goto; conference aarhus

RUN YOUR JAVA CODE ON CLOUD FOUNDRY

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INTERNATIONAL SOFTWARE DEVELOPMENT CONFERENCE

gotocon.com

Hello | I'm Andy

Developer Advocate @ Cloud Foundry

social web enthusiast

maker, educator, LEGO fan

OSS contributor

Eclipse Project Lead (Paho / MQTT)

excited by “what’s next”, Internet of Things, etc.

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a few things about me

Developer Advocate?

hellz to the yeah!

@andypiper

[works on]

#cloudfoundry

[at]

@gopivotal

3 themes

openness, cloud computing, and Java

1. Why be / do / think Open?
2. Why is an Open Cloud Platform important?
3. Why run Java on an open cloud?

1. Why be / do / think Open?

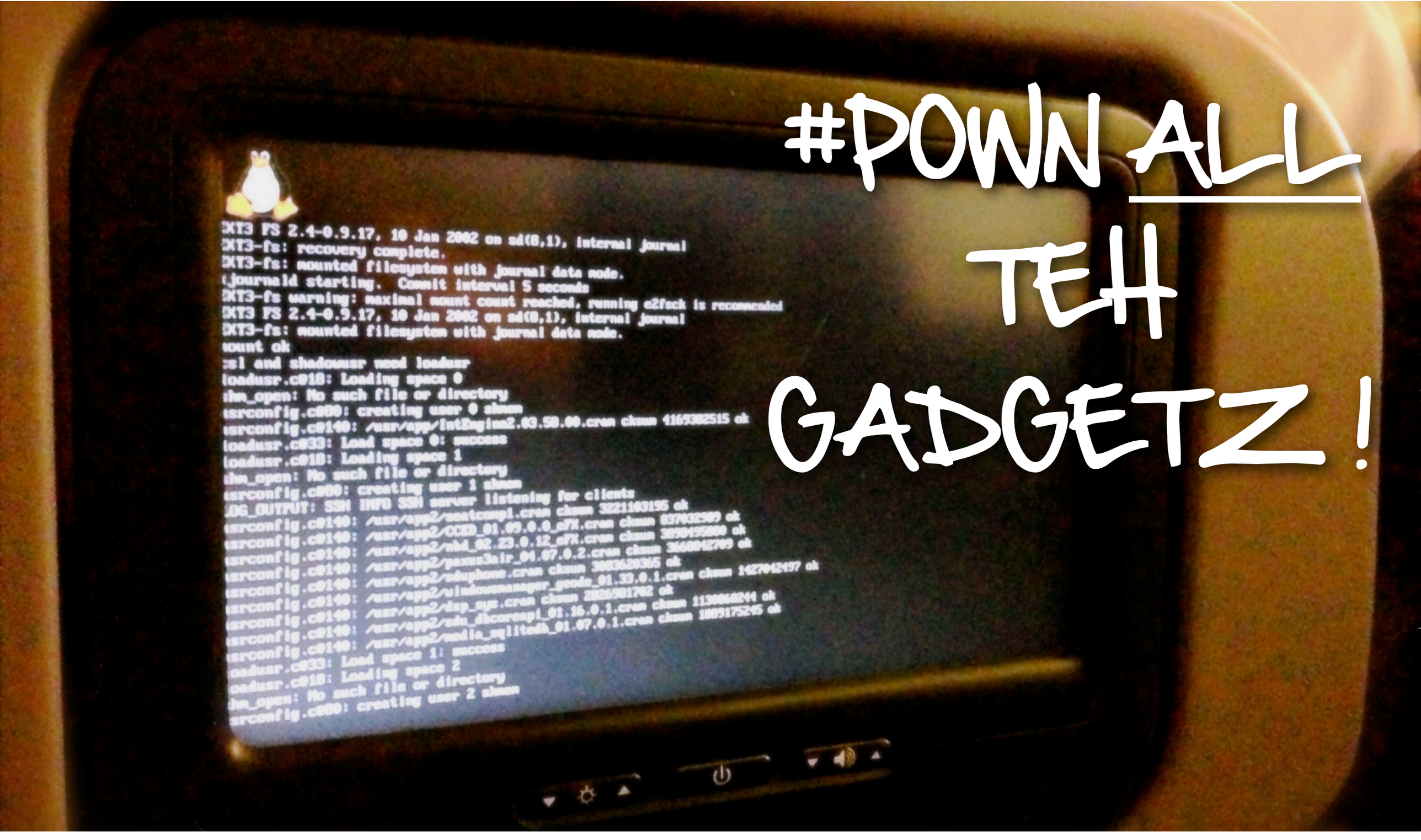
1991

An important year in software

From: torvalds@klaava.Helsinki.FI
Newsgroups: comp.os.minix
Date: 25 Aug 91 20:57:08 GMT
Organization: University of Helsinki

> Hello everybody out there using minix -
>
> I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones.

~21 years later: Linux has won



Linux runs everywhere

(even old versions, on crashy airline entertainment systems...)

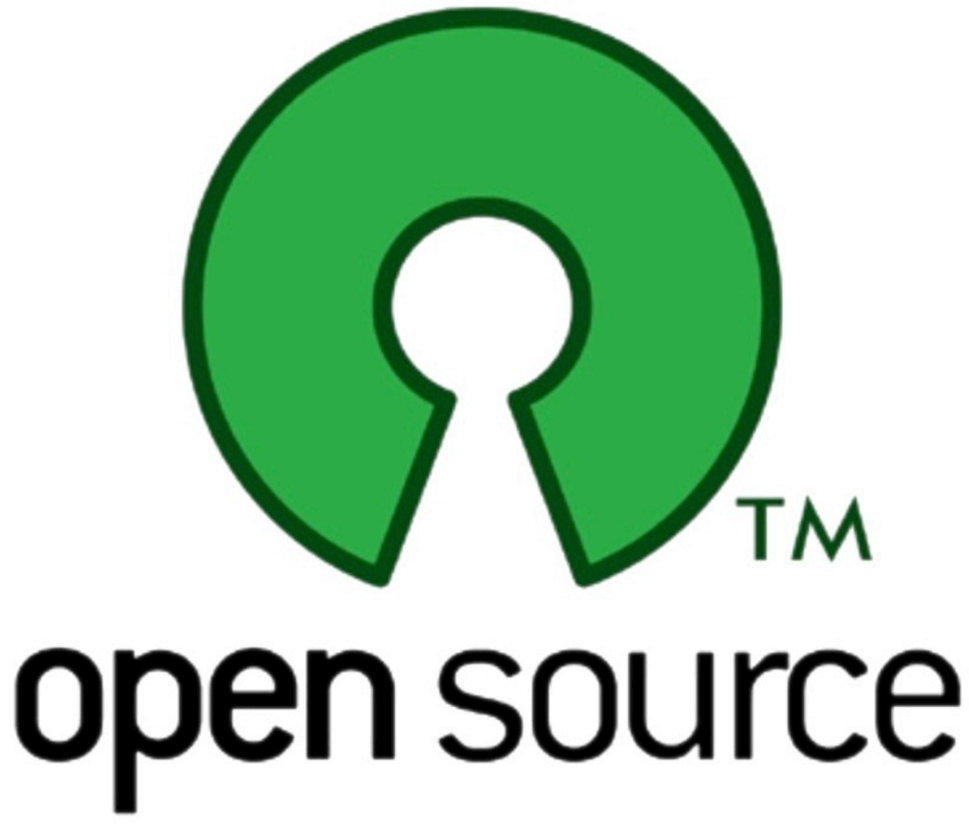
The Penguin is triumphant!

(maybe not this one…)

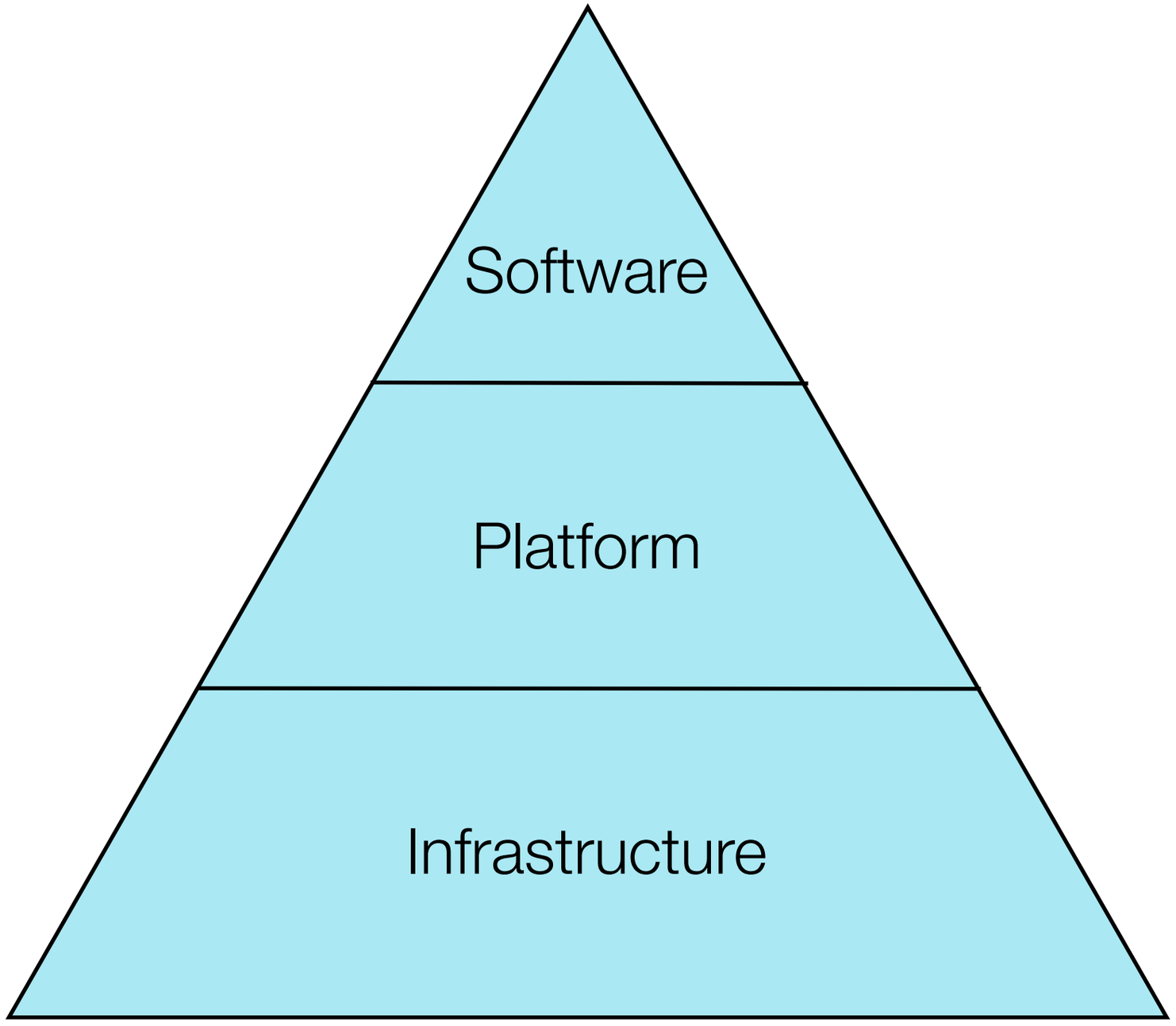
Linux is ubiquitous

(but often invisible)

It works.



2. What about Cloud?



Gmail, Salesforce,
Flickr, Google Docs...

Google AppEngine,
Heroku, Cloud Foundry,
EngineYard, Apprenda...

Amazon EC2, Google CE,
OpenStack, vSphere,
Joyent, Cloud Stack,
Eucalyptus...

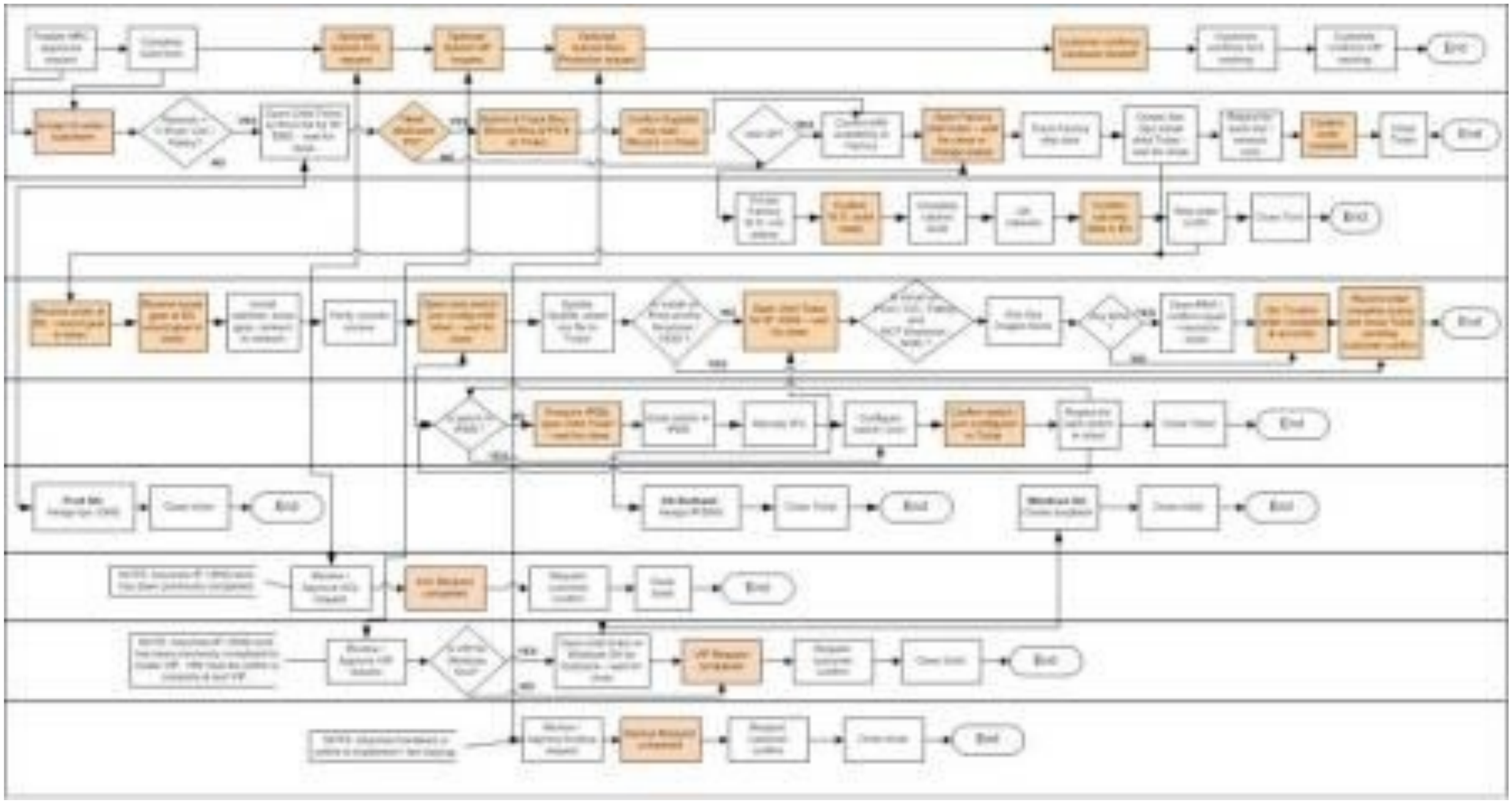
3 layers | IaaS, PaaS, SaaS

How did we get here?

Infrastructure Clouds

- consumer web companies built out according to their own needs to support *Software*

But - still need to build
& manage *Platform*



Why is it so hard...?

A real deployment flow (!)

OPERATOR

```
cf-iaas.yml
provision <my cloud>
add_capacity <my cloud>
```

Cloud Deployment: 2-4 hours

DEVELOPER

```
target <my cloud>
push <my app>
create <my services>
bind <my services>
scale <my app> +100
```

App Deployment: 30-90 seconds

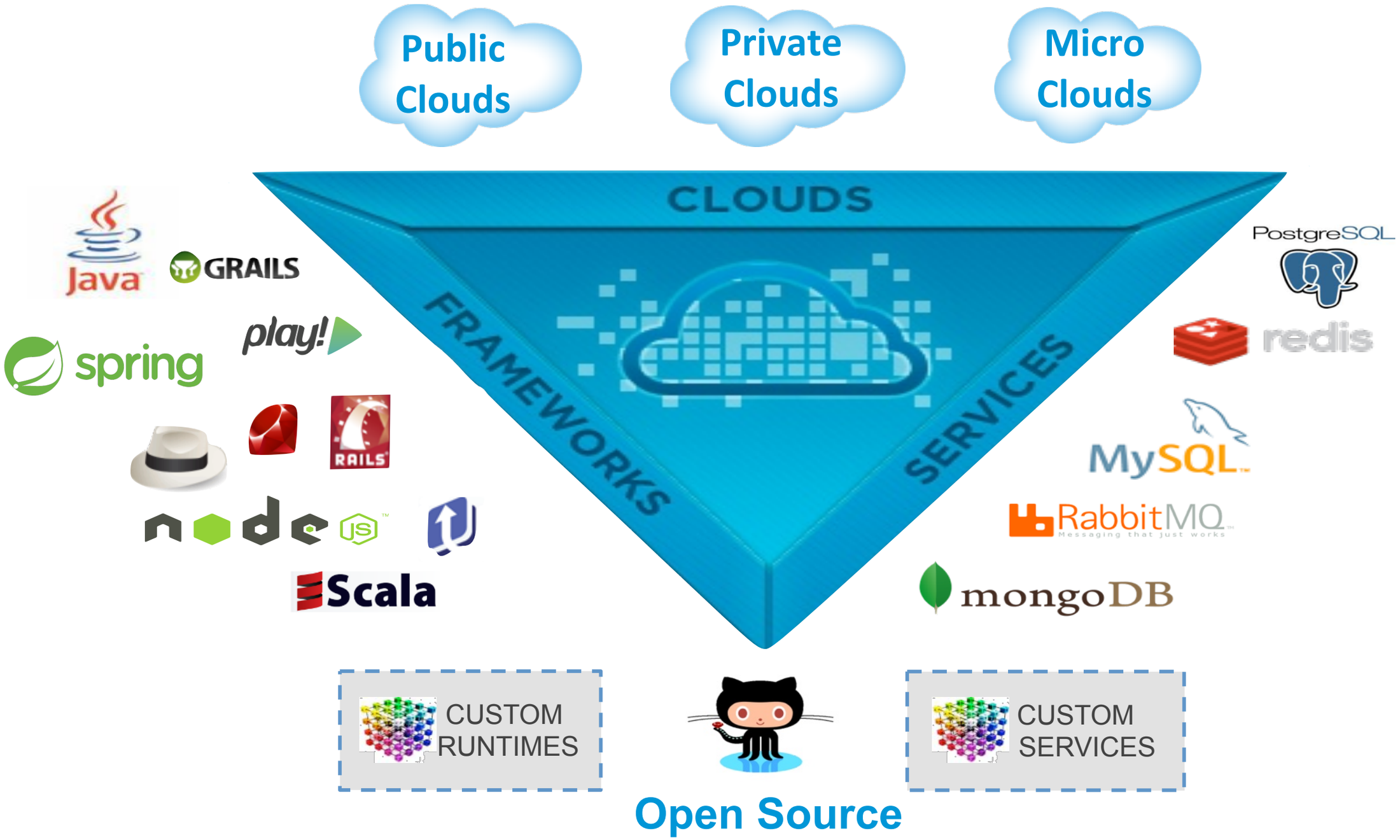
An alternative approach...

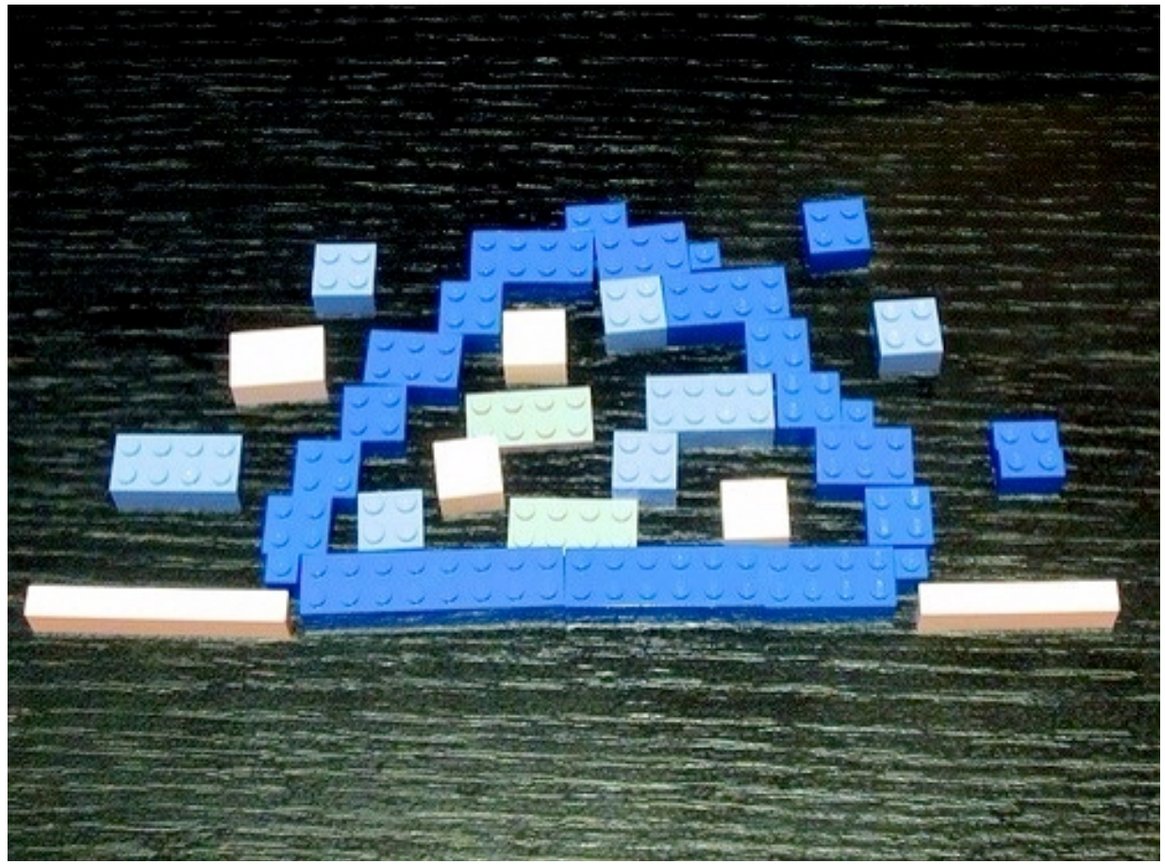
Cloud Foundry can make it simpler!

CLOUD FOUNDRY

Demo

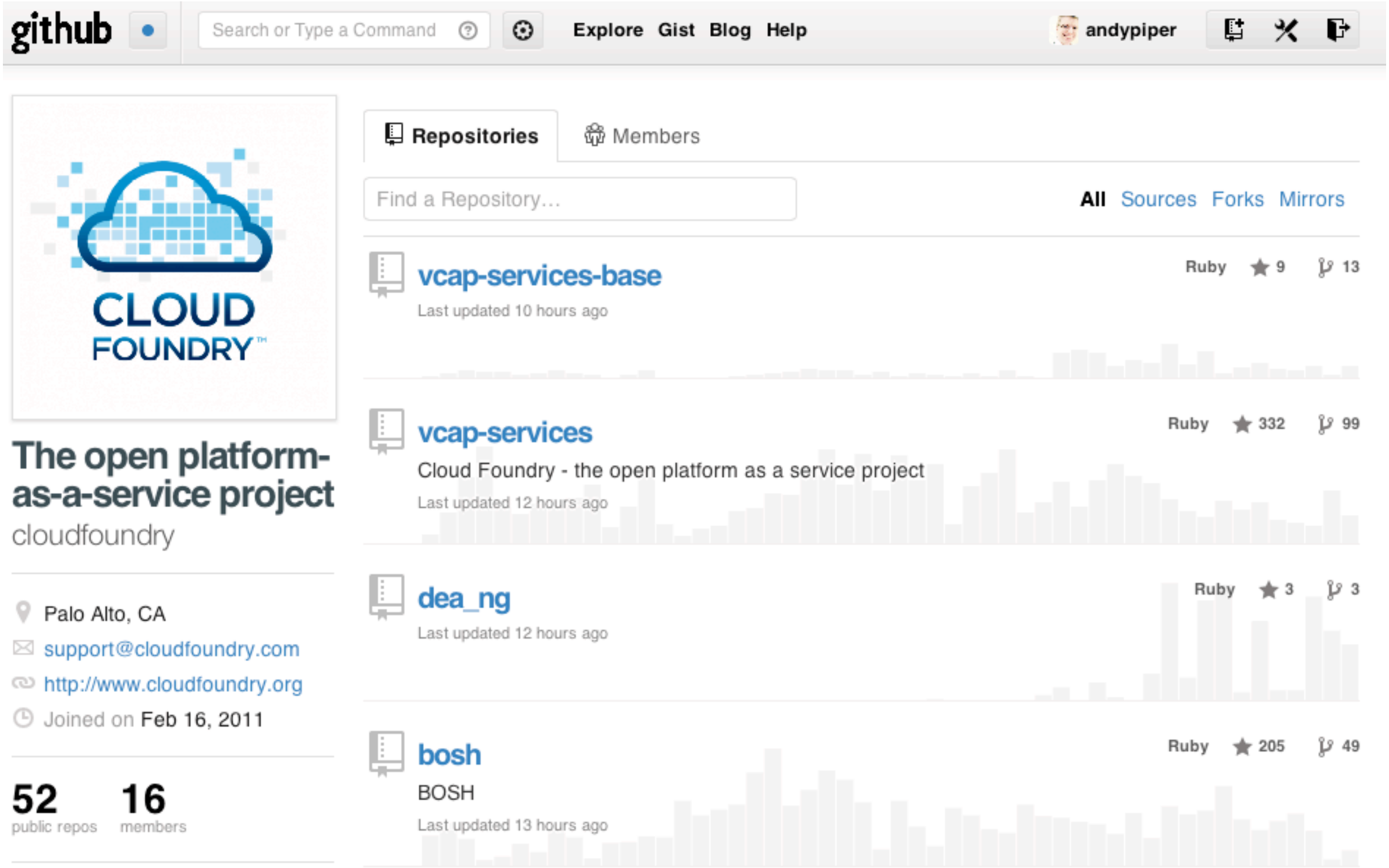
Cloud Foundry - the Open PaaS





All the pieces to make your own!

"if you can't open it, you don't own it" (O'Reilly MAKE)



Open & public from the start

Code all on Github

Google AppEngine,
Heroku, Cloud Foundry,
OpenShift, Stackato,
Cloudbees, AppFog,
Elastic Beanstalk,
anyNines, Apprenda...

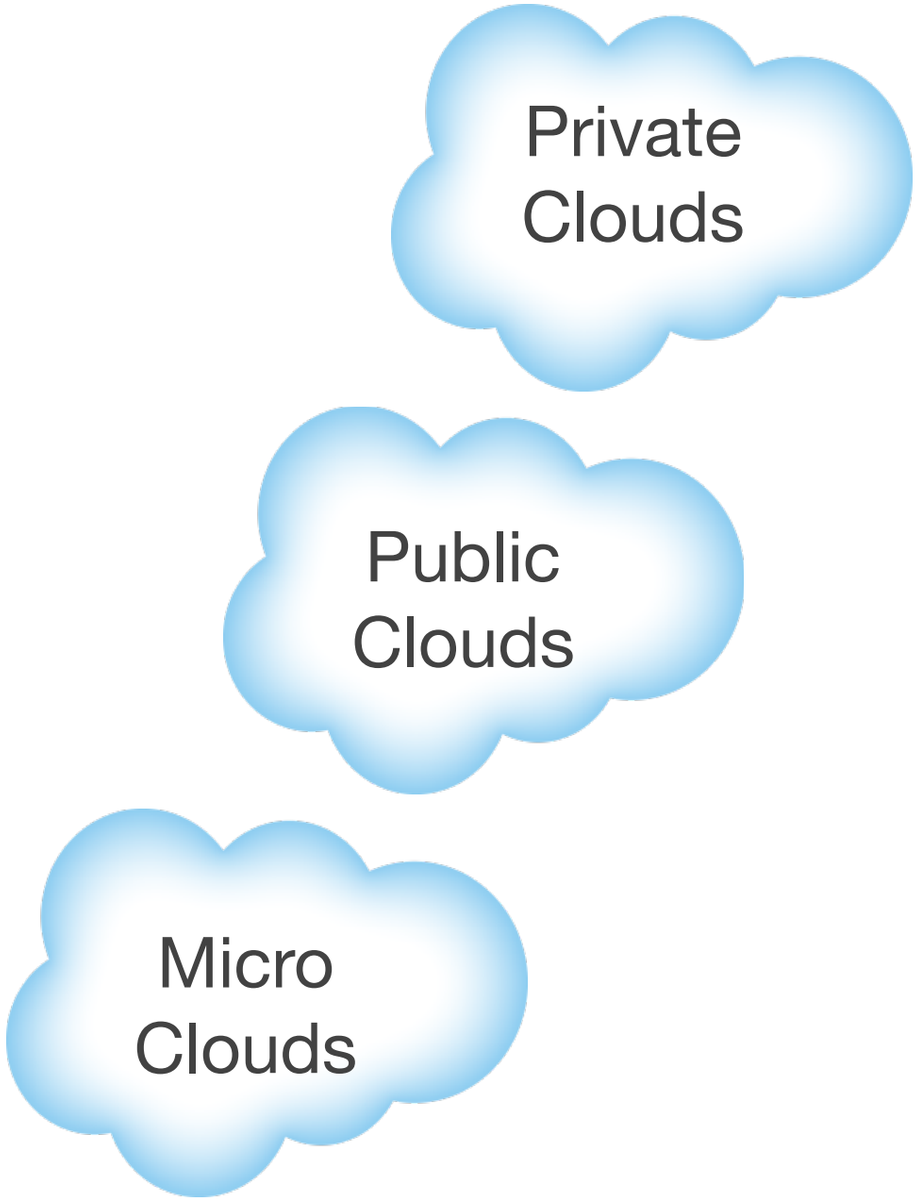
BUILD OWN HEROKU WITH CLOUD FOUNDRY

Dr Nic Williams
Stark & Wayne LLC
@drnic

Not all PaaSes are created equal...

Run on: AWS, OpenStack, vSphere... more to come!

All about Choice



Build your own from github.com/cloudfoundry, buy from Pivotal, or run a compatible private version

At `run.pivotal.io` or *any Cloud Foundry-powered PaaS*

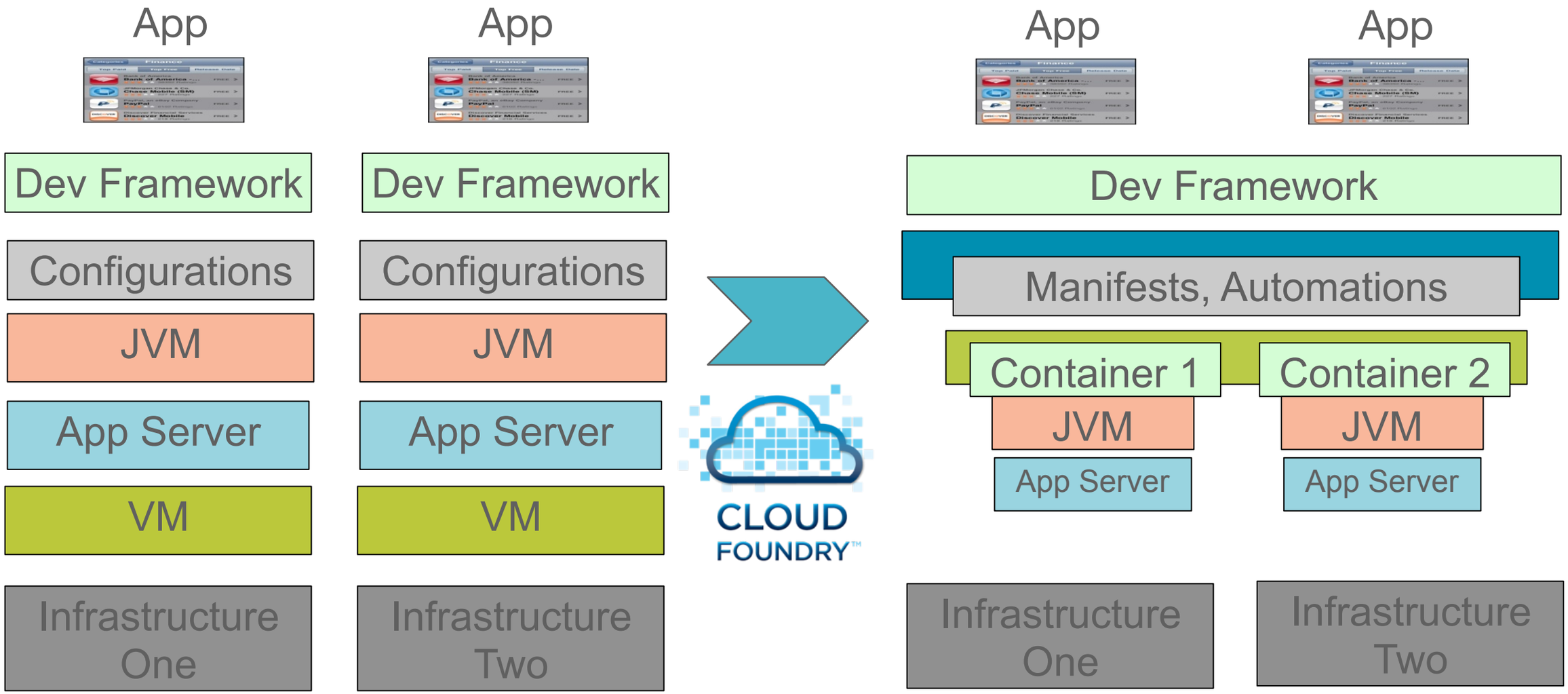
Run in a local virtual machine with identical services and runtimes (MCF, Vagrant)

(pause)

44 years since Mach 1

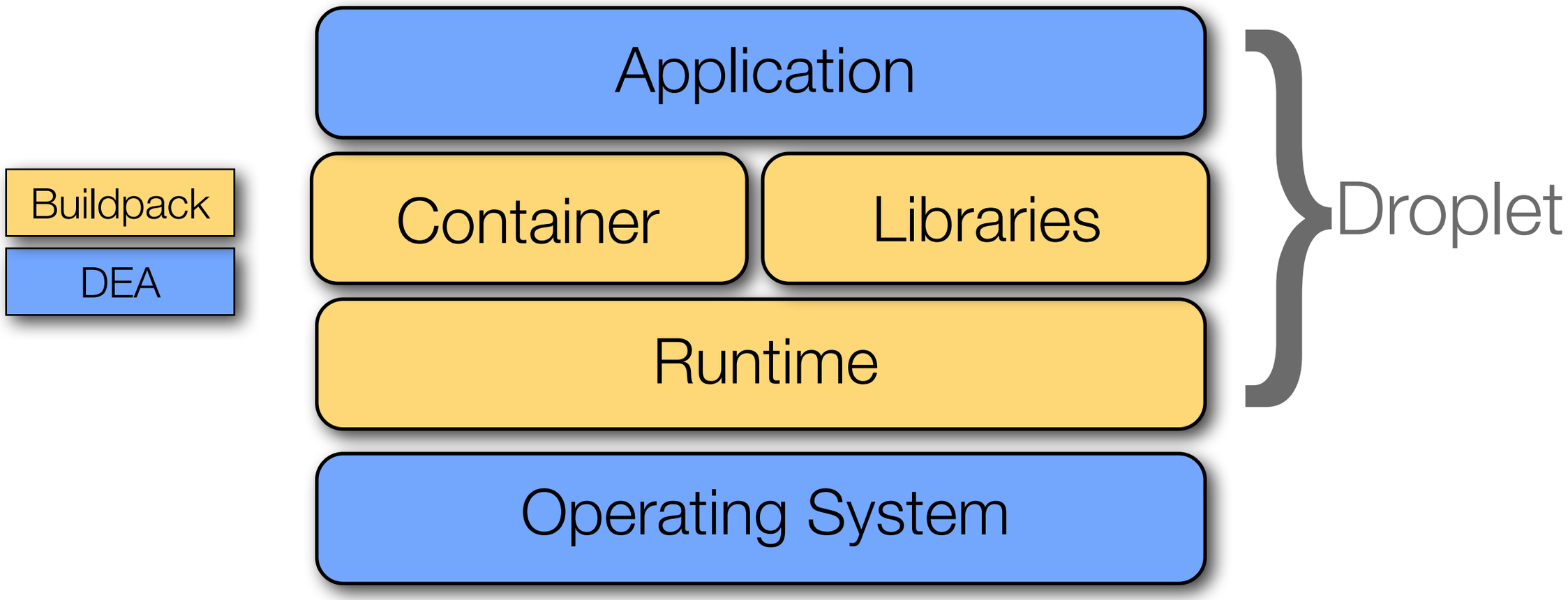
3. What about Java and the JVM?

From VM-centric to *Application Centric*



Buildpacks

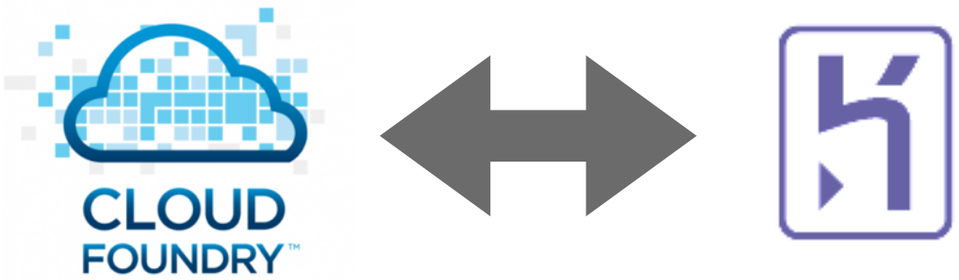
Buildpacks are responsible for preparing the machine image for an application



Compatibility

Cloud Foundry buildpacks follow the Heroku buildpack design

Cloud Foundry and Heroku buildpacks are compatible (if you take care to make them compatible)



Other PaaS providers are adopting the buildpack design - emerging convention

Built-in Buildpacks

cloudfoundry / **dea_ng**

branch: **master** **dea_ng** / buildpacks / **vendor** /

Merge pull request **#53** from glyn/master ···

mariash authored 9 days ago

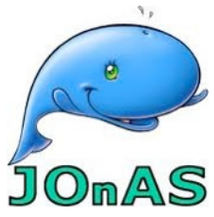
..

java @ d1fcf9b	Upgrade Java buildpack	→ cloudfoundry / **java-buildpack**
nodejs @ 6ab2969	Merging local and Heroku Node manifests [finishes #46649889]	→ cloudfoundry / **heroku-buildpack-nodejs**
ruby @ 2fc4ad8	bump ruby buildpack to support internetless-mode	→ cloudfoundry / **heroku-buildpack-ruby**

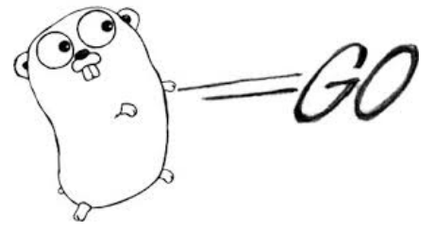
Tested Buildpacks

https://github.com/cloudfoundry-community/cf-docs-contrib/wiki/Buildpacks

Containers



Languages



Java Buildpack

Supports a variety of JVM languages, containers, and frameworks with a modular, configurable, and extensible design

Java Buildpack Concepts

Containers

Java `main()`

Tomcat

Groovy

Spring Boot CLI

Play

Frameworks

Spring config

Play config

Play JPA config

New Relic

JREs

OpenJDK, etc.

Container Detection Criteria

Java `main()`	`META-INF/MANIFEST.MF` exists with `Main-class` attribute set
Tomcat	`WEB-INF` directory exists
Groovy	`.groovy` file with a `main()` method, or `.groovy` file with no classes, or `.groovy` file with a shebang (`#!`) declaration
Spring Boot CLI	one or more POGO `.groovy` files with no `main()` method, and no `WEB-INF` directory
Play	`start` and `lib/play.play_*.jar` exist

Choose zero or one

Framework Detection Criteria

Spring	`spring-core*.jar` **exists**
Play config	Play application detected
Play JPA config	`play-java-jpa` plugin exists in app
New Relic	New Relic service bound to app

Choose all that apply

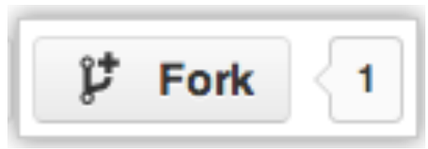
Customization

Two ways to customize the Java buildpack

Configure artifacts used by standard JREs, Containers, and Frameworks

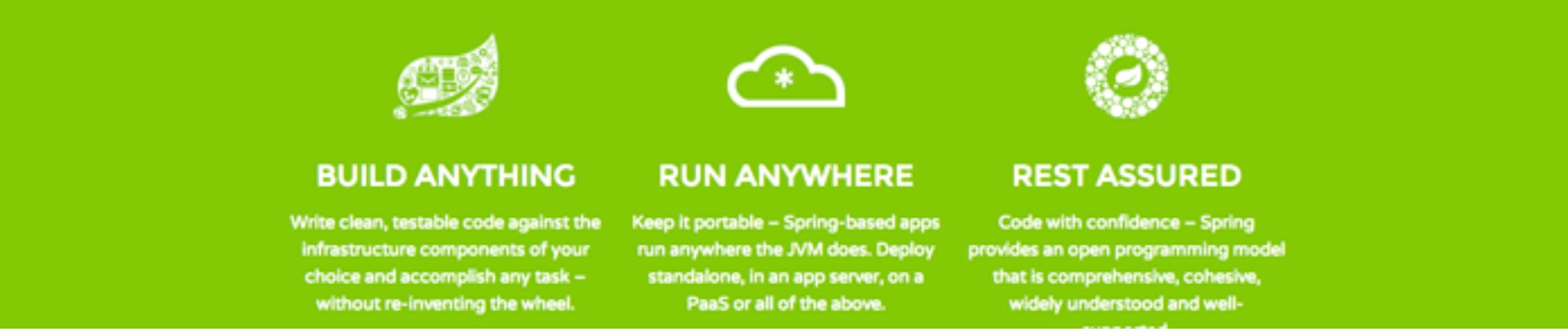
Extend the buildpack with your own JREs, Containers, and Frameworks

Customization is done by forking the buildpack →

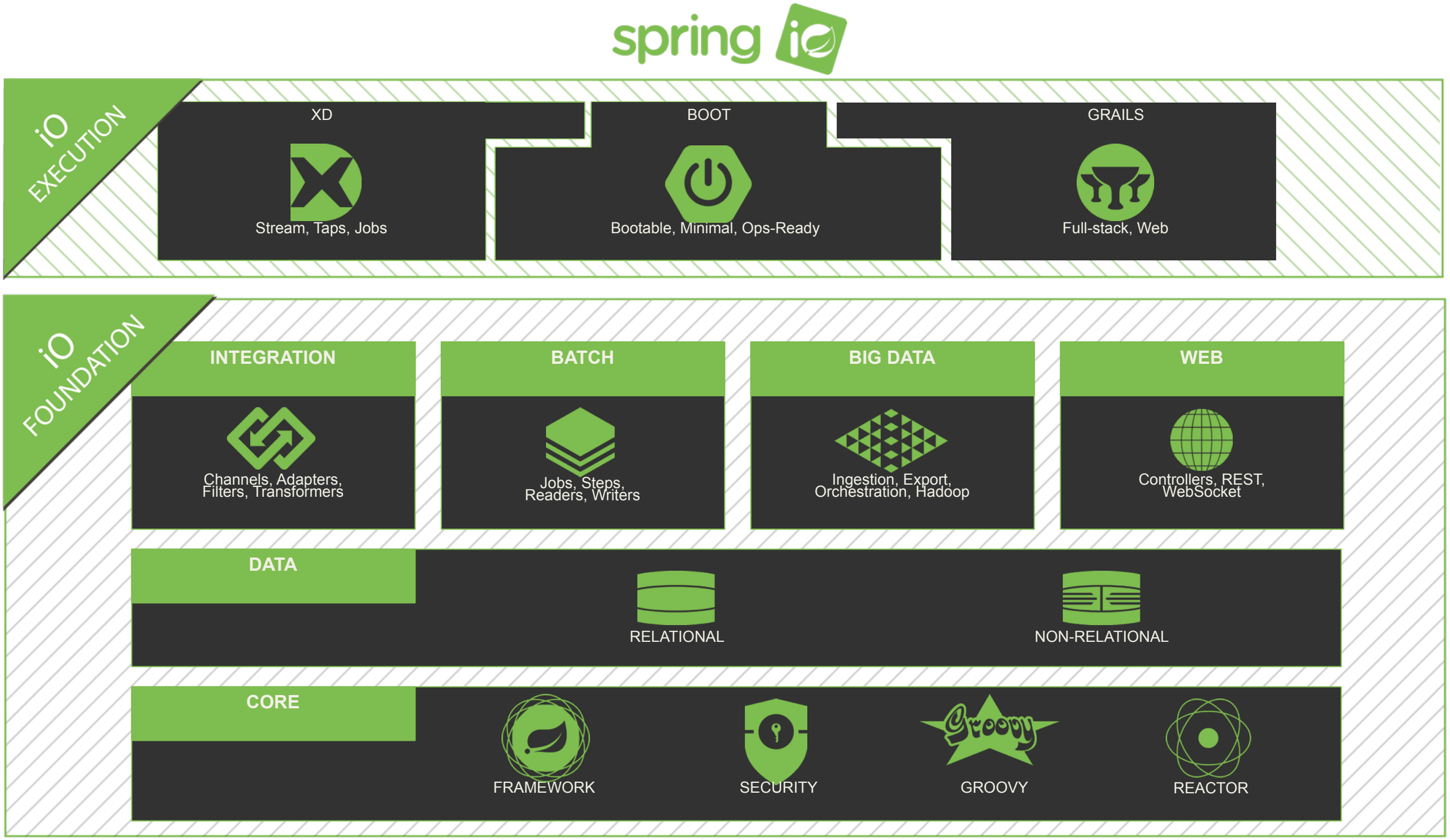


Choice!

- IBM donated WebSphere Liberty Buildpack
- http://blog.cloudfoundry.com/2013/09/09/ibm-websphere-liberty-buildpack-contributed-to-cloud-foundry/



the new Spring | spring.io


spring io
iO EXECUTION
XD
Stream, Taps, Jobs
BOOT
Bootable, Minimal, Ops-Ready
GRAILS
Full-stack, Web
iO FOUNDATION
INTEGRATION
Channels, Adapters, Filters, Transformers
BATCH
Jobs, Steps, Readers, Writers
BIG DATA
Ingestion, Export, Orchestration, Hadoop
WEB
Controllers, REST, WebSocket
DATA
RELATIONAL
NON-RELATIONAL
CORE
FRAMEWORK
SECURITY
GROOVY
REACTOR

Groovy and Spring Boot

Groovy and Spring Boot

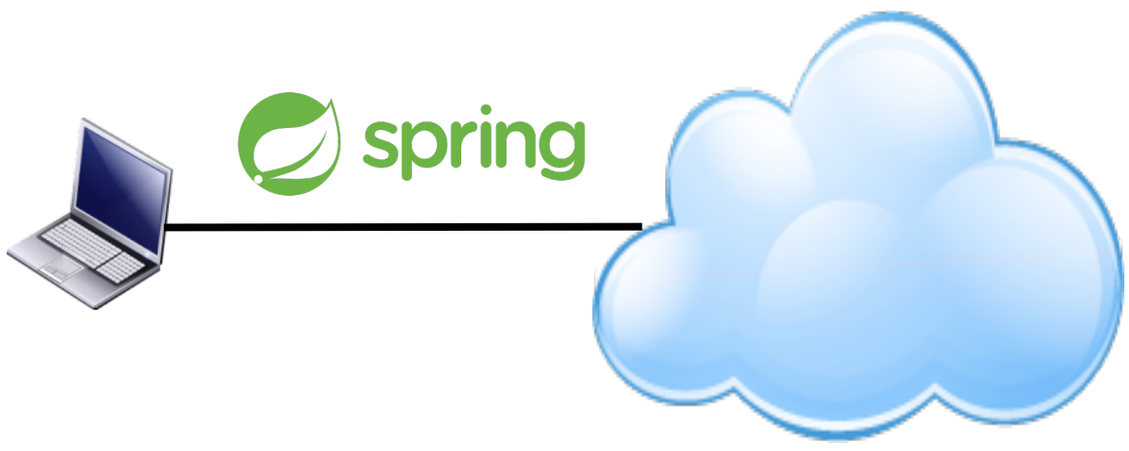
Groovy and Spring Boot

Spring and the Cloud

- Goal: deploy Spring apps to the cloud without changing a single line of code

- Cloud Foundry automatically re-configures bean definitions to bind to cloud services

- Works with Spring and Grails



Portability

ramnivas
@ramnivas

Following

Announcing spring-cloud
github.com/spring-project... #spring
#cloudfoundry #heroku

Usage pattern: Application Developers

- Create a `CloudFactory` instance. Creation of a `CloudFactory` instance is a bit expensive, so caching such an instance is recommended. If you are using a dependency inject frameworks such as Spring, creating a bean for `CloudFactory` will achieve the caching effect.

```
CloudFactory cloudFactory = new CloudFactory();
```

- Obtain a suitable `Cloud` for the environment in which the application is running.

```
Cloud cloud = cloudFactory.getCloud();
```

- Use the `Cloud` instance to get access to application info, service infos, and create service connectors.

```
// ServiceInfo has all the information necessary to connect to the underlying service
cloud.getServiceInfos();
```

```
// Alternatively, let the cloud create a service connector for you
DataSource ds = cloud.getServiceConnector("inventory-db", DataSource.class, null /* default config */);
```

SPRING

Demo

spring

4. ... the end?

CLOUD FOUNDRY by Pivotal

USING CLOUD FOUNDRY | RUNNING CLOUD FOUNDRY | GET INVOLVED

Cloud Foundry Blog

← UK Charity Raises Record Donations Powered by Cloud Foundry

Static.com Adds Hadoop Support for Cloud Foundry →

Want to Contribute to Cloud Foundry? Come on in!

Posted on May 16, 2013 by Andy Piper

Cloud Foundry is an Open Platform-as-a-Service, and an Open Source project. It has attracted phenomenal interest from the community - including partners, companies using the code internally, and those individual developers with a passion for getting involved. You can find the source code on Github. Community contributions are what help to make the platform so extensible. We are always happy when we receive a Github pull request to offer new functionality or fixes! We also appreciate bug reports submitted through Github Issues.

Looking at the Cloud Foundry project as a whole though… where should you start?

CLOUD FOUNDRY COMMUNITY

Join us!

... a pull request is all it takes!

Connect

http://twitter.com/andypiper

http://andypiper.co.uk

http://slideshare.net/andypiper

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