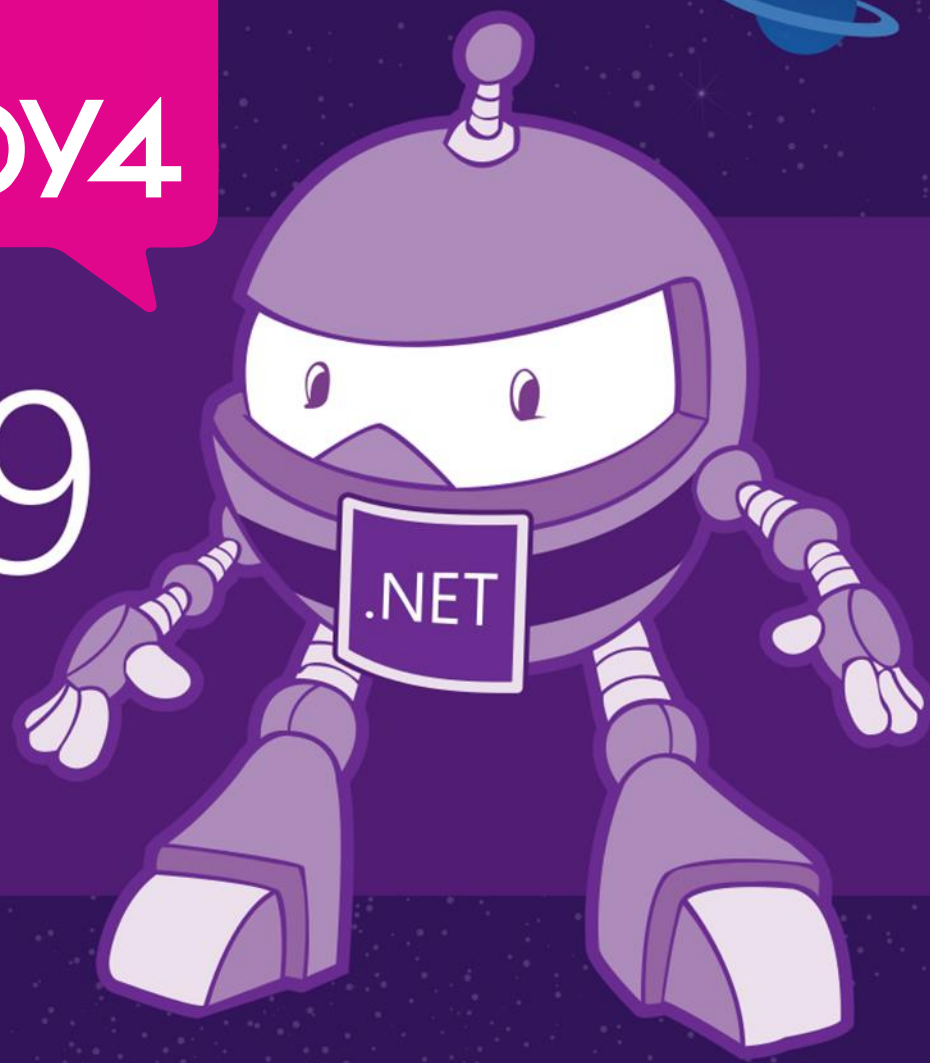


Host by  
**STUDY4**

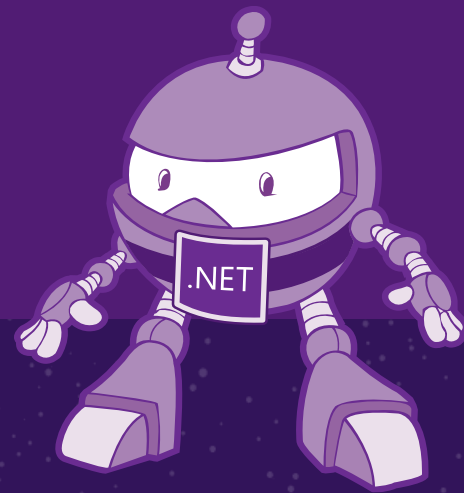
# .NET Conf 2019

探索 .NET 新世界



# Azure 對 .NET 開發人所帶來的改變

李匡正  
雲端解決方案架構師  
合作夥伴暨商務事業群  
台灣微軟

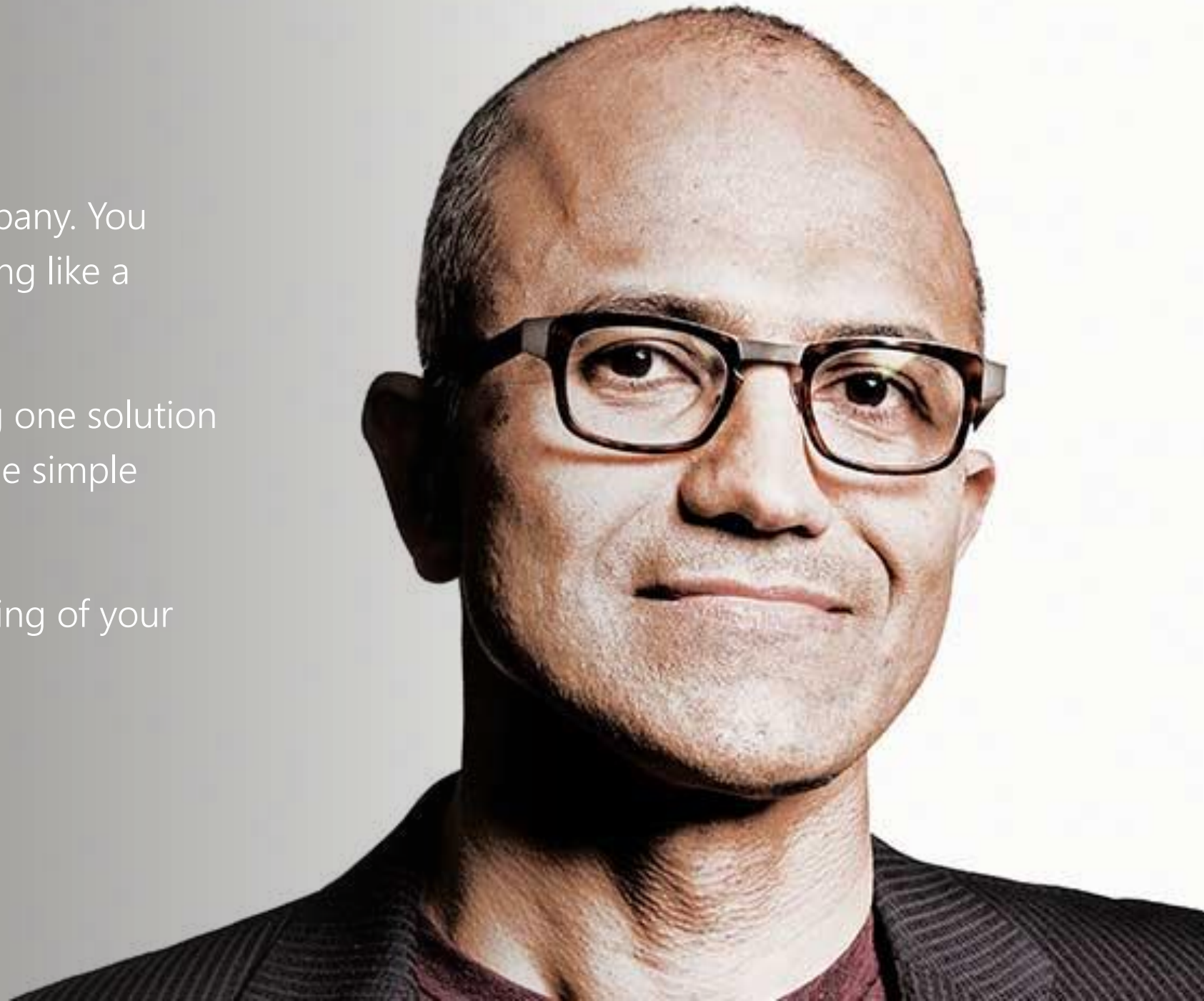


Every company is a software company. You have to start thinking and operating like a digital company.

It's no longer just about procuring one solution and deploying it. It's not about one simple software solution.

It's really about you yourself thinking of your own future as a digital company.

**Satya Nadella**




# 數位公司的樣貌

- 能夠運用科技在新領域創造價值
- 能夠運用科技在核心領域保持領先
- 組織與管理制度具備敏捷特性
- 視軟體研發與系統維運為公司核心能力

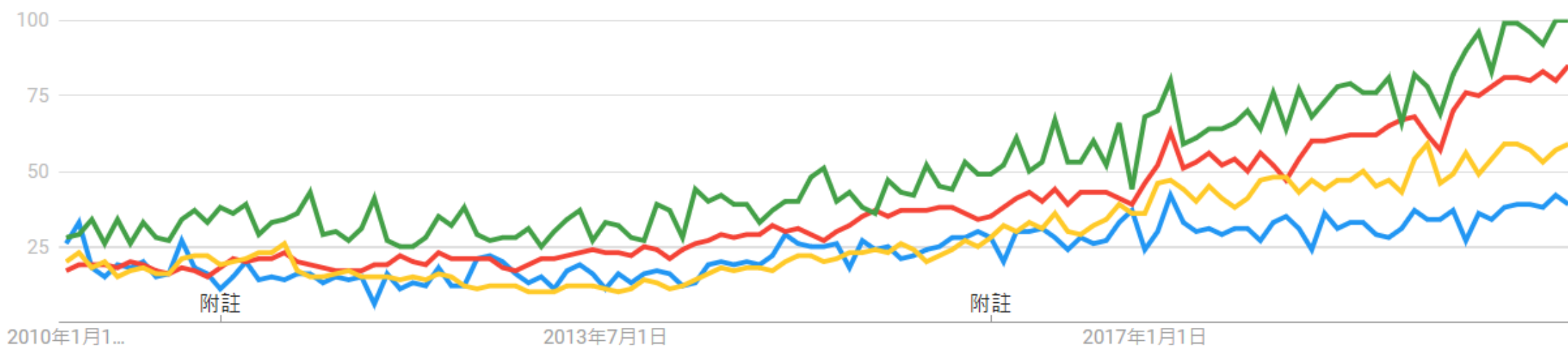
# Google Trends : Azure

2010/1/1 - 2019/11/3

搜尋熱度的趨勢變化 




台灣  
美國  
日本  
香港



# Google Trends : AWS

2010/1/1 -2019/11/3

搜尋熱度的趨勢變化 



台灣  
美國  
日本  
香港



平均值





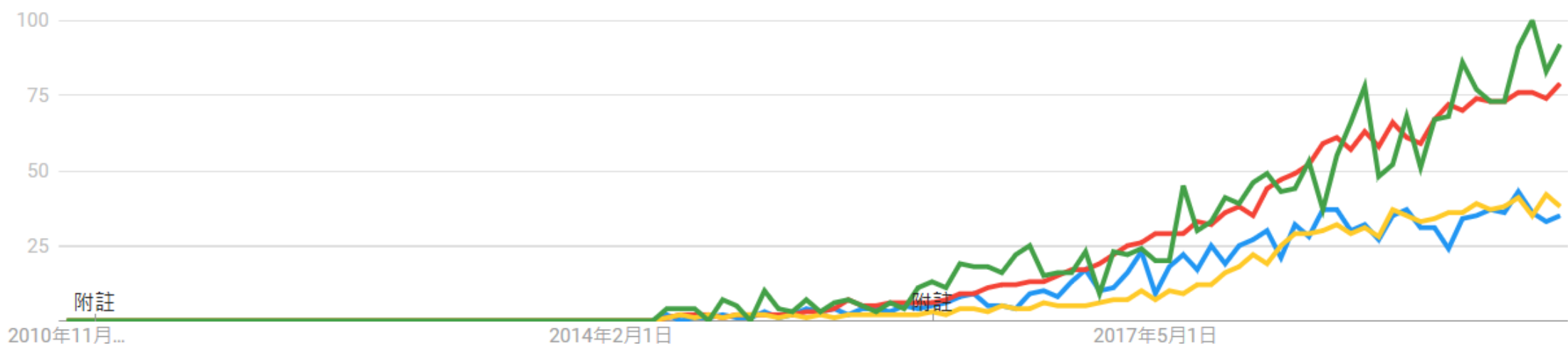
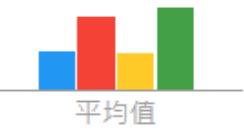
# Google Trends : Kubernetes

2010/10/5 -2019/11/5

搜尋熱度的趨勢變化



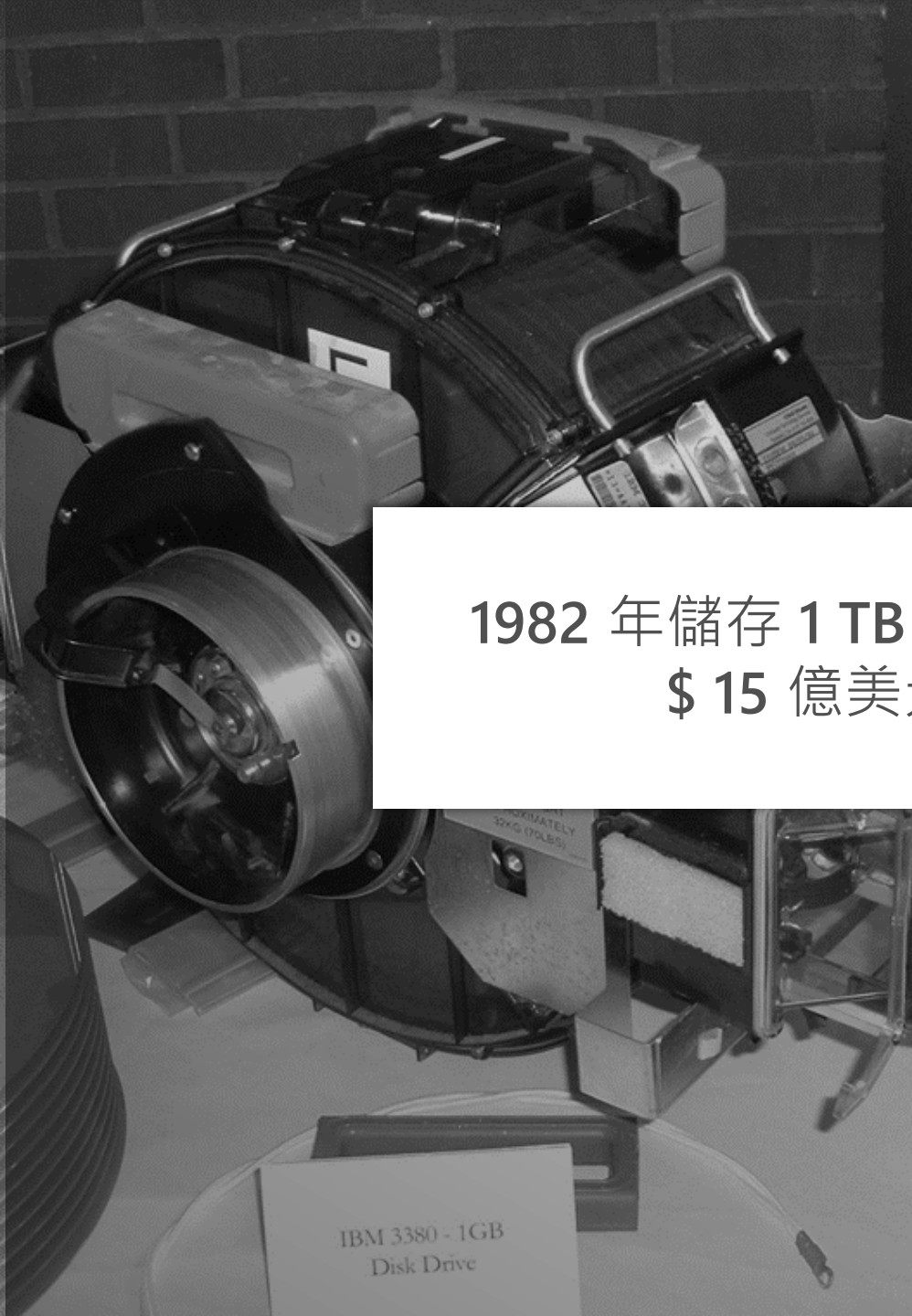
- 台灣
- 美國
- 日本
- 香港



# 雲端帶來的改變







1982 年儲存 1 TB 資料成本  
\$ 15 億美元

1 TB 資料成本



2019 年在 Azure Storage BLOB  
儲存 1 TB 每月 \$ 21 美元



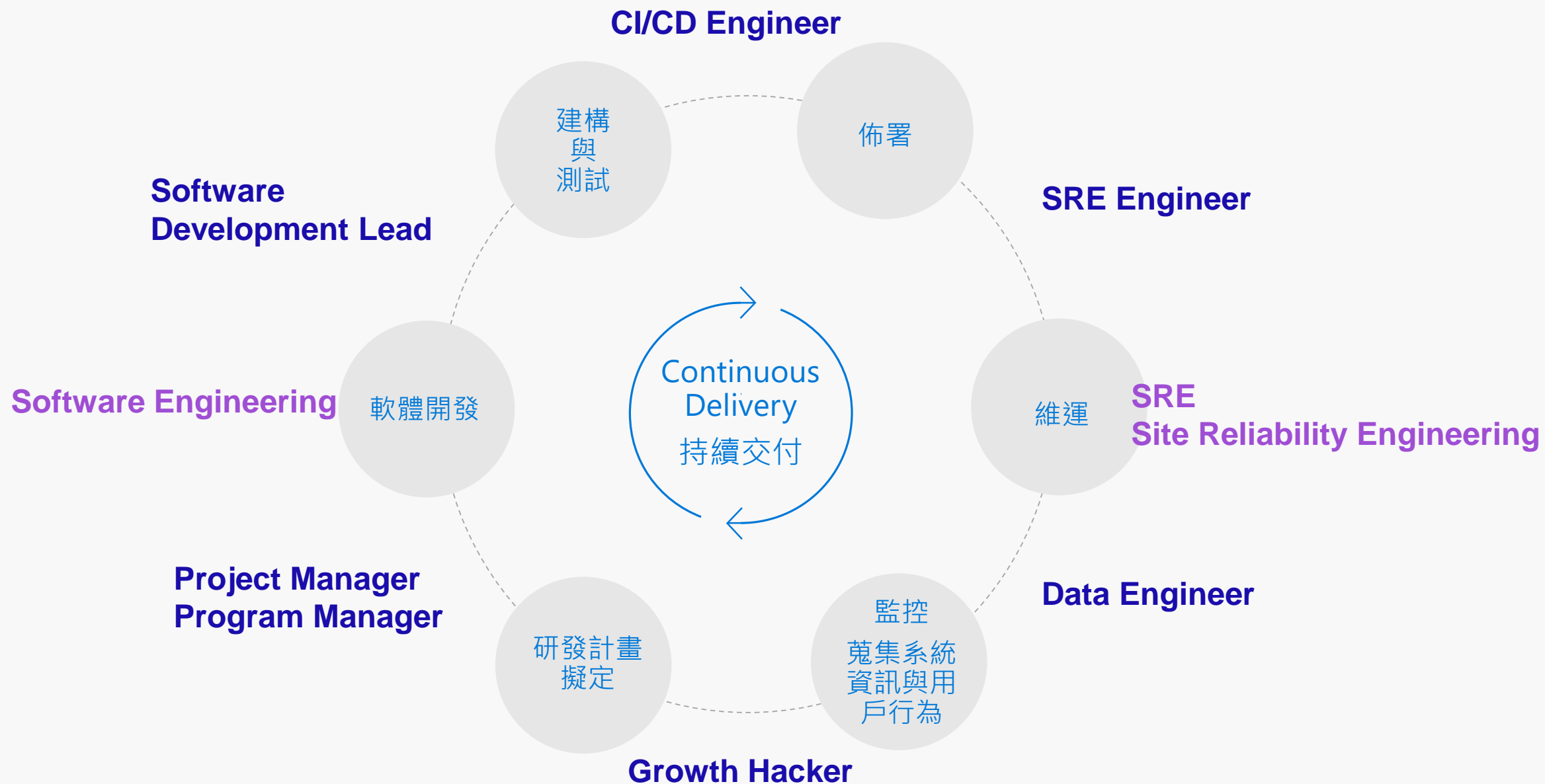


超級電腦 Virginia Tech System X  
建造日期: 2003 年  
造價: \$520 萬美元  
效能: 12.25 tera FLOPS



2019 年在 Azure Virtual  
Machines HB 系列，每小時  
\$4.66 美元可達 18 tera FLOPS

# 開發人員新機會



# Modernizing Application Delivery with Containers & Kubernetes – Ignite 2018


Brendan Burns










A photograph of a white semi-truck with a blue cab, stuck in a deep snowdrift on a highway. The truck is angled, with its front end partially submerged in the snow. A red and white traffic cone is visible in the foreground near the truck's rear. In the background, other vehicles and a clear blue sky are visible. The scene is set in a winter environment with snow-covered ground and bare trees in the distance.

大多數服務中斷都是自己造成的







A photograph of a blue and white semi-truck stuck in a deep snowdrift on a highway. The truck is angled, with its front cab partially submerged in the snow. A red and white traffic cone is visible in the foreground near the truck's rear wheels. In the background, other vehicles and a clear blue sky are visible. A semi-transparent white box with a purple border is overlaid on the image, containing the text.

太困難了 ....





# 解除耦合關係 Decoupling



應用程式 SRE

Container Cluster Managers



容器調度叢集 SRE

Container Runtimes / Images



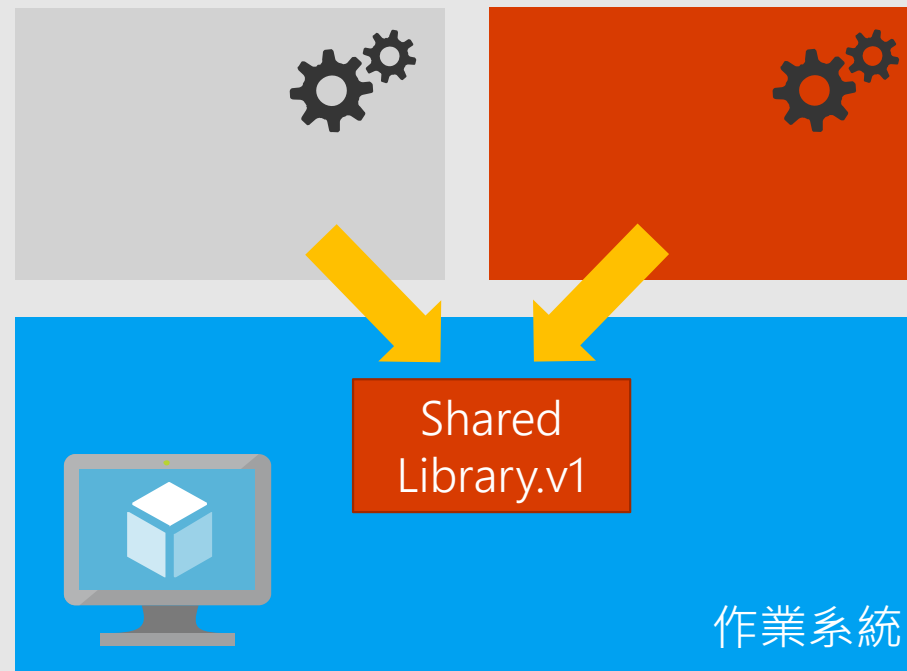
核心/作業系統 SRE

IaaS / Virtualization

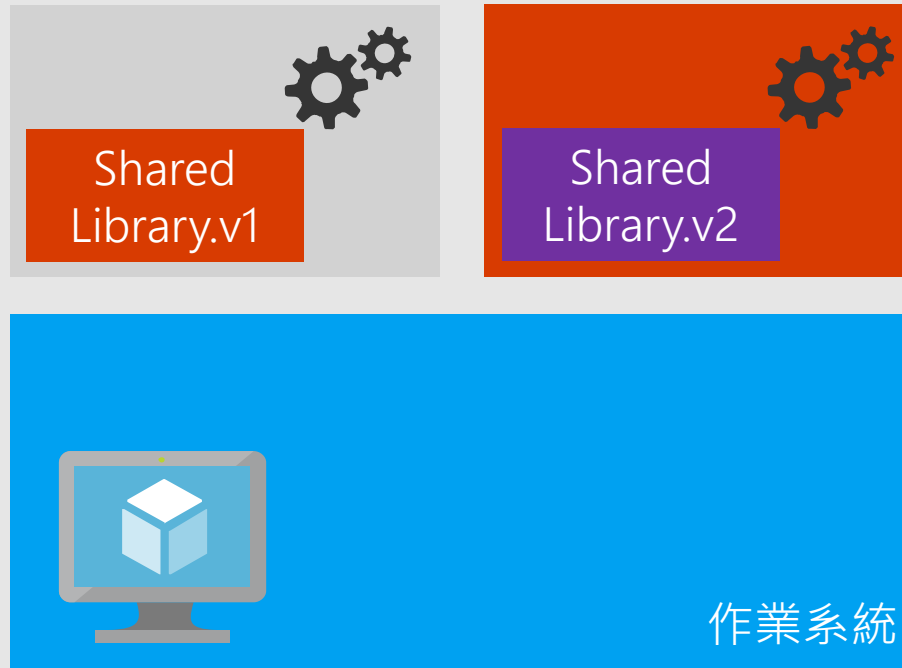


硬體伺服器 SRE

# 容器技術

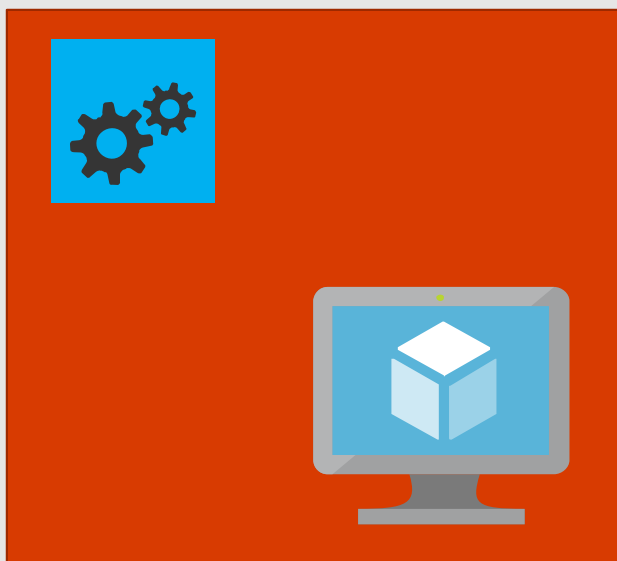


# 容器技術

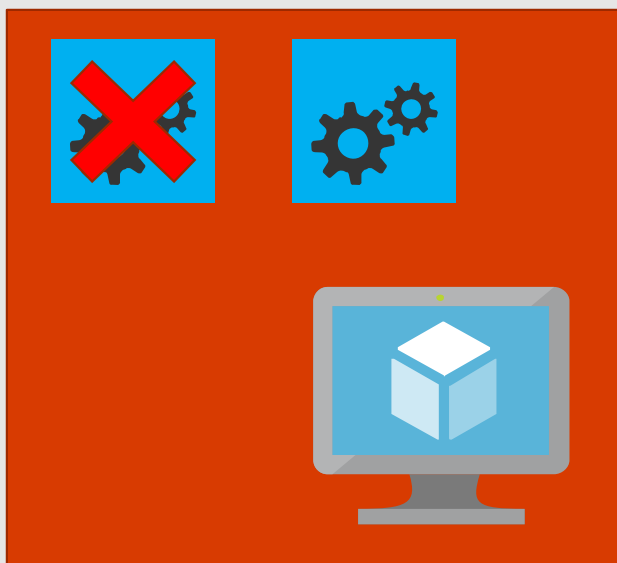




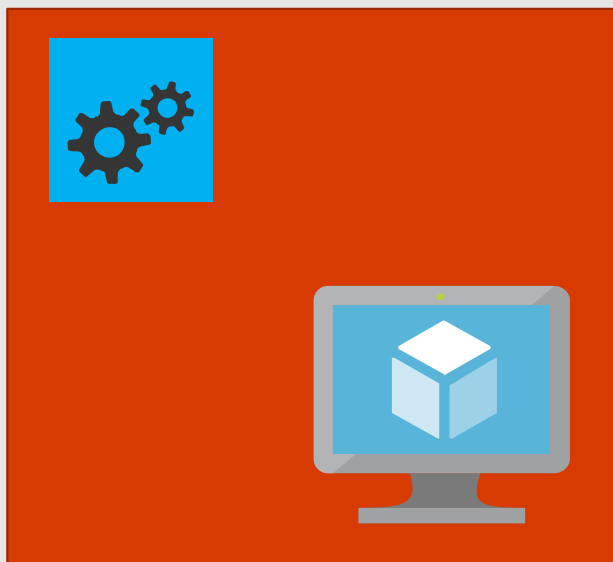
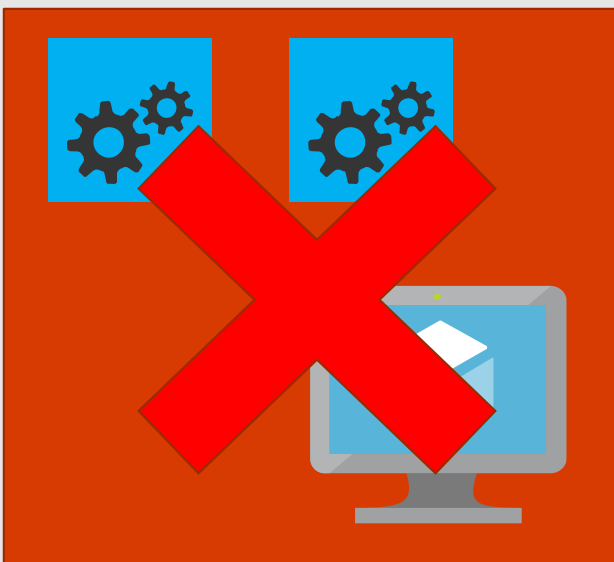
# 容器調度 - Kubernetes



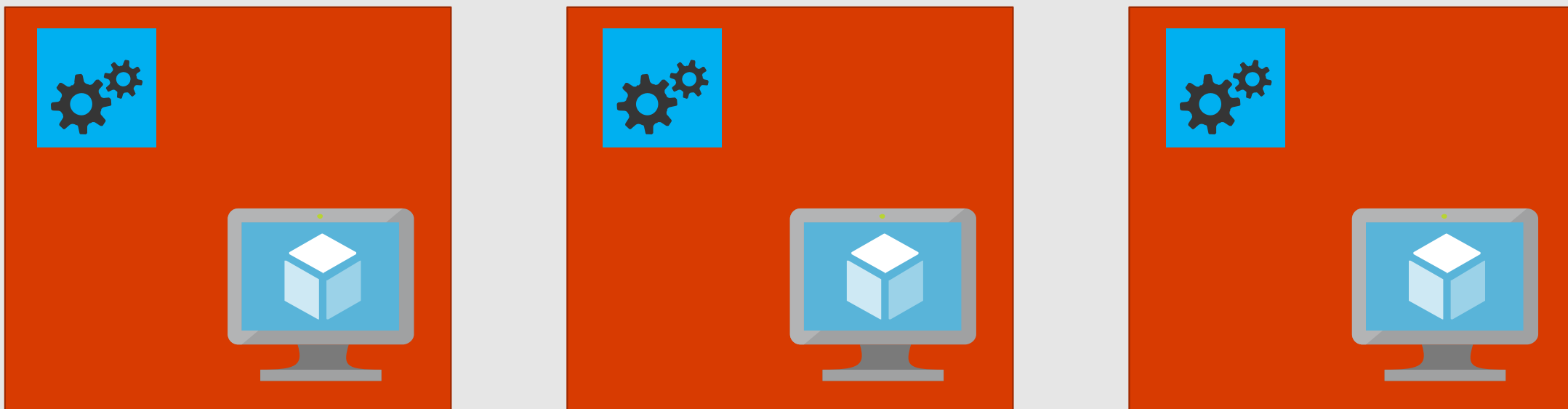
# 容器調度 - Kubernetes



# 容器調度 - Kubernetes



# 容器調度 - Kubernetes



```
kubectl scale replicaSet -count=3
```

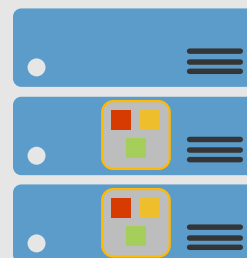
# 應用程式 – 微服務

解除應用程式間耦合性

- 應用程式由眾多獨立之服務所組成
- 每個服務都實作了某項獨立的功能
- 每個服務提供定義明確之 API

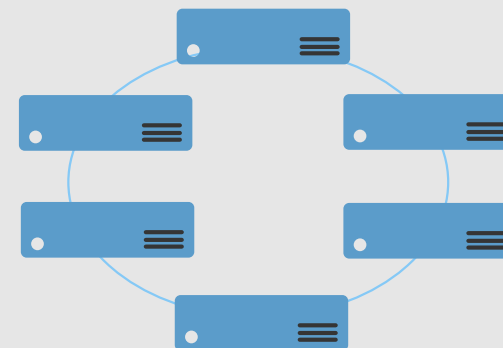
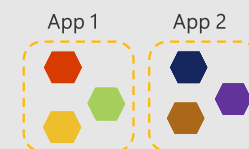
單體應用程式

Monolithic







微服務應用程式

Microservices

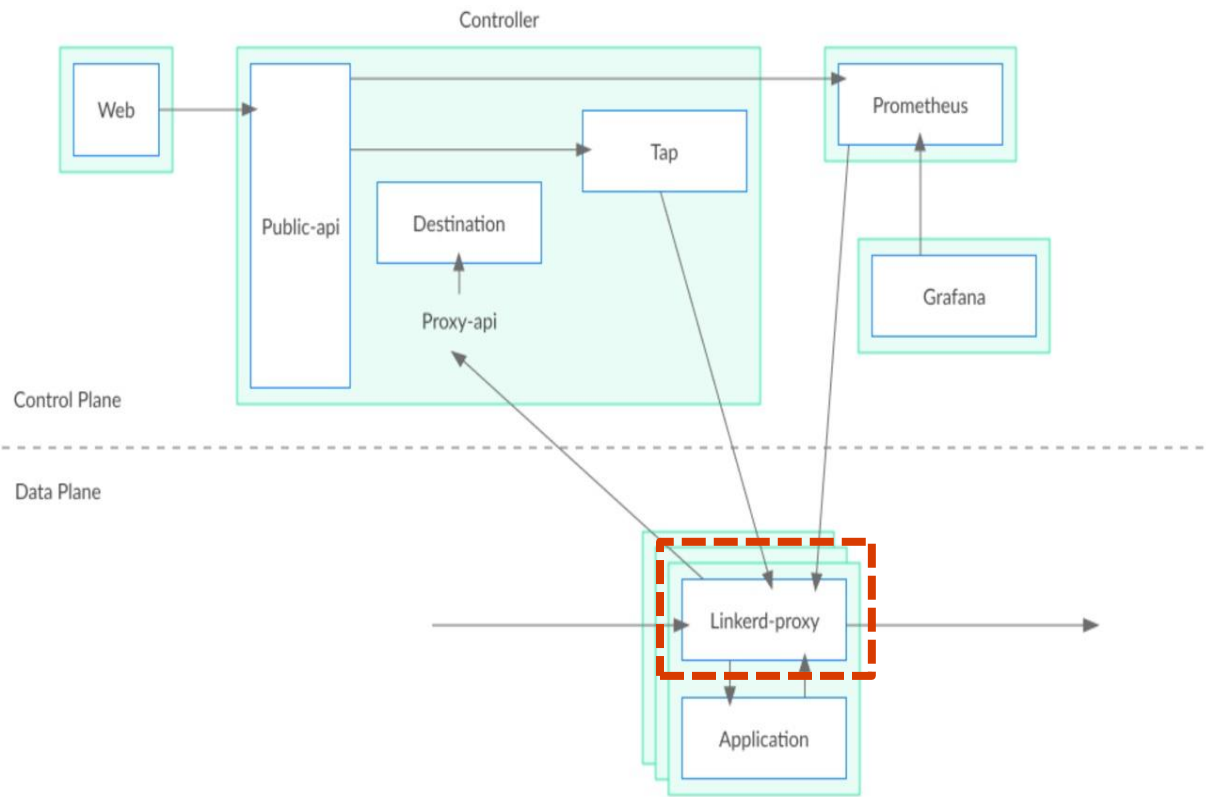


# 應用程式 – 微服務

Service Mesh	Dapr
 Istio  Consul  LINKERD ...	 <a href="https://github.com/dapr/dapr">https://github.com/dapr/dapr</a>
以基礎環境為中心 infrastructure-centric	以開發人員為中心 developer-centric
開放源碼	開放源碼
Sidecar Pattern – 不需要額外函式庫與 SDK	Sidecar Pattern – 不需要額外函式庫與 SDK
支援 Kubernetes , gRPC, HTTP	支援 Kubernetes, gRPC, HTTP
Network traffic flow management	State management, Pub-Sub, Bindings



# 邊車模式 Sidecar Pattern



## CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape [/cncf.io](https://cncf.io) has a large number of options. This Cloud Native Trail Map is a recommended process for leveraging open source, cloud native technologies. At each step, you can choose a vendor-supported offering or do it yourself, and everything after step #3 is optional based on your circumstances.

### HELP ALONG THE WAY

#### A. Training and Certification

Consider training offerings from CNCF and then take the exam to become a Certified Kubernetes Administrator or a Certified Kubernetes Application Developer

[cncf.io/training](https://cncf.io/training)

#### B. Consulting Help

If you want assistance with Kubernetes and the surrounding ecosystem, consider leveraging a Kubernetes Certified Service Provider

[cncf.io/kcsp](https://cncf.io/kcsp)

#### C. Join CNCF's End User Community

For companies that don't offer cloud native services externally

[cncf.io/enduser](https://cncf.io/enduser)

### WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private,

### 1. CONTAINERIZATION

- Commonly done with Docker containers
- Any size application and dependencies (even PDP-11 code running on an emulator) can be containerized
- Over time, you should aspire towards splitting suitable applications and writing future functionality as microservices

### 3. ORCHESTRATION & APPLICATION DEFINITION

- Kubernetes is the market-leading orchestration solution
- You should select a Certified Kubernetes Distribution, Hosted Platform, or Installer: [cncf.io/ck](https://cncf.io/ck)
- Helm Charts help you define, install, and upgrade even the most complex Kubernetes application



### 5. SERVICE PROXY, DISCOVERY, & MESH

- CoreDNS is a fast and flexible tool that is useful for service discovery
- Envoy and Linkerd each enable service mesh architectures
- They offer health checking, routing, and load balancing



### 7. DISTRIBUTED DATABASE & STORAGE

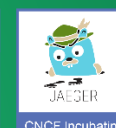
When you need more resiliency and scalability than you can get from a single database, Vitess is a good option for running MySQL at scale through sharding. Back in a storage orchestrator that integrates a

### 2. CI/CD

- Setup Continuous Integration/Continuous Delivery (CI/CD) so that changes to your source code automatically result in a new container being built, tested, and deployed to staging and eventually, perhaps, to production
- Setup automated rollouts, roll backs and testing

### 4. OBSERVABILITY & ANALYSIS

- Pick solutions for monitoring, logging and tracing
- Consider CNCF projects Prometheus for monitoring, Fluentd for logging and Jaeger for Tracing
- For tracing, look for an OpenTracing-compatible implementation like Jaeger



### 6. NETWORKING & POLICY

To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net. Open Policy Agent (OPA) is a general-purpose policy engine with uses ranging from authorization and admission control to data filtering.



## B. Consulting Help

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## WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

The Cloud Native Computing Foundation seeks to drive adoption of this paradigm by fostering and sustaining an ecosystem of open source, vendor-neutral projects. We democratize state-of-the-art patterns to make these innovations accessible for everyone.

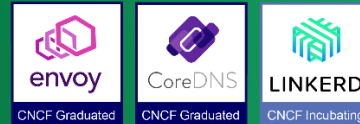
[l.cncf.io](https://l.cncf.io)

v20190524



## 5. SERVICE PROXY, DISCOVERY, & MESH

- CoreDNS is a fast and flexible tool that is useful for service discovery
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## 7. DISTRIBUTED DATABASE & STORAGE

When you need more resiliency and scalability than you can get from a single database, Vitess is a good option for running MySQL at scale through sharding. Rook is a storage orchestrator that integrates a diverse set of storage solutions into Kubernetes. Serving as the "brain" of Kubernetes, etcd provides a reliable way to store data across a cluster of machines. TiKV is a high performant distributed transactional key-value store written in Rust.



## 9. CONTAINER REGISTRY & RUNTIME

Harbor is a registry that stores, signs, and scans content. You can use alternative container runtimes. The most common, all of which are OCI-compliant, are containerd, rkt and CRI-O.



## 6. NETWORKING & POLICY

To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net. Open Policy Agent (OPA) is a general-purpose policy engine with uses ranging from authorization and admission control to data filtering.



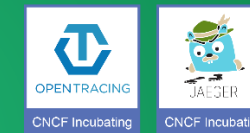
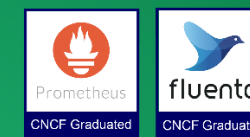
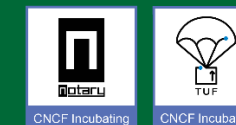
## 8. STREAMING & MESSAGING

When you need higher performance than JSON-RPC, consider using gRPC or NATS. gRPC is a universal RPC framework. NATS is a multi-modal messaging system that includes request/reply, pub/sub and load balanced queues.



## 10. SOFTWARE DISTRIBUTION

If you need to do secure software distribution, evaluate Notary, an implementation of The Update Framework.





## 展示環境

Visual Studio 2019 / Visual Studio Code

.NET Core 3.0

Docker 2.1

Azure Kubernetes Service 1.14.8

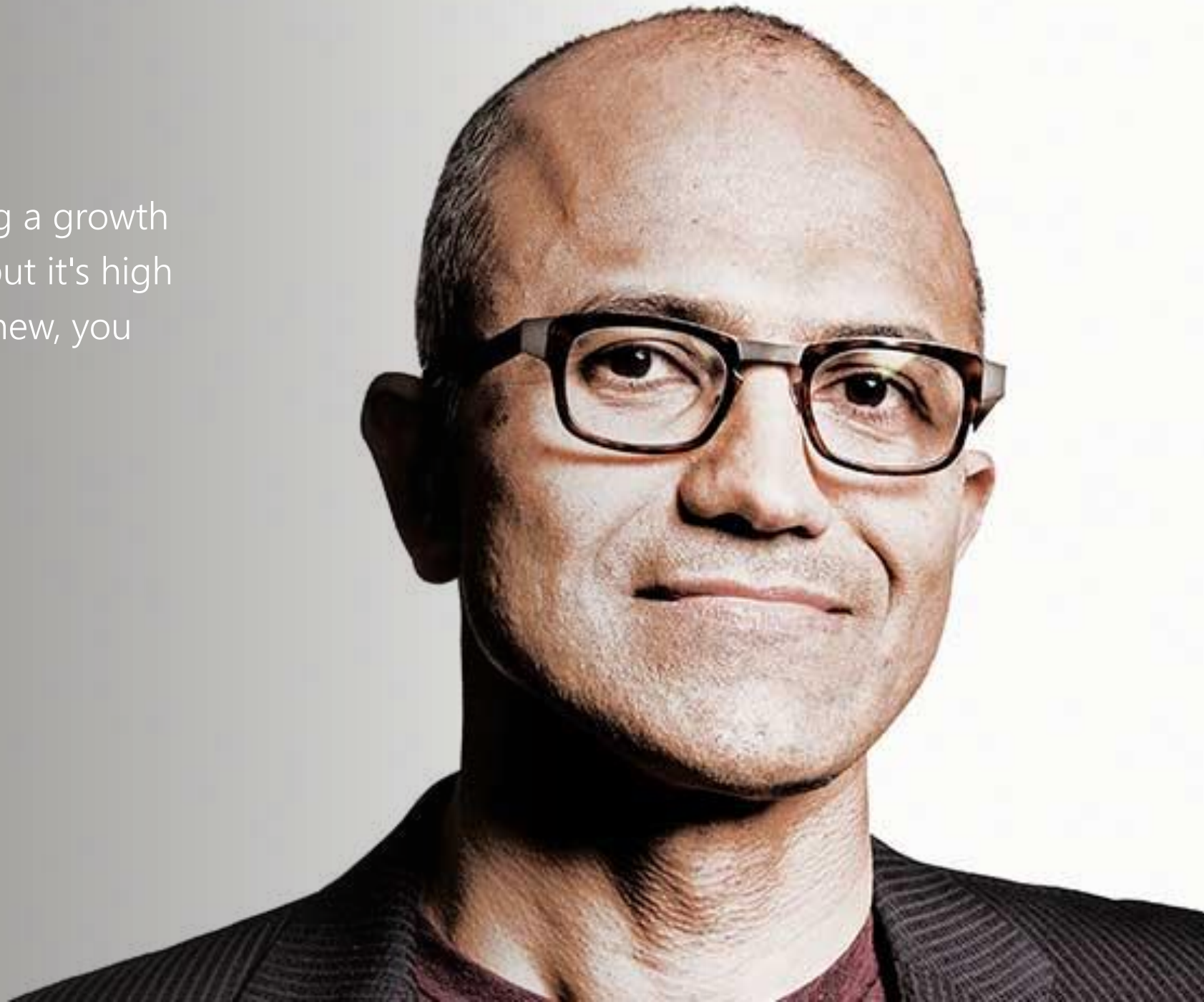
Let's Encrypt

Linkerd 2.6



This is about us individually having a growth mindset. Cloud is just emerging, but it's high growth. If you don't jump on the new, you don't survive.

Satya Nadella



# 特別感謝



R-Ladies Taipei



多奇·數位創意



## 以及各位參與活動的你們

