Module 10

Devops

DevOps

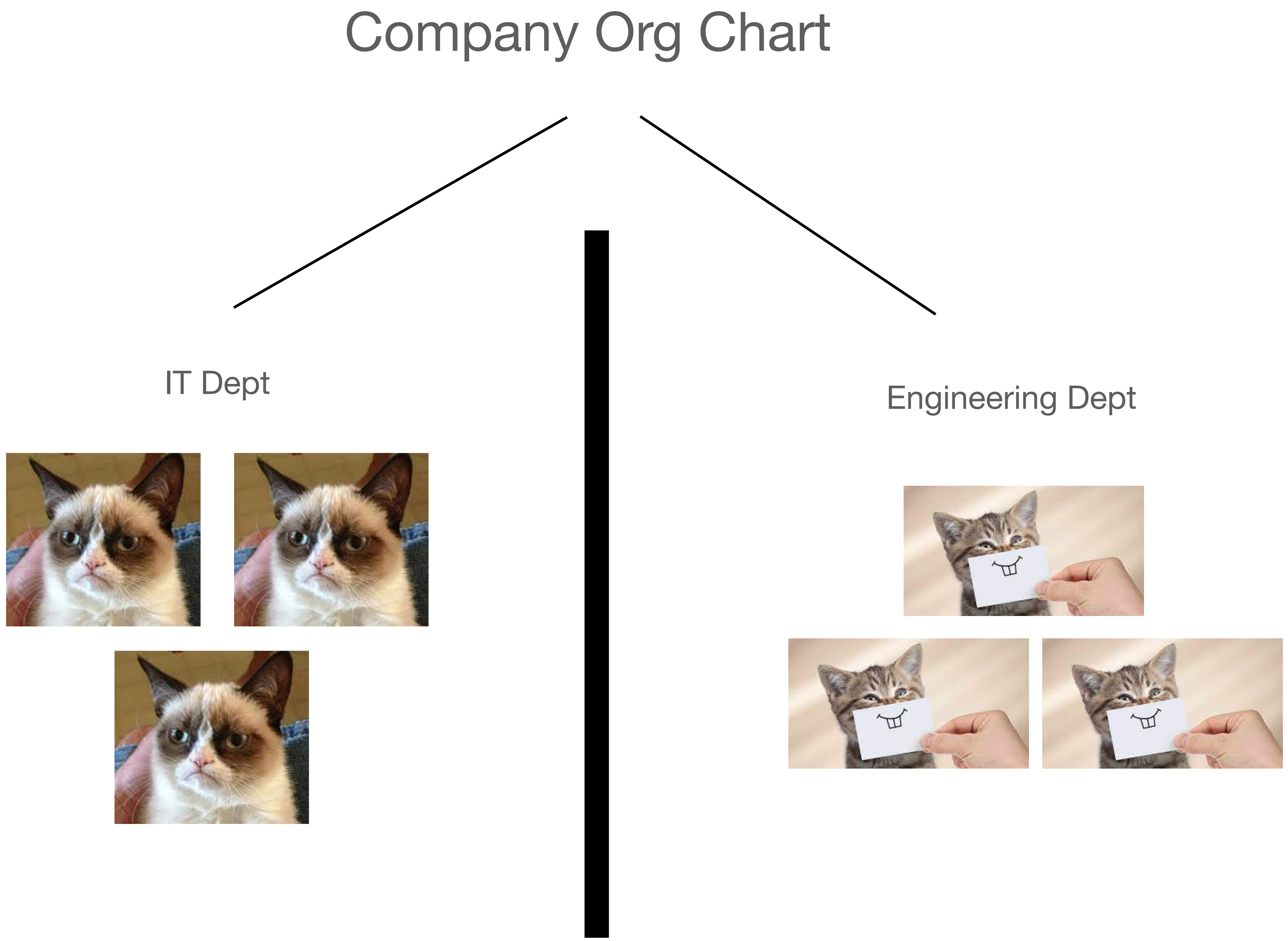
What

DevOps

What

DevOps

What



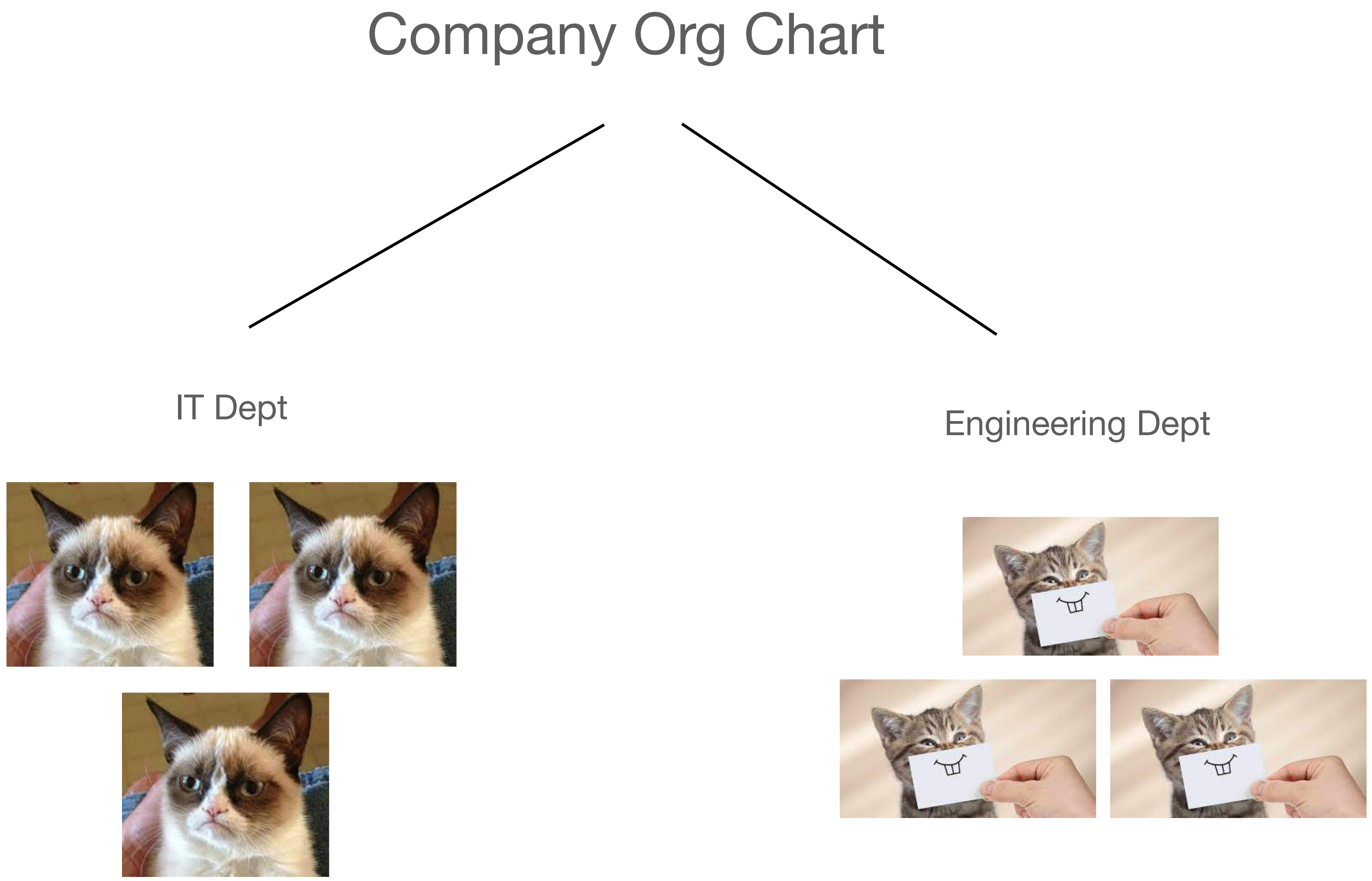
Company Org Chart

IT Dept

Engineering Dept

DevOps

What



Company Org Chart

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DevOps

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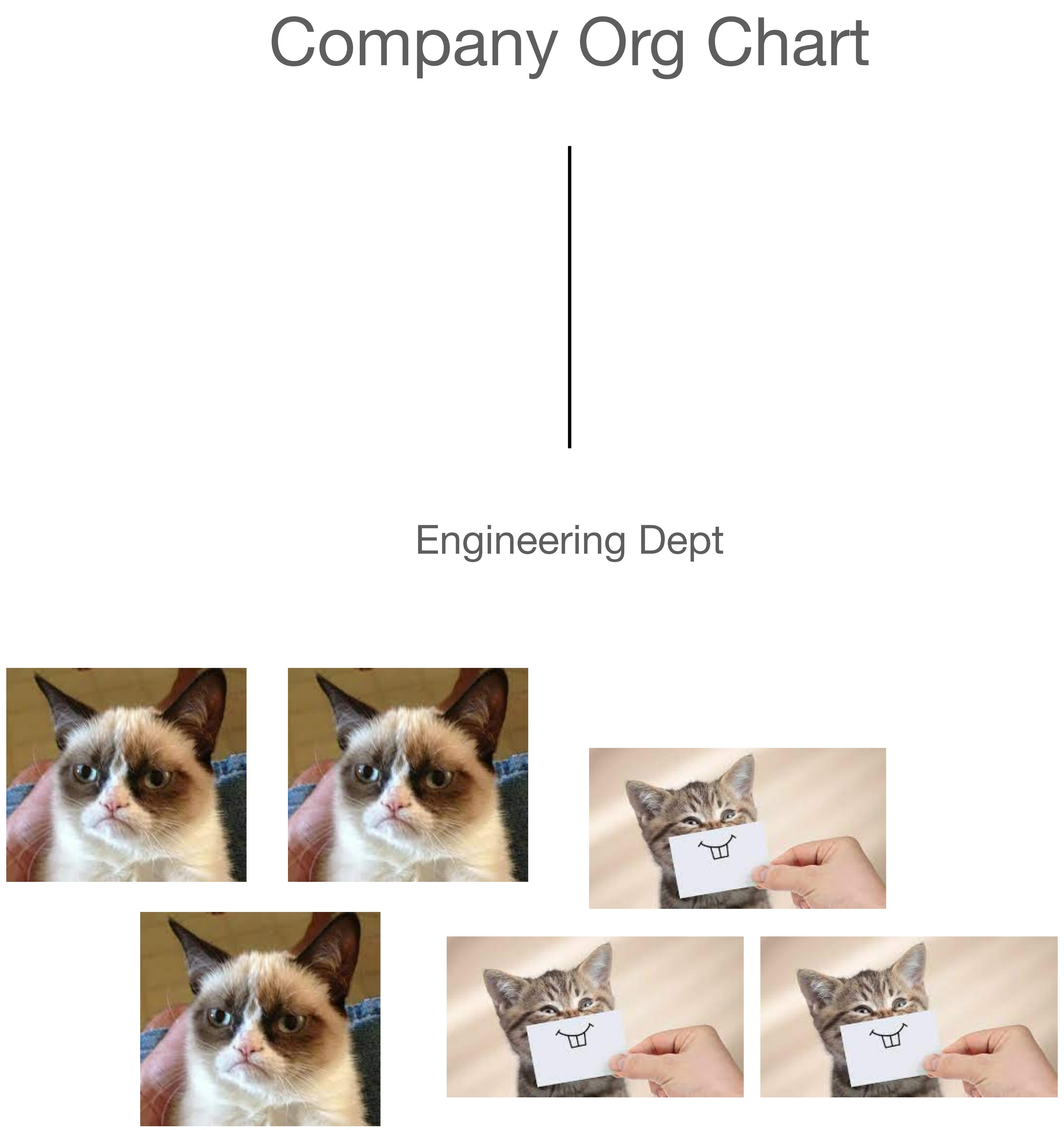

Company Org Chart

Engineering Dept

DevOps

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DevOps

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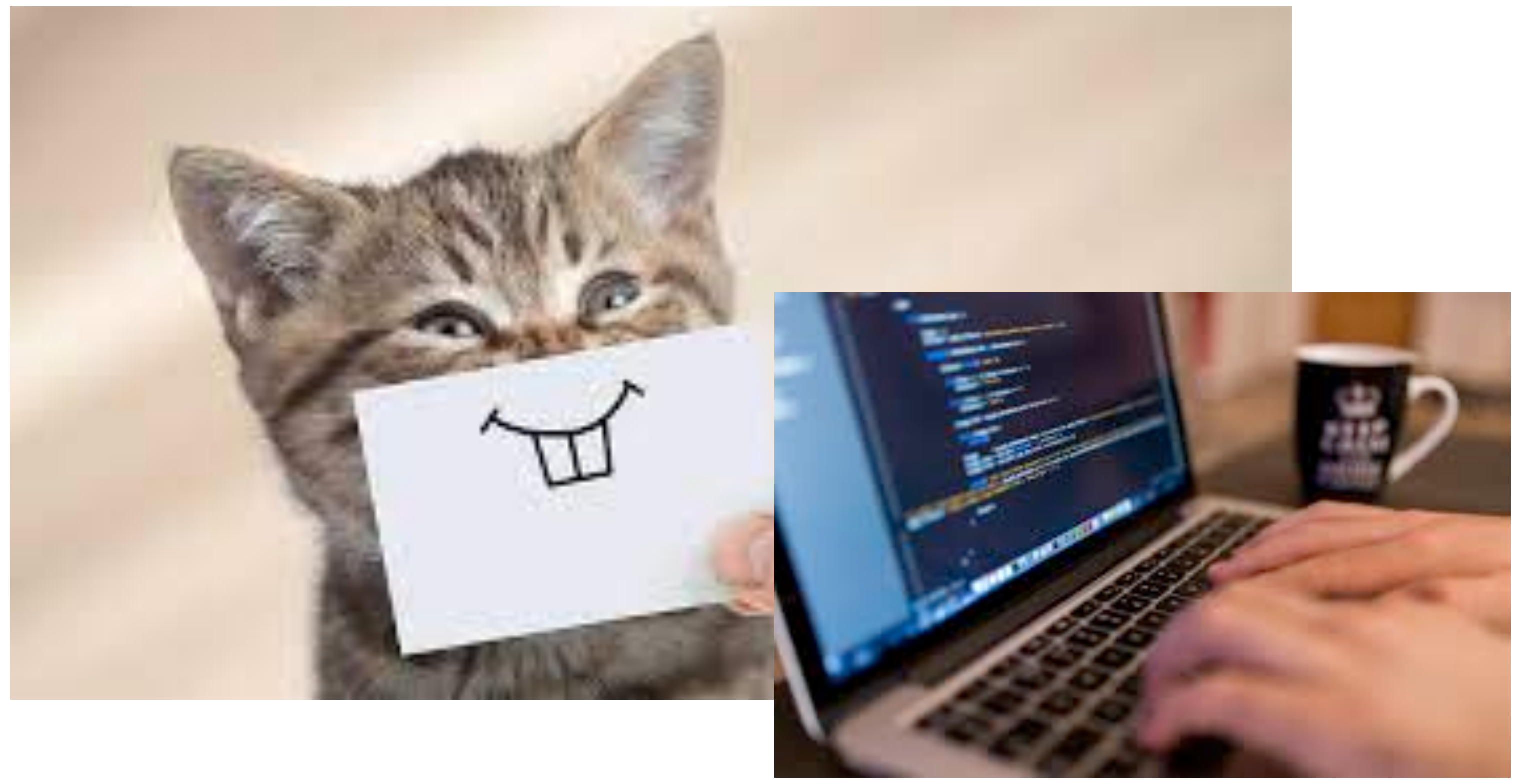

DevOps

What

DevOps

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DevOps

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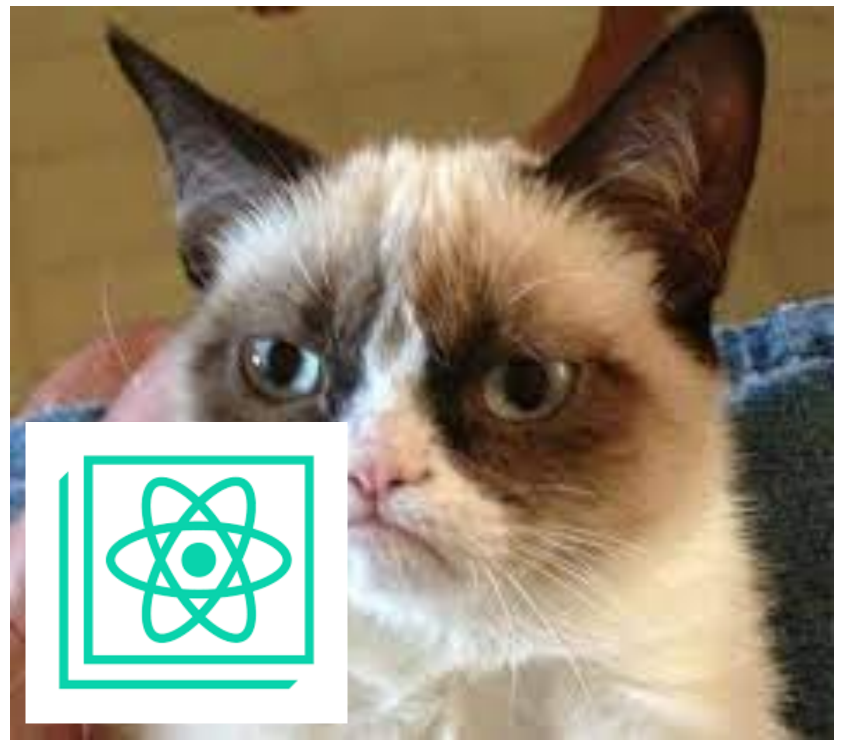
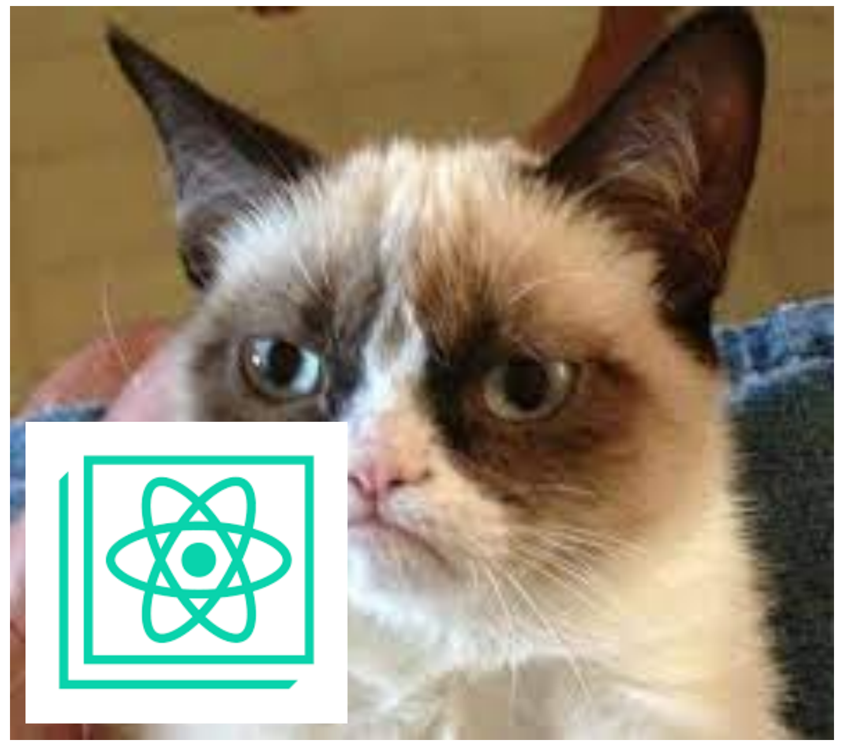


DevOps

What



DevOps

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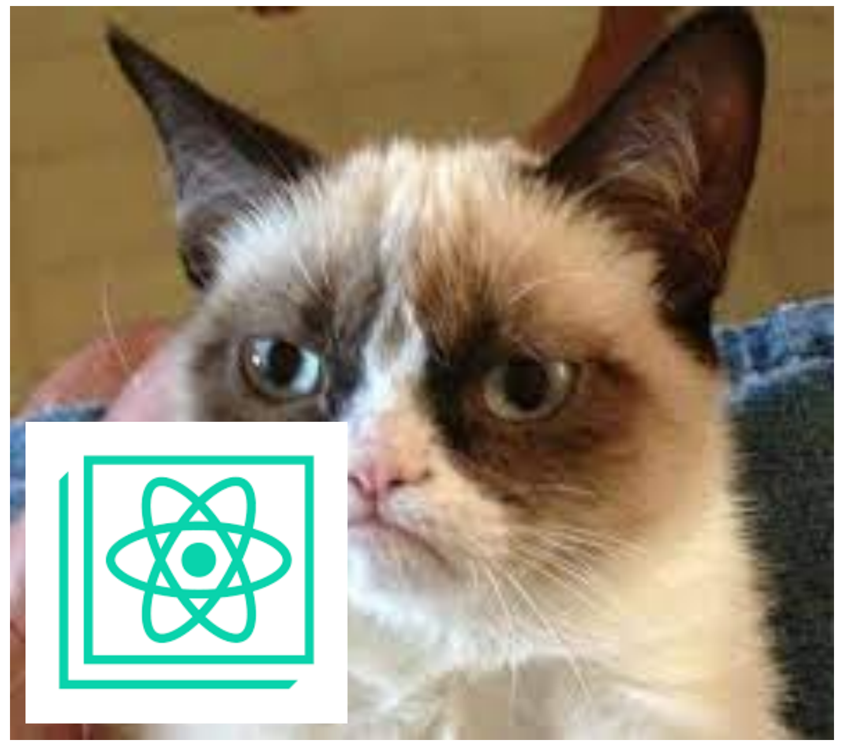


DevOps

What

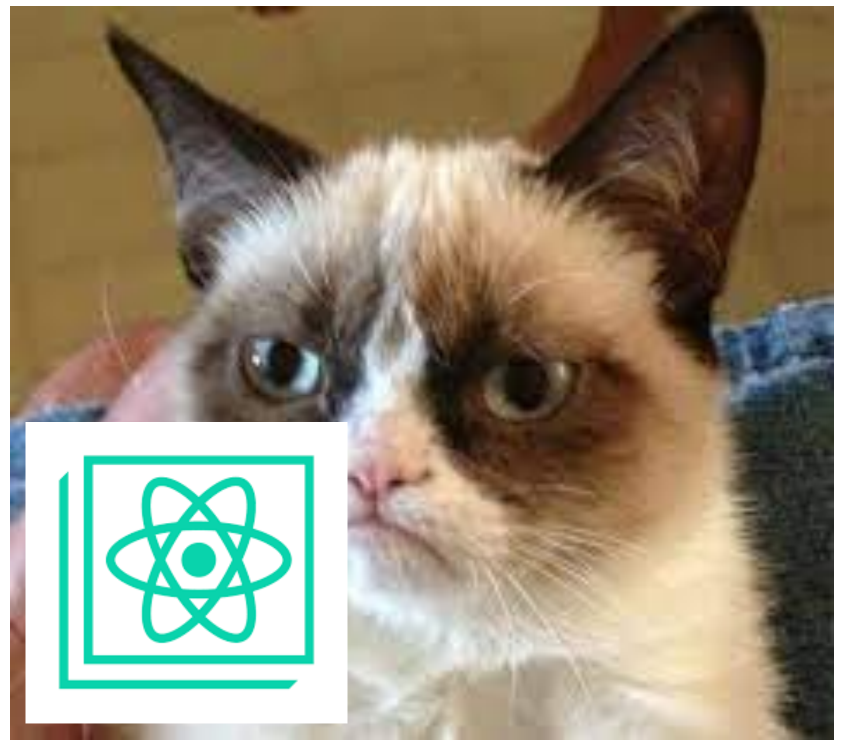
Does it use a database?

What port does it communicate on?

What urls does it expose?

How many copies should be running?

How do I monitor its health?



Does it contain any vulnerabilities?

How much CPU/RAM does it need?

Does it talk to other services?

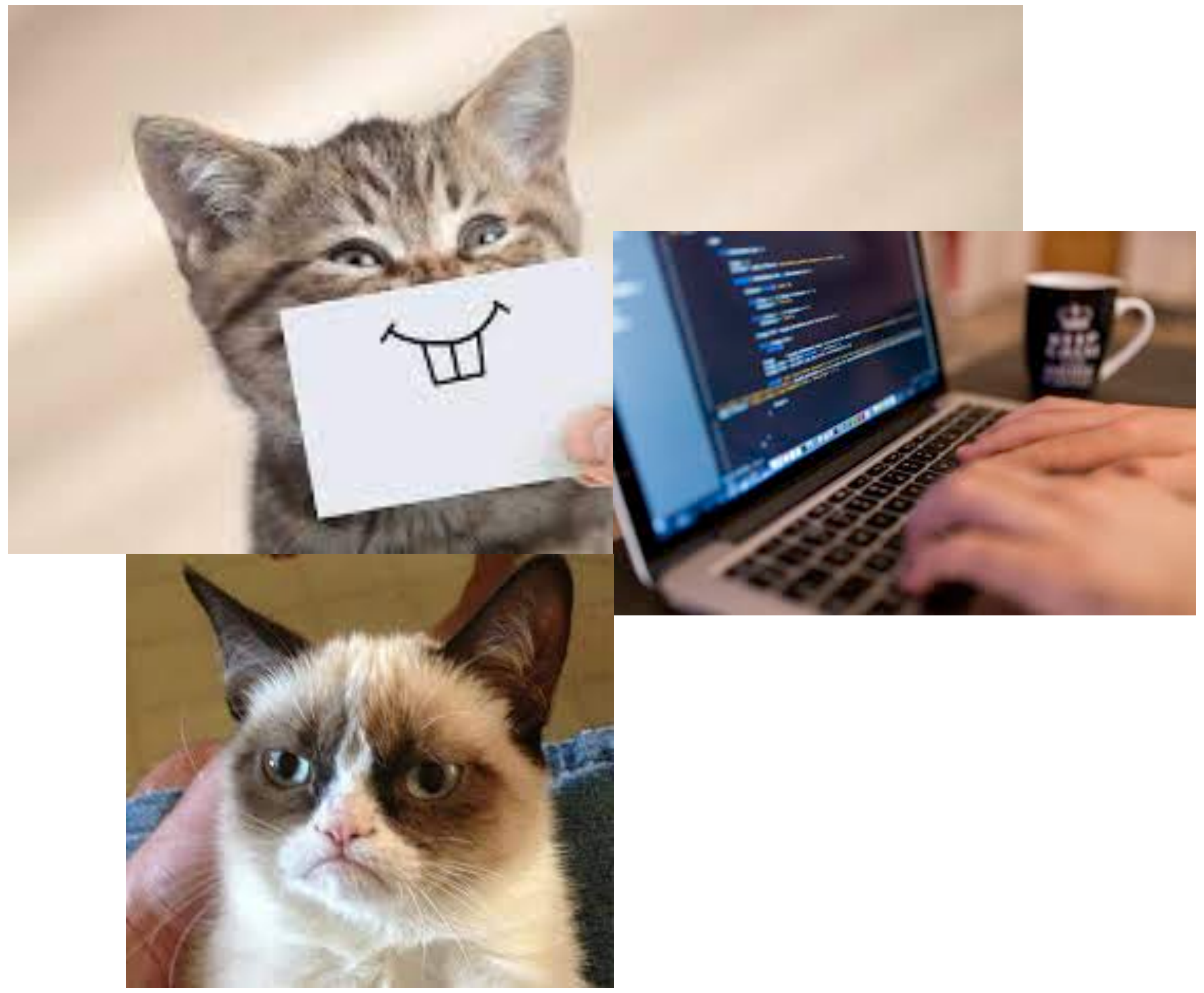
Does it need file storage?

Does it depend on other services to run?

...

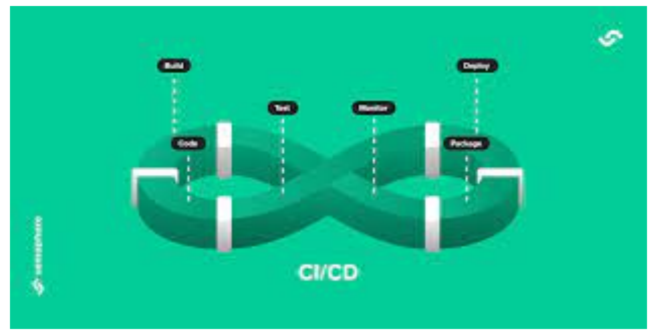
DevOps

What



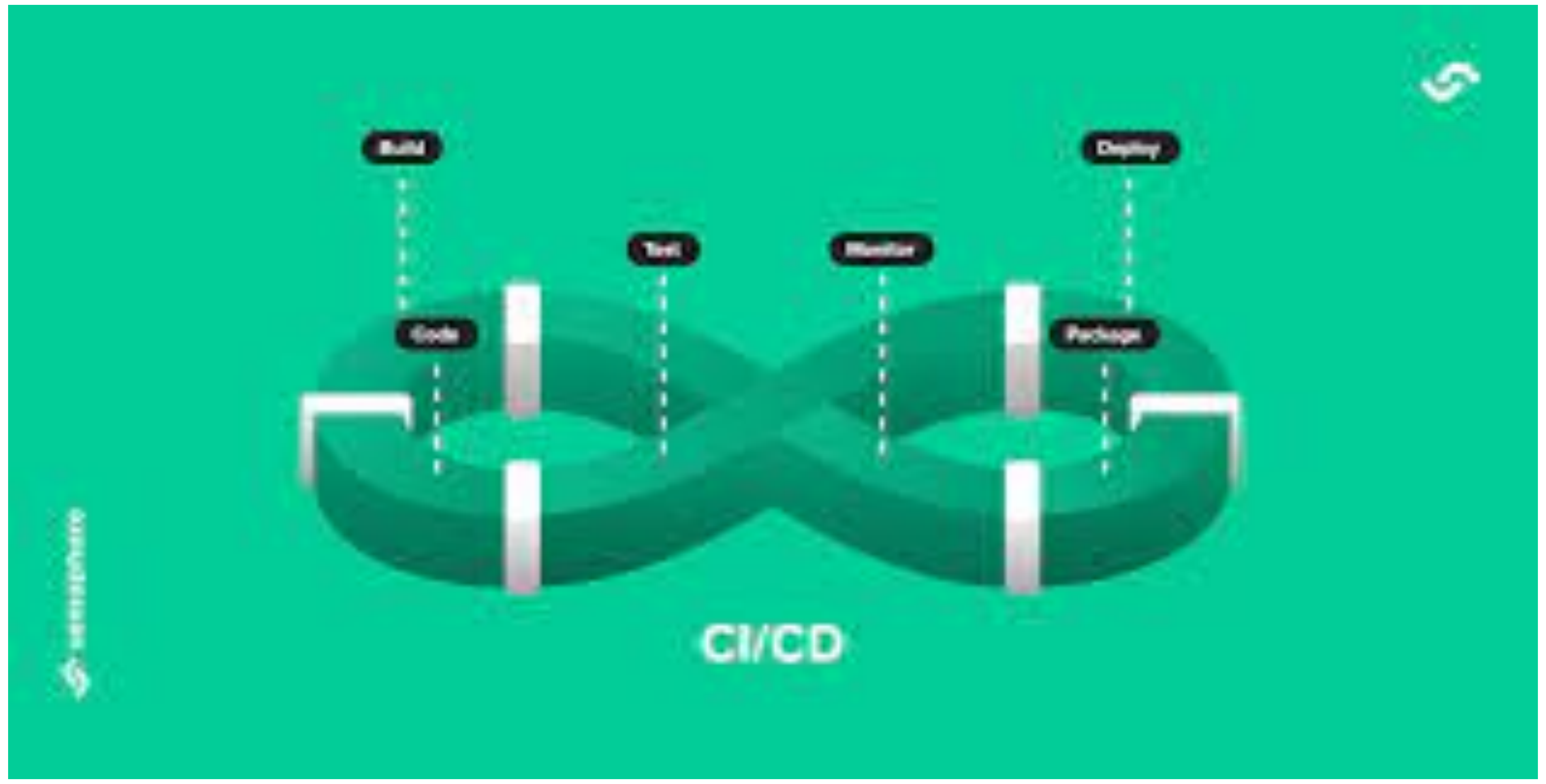
DevOps

What



DevOps

What



DevOps

What

How do we get our software in front of customers?

DevOps

What

1. Build
2. Test
3. Deploy

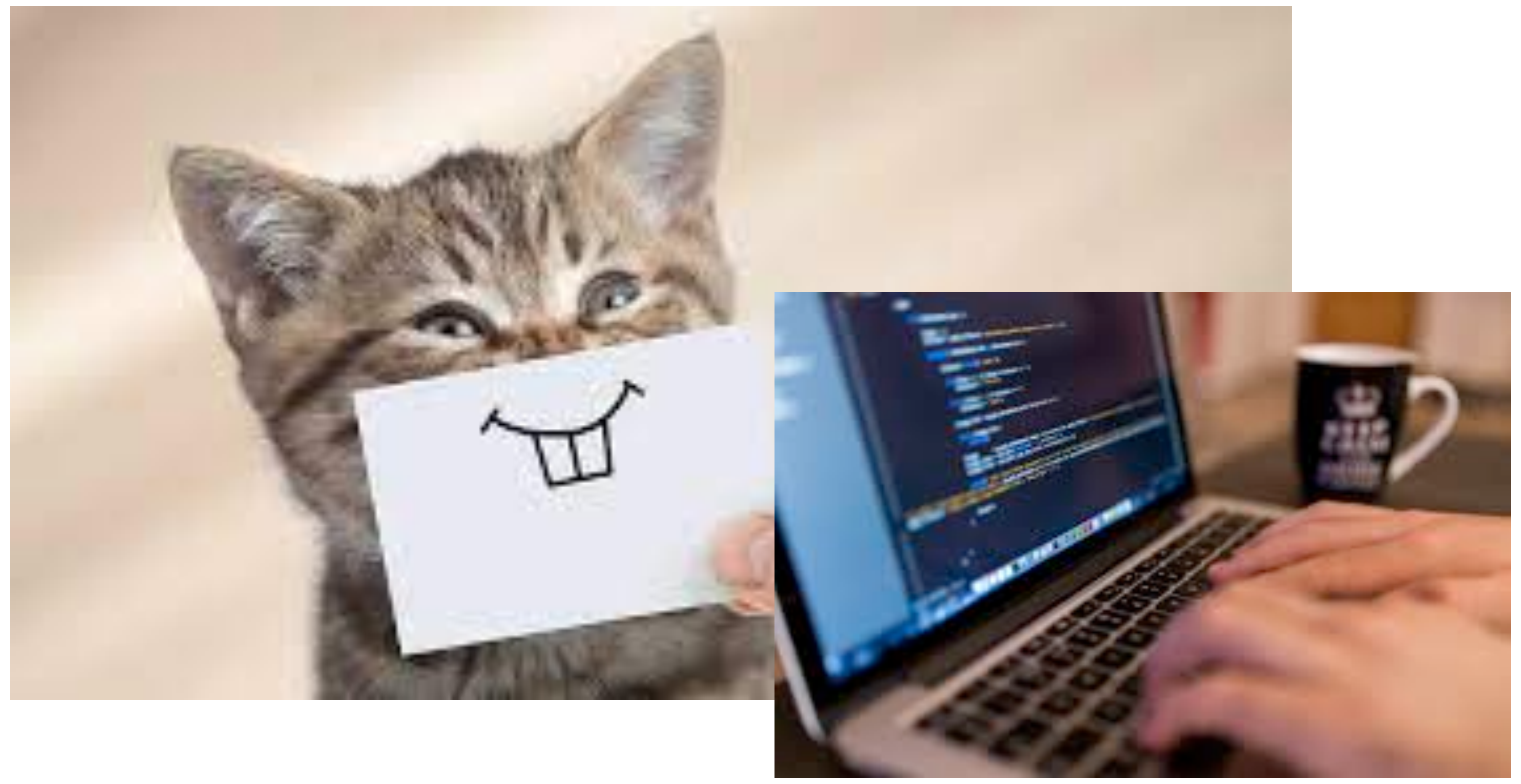
DevOps

What

1. Build
2. Test
3. Deploy

DevOps

Building

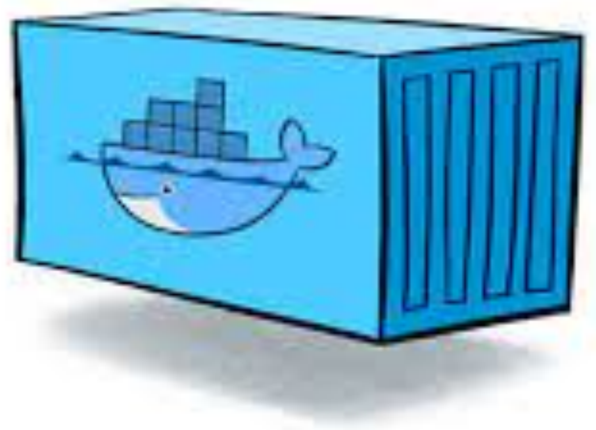


DevOps

Building

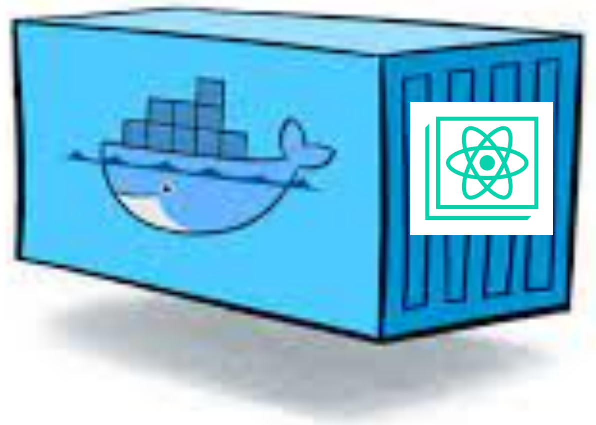
DevOps

Building



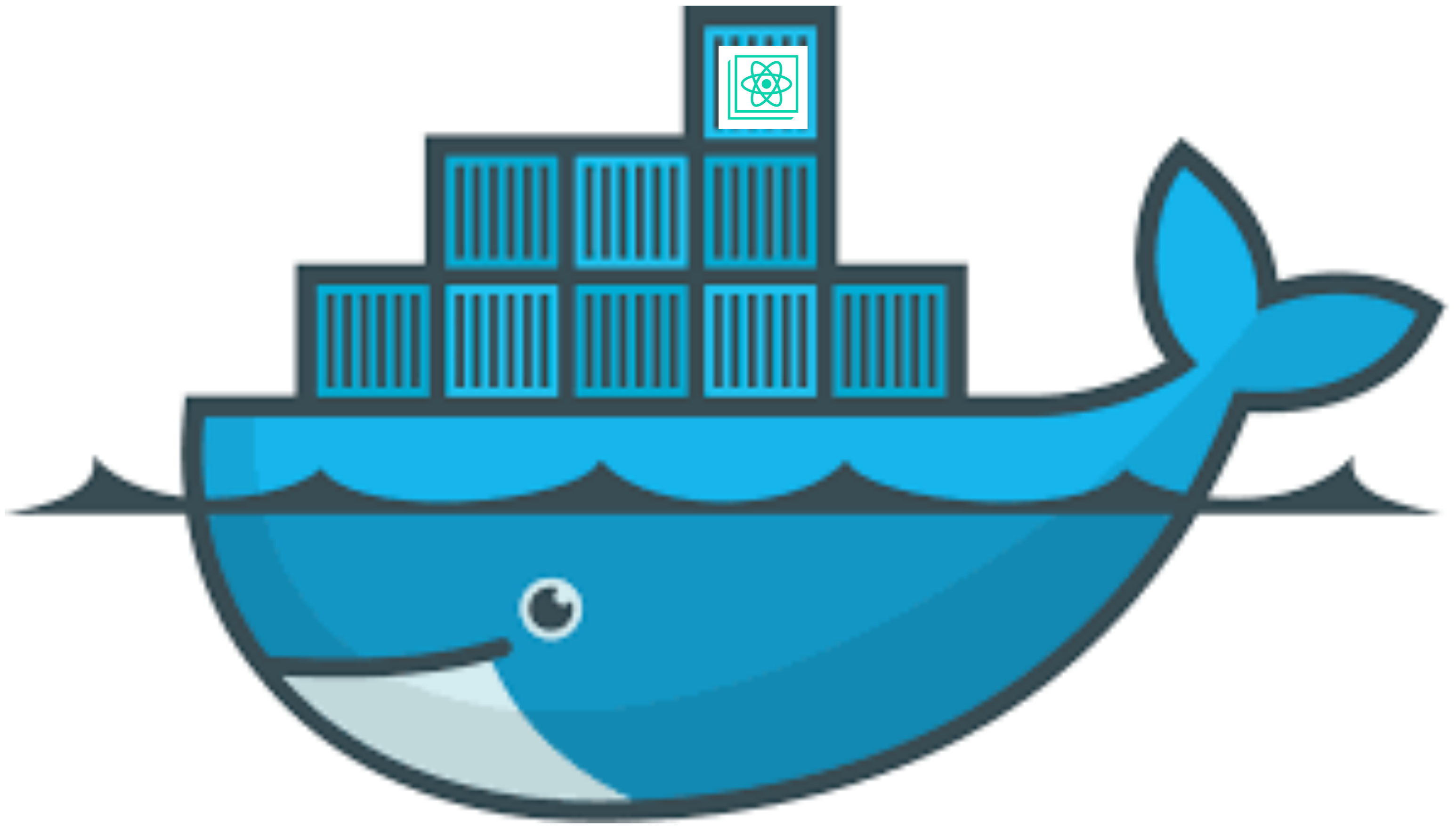
DevOps

Building



DevOps

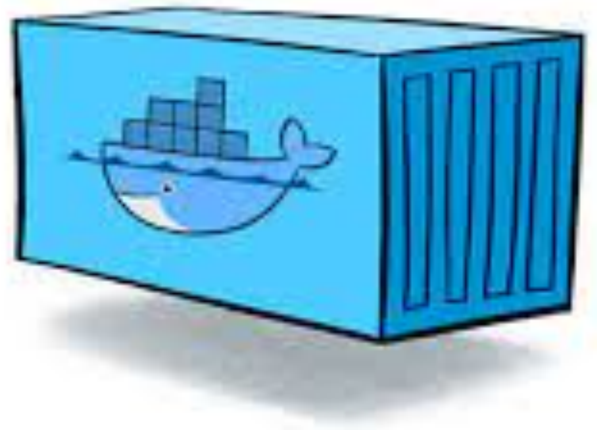
Building



DevOps

Building

Why?



DevOps

Building

Why?

Portability
Reproducibility
Convenience

DevOps

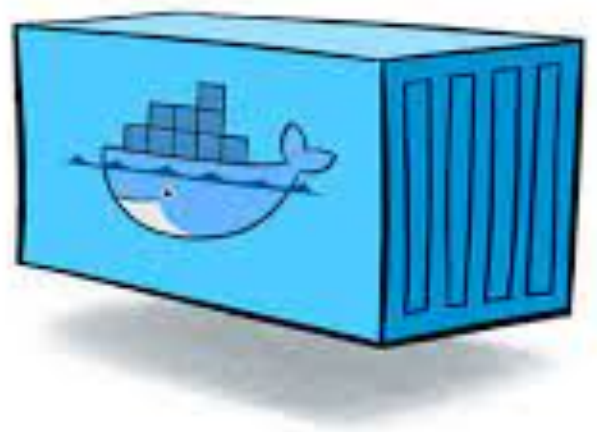
Building

Why?

Portability

Reproducibility

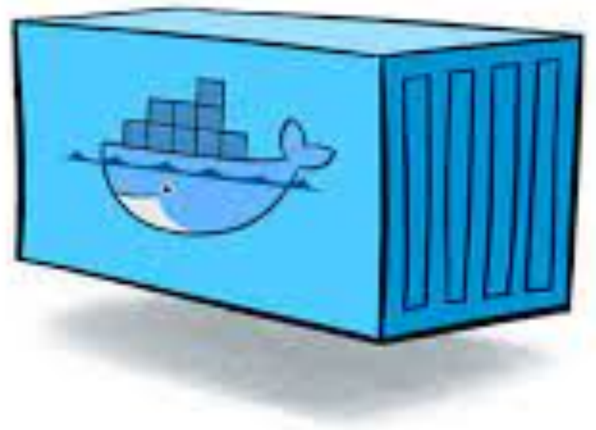
Convenience



DevOps
Building

Why?

Portability
Reproducibility
Convenience



DevOps

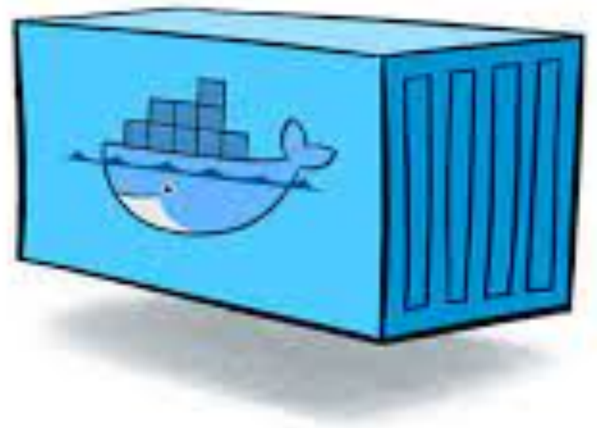
Building

Why?

Portability

Reproducibility

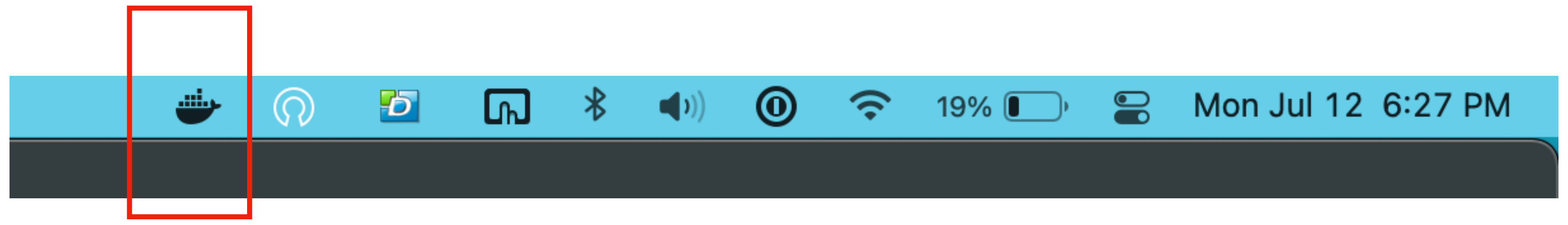
Convenience



DevOps

Installing Docker

https://docs.docker.com/docker-for-mac/install/



DevOps

Building a container - create-react-app

```
$ npm run build
$ docker build -t <myappname> .
```

DevOps

Building a container - create-react-app

Generate static assets	`$ npm run build`
Build container	`$ docker build -t <myappname> .`

DevOps

Running a container - create-react-app

```
$ docker run -p 8000:80 <myappname>
```

DevOps

Building a container - nodejs / express

```
$ docker build -t <myappname> .
```

DevOps

Running a container - nodejs / express

```
$ docker run -p 3000:3000 <myappname>
```

DevOps

Creating a Dockerfile

Dockerfile

```
FROM nginx

WORKDIR /usr/share/nginx/html

COPY build /usr/share/nginx/html
```

DevOps

Testing

1. Build
2. Test
3. Deploy

DevOps

What

1. Build
2. Test
3. Deploy

DevOps

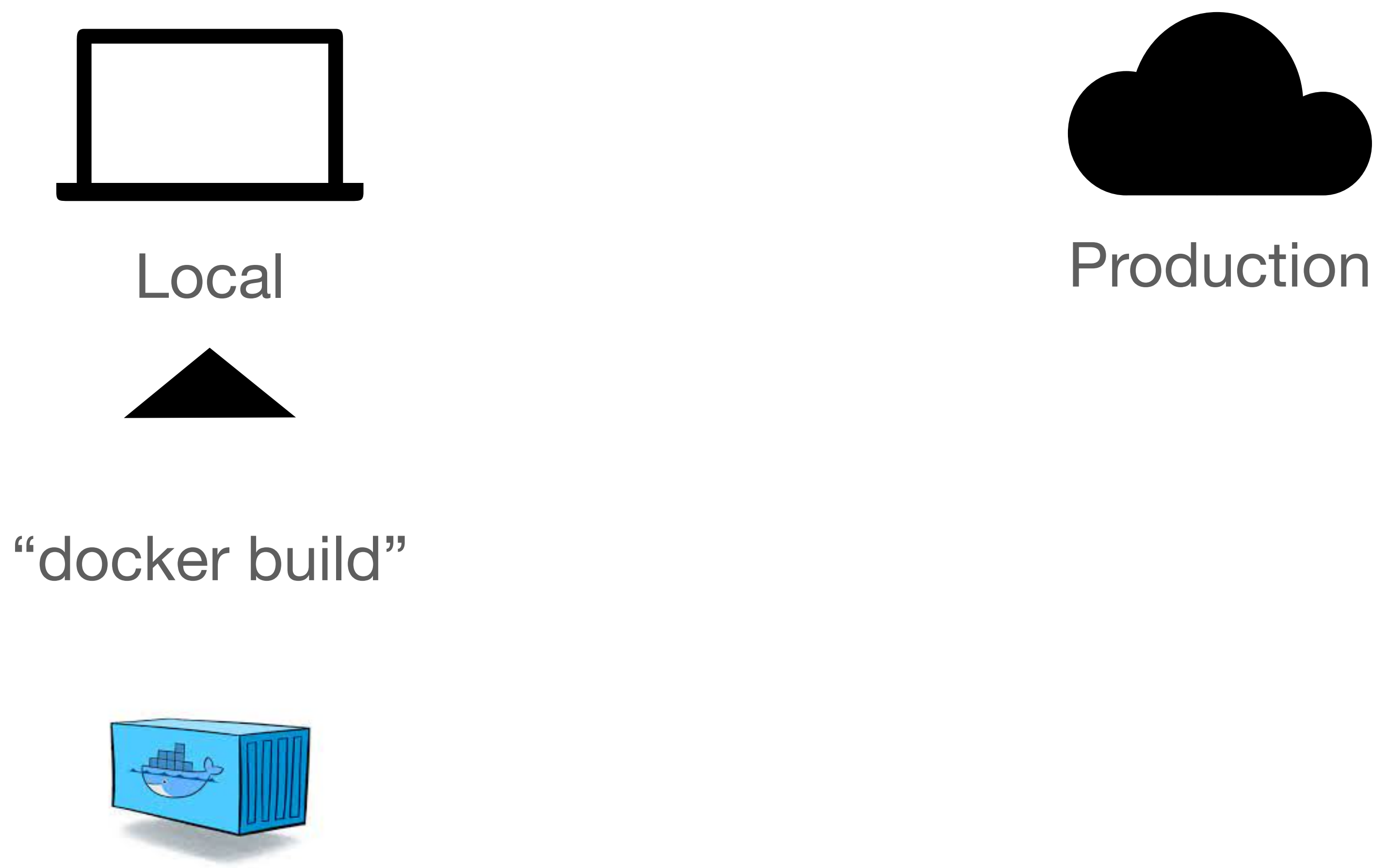
What

Local
Production

Developing on your computer
Building / testing new features

DevOps

What



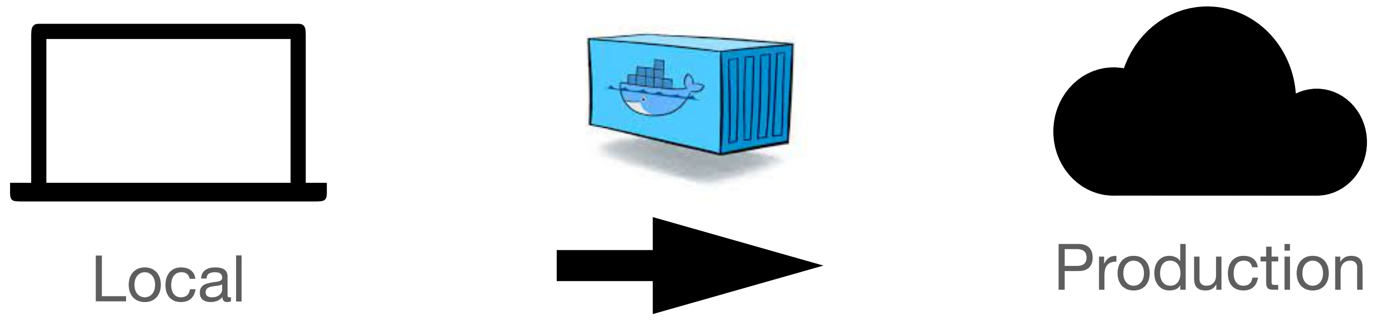
DevOps

What

1. Build
2. Test
3. Deploy

DevOps

Deploying



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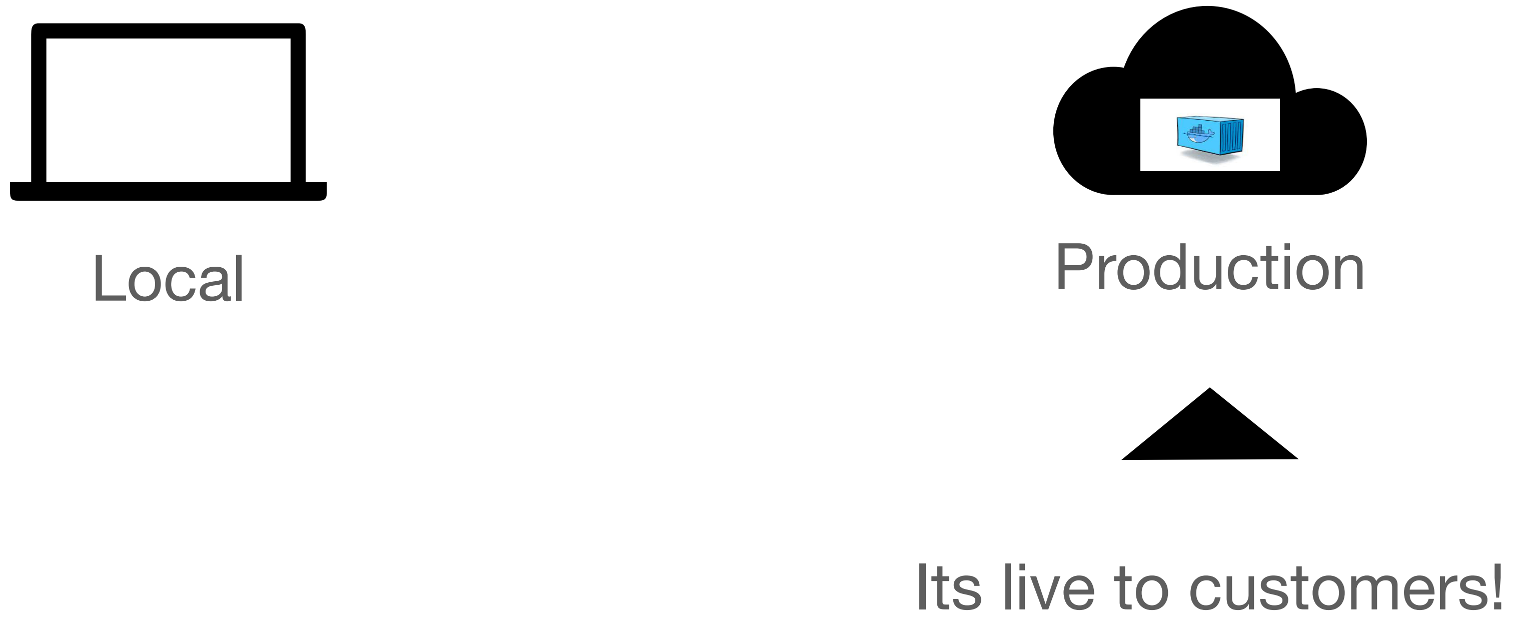
Testing



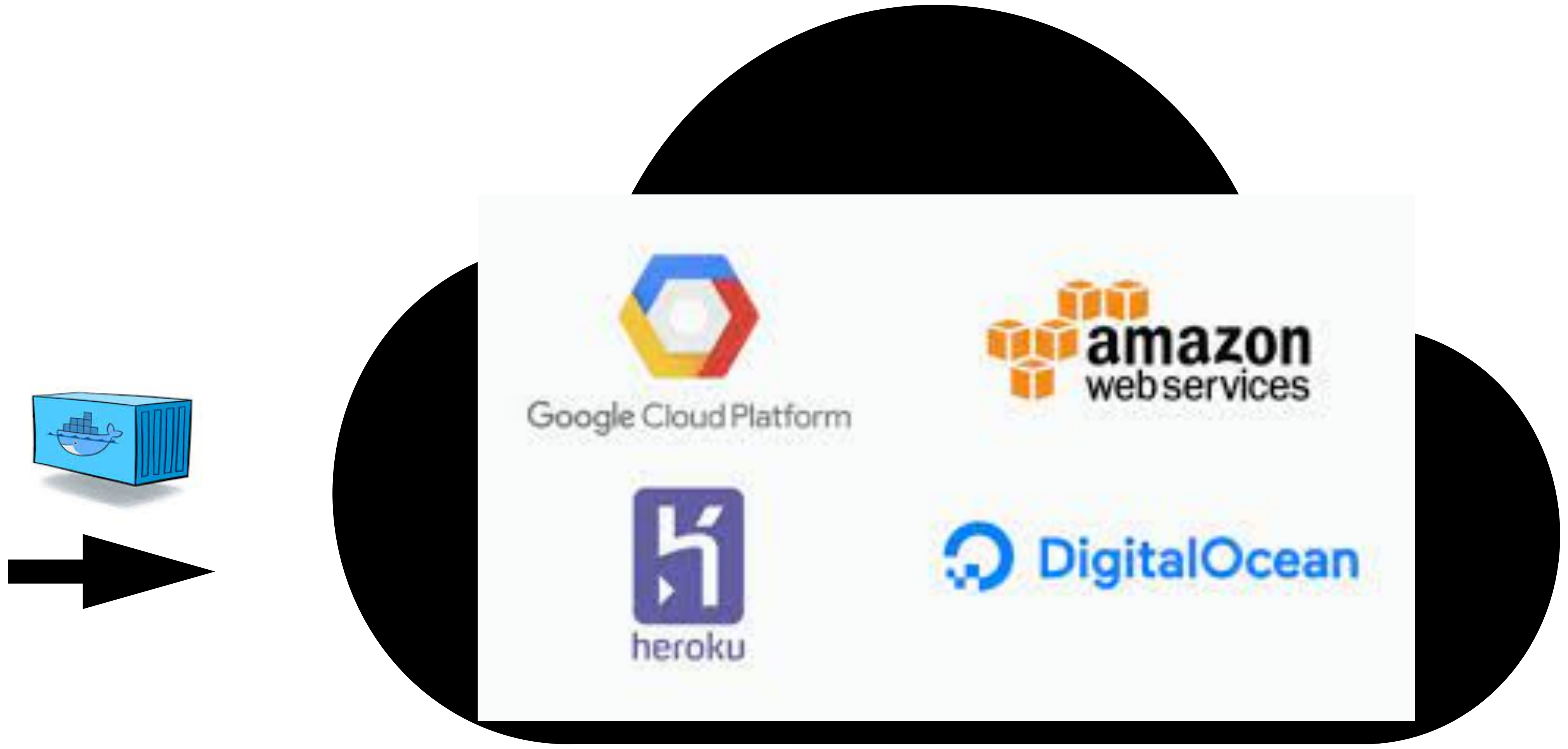
Local

Production

Its live to customers!

DevOps

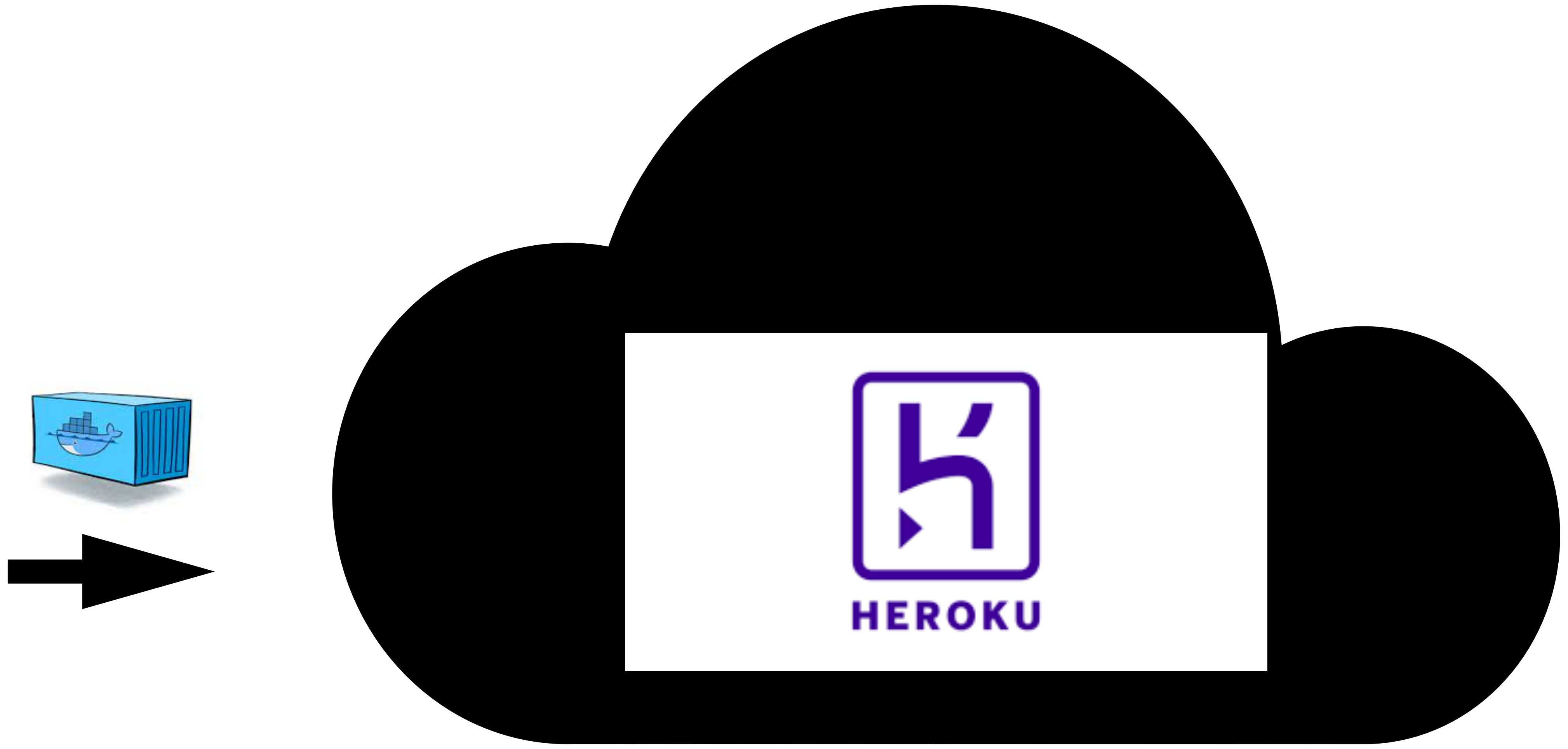
Deploying



Production

DevOps

Deploying



Production

DevOps

Testing

HEROKU

```
# Sign up http://heroku.com/
# Install the CLI

# Only need to do this once
brew tap heroku/brew && brew install heroku

# Only need to do every so often
heroku login
heroku container:login
heroku ps:scale web=1

# Run when you want to deploy a new build
heroku container:push web -a <appname>
heroku container:release web -a <appname>
```

DevOps

Github Actions

.github/workflows/test.yml

```
on: push

jobs:
  jest:
    runs-on: ubuntu-latest

    steps:
    - uses: actions/checkout@v2
    - uses: actions/setup-node@v2
      with:
        node-version: '14'
    - name: Install and run Jest
      run: |
        cd frontend
        npm i
        npm test
```

DevOps

Github Actions

When should this run? (more)

Required keyword

Name of the individual step, call it something descriptive

What image to use?

Steps: what actions to perform

.github/workflows/test.yml

```
on: push

jobs:
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DevOps

Advanced Concepts

DevOps

Advanced Concepts - CI/CD

CI - continuous integration

CD - continuous delivery / deployment

DevOps

Advanced Concepts - CI/CD

CI - continuous integration

DevOps

Advanced Concepts - CI/CD

CD - continuous delivery / deployment

Delivery == ready to be deployed
Deployment == is being deployed

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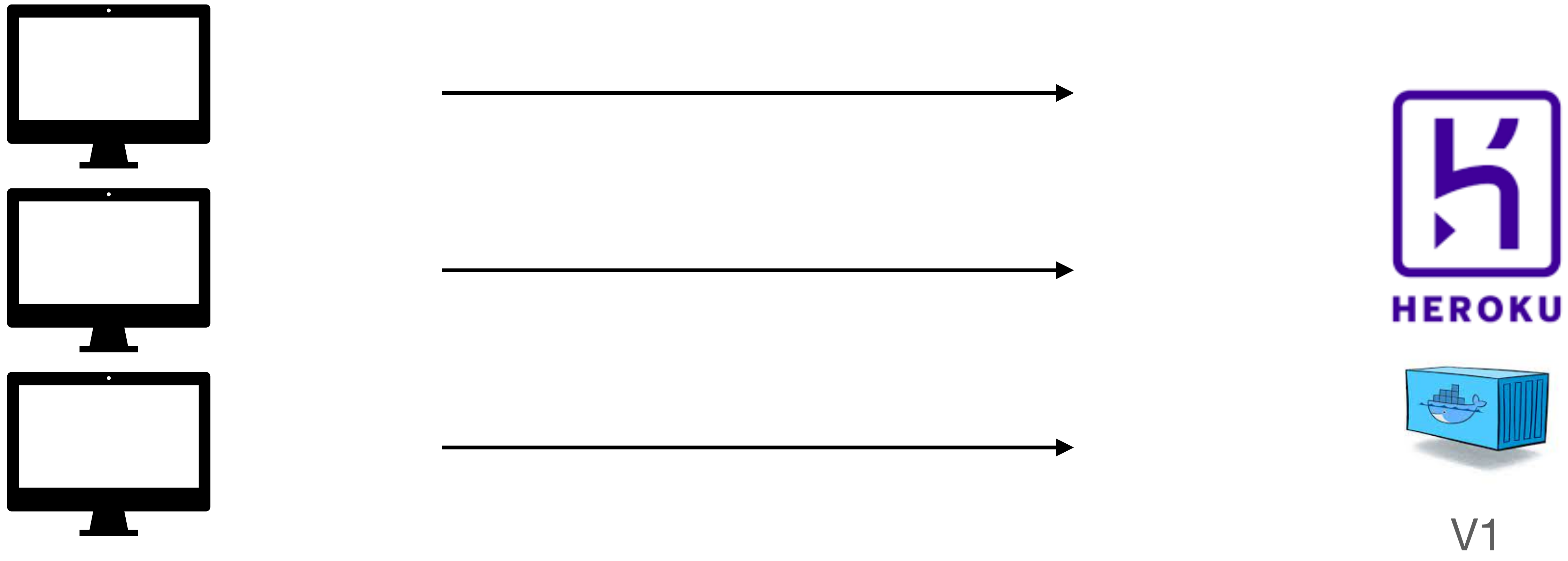
Advanced Concepts - CI/CD

CI - continuous integration

CD - continuous delivery / deployment

DevOps

Advanced Concepts - High Availability



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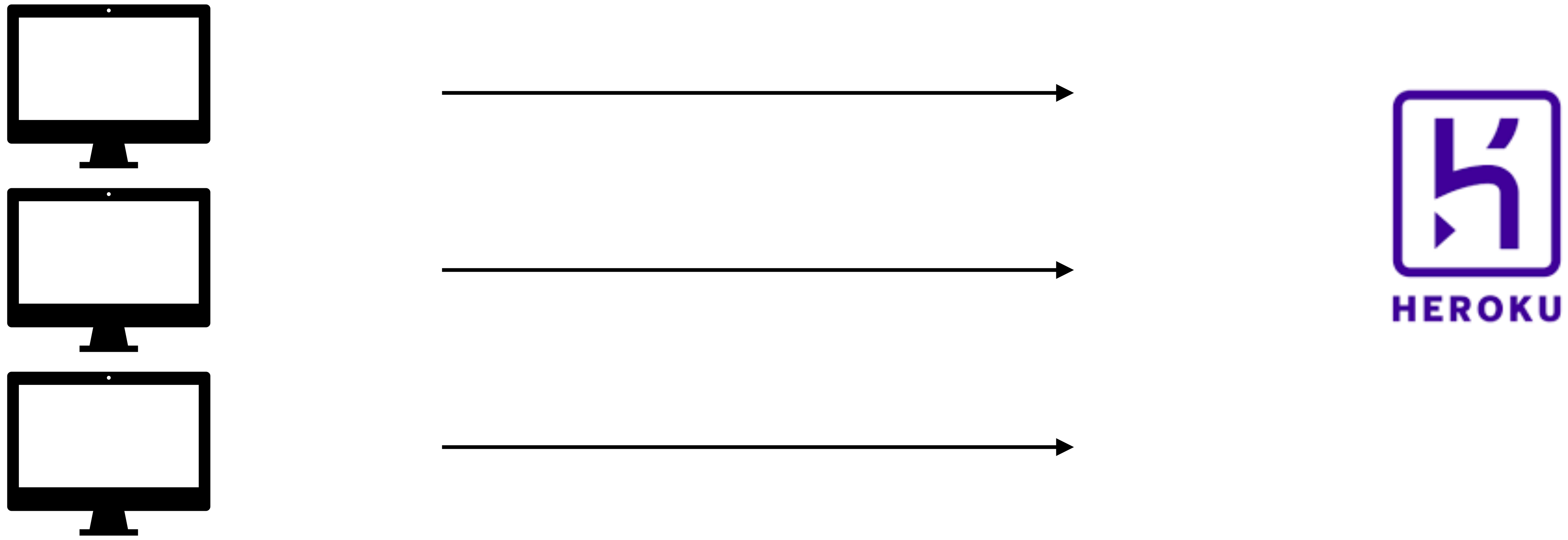
Advanced Concepts - High Availability



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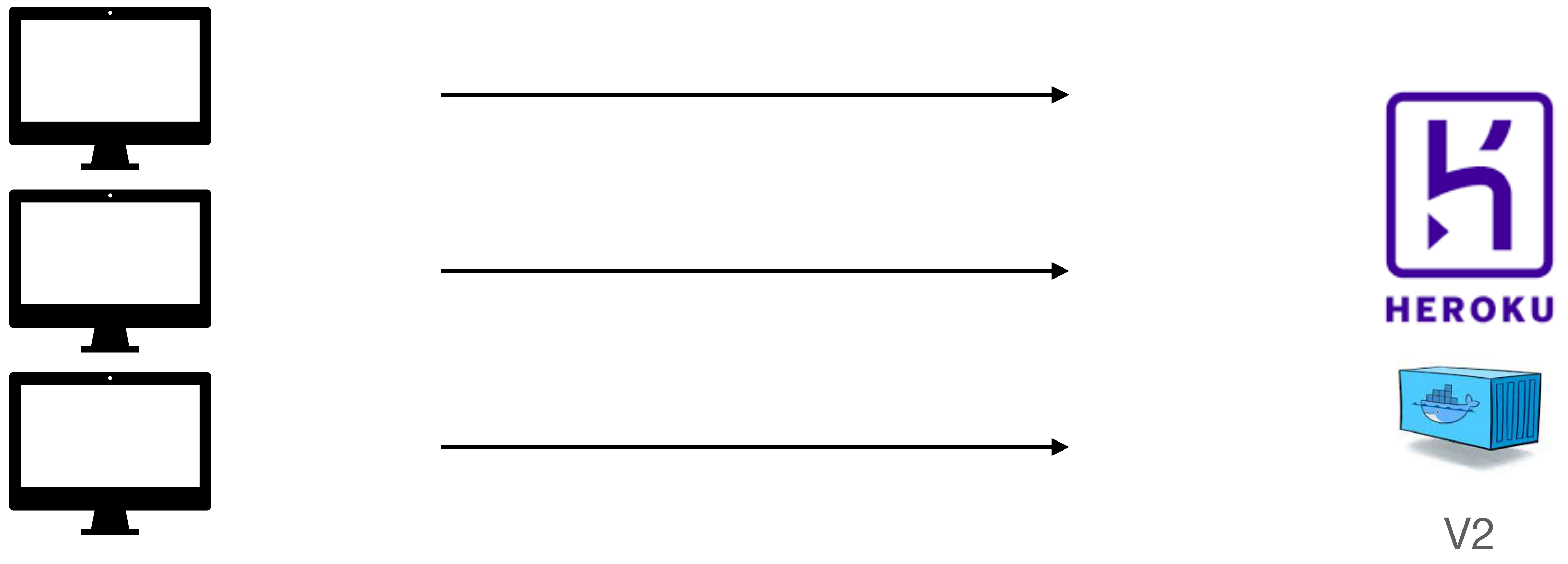
Advanced Concepts - High Availability



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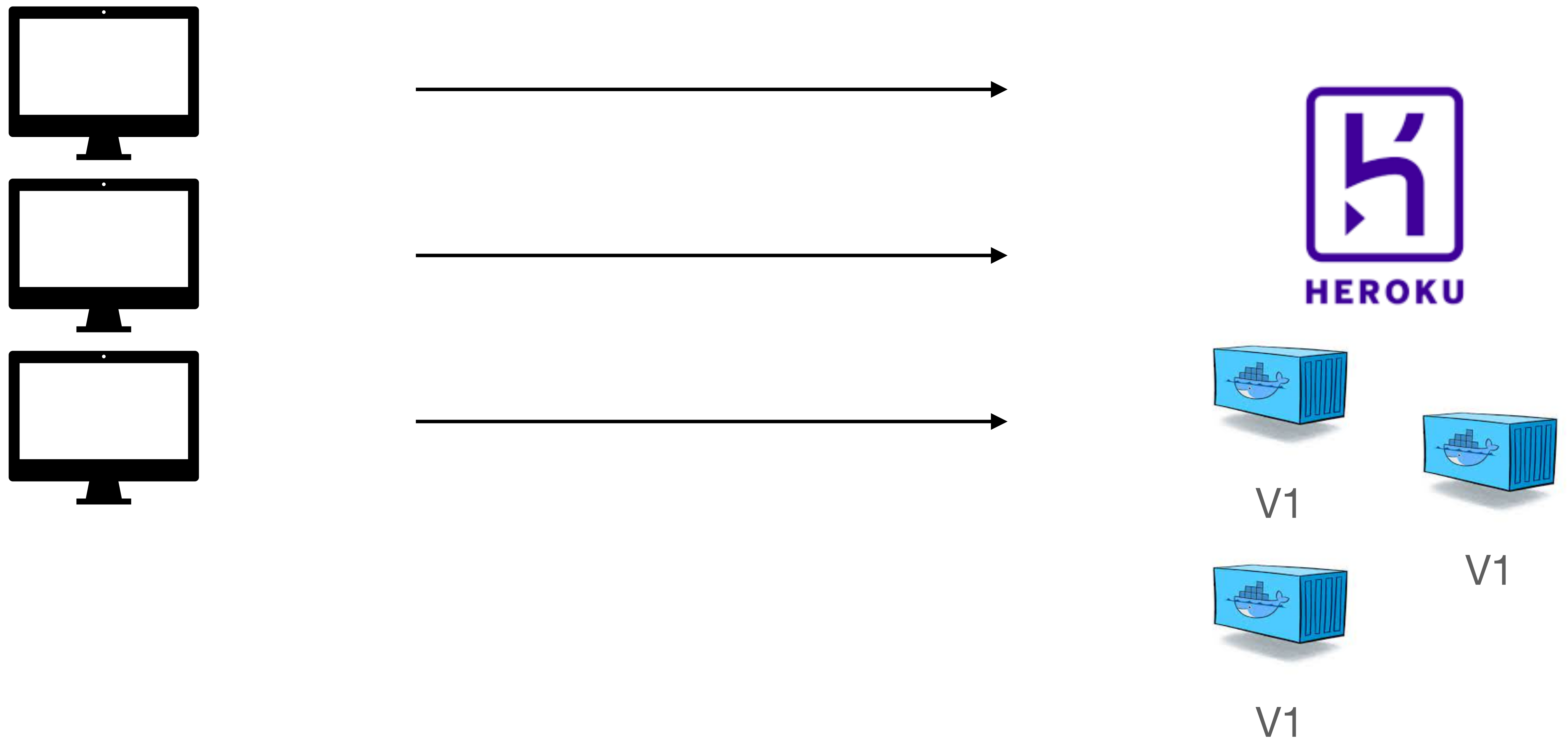

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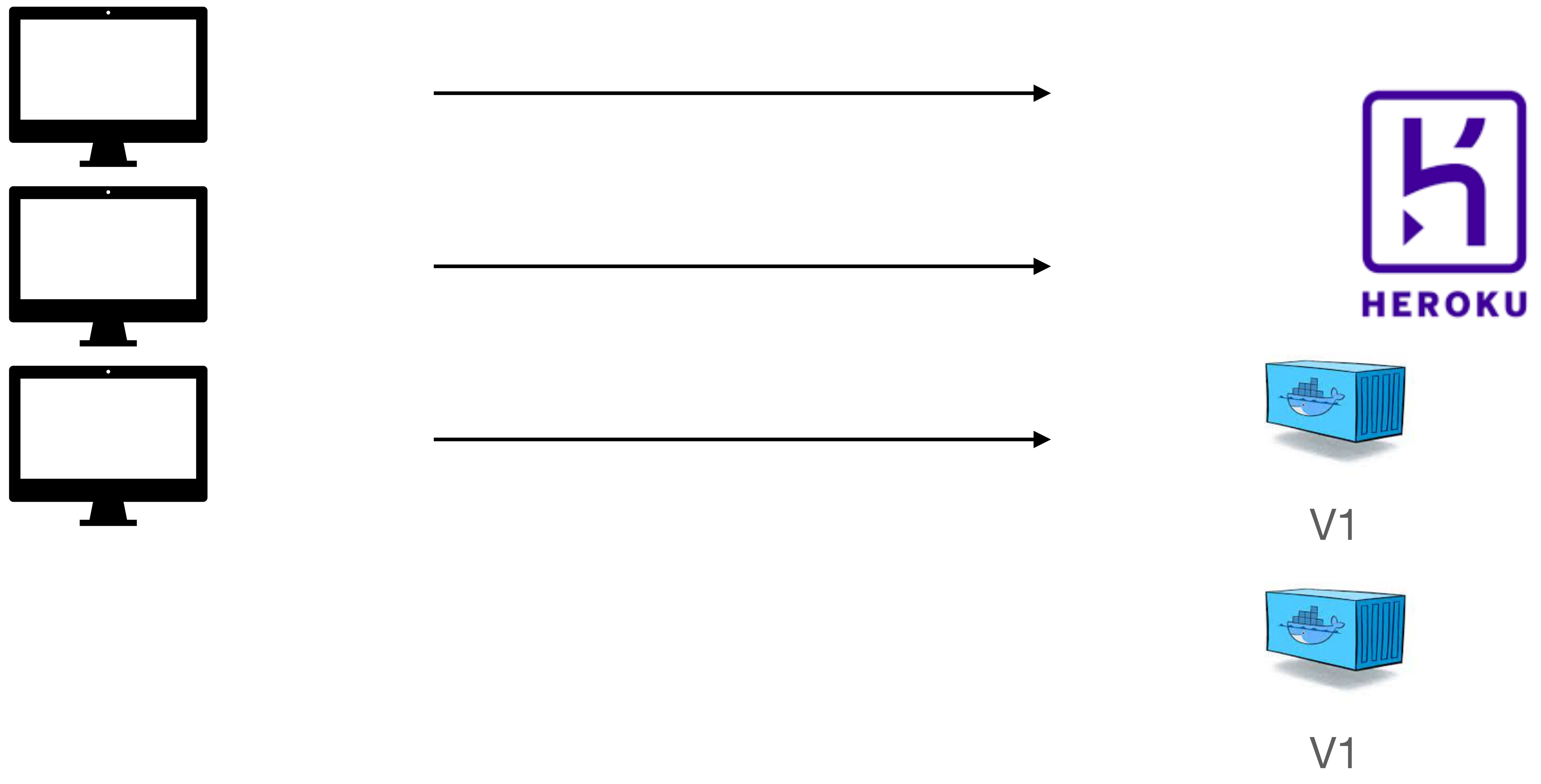

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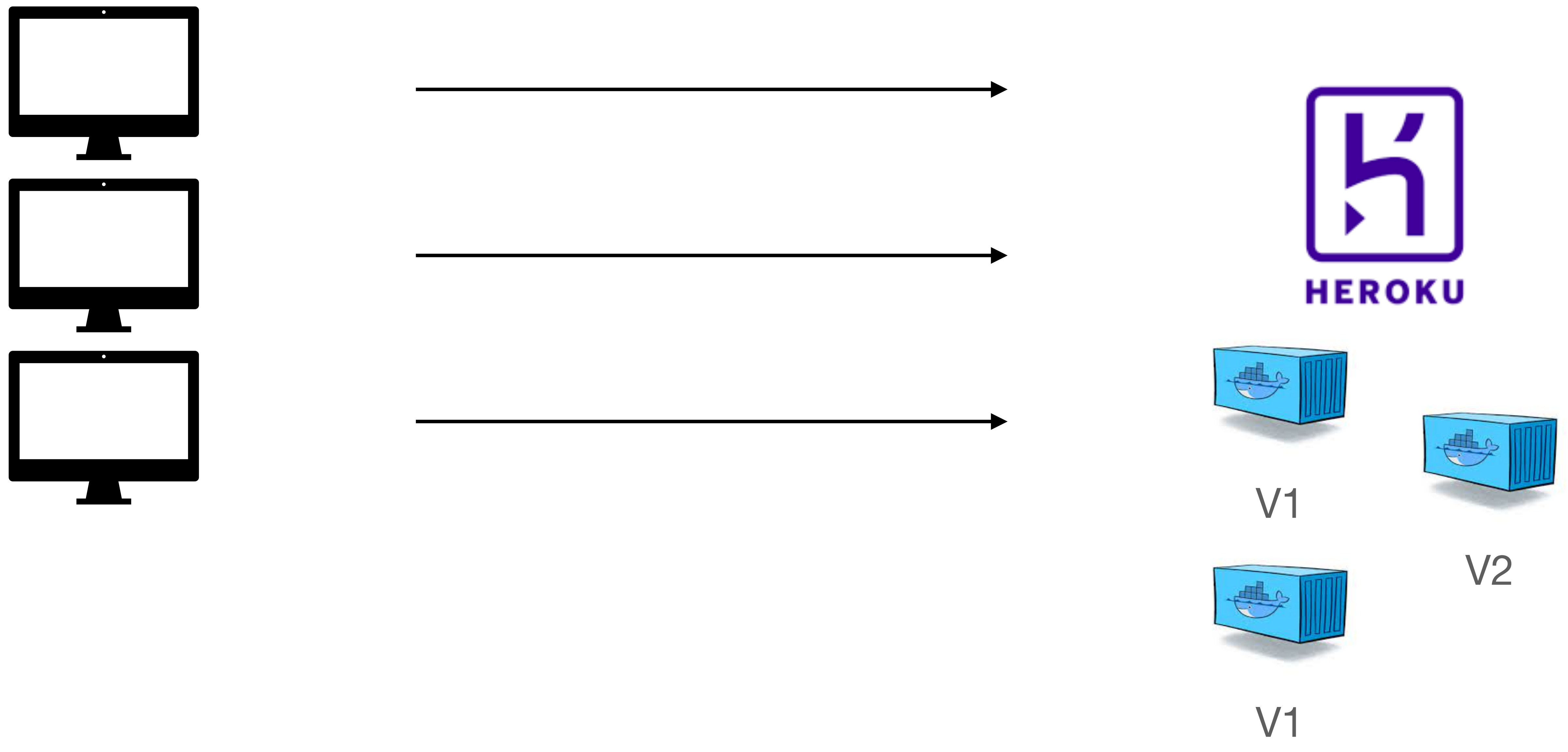

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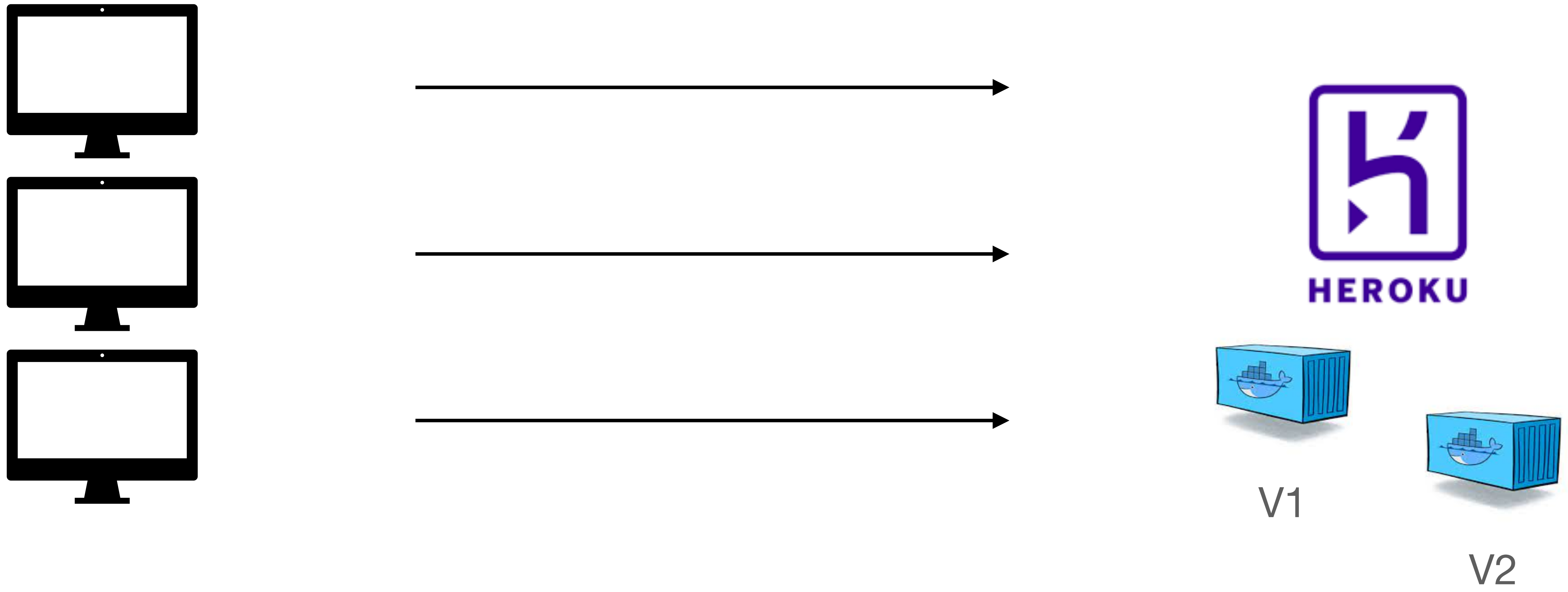

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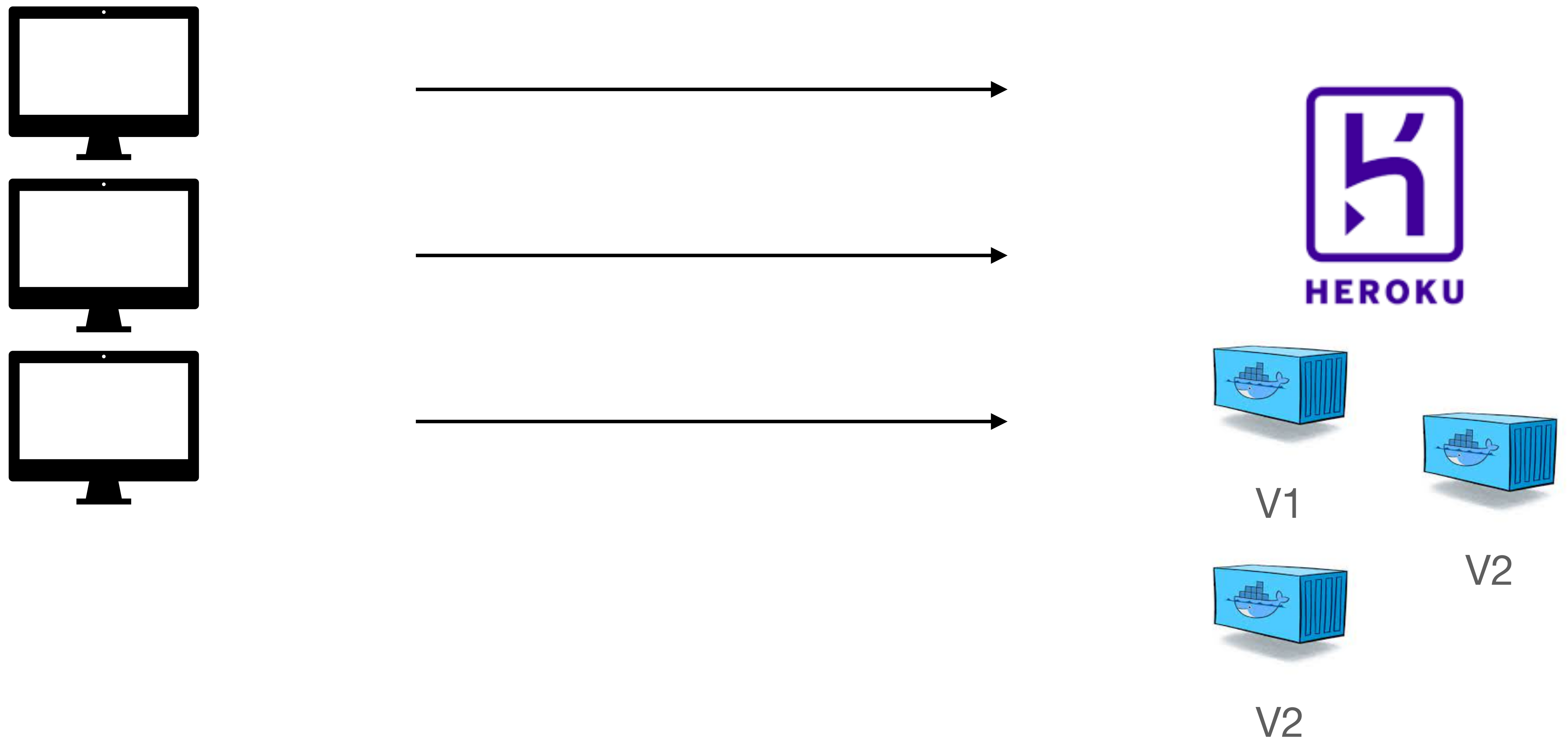

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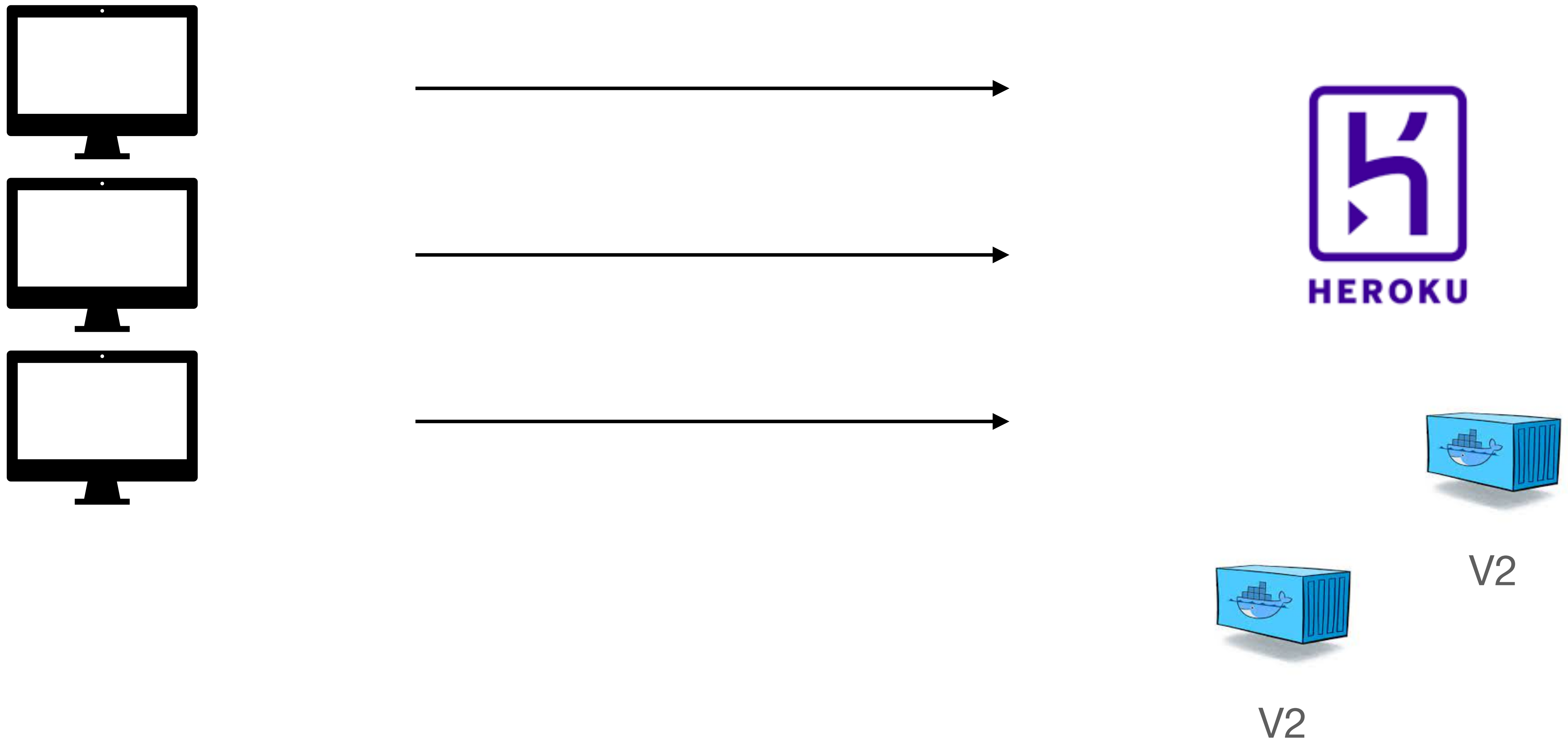
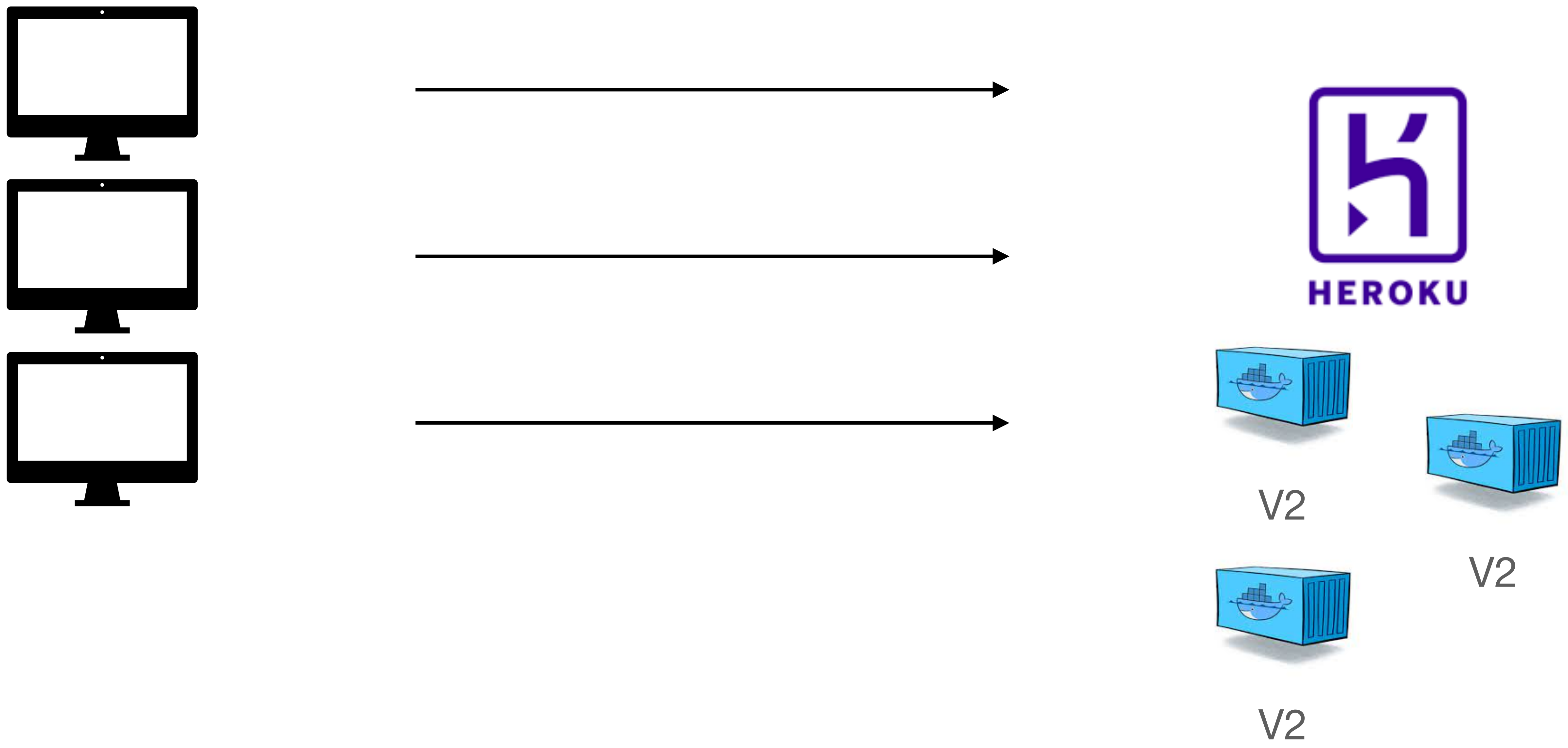
Advanced Concepts - High Availability



DevOps

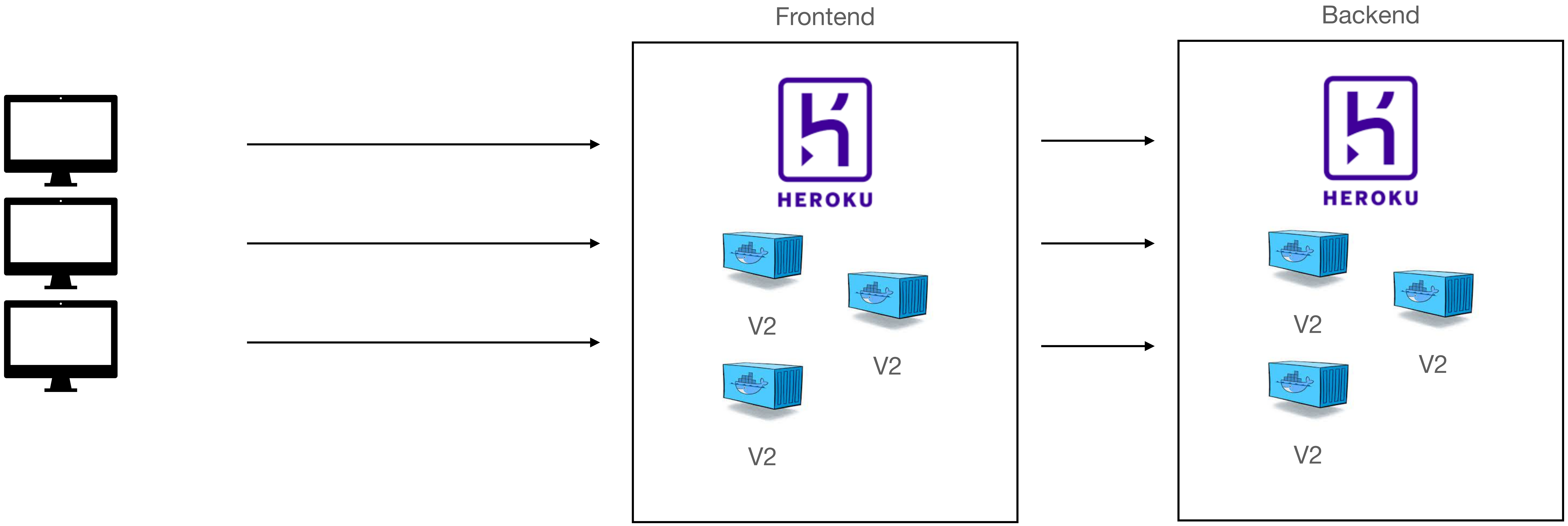
Advanced Concepts - High Availability

https://devcenter.heroku.com/articles/preboot



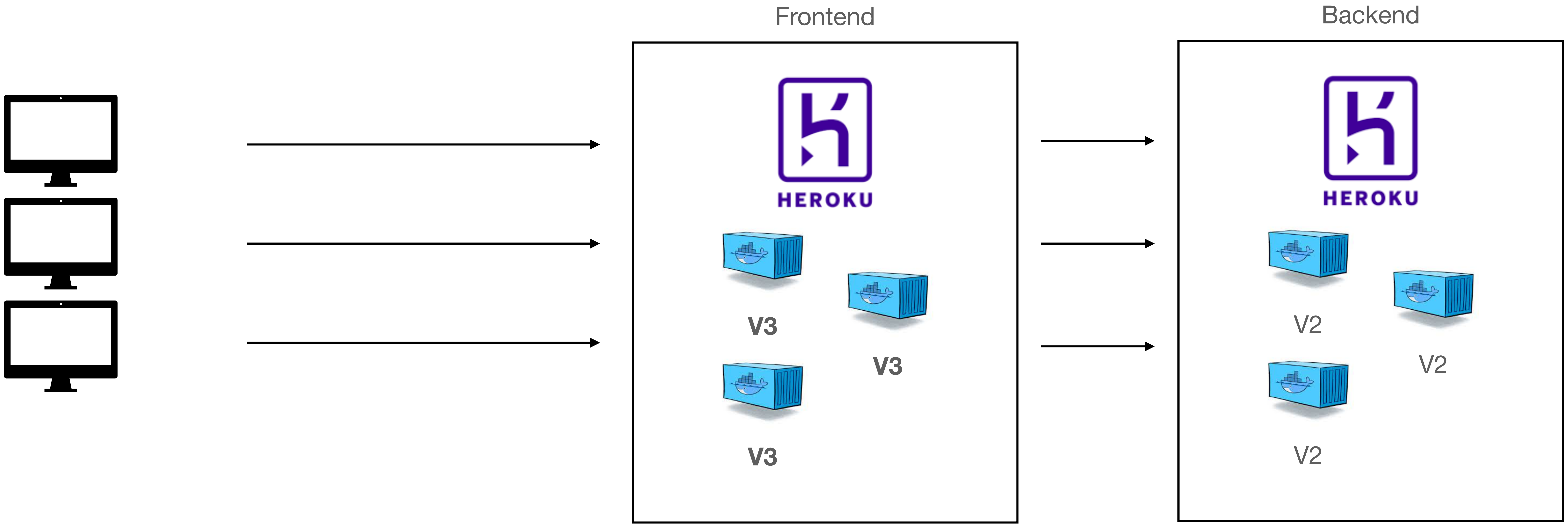
DevOps

Advanced Concepts - Service Dependencies



DevOps

Advanced Concepts - Service Dependencies



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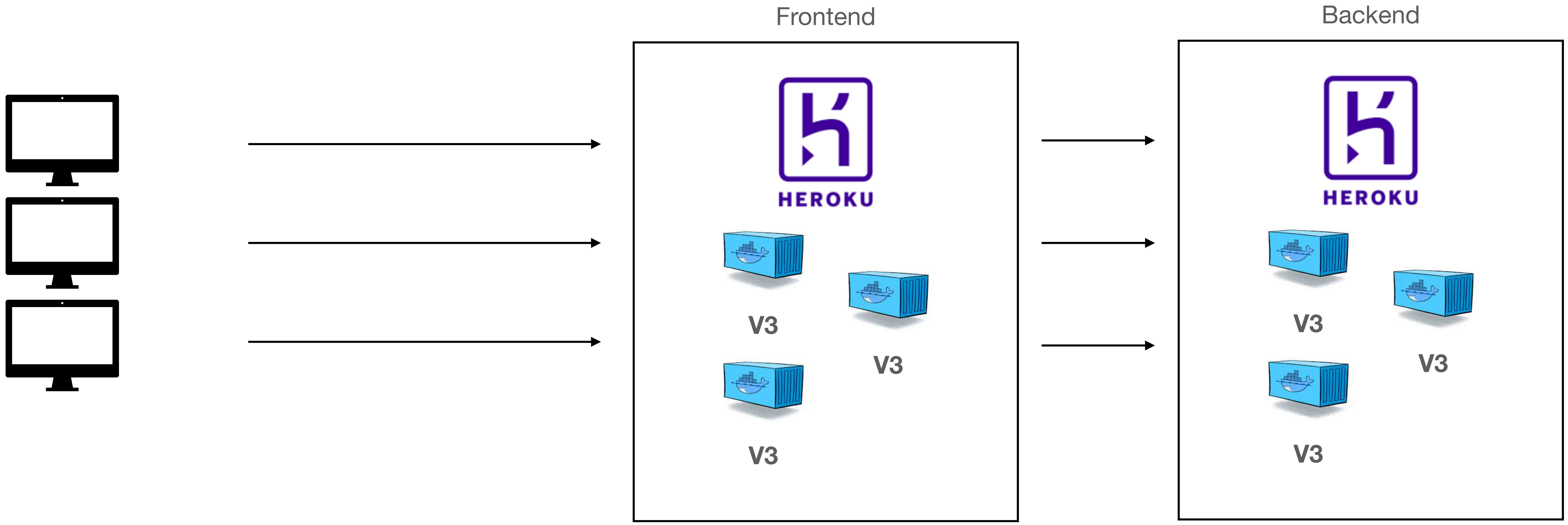
Advanced Concepts - Service Dependencies



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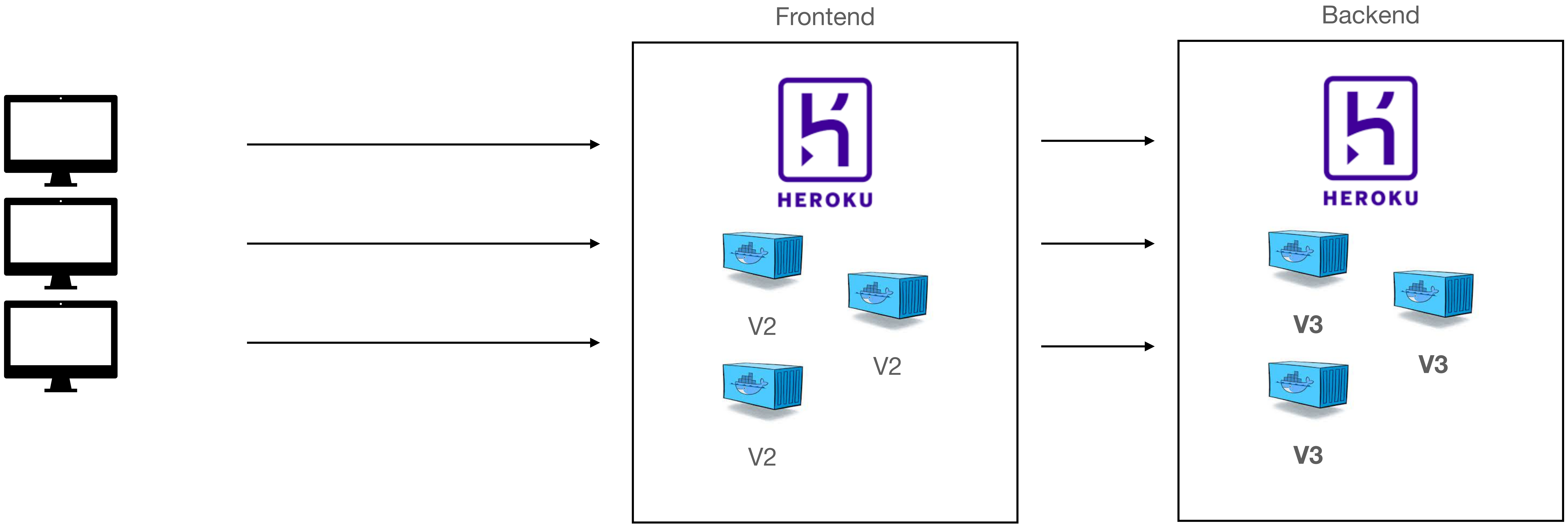

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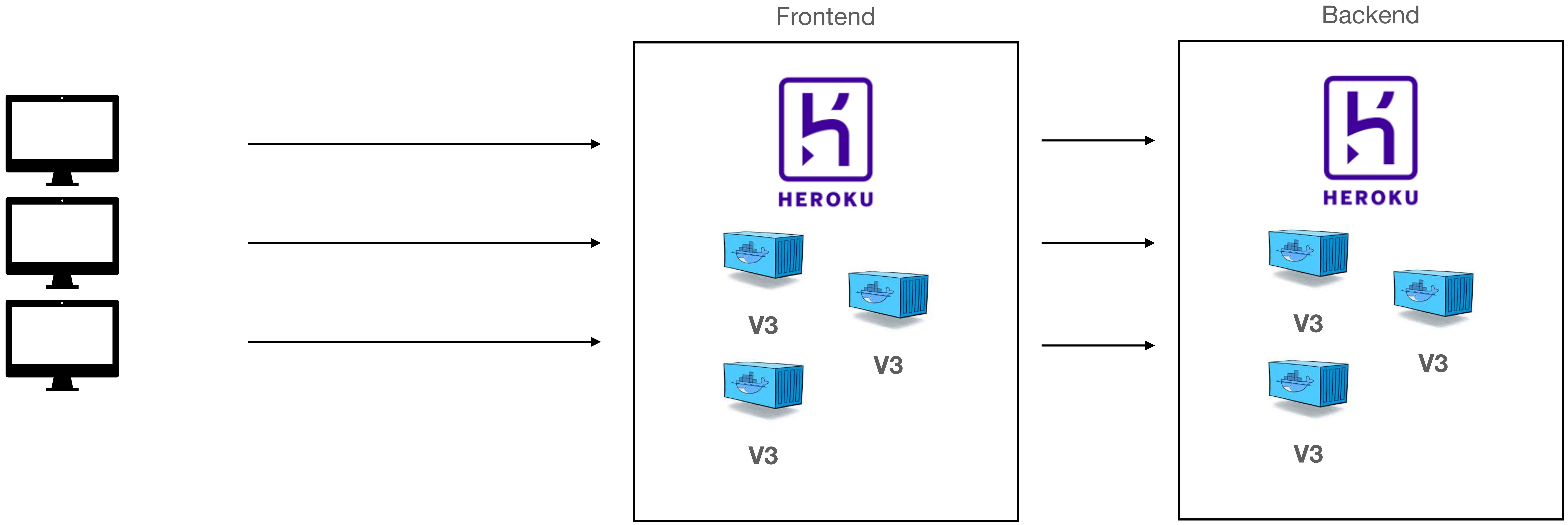
Advanced Concepts - Service Dependencies



DevOps

Advanced Concepts - VMs

Amazon EC2

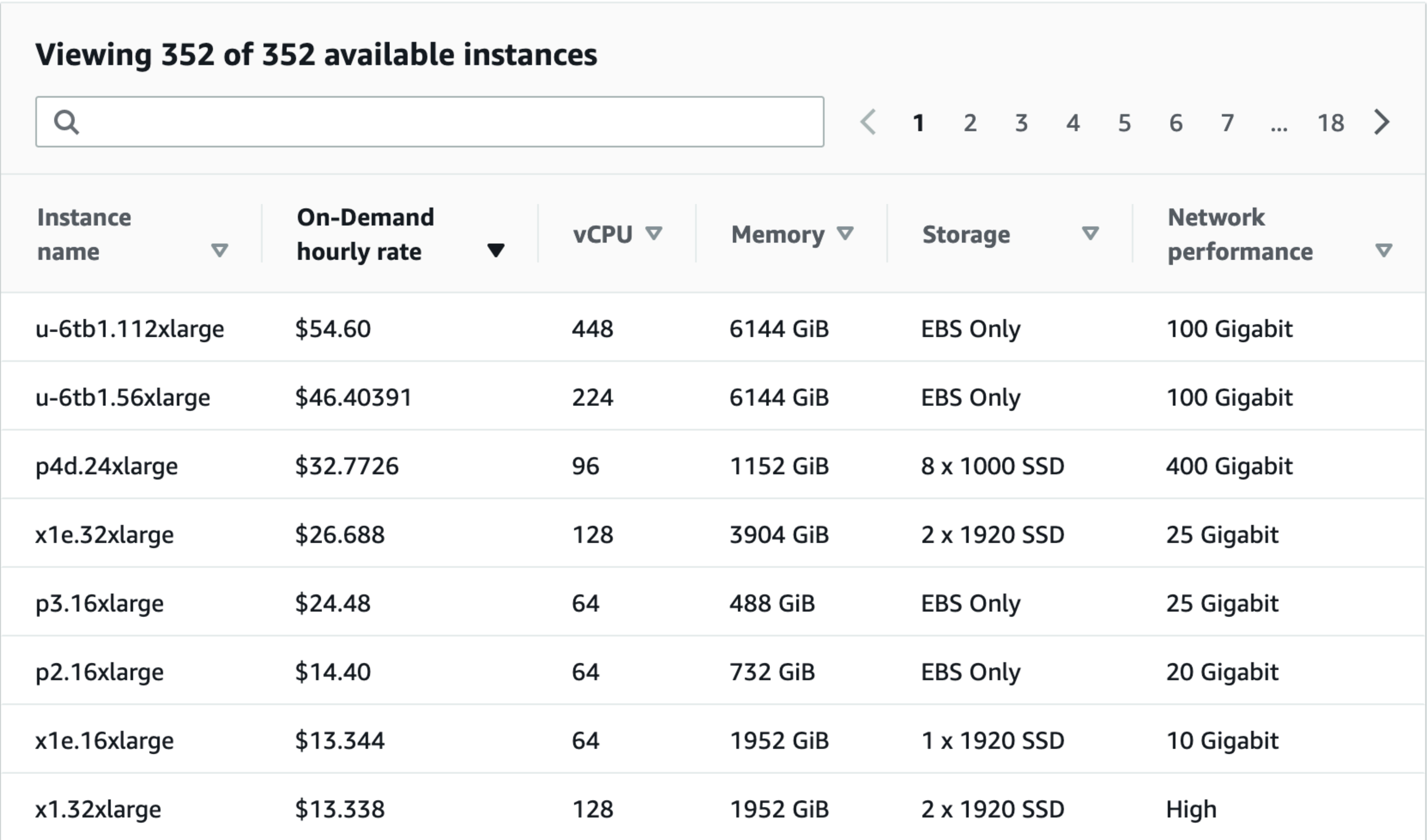
Windows Azure Virtual Machines

DigitalOcean

DevOps

Advanced Concepts - VMs

Amazon
EC2



Viewing 352 of 352 available instances

Instance name	On-Demand hourly rate	vCPU	Memory	Storage	Network performance
u-6tb1.112xlarge	$54.60	448	6144 GiB	EBS Only	100 Gigabit
u-6tb1.56xlarge	$46.40391	224	6144 GiB	EBS Only	100 Gigabit
p4d.24xlarge	$32.7726	96	1152 GiB	8 x 1000 SSD	400 Gigabit
x1e.32xlarge	$26.688	128	3904 GiB	2 x 1920 SSD	25 Gigabit
p3.16xlarge	$24.48	64	488 GiB	EBS Only	25 Gigabit
p2.16xlarge	$14.40	64	732 GiB	EBS Only	20 Gigabit
x1e.16xlarge	$13.344	64	1952 GiB	1 x 1920 SSD	10 Gigabit
x1.32xlarge	$13.338	128	1952 GiB	2 x 1920 SSD	High

DevOps

Advanced Concepts - VMs

Pros

* Learning experience!
* Customizable
* Dedicated hardware

Cons

* Scaling
* Maintenance

DevOps

Advanced Concepts - Monitoring