Managing Dependencies of Helm Charts

Managing Dependencies

Packaging a chart

Publishing to a repository
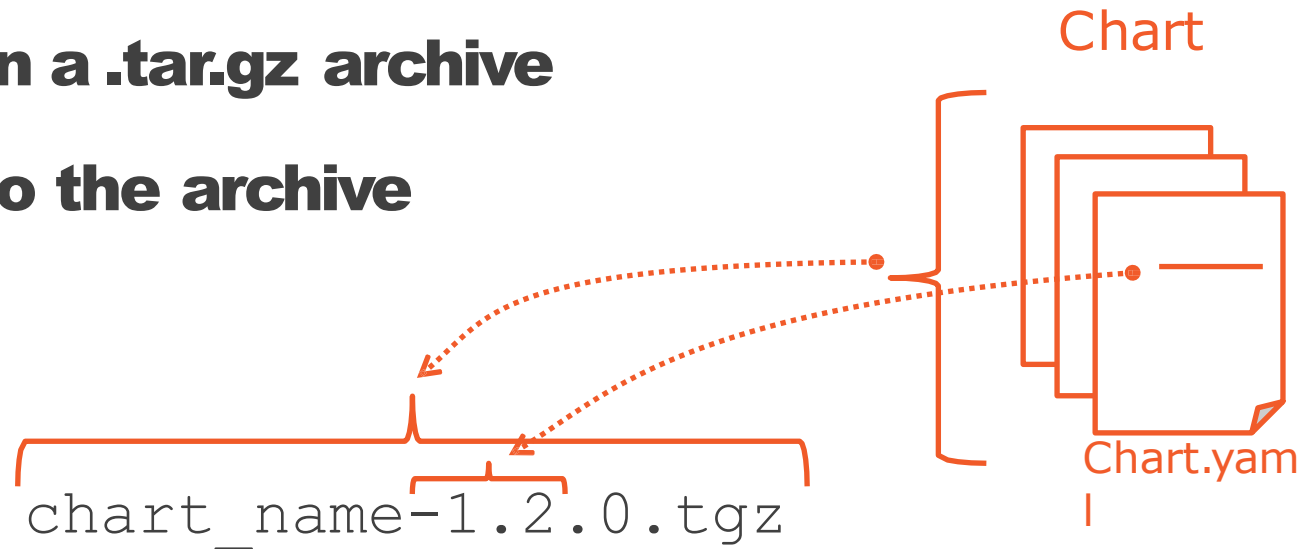
How to define dependencies

Tags and conditions

Packaging Your Charts

Packaging a Chart

— **Compress chart folder in a .tar.gz archive**
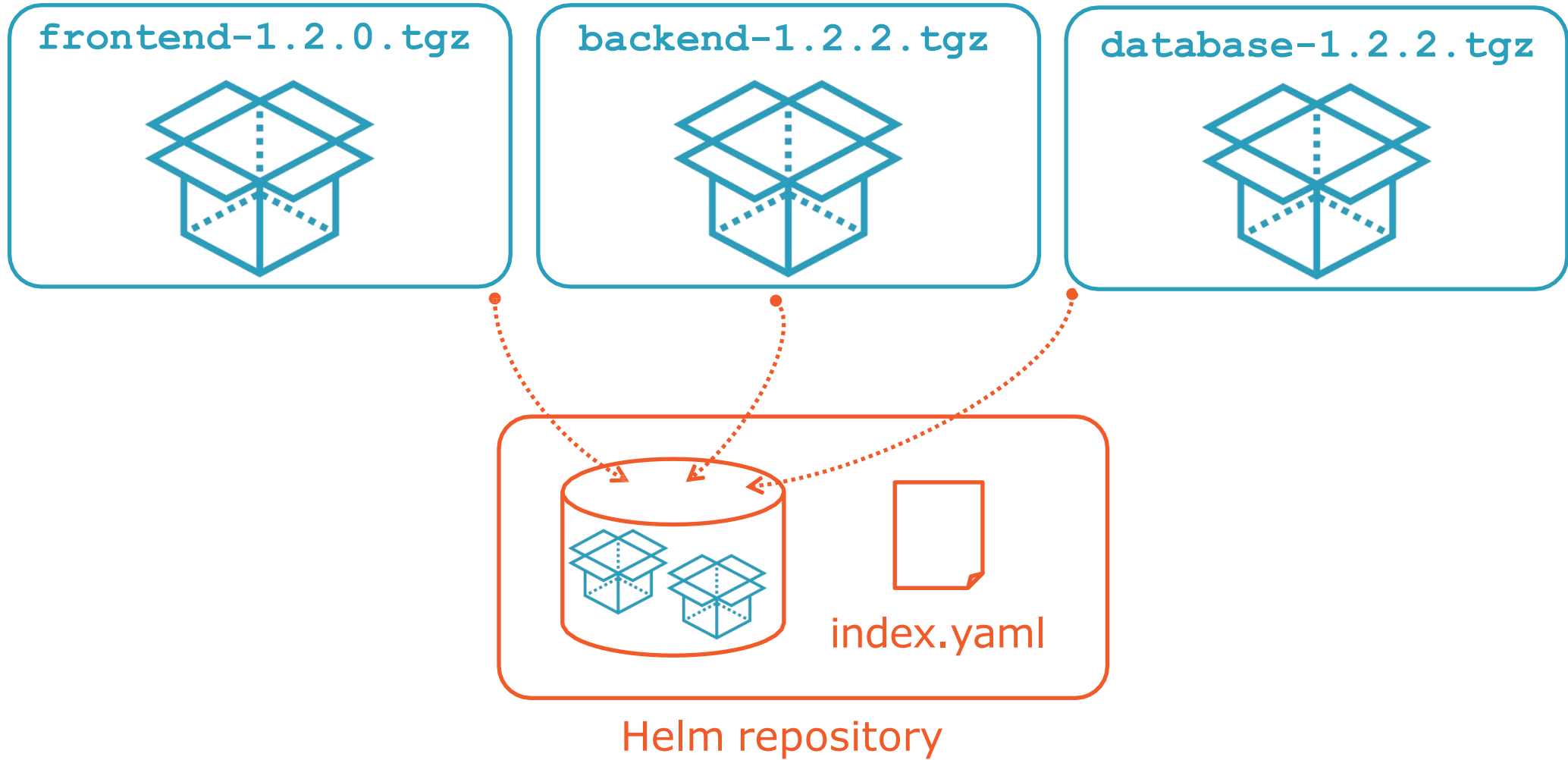
— **Add a version number to the archive**

Chart

Chart.yaml

chart_name-1.2.0.tgz

```
> tar -zcvf chart_name-1.2.0.tgz chart_name

> helm package chart_name
```

Publishing Charts in Repositories

Helm Repository

frontend-1.2.0.tgz

backend-1.2.2.tgz

database-1.2.2.tgz

index.yaml

Helm repository

Publishing in a Repository
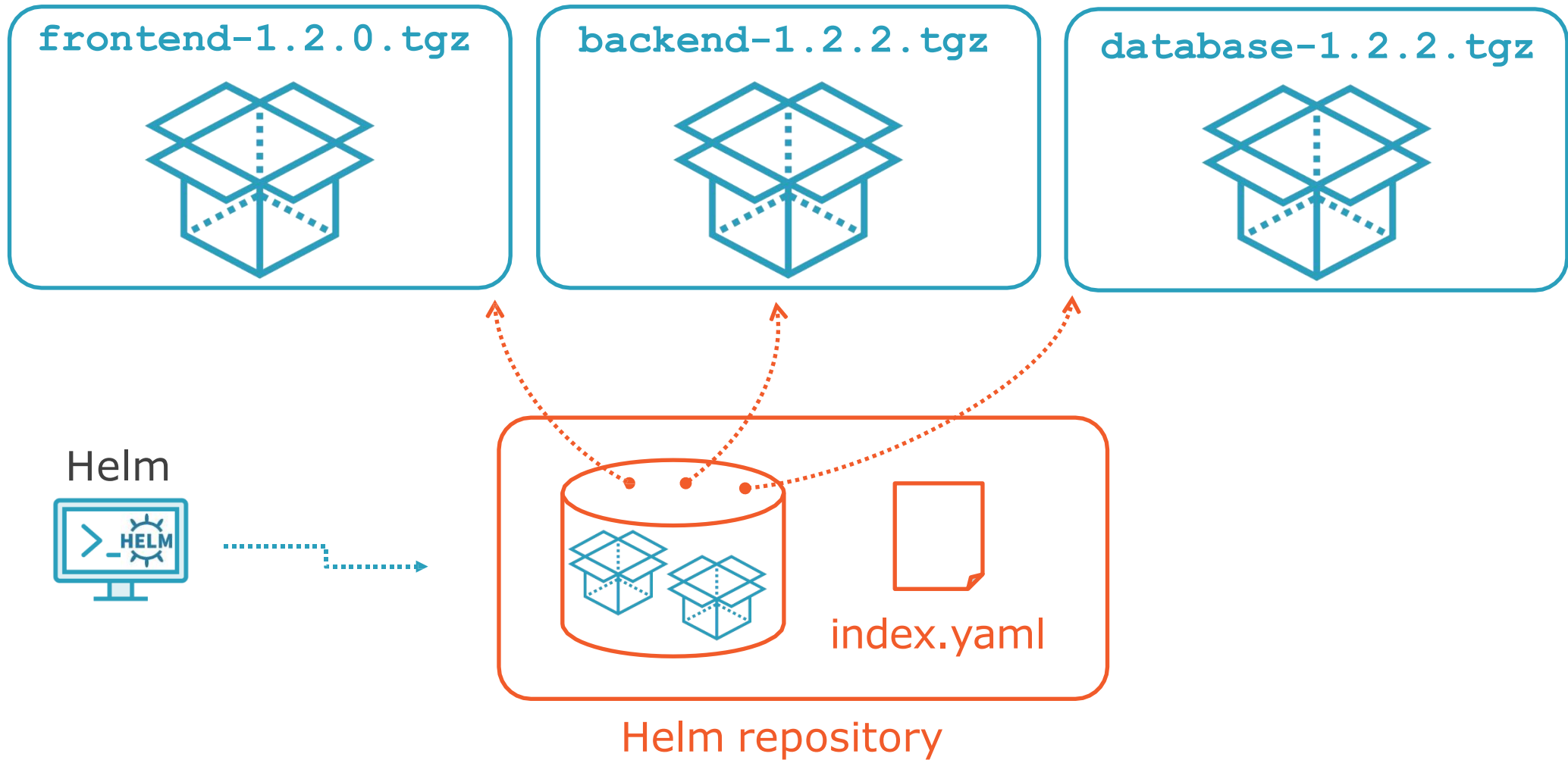
Create the index.yaml

Upload charts' archives and index file to an http server

- Nginx, Apache, Cloud or use Chartmuseum

Provenance files

```
> helm repo index .

> helm package --sign

> helm verify chart.tgz

> helm install --verify
```

Helm Repository

`frontend-1.2.0.tgz`

`backend-1.2.2.tgz`

`database-1.2.2.tgz`

Helm

index.yaml

Helm repository

Managing a Repository List

Helm maintains a list of repositories

- Stable
- Customs

Update that list by adding or removing repositories

```
me@cursus:~/helm/lab11/$ helm repo list
NAME      URL
stable    https://charts.helm.sh/stable
```

Default Repository

No repository by default in Helm 3

Highly recommended to add stable helm repository

```
>  helm repo add stable https://charts.helm.sh/stable
```

Defining Dependencies

What is helm umbrella chart?

Helm charts have the ability to include other charts, referred to as subcharts, via their dependencies section. When a chart is created for the purpose of grouping together related subcharts/services, such as to compose a whole application or deployment, we call this an umbrella chart.
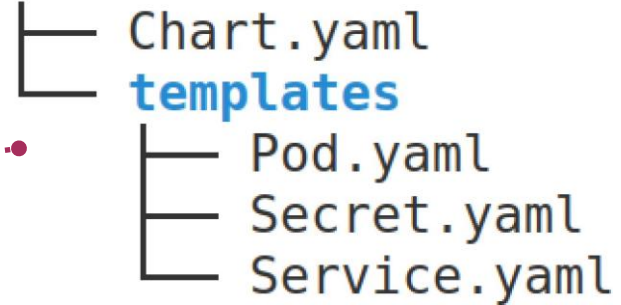
Charts Dependencies

Charts Dependencies
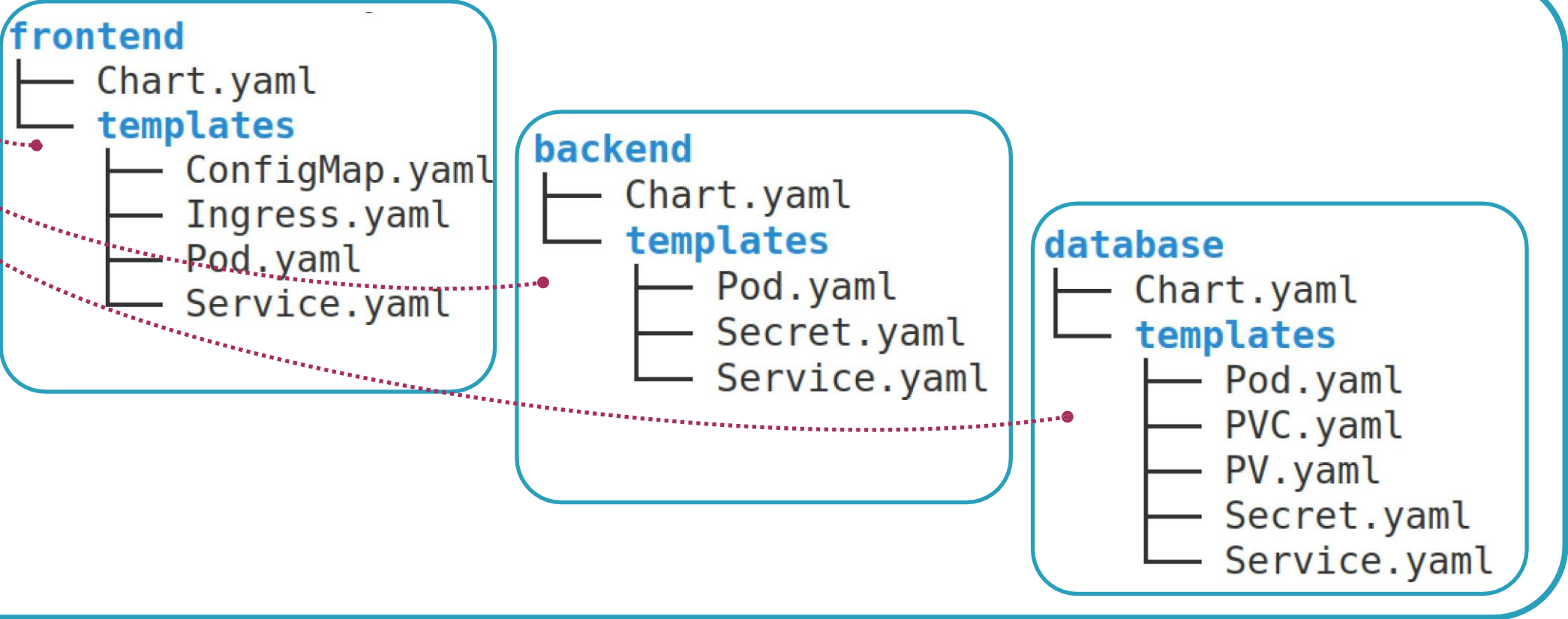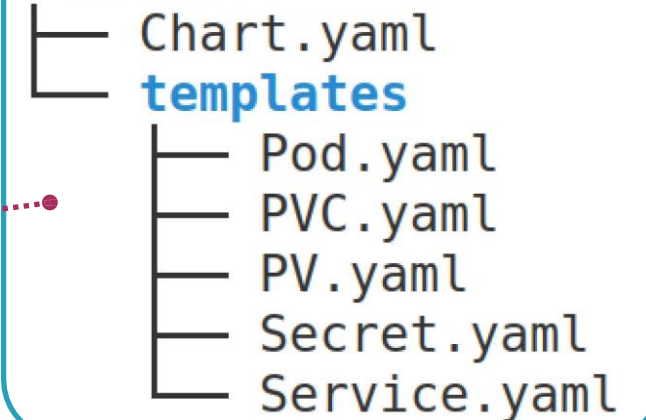
frontend-1.2.0.tgz

backend-1.2.2.tgz

guestbook
    charts
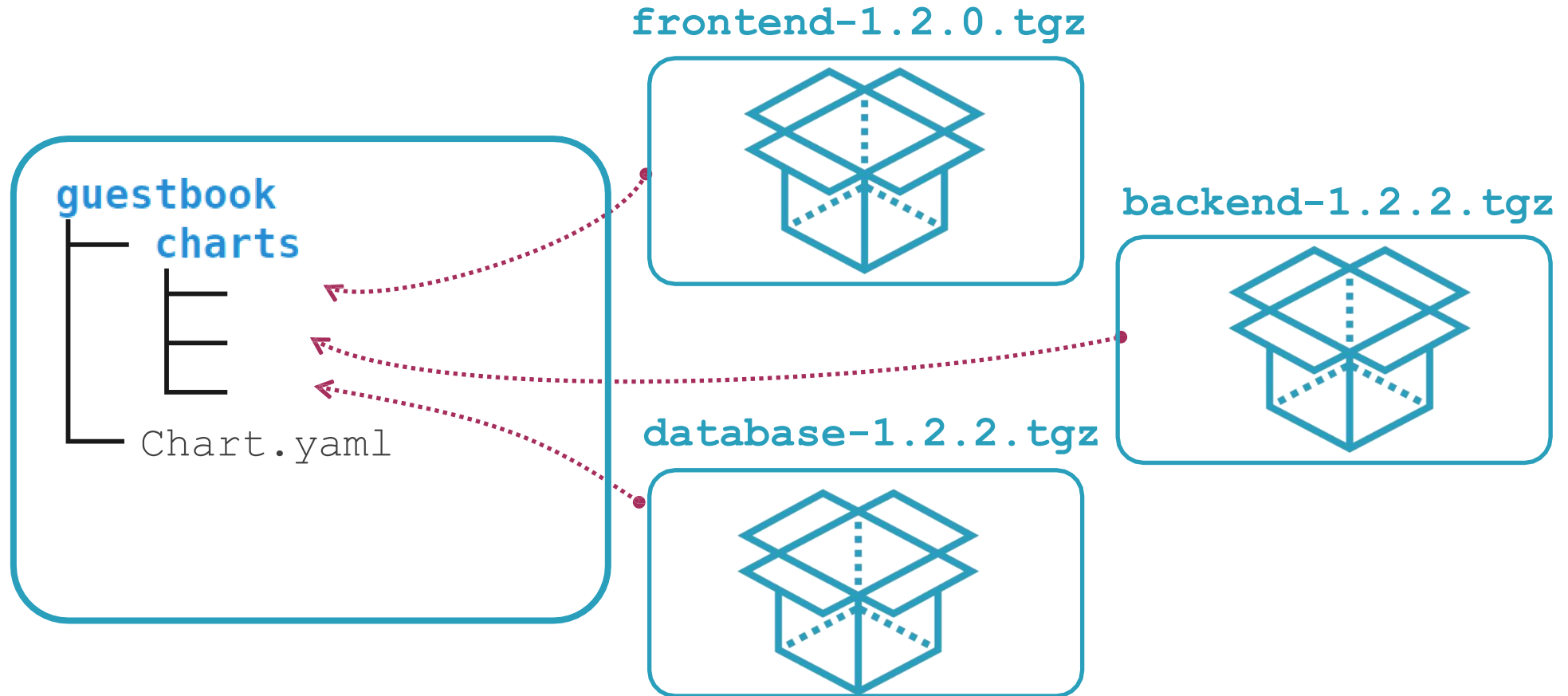   Chart.yaml

database-1.2.2.tgz
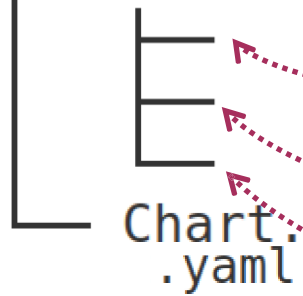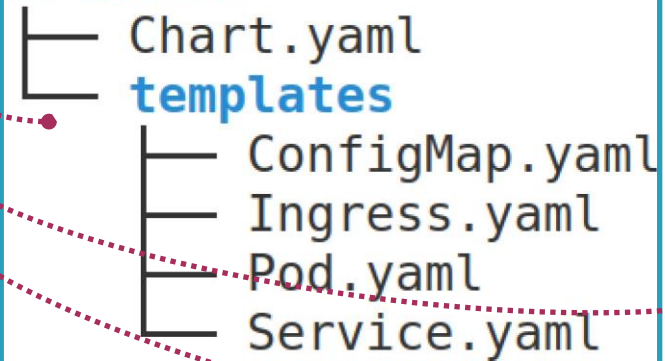
Chart.yaml

```yaml
apiVersion: v2
name: guestbook
appVersion: "2.0"
description: A Helm chart for Guestbook 2.0
version: 1.2.2
type: application

dependencies:
  - name: backend
    version: ~1.2.2
    repository: http://localhost:8080
  - name: frontend
    version: ^1.2.0
    repository: http://localhost:8080
  - name: mongodb
    version: 7.8.x
    repository: https://charts.helm.sh/stable
```

requirements.yaml

```yaml
dependencies:
  - name: backend
    version: ~1.2.2
    repository: http://127.0.0.1:8879/charts
  - name: frontend
    version: ^1.2.0
    repository: http://127.0.0.1:8879/charts
  - name: mariadb
    version: 5.x.x
    repository: https://kubernetes-charts.storage.googleapis.com/
```

Semver 2.0 Versions

Range	Versions
~1.2.3	>=1.2.3, < 1.3.0
1.2.x	>=1.2.0, < 1.3.0
^1.2.3	>=1.2.3, < 2.0.0
1.x.x	>=1.2.0, < 2.0.0
1.2 - 1.4.5	>=1.2, <= 1.4.5

https://github.com/masterminds/semver

Charts Dependencies
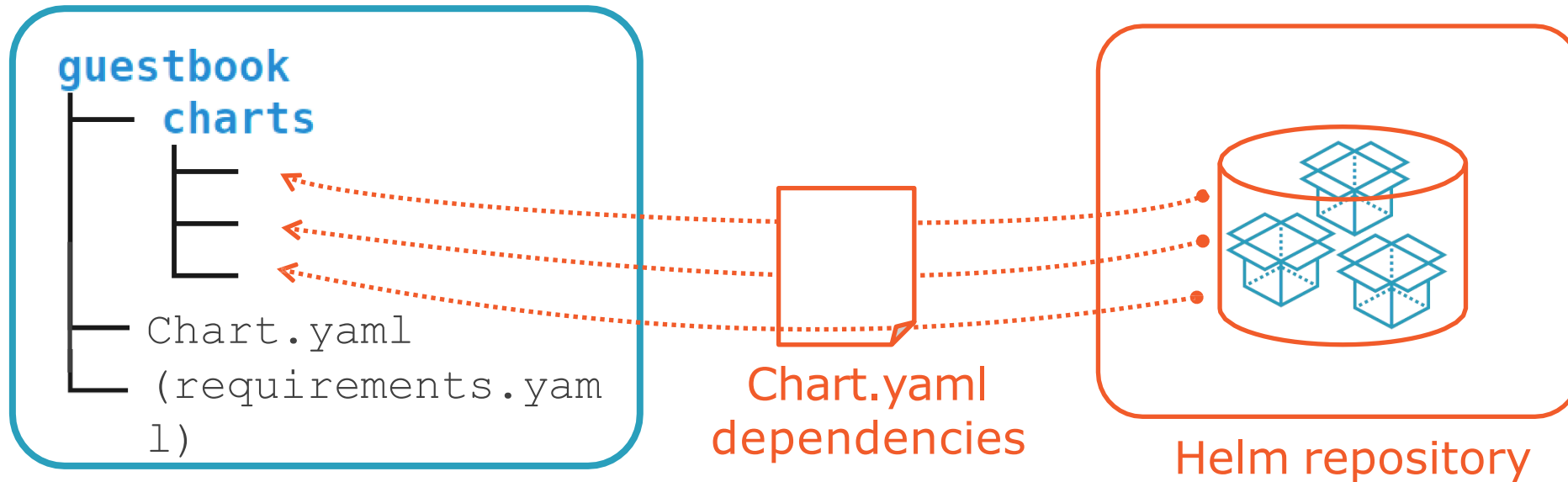

```
> helm dependency update guestbook

> helm dependency list guestbook
```

Chart.lock

```yaml
dependencies:
- name: backend
  repository: http://localhost:8080
  version: 1.2.2
- name: frontend
  repository: http://localhost:8080
  version: 1.2.2
- name: database
  repository: http://localhost:8080
  version: 1.2.2
digest: sha256:6a58a52c55ee4296ec43ffe1985ec1147186025c4d9724bcbe5c5354a13df635
generated: "2020-02-27T12:16:00.991397779+01:00"
```

Charts Dependencies
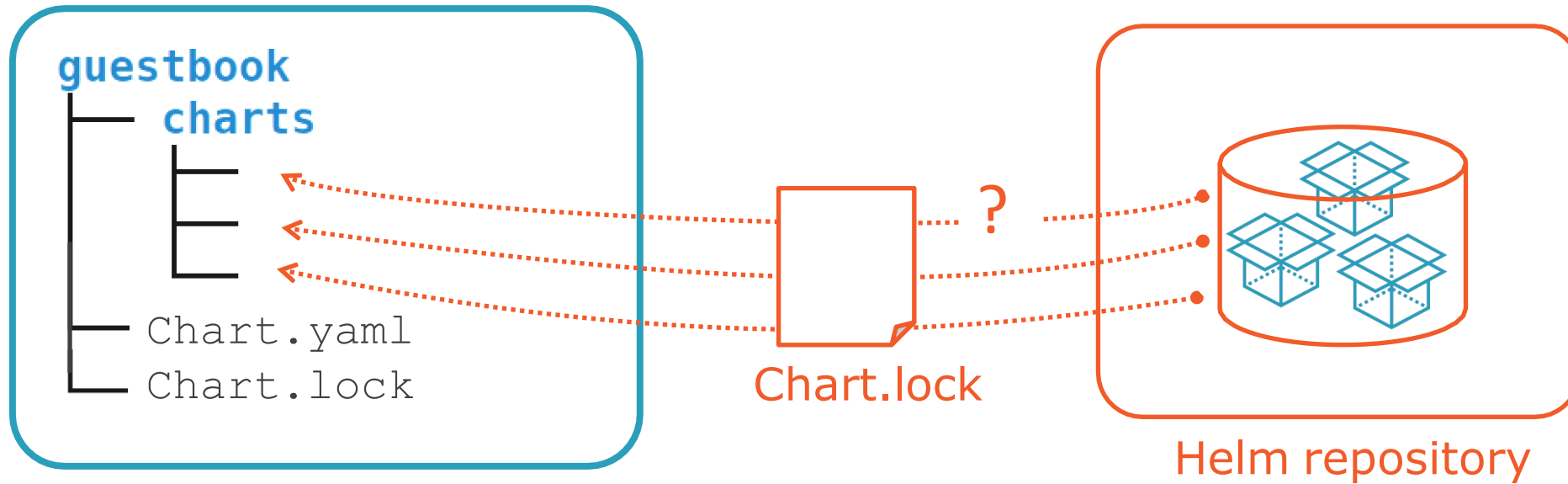

```
> helm dependency build guestbook
```

Adding Conditions and Tags

Conditions & Tags

Chart.yaml

```yaml
apiVersion: v2
name: guestbook
[...]
dependencies:
  - name: backend
    version: ~1.2.2
    repository: http://localhost:8080
    condition: backend.enabled,backend.another_condition
    tags:
      - api
  - name: frontend
    version: ^1.2.0
    repository: http://localhost:8080
  - name: mongodb
    version: 7.8.x
    repository: https://kubernetes-charts.storage.googleapis.com
    conditions: database.enabled
    tags:
      - api
```

values.yaml

```yaml
backend:

frontend:
database:
```
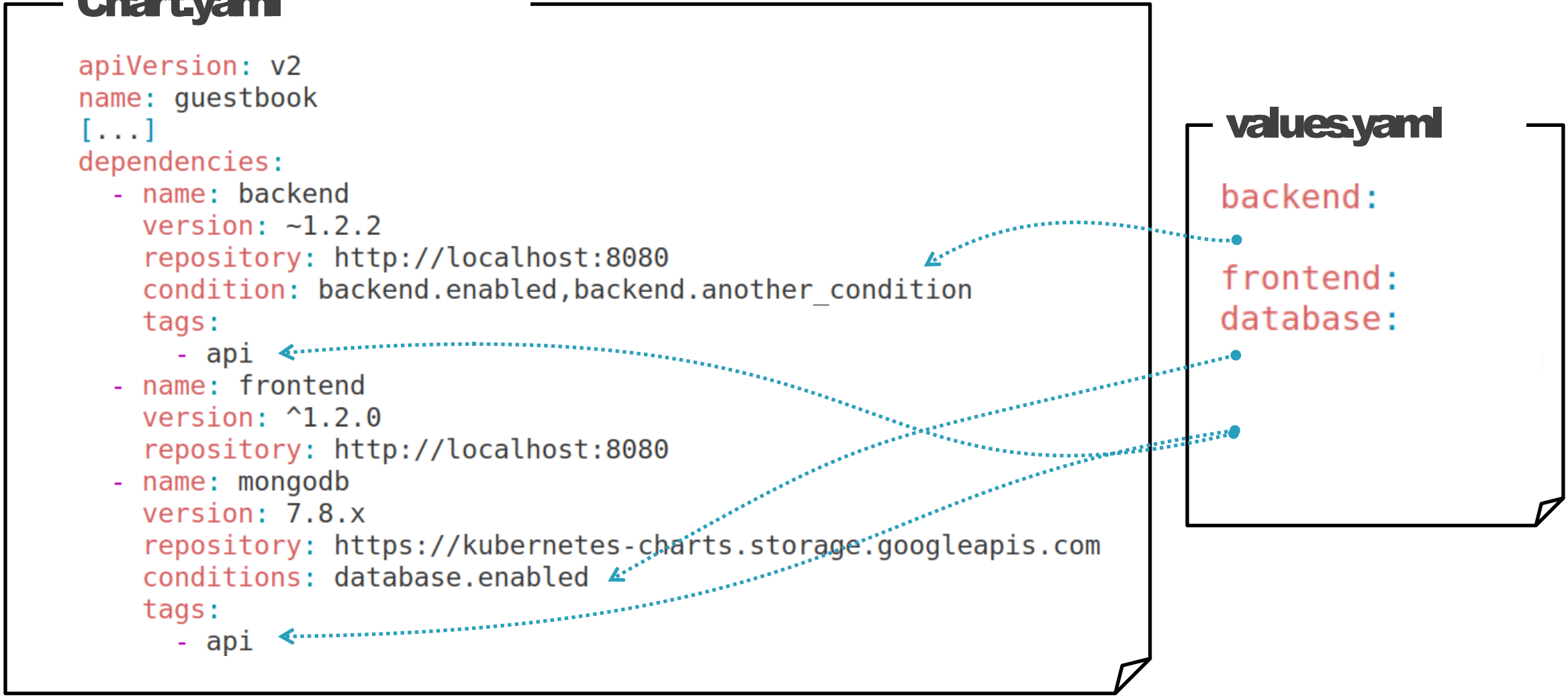
Conditions & Tags

All charts are downloaded with "helm dependency update"

Partial installation with "helm install"

"--set .." overrides value.yaml

Conditions override tags

```
> helm dependency update guestbook

> helm install demo guestbook

> helm install demo guestbook --set database.enabled=true

> helm install demo guestbook --set tags.api=false
```

Demo

Packaging charts

Publishing charts in repositories

- https://github.com/devopsschool-tutorials/helm/tree/master/helm3-lab-manuall
- lab10_helm_dependencies_begin
- lab10_helm_dependencies_final

Demo

Managing dependencies

- https://github.com/devopsschool-tutorials/helm/tree/master/helm3-lab-manuall
- lab10_helm_dependencies_begin
- lab10_helm_dependencies_final

Demo

Controlling dependencies with conditions and tags

- https://github.com/devopsschool-tutorials/helm/tree/master/helm3-lab-manuall
- lab10_helm_dependencies_begin
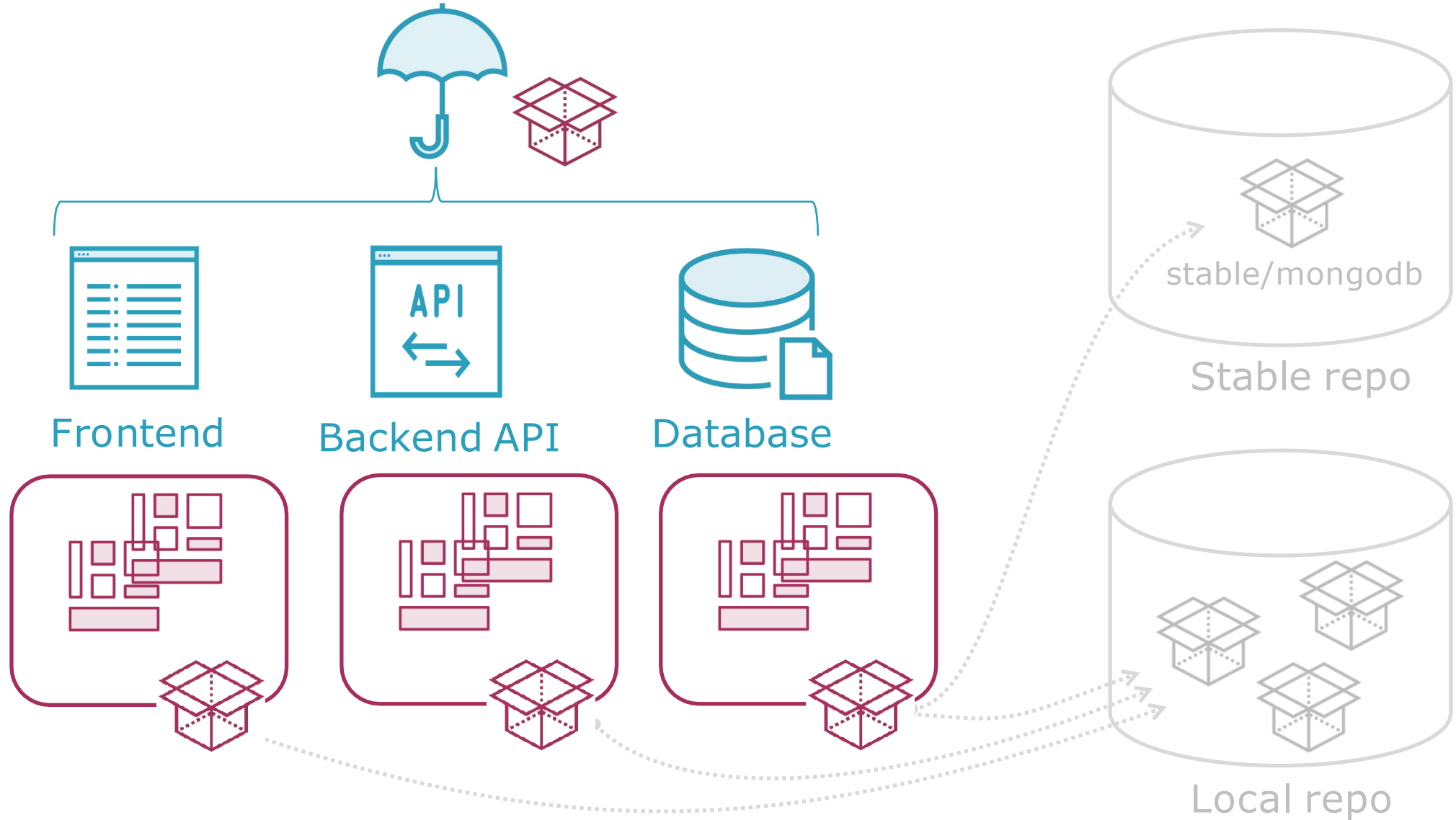- lab10_helm_dependencies_final

Summary

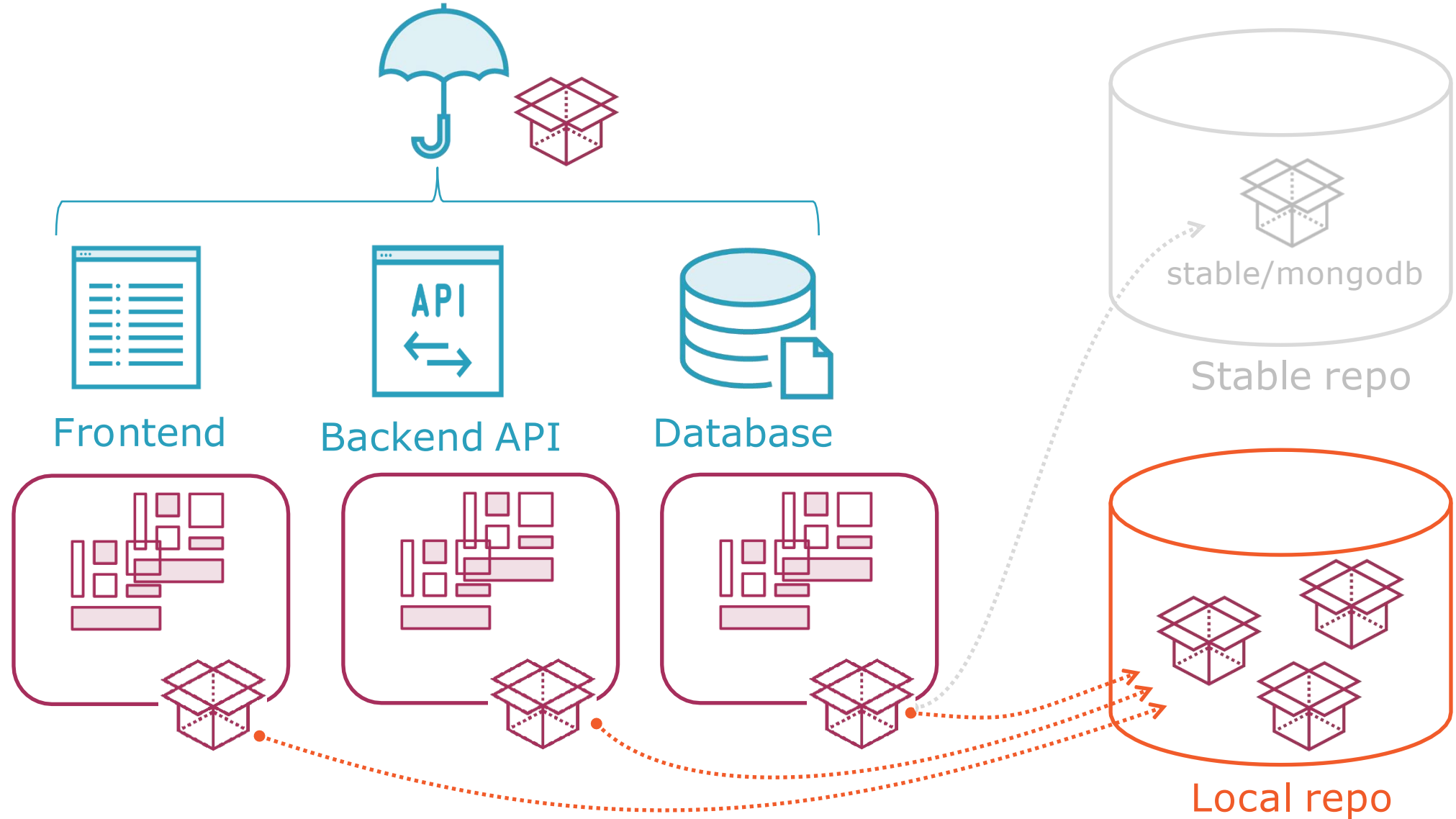**Packaging your chart**

Publishing in a Helm repository

Define and manage dependencies

Add conditions and tags

Guestbook application

Frontend

Backend API

Database

stable/mongodb

Stable repo

Local repo

Guestbook application

Frontend

Backend API

Database

stable/mongodb

Stable repo

Local repo

Guestbook application

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