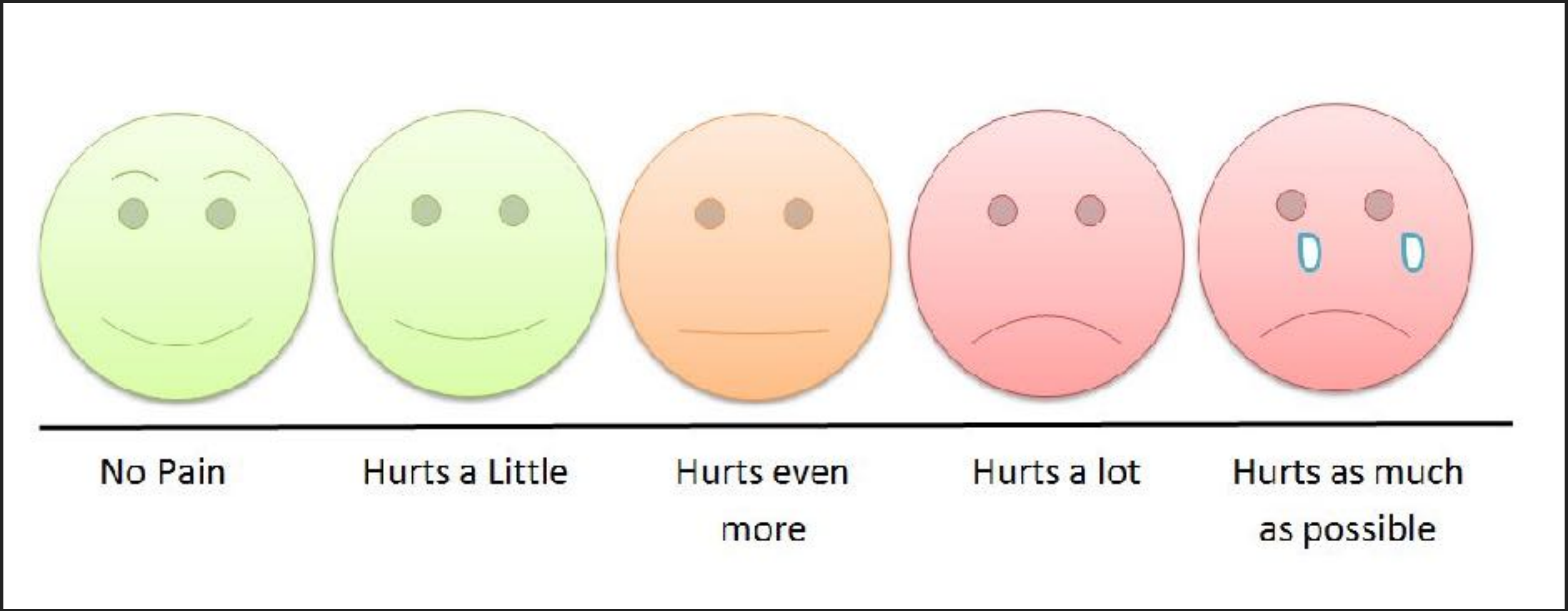
@RYANWASKIEWICZ

RWASKIEWICZ

12 FACTOR (FRONTEND) APPS BY

# DOCKERIZATION

## HOW DO YOUR DEPLOYMENTS MAKE YOU FEEL?



## THE 12 FACTOR APP

- Use **declarative** formats for setup automation
- Have a **clean contract** with the underlying OS to offer **maximum portability**
- **Minimize divergence** between dev and prod
- **Scale up** without significant changes

## THE 12 FACTORS

- Codebase
- Dependencies
- Configuration
- Backing Services
- Build, Release, Run
- Processes
- Port Binding
- Concurrency
- Disposability
- Dev/Prod Parity
- Logs
- Admin Processes

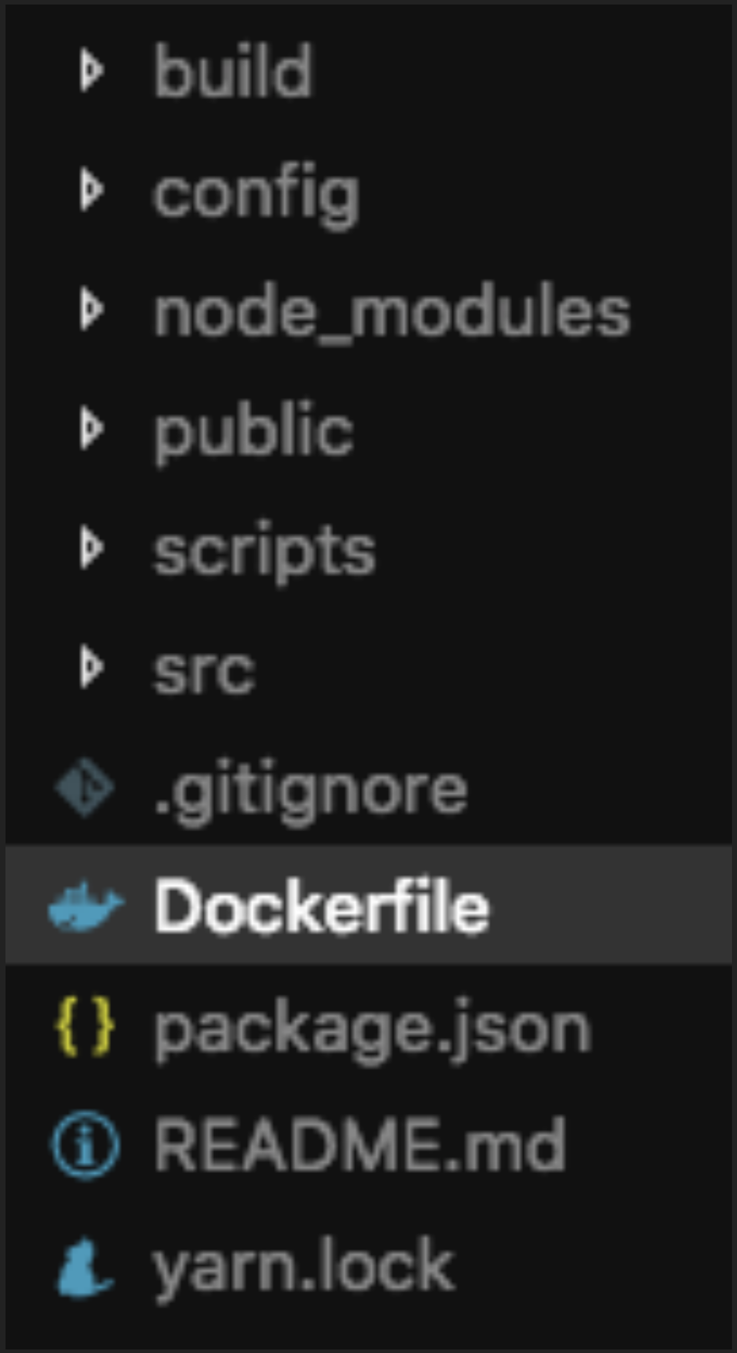
## THE 12 FACTORS

- Codebase
- Dependencies
- **Configuration**
- Backing Services
- **Build, Release, Run**
- Processes
- Port Binding
- Concurrency
- **Disposability**
- **Dev/Prod Parity**
- Logs
- Admin Processes

## HTTPS://WWW.DOCKER.COM/

docker

## DOCKERFILES


build
config
node_modules
public
scripts
src
.gitignore
Dockerfile
package.json
README.md
yarn.lock

```
# Set a 'Base Image' as the
# foundation
FROM nginx:alpine
LABEL maintainer="Ryan Waskiewicz”.

# Copy our built application to a
# place NGINX can serve it
COPY build/ /usr/share/nginx/html

# Define port that our container
# will listen to at runtime
EXPOSE 80

# Start NGINX in the container
CMD ["nginx", "-g", "daemon off;”]
```

## DOCKERFILE → IMAGE → CONTAINER

- Our Dockerfile creates a 'Docker Image'

```
$ docker build -t puzzle-app .
```

- That *Image* can be shared with the development community, colleagues
- From a single *Image* one or more *Containers* can be created

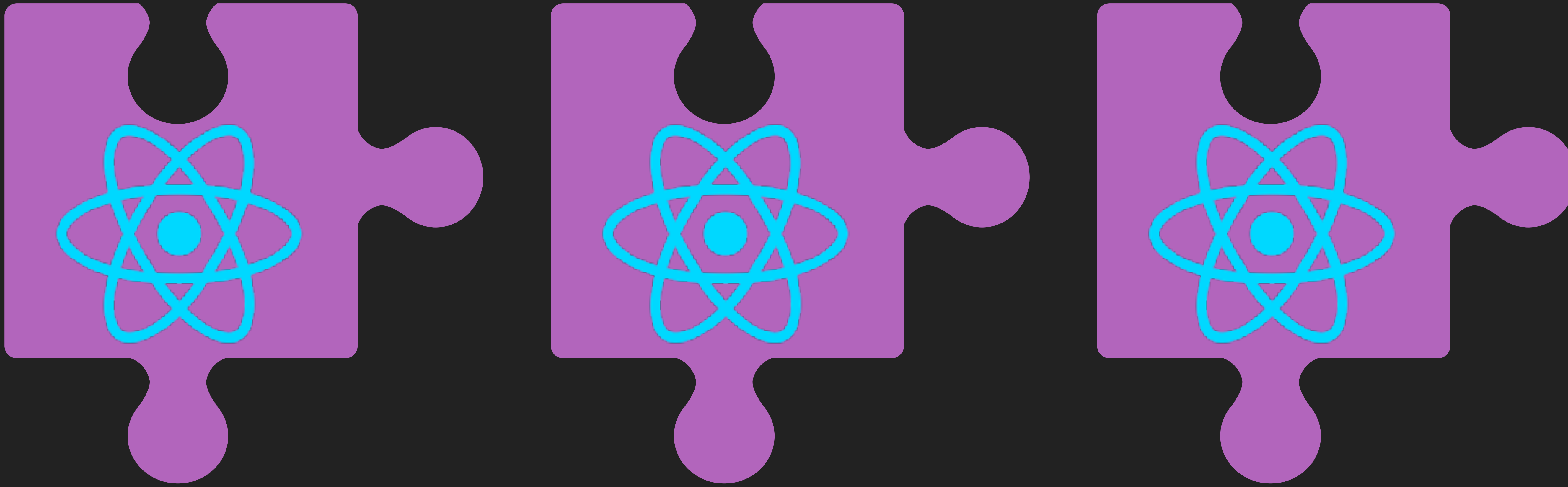
```
$ docker run puzzle-app
```

```
$ docker run puzzle-app
```

MY LOCAL

EVIE'S MACHINE

TIM'S MACHINE



## THE 12 FACTOR APP

- Use **declarative** formats for setup automation
- Have a **clean contract** with the underlying OS to offer **maximum portability**
- **Minimize divergence** between dev and prod
- **Scale up** without significant changes

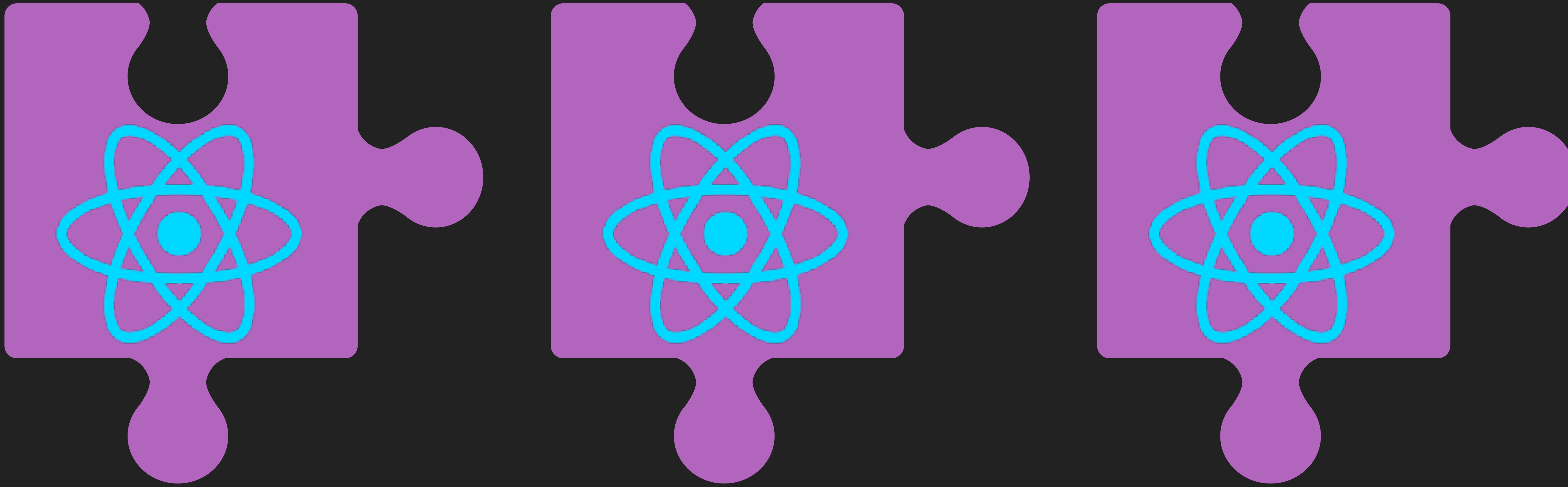
```
# Set a 'Base Image' as the
# Foundation of our App
FROM nginx:alpine
LABEL maintainer="Ryan Waskiewicz”.

# Copy our built application to a
# place NGINX can serve it
COPY dist/ /usr/share/nginx/html

# Define port that our container
# will listen to at runtime
EXPOSE 80

# Start NGINX in the container
CMD ["nginx", "-g", "daemon off;”]
```

```
$ docker run puzzle-app
```

MY LOCAL

EVIE'S MACHINE

TIM'S MACHINE

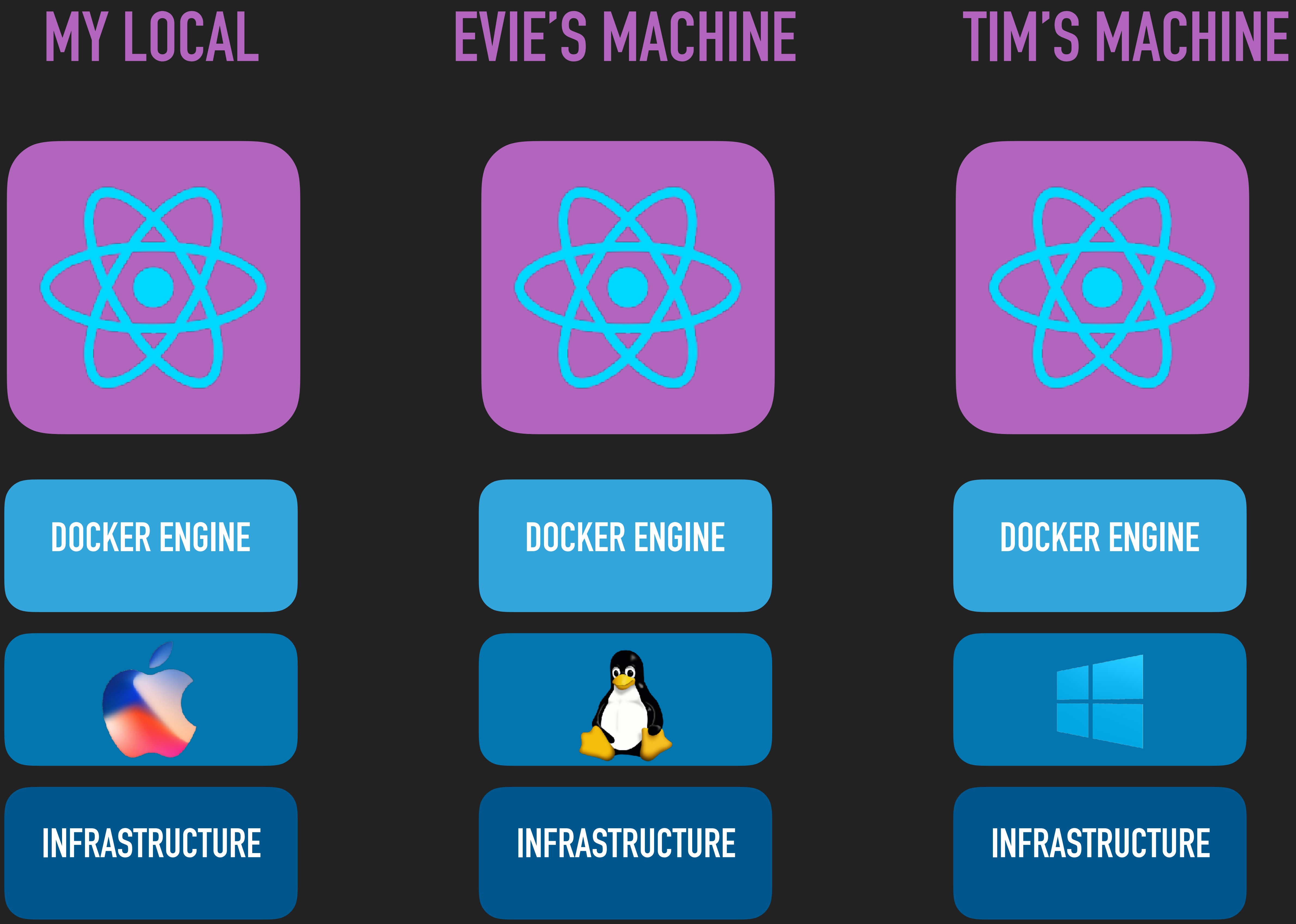


```
$ docker run puzzle-app
```

MY LOCAL

EVIE'S MACHINE

TIM'S MACHINE


MY LOCAL
EVIE'S MACHINE
TIM'S MACHINE
DOCKER ENGINE
DOCKER ENGINE
DOCKER ENGINE
INFRASTRUCTURE
INFRASTRUCTURE
INFRASTRUCTURE

## THE 12 FACTOR APP

- Use **declarative** formats for setup automation
- Have a **clean contract** with the underlying OS to offer **maximum portability**
- **Minimize divergence** between dev and prod
- **Scale up** without significant changes

## CONFIGURATION

## CONFIGURATION

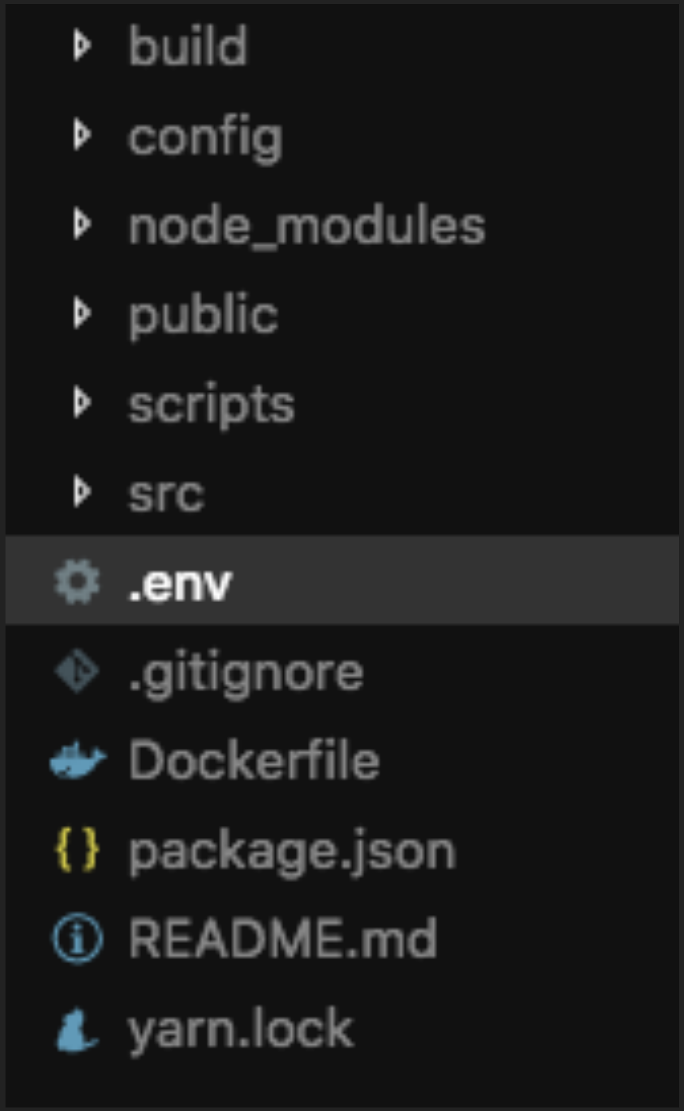
*Resources handles, credentials to external services, per-deploy values are stored in the environment, not the code.*

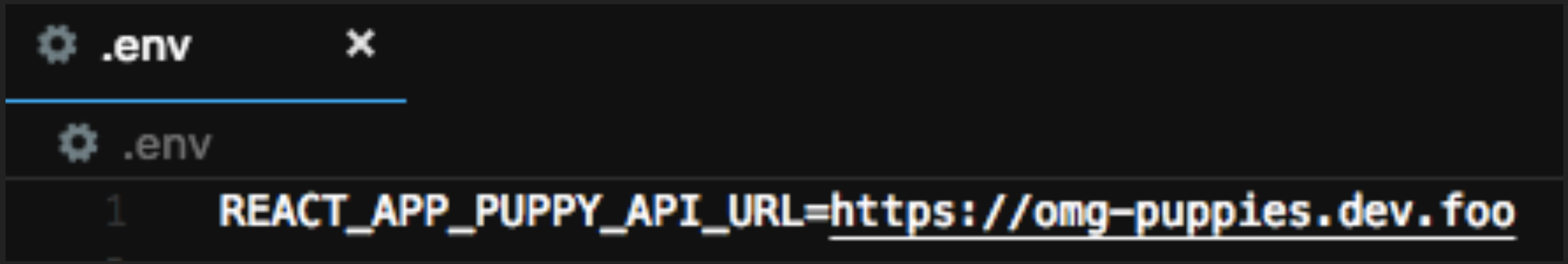
## WHY?

## LITMUS TEST

*If your codebase were made public today, how many passwords, internal URLs, or other 'secrets' would be exposed?*

## CONFIGURATION





```
REACT_APP_PUPPY_API_URL=https://omg-puppies.dev.foo
```

- Create a .env file for each environment
- Allows for granular control of application variables

## CONFIGURATION

```
async getPuppyDetails() {
  let puppyApiUrl = ‘’;

  if (process.ENV === 'production') {
    puppyApiUrl = 'https://omg-puppies.foo';
  } else if (process.ENV === 'stage') {
    puppyApiUrl = 'https://omg-puppies.stg.foo';
  } else if (process.ENV === 'test') {
    puppyApiUrl = 'https://omg-puppies.test.foo';
  } else if (process.ENV === 'development') {
    puppyApiUrl = 'https://omg-puppies.dev.foo';
  } else {
    throw new Error(`Some undefined environment was found: ${process.ENV}`);
  }

  return await axios.get(puppyApiUrl);
}
```

```
async getPuppyDetails() {
  return await axios.get(`${process.env.REACT_APP_PUPPY_API_URL}`);
}
```

## BUILD, RELEASE, RUN

## BUILD, RELEASE, RUN

*A codebase is transformed into a deploy through 3 stages:*

*1) Build - Converting code into a executable bundle*

*2) Release - Combining executable bundle with config*

*3) Run - Run the application in the execution environment*

## BUILD, RELEASE, RUN

- Case Study: Create React App
- Uses Webpack for bundling application
- Scans filesystem for .env* files
- Expands them in place in JS

```
async getPuppyDetails() {
  return await axios.get(`${process.env.REACT_APP_PUPPY_API_URL}`);
}
```

## BUILD, RELEASE, RUN

- Case Study: Create React App
- Uses Webpack for bundling application
- Scans filesystem for .env* files
- Expands them in place in JS

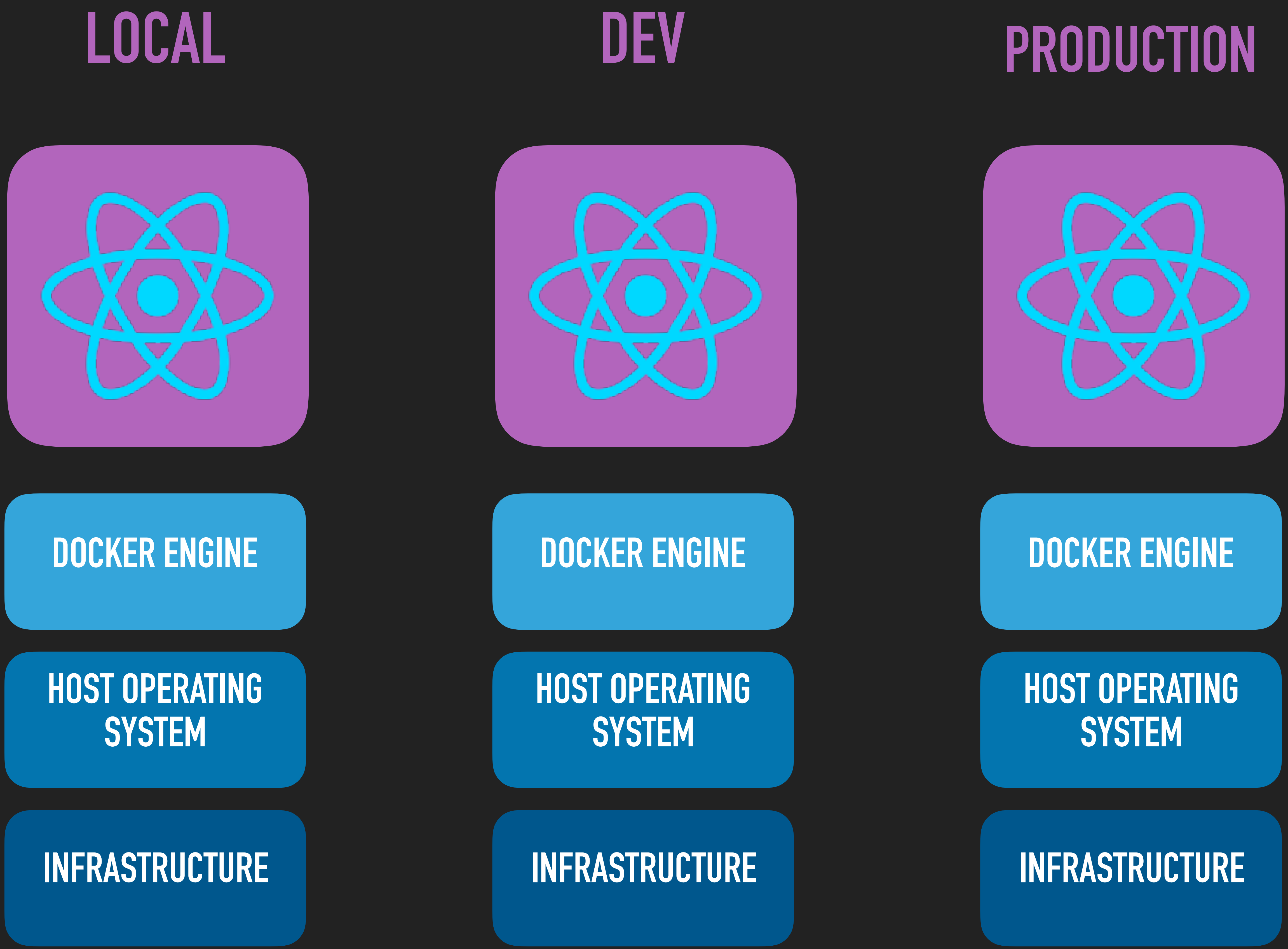
```
async getPuppyDetails() {
  return await axios.get(`https://omg-puppies.dev.foo`);
}
```

## DEV/PROD PARITY

## DEV/PROD PARITY

*Keep development, staging, production, etc. as similar as possible*

## HTTPS://12FACTOR.NET/DEV-PROD-PARITY



## THE 12 FACTOR APP

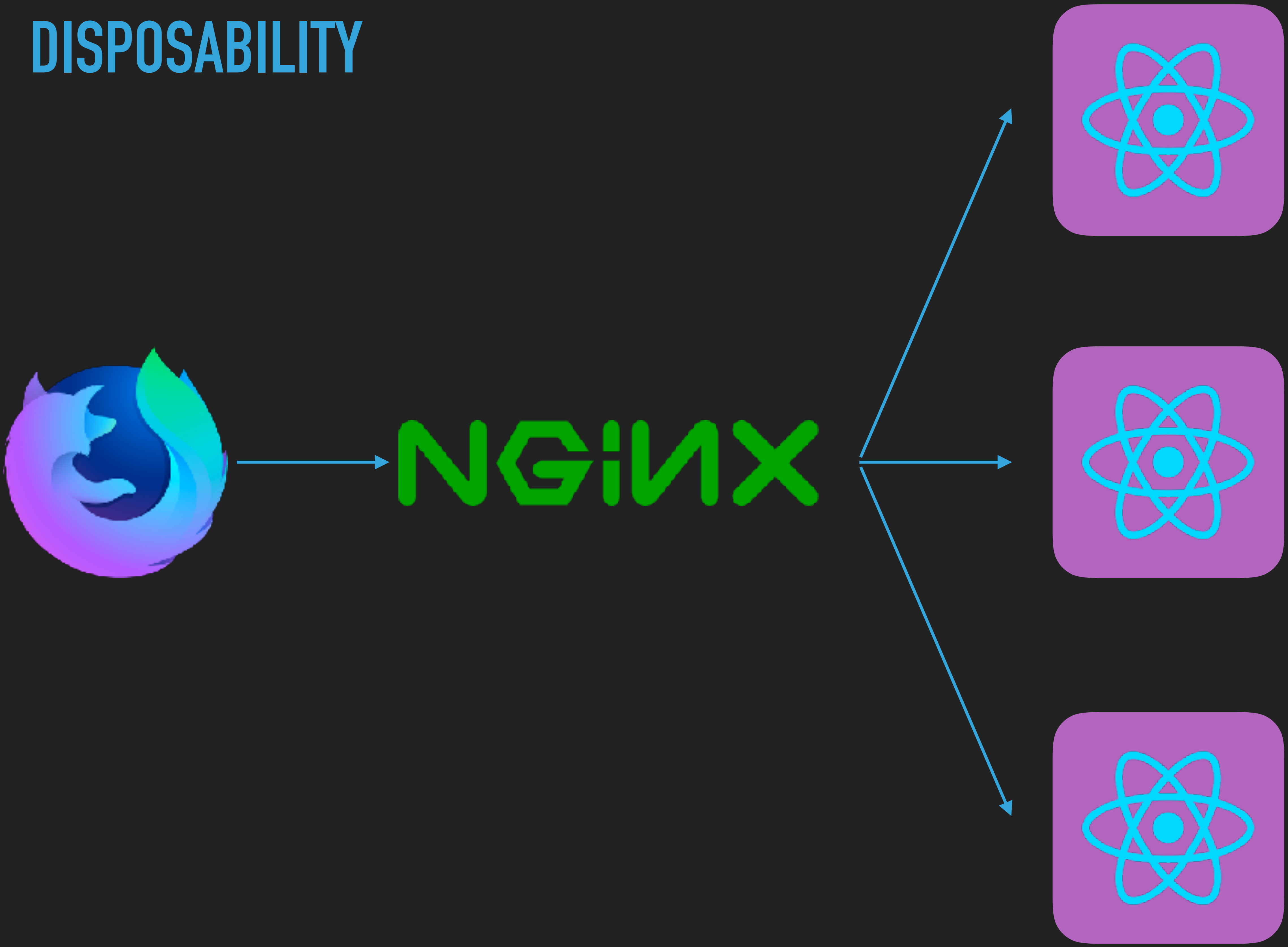
- Use **declarative** formats for setup automation
- Have a **clean contract** with the underlying OS to offer **maximum portability**
- **Minimize divergence** between dev and prod
    - Configuration, Build Release Run, Dev/Prod Parity
- **Scale up** without significant changes

# DISPOSABILITY

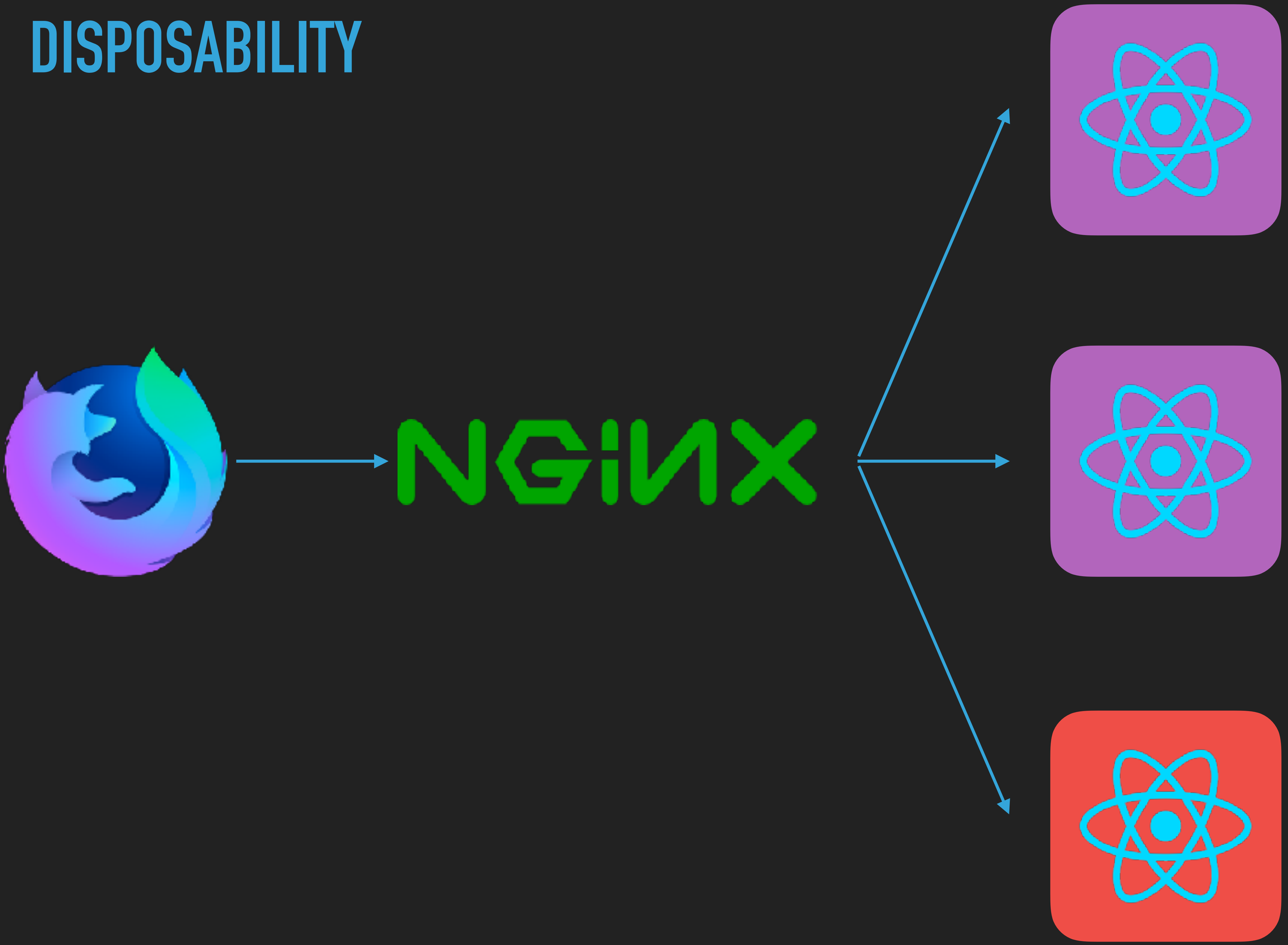
## DISPOSABILITY

*Processes can be started or stopped at a moment's notice*

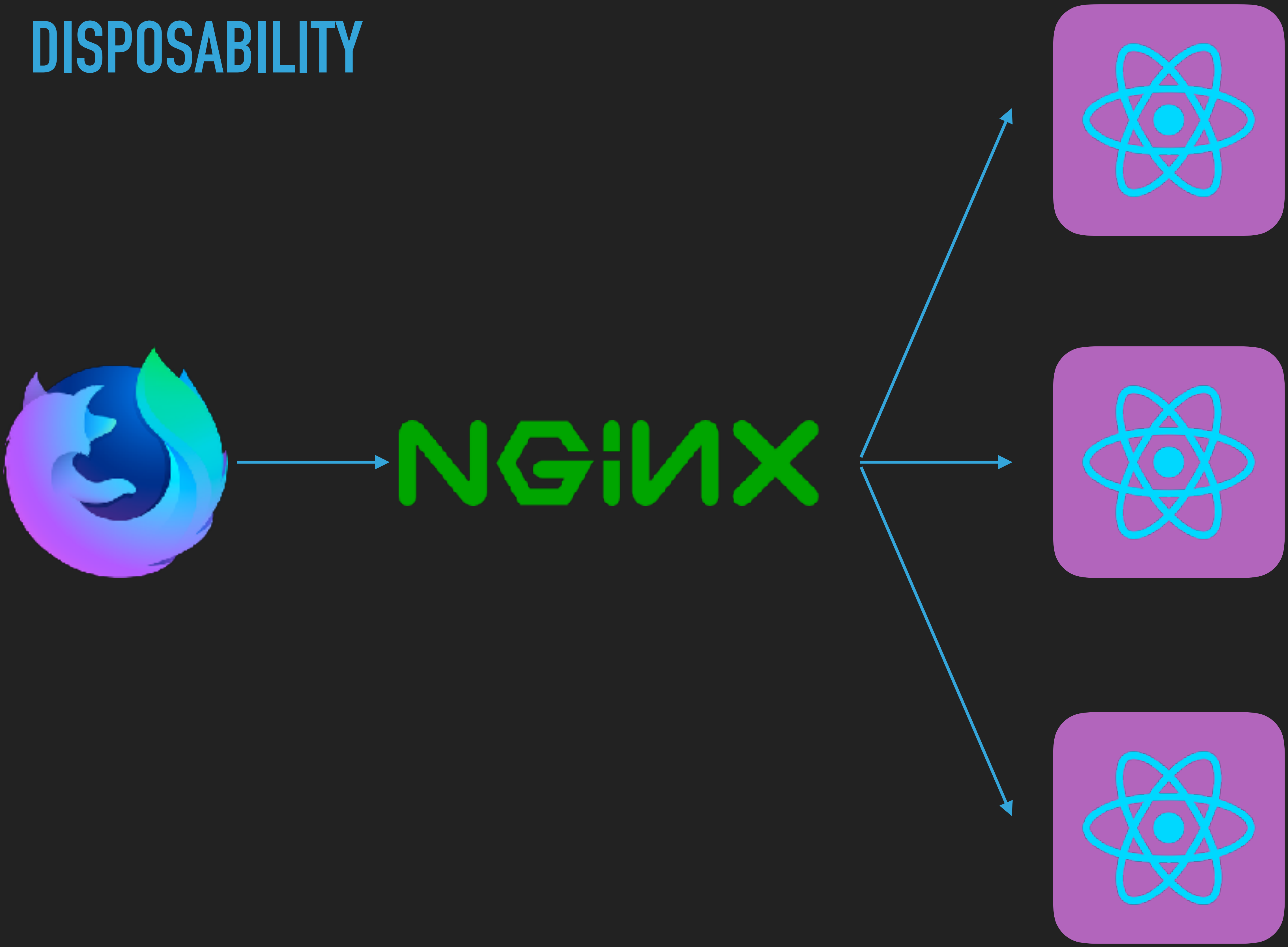
## DISPOSABILITY



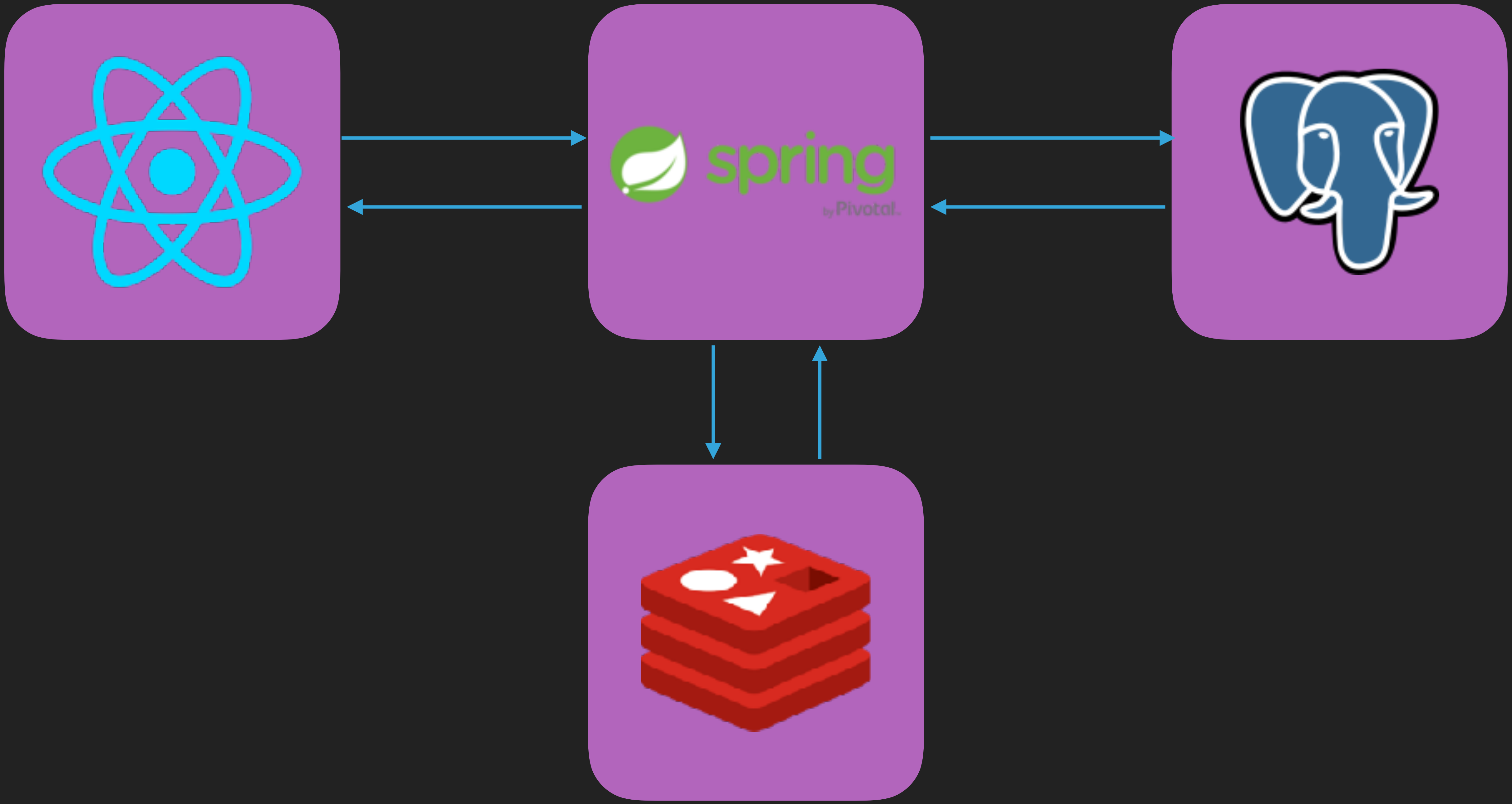
## DISPOSABILITY



## DISPOSABILITY

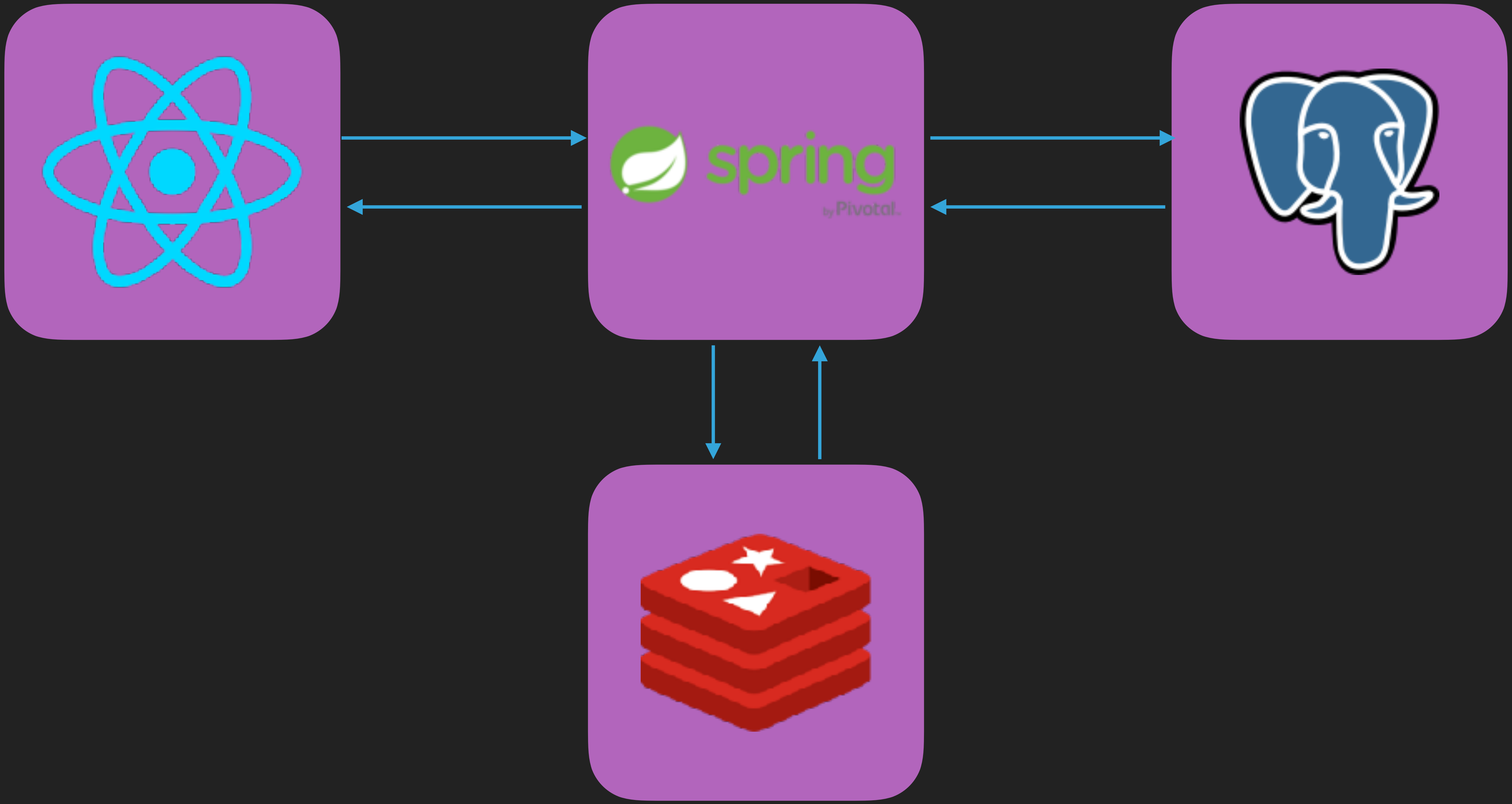


## DISPOSABILITY - TESTING



## DISPOSABILITY - TESTING

## DISPOSABILITY - TESTING



## THE 12 FACTOR APP

- Have a **clean contract** with the underlying OS to offer **maximum portability**
- Use **declarative** formats for setup automation
- **Minimize divergence** between dev and prod
- **Scale up** without significant changes

## THANK YOU

- The 12 Factor App: https://12factor.net/
- Docker: https://docs.docker.com/get-started/
- This talk: @rwaskiewicz