

擁抱或對抗？

談 Docker 對傳統 DevOps 工具鏈的衝擊

William Yeh 葉秉哲

Architect @ Gogolook

2015-12-10



Container Summit 2015

航向容器新世界

經濟學家

經濟學界流行一則笑話：如果你請教十位經濟學家有關一個經濟問題的意見，你會得到十一種意見。

哲學家

你若問十位哲學家：「哲學是什麼？」
很可能會得到二十個以上的答案。

因為每位哲學家會提出兩、三個他認為
還算妥切的答案，而他自己也不能確定
哪一個是最正確的。

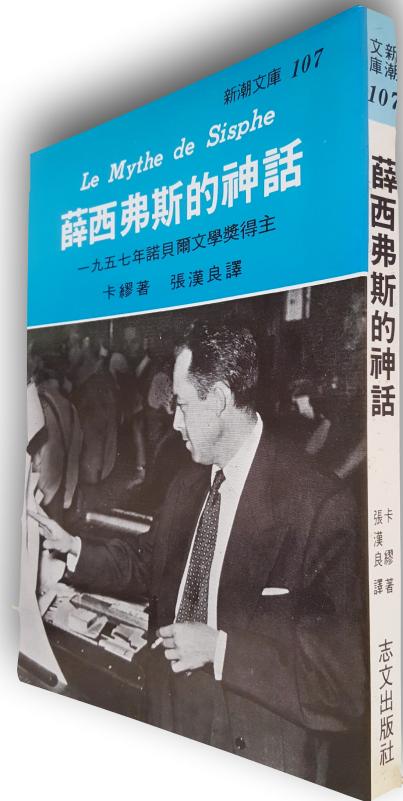
A black and white photograph of Albert Camus. He is shown from the chest up, wearing a dark, textured jacket over a light-colored shirt. He has dark hair styled upwards and is looking slightly to his left with a contemplative expression. A lit cigarette is held between his fingers, with smoke visible near his mouth. The background is dark and out of focus.

Albert Camus

只有一個哲學問題是真正嚴肅的，
那就是自殺。

判斷生命是否值得活下去，就等
於答覆了哲學的根本問題。

其餘的一切——世界有無三度空間、心智到底
有九個還是十二個範疇——都是次要的哲學問
題；不過是遊戲。



你若問十位電腦專家：
「DevOps 是什麼？」

很可能會得到.....

Database	↗	SCM	↗	Build	↗
CI	↗	Repo Mgmt	↗	Testing	↗
Deployment	↗	Config / Provisioning	↗	Containerization	↗
Cloud / IaaS / PaaS	↗	Release Mgmt	↗	Collaboration	↗
BI / Monitoring	↗	Logging	↗	Security	↗

1	En
O	12c
3	Os
My	Gt
MySQL	Git
11	En
Mq	Sv
MSSQL	Subversion
19	Os
Pq	Mc
PostgreSQL	Mercurial
37	Os
Mg	Gh
MongoDB	Github
55	En
Db	Bb
DB2	Bitbucket
73	Fr
Cs	Hx
Cassandra	Helix
74	En
75	Os
76	Os
77	Os
78	Os
79	Fm
80	Os
81	Os
82	Os
83	En
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85	Os
86	En
87	En
88	En
89	Os
90	Os

PERIODIC TABLE OF DEVOPS TOOLS (V1)																																		
		Database			SCM			Build																										
Os	Open Source	Cl	Repo Mgmt	Testing	Containerization	Deployment	Config / Provisioning	Collaboration	Release Mgmt	Logging	Security																							
Fr	Free																																	
Fm	Freemium																																	
Pd	Paid																																	
En	Enterprise																																	
2	Fm	Aws	Amazon Web Services																															
5	En	Ch	Chef	Pu	Puppet	An	Ansible	Sl	Dk	Az	Azure																							
6	En																																	
7	Os																																	
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Brian Brazil

真正嚴肅的 DevOps 問題 只有三個：

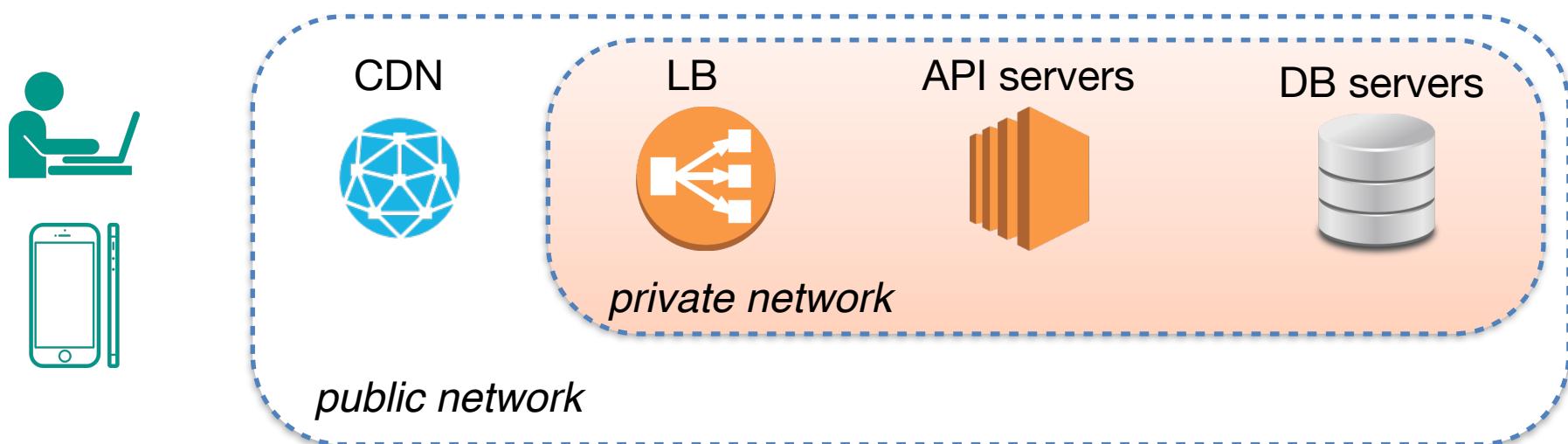
1. How to **recreate** your system
2. How to safely **change** your system
3. When something has gone **wrong**

1. How to **recreate** your system

2. How to safely **change** your system

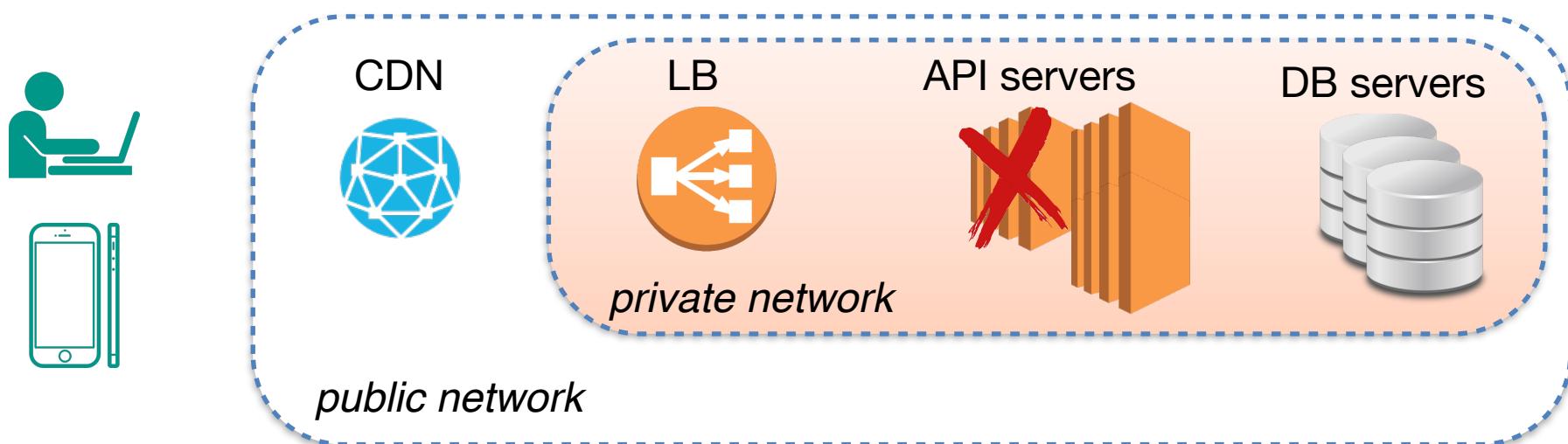
3. When something has gone **wrong**

- 1.1 - 機器
- 1.2 - 組態
- 1.3 - 角色



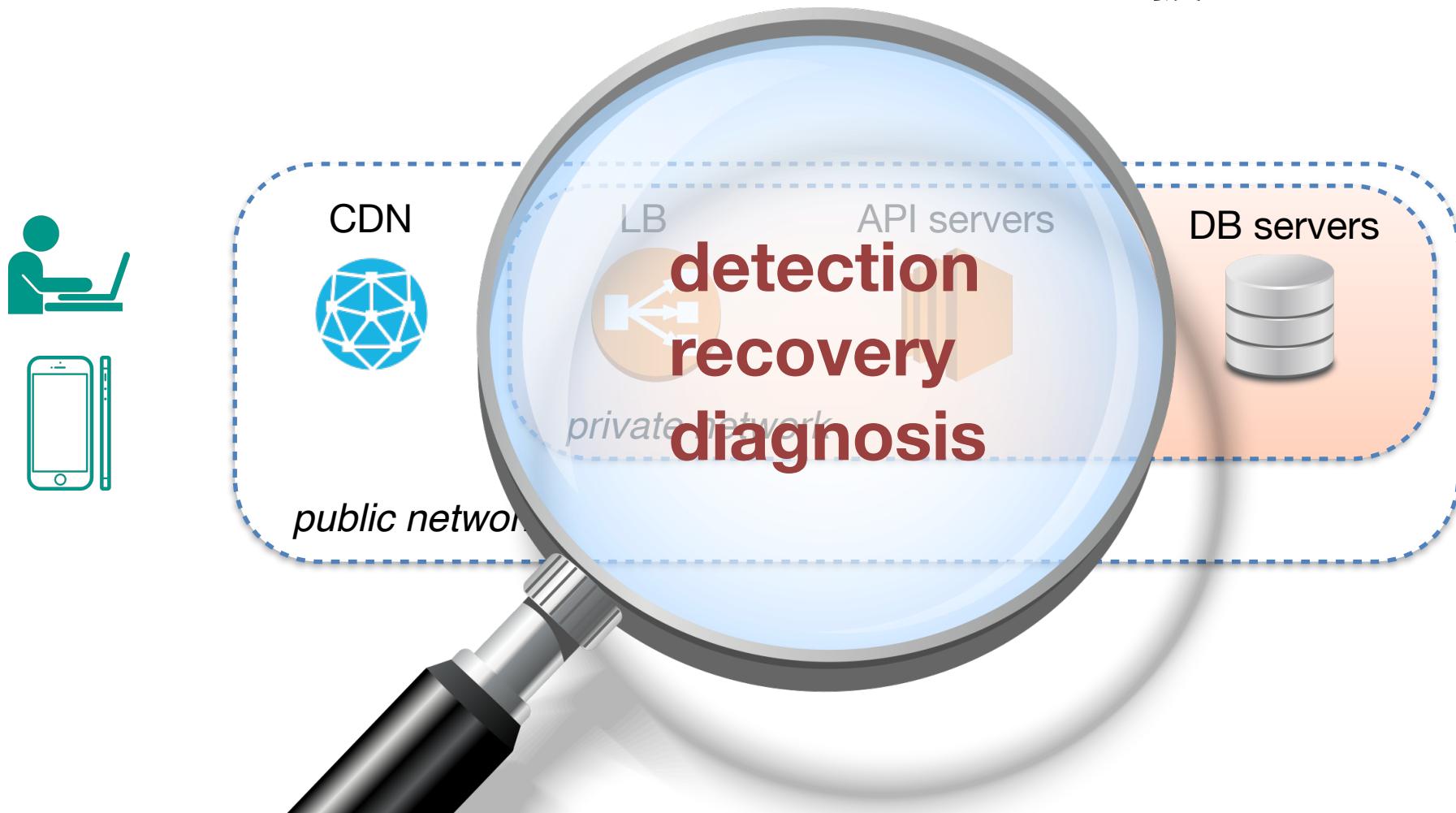
1. How to recreate your system
2. How to safely **change** your system
3. When something has gone wrong

- 2.1 - 機器
- 2.2 - 組態
- 2.3 - 角色



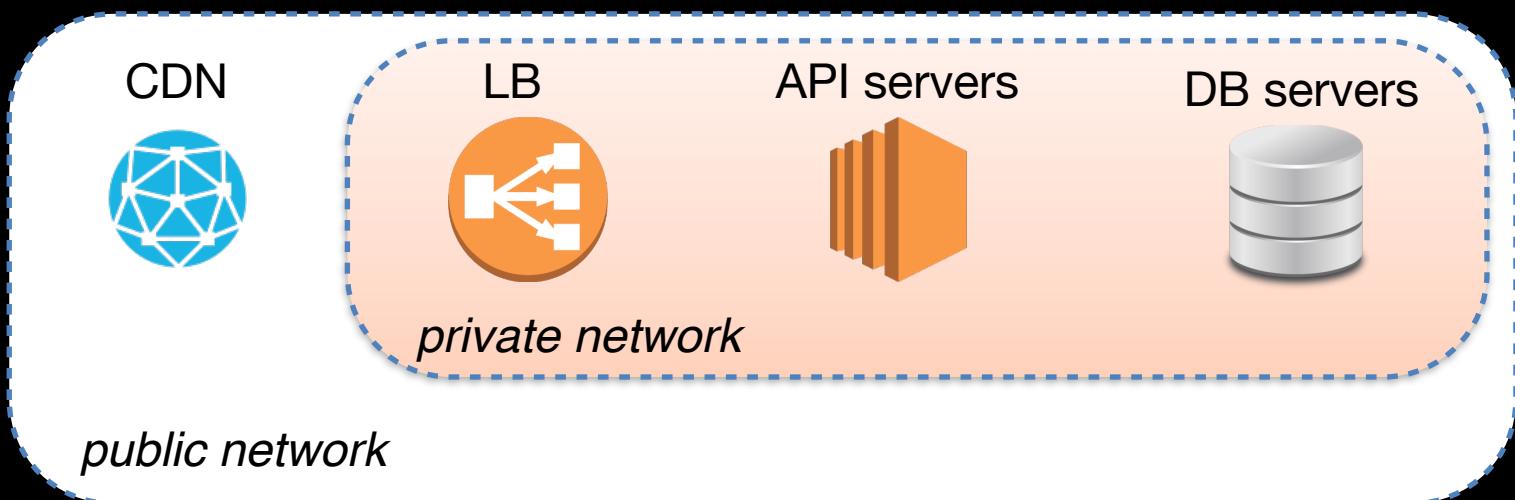
1. How to recreate your system
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現在沒有哪一家廠商敢不支援 Docker...



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1.3 - 角色



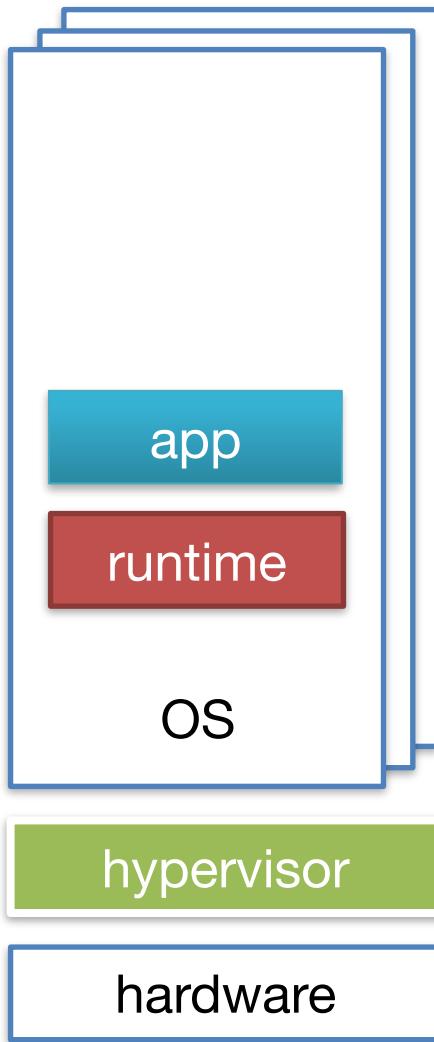
bare metal



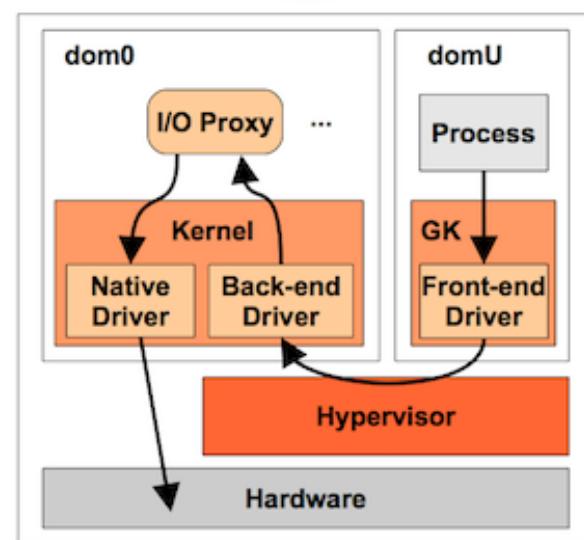
VM



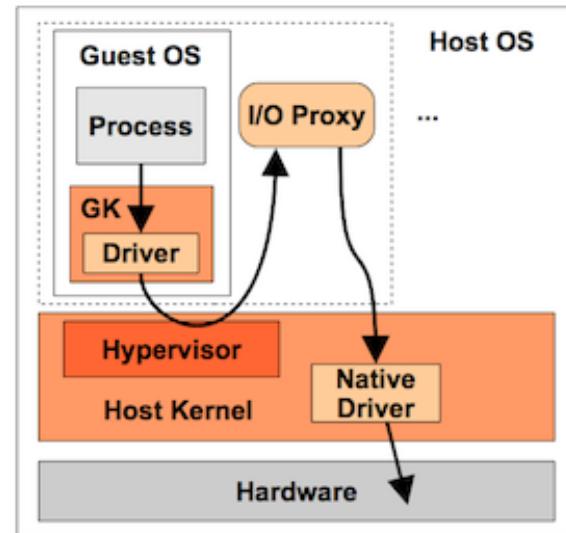
VM



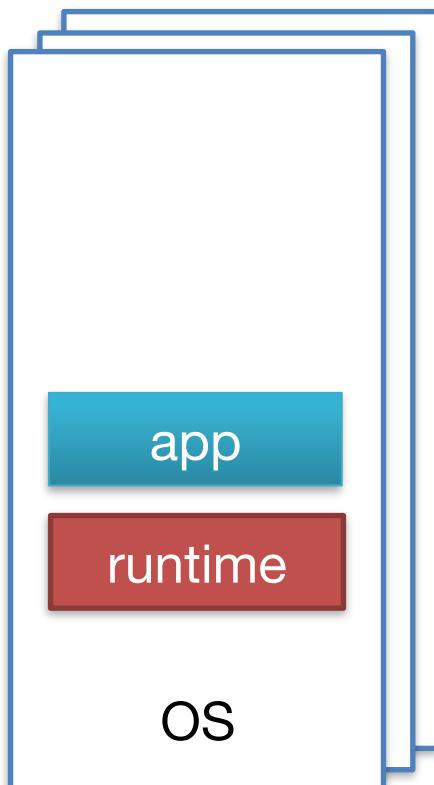
Xen



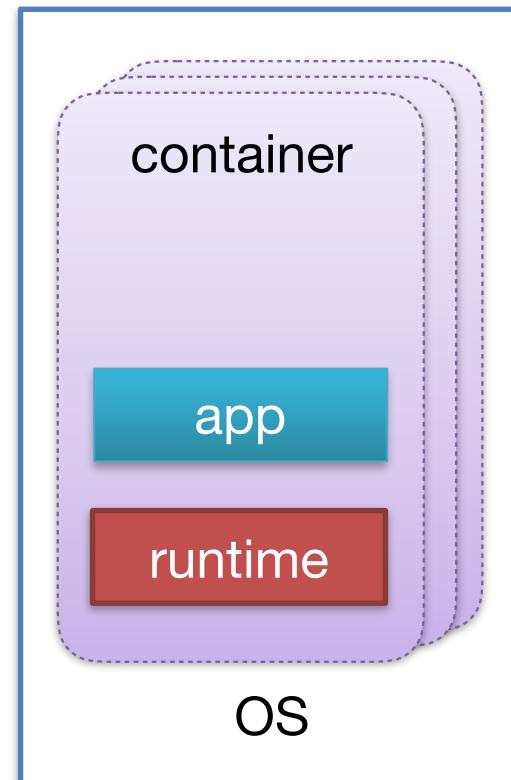
KVM



VM



Docker



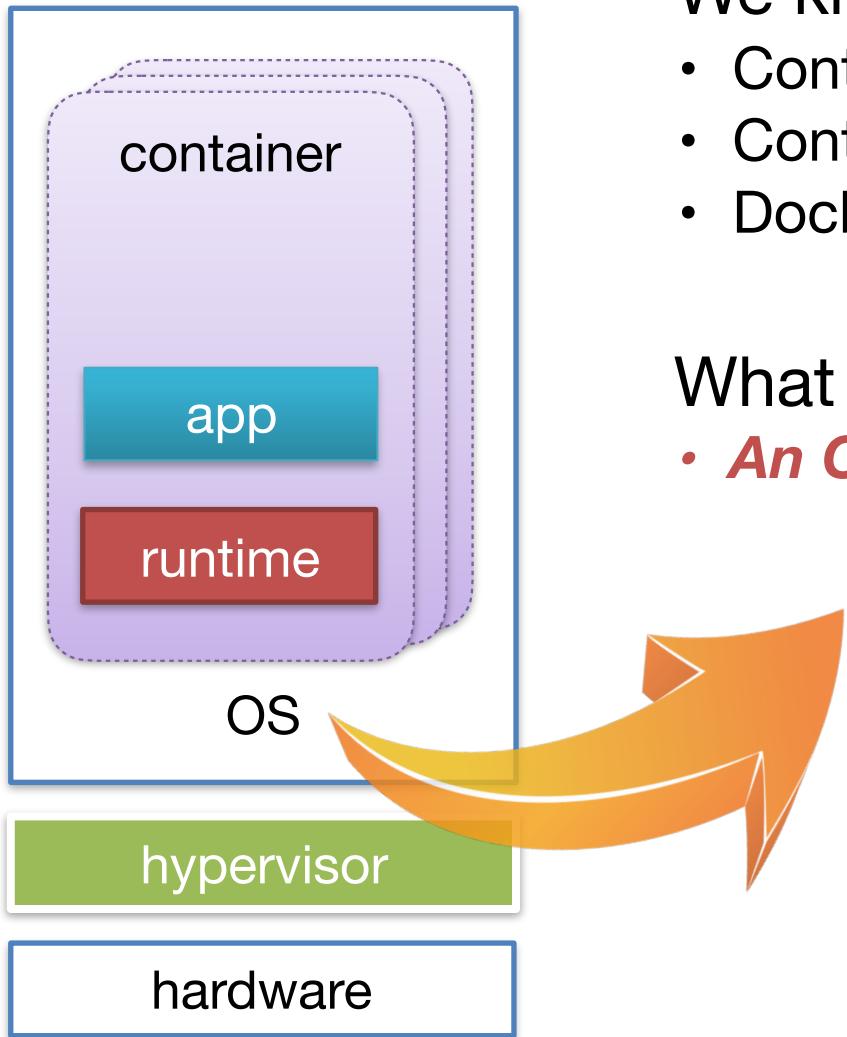
hypervisor

hardware

hypervisor

hardware

Docker



We know:

- Container is faster than VM
- Container is lightweight
- Dockerized app anywhere...

What if...

- *An OS runs only containers?*



Container技術三部曲3

IT架構的新奈米革命

Container OS

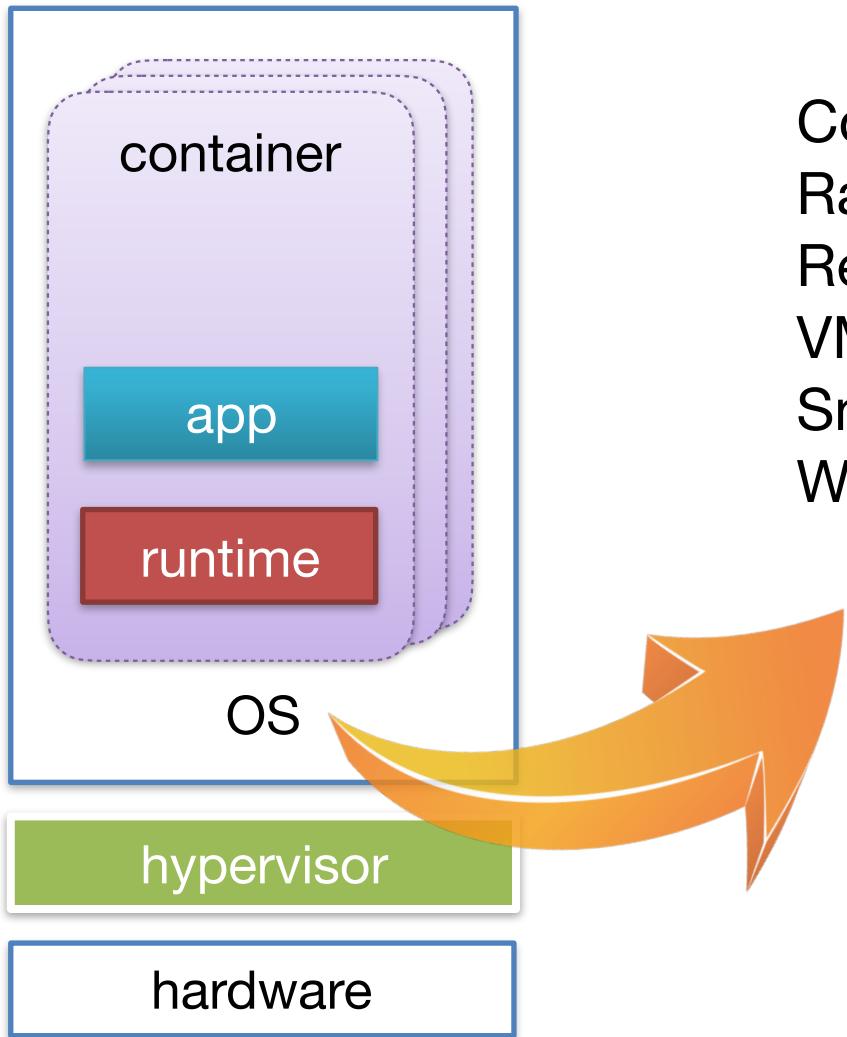
Container三部曲（三）IT架構的新奈米革命：Container OS

Docker不只帶動了Container技術風潮，更掀起了IT架構的微服務革命，看好雲端原生應用的龐大需求，專為大量部署Container而生的輕量級Container OS隔空問世，甚至出現了僅20MB的羽量級容器作業系統。這股熱潮不僅讓知名作業系統大廠如Red Hat、Ubuntu、微軟紛紛瘦身進場，就連VMware也順勢推出自家容器作業系統，到底容器作業系統有多大的魅力，而成為兵家必爭之地？

See *iThome Weekly*, vol 711 (2015/05/09)

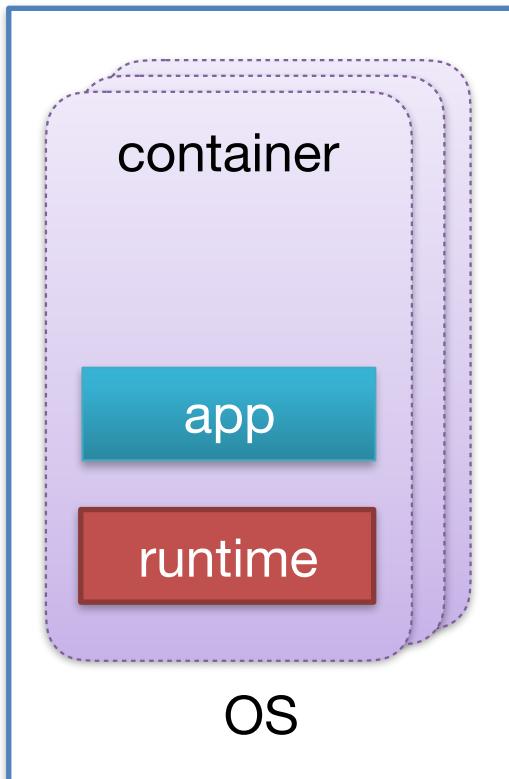
<http://www.ithome.com.tw/article/95763>

Docker

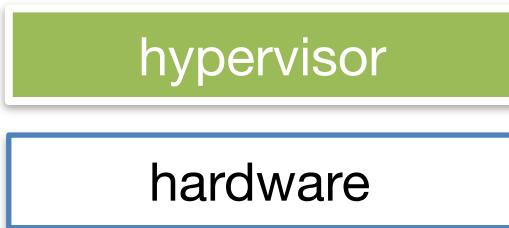
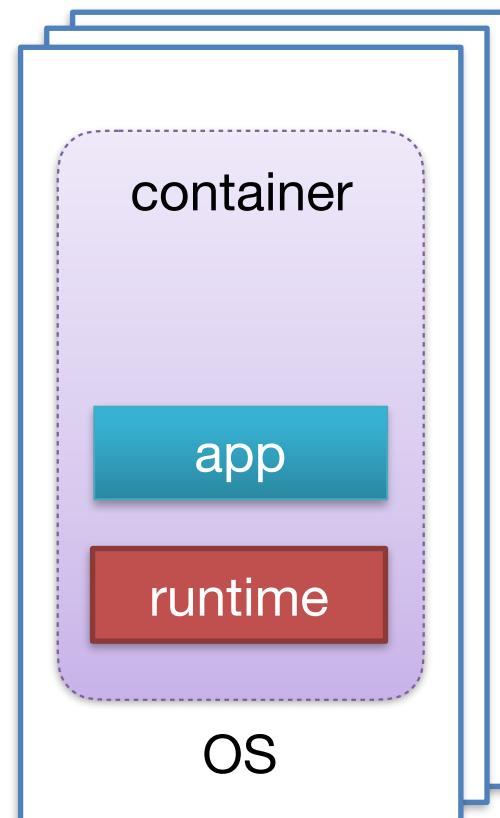


CoreOS
RancherOS
Red Hat Atomic
VMware Photon
Snappy Ubuntu Core
Windows Nano Server

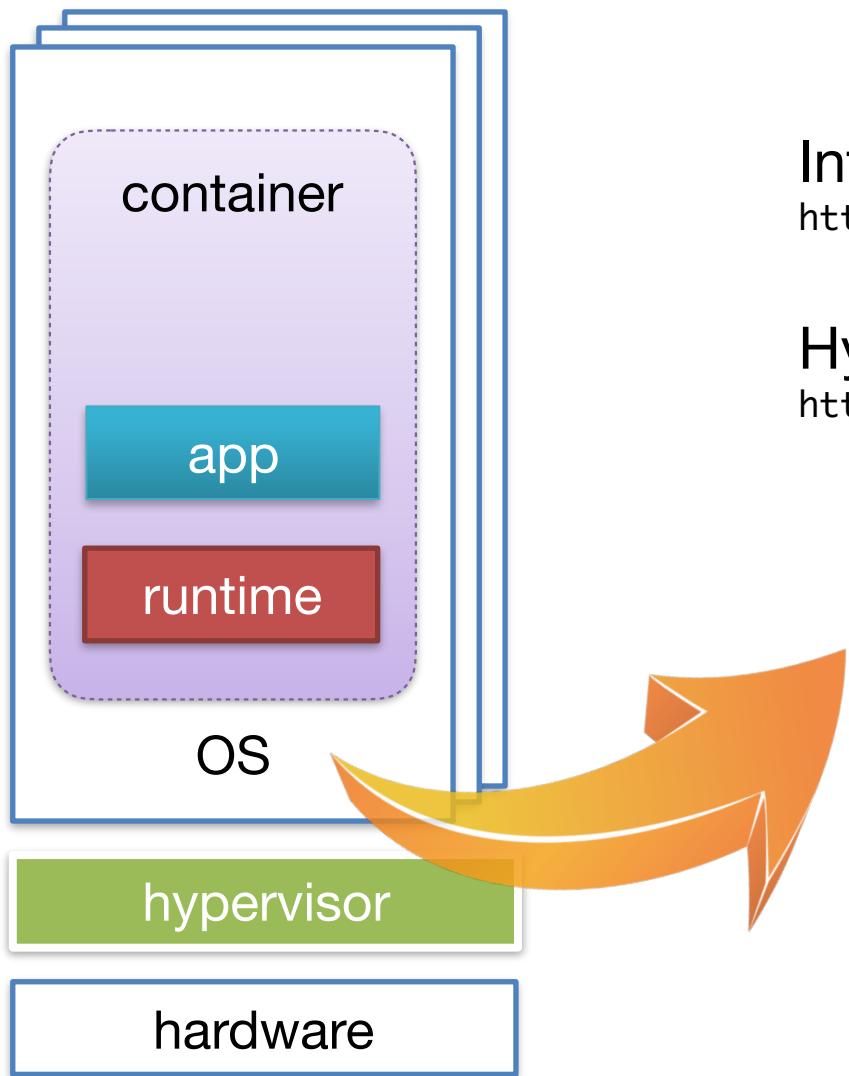
Docker



Container per VM



Container per VM



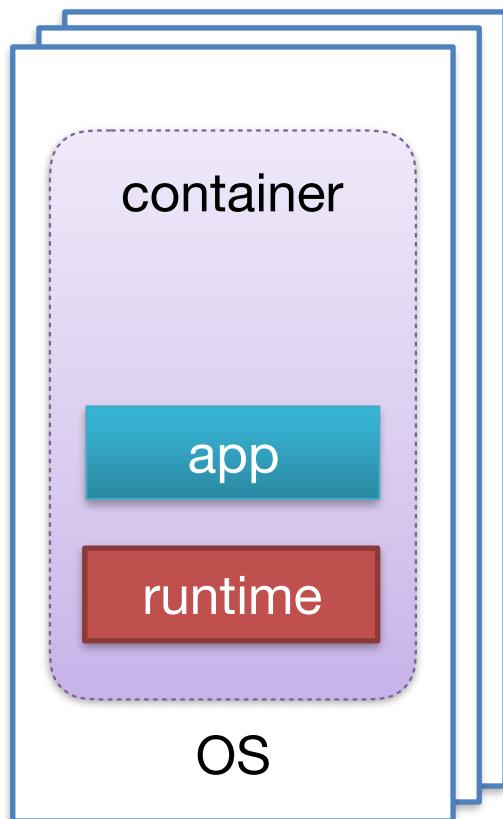
Intel Clear Linux

<http://www.ithome.com.tw/news/96119>

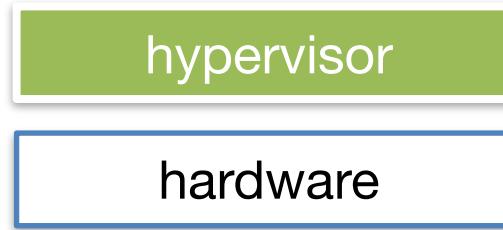
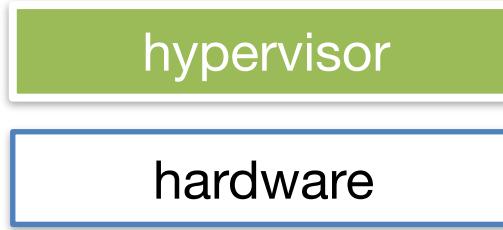
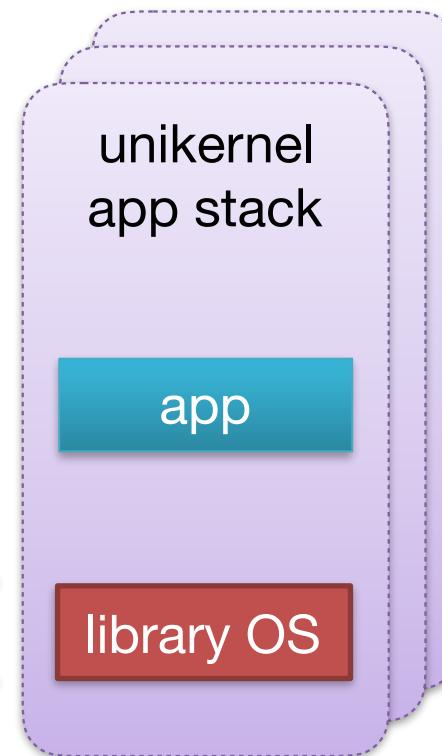
Hyper

<https://hyper.sh/>

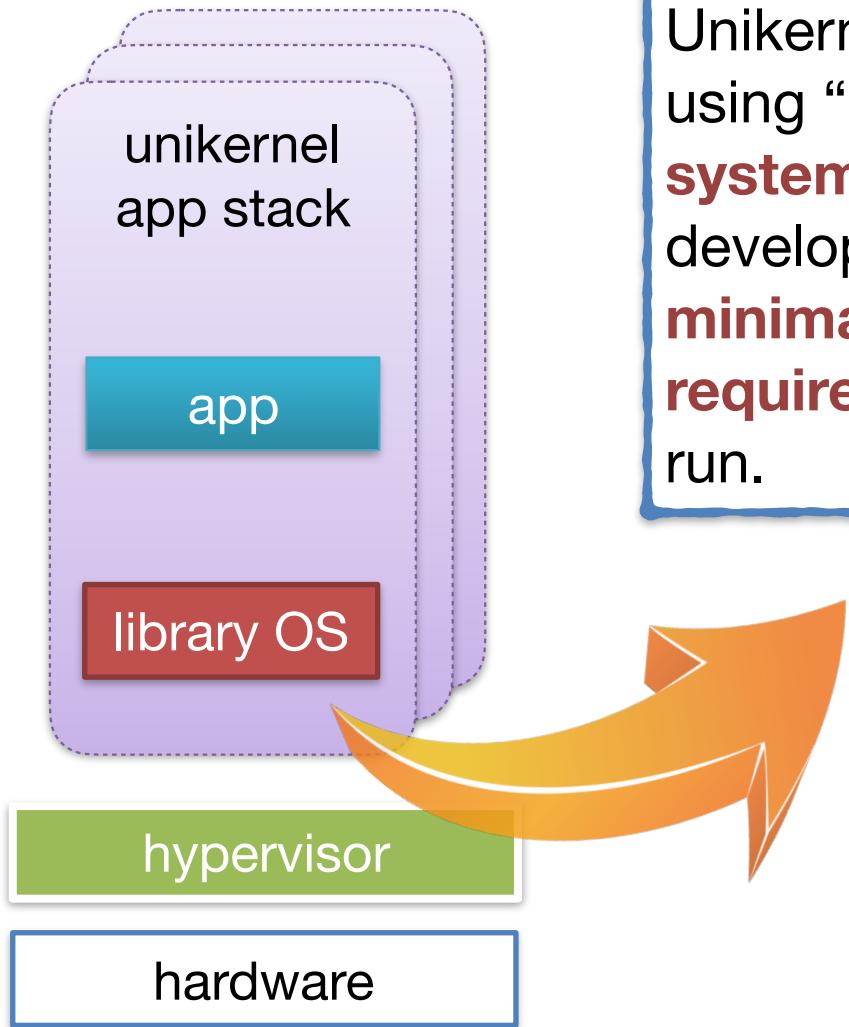
Container per VM



Unikernel

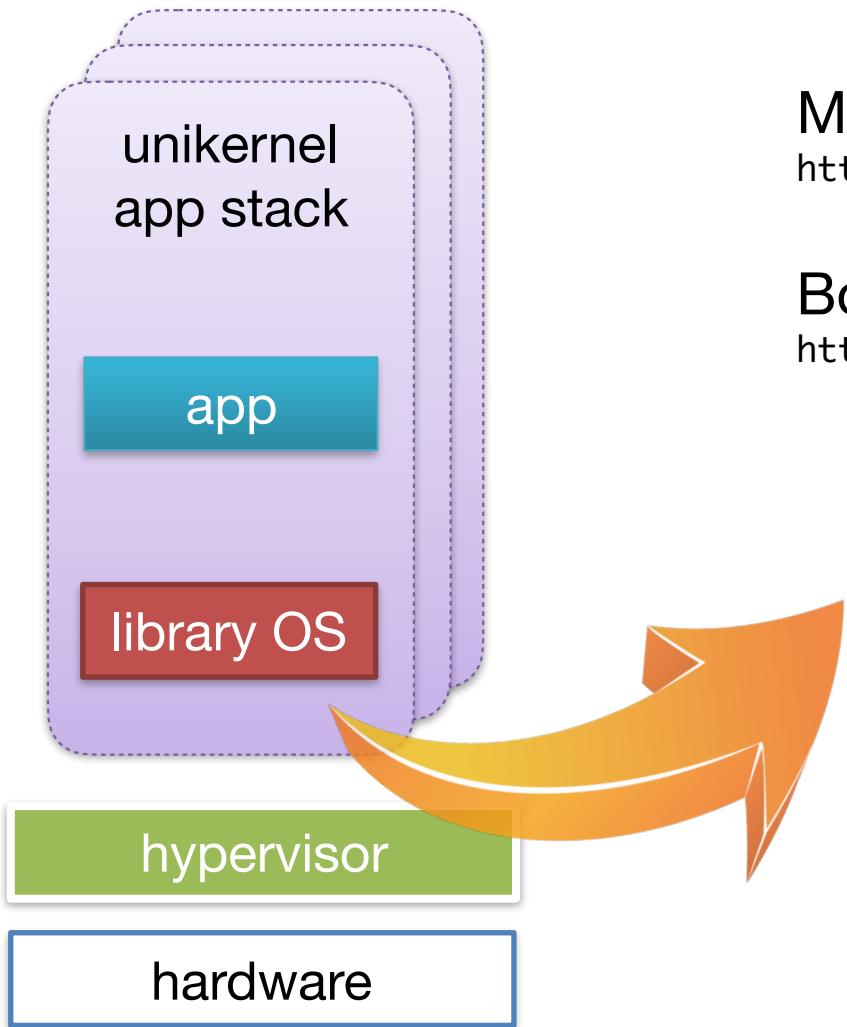


Unikernel



Unikernels are constructed by using “**library operating systems**,” from which the developer selects only the **minimal set of services required** for an application to run.

Unikernel

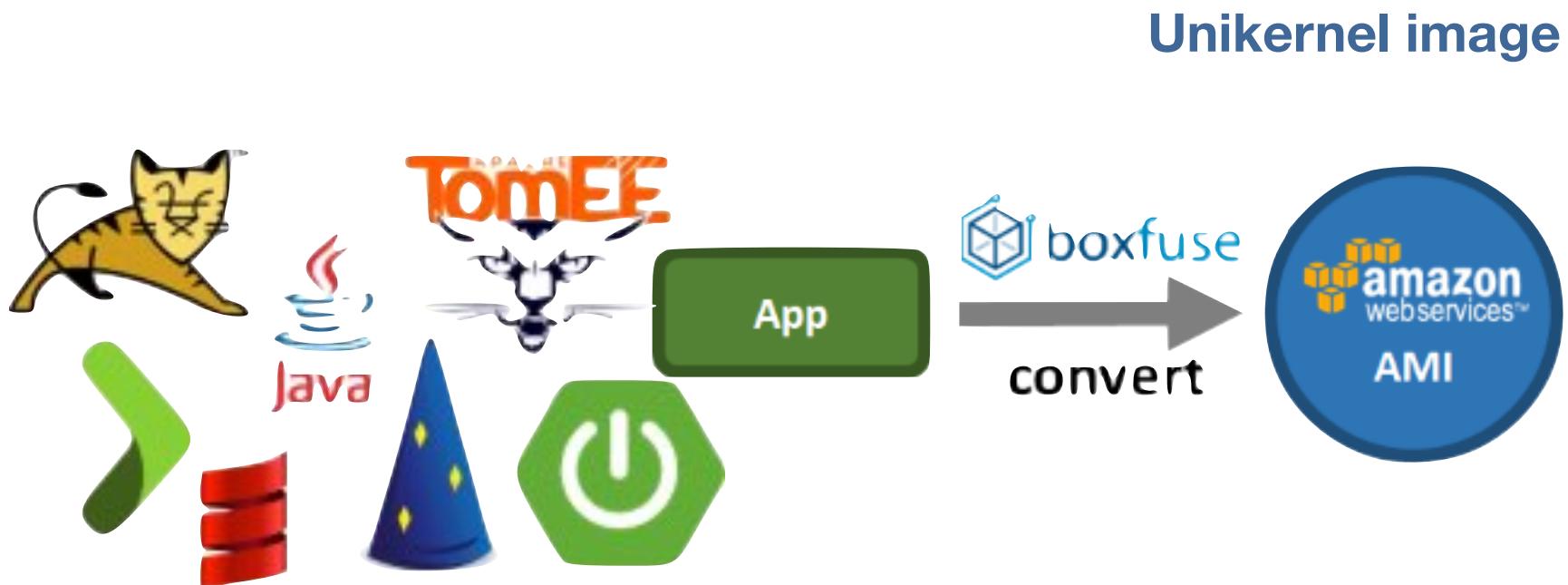


MirageOS
<https://mirage.io/>

Boxfuse
<https://boxfuse.com/>

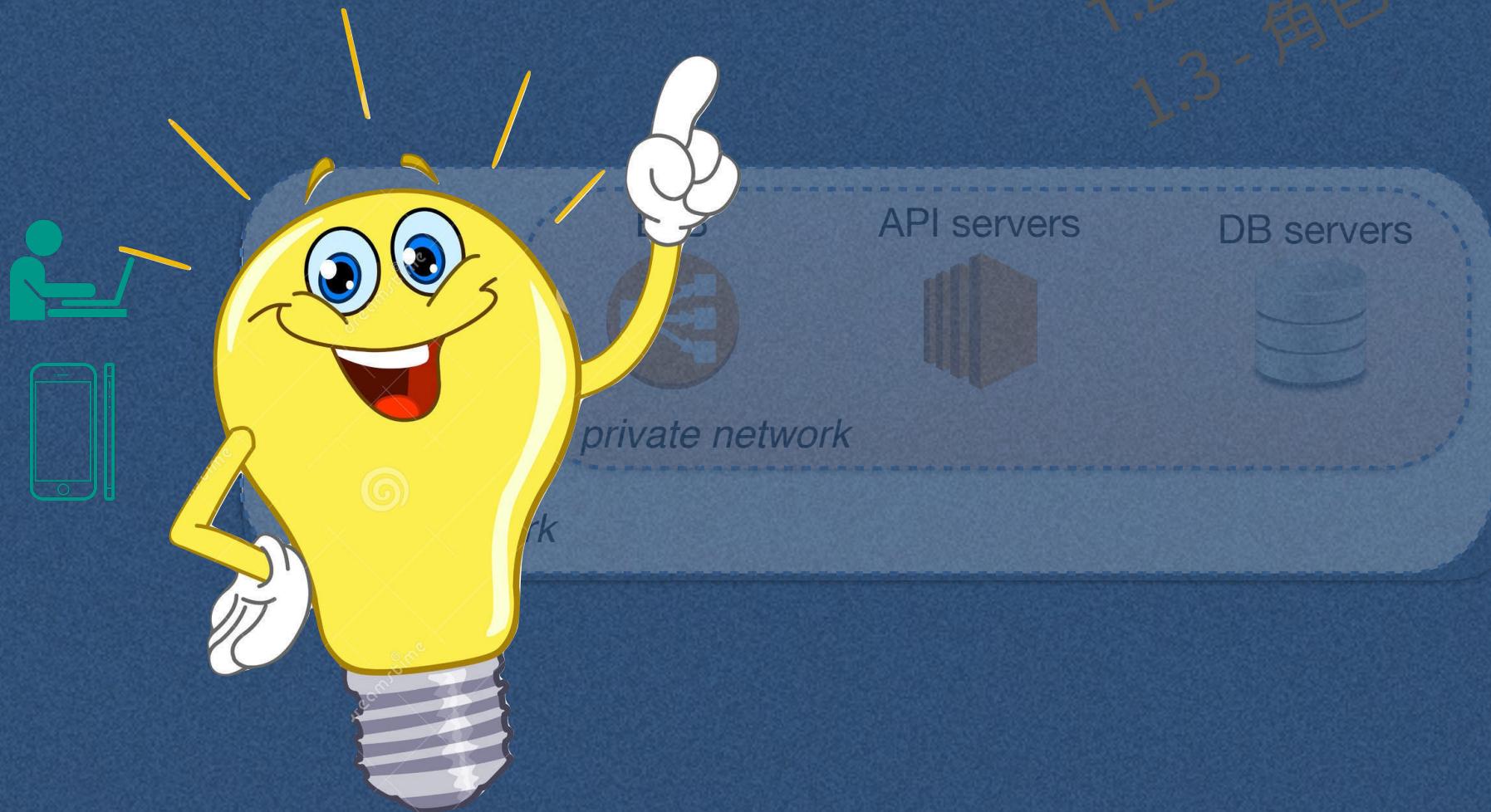
ClickOS
Clive
HaLVM
LING
Rump Kernels
OSv

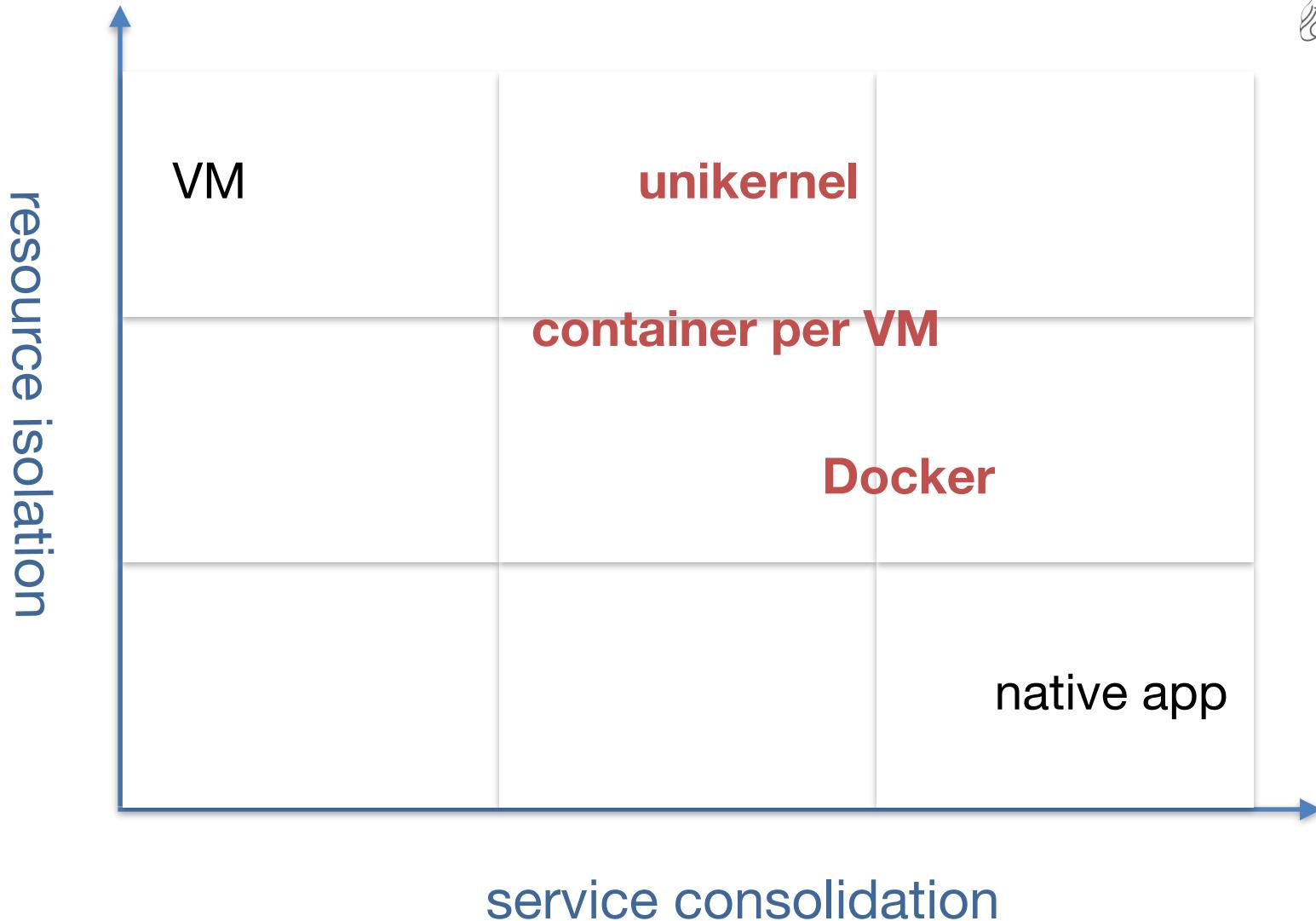
Immutable infrastructure



1. How to **recreate** your system
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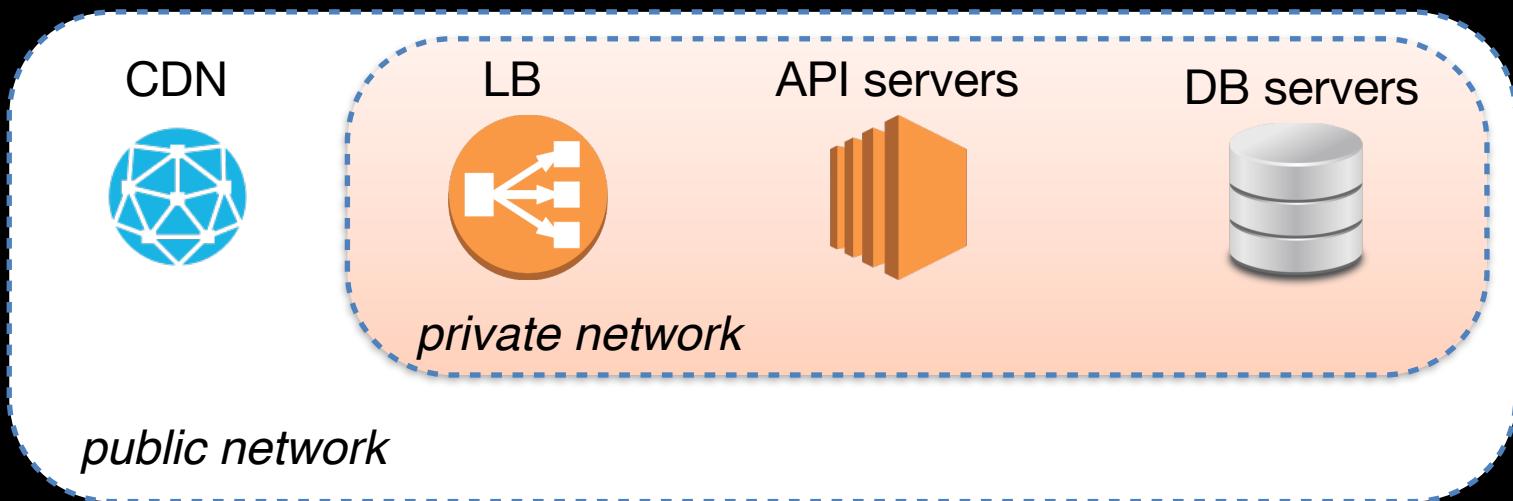
1.1 - 機器
1.2 - 組態
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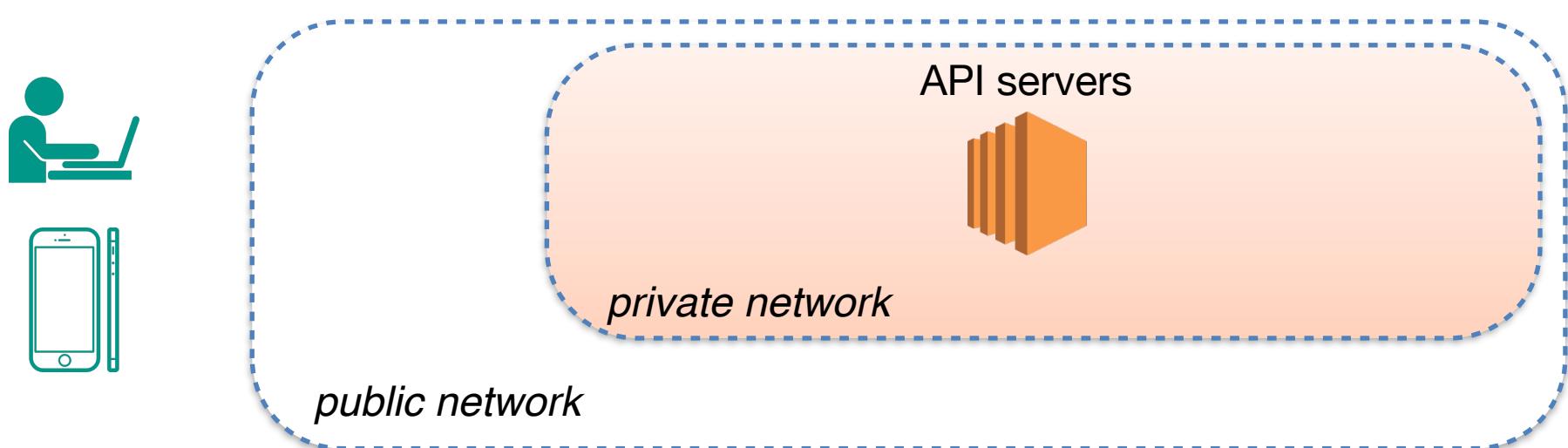


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	app source	
app source	uWSGI/Gunicorn	app (jar, war, ...)
npm	pip	app server (Tomcat, ...)
Node.js runtime	Python runtime	JDK



MySQL

dependencies

MongoDB

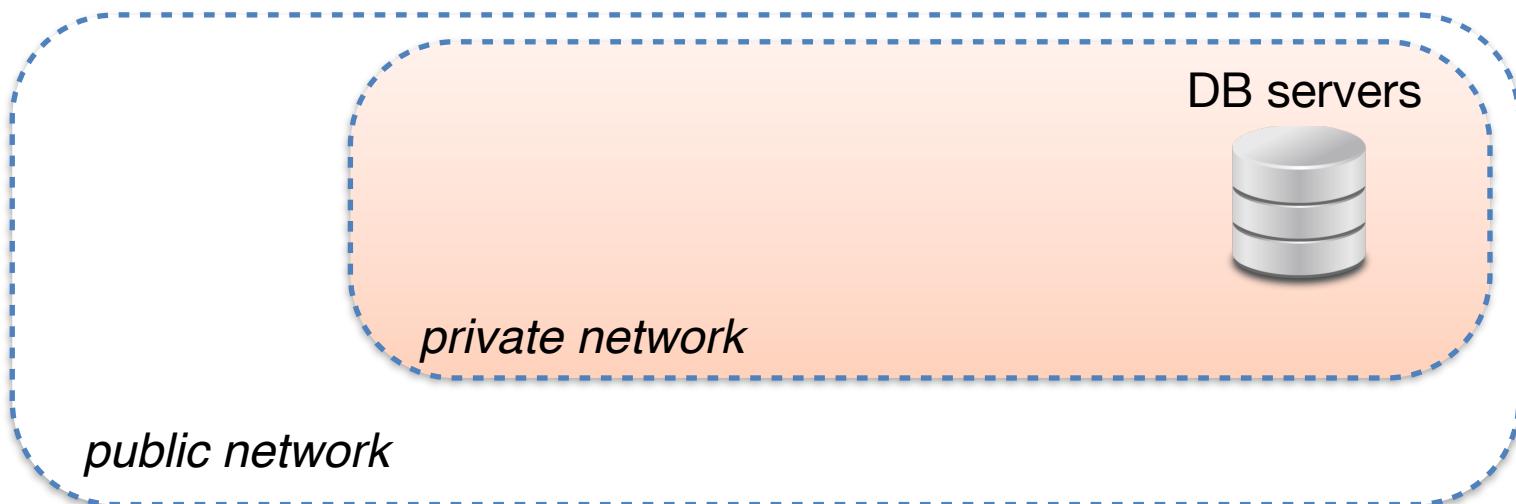
dependencies

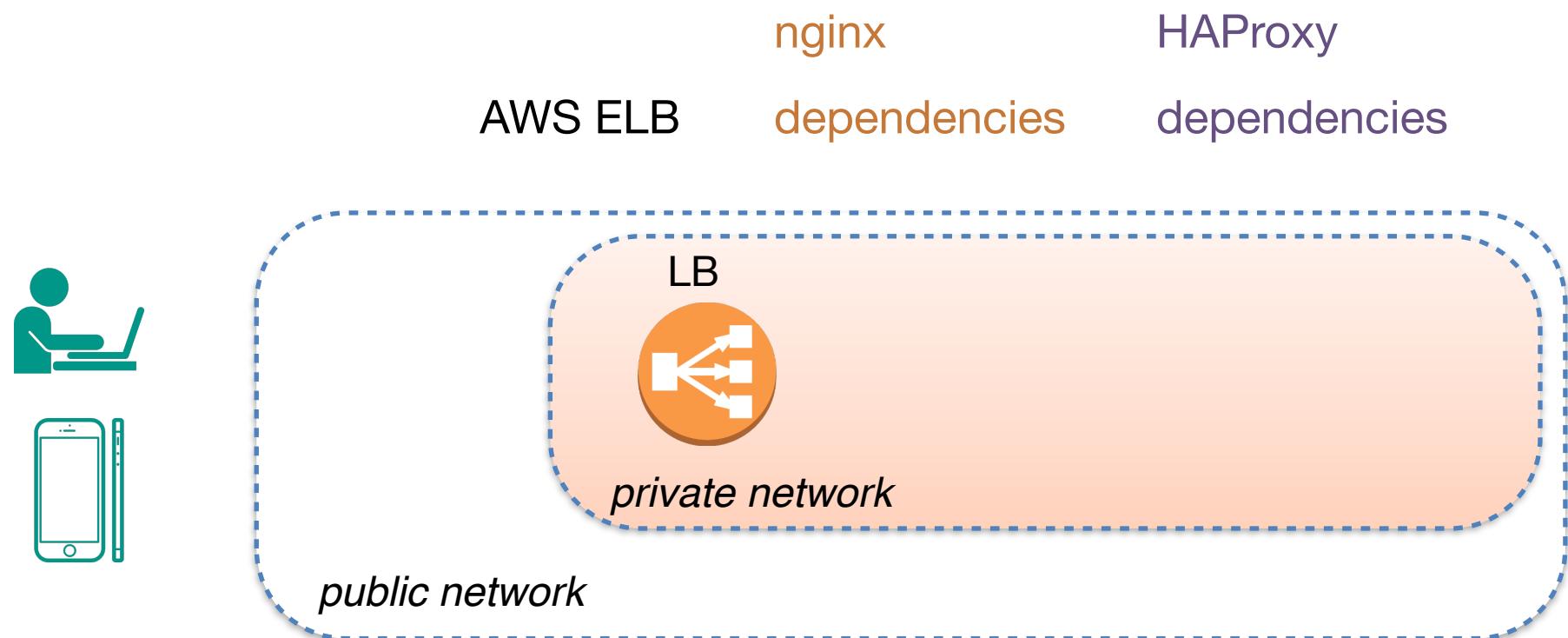
Cassandra

JDK

Elasticsearch

JDK



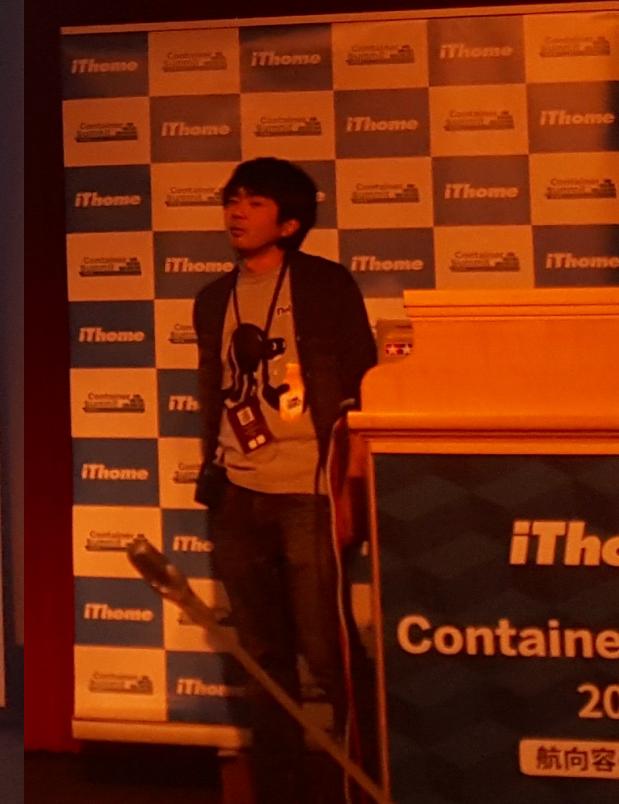
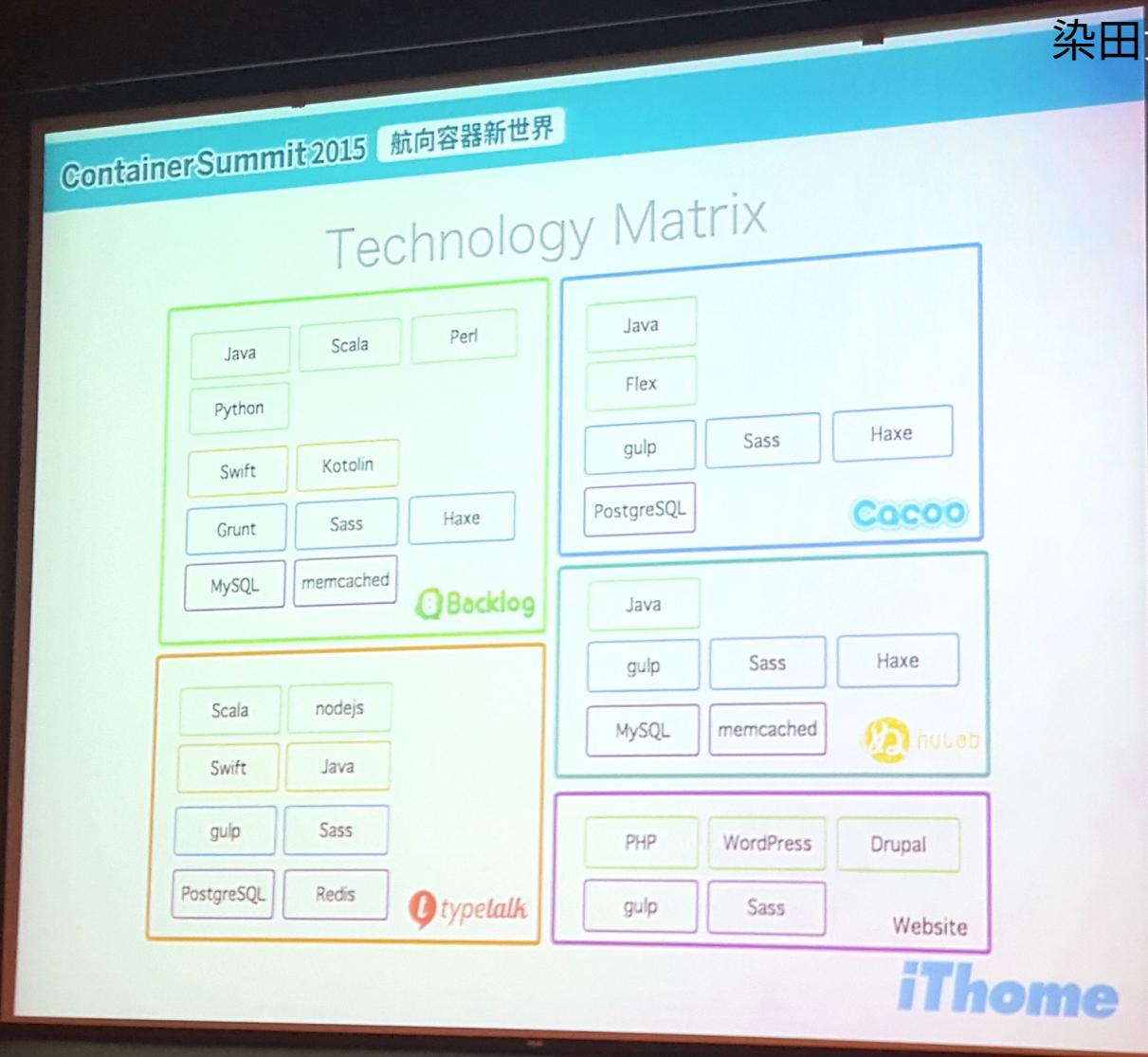


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app source	uWSGI/Gunicorn	app (jar, war, ...)
npm	pip	app server (Tomcat, ...)
Node.js runtime	Python runtime	JDK
MySQL	MongoDB	Cassandra
dependencies	dependencies	Elasticsearch
AWS ELB	nginx	HAProxy
	dependencies	dependencies

Docker in CI : Cacoo 與 Backlog 導入 Docker 的經驗分享

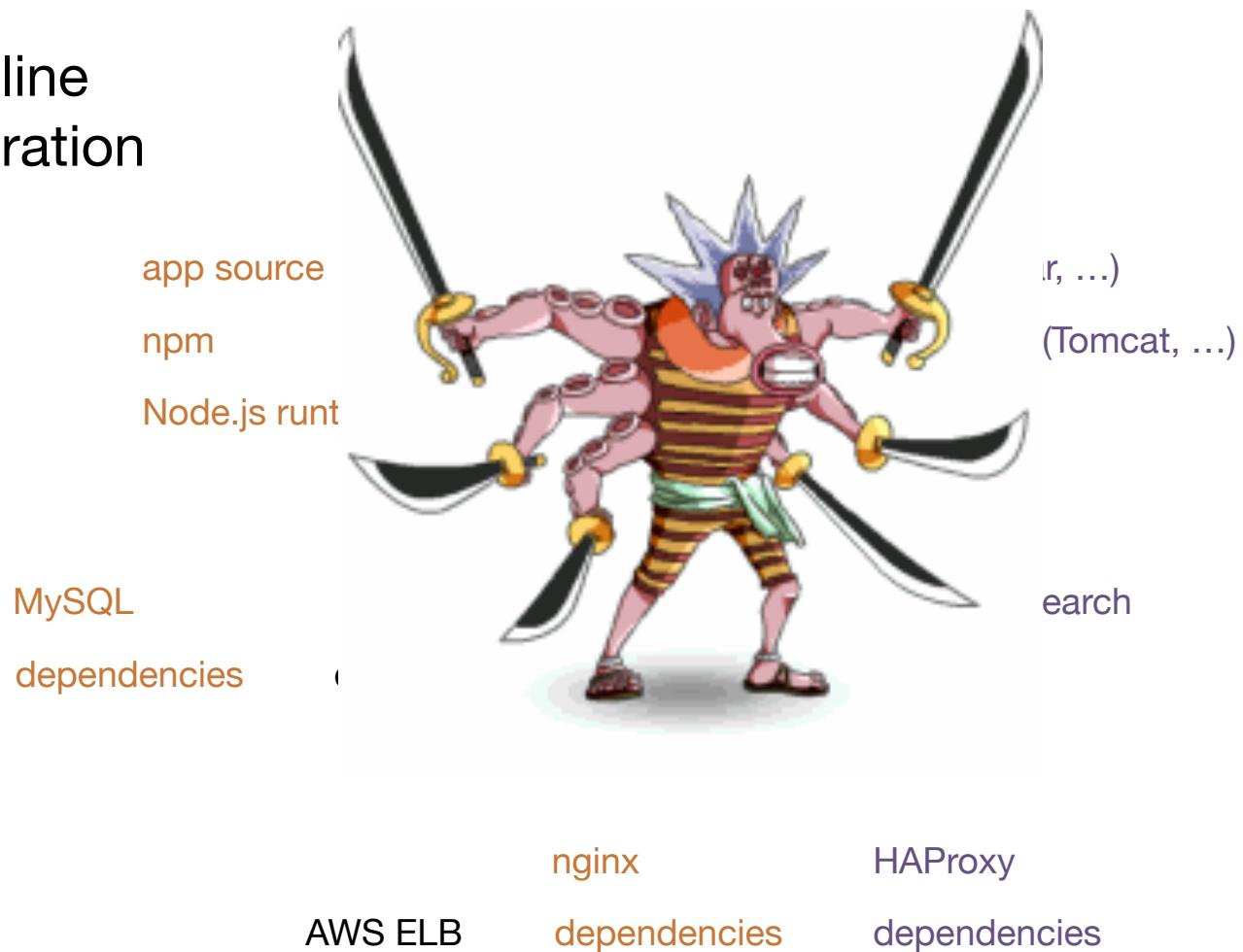
染田貴志 -NuLab Growth Hacker

2015-12-10

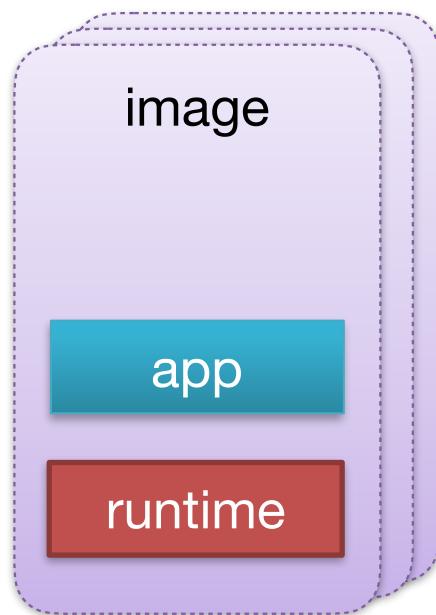


DevOps tools

- Configuration management
- Build system
- Deployment pipeline
- Continuous integration



Docker



Dockerfile
docker build
docker push
docker pull

*immutable image
versioned image
dev/prod parity*

MySQL
dependencies



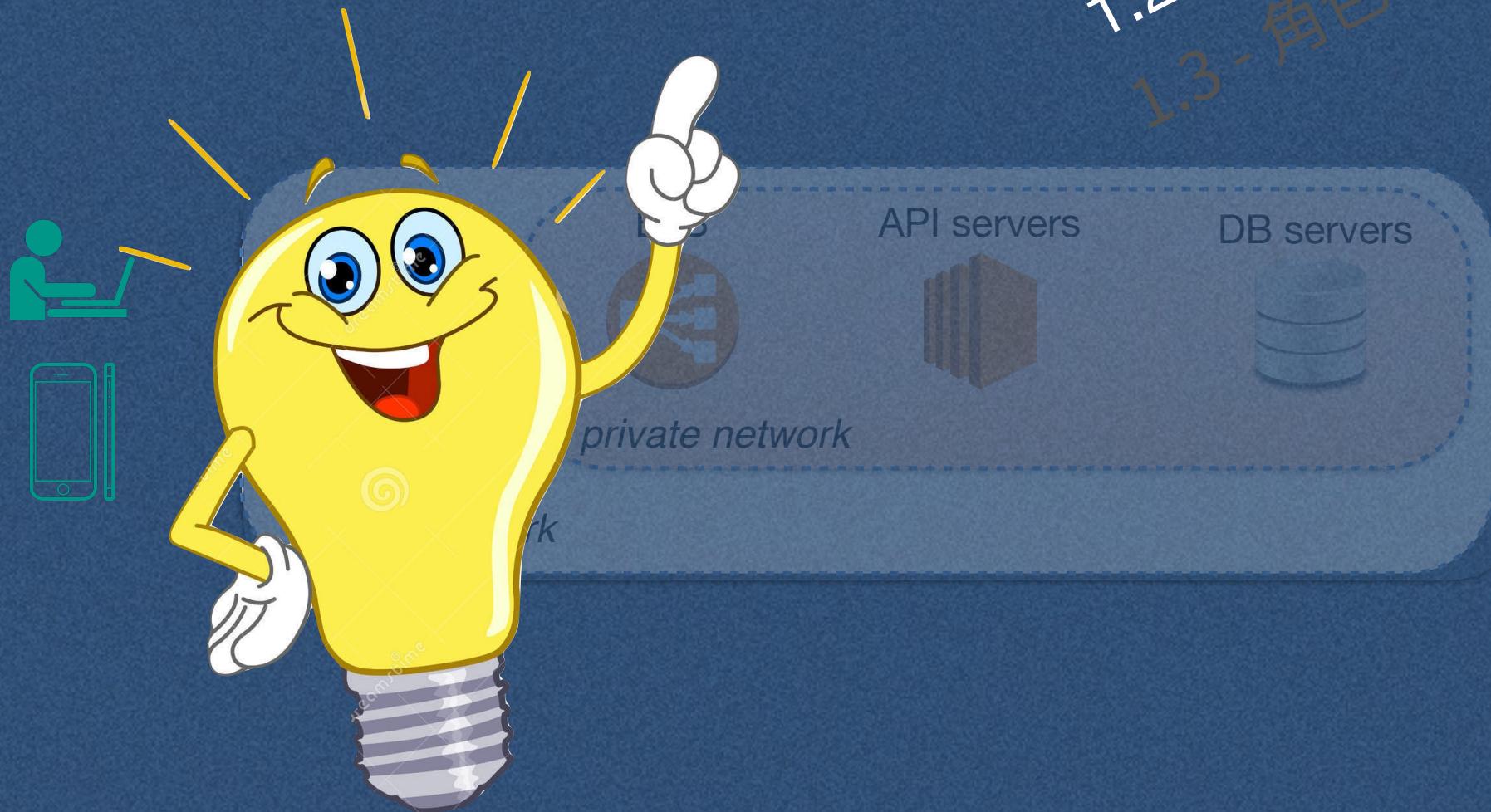
AWS ELB

dependencies

dependencies

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Config management will only be used to install Docker, an orchestration system, configure PAM/SSH auth, and tune OS sysctl values.

... Basically anything not having to do with app deployment.

<https://blog.containerization.io/containers-vs-config-management-e64cbb744a94>

traditional
DevOps
toolchain



tedious

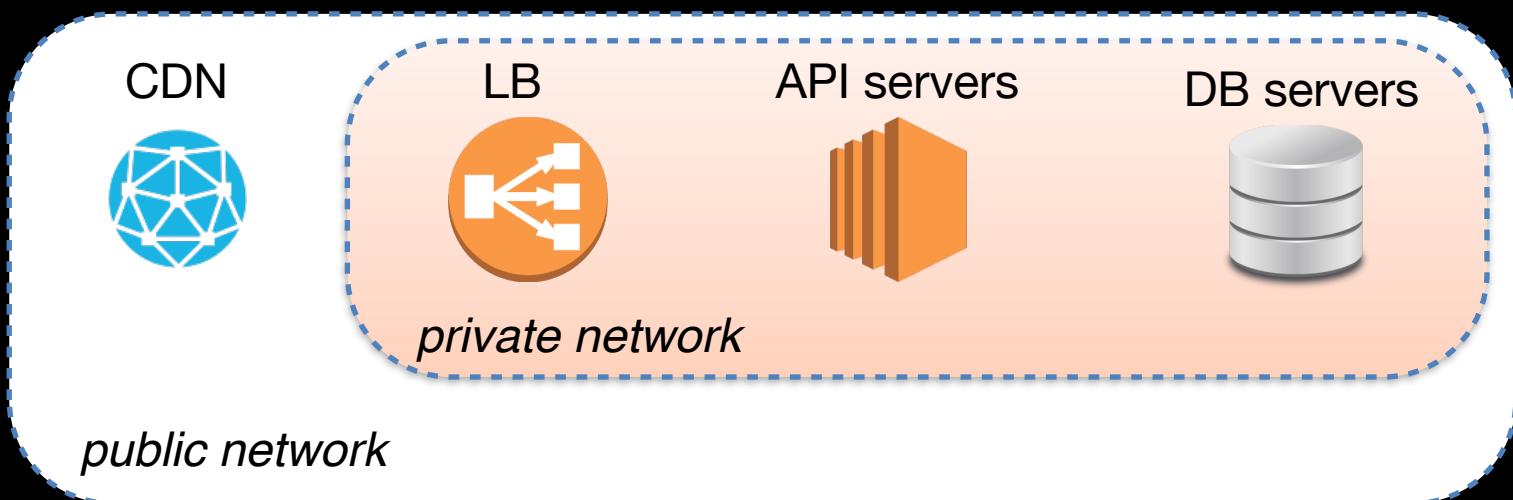
Docker



uniform

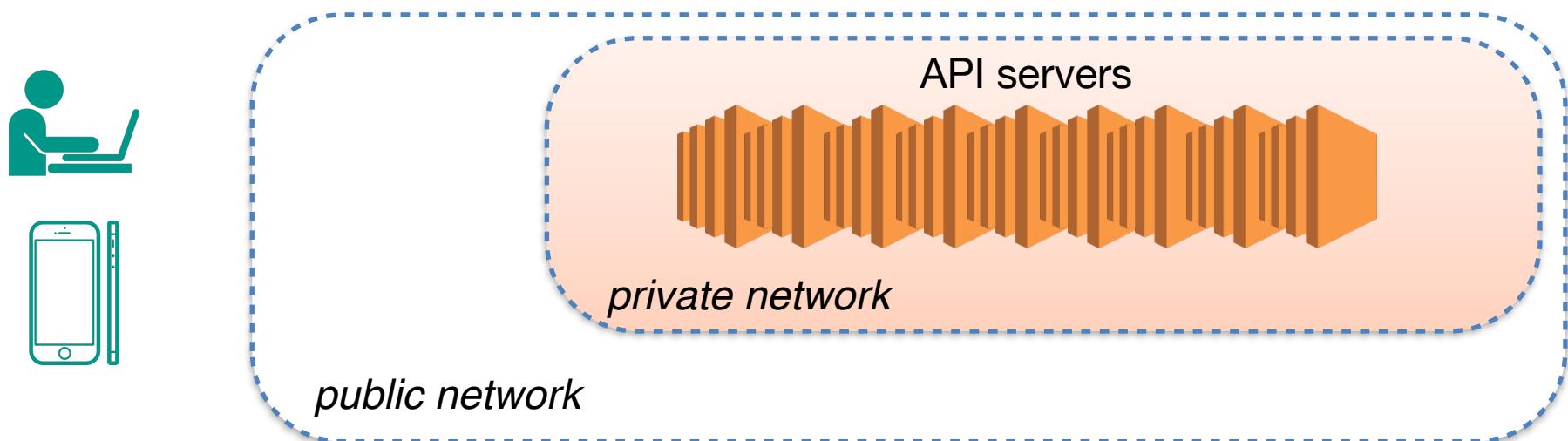
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As the number of machines **grows...**

how to ensure better **allocation?**

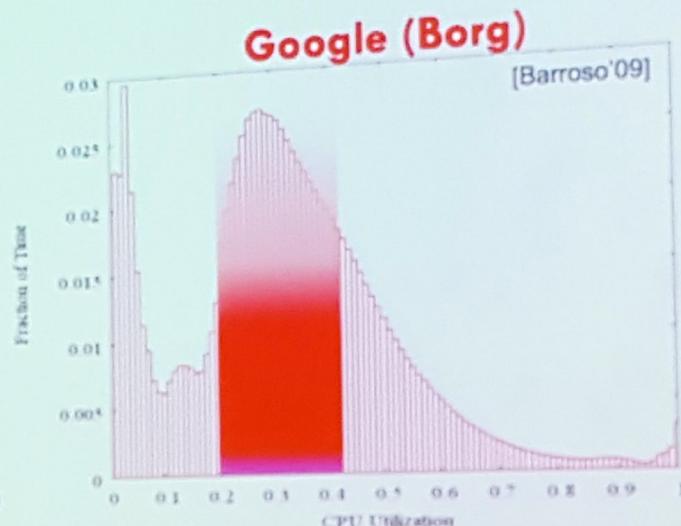
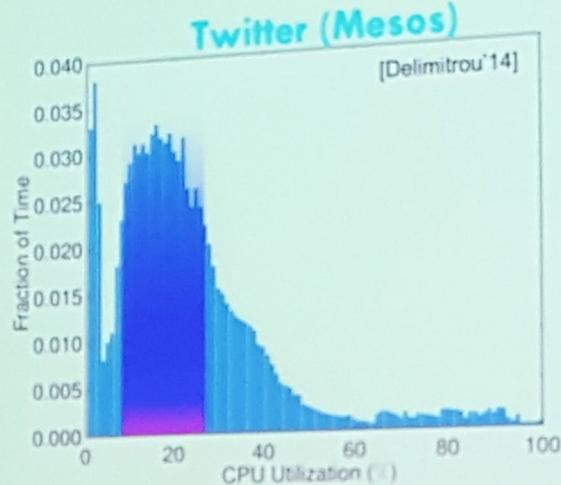


以 Mesos 搭建大規模 Container 平台

Timothy Chen - Mesosphere 首席工程師

2015-12-10

Utilization Reality



以 Mesos 搭建大規模 Container 平台

Timothy Chen - Mesosphere 首席工程師

2015-12-10

Can we run applications on our datacenters
just like we run applications on our mobile
phones?





你把機器
當寵物，

還是畜牲？



pets

cattle



naming?

pets

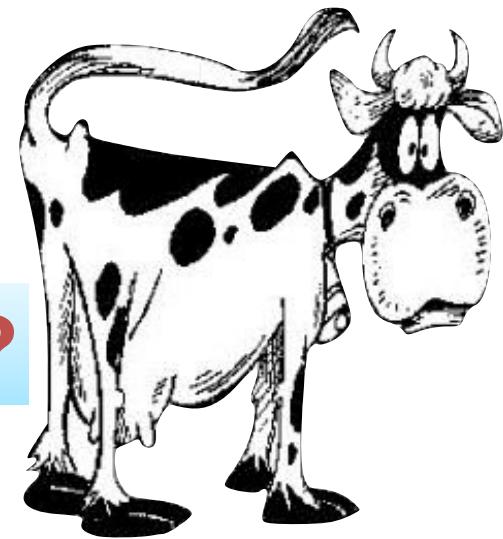


cattle



dispensable?

pets



cattle

你把機器
當寵物，
還是畜生牲畜？



pets

naming?

dispensable?



cattle

你把機器
當寵物，

還是畜牲？



pets

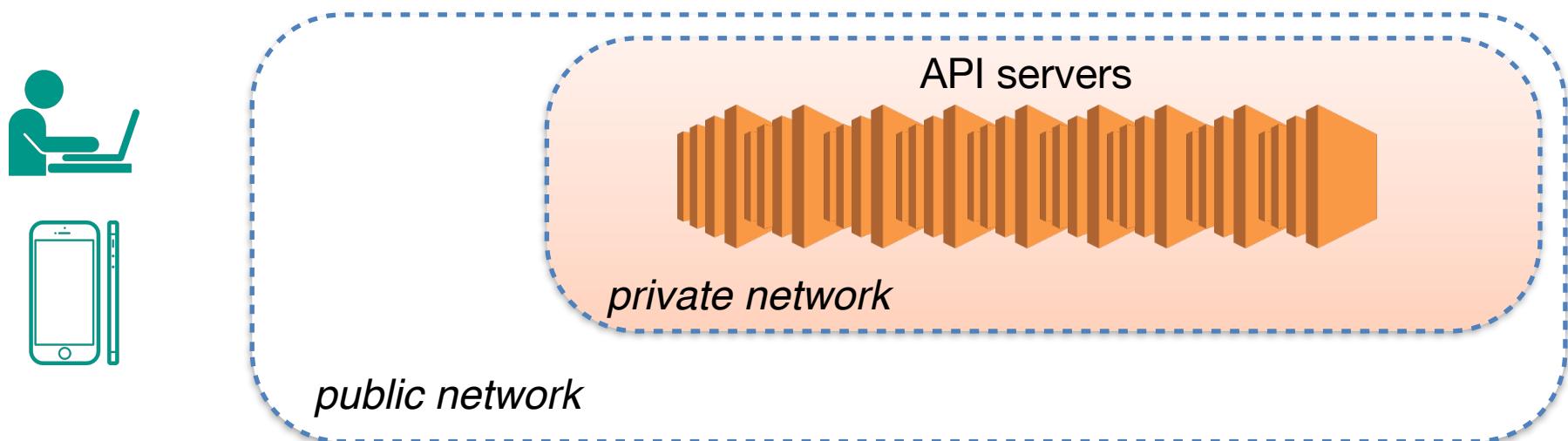
PaaS
Hadoop MapReduce
AWS Lambda
AWS Kinesis
Google Dataflow



cattle

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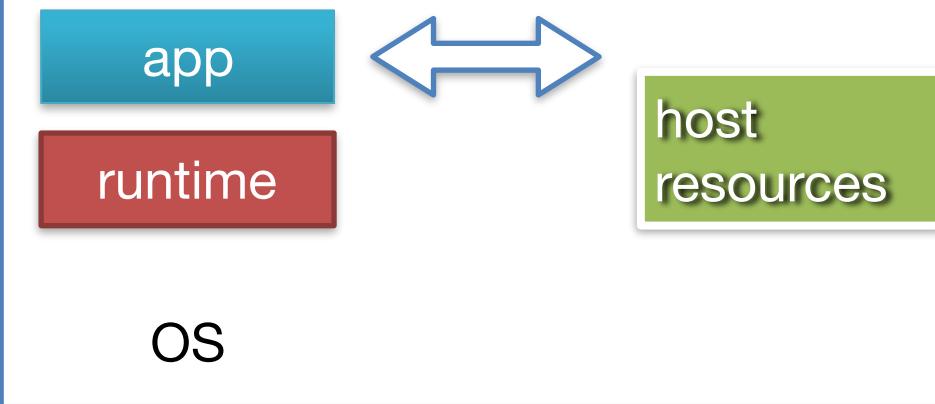




pets

Traditional app

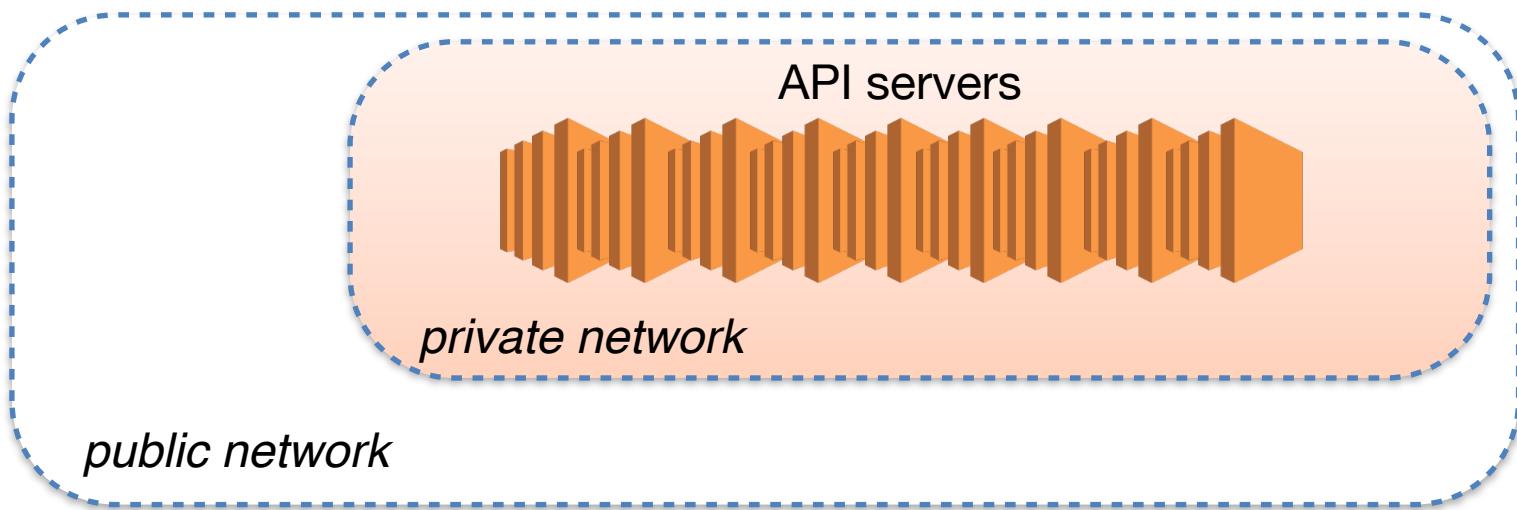
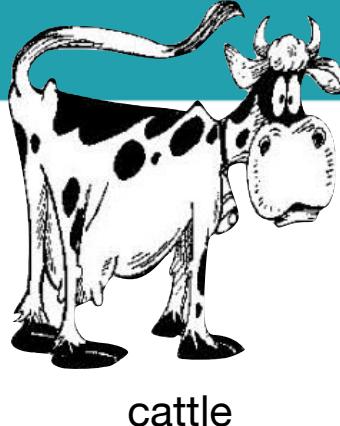
*tight
interaction*







better mobility



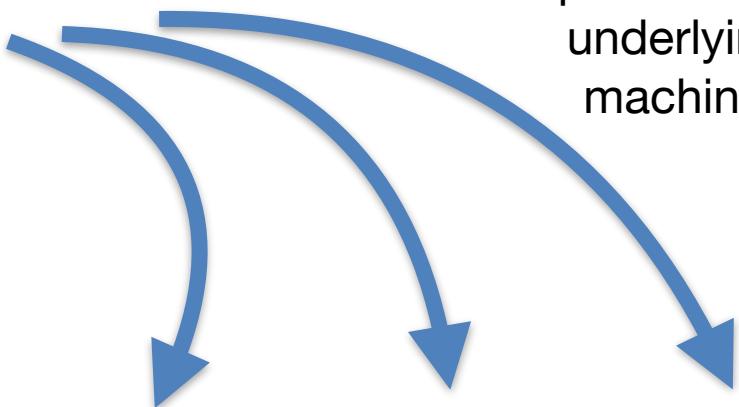


container

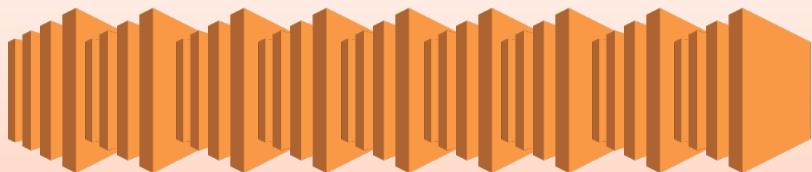


even better mobility

independent of
underlying
machines



API servers

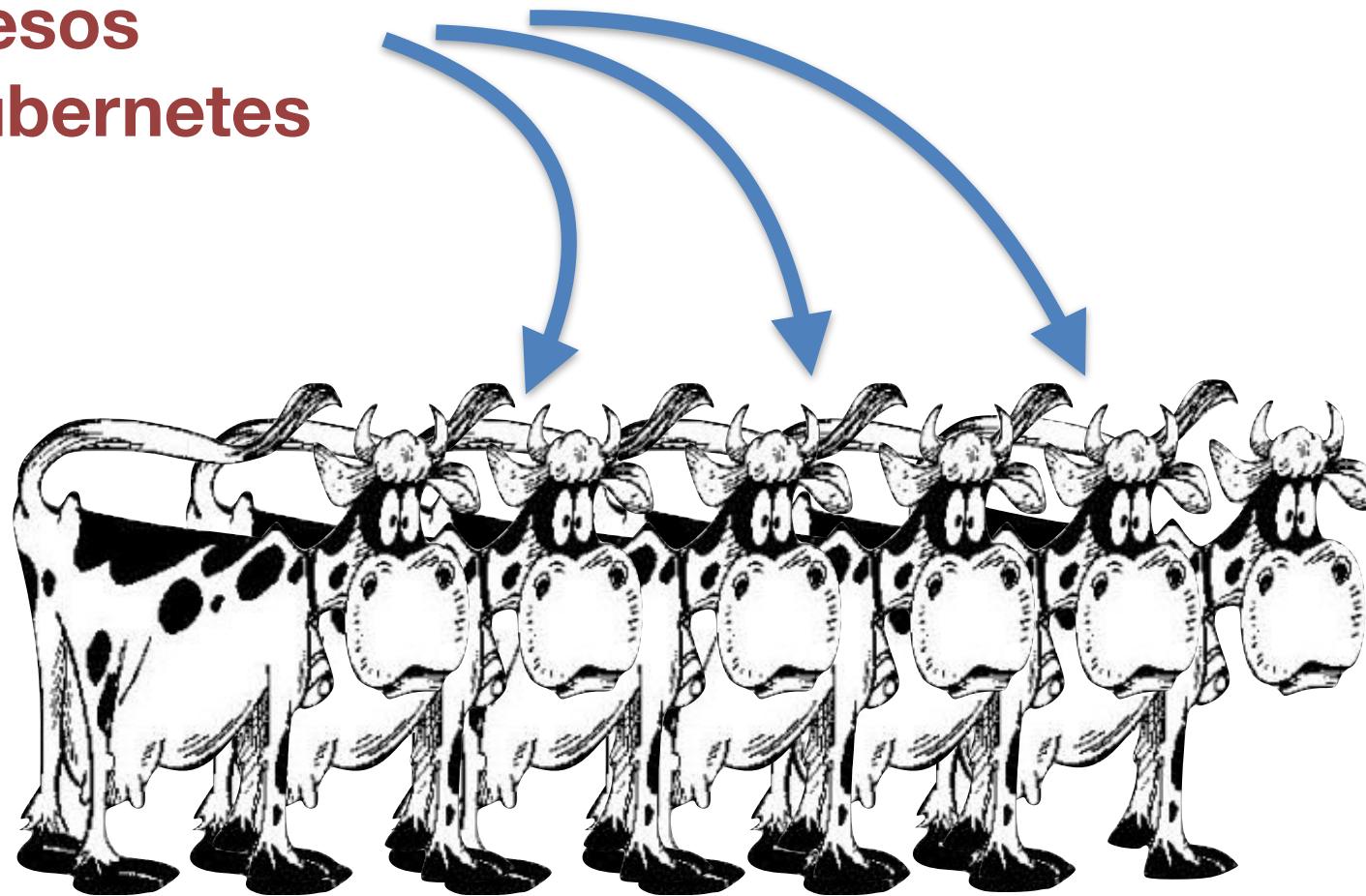


private network

public network

Docker Swarm
Mesos
Kubernetes

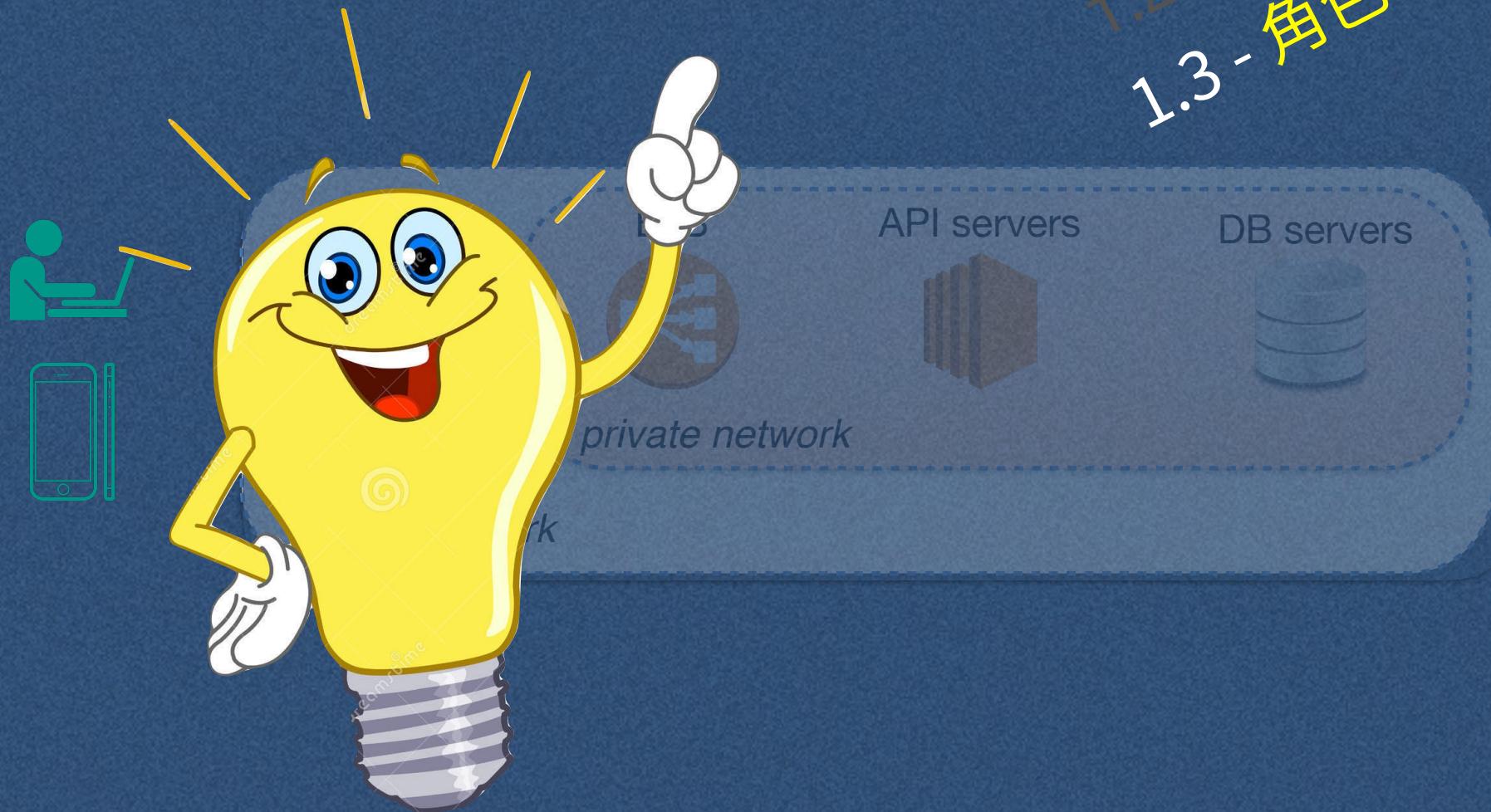
allocation, orchestration



cattle

1. How to **recreate** your system
2. How to safely **change** your system
3. When something has gone **wrong**

1.1 - 機器
1.2 - 組態
1.3 - 角色



*Config management will only be used to install Docker, an **orchestration system**...*



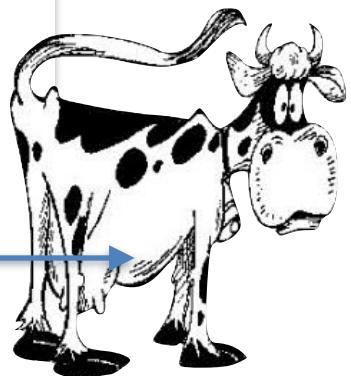
... Don't assume too much about underlying infrastructure.



traditional
DevOps
toolchain

pets

Docker Swarm
Mesos
Kubernetes



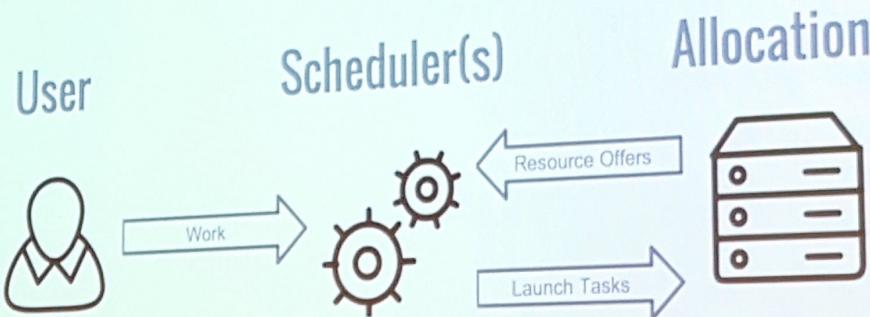
cattle

以 Mesos 搭建大規模 Container 平台

Timothy Chen - Mesosphere 首席工程師

2015-12-10

MESOS ENABLES MULTIPLE SCHEDULER ALGORITHMS



mesosphere





Mesos framework

Long Running Services

- Aurora
- Marathon
- Singularity
- SSSP

Batch Scheduling

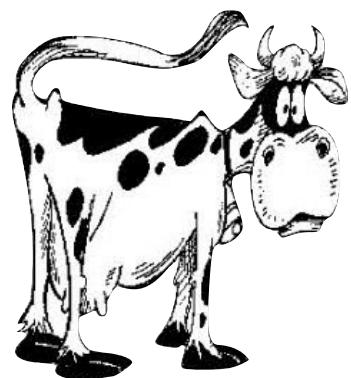
- Chronos
- Jenkins
- JobServer

Big Data Processing

- Cray Chapel
- Dpark
- Exelixi
- Hadoop
- Hama
- MPI
- Spark
- Storm

Data Storage

- Cassandra
- Elasticsearch
- Hypertable



cattle

Mesos



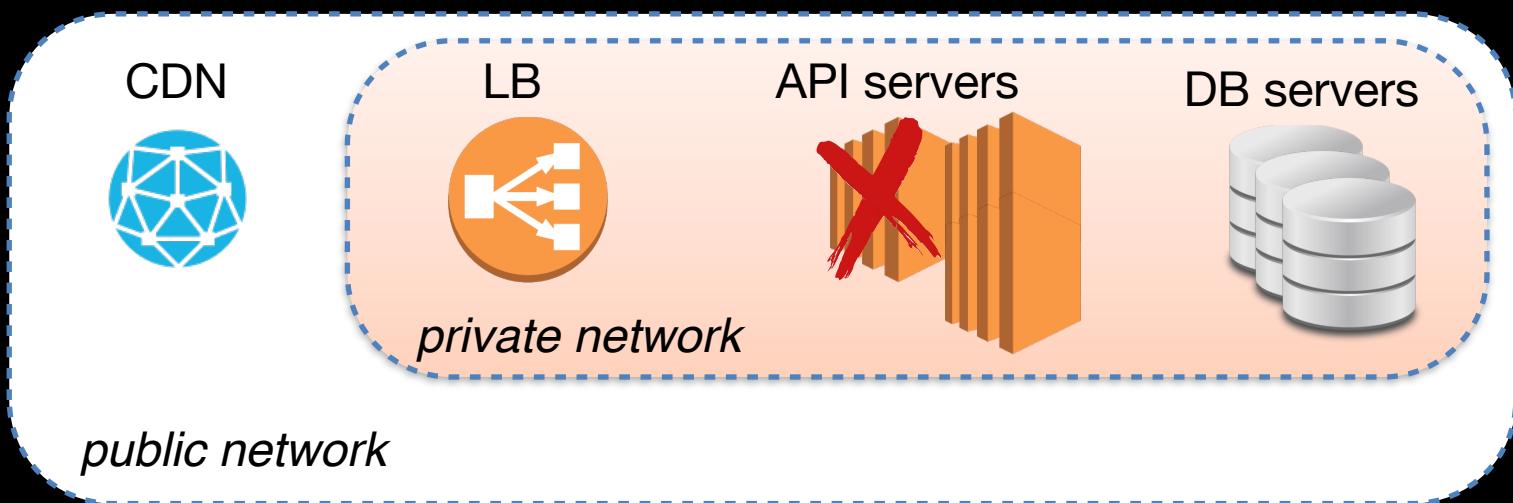
BigData 大會直擊 (2015-12-09)：
Mesosphere 首席工程師 Timothy Chen 說：現在
矽谷需要大資料技術的公司，已經沒人在講
Hadoop，而是講 **SMACK**。就是
Spark+Mesos+akka+Cassandra+Kafka 的縮寫。



cattle

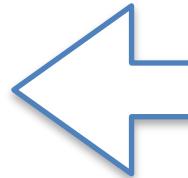
1. How to recreate your system
2. How to safely **change** your system
3. When something has gone wrong

2.1 - 機器
2.2 - 組態
2.3 - 角色

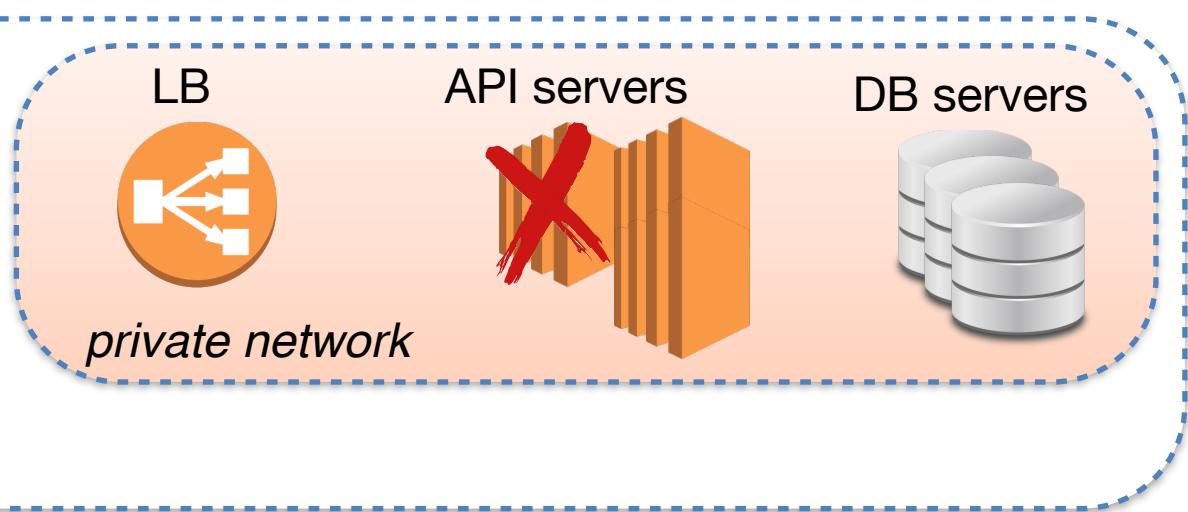
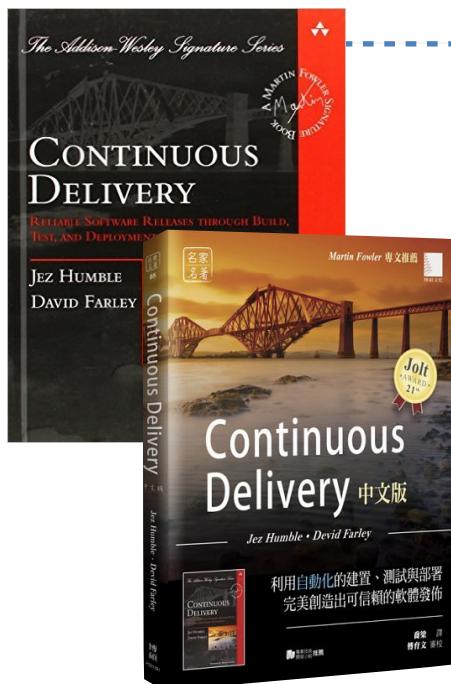


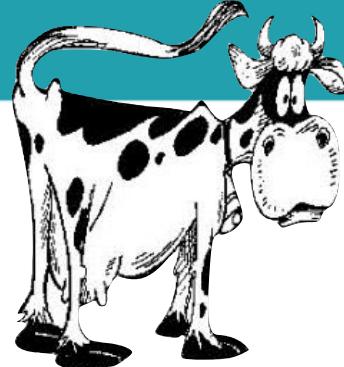
Traditional app

- Rolling upgrade
- Blue/green deployment
- Canary deployment



- **in-place update**
- **immutable infra**





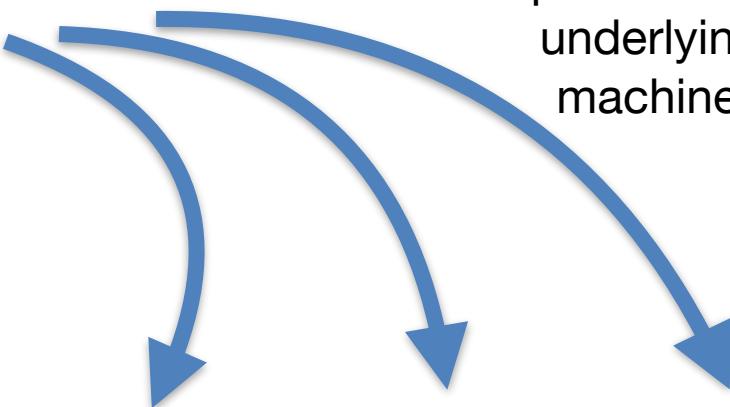
cattle

container

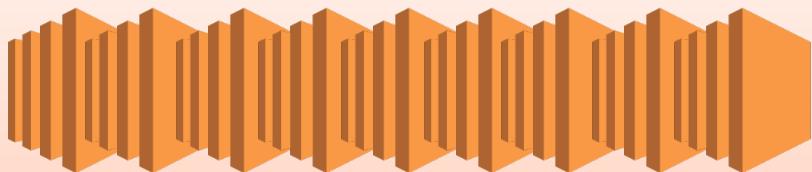


immutable images

independent of
underlying
machines



API servers

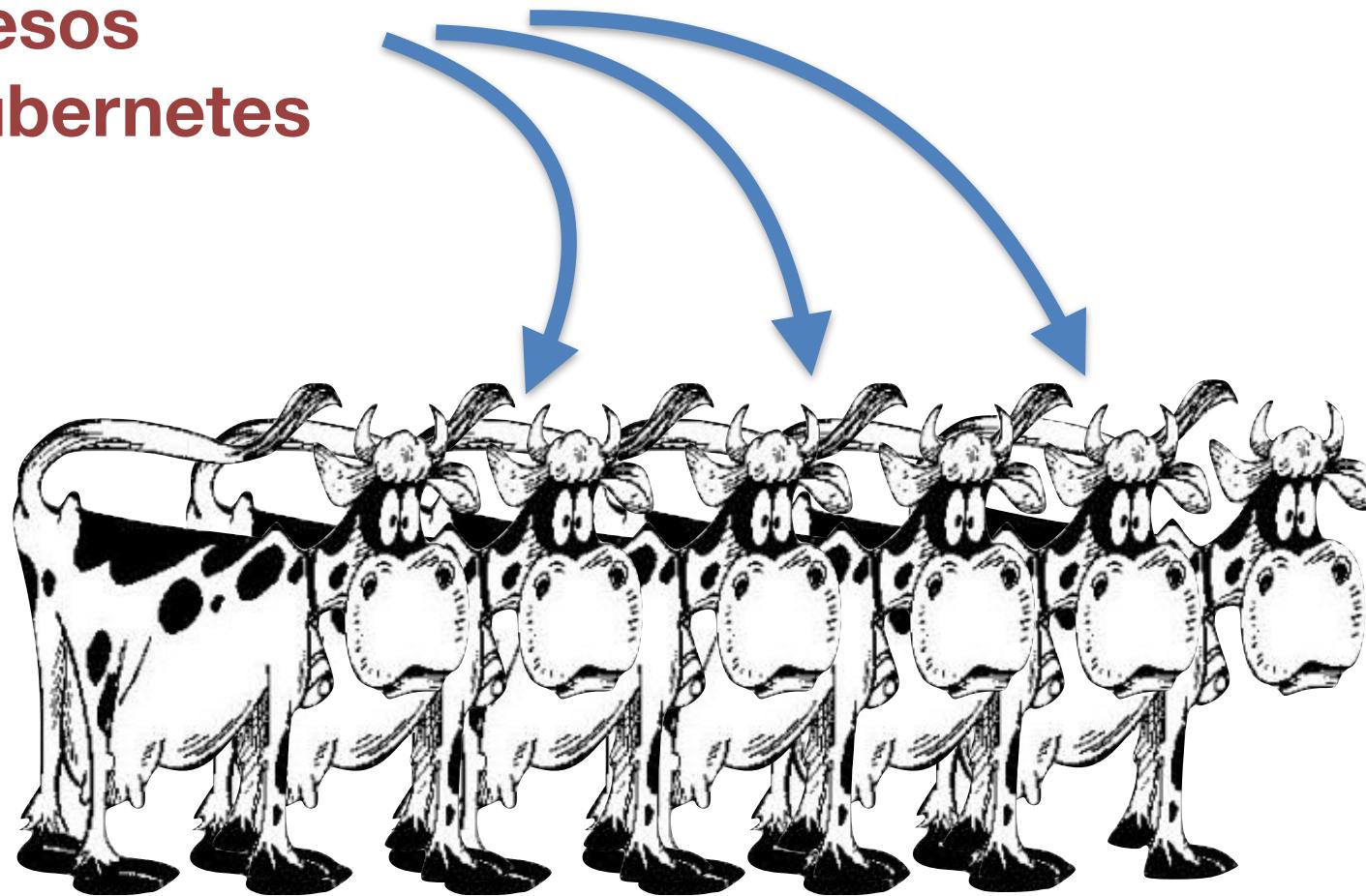


private network

public network

Docker Swarm
Mesos
Kubernetes

allocation, orchestration



cattle

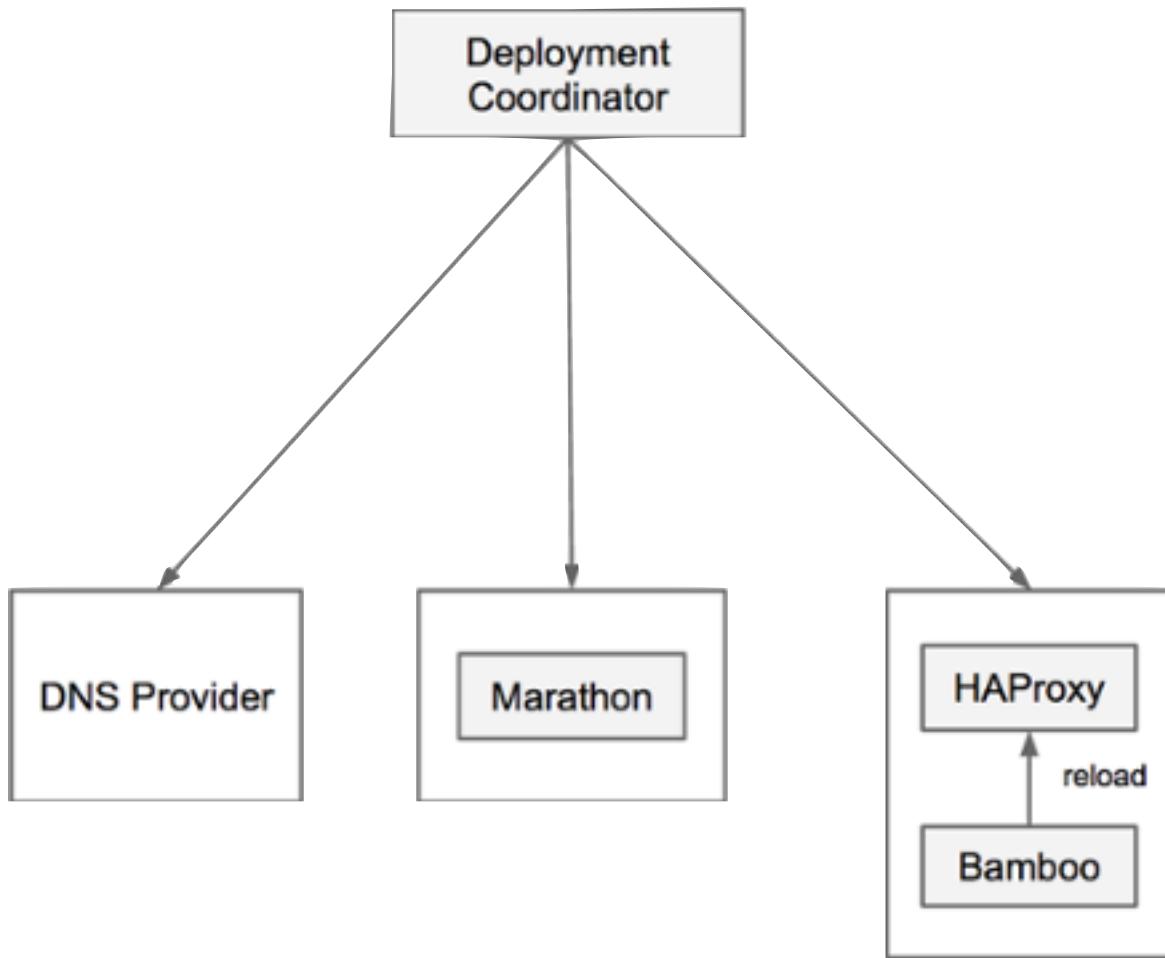
Kubernetes

- Rolling upgrade

```
kubectl rolling-update my-nginx --image=nginx:1.9.1
```

- Canary deployment
 - use **label**

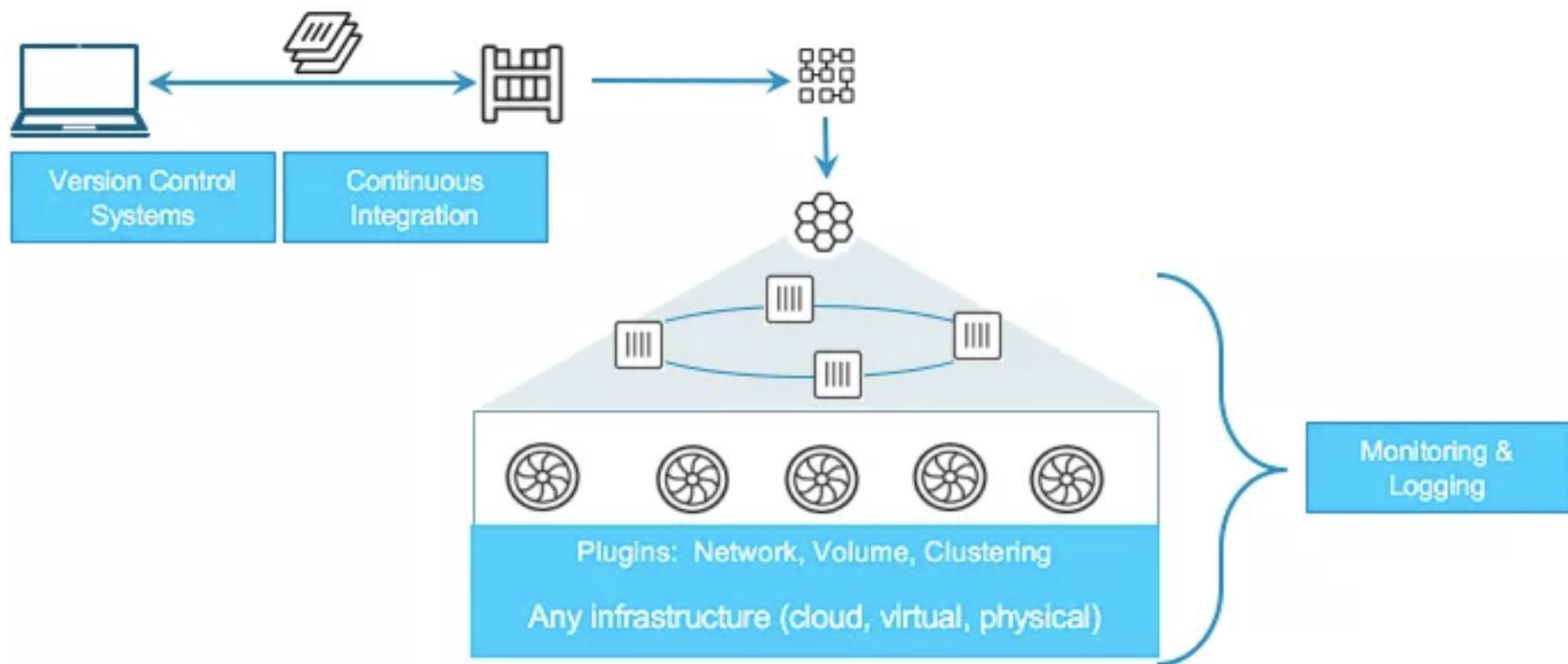
Mesos



<http://blog.qubit.com/opensourcing-bamboo-automated-mesos-marathon-load-balancing>

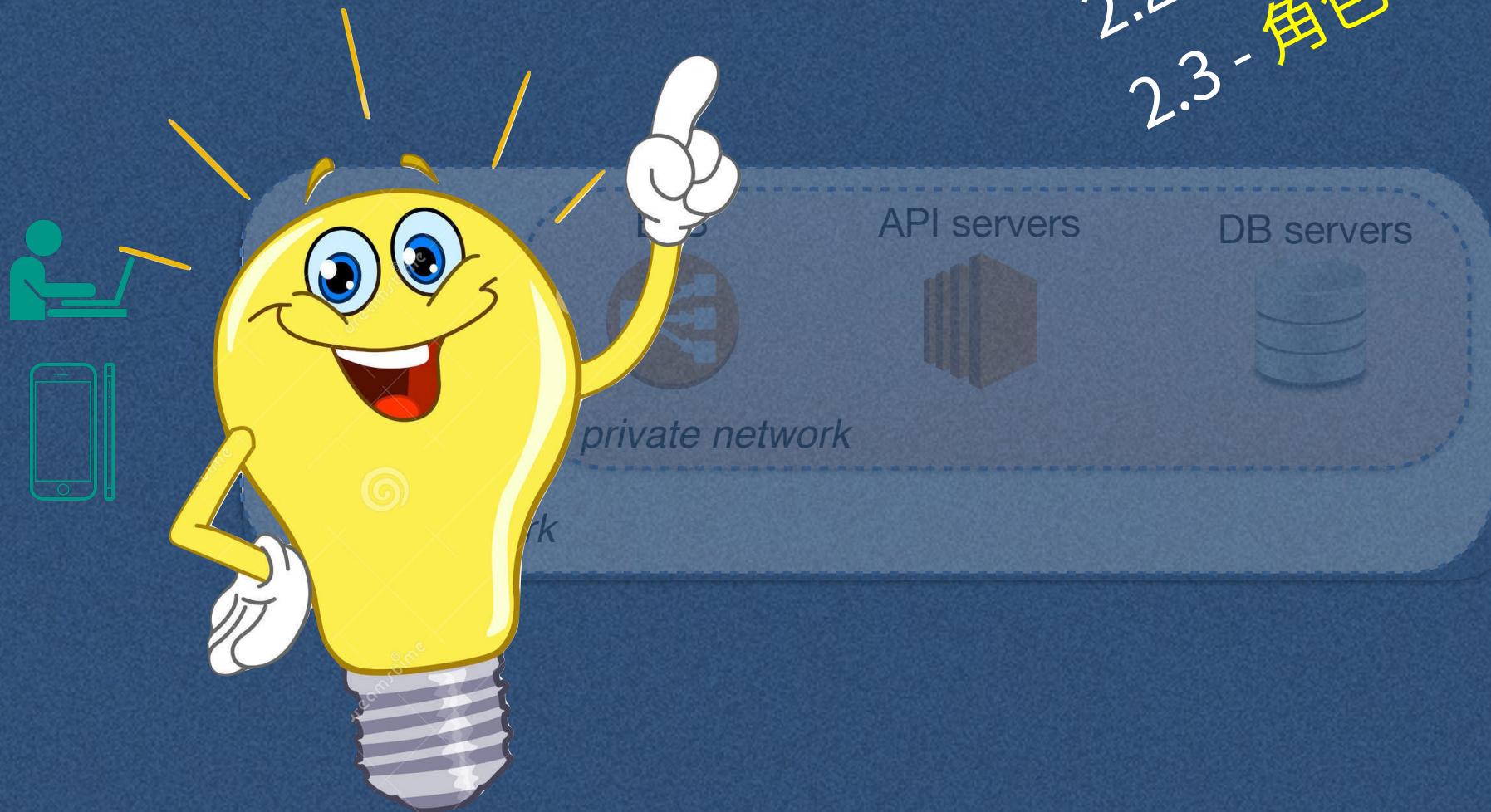
<http://www.slideshare.net/johnadowns/making-developers-happier-with-mesos-docker-and-marathon>

Universal Control Plane



1. How to **recreate** your system
2. How to safely **change** your system
3. When something has gone **wrong**

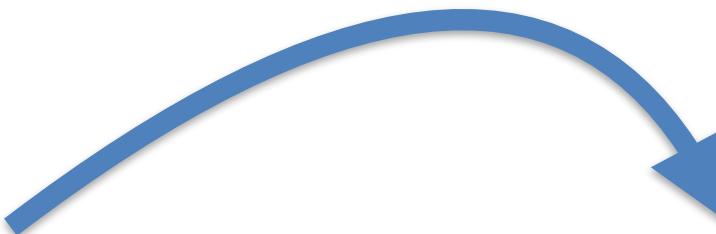
2.1 - 機器
2.2 - 組態
2.3 - 角色





Consider the benefits:

- *immutable infrastructure*
- *automated allocation*
- *automated orchestration*

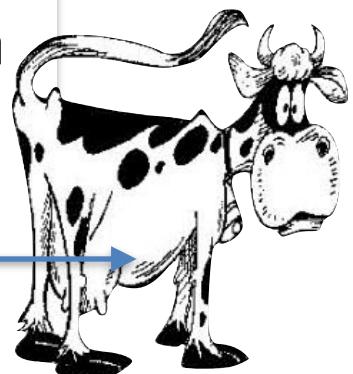


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pets

Docker Swarm
Mesos
Kubernetes



cattle

Key Takeaways



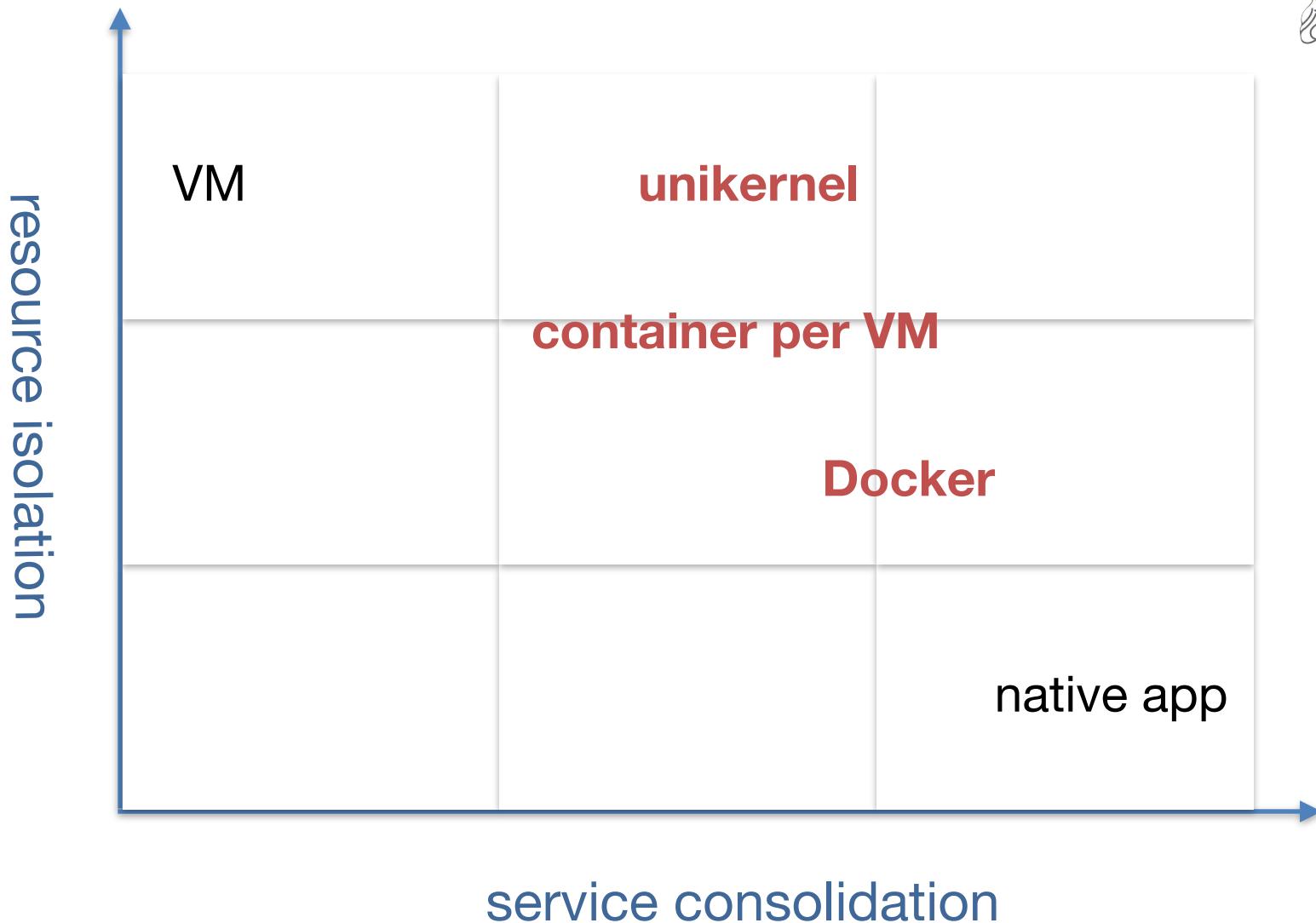


Brian Brazil

真正嚴肅的 DevOps 問題 只有三個：

1. How to **recreate** your system
2. How to safely **change** your system
3. When something has gone **wrong**

Immutable infrastructure



組態管理系統的地位將弱化



*Config management will only be used to install Docker, an **orchestration system**... anything other than app deployment.*

traditional
DevOps
toolchain



tedious

Docker



uniform

你把機器 當寵物， 還是畜生牲畜？

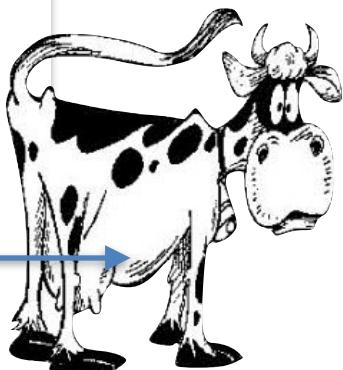
... Don't assume too much about underlying infrastructure.



traditional
DevOps
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pets

Docker Swarm
Mesos
Kubernetes



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Docker Swarm
Mesos
Kubernetes

allocation, orchestration



cattle

iThome

Containers

<http://send.wtf/docker2015>

Thank you

