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OPEN SOURCE INNOVATORS

Kris Buytaert

@krisbuytaert

Works ~~on My Machine~~ in my container, Ops Problem now

Kris Buytaert

- I used to be a Dev,
- Then Became an Op
- CTO and Open Source Consultant @inuits.eu
- Everything is a freaking DNS Problem
- Evangelizing devops
- Organiser of #devopsdays, #cfgmgmtcamp, #loadays, #deliveryconf ? ….

Enterprise Software Deployment

- "Put this Code Live, here's a tarball" NOW!

- What dependencies ?

- No machines available ?

- What database ?

- Security ?

- High Availability ?

- Scalability ?

- My computer can't install this ?

#devoops in 2009

C(L)AMS

- Culture

- (Lean)

- Automation

- Measurement

- Sharing
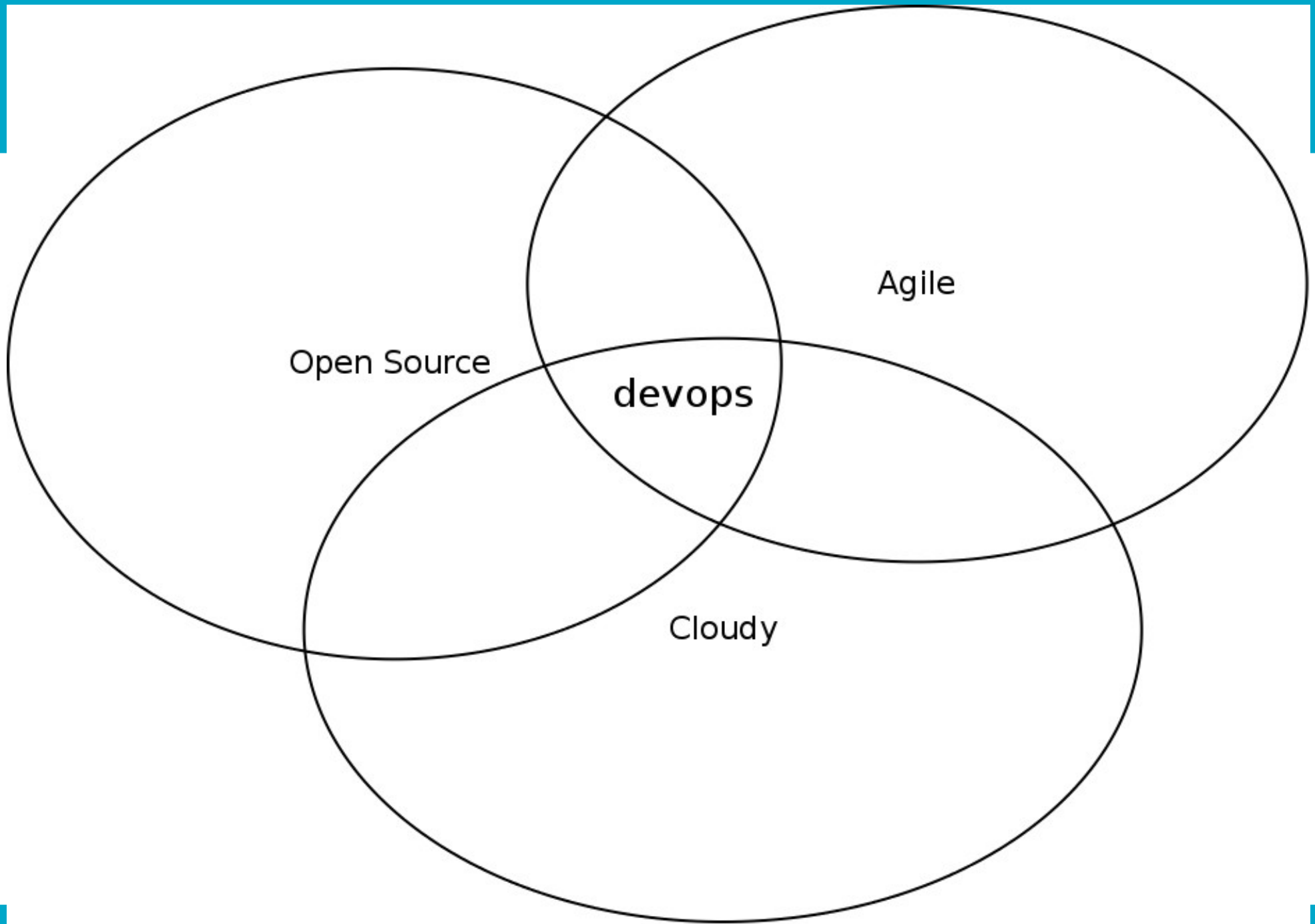
Damon Edwards and John Willis

Gene Kim

Dev/Ops

A global movement to improve the quality of software delivery leveraging Open Source experience, started in Gent in 2009

Agile

Open Source

devops

Cloudy

Some History Lessons

openMosix (+/- 2001-2005)

- 2.4 Kernel patch,

- Loadbalance multiple similar processes

- Both short (compilations) and longlived (calculations) processes

- Parts of processes migrated to other nodes

- OMFS allowed identical access to data from all nodes

openMosix Limitations

- shared memory
  - Limited type of applications could migrate
  - Patches available but not successful

- Filesystem access

  oMFS : unstable => removed

Lessons from openMosix

- Applications need to be adapted

- Files need to be accessible (oMFS)

- Huge gap between developers and consumers

  => Limited working use cases

Linux-HA (2005- now)

- Hearbeat, Heartbeat v2, Pacemaker , Corosync

- Define resource (OCF)

- Define constraints, clones, colocation, …

- Long running services that should not stop

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Pacemaker Architecture
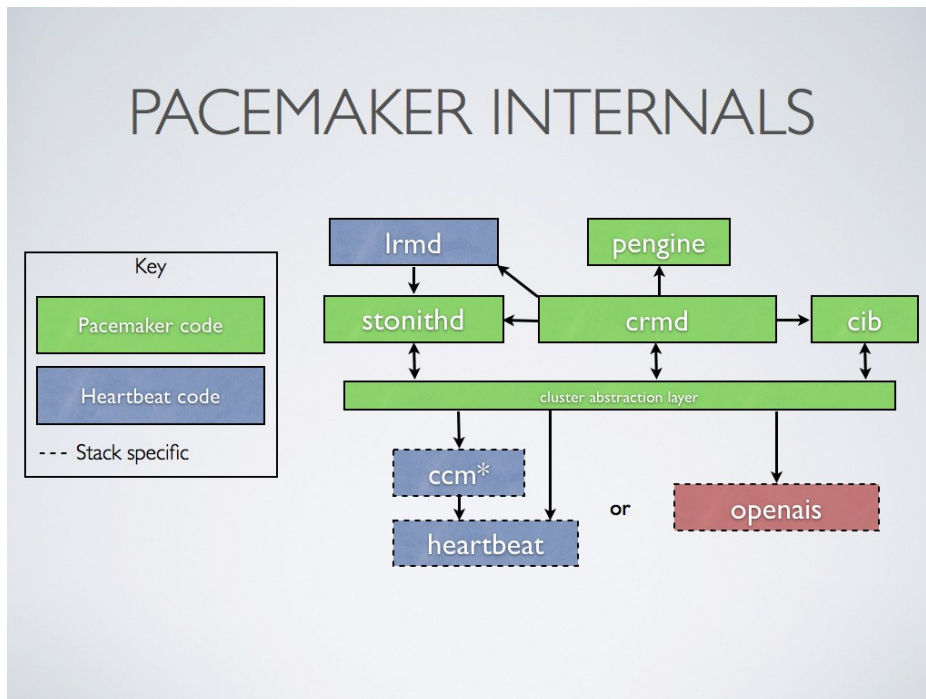
- **Stonithd** : The Heartbeat fencing subsystem.

- **Lrmd** : Local Resource Management Daemon. Interacts directly with resource agents (scripts).

- **pengine** Policy Engine. Computes the next state of the cluster based on the current state and the configuration.

- **cib** Cluster Information Base. Contains definitions of all cluster options, nodes, resources, their relationships to one another and current status. Synchronizes updates to all cluster nodes.

- **crmd** Cluster Resource Management Daemon. Largely a message broker for the PEngine and LRM, it also elects a leader to co-ordinate the activities of the cluster.

- **openais** messaging and membership layer.

- **heartbeat** messaging layer, an alternative to OpenAIS.

- **ccm** Short for Consensus Cluster Membership. The Heartbeat membership layer.

Working with developers

- State vs Stateless
  - Most applications have state somewhere
  - Discuss how to share/access state

- Data access
  - Local filesystem is king
  - We needed distributed / shared filesystems

- Health

- Metrics

Isolating Services

- 1 application per VM

  - Easy configuration

  - No accidental changes

  Anno 2005 – 2010 people called us crazy

- Multiple VM's with the same functions (A,B,001,002,256)

- Isolate code from config

Lessons from Linux-HA

- Applications need to be adapted

- Files need to be accessible (shared/distributed FS)

- Monitoring strategy needs change

- Good collaboration between developers and ops folks

    => Many general purpose use cases

- Works better with an Open Source Mindset

Failed (Private) Cloud Projects

- Identical copies of Bare Metal or vm's moved to the cloud

- No config management

- No monitoring

- No resilience

- No API usage

- I want a VM
  - Please fill in these 4 forms
  - Wait 5 weeks

- Repeat

  IT Departments have not adapted,
  'Shadow'-IT is winning

This new 'D' hype

- New kid on the block

- Vagrant-lxc with a nice cli

- The Ultimate "devops tool"
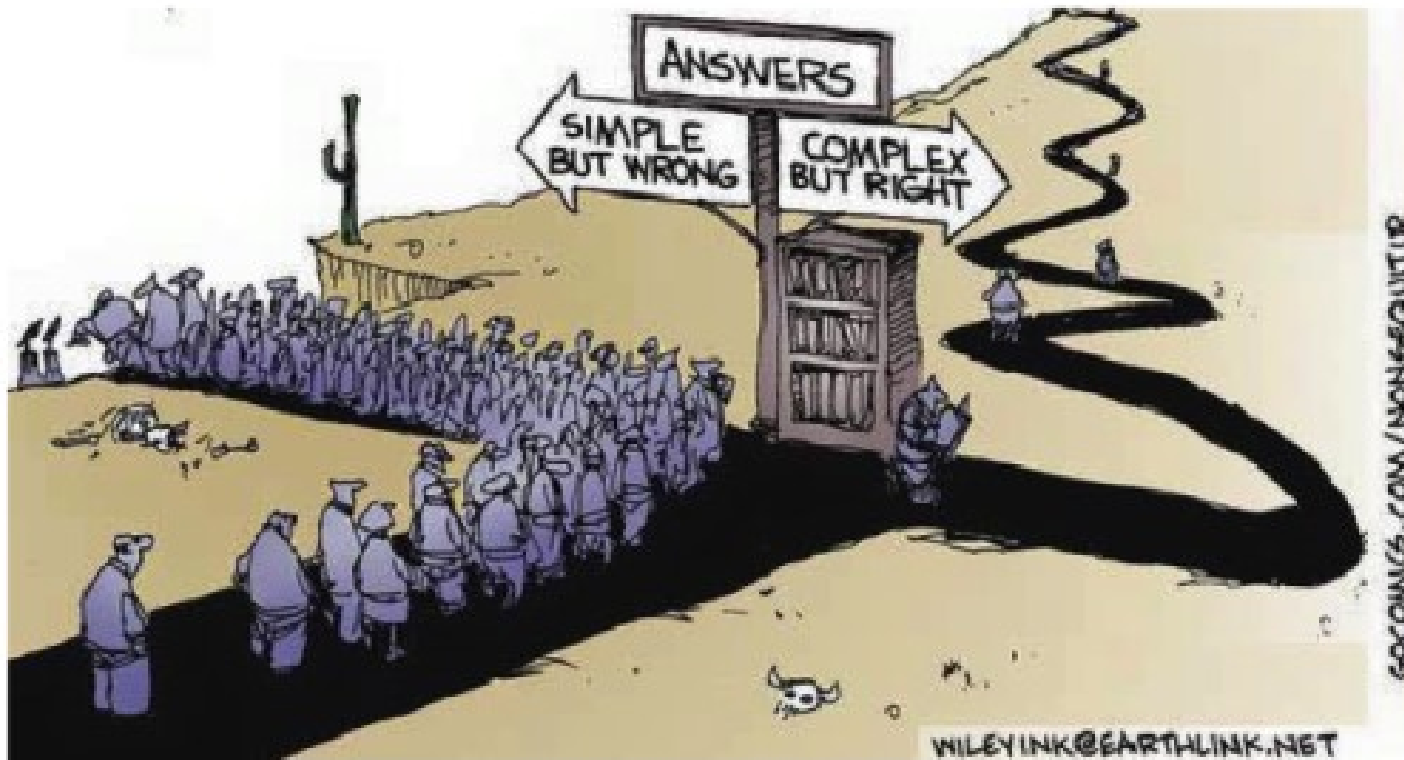
- "Unseen" growth

- Docker is the new cool thing to do

edwheeler.deviantart.com @noticiasda

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Culture vs Tools

Kenny Bastani
@kennybastani

This Dockerizing legacy apps program is kind of like paying IKEA to give your old furniture a Swedish name

Docker brings containerization to legacy apps | TechCrunch
At the DockerCon conference today in Austin, Docker announced a new service called the Modernize Traditional Applications (MTA) Program that enables cust...
techcrunch.com

RETWEETS 25
LIKES 49

2:54 AM - 24 Apr 2017

4   25   49

Richard Seroter
@rseroter
Follow

Stop pretending that things work the same wherever they run (e.g. cloud). It takes work, says @caseywest. #s1p
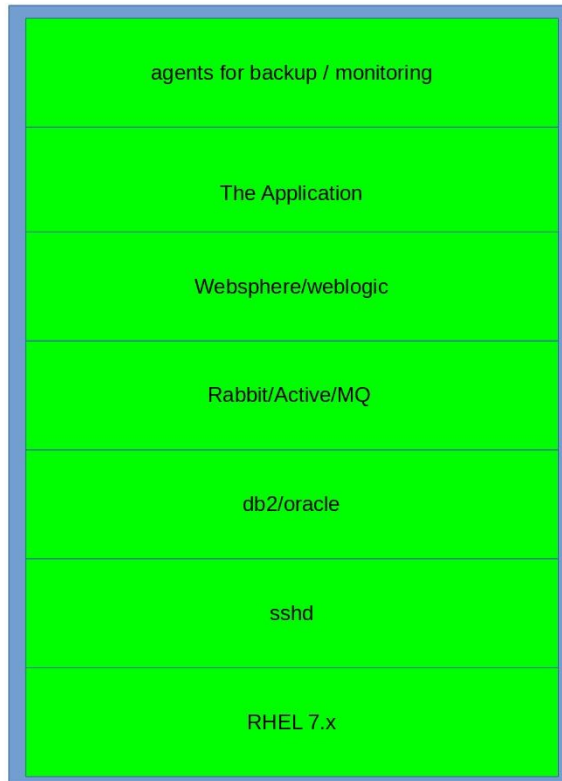
BARGAINING
WE CRAMMED THIS MONOLITH INTO A CONTAINER AND CALLED IT A MICROSERVICE

RETWEETS 74
LIKES 68

12:39 AM - 3 Aug 2016

74   68

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An Enterprise Container

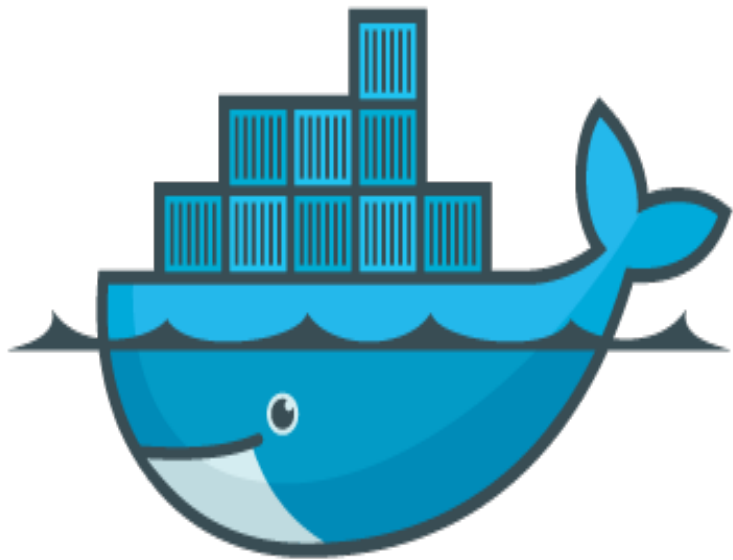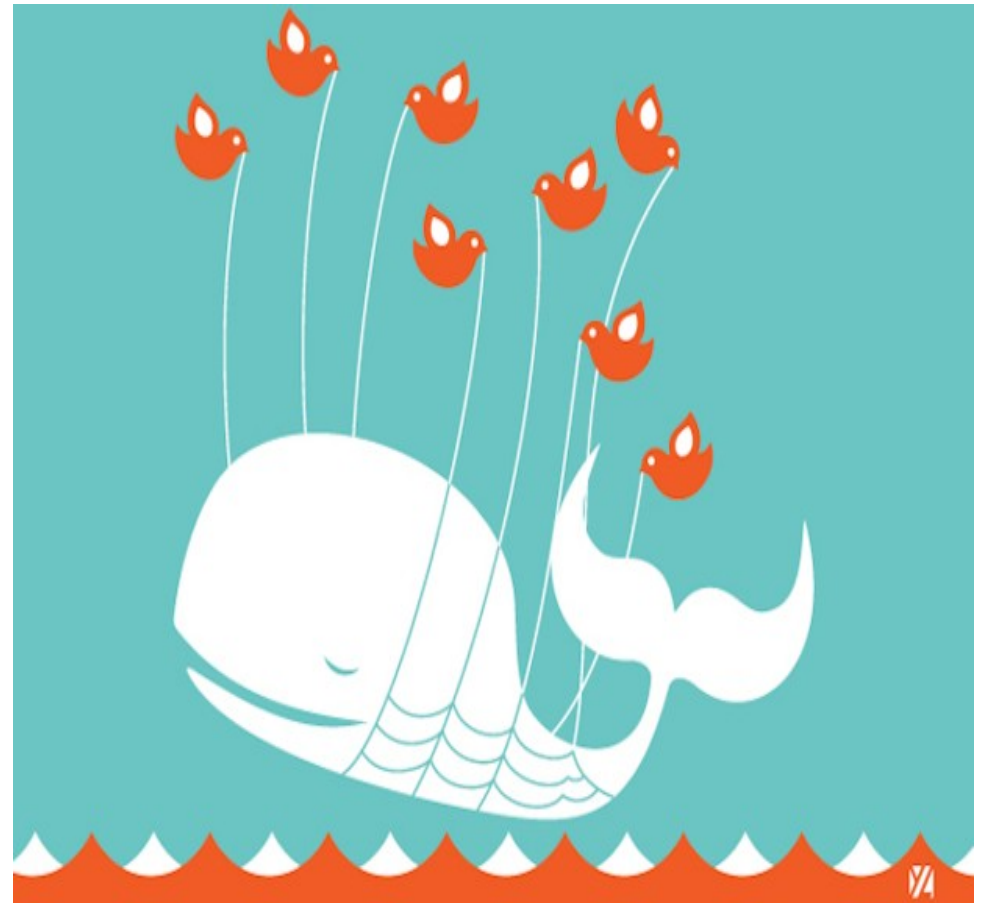| |
|---|
| agents for backup / monitoring |
| The Application |
| Websphere/weblogic |
| Rabbit/Active/MQ |
| db2/oracle |
| sshd |
| RHEL 7.x |

- No different from a full vm

- Multiple services running in one container

- ssh is the default connection

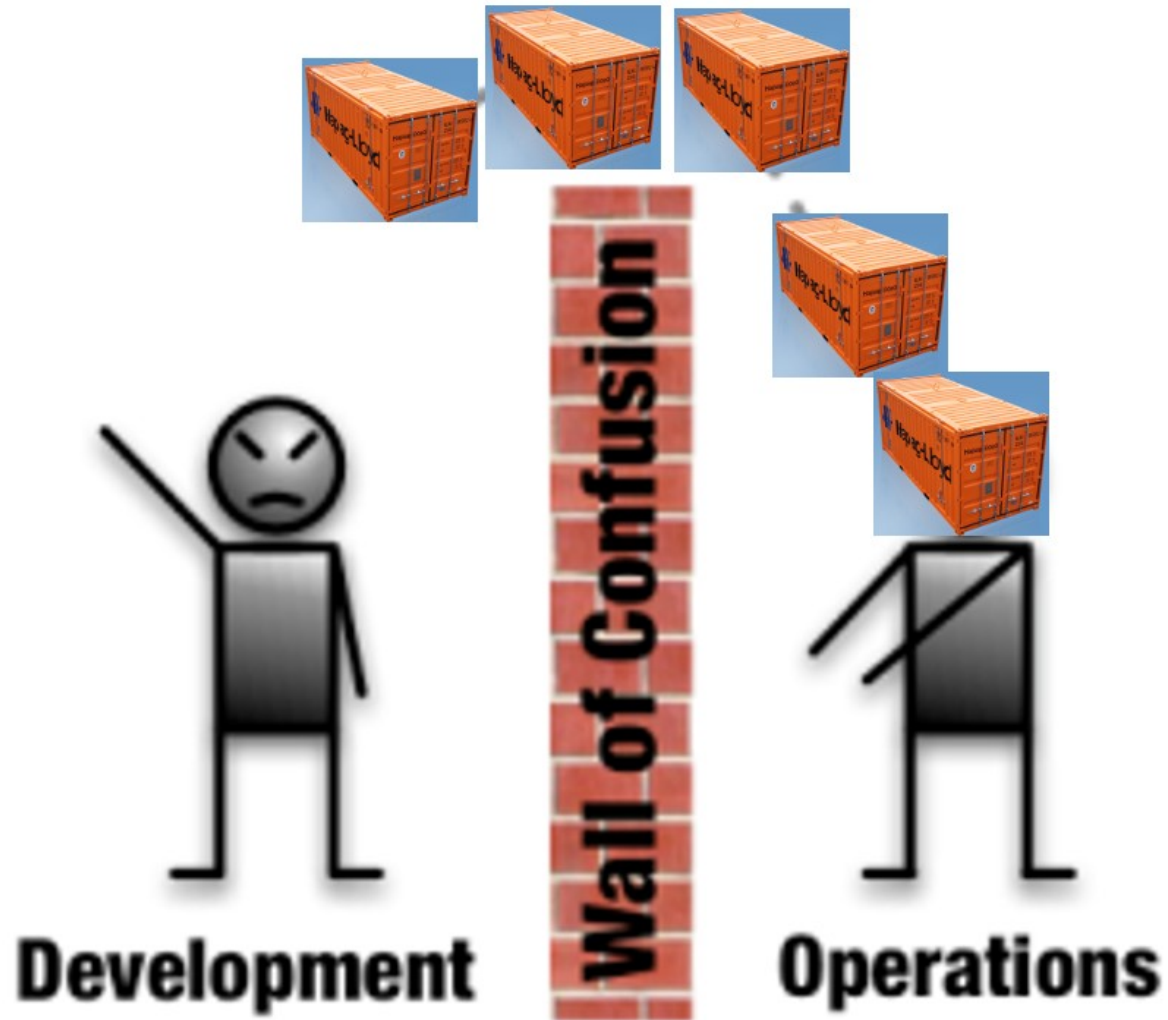# Image Build by devs, maintained by nobody

Dev Ooops #container edition

- "Put this Code Live, here's a Docker Image "

- No machines available ?

- What database ? Where to store the data ?

- Security ? What distro is this even ? Bad Cows ?

- How do we monitor his ?

- Backups ?

- How did you build this ?

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Development

Wall of Confusion

Operations

Closing the gaps between dev and ops, AGAIN !!

- Where do your containers come from ?

- Who build it ?

- Can you rebuild it ?

- Do you even need a container

- How do you build the hosts that run the containers ?

- Infrastructure as code ++

Kubernet
Kubernete
Kubernete
Docker
es
s
Kubernetes
Kube

Container Naive

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10 days into operations

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Failed K8s Stories

- Shiny Sales Demos

- Doesn't fit workflow

- Batteries not included

- Multiple attempts at deploment

- Security Ignored

11 days into operations

- Oh I missed 2 other containers

- Security ? What distro is this even ?
  Bad Cows ?

- What do you mean "We are a RHEL shop

The New Silo

- Container operations team

- Ignore the old farts

- Who cares about 20 years of experience / security anyhow

- Lets' have some n00bs build a cluster

Dev vs Prod

- 1 local dev machine

- 1 local application

- A cluster
  - ~~Swarm~~
  - Kuberenetes
  - ~~Mesos~~
  - Nomad
  - K3s
- Other Applications

Fixing your deployment

- What do you mean we have n+1 versions of our code running (n >1)

- My App ain't suitable for that !

Dev vs Prod

- Localhost :8081

- Https

- Dns

- Ingress

- LoadBalancing

- Service Discovery

- Or Vendor Lock In

Dev vs Prod

- Local disk

- No real data

- Database in Container

- Actual customer data

- Distributed Storage
  - 2017 was the year of NFS (again)

- Object Storage

- Backups

Dev vs Prod

- Random image from the internet

  + Some local files

- CI Pipeline

- Image Registry

- Security Scanning

Dev vs Prod

- Works on my machine

- docker pull yolo

- Monitoring

- Metrics

- Security

- Tracing

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Containers will not fix your broken culture

(and other hard truths)

@bridgetkromhout

Pivotal

@krisbuytaert

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The hard truth

- Most organisations have NO usecase for K8s
- Hype is pushing them to use a total misfit between their application architecture and the infrastructure
- Creating even more problems and frustrations
- Large amounts of K8s introductions FAIL
- % of on prem failures is even higher !
- K8s has to be a fit for your architecture

Nothing Wrong with

- docker-compose in a reproducable vm
- Nomad
- No containers at all

Don't fall for

- Cargo Culting

- YoloOps

- Resume Driven development

- Hype Driven development

It's not about the tools
It's about change
It's about the people

Contact

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Further Reading
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