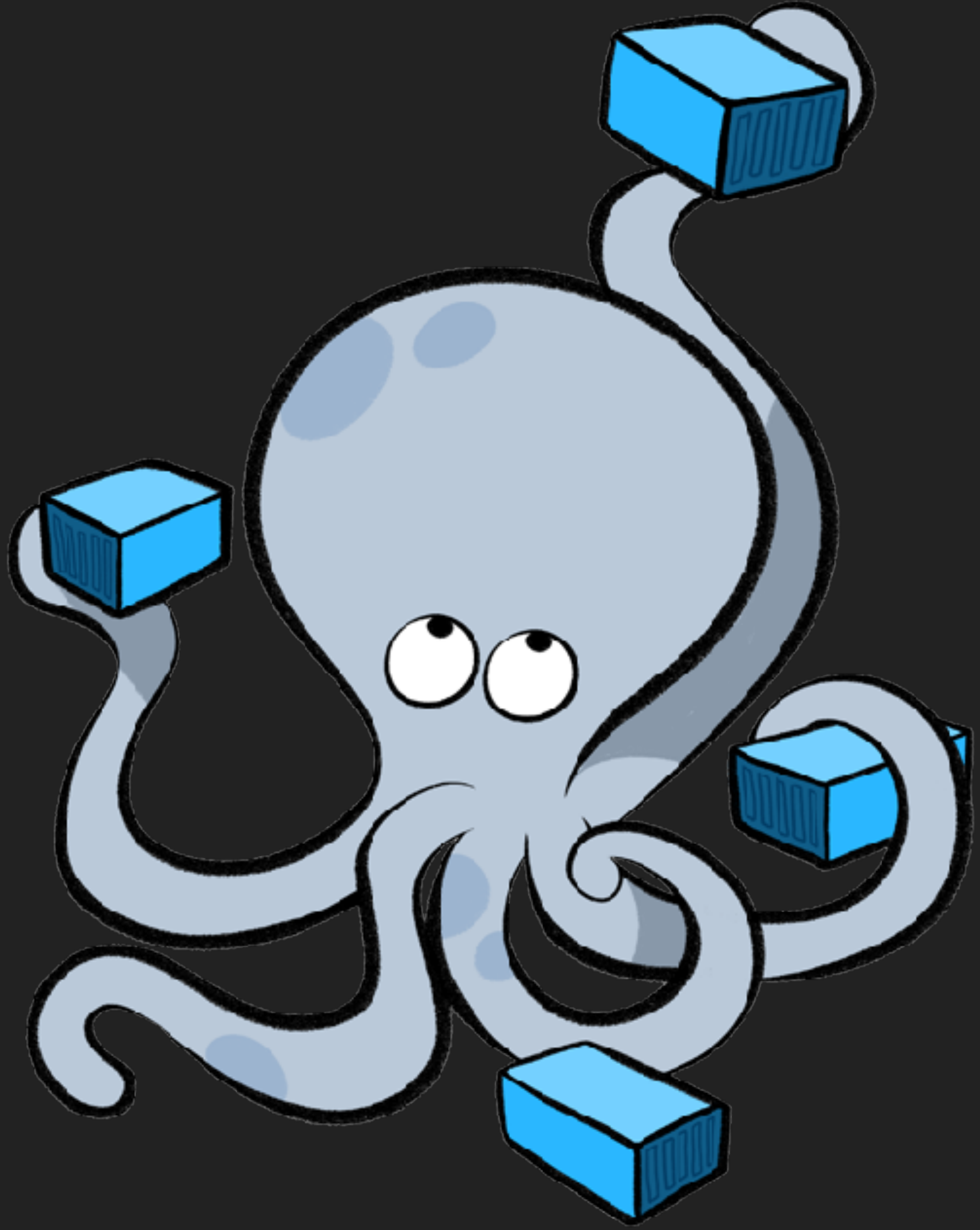
CREATE A DEVELOPMENT ENVIRONMENT WITH

# DOCKER COMPOSE



## WHAT IS A DOCKER CONTAINER?

- Is a way to package your application into a standardized unit for Software Development.
- Docker containers wrap a piece of software in a complete filesystem that contains everything needed to run: code, runtime, system tools, system libraries – anything that can be installed on a server. This guarantees that the software will always run the same, regardless of its environment. —https://www.docker.com/what-docker

## WHAT IS DOCKER COMPOSE?

- Compose is a tool for defining and running multi-container Docker applications. https://docs.docker.com/compose/'
- Its about arranging containers into logical services.  Outlining dependencies and making sure that the appropriate containers are booted.

## WHY USE IT?

- I use Homebrew.
- What about a regular VM?  Vagrant?
- Basically it comes down to one question.

## LETS WRITE A DOCKERFILE

```
FROM ruby:2.3.3
RUN apt-get update -qq
RUN apt-get install -y build-essential
RUN apt-get install -y nodejs
RUN apt-get install -y npm
RUN apt-get install -y nodejs-legacy
RUN apt-get install -y mysql-client libmysqlclient-dev
RUN mkdir /apps
RUN bundle config --global silence_root_warning 1
ADD Gemfile /apps/test/Gemfile
ADD Gemfile.lock /apps/test/Gemfile.lock
WORKDIR /apps/test
RUN bundle install
```

## WHAT HAPPENS WHEN WE RUN IT?

```
⚡ docker-compose build
Sending build context to Docker daemon 139.8 kB
Step 1/8 : FROM ruby:2.3.3
2.3.3: Pulling from library/ruby
5040bd298390: Pull complete
fce5728aad85: Pull complete
76610ec20bf5: Pull complete
52f3db4b5710: Pull complete
73c0dc2c700a: Pull complete
2be97eb0fc33: Pull complete
a385cee59a33: Pull complete
d6108f8be33c: Pull complete
Digest: sha256:523b6d221531ce9e3d418a3074fb879ec0c0b7435f731c7010b81e6c0b3e0c69
Status: Downloaded newer image for ruby:2.3.3
 ---> d089d4d3e81c
Step 2/8 : RUN apt-get update -qq
 ---> Running in cabad8452c76
 ---> 9faacddb076b
Removing intermediate container cabad8452c76
Step 3/8 : RUN apt-get install -y build-essential
 ---> Running in b685324572f4
```

## WHAT IF WE CHANGE IT?

```
⚡ docker-compose build
Sending build context to Docker daemon 140.3 kB
Step 1/9 : FROM ruby:2.3.3
 ---> d089d4d3e81c
Step 2/9 : RUN apt-get update -qq
 ---> Using cache
 ---> 9faacddb076b
Step 3/9 : RUN apt-get install -y build-essential
 ---> Using cache
 ---> 7c74058e1258
Step 4/9 : RUN apt-get install -y nodejs
 ---> Using cache
 ---> 1d2da1e228e1
Step 5/9 : RUN apt-get install -y npm
 ---> Using cache
 ---> eaa8567e0ffb
Step 6/9 : RUN apt-get install -y nodejs-legacy
 ---> Using cache
 ---> 98508d08b7f6
Step 7/9 : RUN apt-get install -y mysql-client libmysqlclient-dev
 ---> Using cache
 ---> 1b2f05a32929
Step 8/9 : RUN mkdir /apps
 ---> Using cache
 ---> f7297217e006
Step 9/9 : RUN bundle config --global silence_root_warning 1
 ---> Running in af292817c386
You have a bundler environment variable for silence_root_warning set to "1". This will take precedence over the global value you are setting
 ---> 586ed297429e
Removing intermediate container af292817c386
Successfully built 586ed297429e
```

## WHAT IF WE CHANGE IT?

```
⚡ docker-compose build
Sending build context to Docker daemon 140.3 kB
Step 1/9 : FROM ruby:2.3.3
 ---> d089d4d3e81c
Step 2/9 : RUN apt-get update -qq
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 ---> 586ed297429e
Removing intermediate container af292817c386
Successfully built 586ed297429e
```
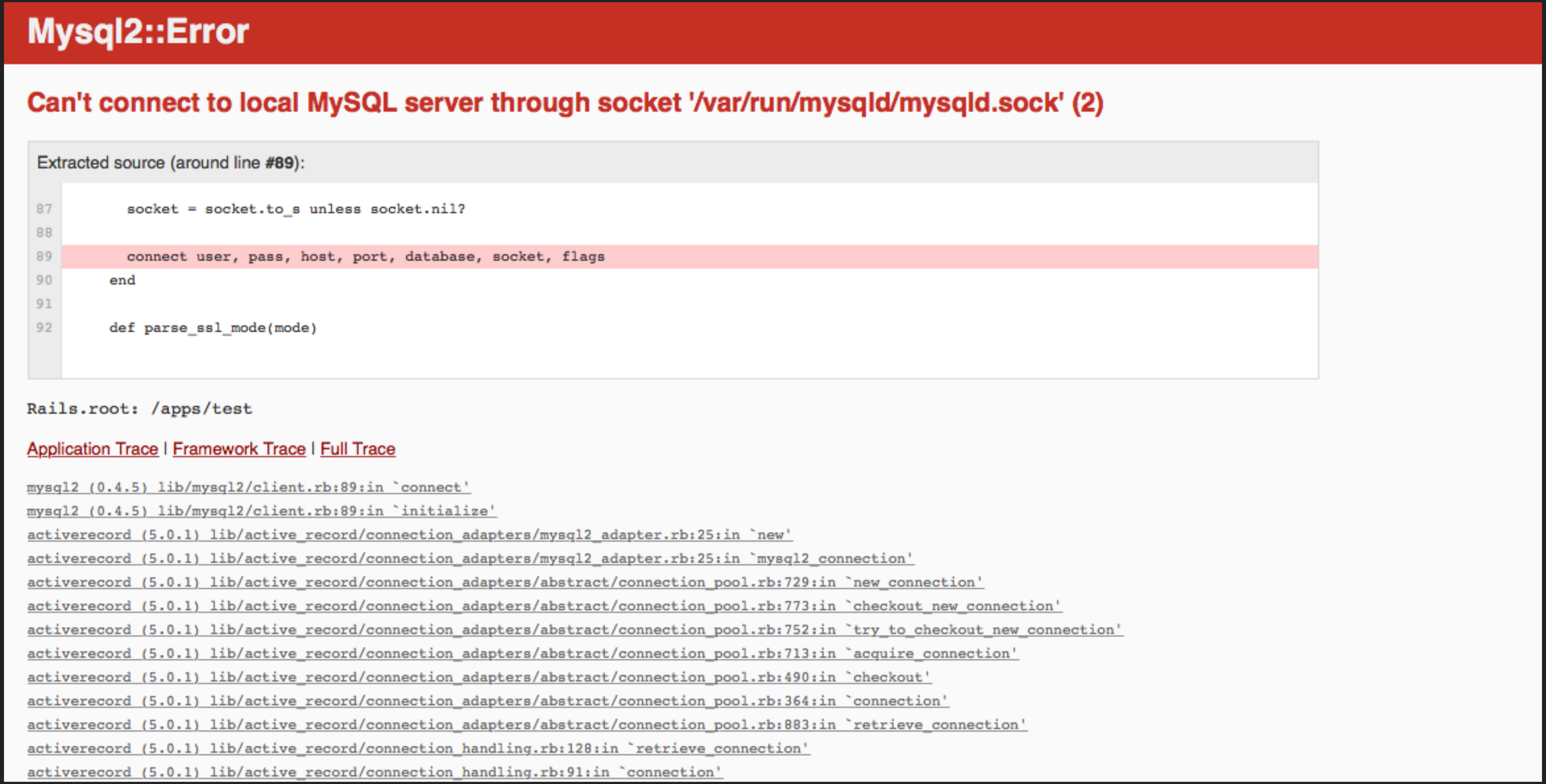

## OK NOW WHAT?

## DOCKER-COMPOSE.YML

```
version: "2"
services:
  web:
    build: .
    volumes:
      - .:/apps/test
    working_dir: /apps/test
    command: bundle exec puma -b 0.0.0.0
    expose:
      - 3000
    ports:
      - 3000:3000
```


Mysql2::Error

Can't connect to local MySQL server through socket '/var/run/mysqld/mysqld.sock' (2)

Extracted source (around line **#89**):

```
      socket = socket.to_s unless socket.nil?

      connect user, pass, host, port, database, socket, flags
    end

    def parse_ssl_mode(mode)
```

```
Rails.root: /apps/test
```

Application Trace | Framework Trace | Full Trace

```
mysql2 (0.4.5) lib/mysql2/client.rb:89:in `connect'
mysql2 (0.4.5) lib/mysql2/client.rb:89:in `initialize'
activerecord (5.0.1) lib/active_record/connection_adapters/mysql2_adapter.rb:25:in `new'
activerecord (5.0.1) lib/active_record/connection_adapters/mysql2_adapter.rb:25:in `mysql2_connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:729:in `new_connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:773:in `checkout_new_connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:752:in `try_to_checkout_new_connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:713:in `acquire_connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:490:in `checkout'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:364:in `connection'
activerecord (5.0.1) lib/active_record/connection_adapters/abstract/connection_pool.rb:883:in `retrieve_connection'
activerecord (5.0.1) lib/active_record/connection_handling.rb:128:in `retrieve_connection'
activerecord (5.0.1) lib/active_record/connection_handling.rb:91:in `connection'
```

## LETS ADD SOME ADDITIONAL SERVICES

```
version: "2"
services:
  web:
    build: .
    volumes:
      - .:/apps/test
    working_dir: /apps/test
    command: bundle exec puma -b 0.0.0.0
    ports:
      - 3000:3000
    depends_on:
      - db
  db:
    image: mysql:5.7
    ports:
      - 3306:3306
    environment:
      MYSQL_ALLOW_EMPTY_PASSWORD: 'yes'
```

## NETWORKING

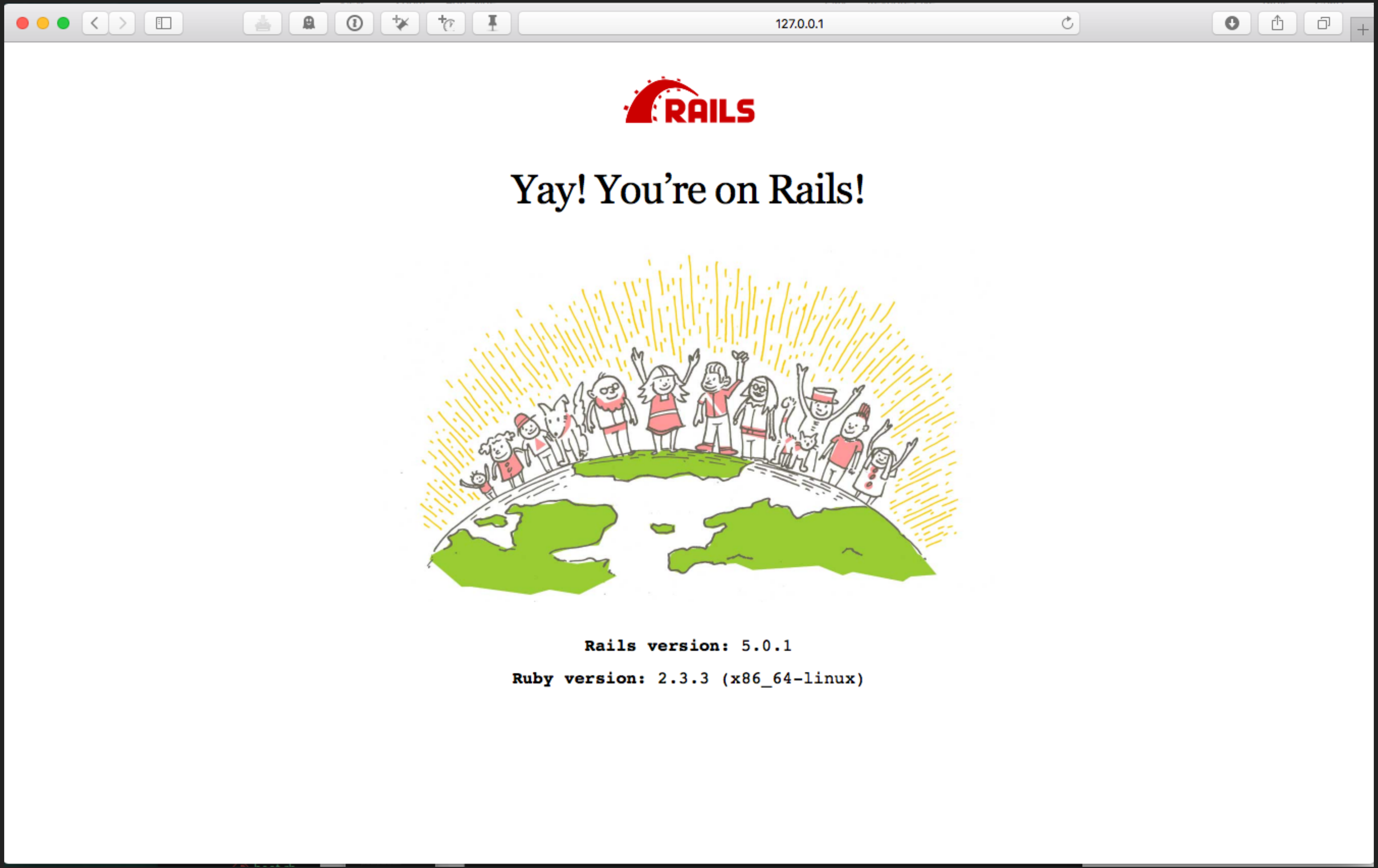
```
⚡ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS                     NAMES
c35e7666439e        test_web            "bundle exec puma ..."   About a minute ago   Up 2 seconds        0.0.0.0:3000->3000/tcp    test_web_1

2bf299b1d180        mysql:5.7           "docker-entrypoint..."   About a minute ago   Up 2 seconds        0.0.0.0:32769->3306/tcp   test_db_1
```

## CHANGES TO DATABASE.YML

```
default: &default
  adapter: mysql2
  encoding: utf8
  pool: 5
  username: root
  password:
  host: db

⚡ docker-compose run web rails db:create
Created database 'Test_development'
Created database 'Test_test'
```

## CHANGES TO DATABASE.YML

```
default: &default
  adapter: mysql2
  encoding: utf8
  pool: 5
  username: root
  password:
  host: db

⚡ docker-compose run web rails db:create
Created database 'Test_development'
Created database 'Test_test'
```



Yay! You're on Rails!

```
Rails version: 5.0.1
Ruby version: 2.3.3 (x86_64-linux)
```

## NOW THAT IT IS RUNNING, WHAT ARE SOME USEFUL COMMANDS

- `docker-compose build`
- `docker-compose rm`
- `docker-compose (up | down)`
- `docker-compose (start | stop)`
- `docker-compose run`
- `docker-compose exec`
- `docker-compose logs (-f)`

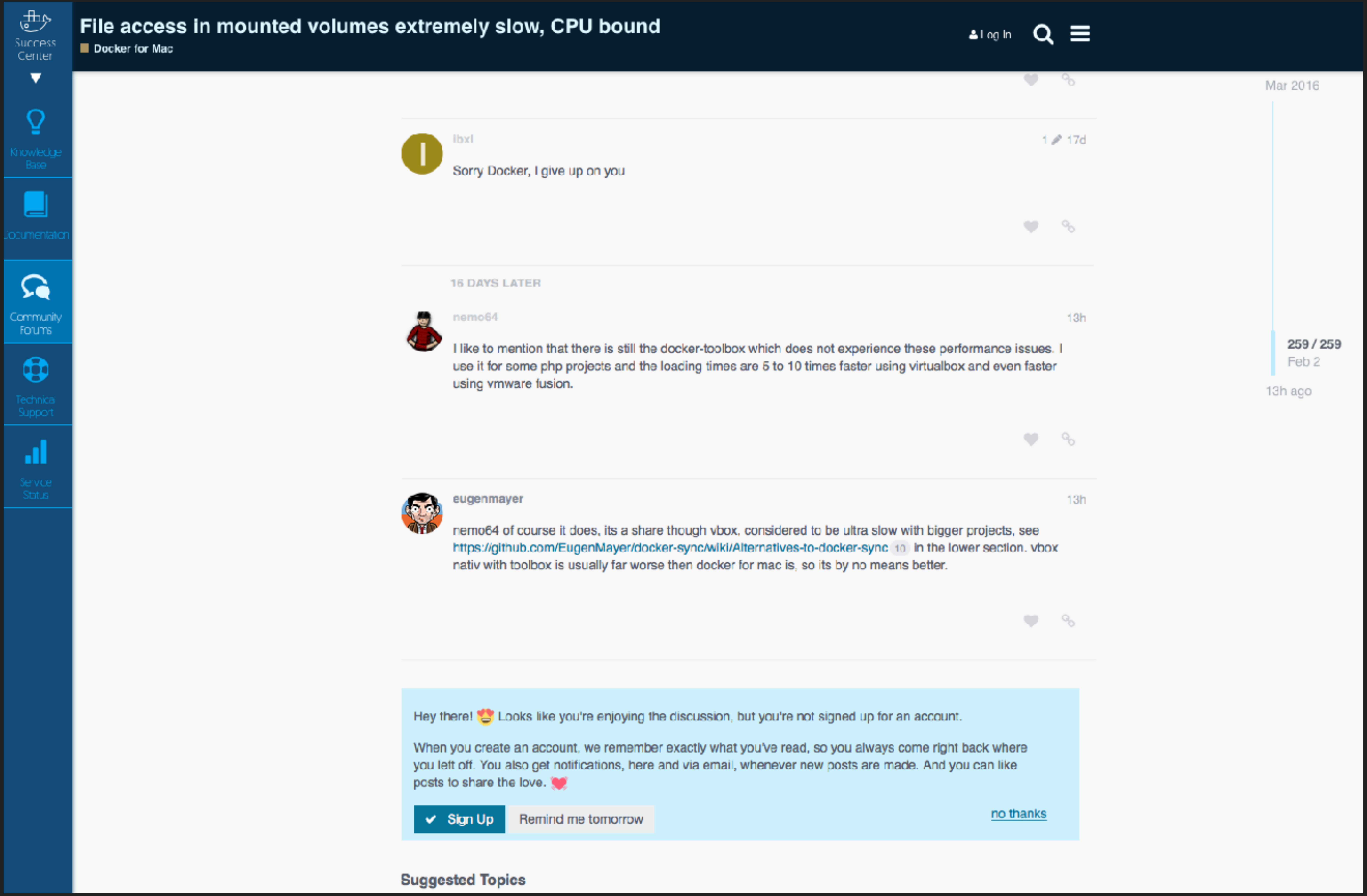
## TIPS FROM REAL WORLD USAGE

- Make your base image specific to your app not its environment.
- Use environment variables to set up environment specific aspects.
- Make individual containers disposable.
- Utilize community containers, but feel comfortable creating your own when you move to production.
- If your docker-compose.yml is getting really complicated use the extends command to break it up.

## TIPS FROM REAL WORLD USAGE CONT…

- If you are using Docker for Mac be prepared for the slow performance of OSXFS if you have a lot of small files (RubyGems, NPM)

## HOW ANGRY? . . .😡



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Documentation

Community Forums

Technical Support

Service Status

File access in mounted volumes extremely slow, CPU bound

Docker for Mac

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Mar 2016

lbxl 1 17d

Sorry Docker, I give up on you

16 DAYS LATER

nemo64 13h

I like to mention that there is still the docker-toolbox which does not experience these performance issues. I use it for some php projects and the loading times are 5 to 10 times faster using virtualbox and even faster using vmware fusion.

eugenmayer 13h

nemo64 of course it does, its a share though vbox, considered to be ultra slow with bigger projects, see https://github.com/EugenMayer/docker-sync/wiki/Alternatives-to-docker-sync 10 in the lower section. vbox nativ with toolbox is usually far worse then docker for mac is, so its by no means better.

259 / 259
Feb 2

13h ago

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Suggested Topics

## THERE ARE SOLUTIONS THOUGH

- Use NFS available with alternate docker-machines such as dinghy (codekitchen / **dinghy**) https://github.com/codekitchen/dinghy
- Use the local driver for volumes that can live on a container

```
volumes:
  mysql-data:
    driver: local
```

```yaml
version: "2"
services:
  web:
    build: .
    volumes:
      - .:/apps/test
    working_dir: /apps/test
    command: bundle exec puma -b 0.0.0.0
    ports:
      - 3000:3000
    depends_on:
      - db
  db:
    image: mysql:5.7
    ports:
      - 3306
    environment:
      MYSQL_ALLOW_EMPTY_PASSWORD: 'yes'
    volumes:
      - mysql-data:/var/lib/mysql

volumes:
  mysql-data:
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```

```yaml
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services:
  web:
    build: .
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```
volumes:
  mysql-data:
    driver: local
```

- docker-sync http://docker-sync.io

## DOCKER-SYNC

```yaml
# docker-sync.yml
options:
  verbose: true
  compose-file-path: './base.yml'
  compose-dev-file-path: './docker-compose.yml'
  sync_user: '1000'
syncs:
  accounts-sync:
    src: '.'
    dest: '/apps/test'
    sync_strategy: 'unison'
    sync_excludes: ['.git', 'tmp', 'log']
    sync_excludes_type: 'Name'
```

THANK YOU.
QUESTIONS?