

Cloud, OpenSource and Community

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dev.to/jlandure
github.com/jlandure

Google Cloud Certified PROFESSIONAL CLOUD ARCHITECT

Google Cloud Certified PROFESSIONAL CLOUD DEVELOPER

docker

CERTIFIED kubernetes APPLICATION DEVELOPER

Merci aux RRLL de m'accueillir 🎉



THE

APACHE™

SOFTWARE FOUNDATION


ECLIPSE™
FOUNDATION



Timeline *aas

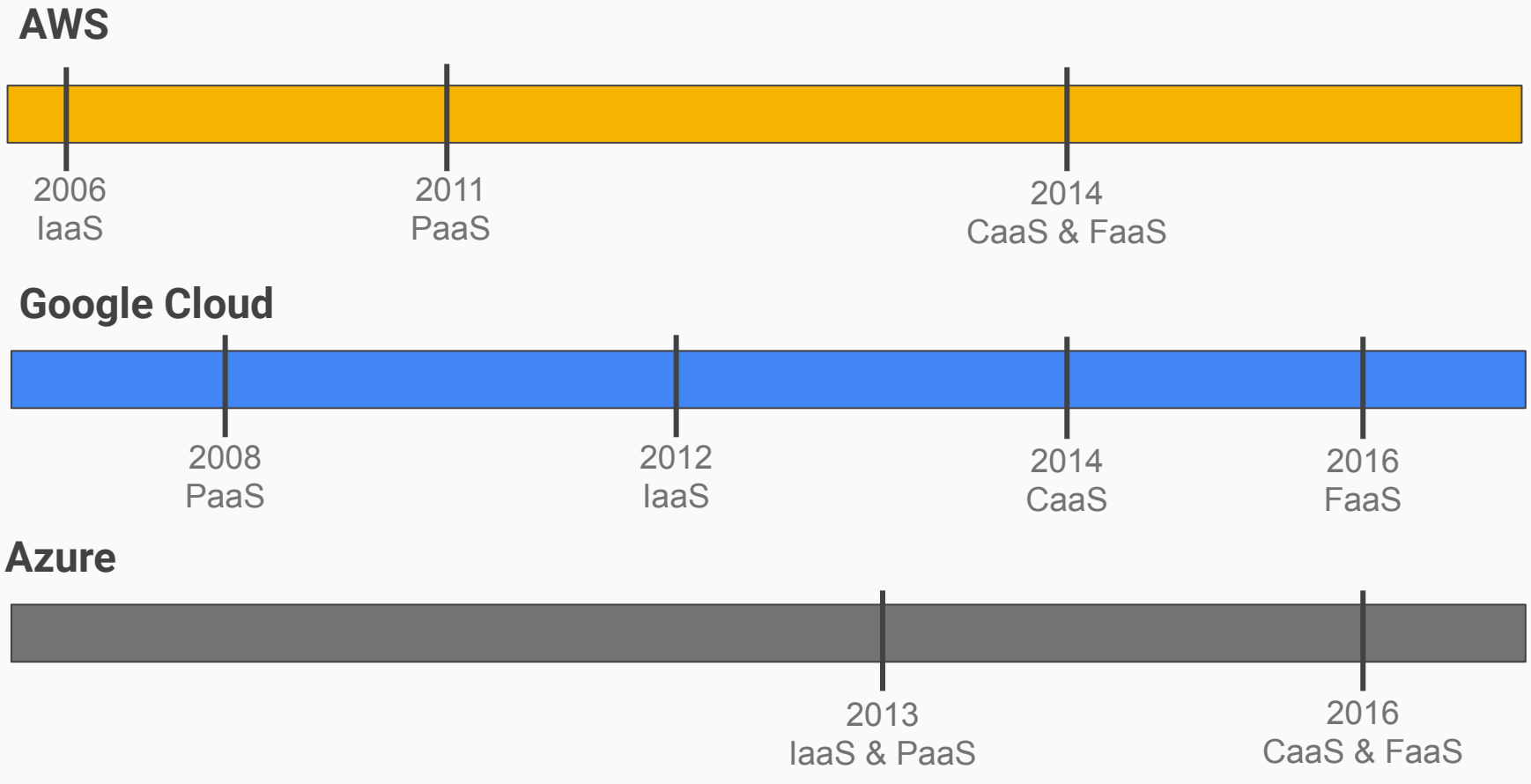
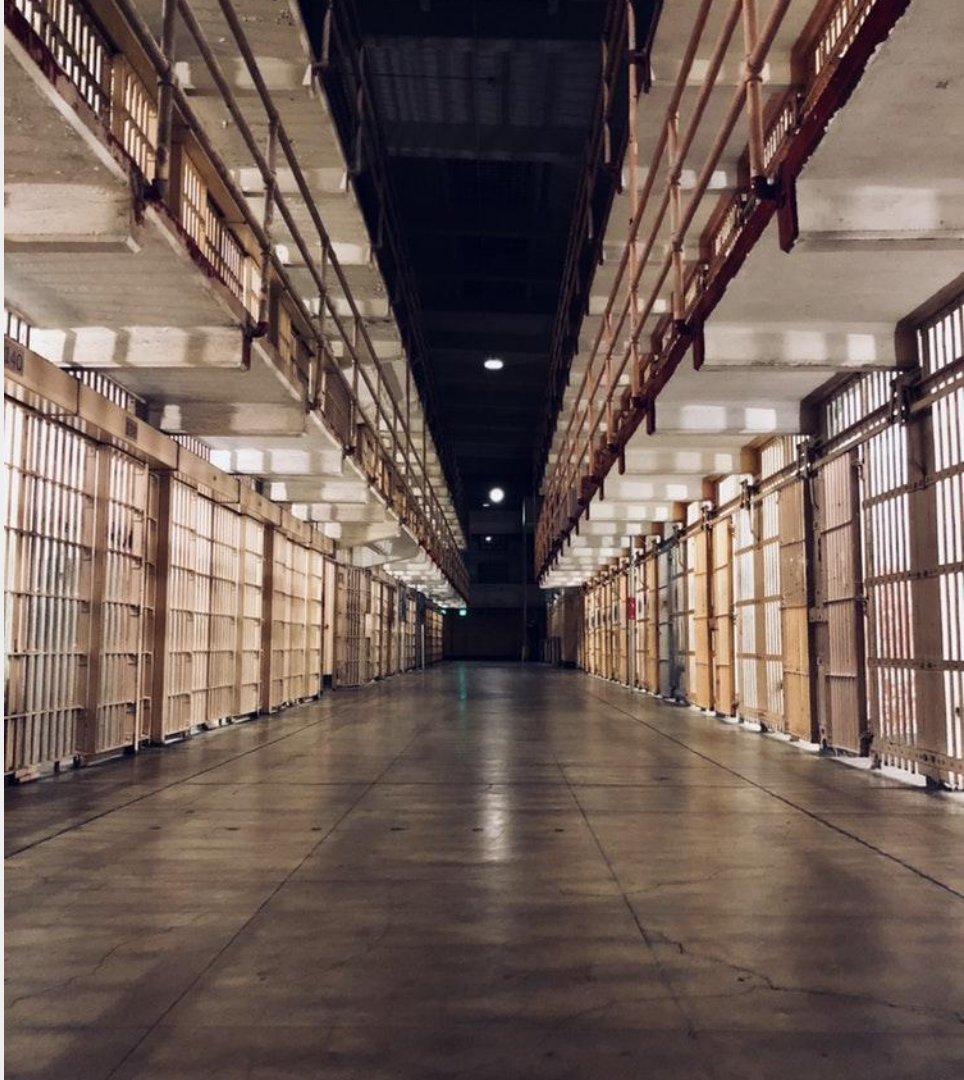


Figure 1. Magic Quadrant for Cloud Infrastructure and Platform Services



Open source software stack enables deployment on any public, private cloud or hybrid cloud



2017: AKS & EKS

2016: Kubernetes adoption by CNCF

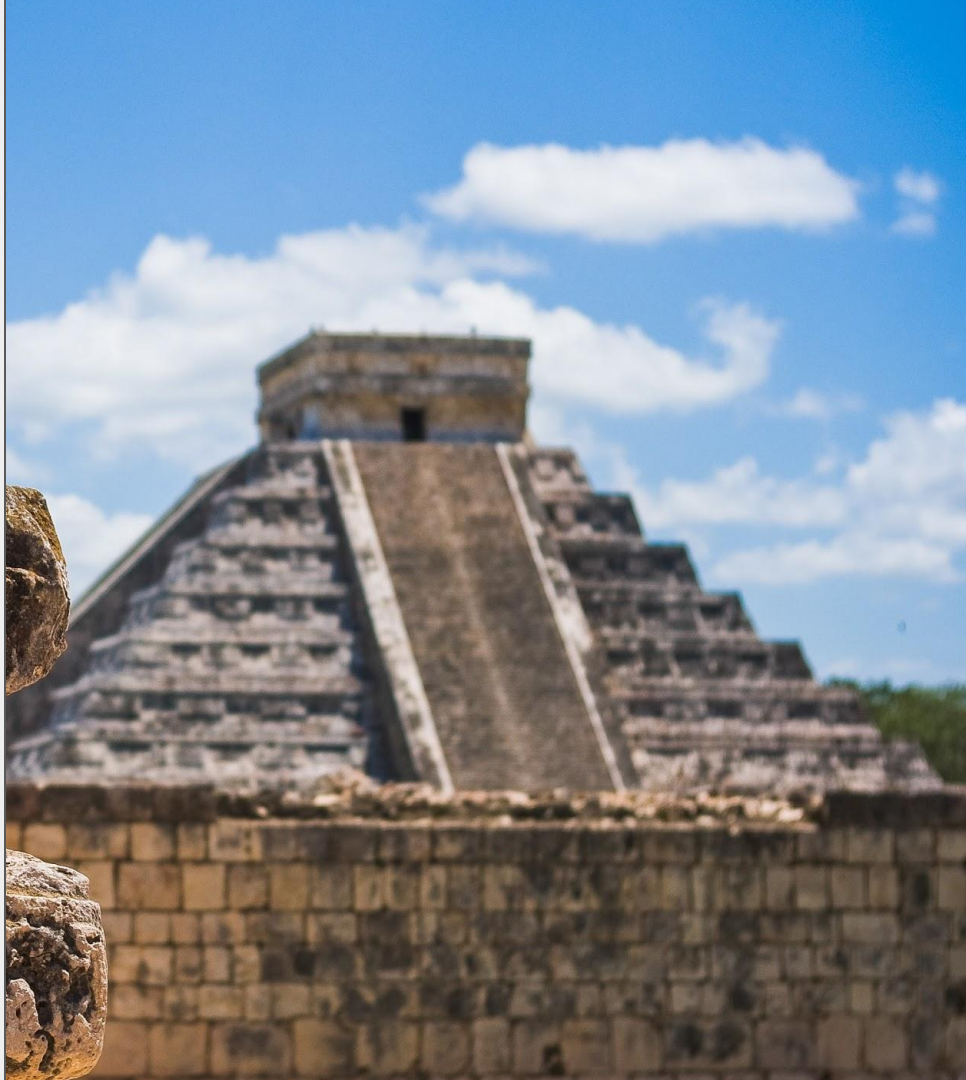
2015: GKE

2014: Kubernetes

2013: Docker

2008: LXC

2007: cgroups





#TuxTurns30

Join us in celebrating **30 years of Linux** 1991 - 2021

THE LINUX FOUNDATION

#1 CNCF



The Linux Foundation is dedicated to building sustainable ecosystems around open source projects to accelerate technology development and industry adoption.

Today the Linux Foundation is much more than Linux



Security

We are helping global privacy and security through a program to encrypt the entire internet.

Let's Encrypt



Networking

We are creating ecosystems around networking to improve agility in the evolving software-defined datacenter.

LF NETWORKING



Cloud

We are creating a portability layer for the cloud, driving de facto standards and developing the orchestration layer for all clouds.

CLOUD NATIVE COMPUTING FOUNDATION



Automotive

We are creating the platform for infotainment in the auto industry that can be expanded into instrument clusters and telematics systems.

AUTOMOTIVE GRADE LINUX



Blockchain

We are creating a permanent, secure distributed ledger that makes it easier to create cost-efficient, decentralized business networks.

HYPERLEDGER



Web

We are providing the application development framework for next generation web, mobile, serverless, and IoT applications.

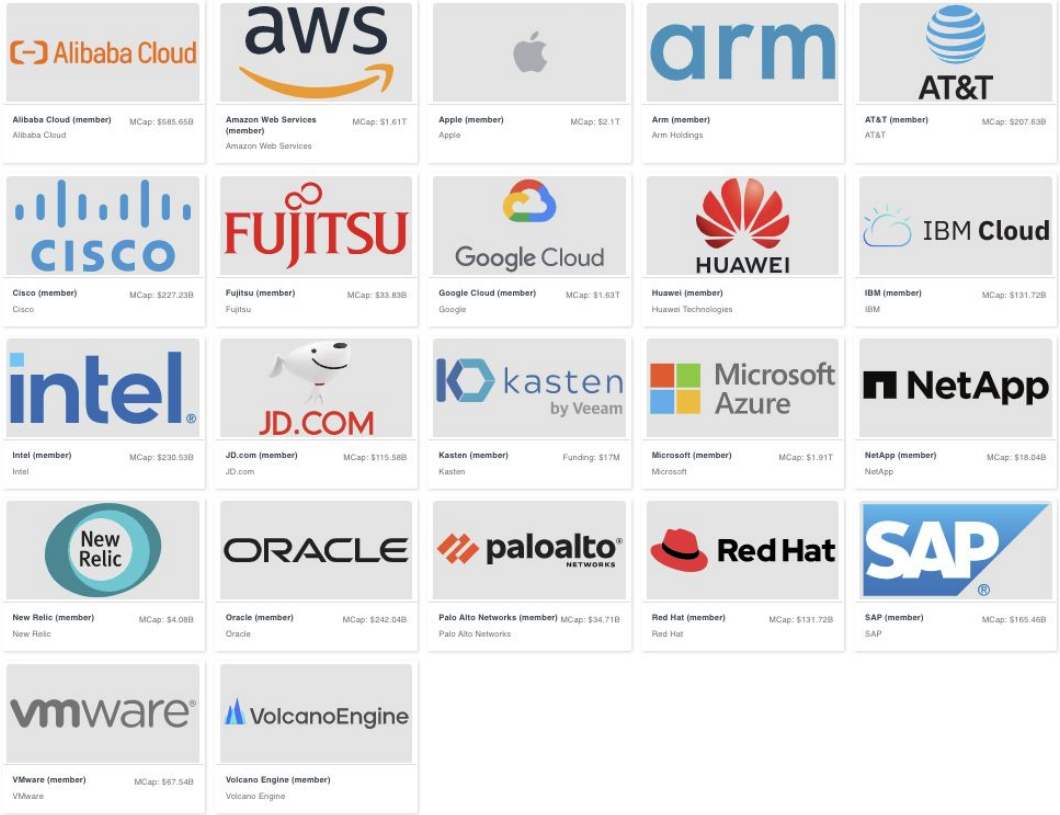
node JS



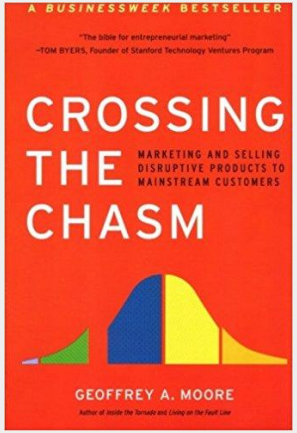
CLOUD NATIVE
COMPUTING FOUNDATION

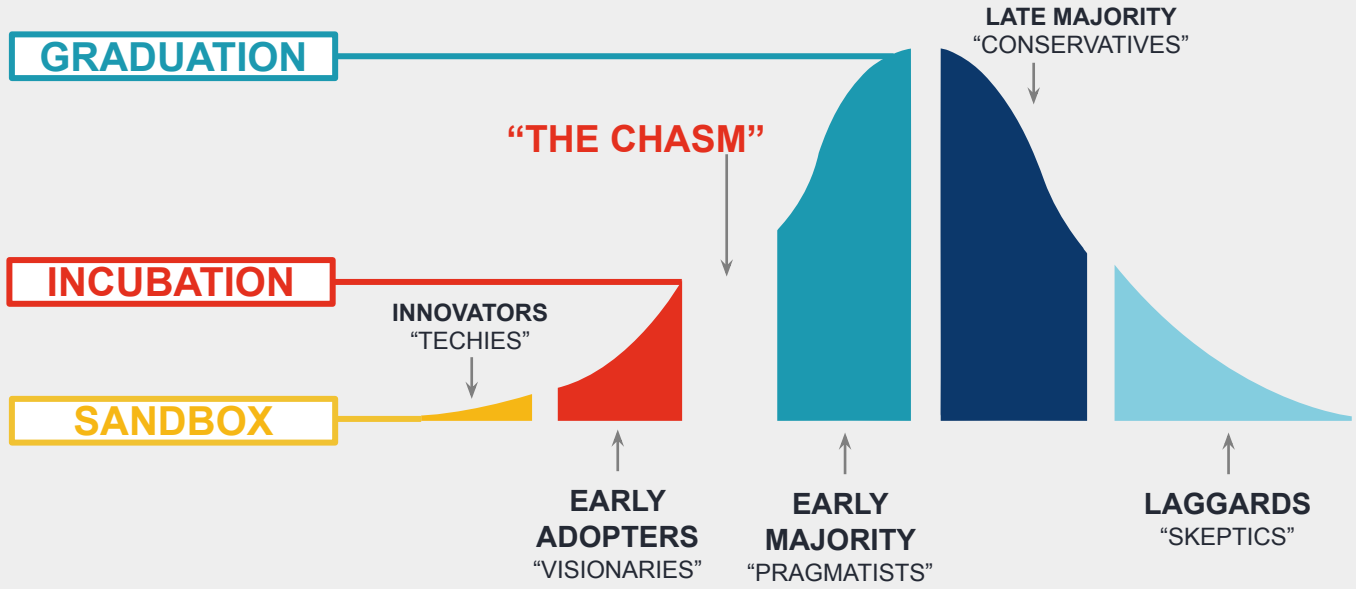
https://www.cncf.io/

22 platinum sponsors



CNCF Project Maturities





cncf / toc

Watch 128 Star 230 Fork 97

Code Issues 12 Pull requests 8 Projects 1 Insights

Branch: master toc / proposals / kubernetes.adoc Find file Copy path

rothgar Update kubernetes proposal doc 3cbb054 on 21 Mar 2017

2 contributors

45 lines (30 sloc) 3.15 KB Raw Blame History

Kubernetes Proposal

Name of project: Kubernetes

Description

Kubernetes is an open source system for managing containerized applications across multiple hosts, providing basic mechanisms for deployment, maintenance, and scaling of applications. Kubernetes will serve as a cluster manager for the CNCF ecosystem.

Sponsor / Advisor from TOC: Alexis Richardson

Unique Identifier: kubernetes

License: Apache License v2.0

Source control repositories: https://github.com/kubernetes (everything in the org)

Initial Committers: https://github.com/orgs/kubernetes/teams/kubernetes-maintainers

Sandbox

Sandbox Stage

To be accepted in the sandbox a project must

- Apply to join the sandbox using the form
- Adopt the CNCF Code of Conduct
- Adhere to CNCF IP Policy (including trademark transferred)
- List their sandbox status prominently on website/readme

See the CNCF Sandbox Guidelines v1.0 for the detailed process.

Incubating

To be accepted to incubating stage, a project must meet the sandbox stage requirements plus:

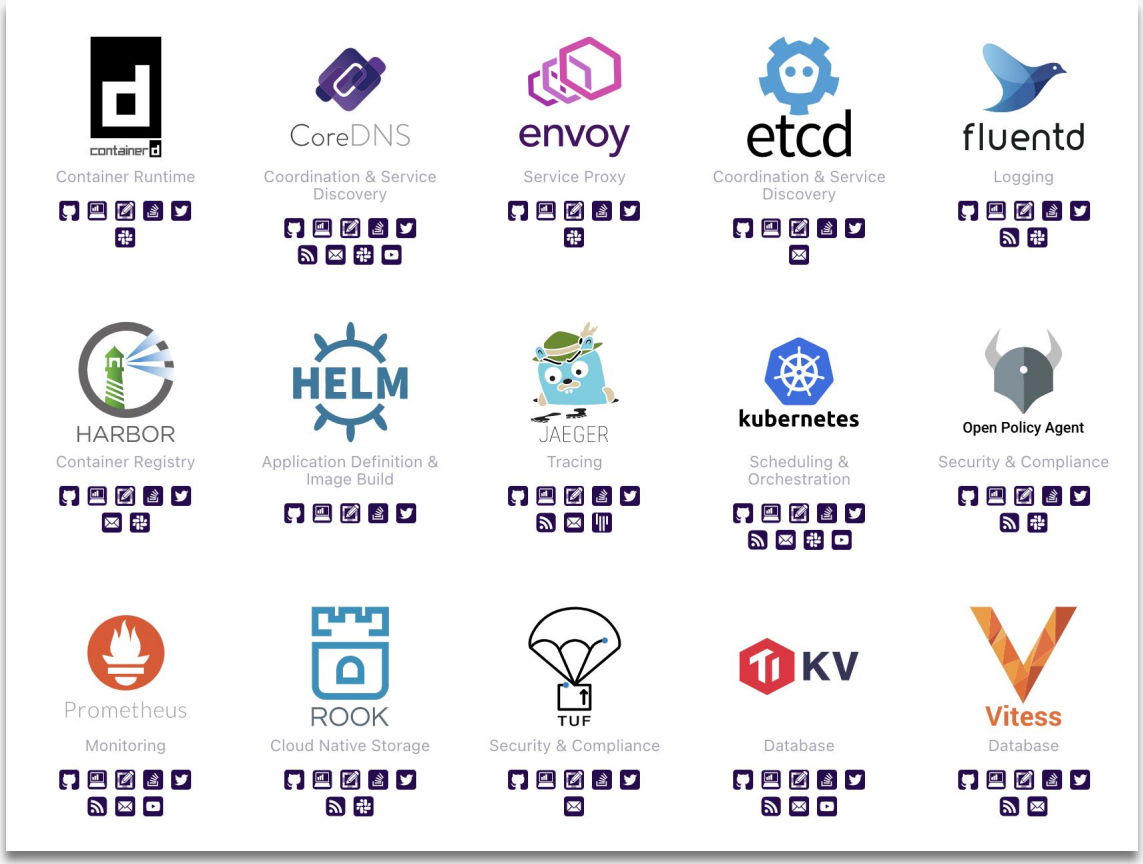
- Document that it is being used successfully in production by at least three independent end users which, in the TOC's judgement, are of adequate quality and scope. For the definition of an end user, see https://github.com/cncf/toc/blob/main/FAQ.md#what-is-the-definition-of-an-end-user
- Have a healthy number of committers. A committer is defined as someone with the commit bit; i.e., someone who can accept contributions to some or all of the project.
- Demonstrate a substantial ongoing flow of commits and merged contributions.
- Since these metrics can vary significantly depending on the type, scope and size of a project, the TOC has final judgement over the level of activity that is adequate to meet these criteria
- A clear versioning scheme.
- Clearly documented security processes explaining how to report security issues to the project, and describing how the project provides updated releases or patches to resolve security vulnerabilities
- Specifications must have at least one public reference implementation.

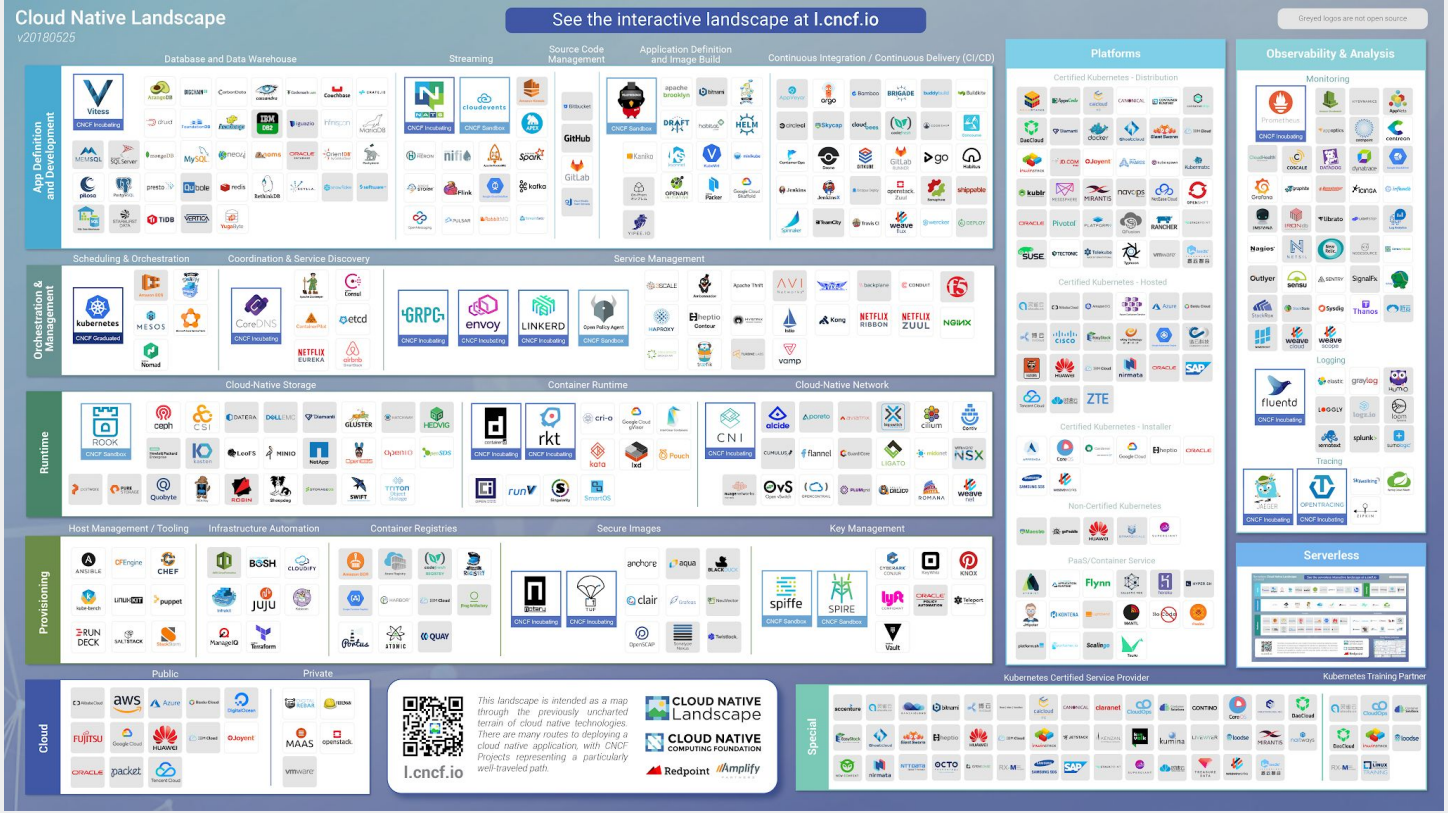
Graduated

To graduate from sandbox or incubating status, or for a new project to join as a graduated project, a project must meet the incubating stage criteria plus:

- Have committers from at least two organizations.
- Have achieved and maintained a Core Infrastructure Initiative Best Practices Badge.
- Have completed an independent and third party security audit with results published of similar scope and quality as the following example (including critical vulnerabilities addressed): https://github.com/envoyproxy/envoy#security-audit and all critical vulnerabilities need to be addressed before graduation.
- Explicitly define a project governance and committer process. This preferably is laid out in a GOVERNANCE.md file and references an OWNERS.md file showing the current and emeritus committers.
- Have a public list of project adopters for at least the primary repo (e.g., ADOPTERS.md or logos on the project website). For a specification, have a list of adopters for the implementation(s) of the spec.
- Receive a supermajority vote from the TOC to move to graduation stage. Projects can attempt to move directly from sandbox to graduation, if they can demonstrate sufficient maturity. Projects can remain in an incubating state indefinitely, but they are normally expected to graduate within two years.

Graduated


containerd
Container Runtime
CoreDNS
Coordination & Service Discovery
envoy
Service Proxy
etcd
Coordination & Service Discovery
fluentd
Logging
HARBOR
Container Registry
HELM
Application Definition & Image Build
JAEGER
Tracing
kubernetes
Scheduling & Orchestration
Open Policy Agent
Security & Compliance
Prometheus
Monitoring
ROOK
Cloud Native Storage
TUF
Security & Compliance
KV
Database
Vitess
Database


Cloud Native Landscape
v20180525
See the interactive landscape at l.cncf.io
Greyed logos are not open source
App Definition and Development
Database and Data Warehouse
Streaming
Source Code Management
Application Definition and Image Build
Continuous Integration / Continuous Delivery (CI/CD)
Orchestration & Management
Scheduling & Orchestration
Coordination & Service Discovery
Service Management
Runtime
Cloud-Native Storage
Container Runtime
Cloud-Native Network
Provisioning
Host Management / Tooling
Infrastructure Automation
Container Registries
Secure Images
Key Management
Cloud
Public
Private
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.
CLOUD NATIVE Landscape
CLOUD NATIVE COMPUTING FOUNDATION
Redpoint
Amplify
Platforms
Certified Kubernetes - Distribution
Certified Kubernetes - Hosted
Certified Kubernetes - Installer
Non-Certified Kubernetes
PaaS/Container Service
Observability & Analysis
Monitoring
Logging
Tracing
Serverless
Special
Kubernetes Certified Service Provider
Kubernetes Training Partner

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CLOUD NATIVE COMPUTING FOUNDATION

CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape (*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

B. Consulting Help

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

cncf.io/kcsp

C. Join CNCF's End User Community

For companies that don't offer cloud native services externally

cncf.io/enduser

WHAT IS CLOUD NATIVE?

Cloud-native technologies, such as containers and microservices, empower organizations to develop and deploy scalable, agile applications and services in dynamic, distributed environments. By taking into account these characteristics, such systems are designed to be resilient, elastic, and loosely coupled, via manageable abstractions and declarative APIs, thereby enabling effective, reliable automation. This allows engineers to observe the applications and to safely make impactful changes, and results in processes and workflows that fully take advantage of these environments and minimize toil.

The Cloud Native Computing Foundation seeks to drive adoption of these techniques by fostering an ecosystem of open-source, vendor-neutral projects that align with these objectives, and which are portable to public, private, and hybrid clouds. We democratize the state-of-the-art patterns and practices to ensure innovations remain open and accessible for everyone.

l.cncf.io

v20180604

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





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

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*
- Helm Charts help you define, install, and upgrade even the most complex Kubernetes application



kubernetes — CNCF Graduated

HELM — CNCF Incubating

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

Prometheus — CNCF Incubating

fluentd — CNCF Incubating

OPENTRACING — CNCF Incubating

JAEGER — CNCF Incubating



5. SERVICE MESH AND DISCOVERY

- 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



envoy — CNCF Incubating

CoreDNS — CNCF Incubating

LINKERD — CNCF Incubating

6. NETWORKING

To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net.



CNI — CNCF Incubating

7. DISTRIBUTED DATABASE

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.

Vitess — CNCF Incubating



8. MESSAGING

When you need higher performance than JSON-REST, consider using gRPC. NATS is publish/subscribe message-oriented middleware.

gRPC — CNCF Incubating

NATS — CNCF Incubating

9. CONTAINER RUNTIME

You can use alternative container runtimes. The most common, all of which are OCI-compliant, are containerd, rkt and CRI-O.



containerd — CNCF Incubating

rkt — CNCF Incubating

10. SOFTWARE DISTRIBUTION

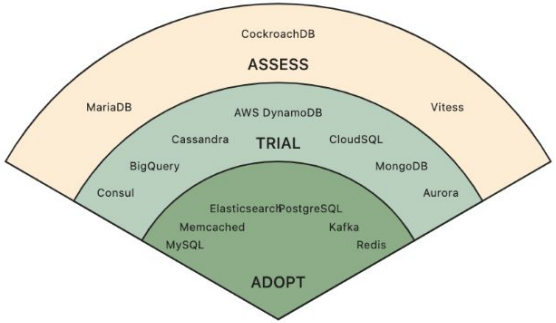
If you need to do secure software distribution, evaluate Notary, an implementation of The Update Framework.

Notary — CNCF Incubating

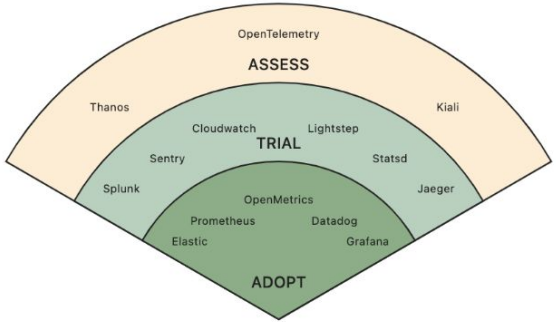
TUF — CNCF Incubating

CNCF Radars

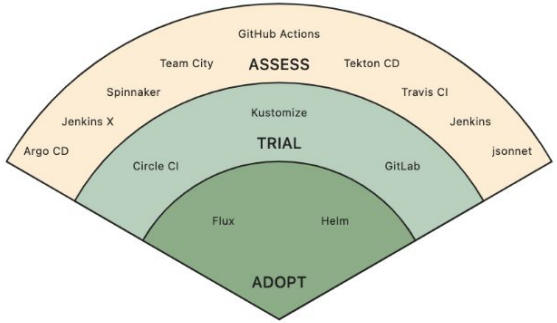
Other Radars



Database Storage, November 2020



Observability, September 2020



Continuous Delivery, June 2020

Source: https://radar.cncf.io/

We are a community of doers who enable open source projects, including Kubernetes, Prometheus, Envoy, and many others.

Kubernetes and other CNCF projects have quickly gained adoption and secured diverse community support, becoming some of the highest velocity projects in the history of open source.



127K+

# of contributors to CNCF projects



656

CNCF Members



141

Certified Kubernetes Distributions & Platforms



163K+

CNCF Meetup members

ANNOUNCEMENTS

Cloud Native Computing Foundation Receives Renewed $3 Million Cloud Credit Grant from Google Cloud

Posted on December 17, 2020

Google's donation will help further the technical maturity and stability of the Kubernetes project

SAN FRANCISCO, Calif. – December 17, 2020 – The Cloud Native Computing Foundation® (CNCF®), which builds sustainable ecosystems for cloud native software, today announced that Google Cloud has recommitted $3 million for another year in cloud credits to maintain its support of the Kubernetes project. This donation will support the management of the project's technical operations, ensuring the continued growth and stability of Kubernetes and the open source community surrounding the project.

Source: https://cloud.google.com/open-cloud/

FinOps



CLOUD COMPUTING > PERFORMANCE MANAGEMENT

FinOps Foundation Brings New Focus to Cloud Costs

The FinOps Foundation is joining the Linux Foundation to accelerate its efforts to bring the costs of the cloud in line with financial accounting within companies.

Sean Michael Kerner | Jun 30, 2020

#2 Open Source

RANK	COMPANY	ACTIVE CONTRIBUTORS	TOTAL COMMUNITY
1 ^1	Google	**5709** +1252	11361 +1797
2 v1	Microsoft	**5051** +192	10095 +567
3	Red Hat	**3127** +361	5003 +561
4	IBM	**2382** +274	5039 +549
5	Intel	**2233** +154	5175 +126
6 ^1	Amazon	**1231** +381	3145 +968
7 v1	Facebook	**1203** +89	3411 +436
8 ^2	GitHub	**987** +324	2356 +677

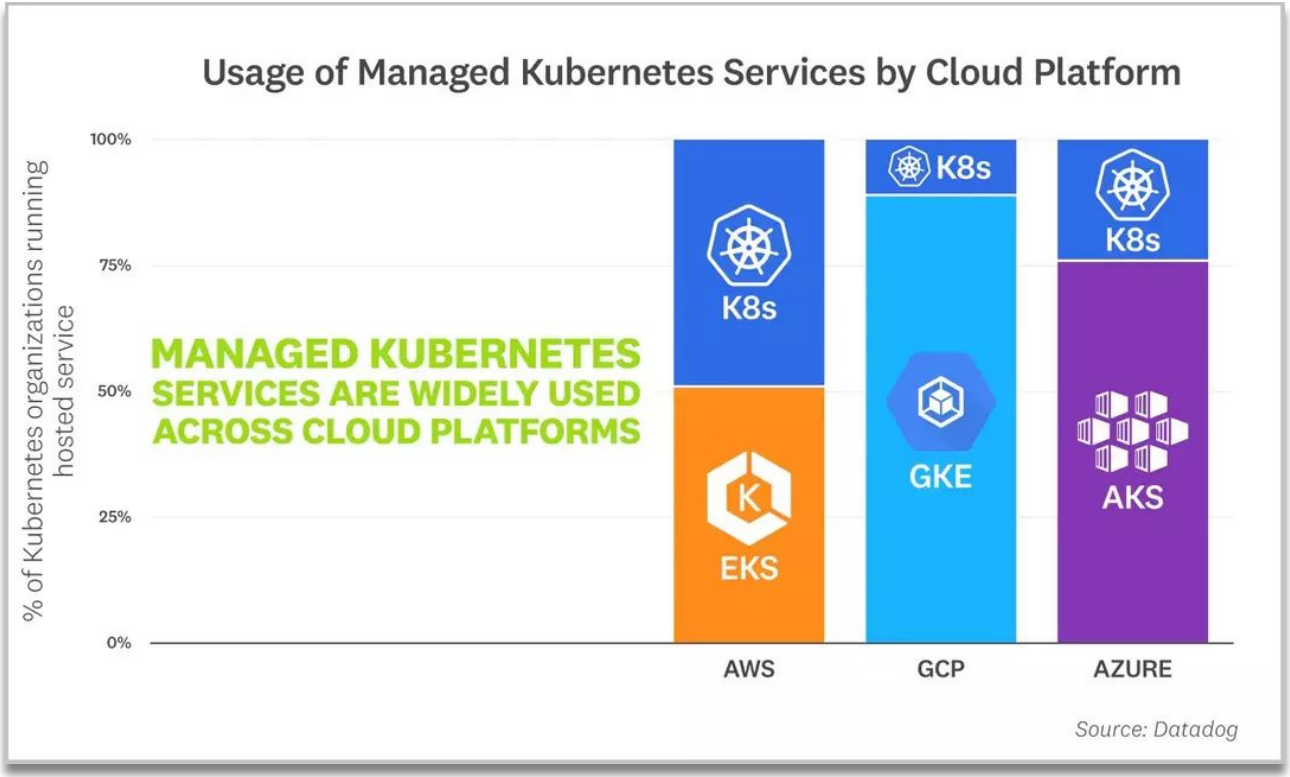
Source: https://opensourceindex.io/ for 2020

Kubernetes adoption



AWS AZURE GCP

Kubernetes usage



https://www.datadoghq.com/container-report/

Open Source Stack: Big success



















The Initial Preview of GUI app support is now available for the Windows Subsystem for Linux



Craig

April 21st, 2021

A year ago at BUILD 2020 we introduced our goal to bring Linux GUI applications to the Windows Subsystem for Linux (WSL) to run Linux GUI applications. We are proud to announce the first preview of this highly anticipated and open source feature! We've given this feature the nickname: "WSLg". Please check out the video below or keep reading to see what you can use this feature for, how it works, and how to install it.

Partner Ecosystem: Azure



Source: https://azure.microsoft.com/en-us/overview/open-source/

Partner Ecosystem: Google Cloud

Embraces partner ecosystem

Open cloud embraces its partner ecosystem rather than competing against it. With that in mind, we offer managed open source services operated by our partners that are tightly integrated into Google Cloud, providing a seamless user experience across management, billing, and support. This makes it easier for our enterprise customers to build on open source technologies.



Source: https://cloud.google.com/open-cloud/

Partner Ecosystem: AWS



Partnering with open source leaders

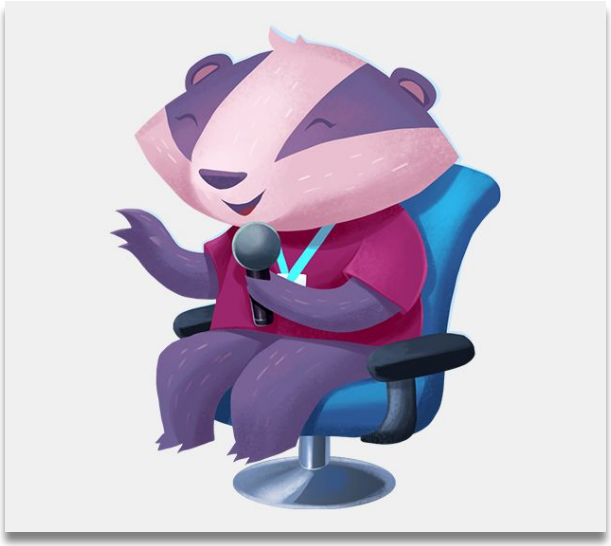
One important way we contribute to open source is by helping to enable the success of open source partners. We partner closely with leading open source companies – from Hashicorp to MongoDB to Confluent to Red Hat – and help them exceed customer expectations. We also support foundations such as the Cloud Native Computing Foundation and Apache Software Foundation to sustain and accelerate open source innovation.

Source: https://aws.amazon.com/fr/opensource/

#3 Community


EXIT

Azure Heroes / MVP & Meetups



Meetups: 157+

MVP (Cloud) : 220+

Azure Heroes Badgers: 6000+

Source: https://mvp.microsoft.com/fr-FR/
https://www.azureheroes.community/map
https://www.meetup.com/fr-FR/pro/azuretechgroups/

GDE & GDG



Cloud Meetups: 175+
(GDGs: 400+)

GDE : 143+

Source: https://developers.google.com/community
https://www.meetup.com/fr-FR/pro/gdg/

AWS Heroes & Meetups



Meetups: 400+

AWS Heroes: 220+

Source: https://aws.amazon.com/developer/community/

CNCF Ambassadors & Meetups



Meetups: 195+
(54 countries)

CNAs: 126+

Source: https://www.cncf.io/people/ambassadors/
https://www.meetup.com/fr-FR/pro/cncf/

Main Events

AWS re:Invent

NEXT Google Cloud



KubeCon | CloudNativeCon

#Case study

Kubernetes & Google Cloud

Kubernetes Success

- Google Cloud starts with a PaaS AppEngine
- Containerization becomes popular
- Kubernetes is the biggest player in the container ecosystem
- ...and it's created by Google







Rank	Company	Number
1	Google	14568
2	VMware Inc.	4722
3	Microsoft Corporation	4616
4	Independent	2734
5	Red Hat	2542
6	IBM	1214
7	Intel	1071
8	Kubermatic	825
9	Sematext	809
10	Alibaba	724
11	Mattermost Inc.	721
12	SUSE LLC	719
13	Amazon	647
14	TUNE	562
15	Apple	535

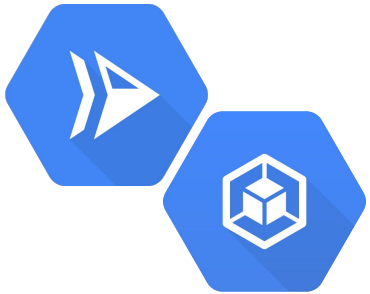
Source: https://k8s.devstats.cncf.io/d/9/companies-table?orgId=1&var-period_name=Last%20year&var-metric=commits

🚀 Cloud Run Success



Cloud Run

Fully managed, deploy your workloads and don't see the cluster.



Cloud Run on Anthos

Deploy into Anthos, run serverless side-by-side with your existing workloads.



Knative Everywhere

Use the same APIs and tooling anywhere you run Kubernetes with Knative.

#Case study

AWS & Open Distro for ElasticSearch

💸 Open Source Monetization

- Redis with Redis Labs
- MongoDB with MongoDB Inc
- ElasticSearch with Elastic
- Kafka with Confluent
- ...

2018 👉 sudden changes to their licenses with the adoption of SSPL



📝 Mongo

Why did you base the SSPL on GPL v3 instead of AGPL?

The AGPL is a modified version of GPL v3. The only additional requirement of AGPL is in section 13: if you run a modified program on a server and let other users communicate with it there, you must open source the source code corresponding to your modified version, known as the "Remote Network Interaction" provision of AGPL.

There is some confusion in the marketplace about the trigger and scope of the Remote Network Interaction provision of AGPL.

As a result, we decided to base the SSPL on GPL v3 and to add a new section 13 which clearly and explicitly sets forth the conditions to offering the licensed program as a third-party service.

🤔 AWS & Open Source

“Monetizing open source was always the big challenge for open source vendors, and more so in the cloud era,”

-- Ofer Bengal, CEO at Redis Labs

“But running an open source project isn’t as simple as throwing some code over the wall and putting up a web page, as AWS has done. It’s about things like shepherding and supporting the community, encouraging committers, and having momentum on a compelling vision.”

-- Raj Dutt, CEO at Grafana Labs



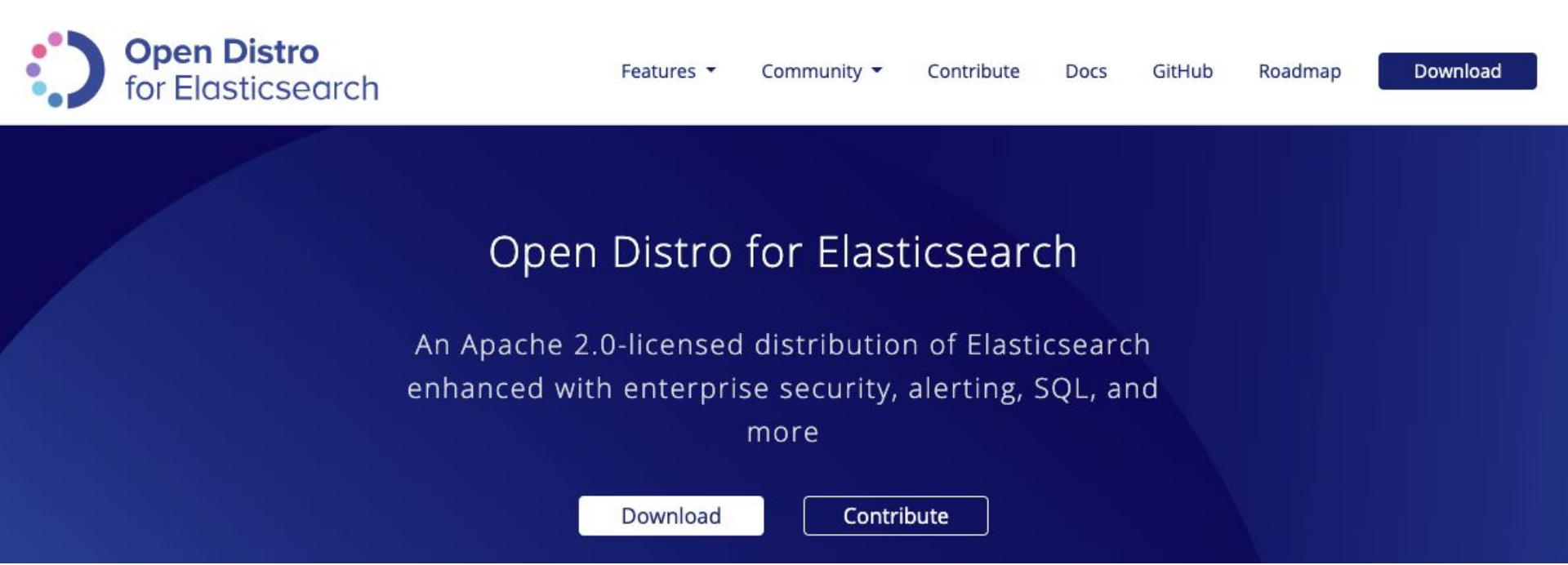
💬 Reactions

Red Hat drops MongoDB over concerns related to its Server Side Public License (SSPL)

> To consider the SSPL to be “Free” or “Open Source” causes that shadow to be cast across all other licenses in the FOSS ecosystem, even though none of them carry that risk
>
> — Fedora

> The SSPL is clearly not in the spirit of the DFSG (Debian’s free software guidelines), let alone complimentary to the Debian’s goals of promoting software or user freedom”
>
> — Debian

Source:
https://hub.packtpub.com/red-hat-drops-mongodb-over-concerns-related-to-its-server-side-public-license-sspl/



Source: https://opendistro.github.io/for-elasticsearch/

#Case study

Multi Cloud

☁️ Kubernetes-based hybrid-cloud solutions



- Avoid vendor lock-in
- Deploy in any cloud
- Blur the traditional lines between cloud and on-prem environments
- Now manage on-prem and cloud clusters
- Need more observability, consistency and interoperability 👉 **Open Source**



Anthos





Amazon EKS Distro

Download and build Kubernetes clusters with your own tooling



Self-managed resources

Bare metal, virtual machines, or Amazon EC2 instances



Run Kubernetes apps

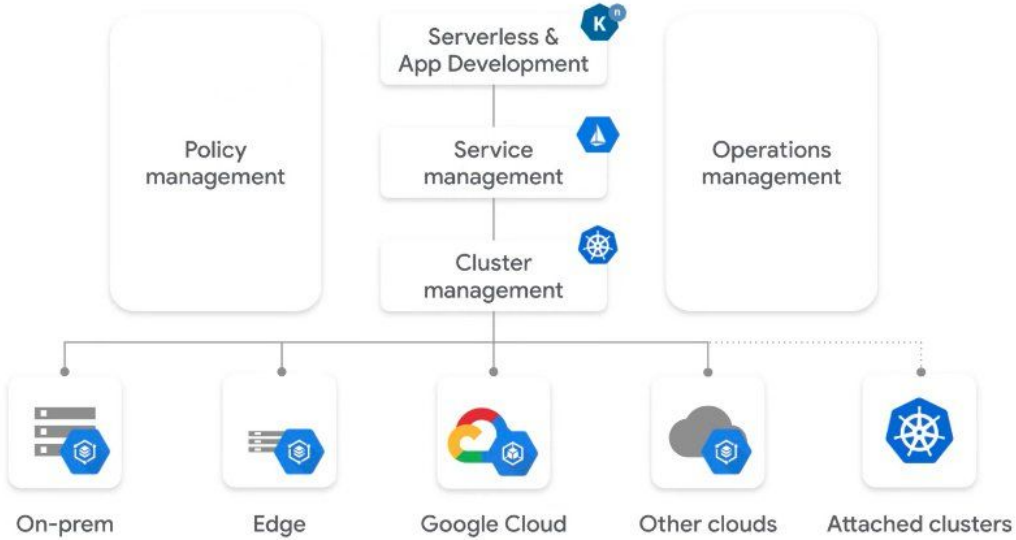


Amazon EKS dashboard in the AWS console

View and explore running Kubernetes apps


SHOP
ZÜRICH

Kubernetes as a tech foundation for Anthos



Test it!

Anthos Developer Sandbox

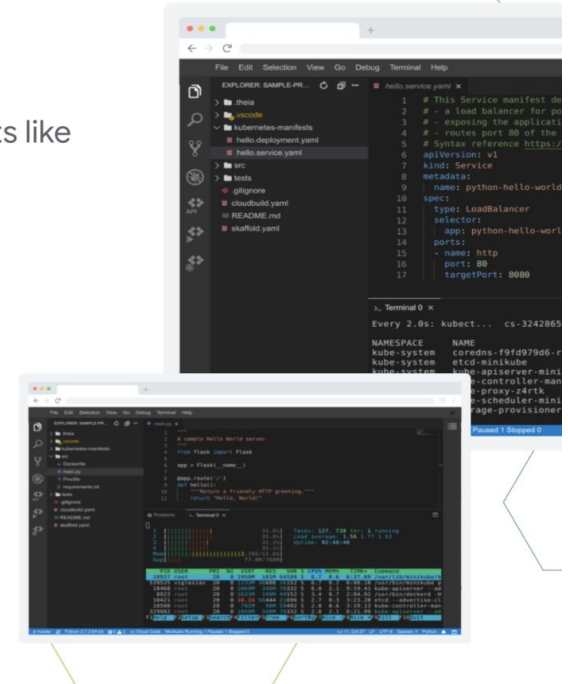
A cloud-based development environment that helps you learn what its like to develop on Anthos.

What's in the box?

- ✓ **Cloud Shell** - a computing environment with the best of Google Cloud Platform tooling pre-installed.
- ✓ **Cloud Code** - an IDE extension that helps you write, run, and debug cloud-native applications quickly and easily.
- ✓ **Minikube** - a tool that makes it easy to run a single-node Kubernetes cluster in Cloud Shell.
- ✓ **Cloud Build Local Builder** - a tool for running your continuous integration process locally.

Get started now

Open in Google Cloud Shell



Source: https://anthos-sandbox.dev/

#What’s next?



Bet on Open Source Serverless products





#Diversity+Inclusion

Prioritizing inclusion—our commitment to building healthy open source communities >

May 4, 2021



By Emma Irwin, Senior Program Manager, Microsoft Open Source Programs Office (OSPO).

Microsoft products and services run on trust, an extension of our commitment to building healthy open source communities....Read more

TRAINING COURSE

Inclusive Speaker Orientation (LFC101)

Created in collaboration with the National Center for Women & Information Technology (NCWIT), this free orientation course is designed to provide you with essential background knowledge and practical skills to promote inclusivity in presentations, messaging and other communications.



$0

Login Using My Portal Before Enrolling

Enroll Today

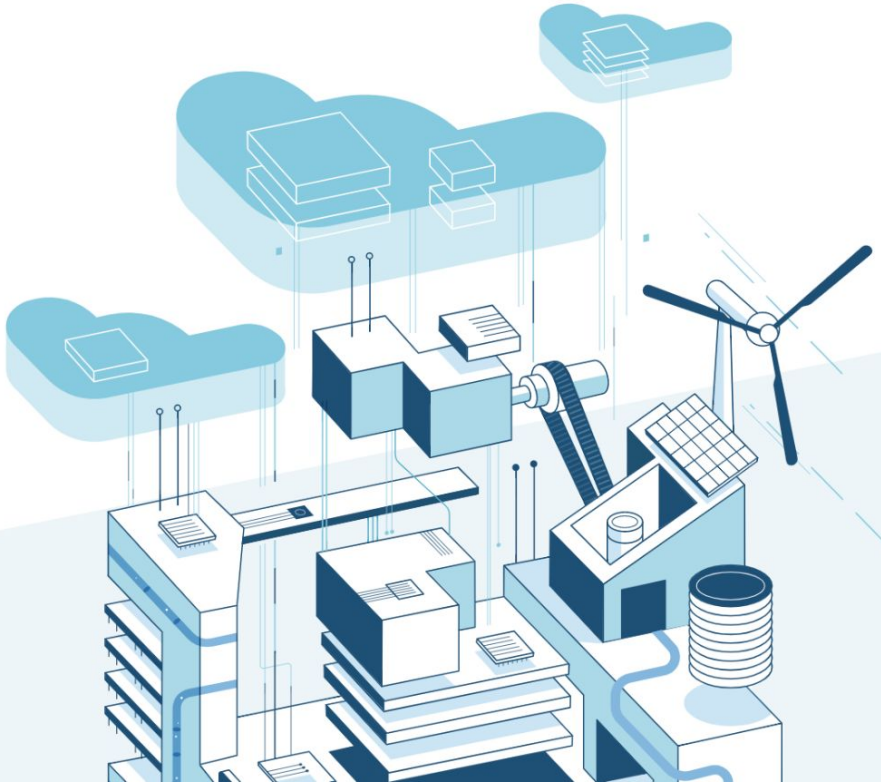
Get a Quote



#Sustainability

Sustainability in the Cloud

Amazon Web Services (AWS) is committed to running our business in the most environmentally friendly way possible and achieving 100% renewable energy usage for our global infrastructure.



Evolving beyond an operational approach

Sustainability is often viewed from an operational point of view, with the environmental mission treated as a cost center in the business, as a risk or compliance to be managed. But for Azure, datacenters and sustainable cloud infrastructure are more than just business—they provide an incredible opportunity to give back to the communities where we operate.

Azure has committed to focus on **four key areas of environmental impact to local communities—carbon, water, waste, and ecosystems**.

100%

renewable energy by 2025

Water positive by 2030

replenish more water than we consume by 2030

Zero-waste

certification by 2030

Net-zero

deforestation from new construction

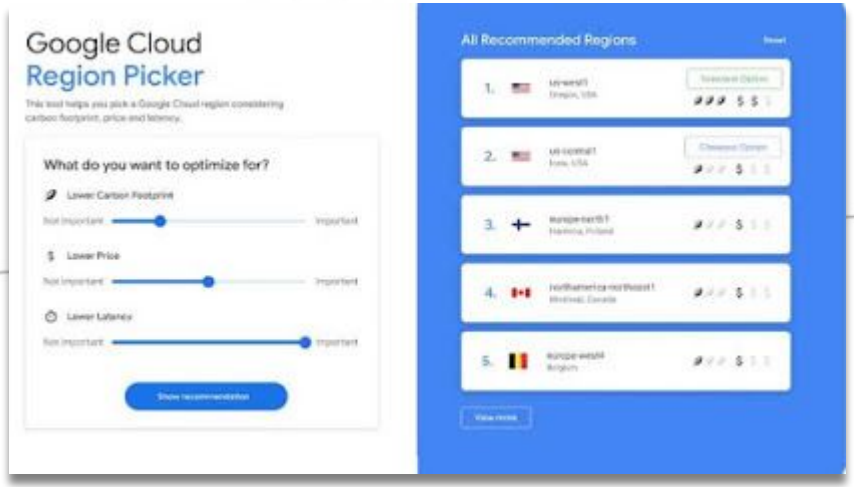
Carbon Neutrality

(Offsetting emissions)



100% Renewable Energy

(Reducing emissions)



24/7 Carbon-free Energy

(Eliminating emissions)



Since 2007

Google has purchased enou
high-quality carbon offsets and
renewable energy to bring our net
operational emissions to zero.

Since 2017

electricity use with wind and solar purchases.
However, our facilities still rely on carbon-
based power in some places and times.

By 2030

gle will match our operational
electricity use with nearby (on the same
regional grid) carbon-free energy sources
in every hour of every year.

https://googlecloudplatform.github.io/region-picker/

Thanks!



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