

Living in a Box

Clojure in a World of Containers

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Who me?

On Twitter: [@MaximumGilliard](https://twitter.com/MaximumGilliard)

Coding in Clojure since 2010 (ish?)

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Clojure in Containers



The JVM in Containers

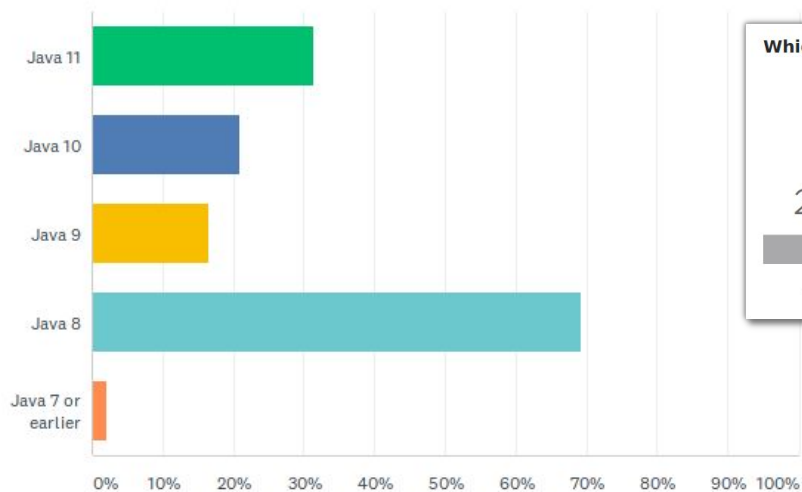


Clojure Programmers

Q16

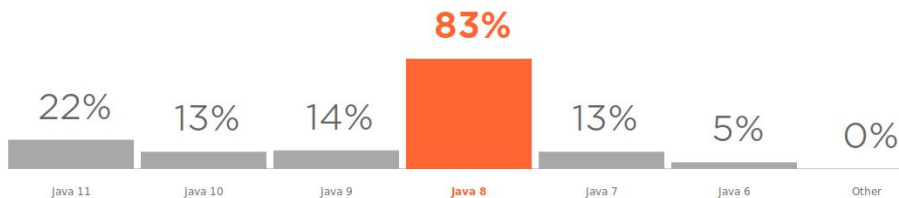
What versions of Java do you target?

Answered: 2,263 Skipped: 198



Java Programmers

Which versions of Java do you regularly use?



The JVM in Containers

- Fast Startup
- Efficient Images
- Respect your Environment



Fast Startup

Move Startup activities to Build Time



Fast Startup

Move Startup activities to Build Time

Class Data Sharing &

Application CDS



Fast Startup

Move Startup activities to Build Time

AOT Compilation with Graal



Efficient Images



Efficient Images

- Small Size
- Use Layers to your Advantage



Efficient Images

→ Small Size

Use an Alpine Linux base image



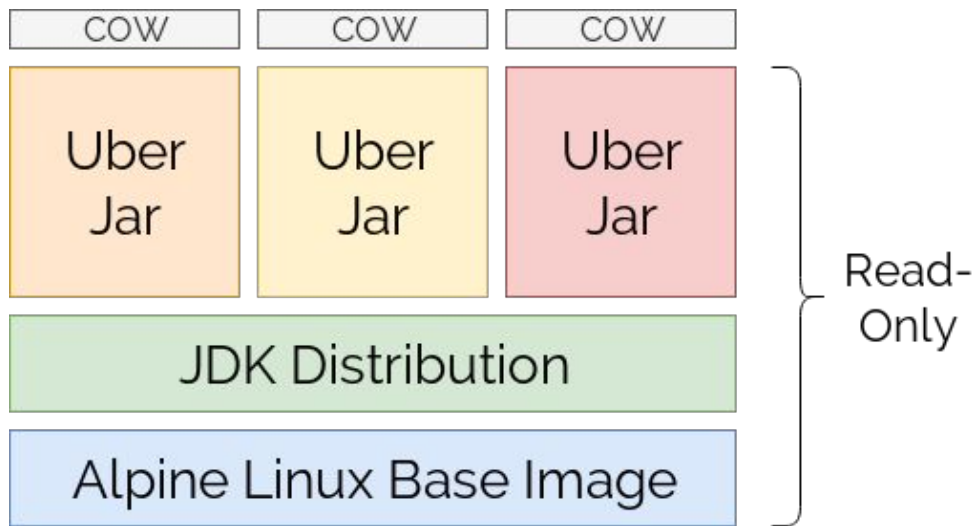
Efficient Images

→ Use Layers to your Advantage



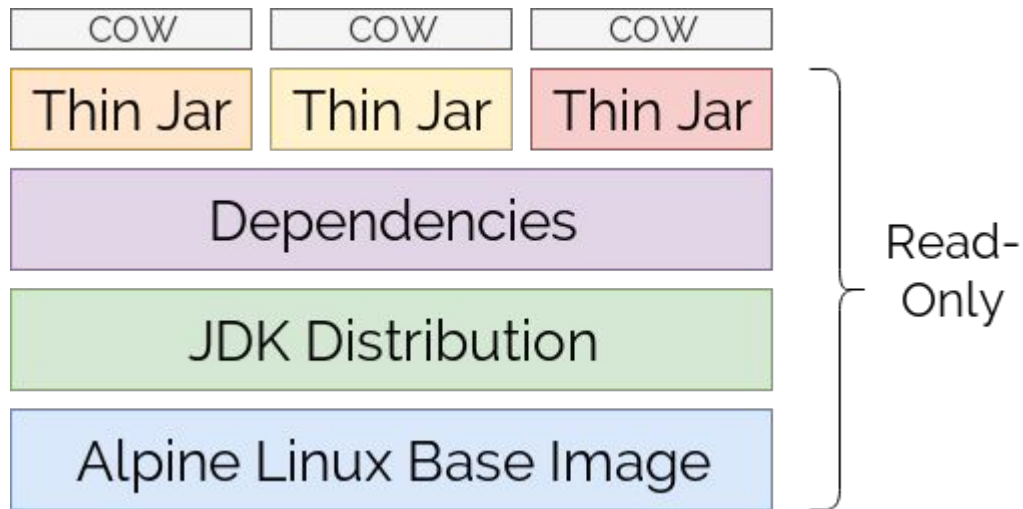
Efficient Images

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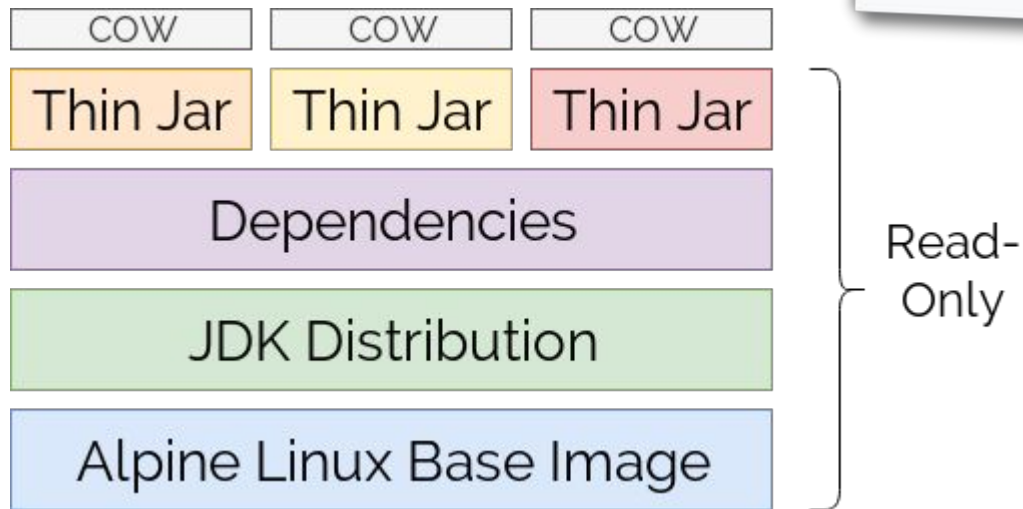
Efficient Images

→ Use Layers to your Advantage



Efficient Images

→ Use Layers to your Advantage



Respect the Environment



Respect the Environment

The container environment can have a **restricted** view of CPU/memory/etc compared to the host.



Respect the Environment

JVM self-tunes based on

Available RAM

Available CPUs

This is called **ergonomics**



Respect the Environment

Depending on available **memory**,

JVM ergonomics selects:

- Heap space,
- Compiler/GC cache sizes
- Which GC to use



Respect the Environment

Depending on available **CPUs**,

JVM ergonomics selects:

- GC/Compiler threadpool sizes
- `Runtime::getAvailableCPUs`



Respect the Environment



Good news everyone!

This isn't your problem!
It's the JVM engineers'.

Use **Java 8 u212** or later
(or better yet, Java 11)



Respect the Environment

Checking up on ergonomics:

```
docker run adoptopenjdk/openjdk11:alpine \  
  java -XX:+PrintFlagsFinal -version \  
    | grep ergonomic
```



Thank You!

Clojure in a World of Containers

Slides online soon → @MaximumGilliard

