Open Source AceCon
2021 智能云边开源峰会
AI x Cloud Native x Edge Computing
人工智能 × 云原生 × 边缘计算

从云原生看开源：挑战与机遇

陈恺

灵雀云 创始人&CTO

About us

灵雀云 创始人&CTO

前微软 Azure 云平台创始成员/首席架构师

灵雀云 alauda.cn

全栈云原生开放平台

企业数字化转型中可信赖的云原生技术合作伙伴

Kube-OVN

CNCF 项目

企业级开源 Kubernetes 网络编排系统

A brief history of Open Source Software

1950s-1960s: Software started as free

1970s-1980s: Rise of proprietary software (AT&T, IBM, Microsoft, Apple)

1983: Free Software Movement & The GNU Project

1991: The Linux Kernel

1990s: Dot-Com Boom & LAMP

1998: Open Source Initiative (rebranding Free Software)

2000s-: Internet company by-products (Amazon, Google, Facebook)

2010s-: VC-backed Commercial Open Source Startups

Kai Chen

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Tel: ***(too high-tech for me)***

If you find the contents of this site not interesting, you might want to visit my new personal homepage at: http://www.cs.williams.edu/~04kc. Some people found my old homepage http://wso.williams.edu/~kchen a good place to visit, too.

I received my BA degree in Computer Science and Mathematics from Williams College. During the academic year 2002-03, I was on study-away leave at California Institute of Technology. You may read more about me in my **resume**.

Here is my **PGP Public Key**.

You are welcome to aim me, or add me to your list.

Research and Projects:

I am interested in Theory, Systems, and Algebra.

I am doing an Honor Thesis with Prof. Duane A. Bailey on *DNA-based Computation*. A thesis summary is available in [pdf] or [ps] formats.

I am continuing my research with Prof. Chris Umans in Complexity Theory. We are working on the explicit constructions of combinatorial objects, in particular, extractors -- functions that *extract* random bits from arbitrary distributions which contain sufficient randomness. Our results were summarized in the papers *Generic Construction of Extractors with Error-correcting Codes* , *Advice String Lower-Bound and Improved Extractors*., and *On Extractors and Local Description Size for Codes*.

I am studying the characterizations of the completions of local domains. In particular, I am trying to answer the question:
--- When is a local complete ring the completion of an excellent local integral domain? (Read more)
I formulated a method for constructing a chain of excellent local domains with generic formal fibers satisfying some "unusual" conditions: *Chains of Unusual Excellent Local Rings* (preprint).

The **K-OS** (**K**ai's **O**perating **S**ystem) Project. The current implementation provides a rather complete set of the basic features enjoyed by most modern operating systems. For an overview, see the paper: *On the Design and Implementation of K-OS* [PS].

The **FJavaC** (Functional Java Compiler) Project. A compiler written in OCaml for an extended version of Java with functional features such as *higher-order functions* and *nested function compositions*.

The Reed-Solomon Project. A Java implementation of the Reed-Solomon decoder for a (31, 15) RS code over GF(32).

The BCJR Project. A simulation and analysis of the BCJR decoding algorithm. Here is a Project Report and an accompanying paper on the Theoretical Underpinning [PS].

I finally put together some documentation for my *Viturl Mesh*. I conducted this project with Prof. Jim Teresco in summer 2001. This work was included in the presentation at USNCCM IV.

CS337(T) final project was a fun one. We designed and implemented a *Systolic Array* element. Besides being the project manager, I designed a cute mini block cipher called *Iak* (does this name look familiar?) There is documentation available in [PS] and [PDF] formats. It was inspired by the new *AES* algorithm: *Rijndael*. (Read more)

CS237 final project: A Microcode Interpreter for 68000-like architecture. This program translates WC34000 (some 68000-like virtual architecture) machine code (macro) into micro machine code.

A potential project (could be big) is to design an *Architecture-aware Parallel Programming Methodology*. The idea is to allow a concurrent program to dynamically select the most suitable parallel model (message-passing, multi-threading under SM, etc) according to the underlying hardware. (See details)

I am looking for partners to finish the new version of my Cimomo Messenger. It currently looks like this.

Open Source has won

Industry consensus: Open Source is a *superior* way to *develop* and *distribute* software.

- Adoption
- Innovation
- Quality

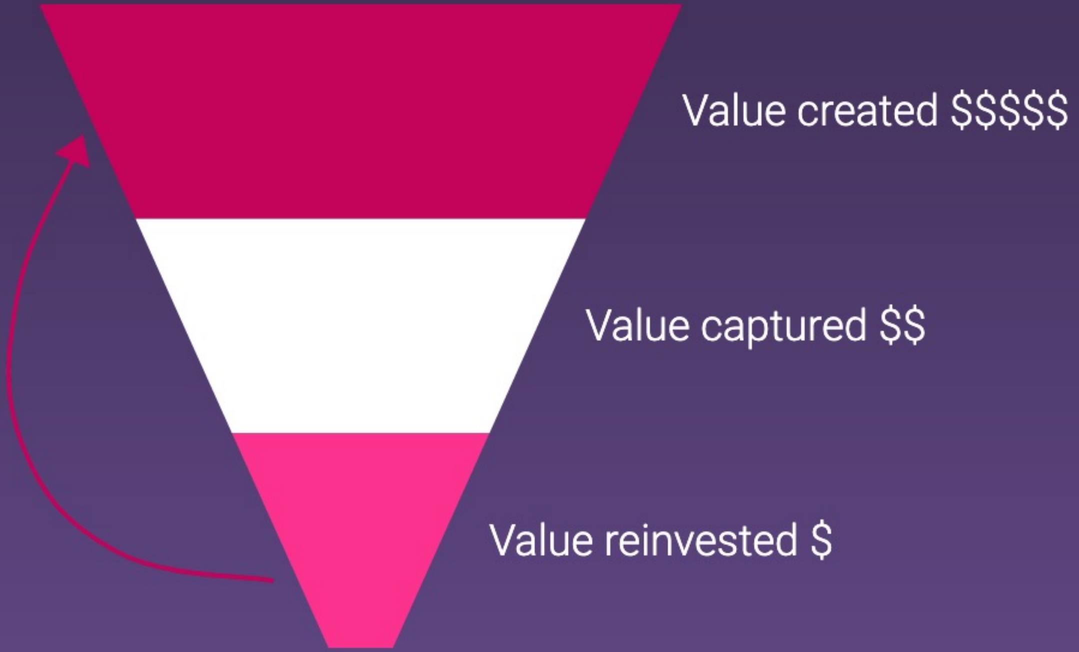
Who creates OSS?

Hobbyists & Academia

Internet companies exhaust

Commercial OSS Companies

OSS Economy



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To sustain and scale Open Source ecosystems, we need viable business models.

OSS Business Models

Pure Open Source

Support & services

E.g. Redhat* (Linux)

Open Core

Proprietary features

E.g. Elastic (ElasticSearch)

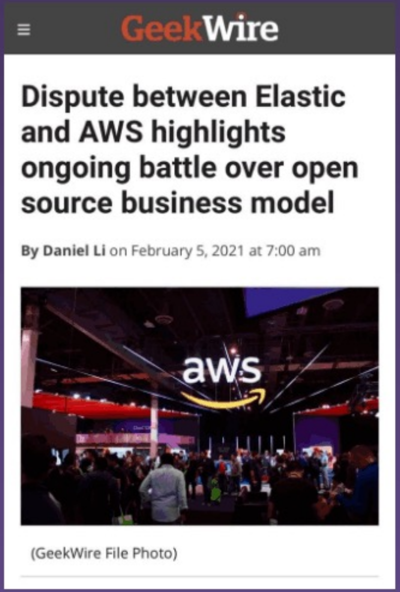
SaaS

Hosting & operations

E.g. Databricks (Spark)

*In my view, Redhat's model is more nuanced. I prefer to call it the "Enterprise Open Source Product" model.

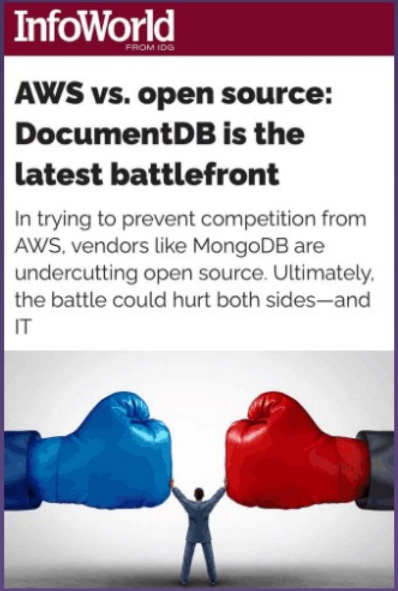
Cloud & Open Source


GeekWire

Dispute between Elastic and AWS highlights ongoing battle over open source business model

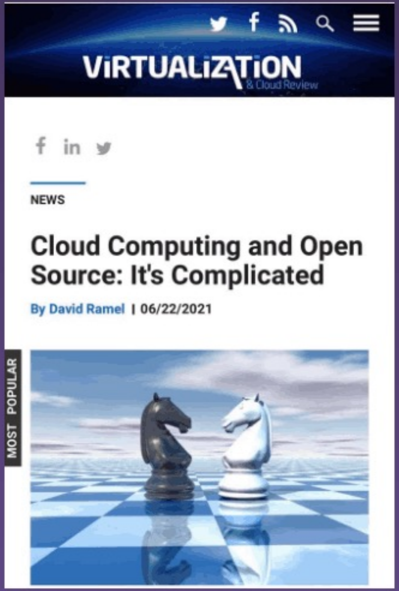
By Daniel Li on February 5, 2021 at 7:00 am

(GeekWire File Photo)


InfoWorld FROM IDG

AWS vs. open source: DocumentDB is the latest battlefront

In trying to prevent competition from AWS, vendors like MongoDB are undercutting open source. Ultimately, the battle could hurt both sides—and IT


VIRTUALIZATION & Cloud Review

NEWS

Cloud Computing and Open Source: It's Complicated

By David Ramel | 06/22/2021

MOST POPULAR

Impact of Cloud on OSS Business Models

Pure Open Source

Cloud providers offer SLA, handle RAS (reliability, availability & security) and the software lifecycle.

Open Core

Cloud providers can invest resources to implement the missing proprietary features.

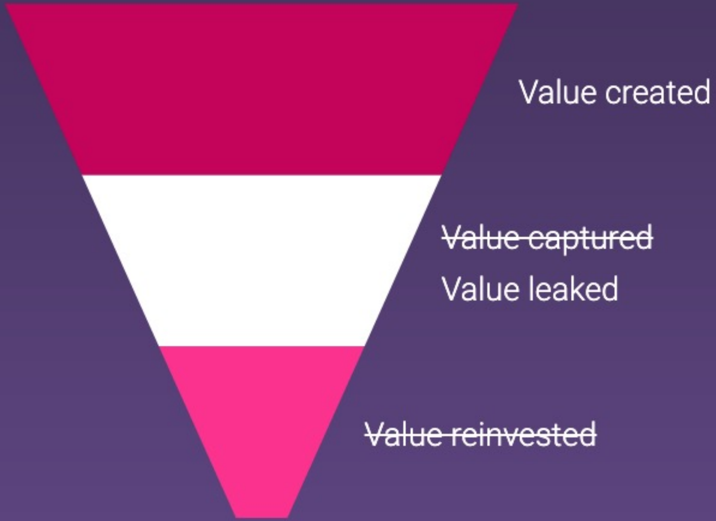
SaaS

Cloud providers are better at operating a given service reliably at scale, and at lower costs.

The core issue is not with the licenses. Fundamentally, the existing OSS business models depend too heavily on the friction of running and operating Open Source Software on-prem.

In that regard, the cloud is simply a better alternative.

Potential impact on the OSS economy



The effort-reward asymmetry may break the OSS economic value chain:

- Existing companies disincentivized to invest further in the OSS project.
- Entrepreneurs disincentivized to start new projects.
- Venture capital disincentivized to fund new projects.

“

In the cloud era, to continue to sustain Open Source ecosystems, we need to innovate and evolve the OSS business and governance models.

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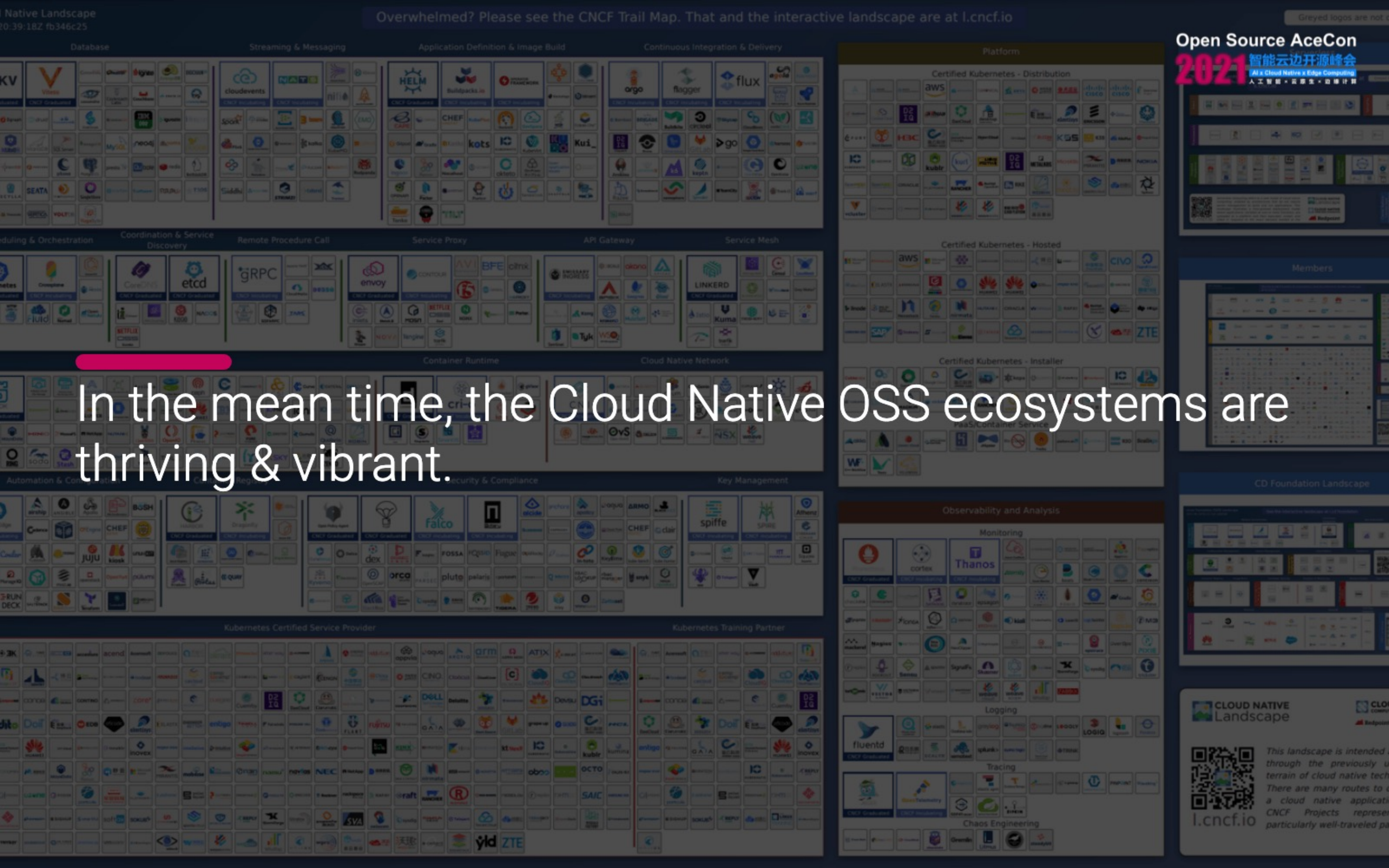
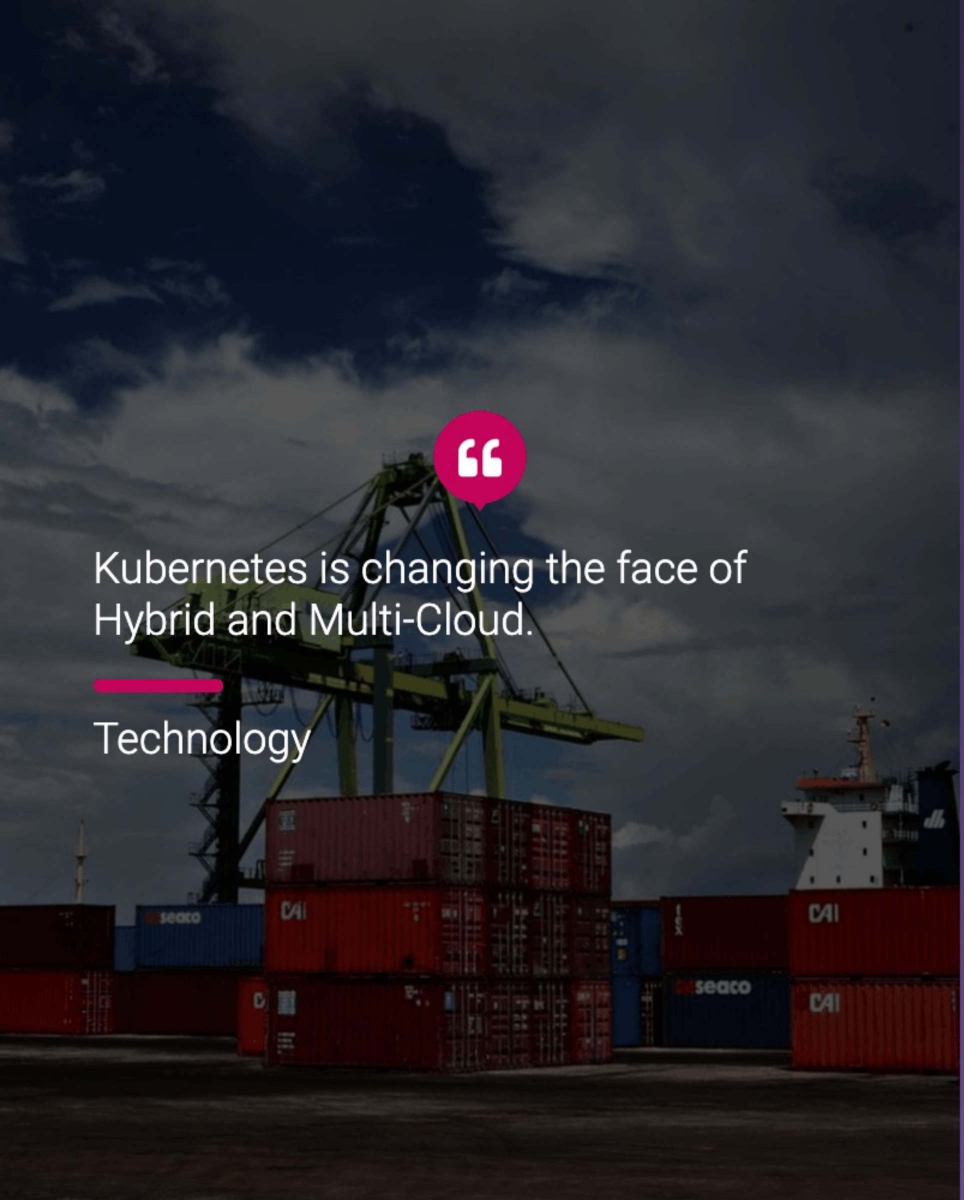

Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io
Database
Streaming & Messaging
Application Definition & Image Build
Continuous Integration & Delivery
Platform
Certified Kubernetes - Distribution
Certified Kubernetes - Hosted
Certified Kubernetes - Installer
PaaS/Container Service
Coordination & Service Discovery
Remote Procedure Call
Service Proxy
API Gateway
Service Mesh
Container Runtime
Cloud Native Network
Automation & Configuration
Security & Compliance
Key Management
Kubernetes Certified Service Provider
Kubernetes Training Partner
Observability and Analysis
Monitoring
Logging
Tracing
Chaos Engineering
Members
CD Foundation Landscape
CLOUD NATIVE Landscape
l.cncf.io
This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path.

In the mean time, the Cloud Native OSS ecosystems are thriving & vibrant.



Kubernetes is changing the face of Hybrid and Multi-Cloud.

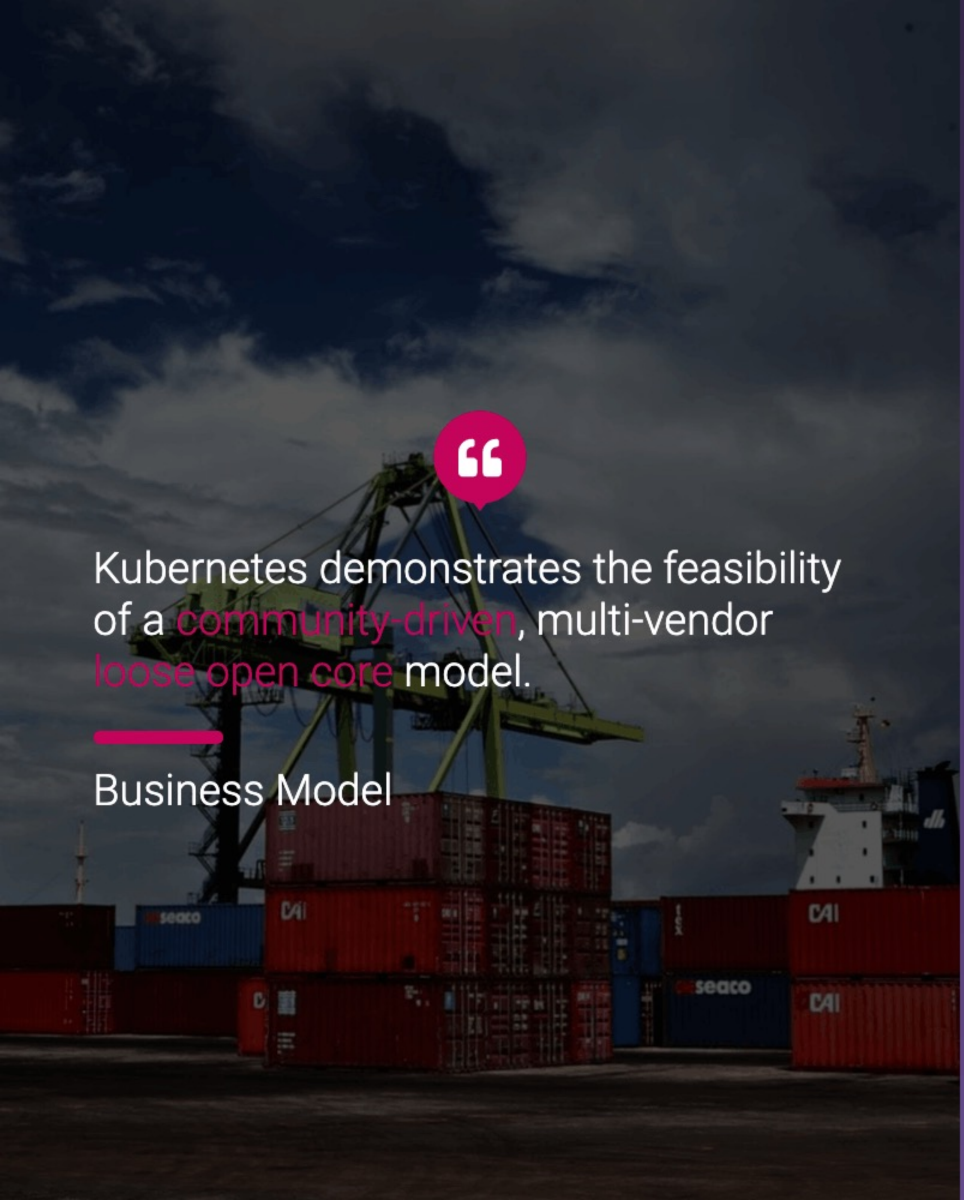
Technology

An open portability layer for workloads

An open cloud operating system

An open Cloud-Native tech stack

An open universal cloud control plane



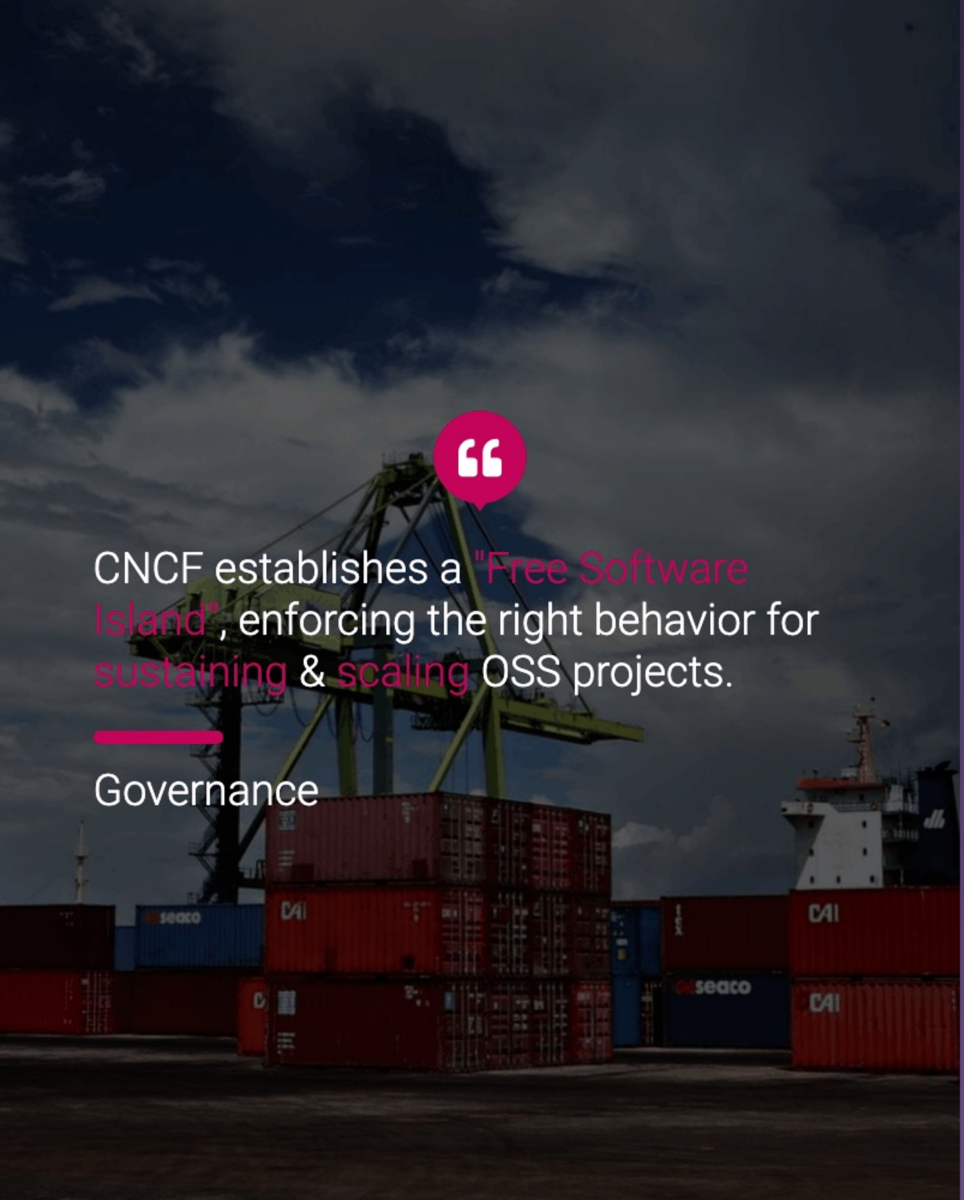
Kubernetes demonstrates the feasibility of a community-driven, multi-vendor loose open core model.

Business Model

The OSS project is vendor-neutral and completely community driven.

A vibrant vendor ecosystem can form down stream to sell proprietary value-added services.

Smaller vendors can go "up the stack" without competing with cloud providers.



CNCF establishes a "Free Software Island", enforcing the right behavior for sustaining & scaling OSS projects.

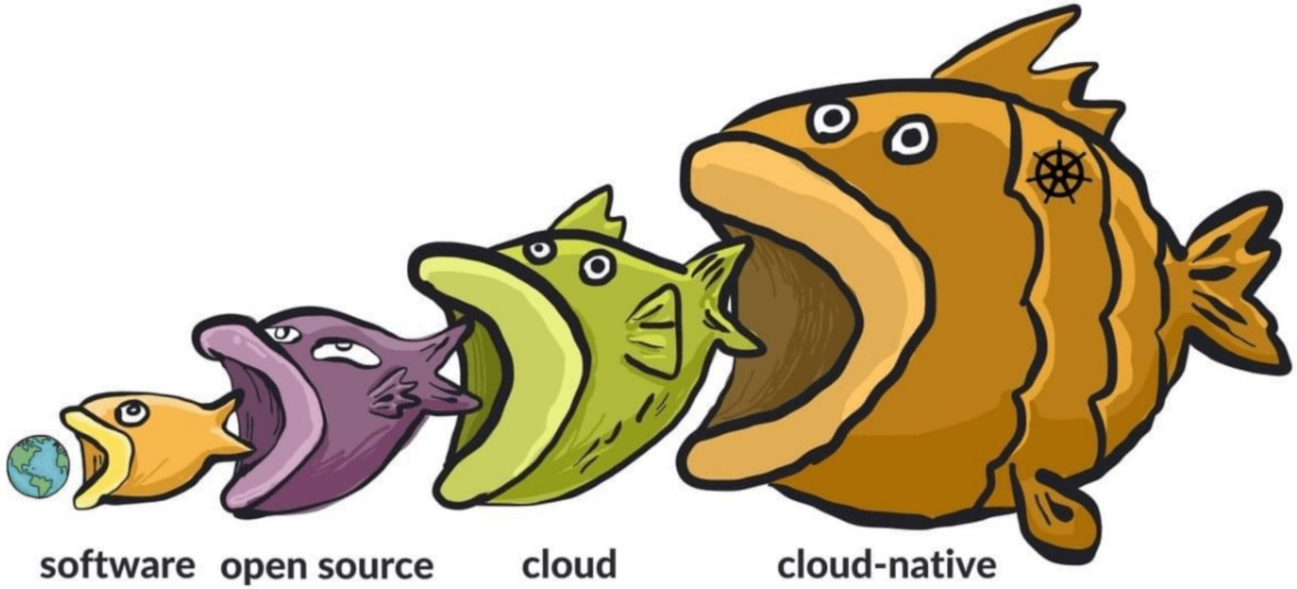
Governance

The Foundation acts as an external agent, enforcing vendor-neutrality and encouraging contributions from all.

It can promote vendors with bigger contributions, thereby creating incentives.

It may fund maintenance of the OSS projects directly.

Cloud-Native is an Open Source Movement in the Cloud Era



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Thank You