DESTROY Long Build Times

using Docker, Go, Java, Bazel & Codefresh

Thanks!

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Why speed up builds?

100 Engineers

X

5 Builds/Day

X

Saving 5 Min/Build

Making Average $150k/yr

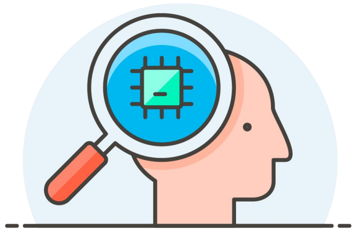
Annual Savings

$781k

codefresh

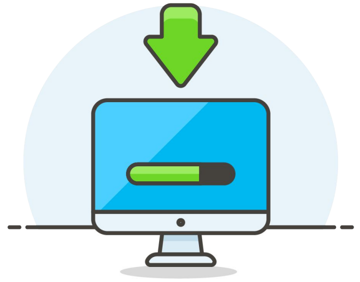
DevOps.com

Intangible Benefits



Happy Devs

Creativity Flourishes



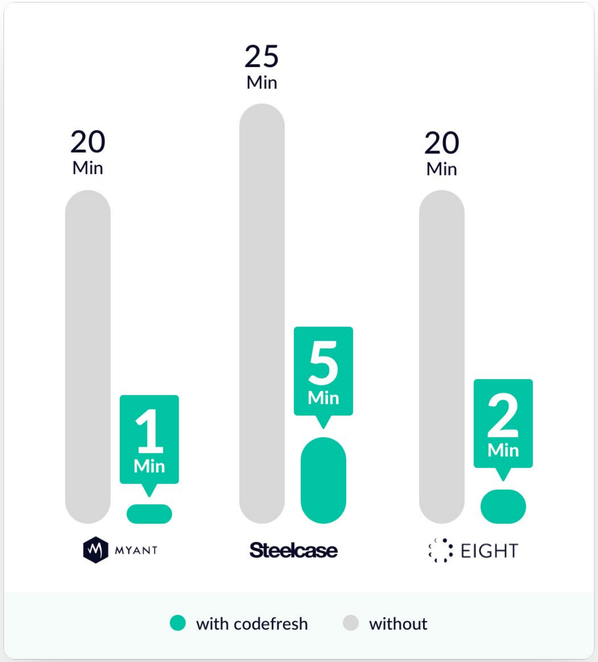
Faster Iteration

What you'll learn to day

How to strategically use distributed caching

Tips for optimizing Docker builds

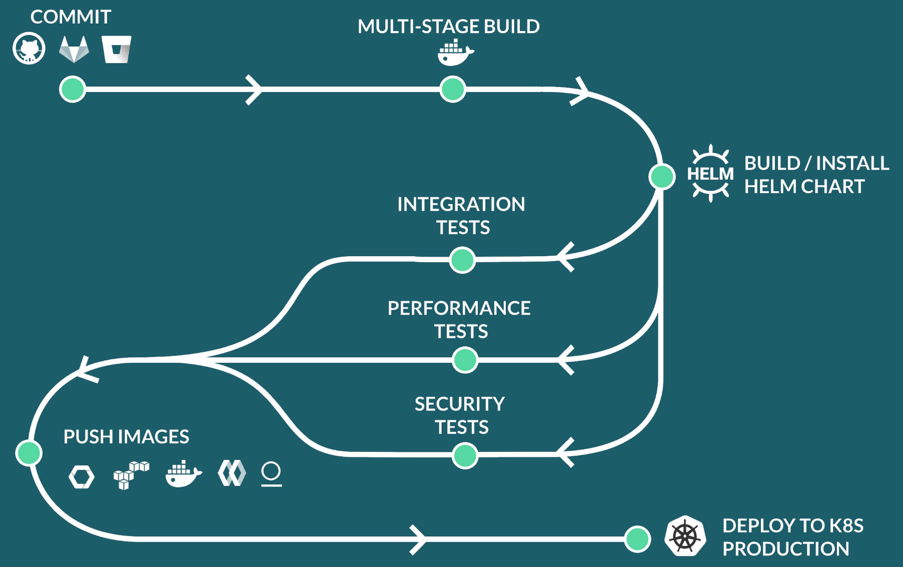
Why you need multi-stage builds



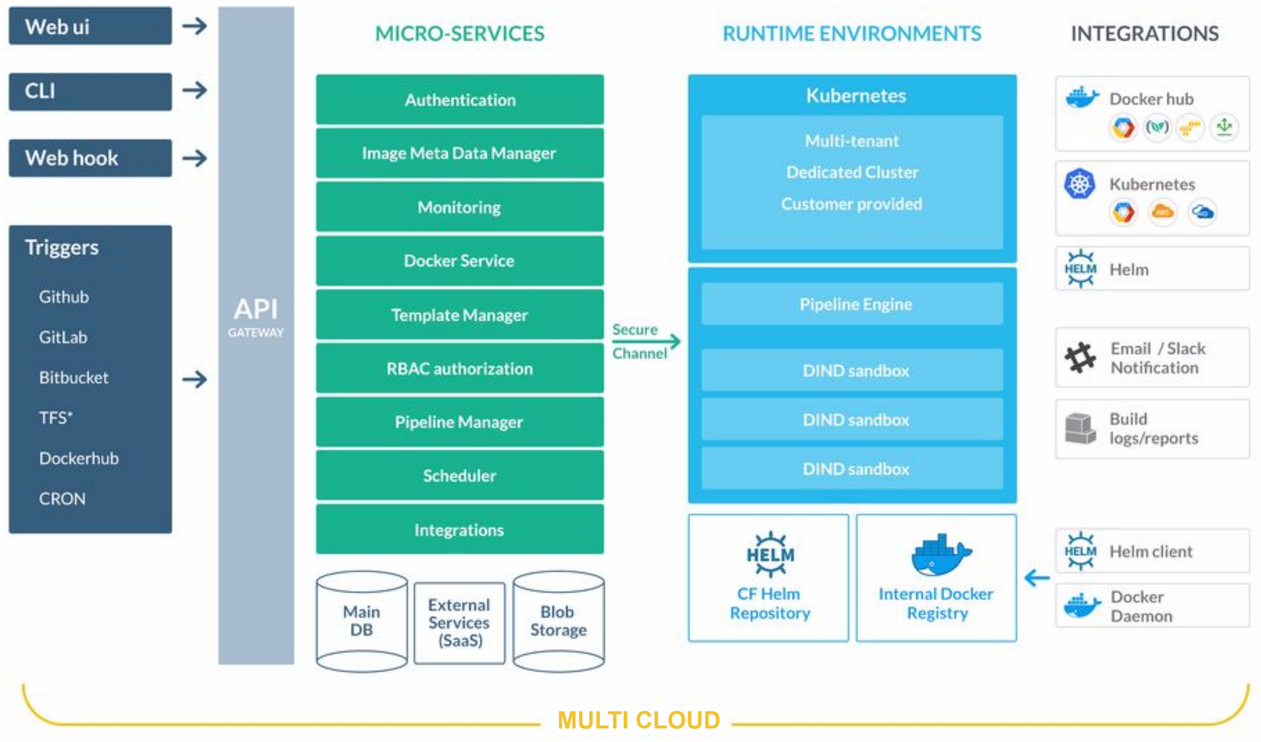
Codefresh

The 1st container-native CI/CD Platform for Microservices

- Cloud-native
- Intuitive & Robust
- Enterprise Ready
- Flexible Delivery



CODEFRESH ARCHITECTURE DIAGRAM



codefresh

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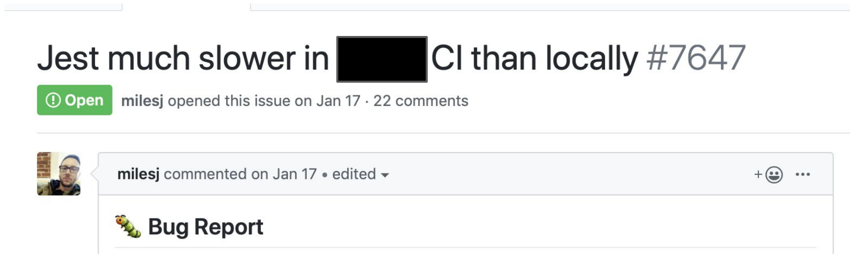
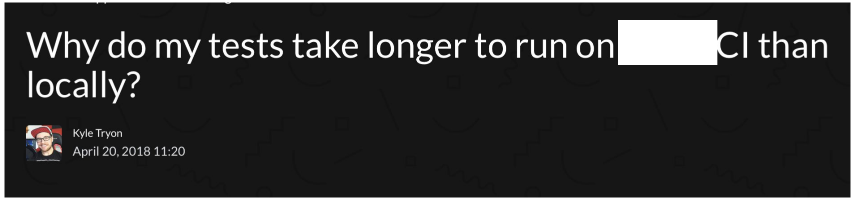
Why do CI systems usually struggle with speed?


Jest much slower in [redacted] CI than locally #7647

Open milesj opened this issue on Jan 17 · 22 comments

milesj commented on Jan 17 • edited

Bug Report


Why do my tests take longer to run on [redacted] CI than locally?

Kyle Tryon
April 20, 2018 11:20

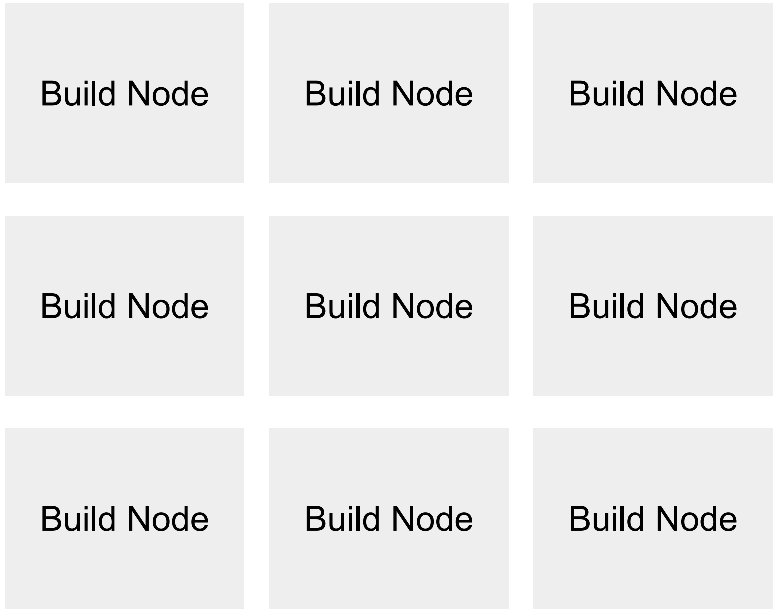
Local Build Isn't the Answer

Blocks Dev from working

Not secure or traceable

Not reliable

Why do CI systems usually struggle with speed?



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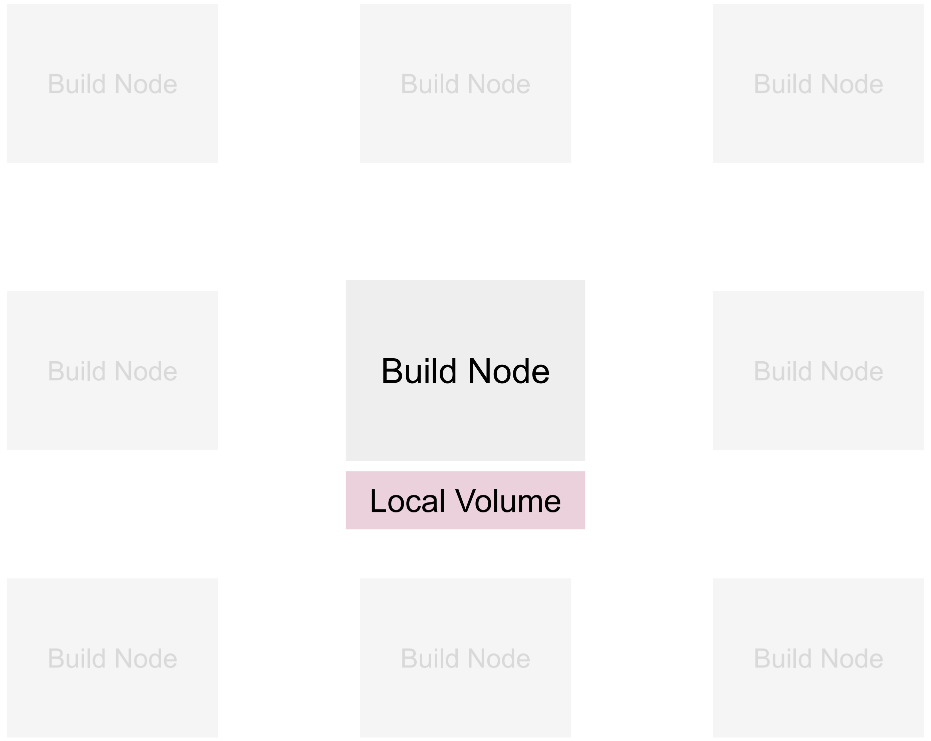
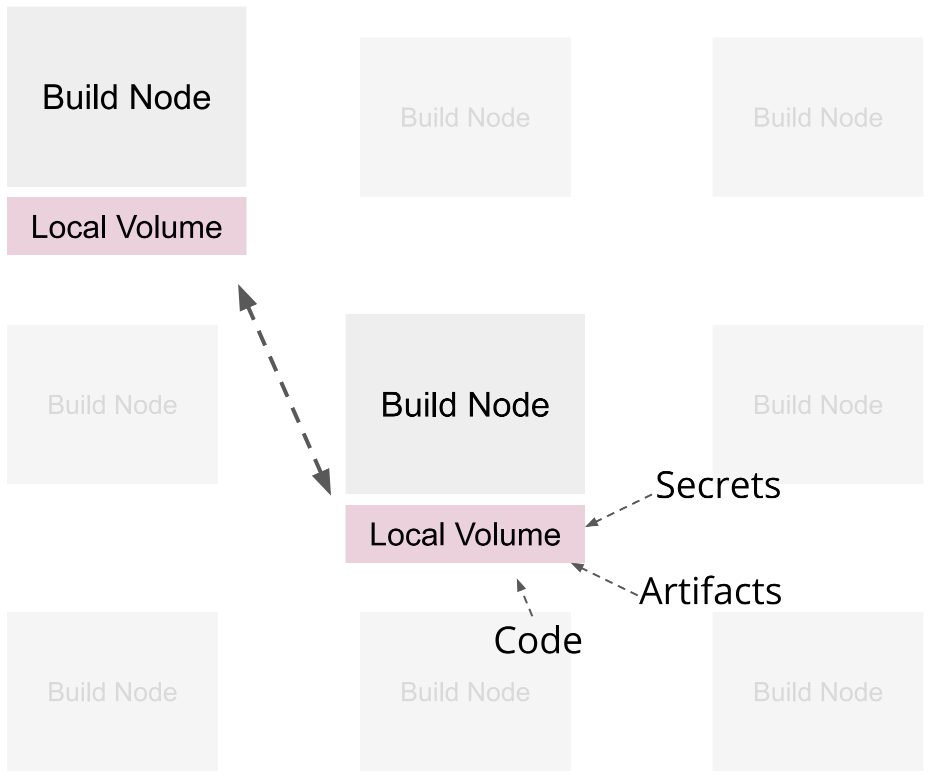


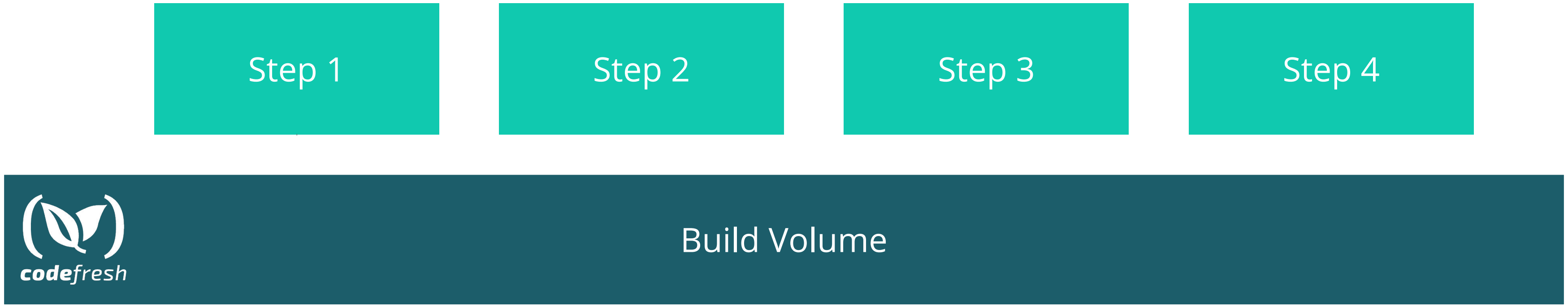
Why do CI systems usually struggle with speed?



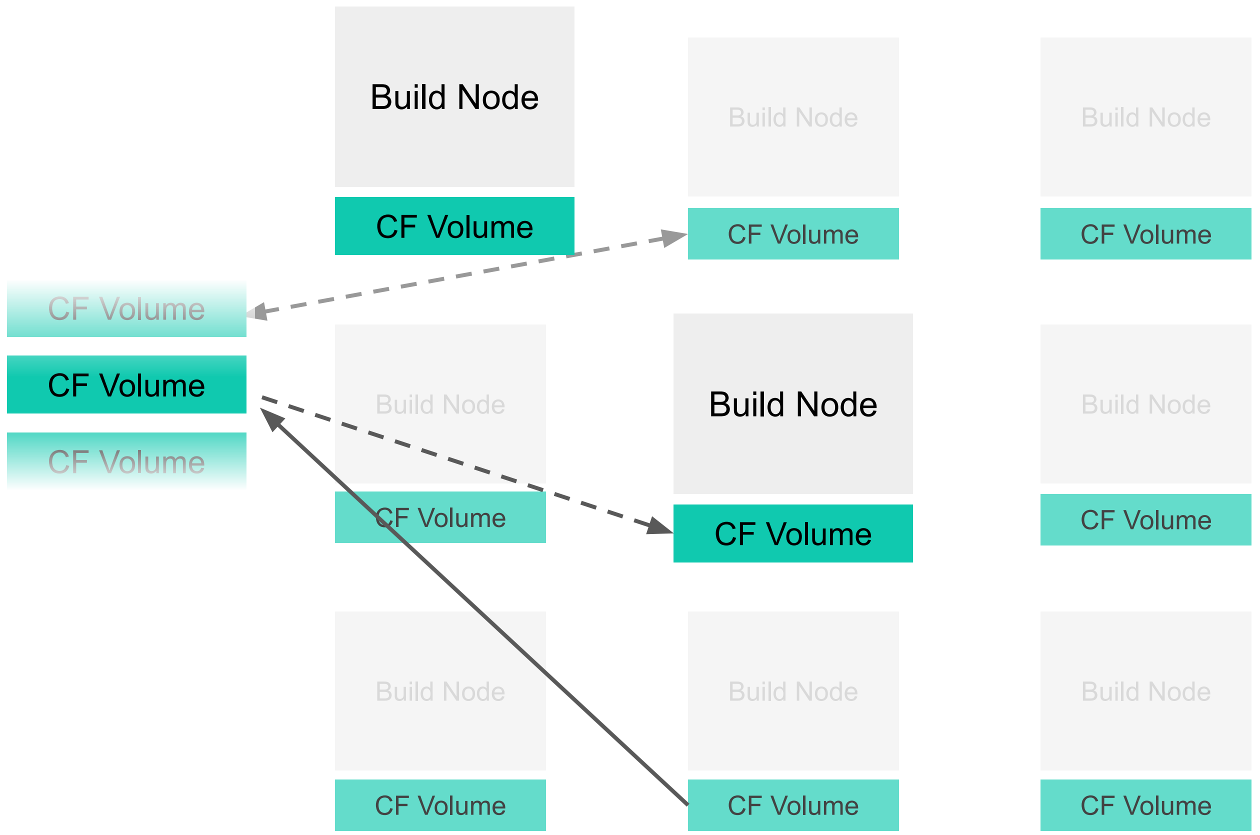
CODEFRESH BUILD OPTIMIZATION

Every step a container

Codefresh attaches build volumes



Codefresh Distributed Caching

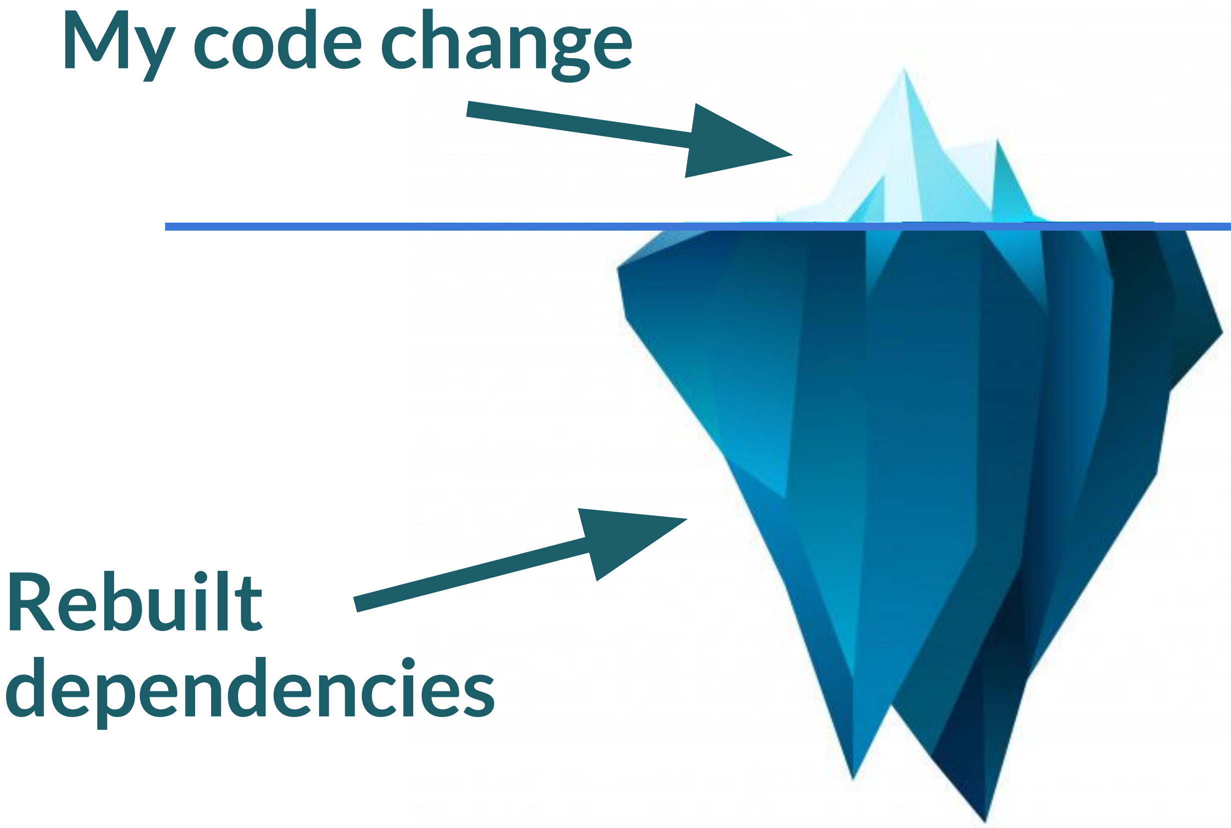


Demo 1:
Using Distributed Cache

https://g.codefresh.io/build/5d831fed577e2f81e4569104

Demo 2: Running Locally

```
$ codefresh run 'Go Speed/Hugo Build' --local
```



80-90%

Build Time is Wasted!

My code change

Only Rebuild the Part that changes

- Cached Docker Layers
- Gradle Cache
- Go Cache
- Bazel

codefresh

DevOps.com

Caching

Go has GOPATH

Using ${{CF_VOLUME_PATH}} for your go path with cache the modules.

Java has Gradle Cache

Using ${{CF_VOLUME_PATH}} for your gradle cache.

Bazel has Cache

Using ${{CF_VOLUME_PATH}} for your gradle cache.

Build Volume

Caching

Go has GOPATH

Using ${{CF_VOLUME_PATH}} for your go path with cache the modules.

Java has Gradle Cache

Using ${{CF_VOLUME_PATH}} for your gradle cache.

Bazel has Cache

Using ${{CF_VOLUME_PATH}} for your gradle cache.

https://github.com/todaywasawesome/bazelbuild-examples

Demo 3:
Using App Cache

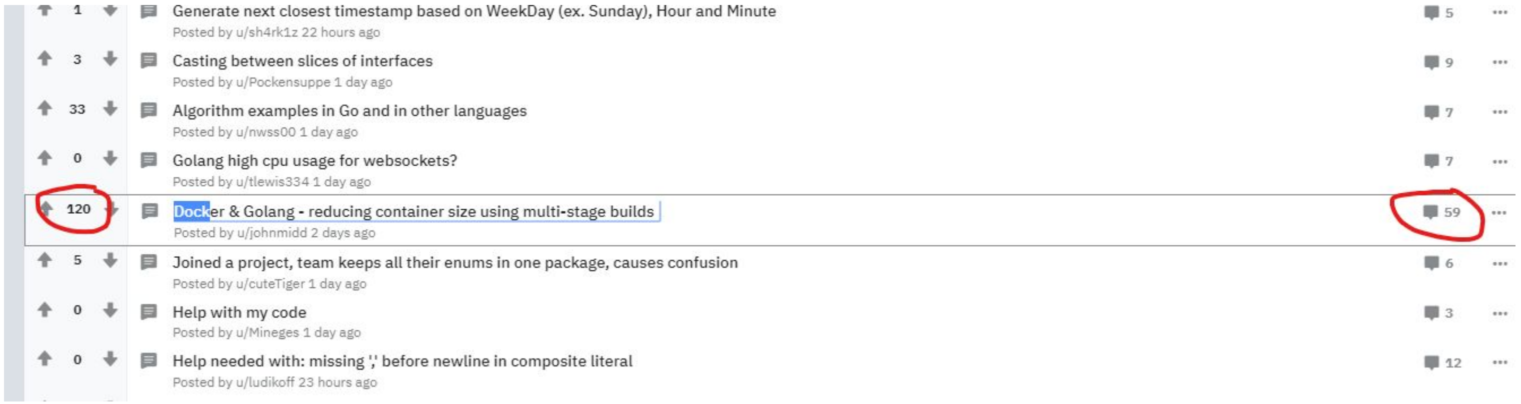
https://g.codefresh.io/build/5d82fb46c23d4552518b95e3

Demo 4: Optimizing Layers

https://g.codefresh.io/build/5d832c75353ca93b16374775

Docker multi-stage build

Multi-stage build is available starting from Docker 17.05 (released in 2017!) - so why now?



1	Generate next closest timestamp based on WeekDay (ex. Sunday), Hour and Minute Posted by u/sh4rk1z 22 hours ago	5	...
3	Casting between slices of interfaces Posted by u/Pockensuppe 1 day ago	9	...
33	Algorithm examples in Go and in other languages Posted by u/nwss00 1 day ago	7	...
0	Golang high cpu usage for websockets? Posted by u/tlewis334 1 day ago	7	...
120	Docker & Golang - reducing container size using multi-stage builds Posted by u/johnmidd 2 days ago	59	...
5	Joined a project, team keeps all their enums in one package, causes confusion Posted by u/cuteTiger 1 day ago	6	...
0	Help with my code Posted by u/Mineges 1 day ago	3	...
0	Help needed with: missing ',' before newline in composite literal Posted by u/ludikoff 23 hours ago	12	...

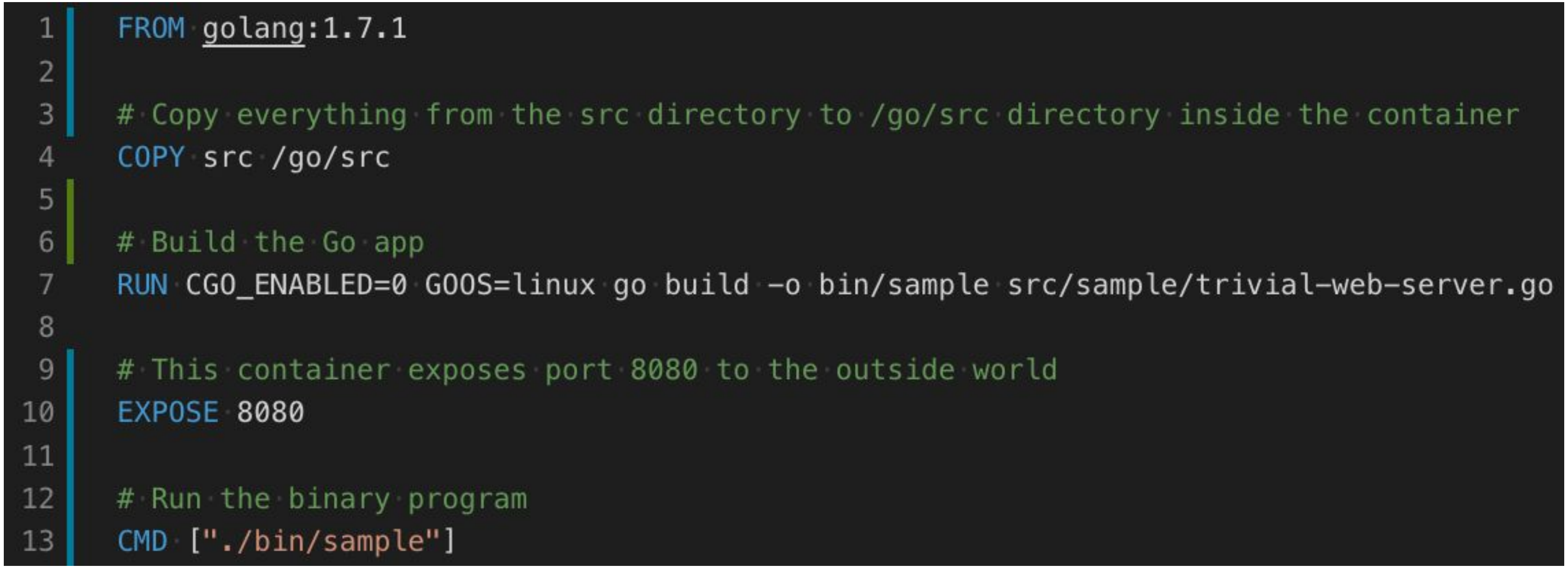
https://www.reddit.com/r/golang/comments/crkibq/docker_golang_reducing_container_size_using/

- “oh man! thank you! I've been fighting with build times on an image stack for weeks”
- “Wow, this is great for deploying tonnes of microservices!”
- “I've been meaning to use multistage builds, thanks for the walkthrough!”

Dockerfile and Docker build

- **Dockerfile -** imperative DSL that defines build commands
- Each **Docker build** command generates ONE image layer
- Complete **Docker build** execution generates ONE Docker image

Dockerfile and Docker build



```dockerfile
FROM golang:1.7.1

# Copy everything from the src directory to /go/src directory inside the container
COPY src /go/src

# Build the Go app
RUN CGO_ENABLED=0 GOOS=linux go build -o bin/sample src/sample/trivial-web-server.go

# This container exposes port 8080 to the outside world
EXPOSE 8080

# Run the binary program
CMD ["./bin/sample"]
```

Demo 5:
Docker build on GO app

https://github.com/codefresh-contrib/helm-sample-app

The Problem with Docker build

Image we want
runtime
configuration
application

X (4..10)

Image we build
Compilers, debuggers, ...
Linters, tests, profilers, ...
code, build and test logs, ...
runtime
configuration
application

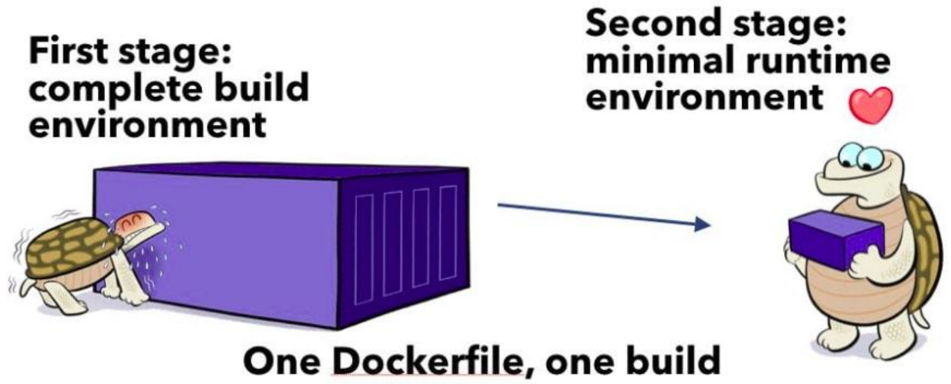
The Problem with Docker build

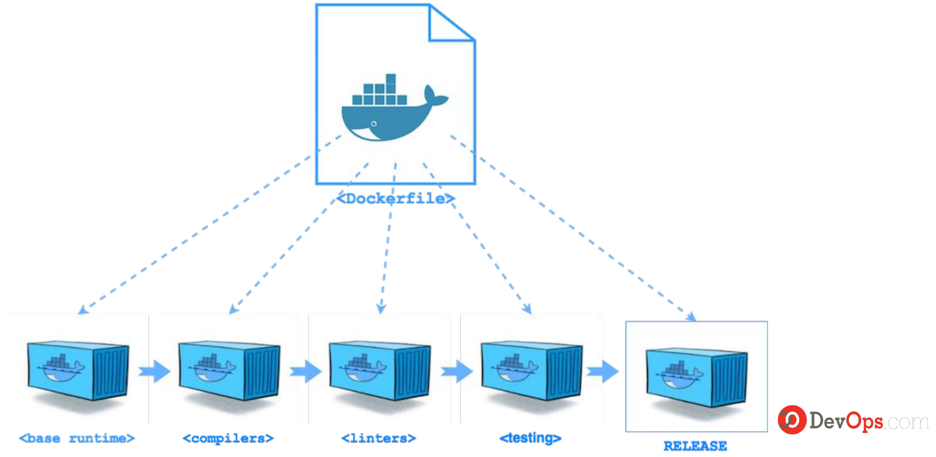
- **2 Dockerfiles**
  - 1st for build tools
  - 2nd for runtime

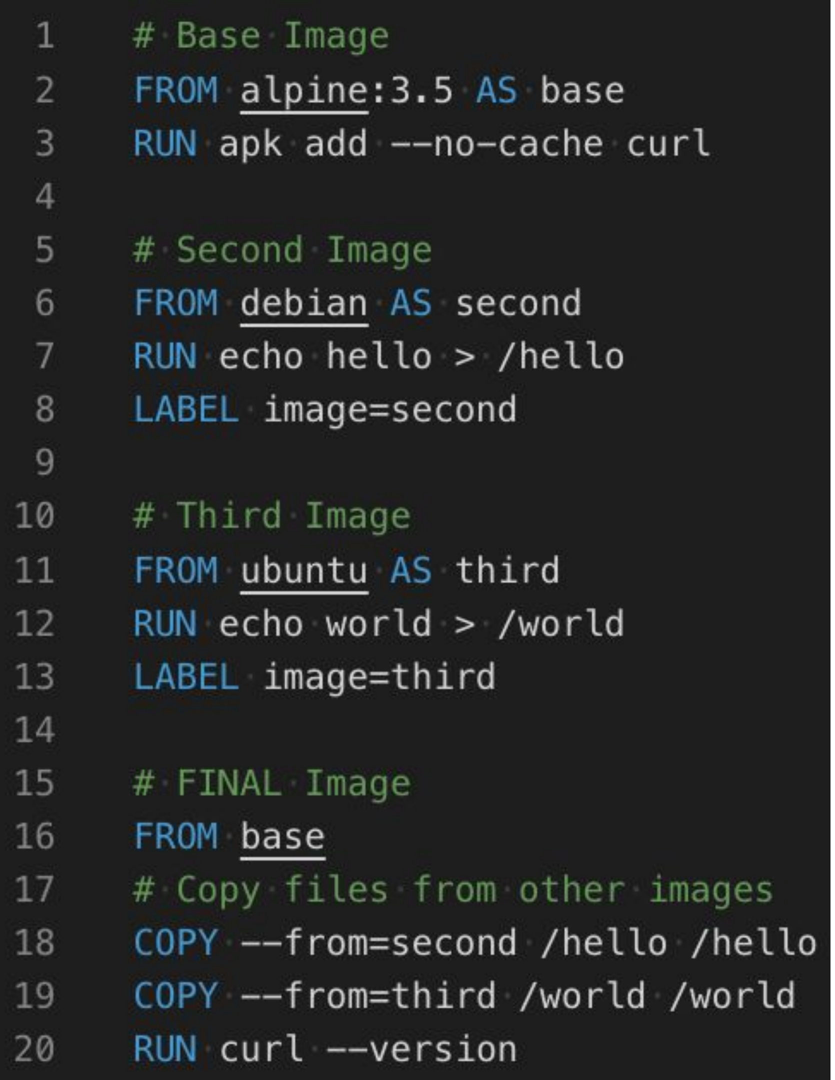
- **Drawbacks**
  - 2+ Dockerfiles
  - Orchestration needed: Bash, make, YAML, ...

Solution: Docker multi-stage build

- Benefits
  - One Dockerfile
  - One syntax to learn
  - Same build
    - Local and CI
  - Create multiple stages


First stage: complete build environment
Second stage: minimal runtime environment
One Dockerfile, one build



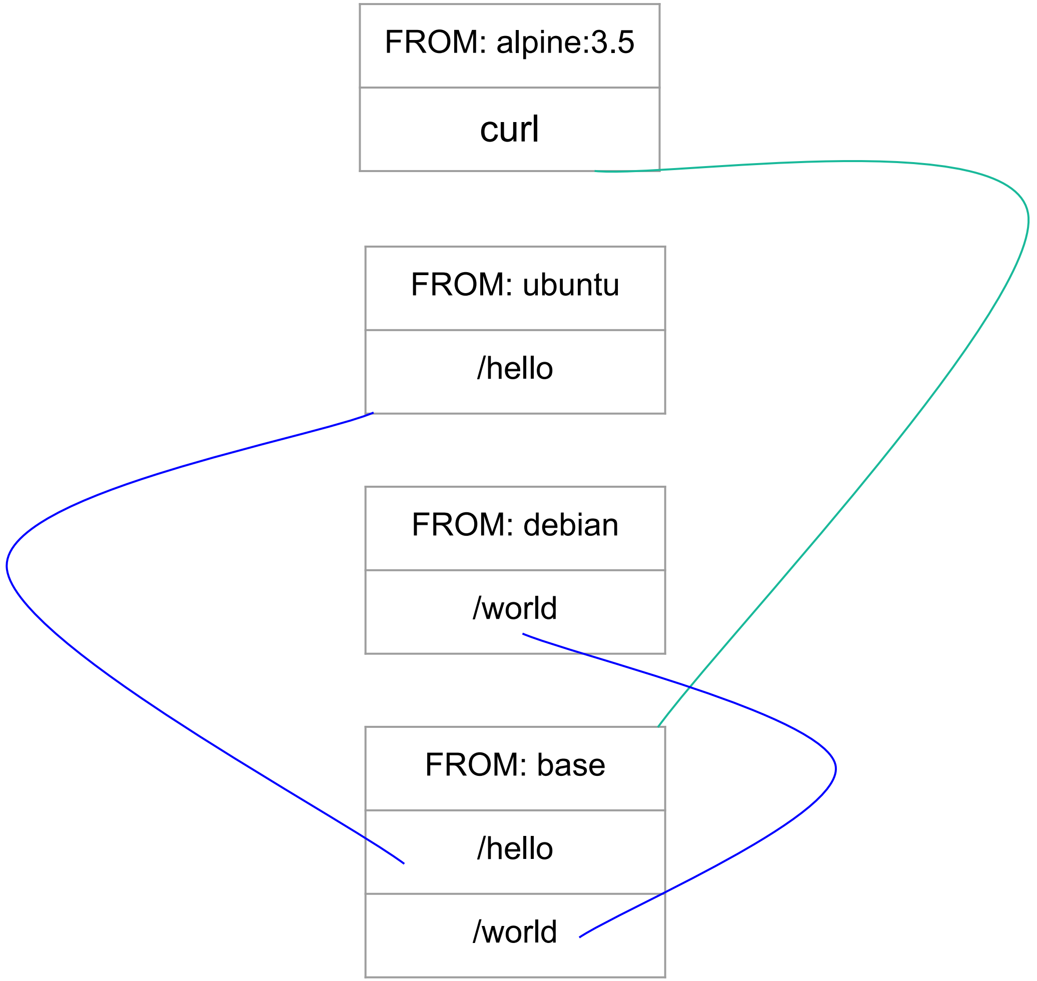


```
# Base Image
FROM alpine:3.5 AS base
RUN apk add --no-cache curl

# Second Image
FROM debian AS second
RUN echo hello > /hello
LABEL image=second

# Third Image
FROM ubuntu AS third
RUN echo world > /world
LABEL image=third

# FINAL Image
FROM base
# Copy files from other images
COPY --from=second /hello /hello
COPY --from=third /world /world
RUN curl --version
```



Demo 6:
Docker multi-stage build

Docker multi-stage build

You can enjoy multi-stage build with every programming language (not only GO):

- GO example - https://codefresh.io/docs/docs/learn-by-example/golang/golang-hello-world/#create-a-multi-stage-docker-image-for-go
- JAVA example - https://codefresh.io/docs/docs/learn-by-example/java/spring-boot-2/#spring-boot-2-and-docker-multi-stage-builds
- Node example - https://codefresh.io/docs/docs/learn-by-example/nodejs/react/#react-and-docker-multi-stage-builds
- PHP example - https://codefresh.io/docs/docs/learn-by-example/php/#the-example-php-project

Docker anti-patterns https://codefresh.io/containers/docker-anti-patterns/

Summary

- Saving just 5 min is worth big $$
- Distributed Caching is basically free optimization
- Pair with Application Cache

Summary

- Using 1 Docker image for both build and production results in slow deployment and lots of CVE violations

- Multi-stage build to produce lean, secure and production ready Docker image

- On Codefresh, speedier builds thanks to caching across all images and layers

Questions?

Try it free at
codefresh.io

Upcoming Events

Codefresh.io/events