

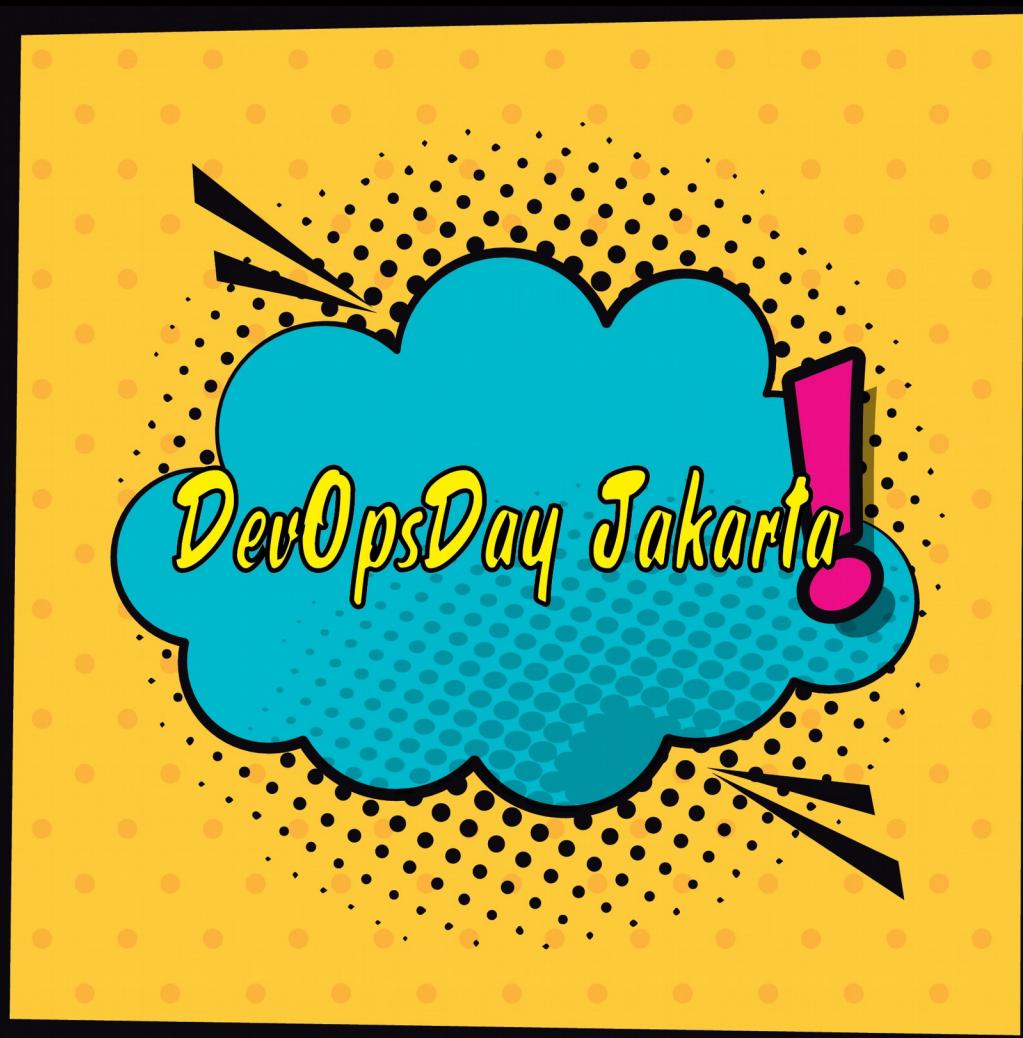


Jakarta, 22 Maret 2018

DevOps & The Future of Containers

DEVOPS INDONESIA
DevOps Community in Indonesia

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APRIL 2018

9 AM - 5 PM



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The banner for DevOpsDays Jakarta 2018 features a red and white design with a large microphone icon. It includes the event name "DEVOPSDAYS JAKARTA", the date "26 & 27 APRIL 2018", and the time "9 AM - 5 PM". The banner also includes a red arrow pointing towards the speaker list.

Speaker	Title	Speaker	Title	Speaker	Title
	The State Of DevOps 2018		Not Actually a DevOps Talk		DevOps Adoption, Challenges and Opportunities
Matt Ray		Michael Côté		Iskak Hendrawan	
	DevOps Practice In Nonprofit		Compliance As Code - Minimal Viable Cloud		How Honestbee Does CI/CD On Kubernetes
Abdurrahman Mappuji		Sergiu Bodiu		Vincent De Smet	
	Continuous Delivery For Mobile Apps, Both Android And iOS		Batch Size matter - Small is beautiful		Dockerizing your web application stack (Nginx, PHP, MySQL)
Ifnu Bima Fatkhan		Thomas Rothe		Salman El Farisi	
	The Universe As Code - What Programming Can Teach Us About Maths, Science And Philosophy				
Dave Kerr					

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MORE INFO

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Yusuf Hadiwinata Sutandar

Linux Geek | OpenSource Enthusiast | Security Hobbies





*How the Open Container Initiative (OCI)
is driving innovation.*

1	Fm
Gh	Github

PERIODIC TABLE OF DEVOPS TOOLS (V2)

EMBED DOWNLOAD ADD

Os Open Source

Fr Free

Fm Freemium

Pd Paid

En Enterprise

SCM

CI

Deployment

Cloud / IaaS / PaaS

BI / Monitoring

Database Mgmt

Repo Mgmt

Config / Provisioning

Release Mgmt

Logging

Build

Testing

Containerization

Collaboration

Security

5

En

Ch

Chef

Os

6

En

Pu

Puppet

En

7

Os

An

Ansible

En

8

En

Sl

Salt

Os

9

Os

Dk

Docker

Os

10

Pd

Az

Azure

2	Fm
Aws	Amazon Web Services

3	Os	4	Pd
Gt	Dm DBmaestro		

11	Fm	12	Os
Bb	Lb Liquibase		

19	Os	20	En	21	Os	22	Os	23	Os	24	Os	25	Fr	26	Os	27	Fr	28	Os	29	Pd	30	Os	31	Pd	32	Os	33	Os	34	Os	35	Os	36	En
Gl	Rg	Mv	Gr	At	Fn	Se	Ga	Dh	Jn	Ba	Tr	Gd	Sf	Cn	Bc	Mo	Rs																		

37	Os	38	En	39	Os	40	Os	41	Os	42	Fr	43	Os	44	Fr	45	Os	46	Fm	47	Pd	48	Fm	49	Fr	50	Fr	51	Os	52	Os	53	Fr	54	Os
Sv	Dt	Gt	Gp	Br	Cu	Cj	Qu	Npm	Cs	Vs	Cr	Cp	Ju	Rd	Cf	Ds	Op																		

55	Os	56	En	57	Fr	58	Os	59	Os	60	Fr	61	Fr	62	Fr	63	Os	64	Fm	65	Fm	66	Os	67	En	68	Fm	69	En	70	En	71	Os	72	Fm
Hg	Dp	Sb	Mk	Ck	Ju	Jm	Tn	Ay	Tc	Sh	Cc	Ry	Cy	Oc	No	Kb	Hr																		

73	En	74	En	75	Os	76	Os	77	Fr	78	Os	79	En	80	Os	81	Os	82	Os	83	Fm	84	Pd	85	En	86	En	87	Fm	88	En	89	Os	90	En
Cw	Id	Msb	Rk	Pk	Mc	Xltv	Jm	Nx	Co	Ca	So	Xld	EB	Dp	UD	Nm	Os																		

91	En	92	En	93	En	94	En	95	En	96	En	97	En	98	Pd	99	Fm	10	Pd	101	Fm	102	Fm	103	Fm	104	Pd	105	En
Xlr	Ur	Bm	Hp	Au	Pl	Sr	Tfs	Tr	Jr	Rf	Sl	Fd	Pv	Sn	Tr	Ff													

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*Raise You Hand!
Who..*

...has heard of Docker?

...knows what Docker is?

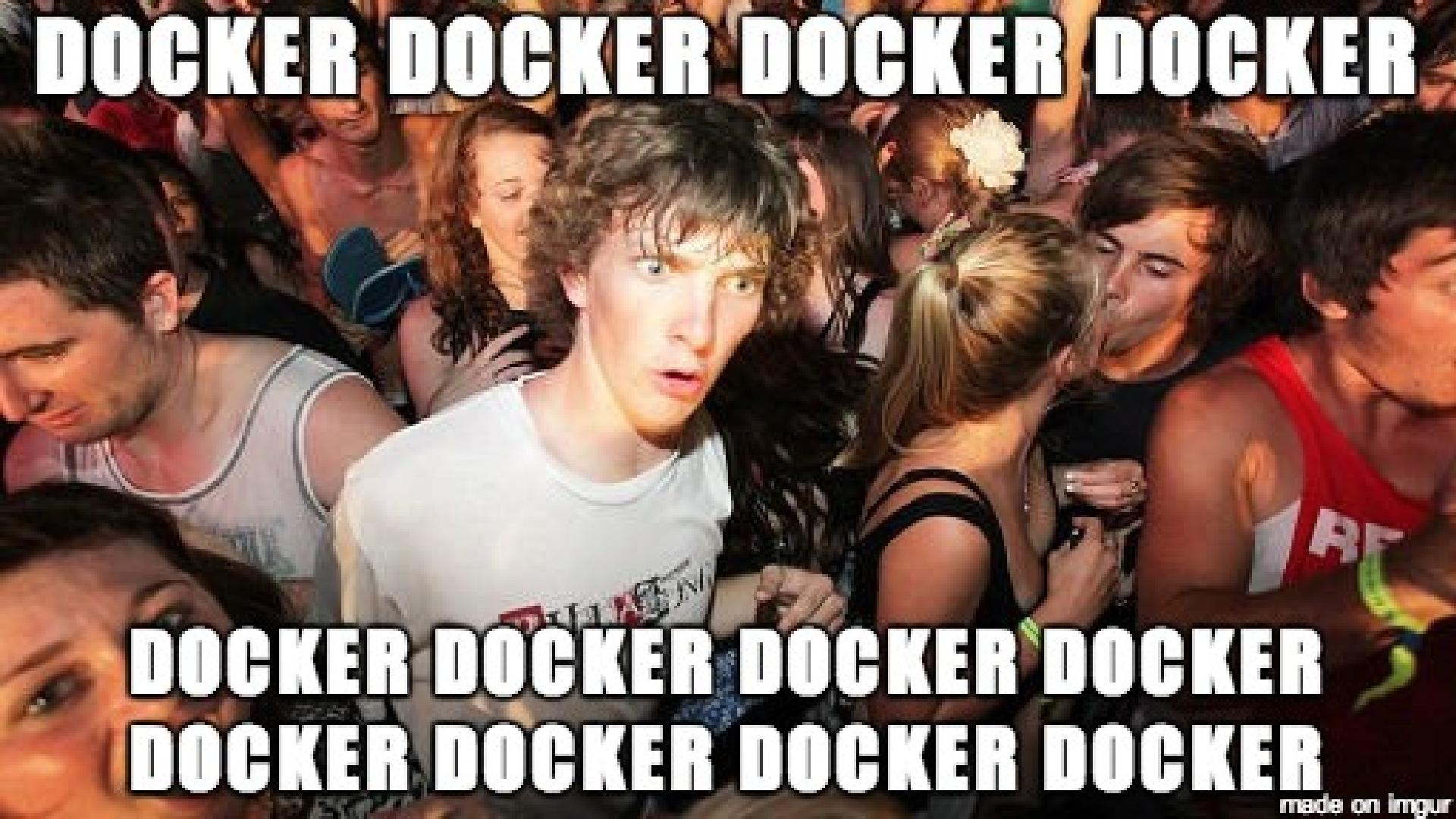
...has tried Docker?

or

...uses Docker?

*....uses Docker in production?
...with additional tools?*

DOCKER DOCKER DOCKER DOCKER



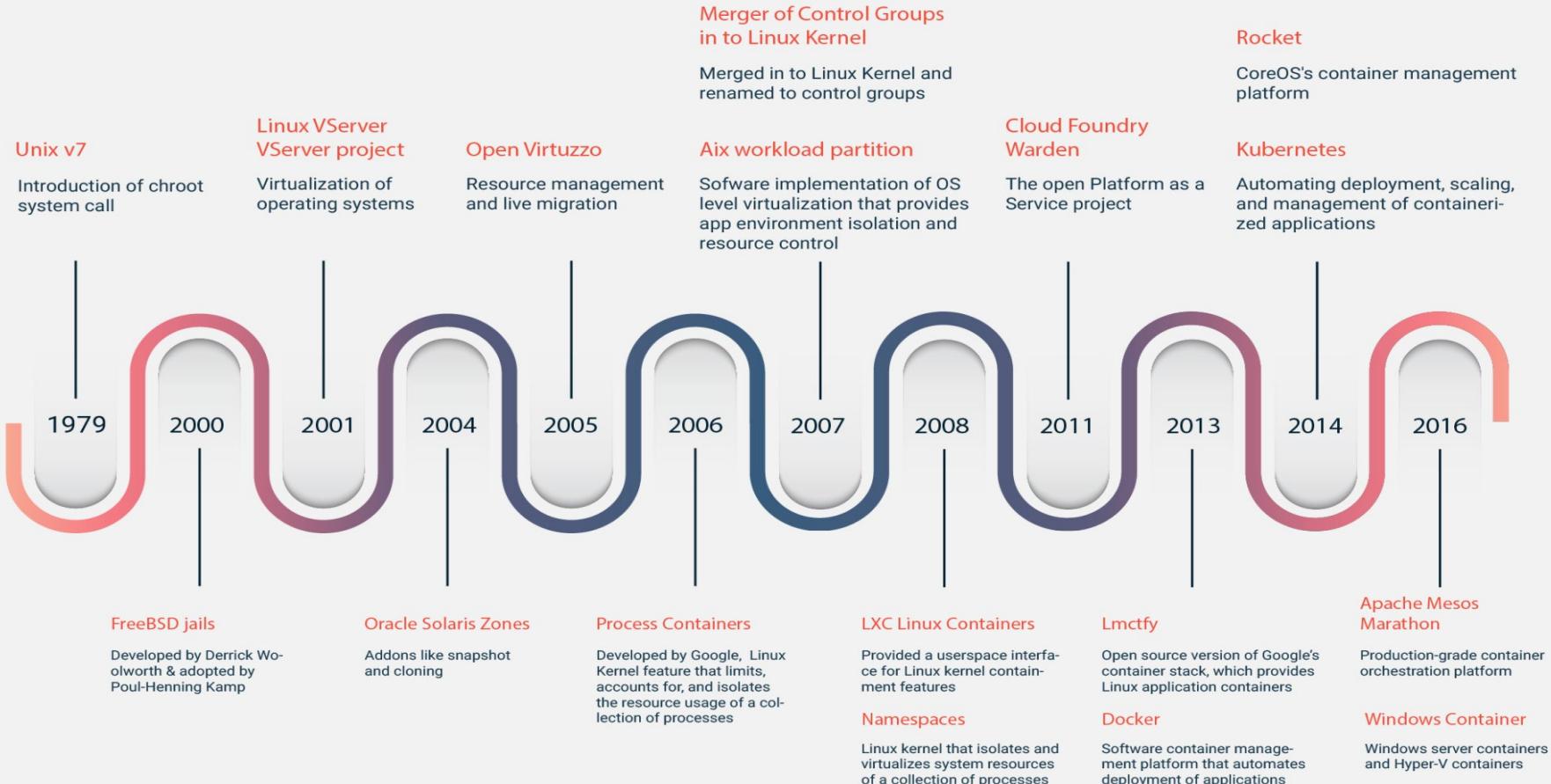
**DOCKER DOCKER DOCKER DOCKER
DOCKER DOCKER DOCKER DOCKER**

DOCKER





Container Ecosystem Evolution Timeline



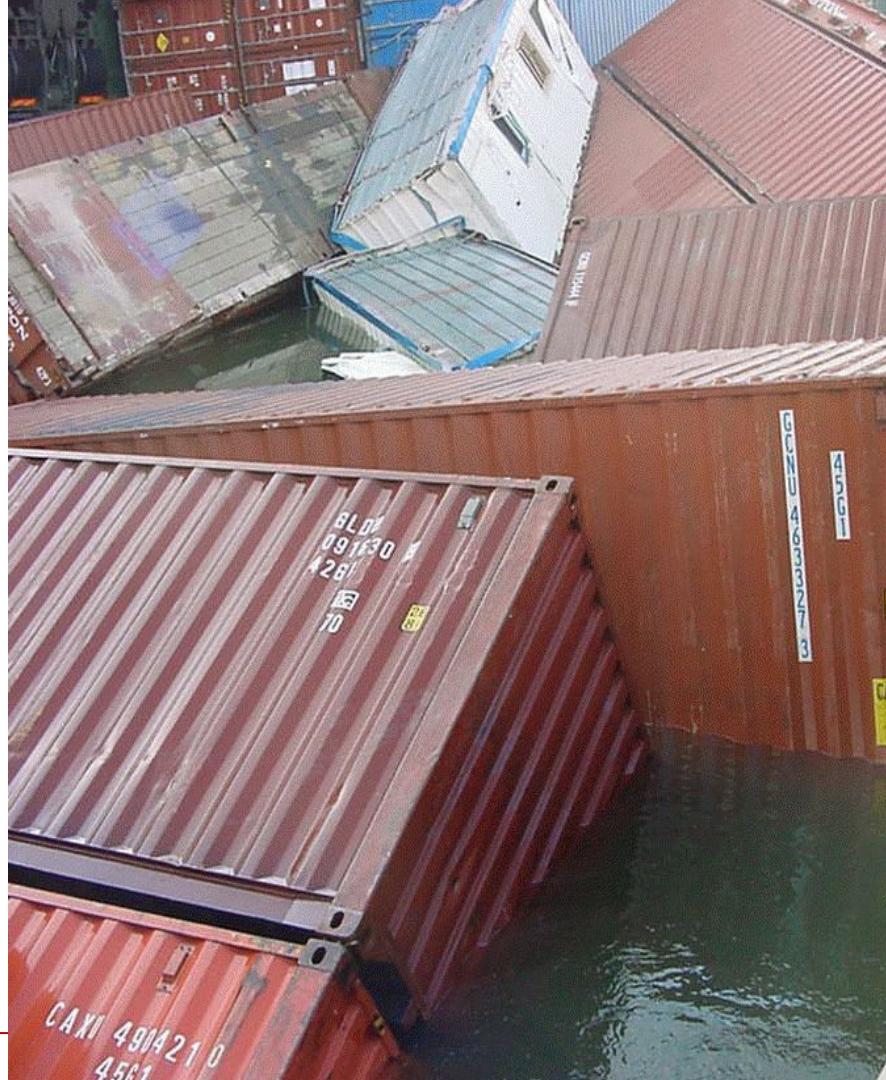
What was Docker's big contribution?

- Daemon, container engine that manages the configuration of Linux kernel namespaces, additional security features, and cgroups
- Introduced a layered packaging format for content that runs inside containers
- Command Line Interface (CLI) that made it easy to use. # docker build/run/push/pull etc.
- Docker drove the industry standardization of LXC

RHTE - WH - Linux Containers Future.pdf

Early Concern with Docker

- Since the early days enterprise Docker users had some concerns
- Build requires a daemon
- Build requires a running container (sometimes makes sense)
- Build has secret handling issues
- Root concerns at runtime.



Most container tools focus on the developer Container image development

```
# docker build, docker commit, docker pull,  
    docker push
```

Standardization of image format and runtime
New tools to build and run images can arise

Several initiatives and discussions are going on these days, including **appc** (App Container specification), **CNI** (Container Network Interface), **CNCF** (Cloud Native Computing Foundation) or **OCI** (Open Container Initiative). For instance, the OCI tries to standardize container image definitions. Docker, CoreOS, Google, Red Hat, Facebook, Amazon and others work together here.



OPEN CONTAINER
INITIATIVE



appc



CNI



Introduction to Open Container Initiative

Two Specifications:

- Runtime - How to run a “filesystem bundle” that is unpacked on disk
- Image Format - How to create an OCI Image that contains sufficient information to launch the application on the target platform



The industry standards for container formats and runtimes.

OCI as the most important organization in the container ecosystem driving vendor neutrality, standardization and making this amazing technology accessible globally



OPEN CONTAINER
INITIATIVE



Docker also has huge momentum today. However, there exist some doubts about what the future will bring.

Several software vendors are not happy with the power of Docker Inc. as company behind Docker. For example:

- Putting Docker Swarm Mode into the main Docker project made other orchestration vendors like Red Hat or Google unhappy, because they focus on Kubernetes as container orchestration tool
- Docker starts behaving like The Old Microsoft - Docker is trying to defeat Kubernetes, Mesos/Marathon? and? Nomad by including Swarm into the Docker Core.



Continue...

- Docker's architecture is fundamentally flawed - the docker executable is merely a REST client that requests the Docker daemon to do its work. Critics of Docker say this is not very Linux-like.
- The Docker build process is stuck in second gear - Dockerfile syntax has been frozen in Docker's roadmap for a long time now. This means that the Dockerfile format has not evolved with the insights in the Docker community for at least a year and a half..



Update (4 September 2017): To be fair, it must be noted that Docker appears to have taken this feedback seriously. They have separated the core of Docker into the Moby Project which can be re-packaged/re-assembled by the community in any way they see fit.
<https://blog.docker.com/2017/04/introducing-the-moby-project/>.

Update (20 October 2017): Moreover, Docker now also packages Kubernetes with their product.
<https://blog.docker.com/2017/10/kubernetes-docker-platform-and-moby-project/>

Update (11 May 2017): The above is FIXED with Multi-Stage Builds. See my new blog “Simplify the Smallest Possible Docker Image”
<https://medium.com/@adriaandejonge/simplify-the-smallest-possible-docker-image-62c0e0d342ef>



A 'boring' Docker fork could solve some problems - and create others

Wise was especially dismayed by Docker's recent move to include its Swarm orchestration functionality, since it was "a large new system developed in secret without transparent community involvement." He cited this as an example of Docker pursuing a strategy of "[using its] position to impede the progress of [open source] communities in favor of [Docker's] commercial interests."

The Important Things:

Container Wars with Various Technologies

*Do not focus on developing code for the container under the hood. Care instead about the business logic.
Implement your microservices in a vendor agnostic way.*



*..Also, The container technology market is becoming **crowded**. Various technologies are competing for share of this emerging market*

*“Red Hat acquires CoreOS for **\$250 million** in Kubernetes expansion” to **win** Container orchestration in Today Market*

<https://www.redhat.com/en/blog/faq-red-hat-acquire-coreos>

A wide-angle photograph of a crowded beach and ocean. The beach is packed with people, many of whom are lying on towels or small umbrellas. In the water, numerous people are on colorful inflatables like inner tubes and rafts. The water is a vibrant blue, and the sky above is clear and bright.

WHEN IT'S A BEAUTIFUL, SUNNY DAY OUTSIDE

BUT EVERYONE ELSE HAS THE SAME IDEA AS YOU...

<https://www.redhat.com/en/blog/faq-red-hat-acquire-coreos>

Docker ContainerD & CoreOS's rkt Donating to Cloud Native Computing Foundation

Over the past 4 years, the adoption of containers with Docker has triggered an unprecedented wave of innovation in our industry: docker,inc believe that donating containerd to the CNCF will unlock a whole new phase of innovation and growth across the entire container ecosystem - march 2017

<https://blog.docker.com/2017/03/docker-donates-containerd-to-cncf/>
<https://coreos.com/blog/rkt-container-runtime-to-the-cncf.html>

How does rkt improve the situation?

The short answer is that rkt now provides a viable alternative to Docker. It has a more Linux-like architecture. And a strong competitor will keep the monopolist sharp.

<https://medium.com/@adriaandejonge/moving-from-docker-to-rkt-310dc9aec938>

How does rkt improve the situation?

The long answer:

- *rkt can run Docker images*
- *rkt has a simpler architecture*
- *rkt follows an open standard for images*
- *If you want to run Kubernetes without Docker, you may also like to learn about the cri-o project. This project is part of an official Kubernetes incubator and based on runc*

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Introduction to OCI CRI-O



cri-o

A Kubernetes thing

- *Lightweight Container to run Kubernetes*
- *OCI Daemon renamed to CRI-O*
- *Implements Kubelet Container Runtime Interface*
 - *OpenShift tells Kubernetes to execute pod*
 - *Kubernetes communicates with **ocid***
 - *ocid pulls image using **skopeo/image***
 - *ocid stores image on disk using storage*
 - *ocid runs container/pod using **runc***

Red Hat Technical Exchange 2017 – Vietnam
More detail about CRI-O: <http://cri-o.io/>

Introduction to CrooT

*Stand for Container Running on OpenStack
The next Generation Container*

Pricing Model for Croot As a Services

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3x CrooT_{node cluster} = Rp 250000

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Container On Openstack



Croot

Container On Openstack

Certified Provider

Boleh kk... Croot nya kk!!

When Croot Become Community Product

Conclusion: Develop Container-Agnostic Microservices

There are plenty of different fantastic container technologies, orchestration platforms and cloud services. All of them have their pros and cons. In addition, the market is evolving quickly.

The key conclusion for now: Develop the business logic of your microservices in a vendor-agnostic approach to be future-safe and have fun leveraging all the great advantages and features of microservices and container technologies in opposite to monoliths and heavyweight virtual machines.

....

In summary, no matter if you develop your business logic within a microservice with source code (using technologies such as Java, .Net or Go) or visual coding (such as middleware technologies), you should be able to develop it once and be able to deploy it in different containers, test environments or cloud providers without re-developing it or even having to change the technology you chose before.

To Avoid Vendor Lock-in, please Visit:

<http://aaronallport.com/2016/03/23/can-we-avoid-cloud-vendor-lock-in.html>



*How the Open Container Initiative (OCI)
is driving innovation.*

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<https://www.meetup.com/Docker-Indonesia/>

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THANK YOU !



Quote by Steve Anderson