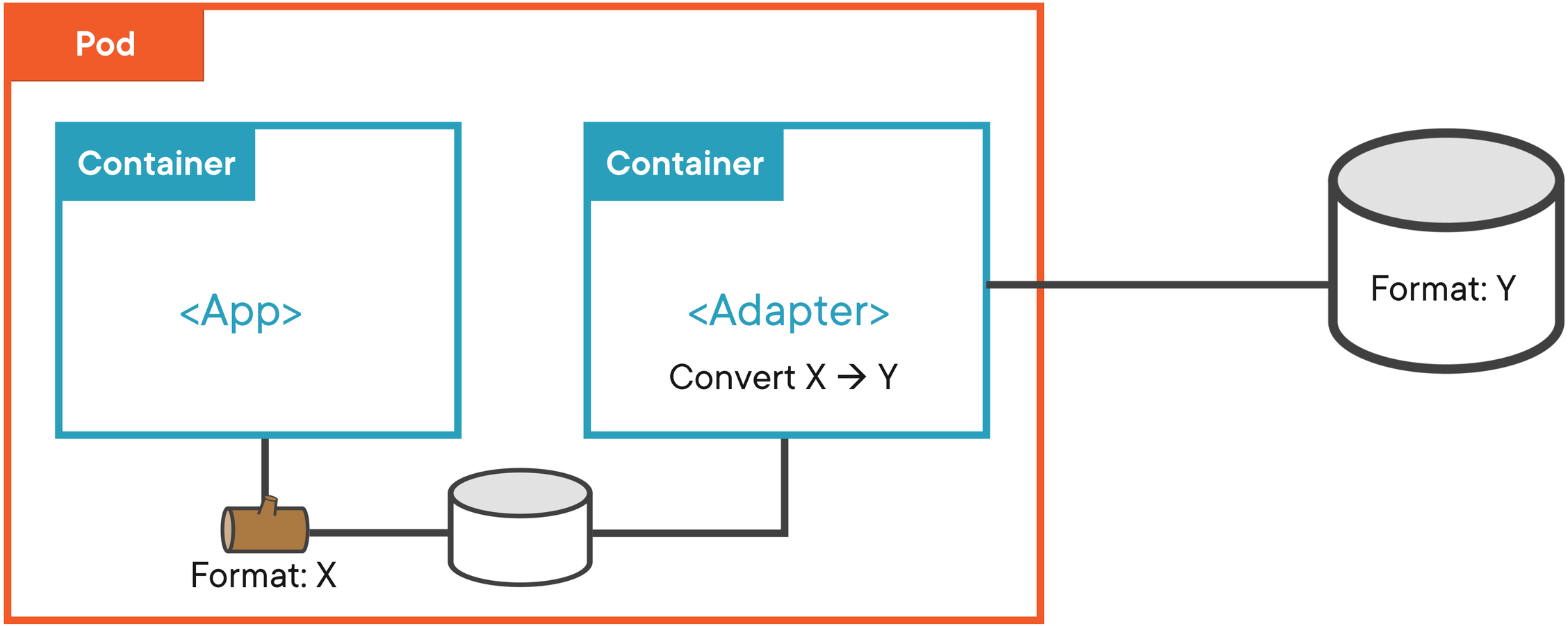
Postgres:5432


Pod
Container
<App>
Container
<Ambassador>
Postgres:5432
Localhost
Postgres:5432

Adapter Pattern


Pod
Container
<App>


Pod
Container
<App>
Format: X
Format: Y

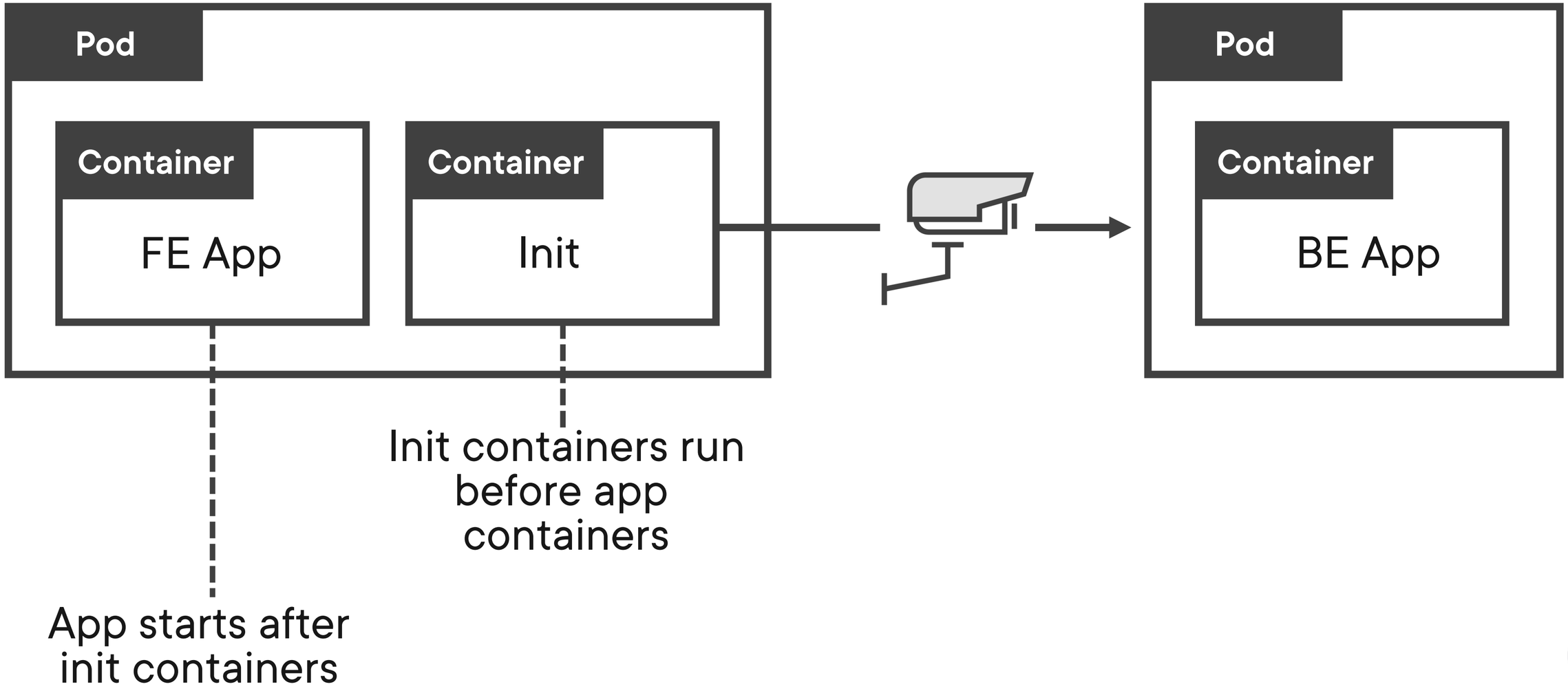

Pod
Container
<App>
Container
<Adapter>
Convert X → Y
Format: Y
Format: X

Definition

***Ambassadors* and *Adapters* are versions of the generic *sidecar* model.**

Init containers


Pod
Container
FE App
Pod
Container
BE App


Pod
Container
FE App
Container
Init
Pod
Container
BE App
Init containers run before app containers
App starts after init containers

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: ckad-app
  …
spec:
  initContainers:
  - name: svc-check
    image: busybox
    command: [‘sh’...]
  containers:
  - name: app-ctr
    image: nigelpoulton...
    command: "bash"  ...
```

Init containers run first

Normal container run after init containers

Working with Multi-container Pods

Init containers

Exam Scenarios

< Prev. | Task 1 of X | Next >

Task weight: 6%

Complete this task
in XYZ environment.
The command to connect is
Blah blah blah...

Task

You have an app defined in the **ps-app.yml** file in your working directory defining a Pod that will run in the **ps-dev Namespace**.

Augment the Pod with the following container spec that checks for the availability of a Service called **ckad-svc**. Configure the Pod so the **app-ctr** container does not start until the Service is created.

Deploy the Pod. It will sit waiting for the service to start.

```
initContainers:
  - name: svc-check
    image: busybox
    command: ['sh', '-c', 'until
nslookup ckadsvc; do echo
waiting for Service; sleep 1;
done; echo Service found!']
```

```
Terminal: $
```

Complete this task in XYZ environment.
The command to connect is blah blah blah...

Task

You have an app defined in the **ps-app.yml** file in your working directory defining a Pod that will run in the **ps-dev Namespace**.

Augment the Pod with the following container spec that checks for the availability of a Service called **ckad-svc**. Configure the Pod so the **app-ctr** container does not start until the Service is created.

Deploy the Pod. It will sit waiting for the service to start.

```
- name: svc-check
    image: busybox
    command: ['sh', '-c', 'until nslookup ckadsvc; do echo waiting
for Service; sleep 1; done; echo Service found!']
```

Complete this task in XYZ environment.
The command to connect is blah blah blah...

Perform all tasks in the CKAD Namespace

Task

There's an app called **sync-app** running in the *CKAD Namespace*. It's defined in the **sync-app.yml** file in your current working directory. The app needs updating to pull content from a remote Git repo and put that content in the volume used by the **main-app** container.

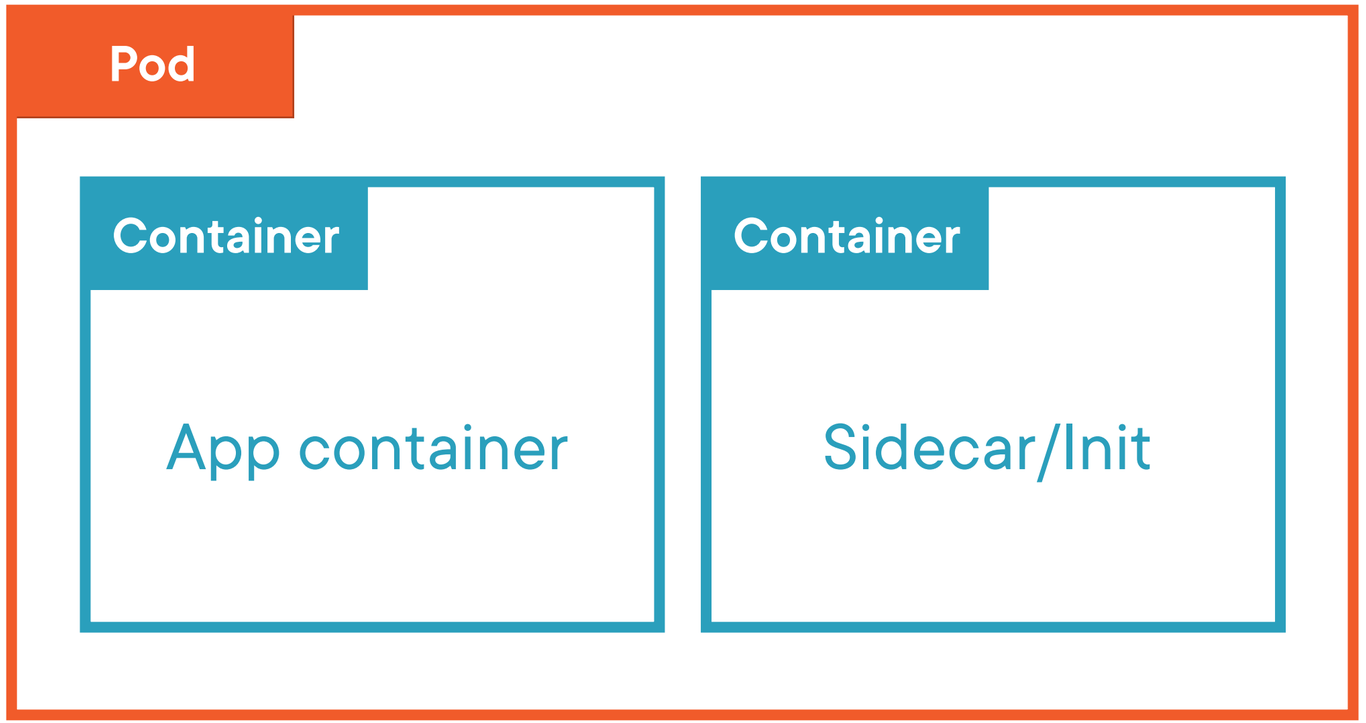
Add the following container spec to the Pod and make sure it runs alongside the main-app container. Also update the syncer container configuration so that it mounts the shared HTML volume to /tmp/git.

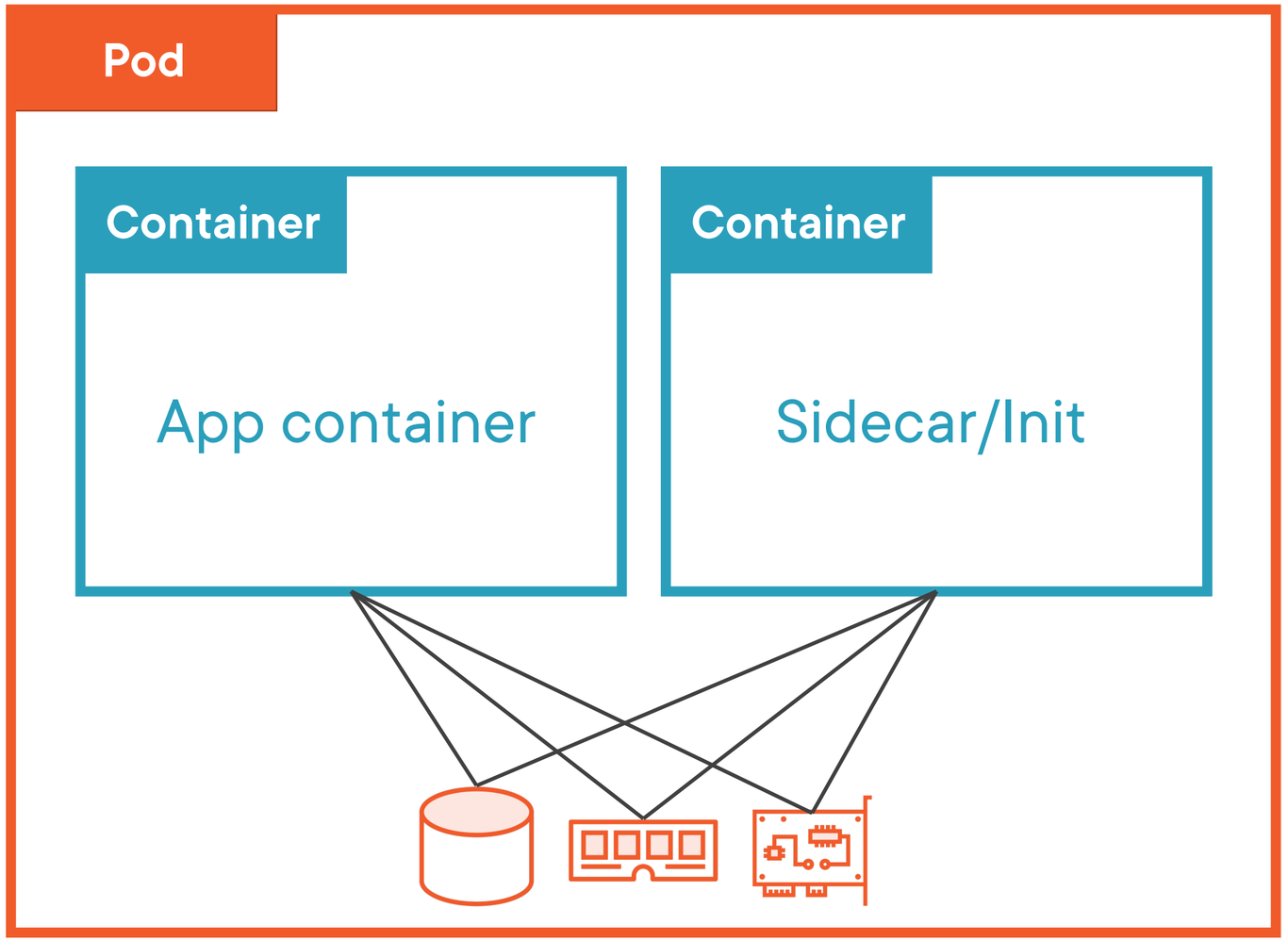
When you're done, deploy the app and run the following curl command to verify it works. If you get a 404 response, it hasn't worked. If you get some HTML with version 1.0, it worked.

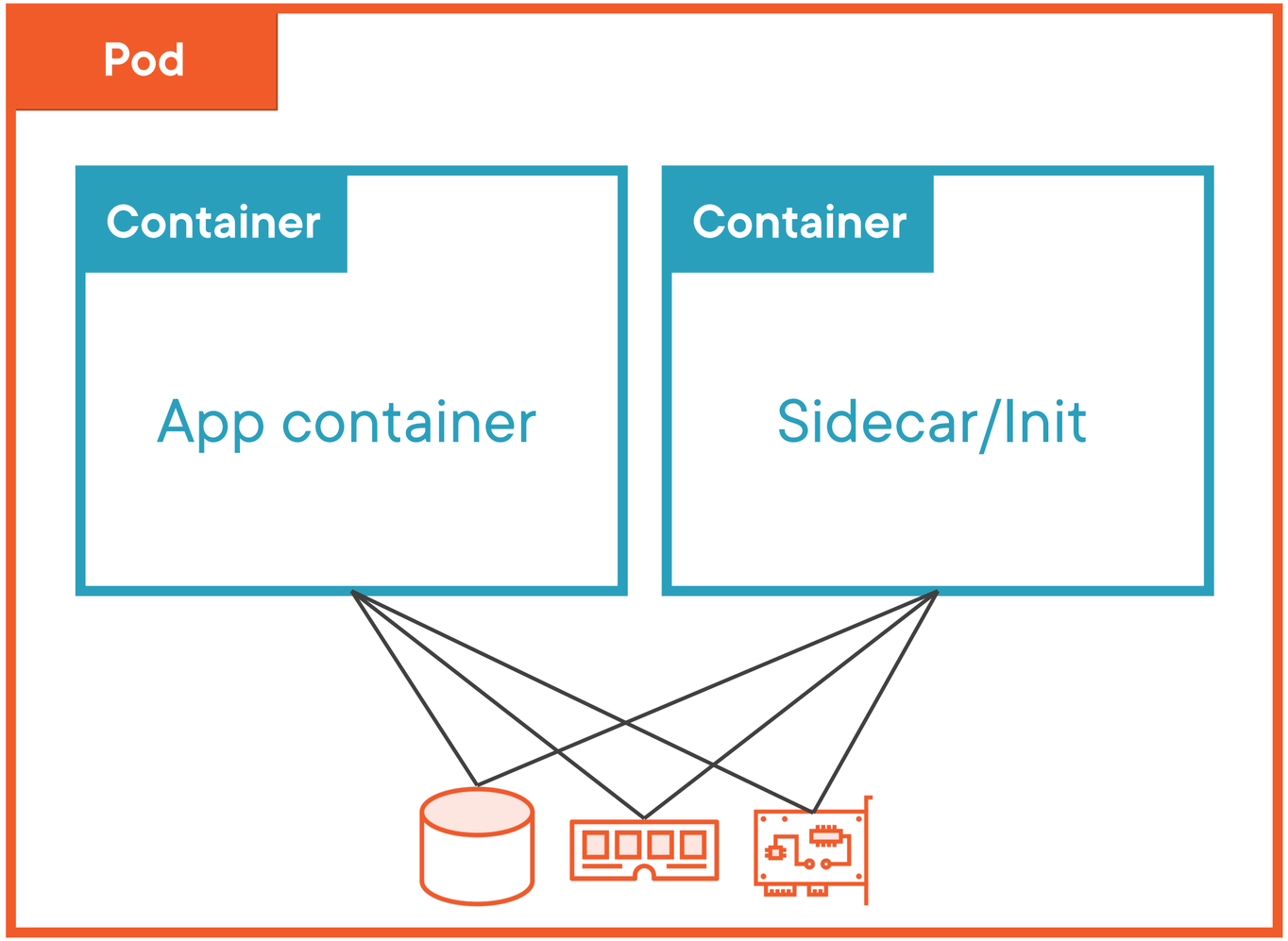
```
$ curl localhost:30001
```

```
- name: syncer
    image: k8s.gcr.io/git-
sync:v3.1.6
    env:
    - name: GIT_SYNC_REPO
      value:
https://github.com/nigelpoulto
n/ps-sidecar.git
    - name: GIT_SYNC_BRANCH
      value: master
    - name: GIT_SYNC_DEPTH
      value: "1"
    - name: GIT_SYNC_DEST
      value: "html"
```

Recap and Test Yourself


Pod
Container
App container
Container
Sidecar/Init


Pod
Container
App container
Container
Sidecar/Init

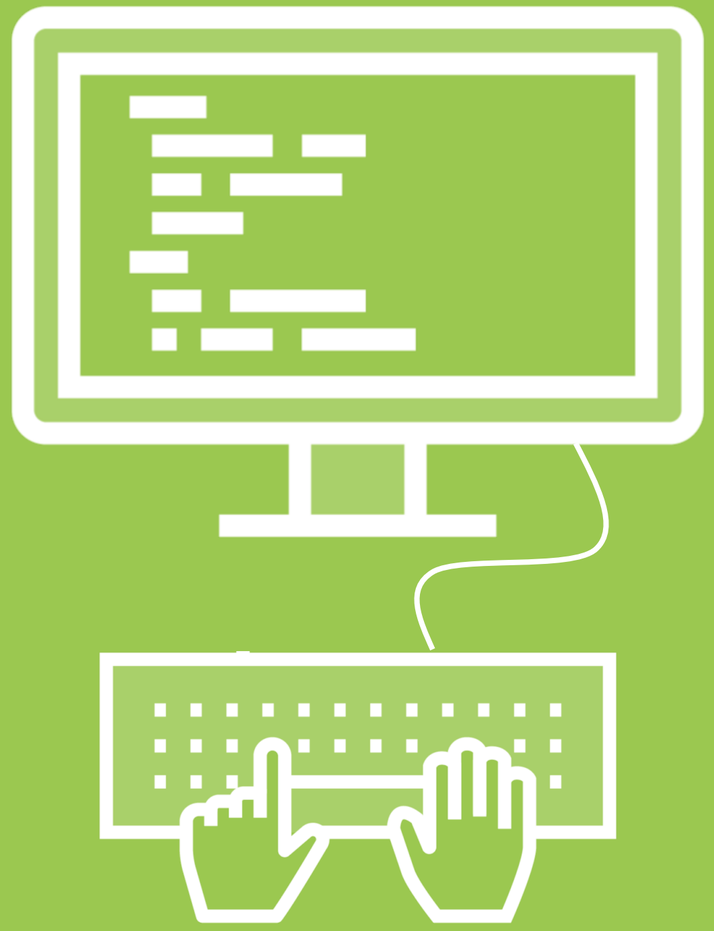


Sidecars:

- Run alongside main app container
- Augment app container
- Separation of concerns

Init containers:

- Run before other containers
- Good for preparing environments



GitHub Repo

https://github.com/nigelpoulton/ckad

Navigate to:

- 1 Application Design and Build
- 4 Understand Multi-container Pod Design Patterns
- Test Yourself

Up Next:
Utilize Persistent and Ephemeral Volumes