DockerCon Day 1
Welcome

dockercon 15

SF JUNE 22-23

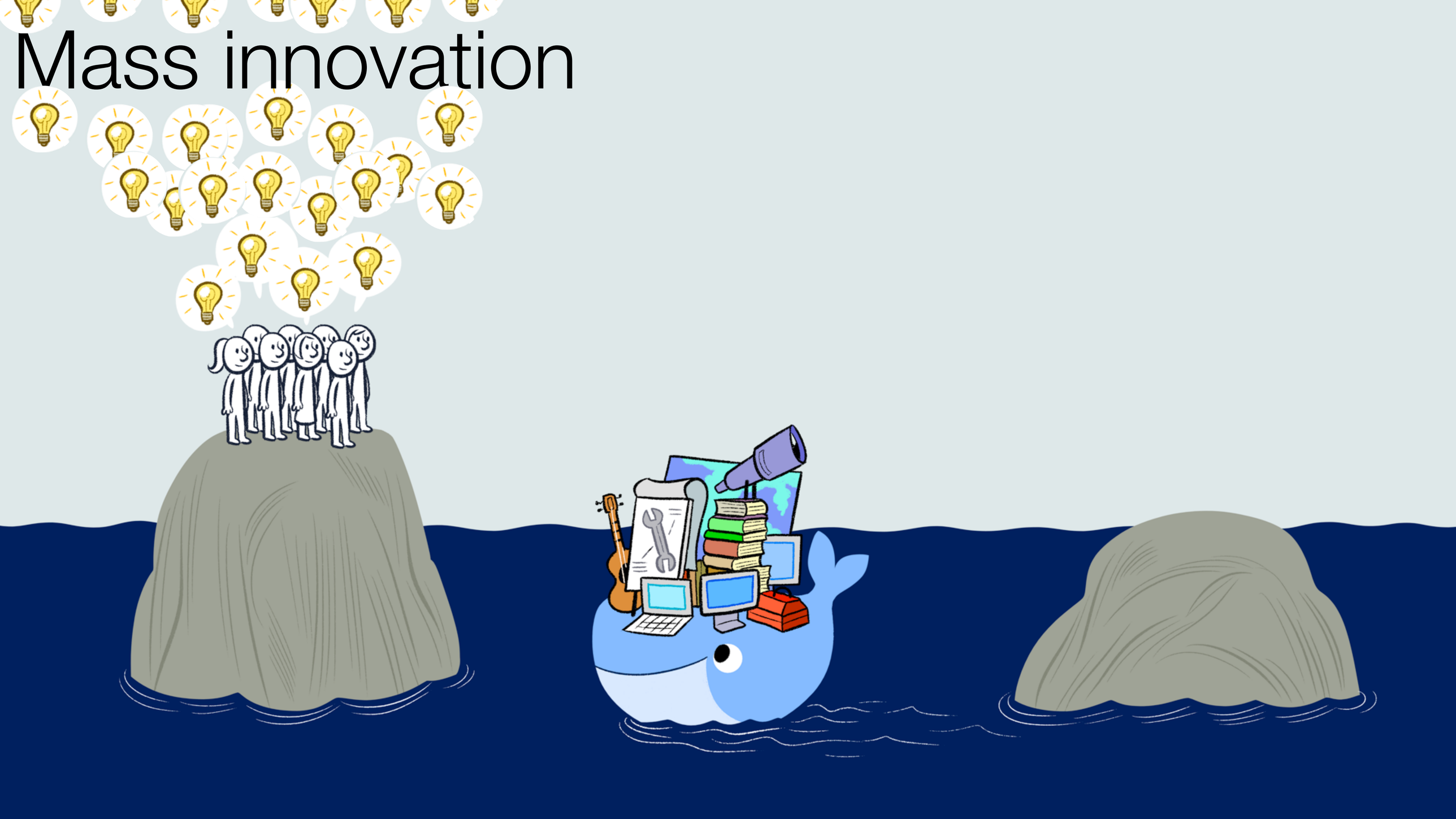
Our mission is to build

tools of mass innovation

Billions of creative people

Incredible technology

Mass innovation

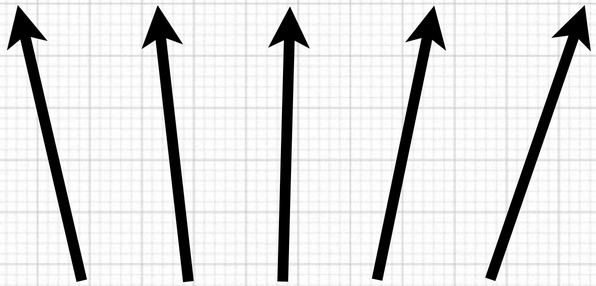


What is the biggest innovation multiplier today?

What is the biggest
innovation multiplier today?

PROGRAMMING

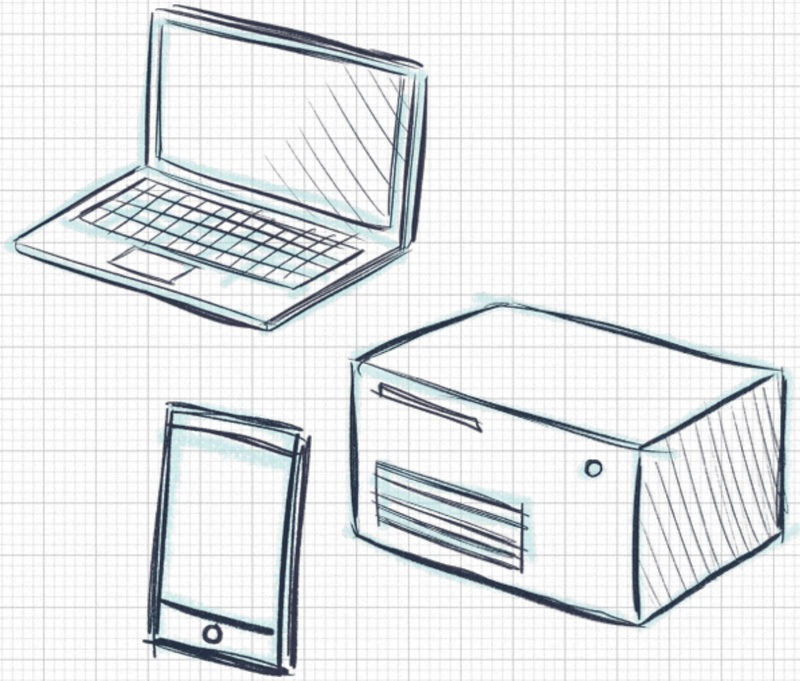
Mass innovation



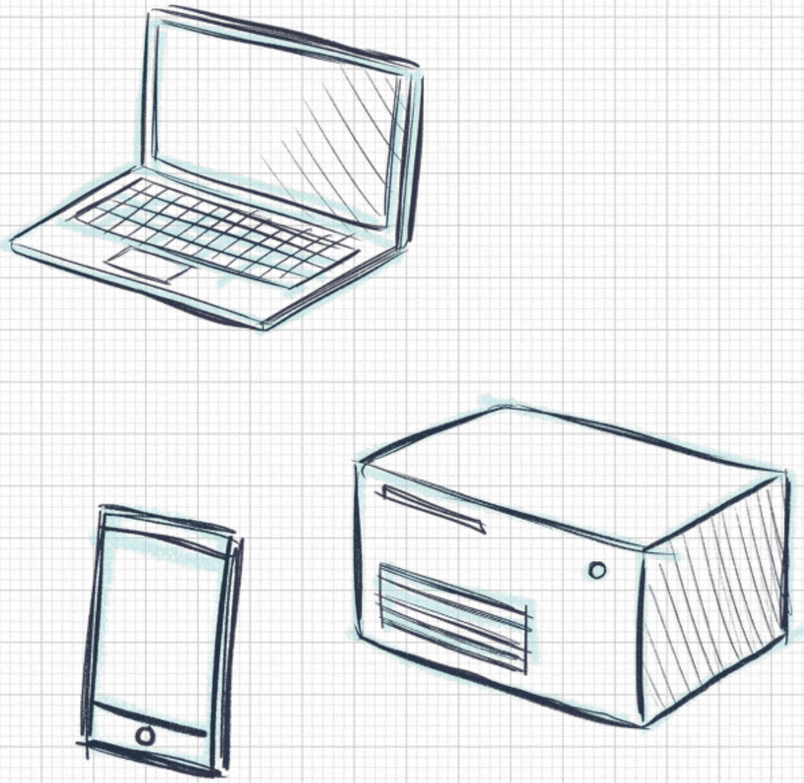
Millions of programmers

Make it programmable

New hardware
can do incredible things



What new hardware could do incredible things if made programmable?



The Internet is pretty cool...

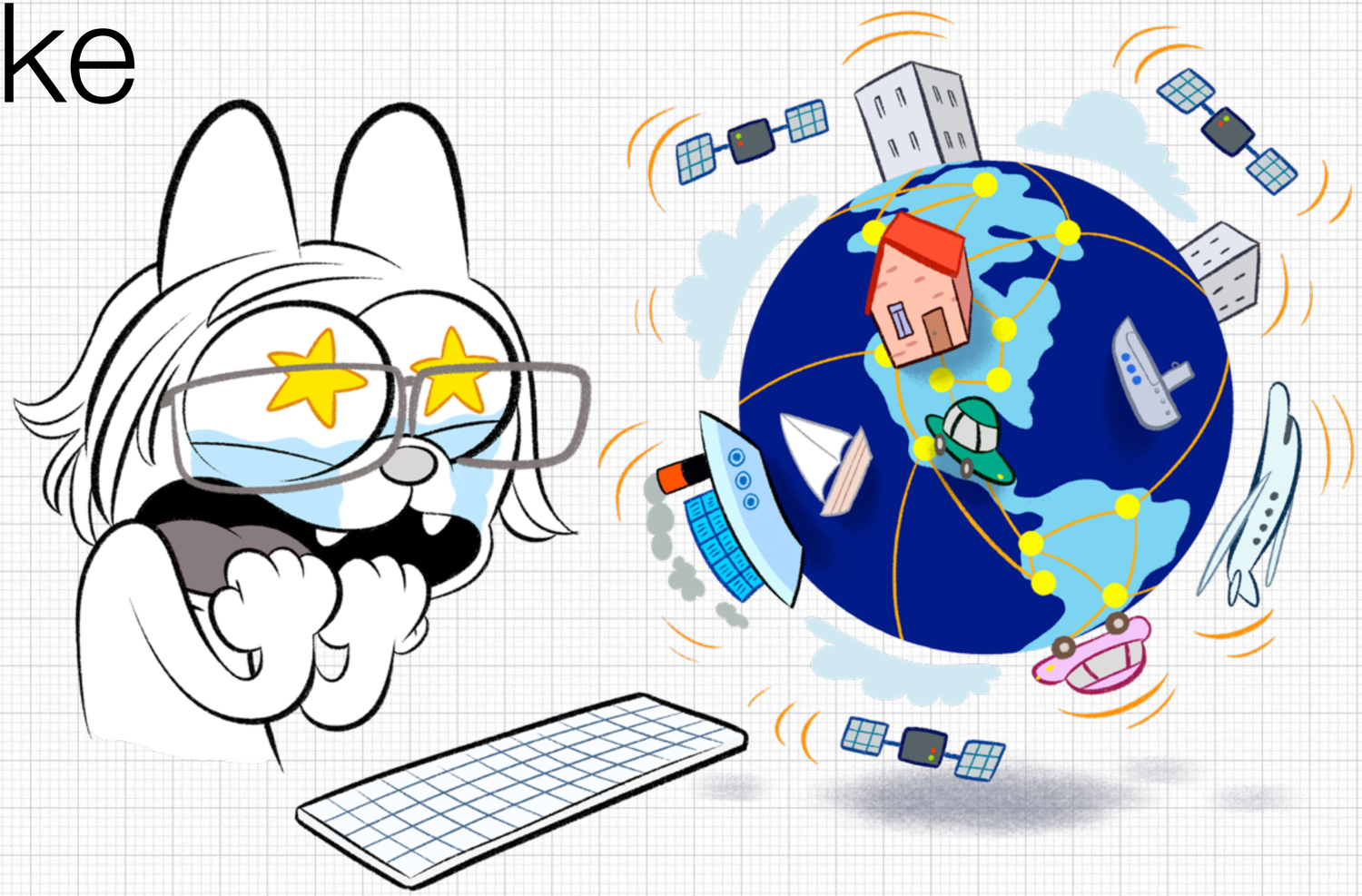
The Internet is pretty cool...

and getting lots of upgrades!

Servers, phones, TVs, cars, sensors, drones, homes, watches, maps, payment systems, scientific equipment, virtual worlds, data banks, crypto-currencies...

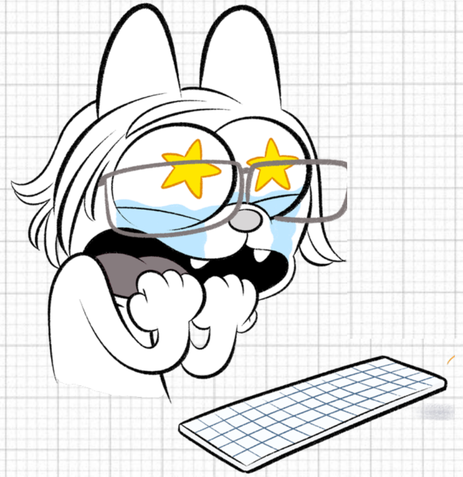
Could we make the Internet...

Could we make the Internet...

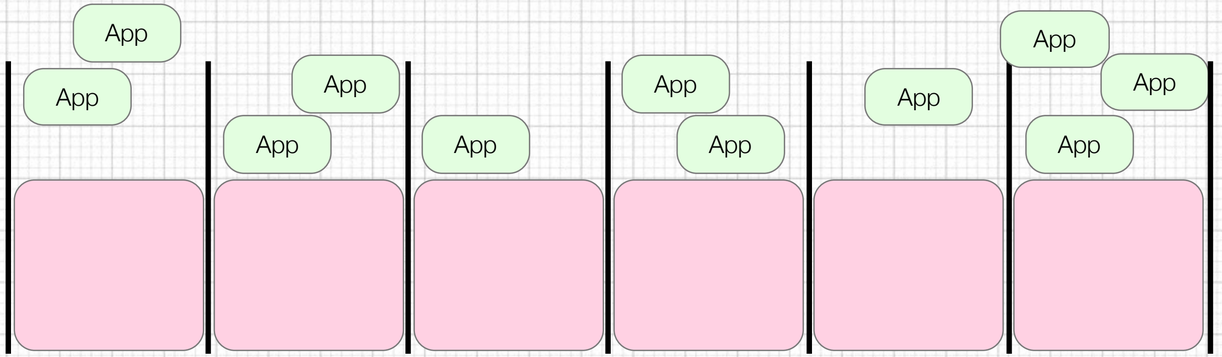


PROGRAMMABLE?

Eager developer

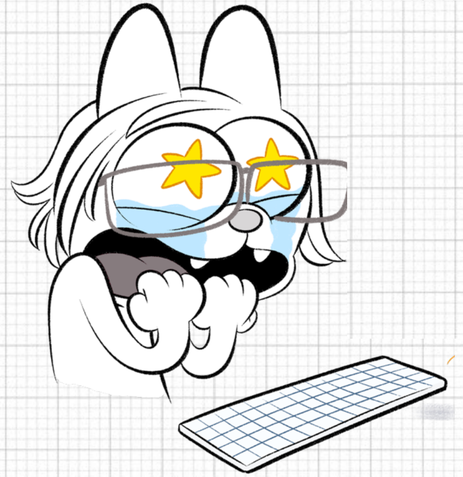


Software walled gardens

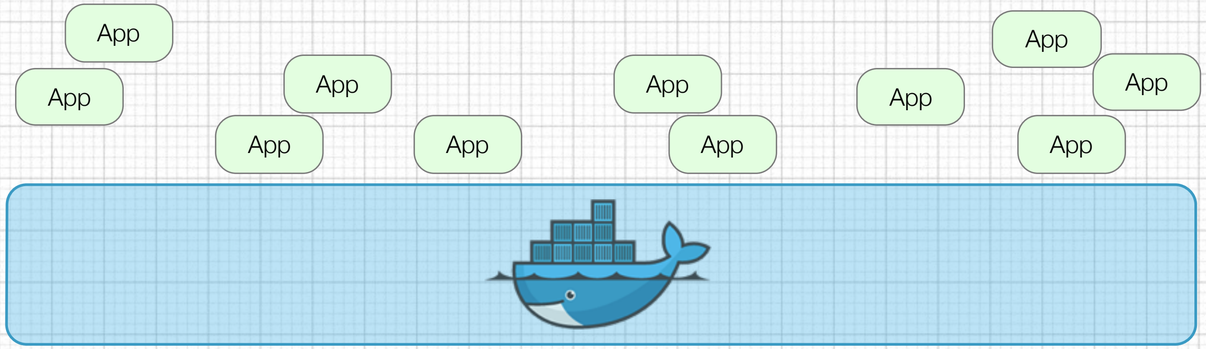


The Internet

Happy developer



Open software layer



The Internet

For the next 5 years
we’re going to build a software layer

to make the Internet programmable

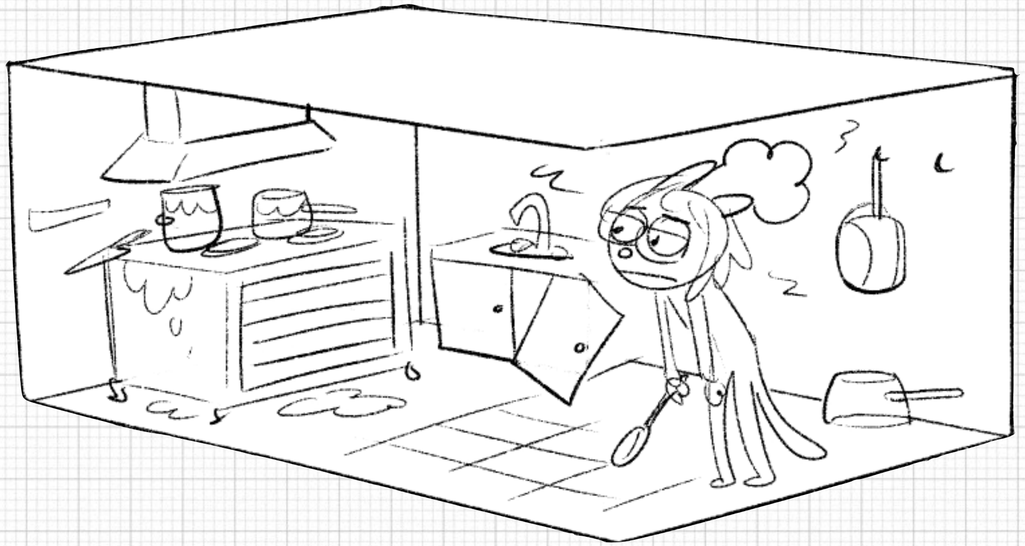
How do we get there?

4 big goals.

Goal 1

Reinvent the programmer’s toolbox

Building distributed applications is too hard, because the tools are not adequate.



Developer experience matters!

Let’s give programmers a toolbox designed for distributed applications.

Incremental Revolution

1. Choose one fundamental problem.
2. Solve it in the simplest possible way.
3. Repeat.

Problem 1: runtime

- “How do I run my code repeatably on different machines?”

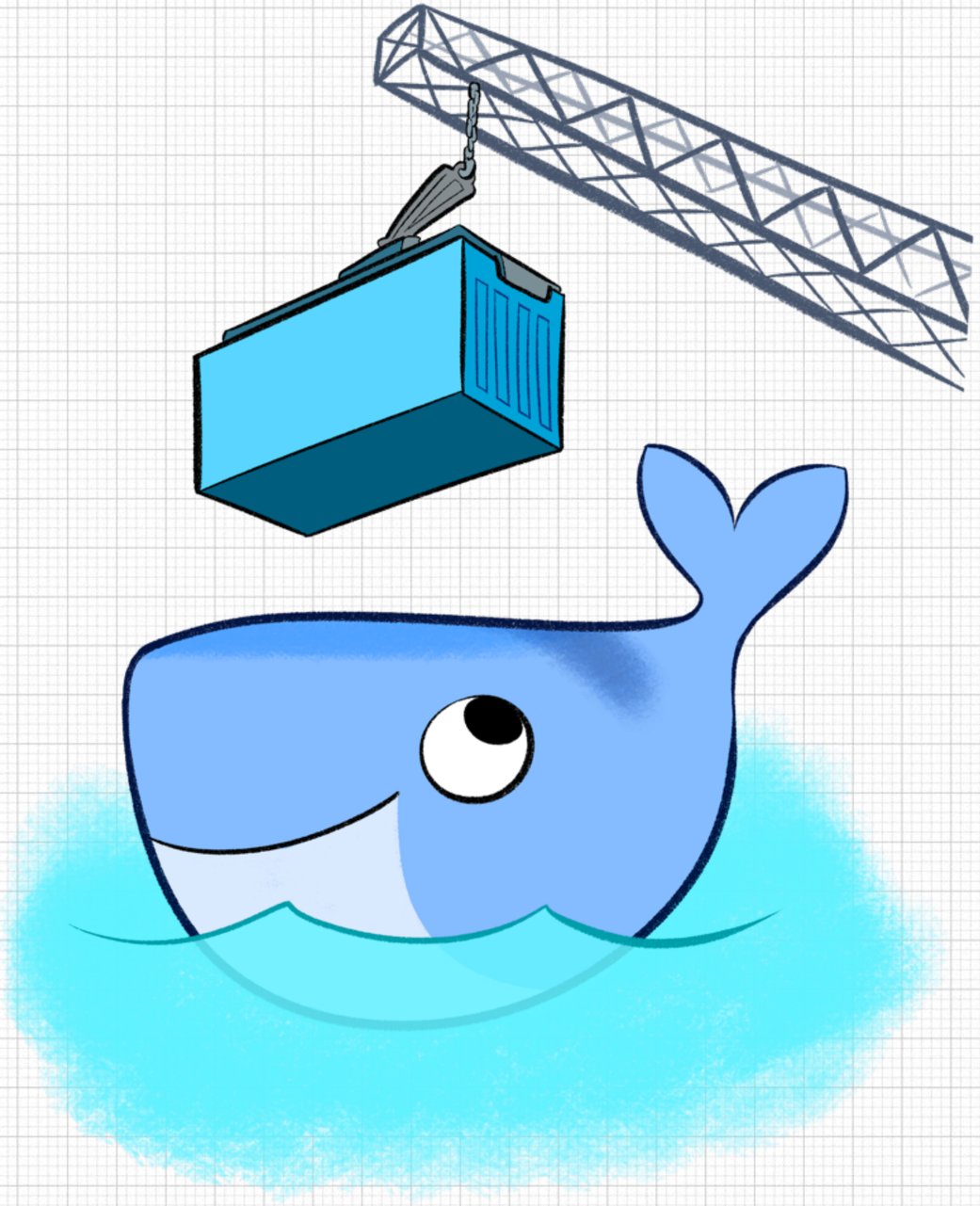
Docker
container runtime

Problem 1: runtime

- Problem 2: packaging & distribution

- “How do I ship my code across many different machines?”

Docker distribution tools



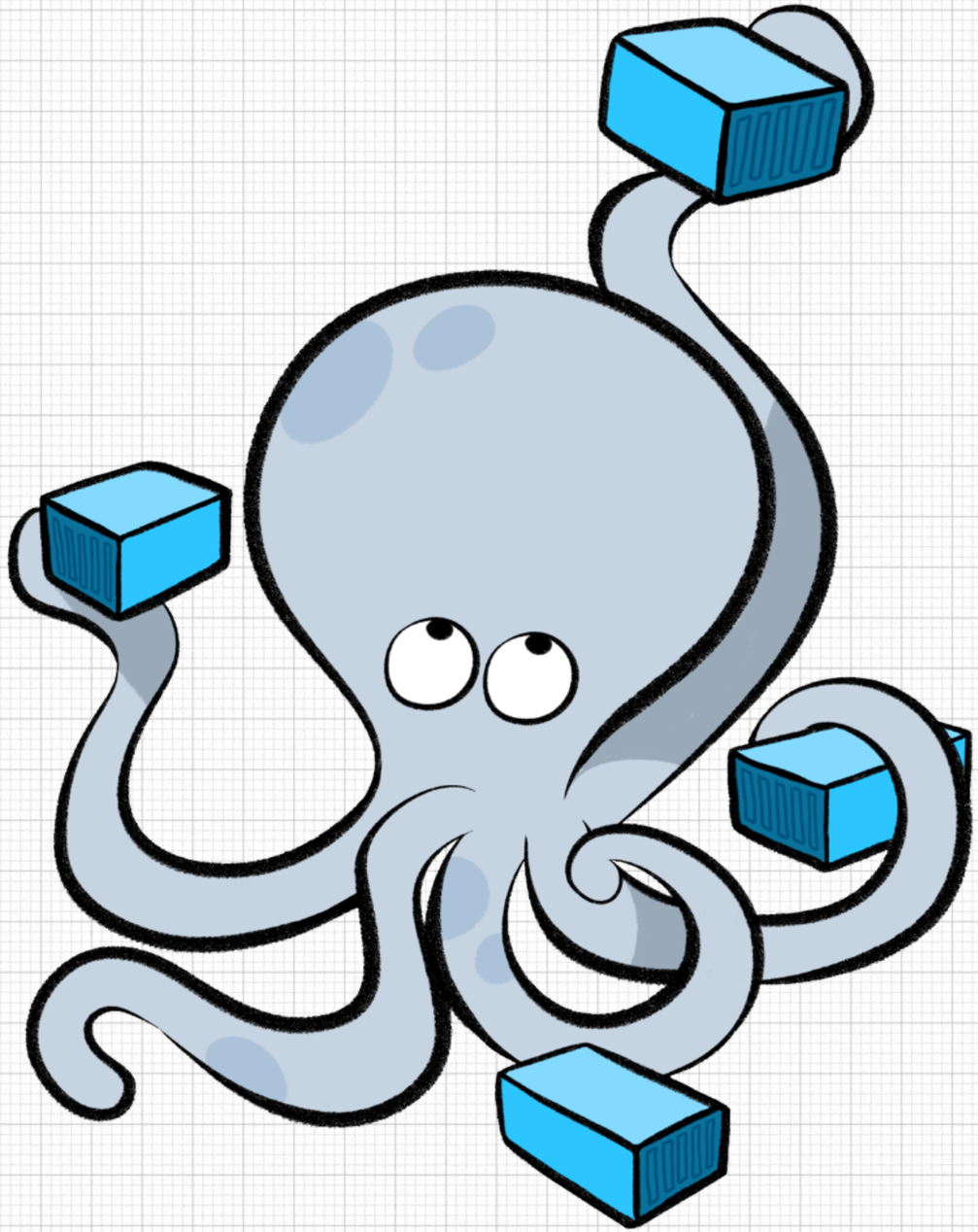
Problem 1: runtime

Problem 2: packaging & distribution

- Problem 3: service composition

- “How do I organize my application in scalable services?”

Docker Compose



Problem 1: runtime

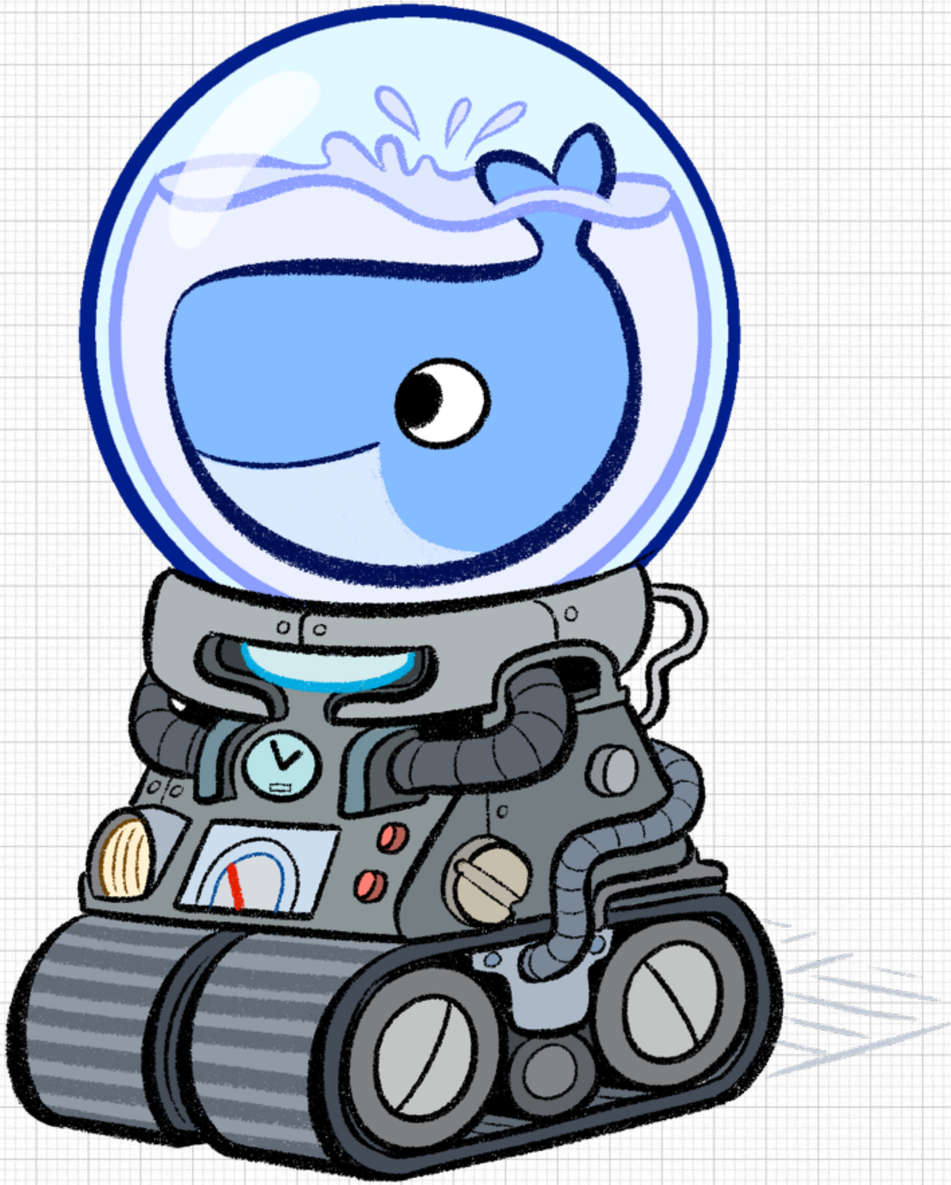
Problem 2: packaging & distribution

Problem 3: service composition

- Problem 4: machine management

  - “How do I deploy many machines to run my code?”

Docker Machine



Problem 1: runtime

Problem 2: packaging & distribution

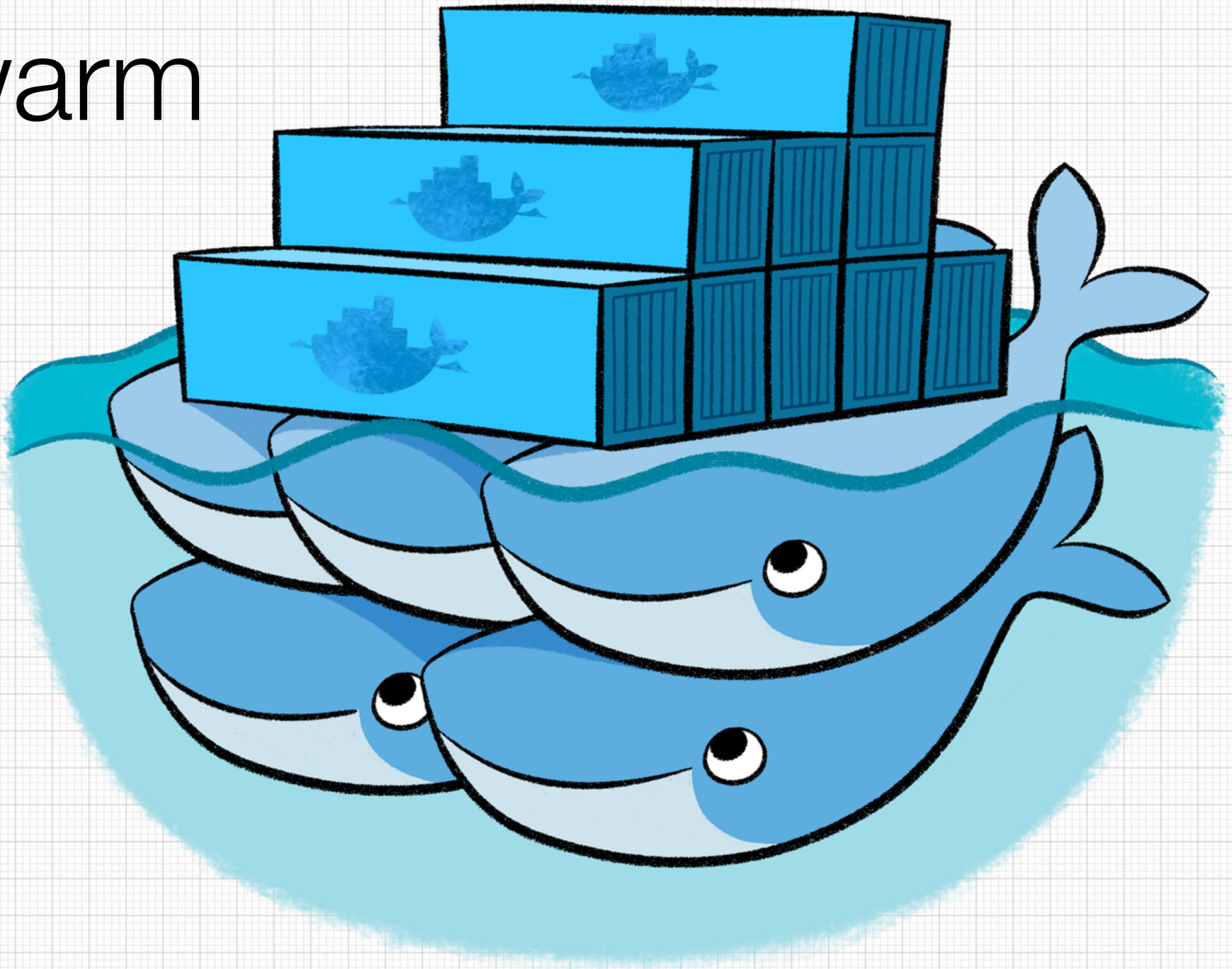
Problem 3: service composition

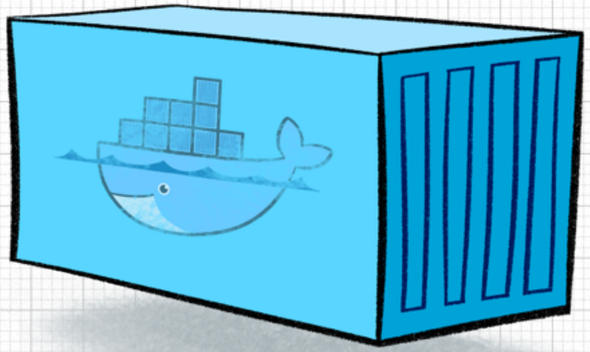
Problem 4: machine management

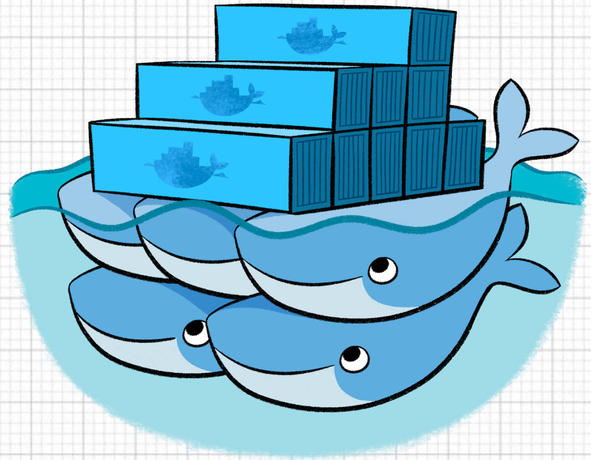
- Problem 5: clustering

  - “How do I stop worrying about individual machines?”

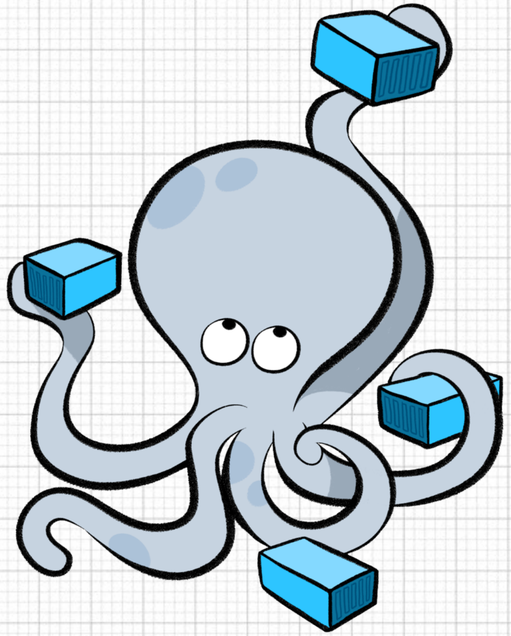
Docker Swarm

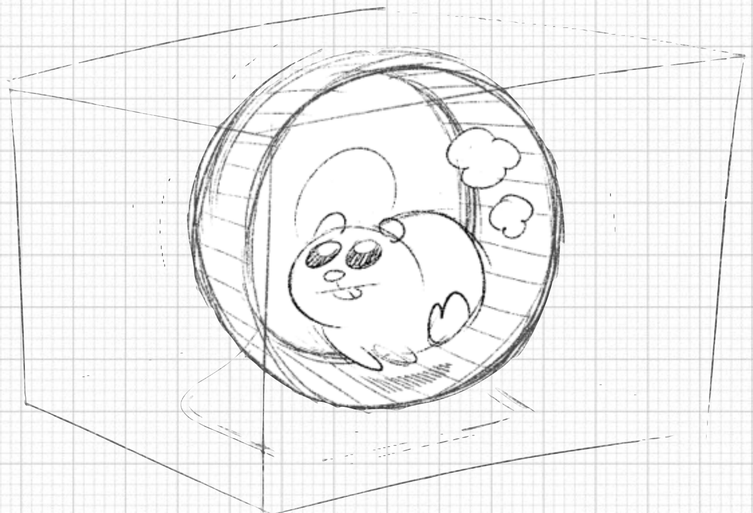


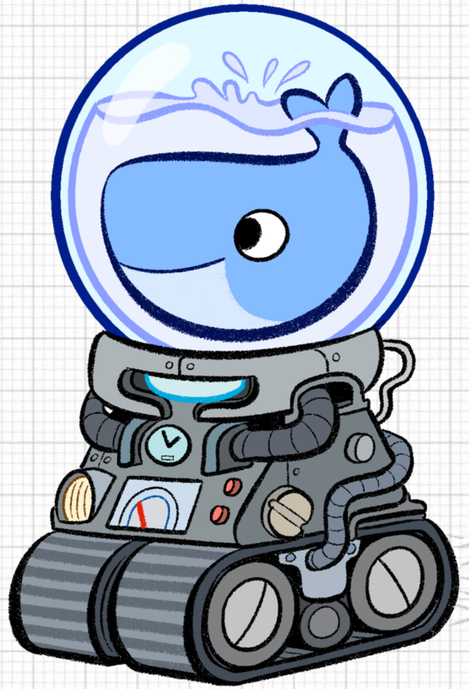




This is what
incremental revolution
looks like.

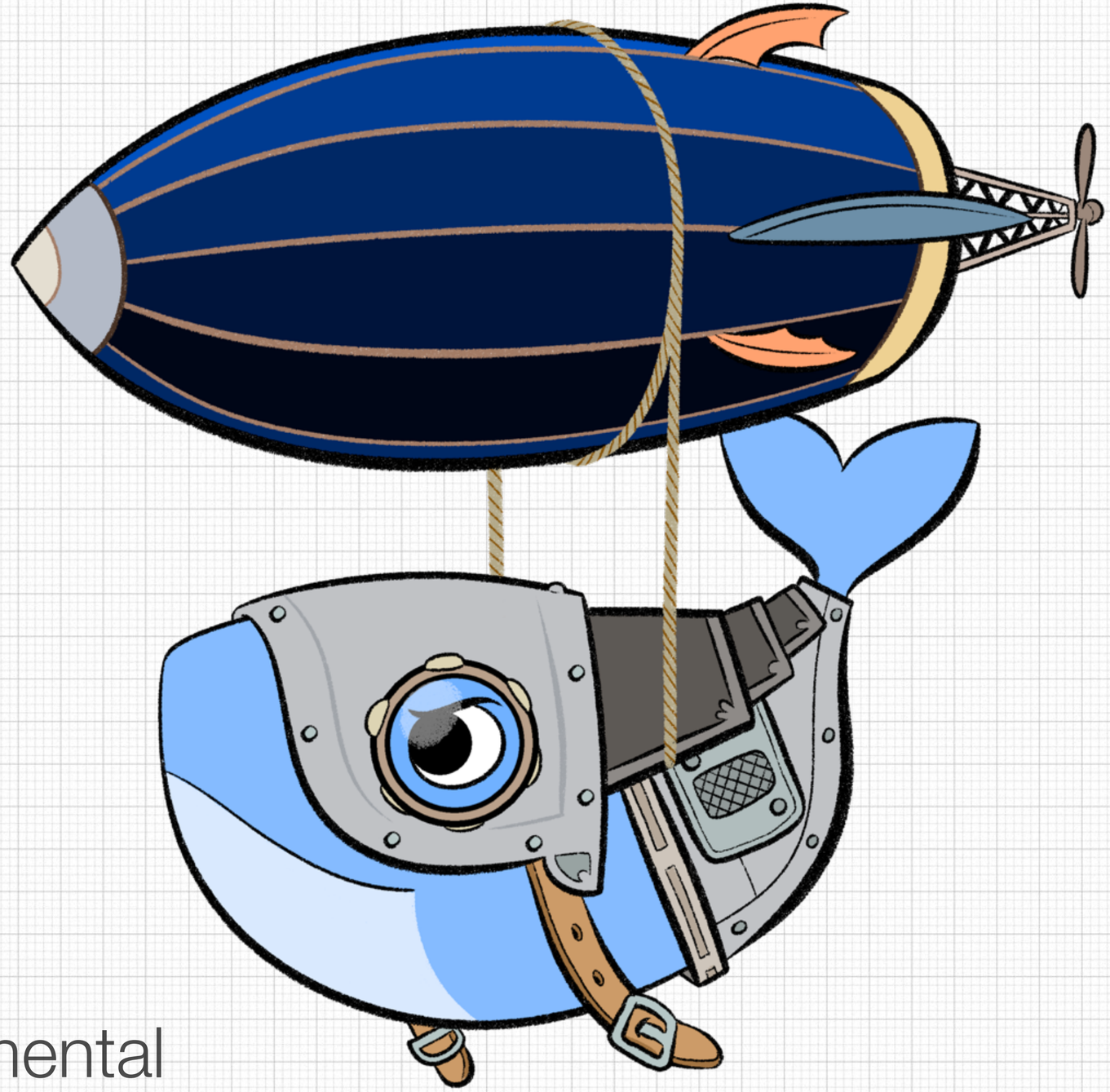




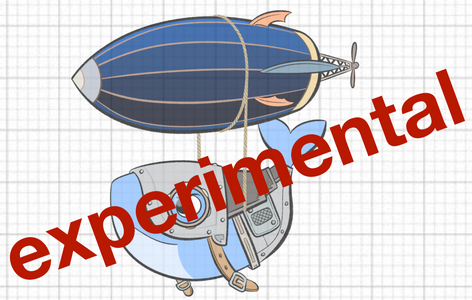


“What problems are you solving next?”

Docker experimental releases



https://docker.com/experimental


experimental

Problem 1: runtime

Problem 2: packaging & distribution

Problem 3: service composition

Problem 4: machine management

Problem 5: clustering

Problem 6: networking

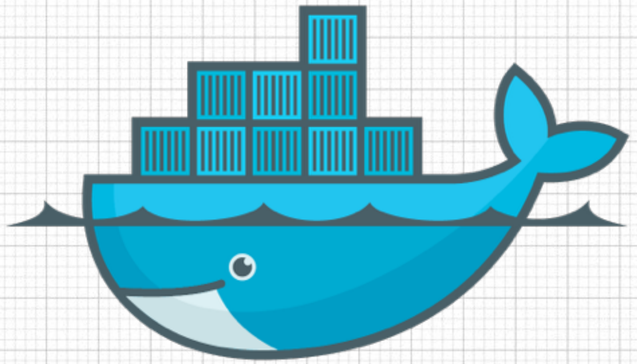
“How do I securely connect my containers across machines?”

The network should be part of the application, not the other way around.

Earlier this year...

SocketPlane

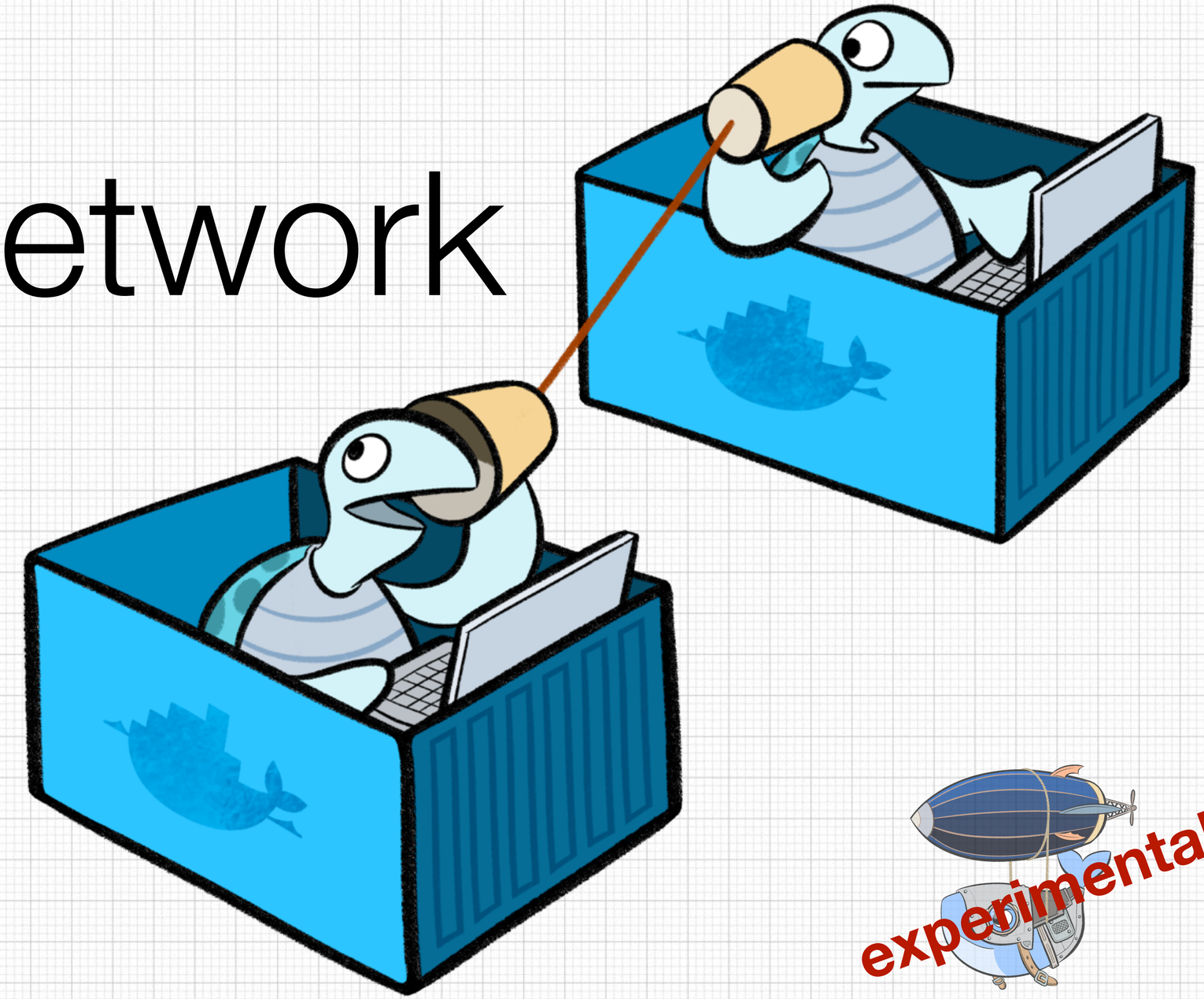
+



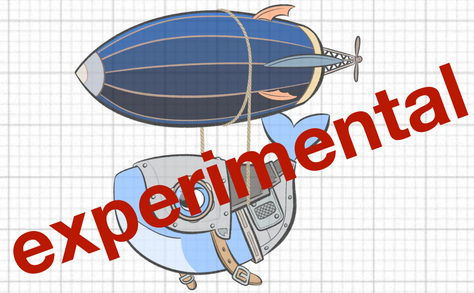
3 months later...

Introducing

Docker Network

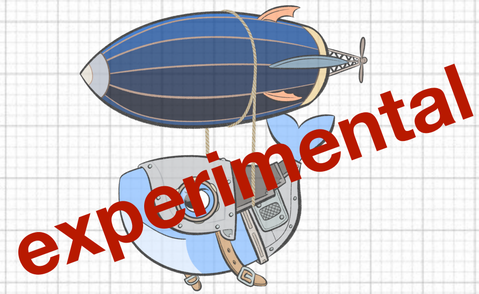


Multi-host networking out of the box



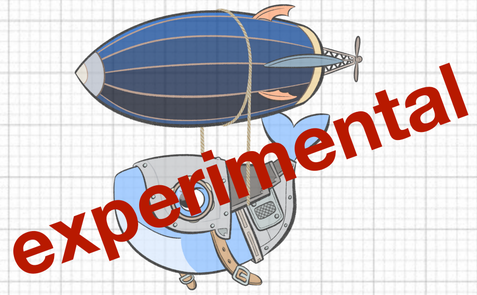
Micro-segmentation is built-in

Assemble virtual networks into any topology,
enforce security policies,
insert probes and firewalls.



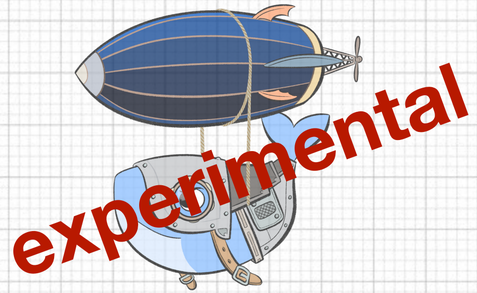
Built on industry standards

Don’t modify your application,
Don’t rip out your infrastructure.



Standardized service discovery

Do you use DNS?
Congratulations, you support Docker service discovery.



11 community-contributed backends

And more on the way.

azure

calico

cisco

consul

etcd

midokura

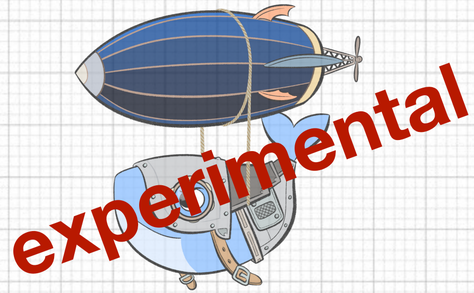
NETFLIX

nuagenetworks

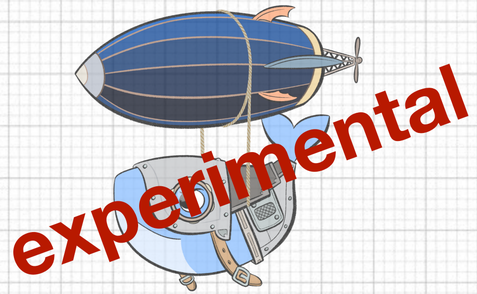
vmware

weave

zookeeper



Demo time!



Problem 1: runtime

Problem 2: packaging & distribution

Problem 3: service composition

Problem 4: machine management

Problem 5: clustering

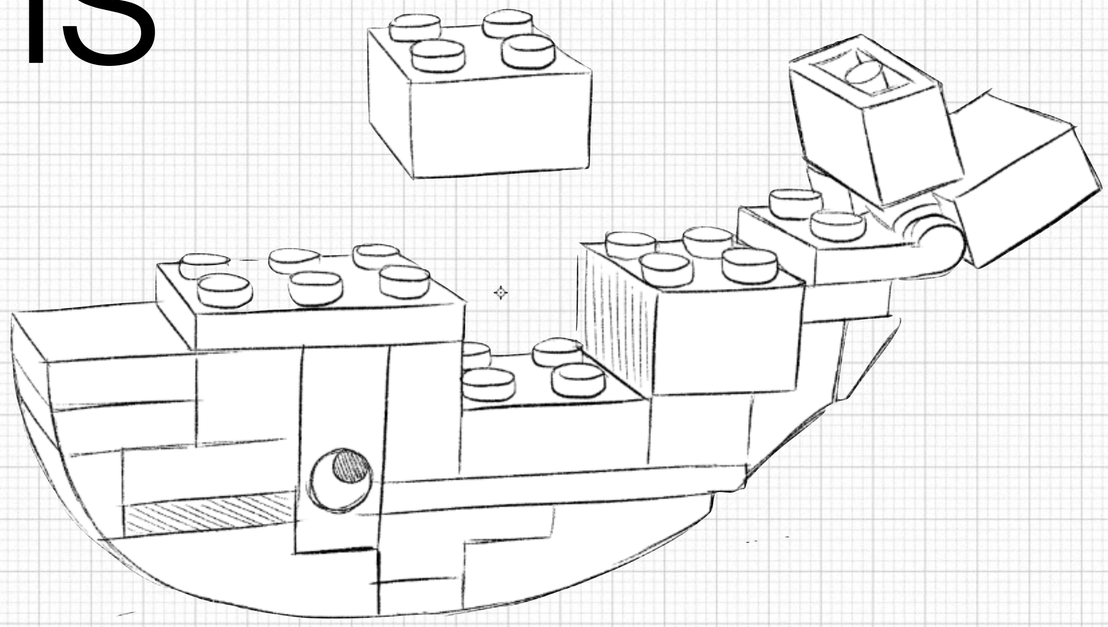
Problem 6: networking

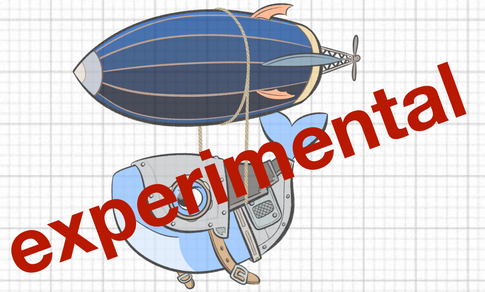
Problem 7: extensibility

"How do I add my own tools to the toolbox?"

Introducing

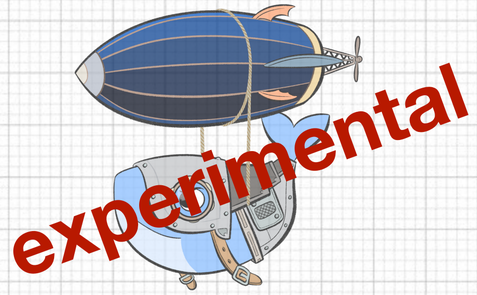
Docker Plugins





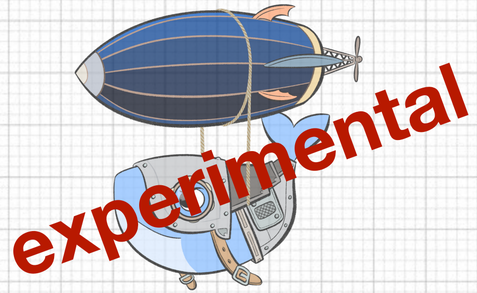
4 new extension points

Network plugins,
Volume plugins,
Scheduler plugins,
Service discovery plugins.
... and more to come.



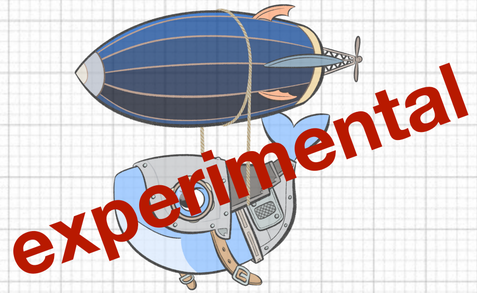
Dynamic loading

No patches or restarts needed.



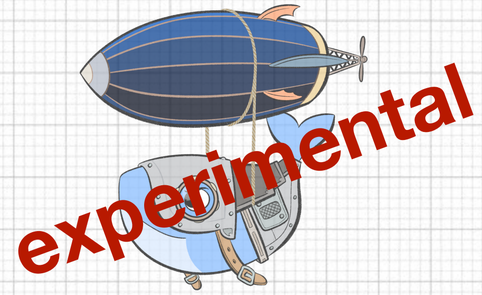
Multi-tenant

Use different plugins for different applications.



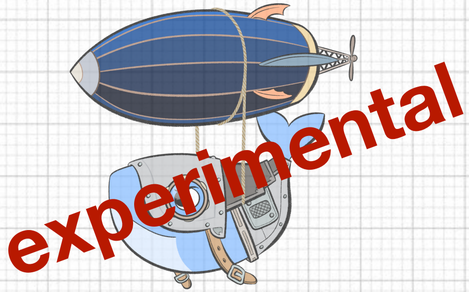
No lock-in

if your application works in Docker, it already supports every plugin.



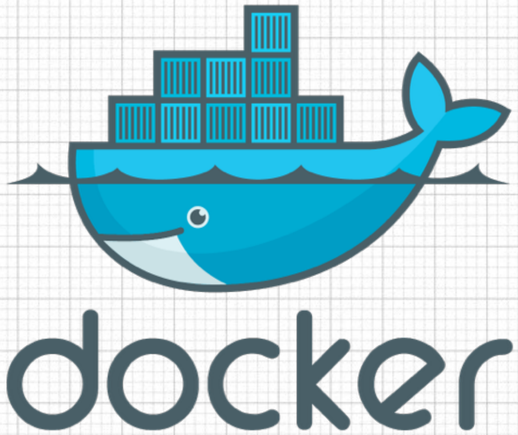
Developed with the ecosystem

A very special thank you to:



There is no platform
without ecosystem

Deepak Singh
Sr Manager, Amazon Container Service



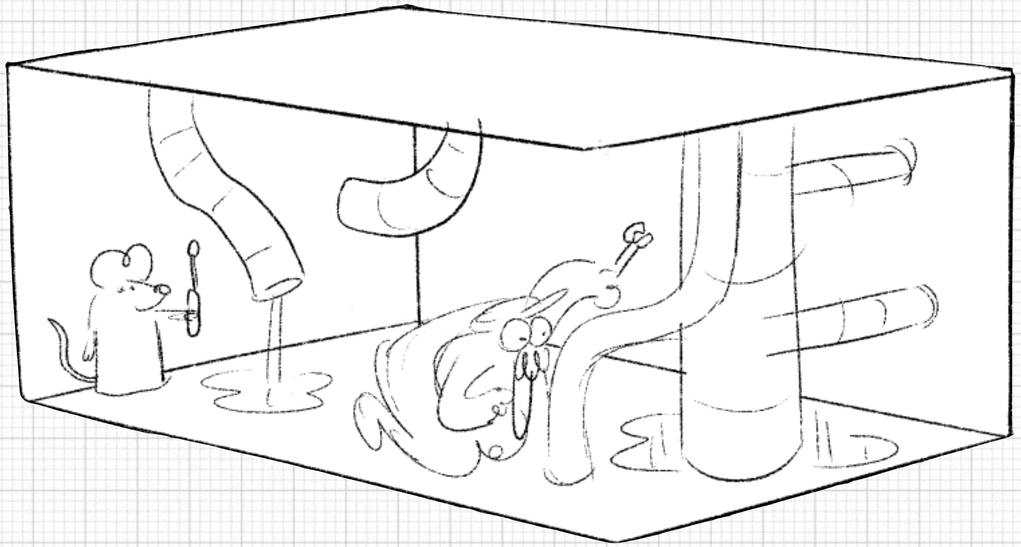
Goal 1

Build better plumbing

To build a developer platform, we need infrastructure plumbing.

Lots of it.

Infrastructure plumbers around the World are improving the Internet's software infrastructure.



The principles of software plumbing

THOU SHALT

I

Re-use and improve existing plumbing.

II

Make new plumbing easy to re-use and improve.

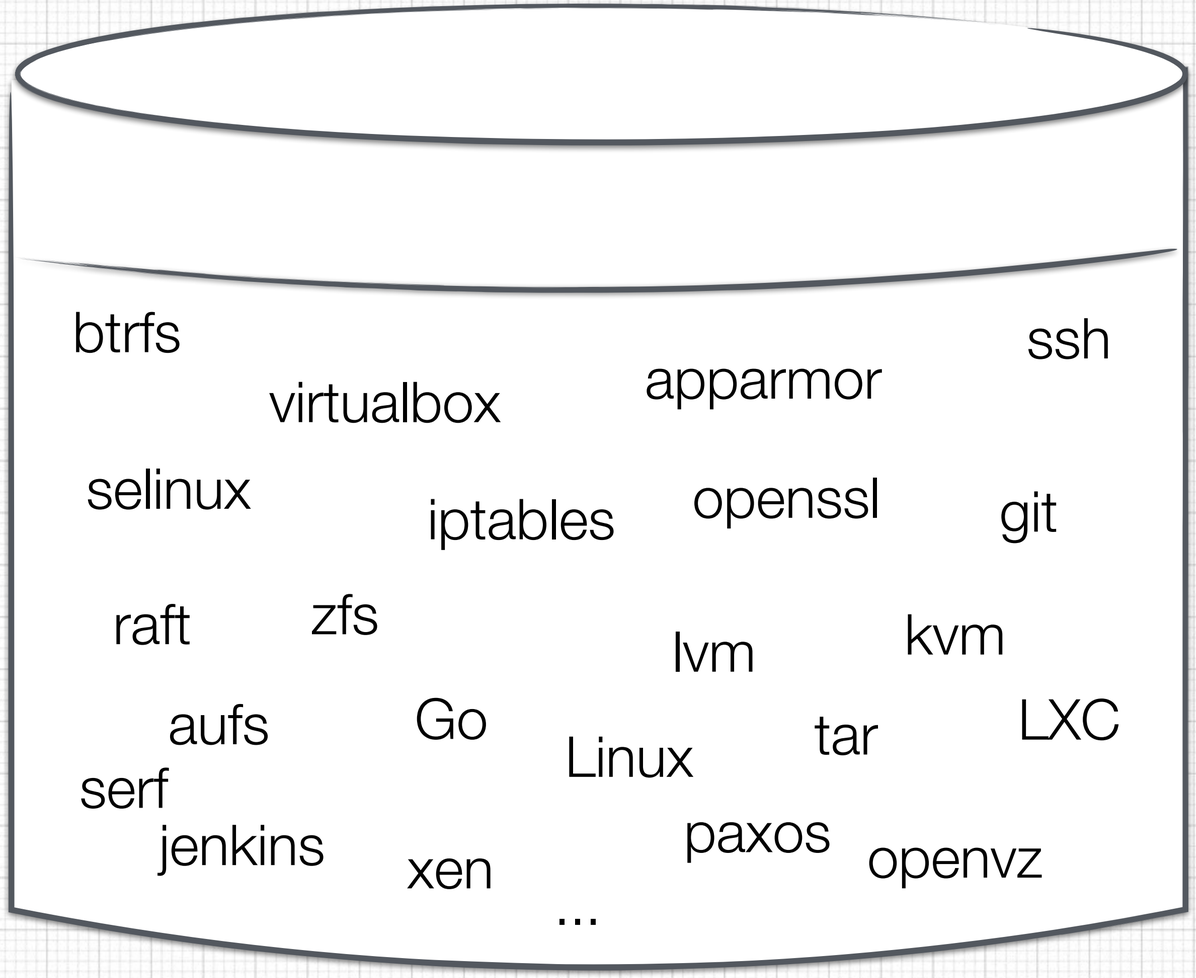
III

Follow the unix principles: make small simple tools, not big complicated ones.

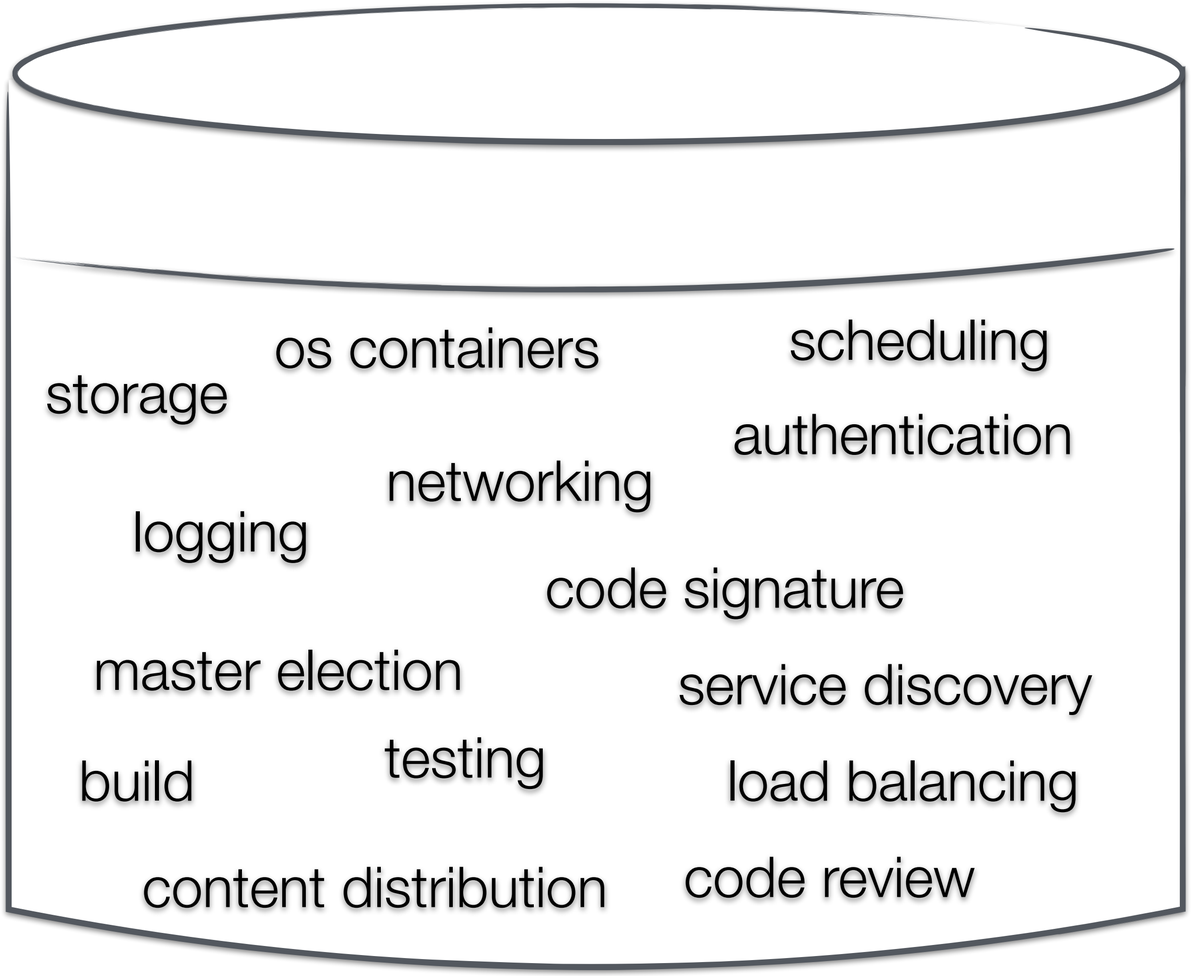
IV

Define standard interfaces for assembling larger systems.

We have re-used a lot of plumbing to build Docker.



We have also built a lot of our own.



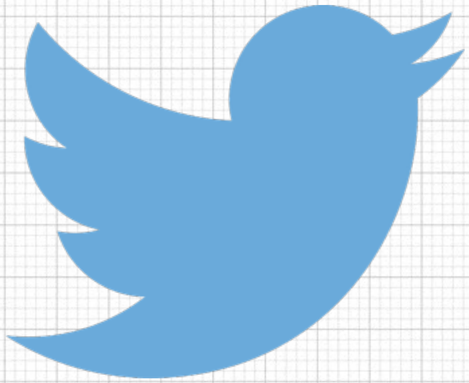
50% of Docker’s source code is plumbing!

Introducing

The Docker Plumbing Project

Let’s spin it all out!

We need your help!



#dockerplumbing

Plumbing for....

SECURITY

Trusted, cross-platform content distribution

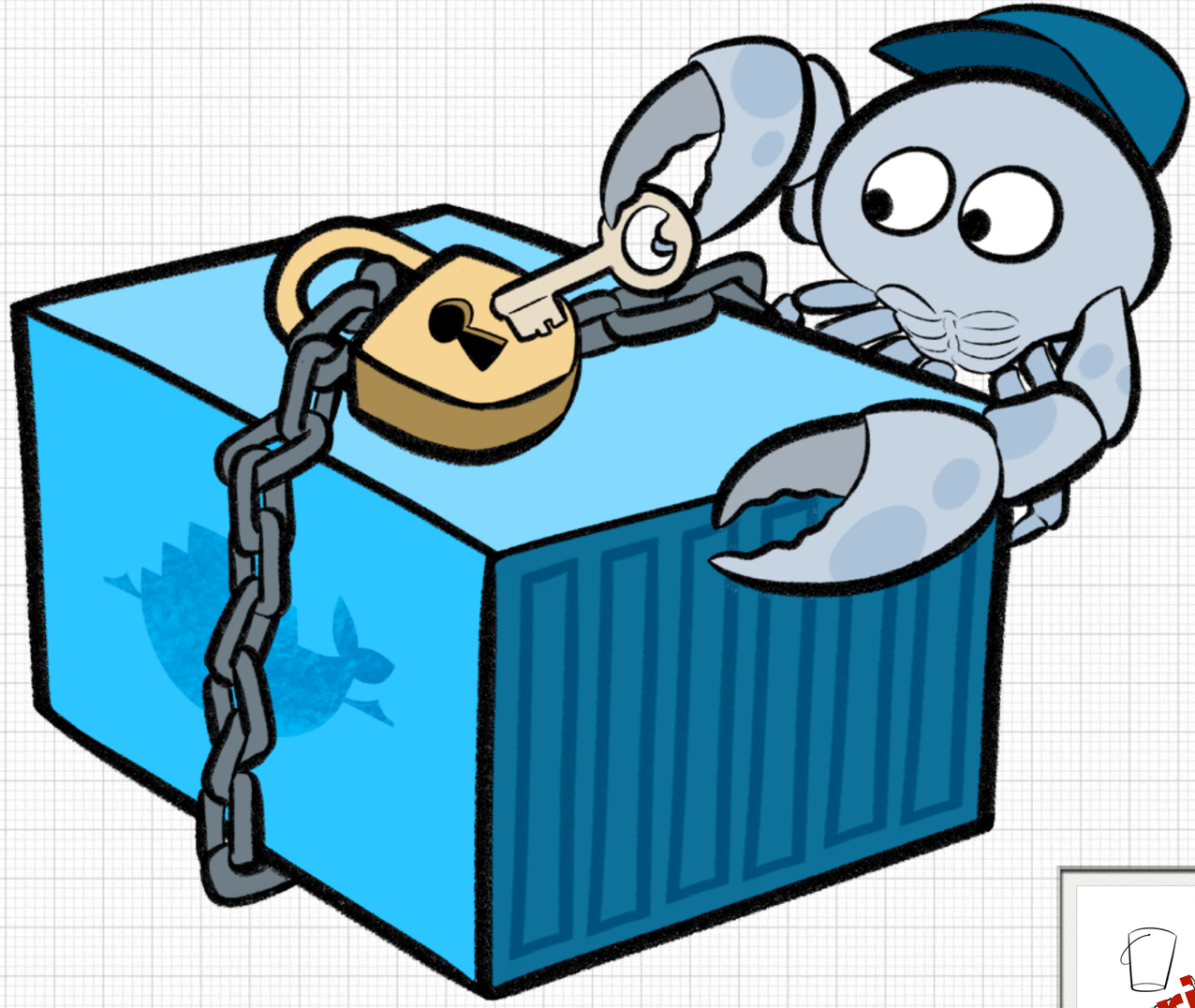
on the Internet is an unsolved problem.

“Is curl | sh really the best we can do?”

Introducing

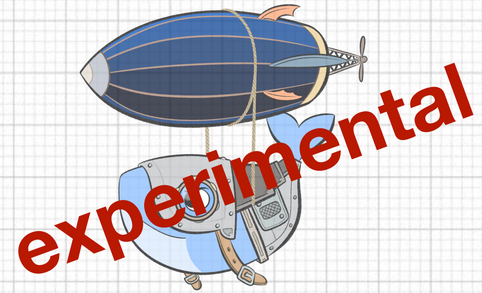
Notary

A trusted publishing system for any content.



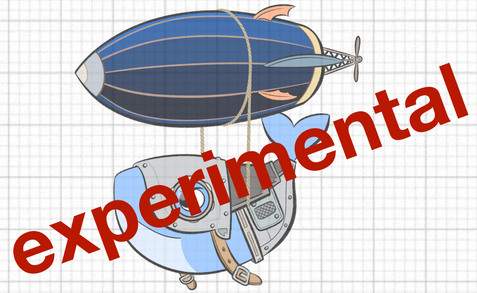
Platform-agnostic

Distribute any content: source, build artifacts, packages, containers, vm images, documentation...



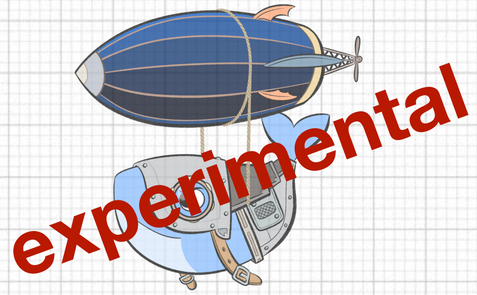
Build on industry-leading research

Reliable updates,
proof of origin,
resistant to untrusted transport,
survivable key compromise.



Build on industry-leading research

Distribute any content: source, build artifacts, packages, containers, vm images, documentation...



A quick demo of Notary

Plumbing for...

OS CONTAINERS

Containers are 5% of Docker's code

It's just plumbing... but it's popular plumbing!

Introducing RunC

The universal container runtime

All of Docker's container management plumbing and nothing else
Super lightweight
Battle-tested and production-ready
Supports all security features of Linux: selinux, apparmor, cgroups, seccomp, namespaces, cap-drop..
Supports user namespaces
Supports live migration
Microsof is contributing Windows support
Arm support underway
Intel is contributing DPDK, Secure enclave
Defines a standard, portable runnable format
Usable from the command-line

https://runc.io

Introducing runC

A universal runtime for OS containers

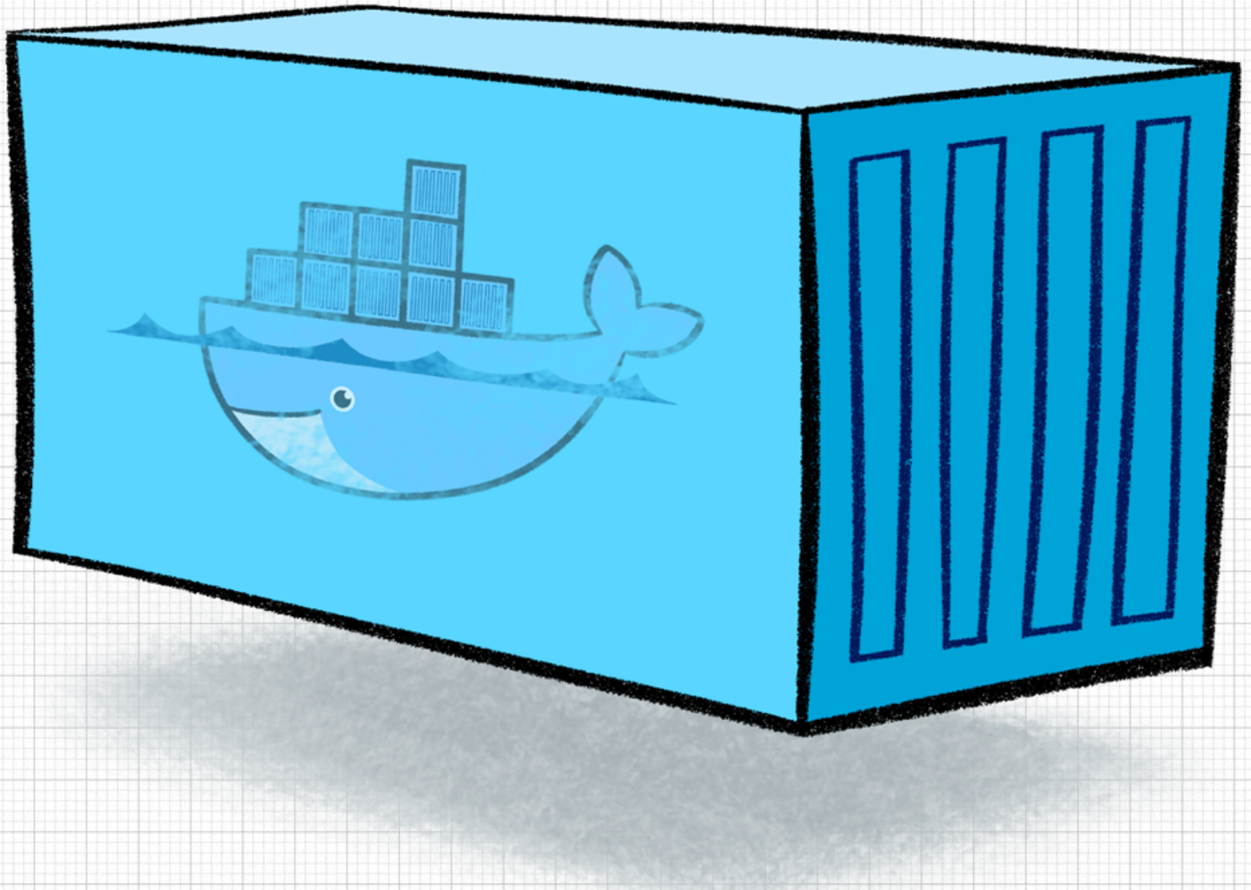
https://runc.io

Just the runtime and nothing else

Battle-tested and production-ready
Supports all security features of Linux: selinux, apparmor, cgroups, seccomp, cap-drop..
Supports user namespaces
Supports live migration
Microsoft is contributing Windows support
Arm support underway
Intel is contributing DPDK, Secure enclave
Defines a standard, portable runnable format
Usable from the command-line or programmatically

Goal 3.
Promote open standards

The real value of Docker is not technology



It’s getting people to agree on something

“You are the de facto standard.
Now it’s your responsibility to
make it a proper standard”.

What is a proper standard?

A proper standard needs...

1. A formal specification

- “Make it easy for anyone to write their own implementation”

Introducing OCF: a universal intermediary format for OS containers

Supports all hardware architectures and OS

A proper standard needs...

1. A formal specification
2. Independent governance

- “Don’t tie the standard to a single company”

Introducing

OPEN CONTAINER PROJECT

in collaboration with

A proper standard needs…

1. A formal specification
2. Independent governance
3. A neutral reference implementation

- “The best standards start with rough consensus and working code”

Docker donates runC to the Open Container Project

runC is now the OCF reference implementation

A proper standard needs…

1. A formal specification
2. Independent governance
3. A neutral reference implementation
4. Support from a broad coalition

- “Your standard must present a majority of the market”

OPEN CONTAINER PROJECT

founding members:

OPEN CONTAINER PROJECT

founding members:

A proper standard needs…

1. A formal specification
2. Independent governance
3. A neutral reference implementation
4. Support from a broad coalition
5. An open door to fresh ideas

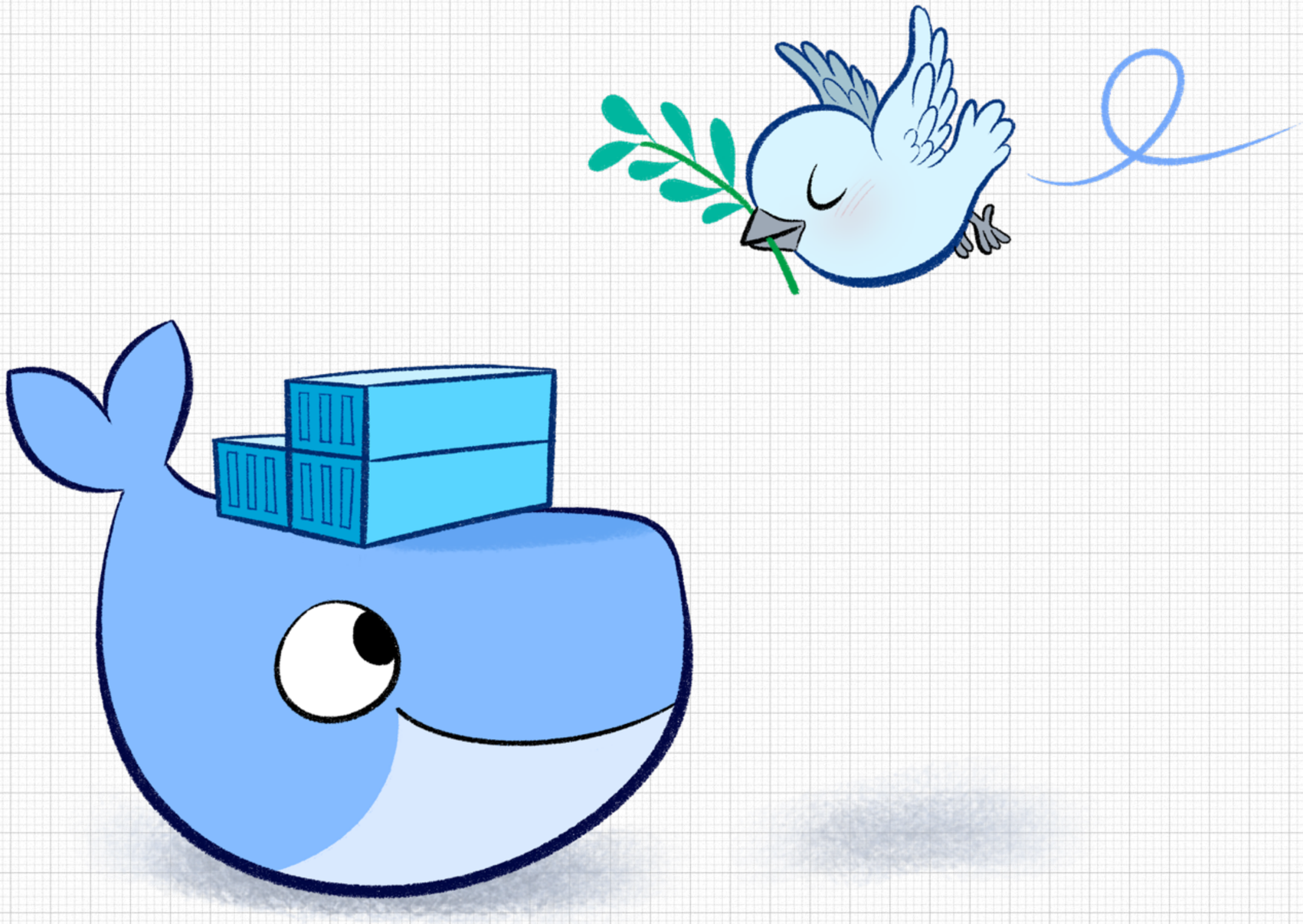
“Many people have been thinking about this. Hear them out.”

OPEN CONTAINER PROJECT

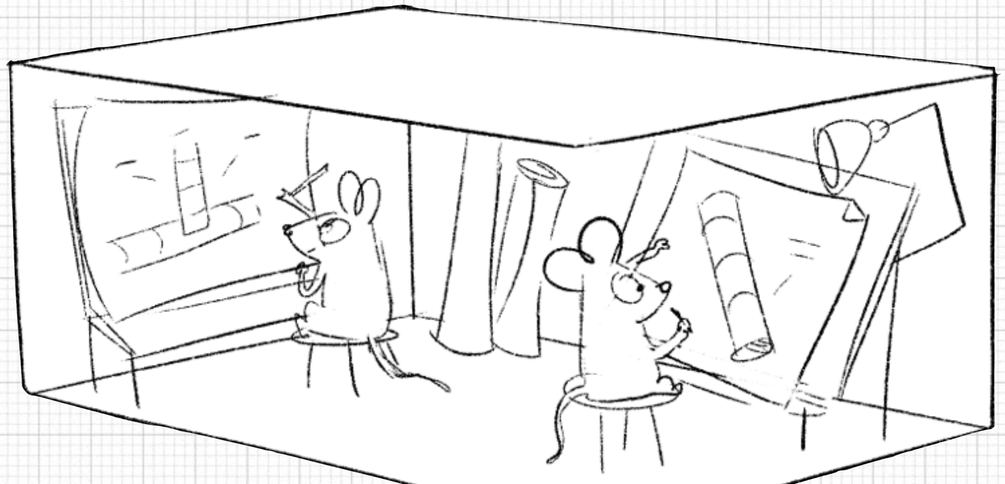
welcomes

the APPC maintainers

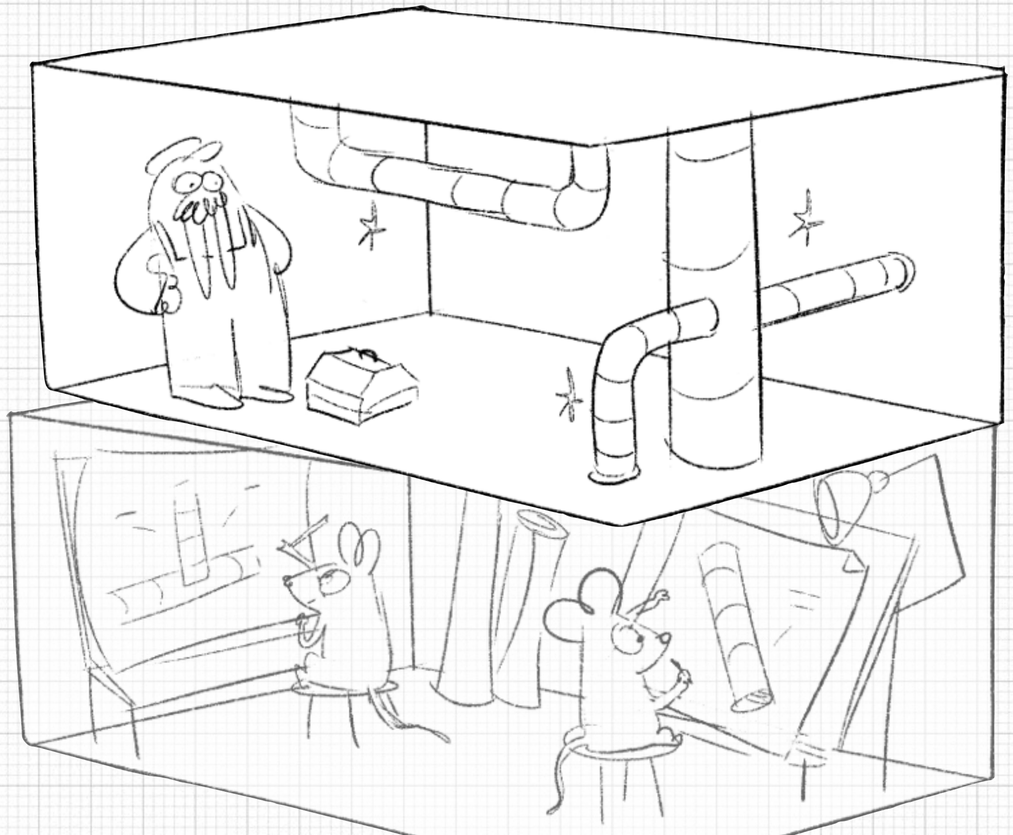
as founding members



Promote open standards

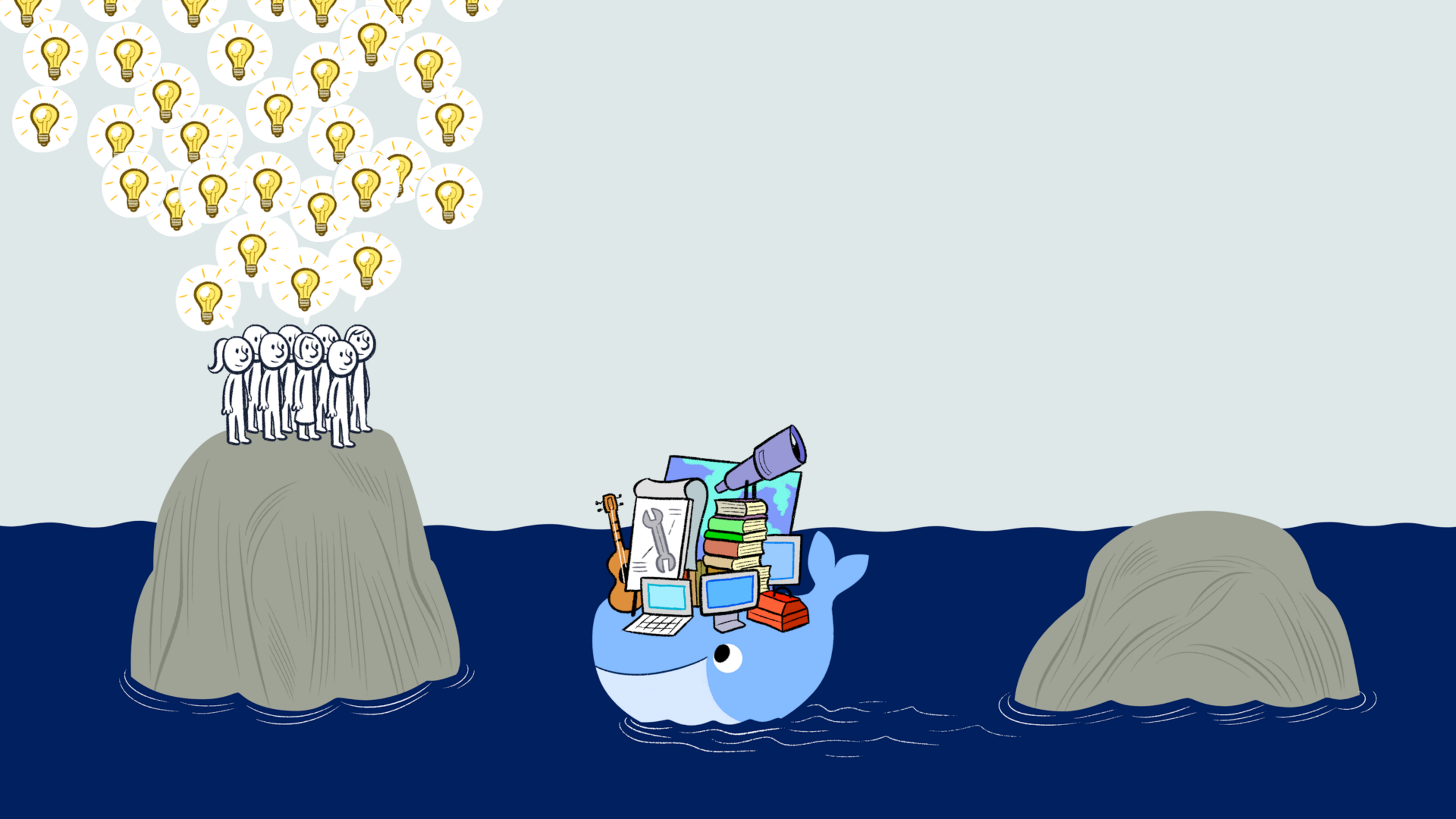


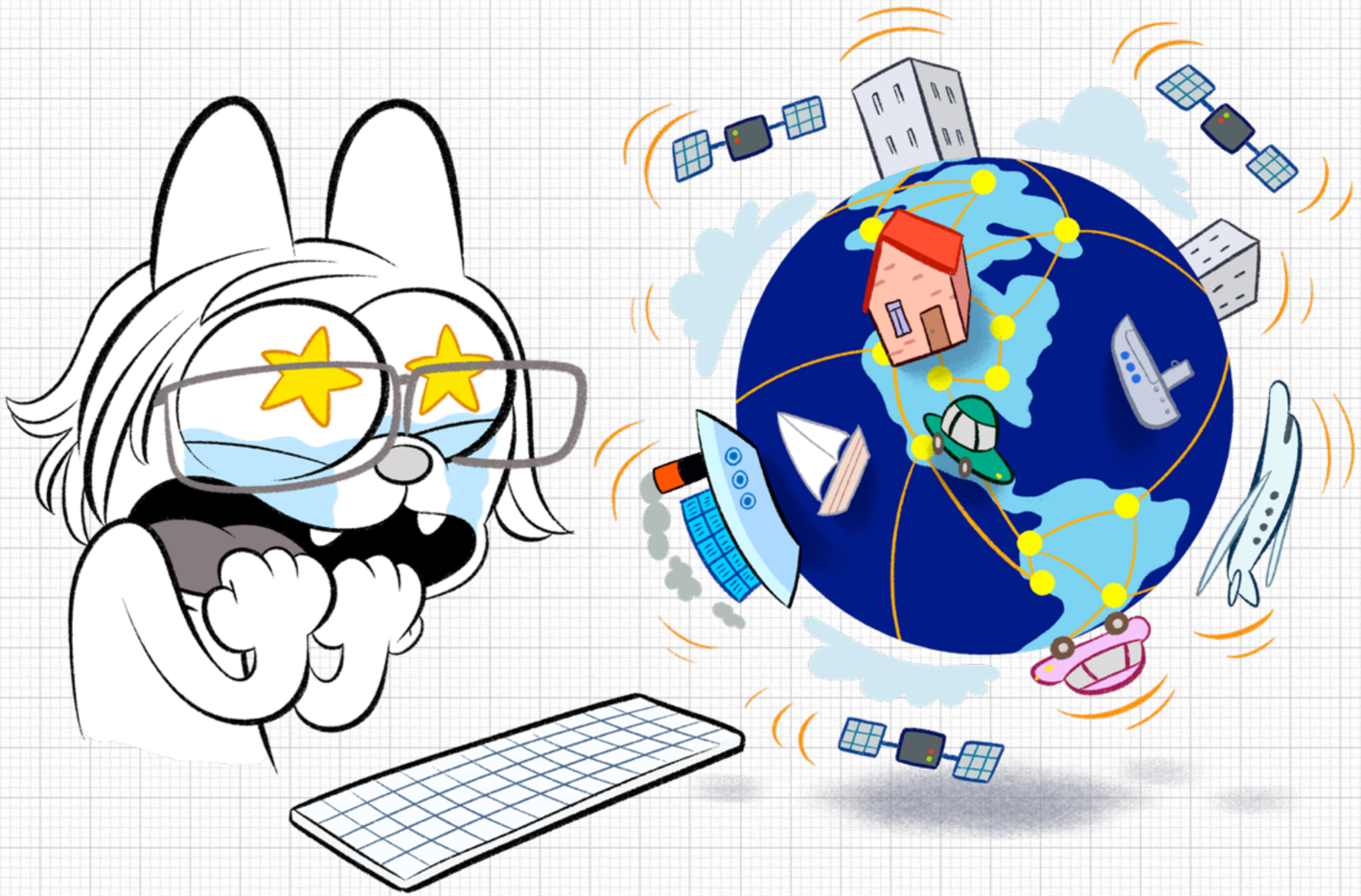
Build better plumbing



Reinvent the
programmer toolbox.

Help organizations solve real-world problems in unique ways.





Happy hacking!

WIFI FOR EVERYONE!

NETWORK: DockerCon15
PASSWORD: mobydock

DOWNLOAD THE MOBILE APP:

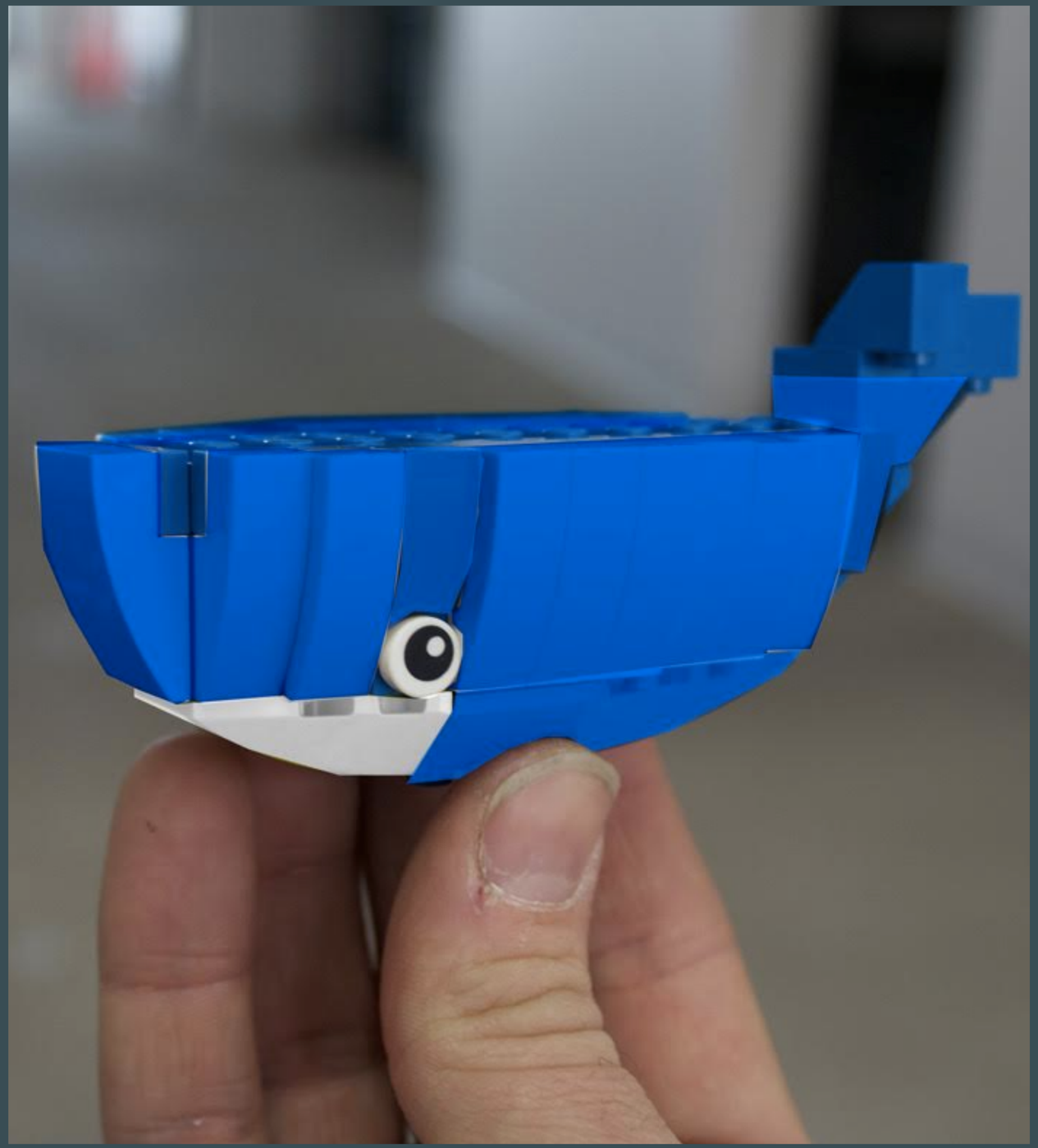
guidebook.com/app/DockerCon

ASK THE EXPERTS

- MONDAY & TUESDAY
  - 11:00AM - 5:00PM

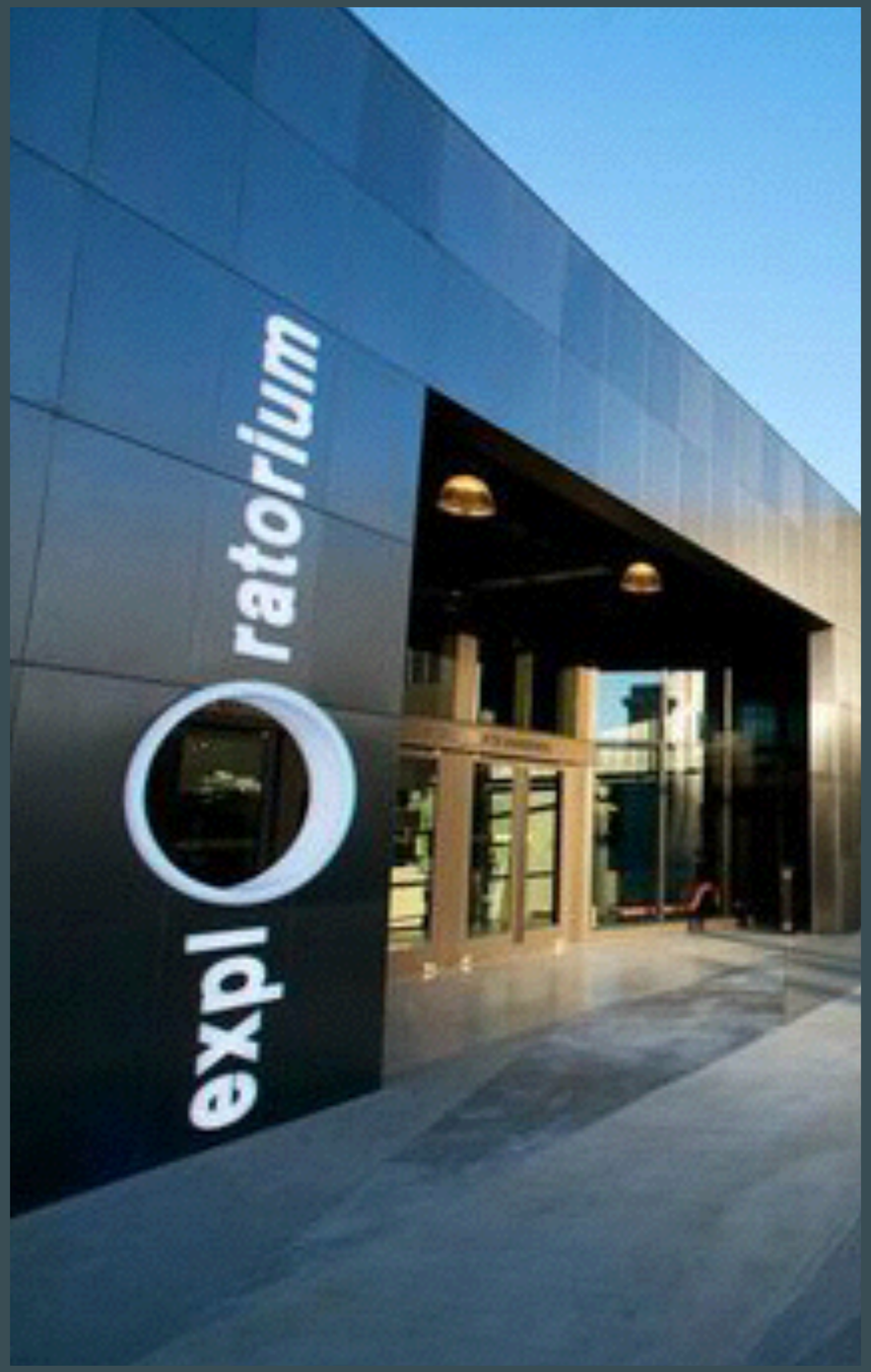
CONTRIBUTOR

- MONDAY & TUESDAY
  - 11:00AM - 5:00PM



BUILD YOUR OWN STACK AT THE SPONSOR BOOTHS

- MONDAY BREAK
  - 11:00AM - 11:45AM



CONFERENCE PARTY

- STARTS AT 7 PM ON MONDAY EVENING
- BUSES WILL DEPART FROM MARRIOTT AND WILL RETURN BACK TO HOTEL STARTING AT 8:45PM
- THANKS INTEL FOR SPONSORING!