The rise of Docker, and the future of computing

Arnaud Porterie - @icecrime - 2015-09-29 - HPTS

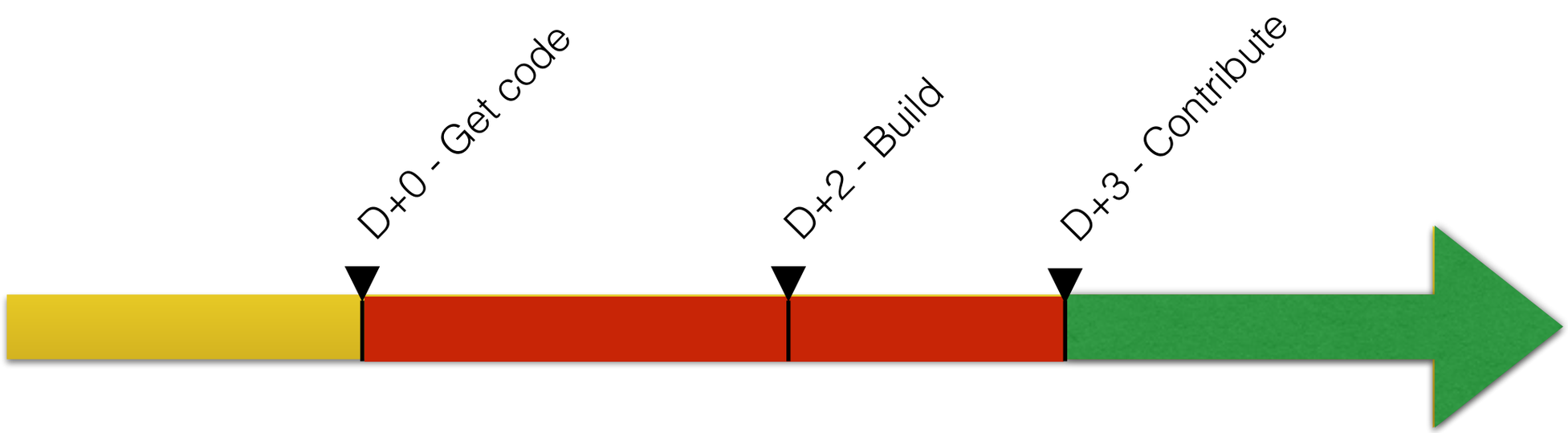
Who am I?

- Arnaud Porterie, @icecrime on  and 
- Core maintainer of the Docker open source project
- Engineering manager at Docker

From dev to prod, what is now different with Docker?

Developer onboarding

- Development dependencies described in a wiki page
- ~2 days process (when things go right)
- Team must keep the document up to date



Developer onboarding

- Docker value: **the builder**
- Development environment as code, with the `Dockerfile` as the source of truth
- **Universal**: get code, `docker build`, `docker run`
- *Docker own dev environment is in Docker*

Developer onboarding

14 lines (10 sloc) | 272 Bytes

```
FROM golang:1.4.2
MAINTAINER Arnaud Porterie <icecrime@docker.com>

# Install GB dependency manager
RUN go get github.com/constabulary/gb/...

# Build the project
ADD . /src
WORKDIR /src
RUN gb build all

# Set the entrypoint
ENTRYPOINT ["/src/bin/vossibility-collector"]
```

Continuous integration

- Traditionally: specific hosts test a specific app
- Managed by the individual dev teams
- “Works on my machine” syndrome

Continuous integration

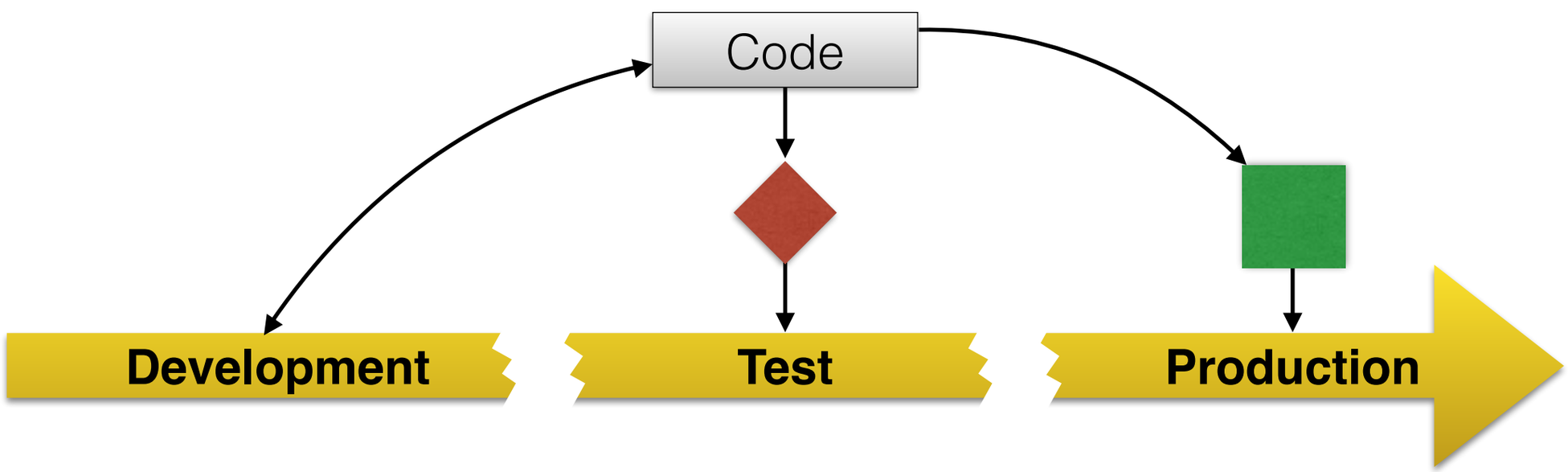
- Docker value: **repeatability through isolation**
- Running containers don’t share anything by default
- Tests don’t interfere with each other, no traces on host

Continuous integration

- Docker value: **universality of operations**
- Standard way to build & run across languages & stacks
- *Docker own tests are run in a Docker container*

Deployment

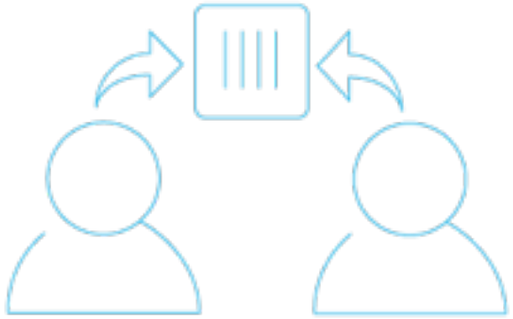
- Dependency management
- Specialized ops for a set of services



Deployment

- Docker value: **unified artifact**
- The Docker image is the artifact you **build** once, **test**, **ship** & **run** in production

Deployment



- Docker value: **collaboration**
- Docker Hub, on prem. Docker Registry
- Define deployment workflow, permissions

Summing it up

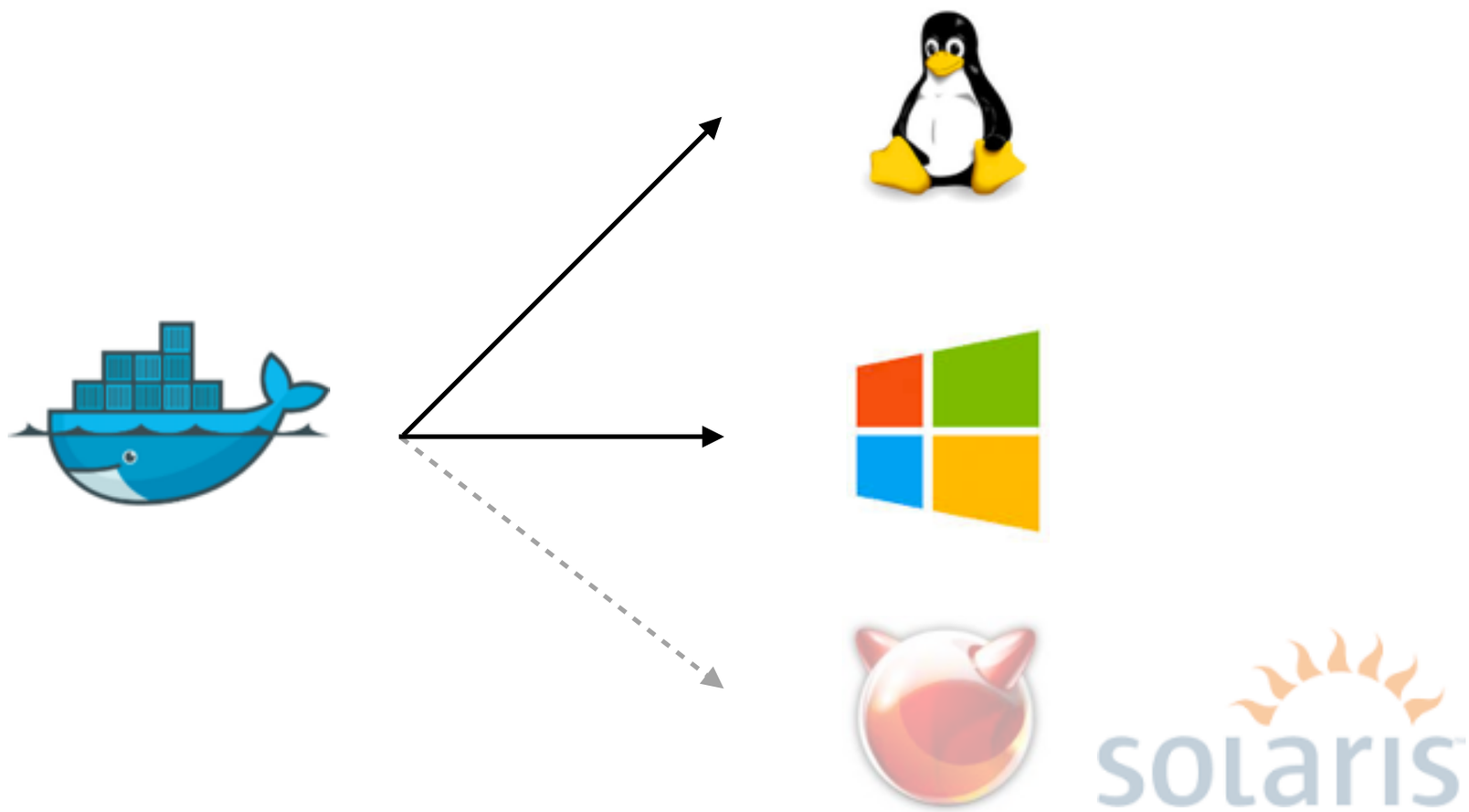
- Docker elegantly solves very common problems
- Makes modern best practices natural
  - Repeatability (e.g., host independence)
  - Immutability (the Docker image is the unit)
  - Single responsibility principle (microservices)

Docker is established as an essential building block for distributed applications

What’s next?

Operating system

- Docker abstracts underlying OS differences
- Defines a unified API for processes management



Operating system

- Race for the “best OS for running containers”

RANCHEROS

Nano Server

Linux kernel

- Linux containers have existed for ~ a decade, but never had as much attention than in the past 2 years
- Downside: aggressive kernel version requirements can contribute to slowing down adoption

Container runtime

- The Open Container Initiative
- Driven by a group of technical experts (Docker, Google, RedHat, CoreOS, IBM, …)

https://www.opencontainers.org

THE LINUX FOUNDATION

User experience

- Docker succeeded at the frontier of dev & ops
- Containers are now in everybody's hands
- Can one size fit all?

Dev

Ops

Docker

Early adopters

Skeptics

Want Docker end-to-end

Evaluating for production

Well established

Rapidly growing


experience
fast
iteration
one-click deploy
magic
share
in code
one-click deploy
one-click deploy
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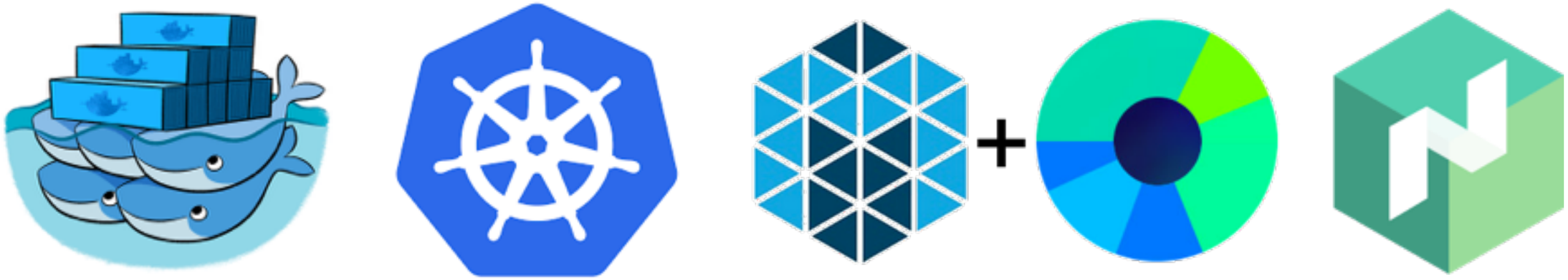
Orchestration

- Currently the biggest area of innovation



- Challenges: networking, storage, service discovery, monitoring, log aggregation, …

Orchestration

Will a standard for orchestration emerge?

Thank you!
Questions?

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