Rise of Kubernetes and CNCF

Chris Aniszczyk, CTO/COO, CNCF.io (@cra)
https://aniszczyk.org

CLOUD NATIVE
COMPUTING FOUNDATION

Hi, I'm Chris Aniszczyk (@cra)

› CTO/COO, Cloud Native Computing Foundation (CNCF)

› Executive Director, Open Container Initiative (OCI)

› VP, Developer Relations, Linux Foundation (LF)

› https://twitter.com/cra

› In a previous life…
> › Director of Open Source (@Twitter) / Sr. Eng Manager
> › Co-Founder of the TODO Group
> › Co-Founder of EclipseSource (via Code9)
> › Open Source Committer (Gentoo, Fedora)
> › Principal Software Engineer, Red Hat
> › Senior Software Engineer, IBM
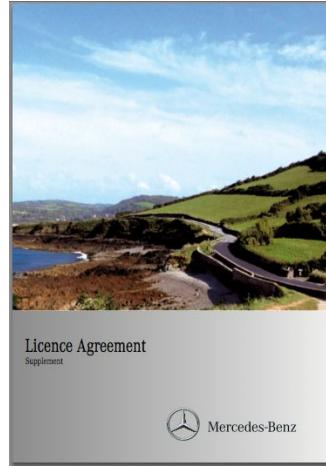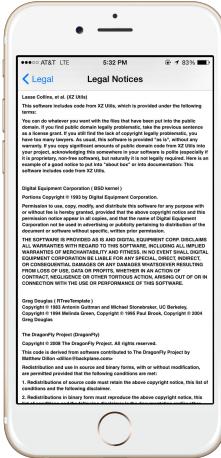
Open Source is Eating the World!

› "**78% of companies are using open source**… 63% are participating… " (https://www.blackducksoftware.com/future-of-open-source)

iOS: General->About->Legal->Legal Notices

http://www4.mercedes-benz.com/manual-cars/ba/foss/content/en/assets/FOSS_licences.pdf

https://www.tesla.com/blog/all-our-patent-are-belong-you

Open Source: Not for Charity, Good for Business!
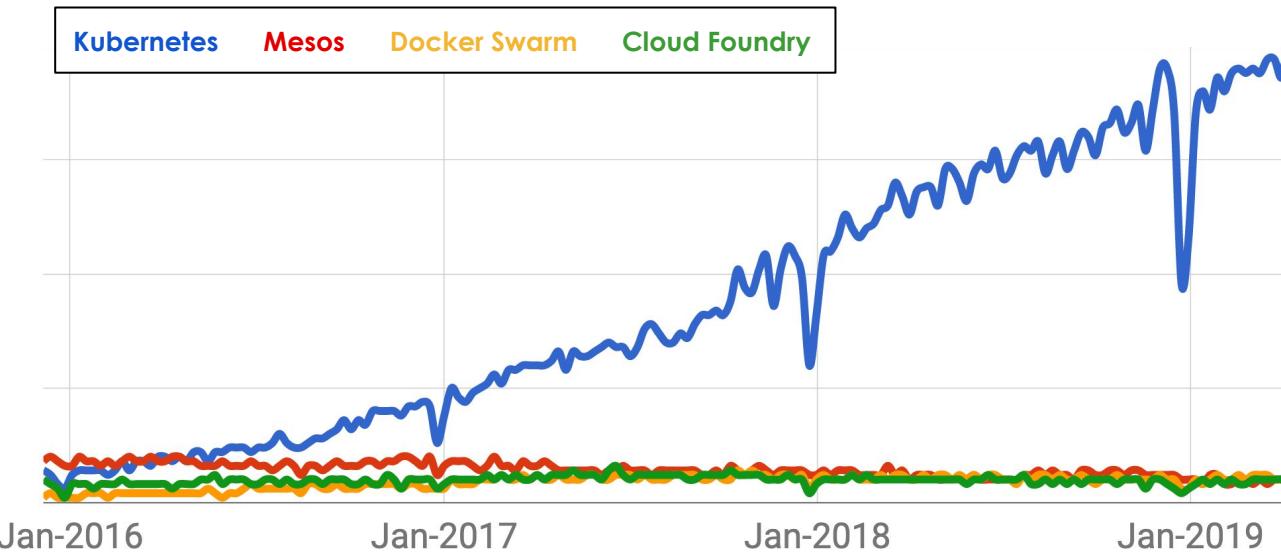
› "...**achieved at least a 200% return on investment in its open source** software efforts"

  › https://blogs.worldbank.org/opendata/leveraging-open-source-public-institution-new-analysis-reveals-significant-returns-investment-open

› "All of these outcomes help to increase productivity and competitiveness at the national level. In aggregate, these results show that changes in government technology policy that favor OSS can have a positive impact on both global social value and domestic national competitiveness."

  › https://hbswk.hbs.edu/item/government-technology-policy-social-value-and-national-competitiveness

› "Data on firm contributions to open source software (OSS), an important crowdsourced public good, is used to test the theoretical predictions. Using matching and panel data methods to help address endogeneity concerns, this **study shows that contributing firms capture up to 100% more productive value from usage of OSS than their free-riding peers**."

  › https://www.hbs.edu/faculty/Pages/item.aspx?num=54809

My life has been crazy the last four years...

Kubernetes   **Mesos**   **Docker Swarm**   **Cloud Foundry**

Jan-2016   Jan-2017   Jan-2018   Jan-2019

YOU FOUGHT IN THE CONTAINER WARS?

YES. I WAS ONCE A DEVELOPER, THE SAME AS YOUR FATHER

imgflip.com

Drew Petersen
@KirbySaysHi   Follow

Regarding the Docker/Rocket stuff
5:26 PM - 2 Dec 2014
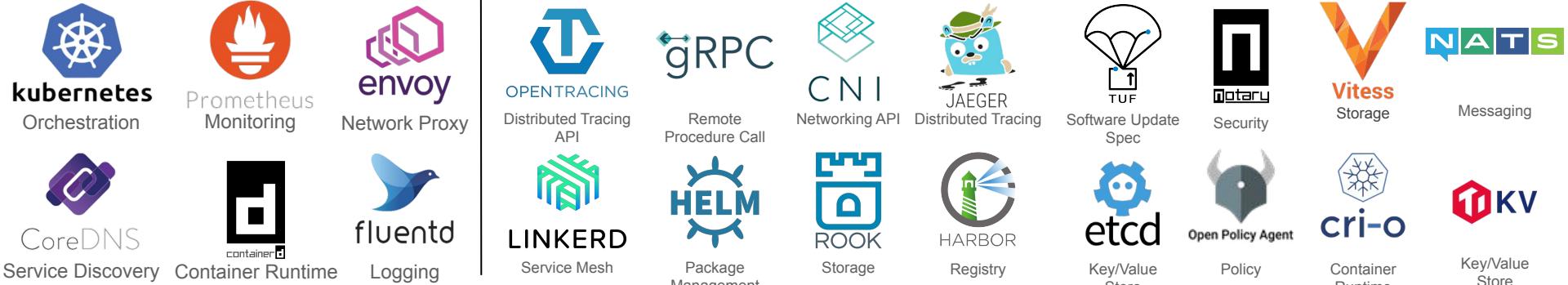
85   46

Cloud Native Computing Foundation (CNCF)

- **Nonprofit, part of the Linux Foundation**; founded Dec 2015

Graduated   **Incubating**

kubernetes	Prometheus	envoy	OPENTRACING	gRPC	C N I	JAEGER	TUF	Notary	Vitess	NATS
Orchestration	Monitoring	Network Proxy	Distributed Tracing API	Remote Procedure Call	Networking API	Distributed Tracing	Software Update Spec	Security	Storage	Messaging

CoreDNS	containerd	fluentd	LINKERD	HELM	ROOK	HARBOR	etcd	Open Policy Agent	cri-o	KV
Service Discovery	Container Runtime	Logging	Service Mesh	Package Management	Storage	Registry	Key/Value Store	Policy	Container Runtime	Key/Value Store

- Platinum members:

Alibaba Cloud · aws · Apple · CISCO · DELL Technologies · FUJITSU · Google Cloud · HUAWEI · IBM Cloud

intel · JD.COM · Microsoft Azure · ORACLE · Pivotal · Red Hat · SAMSUNG / SAMSUNG SDS · SAP · vmware

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

#1 SSL provider in the world

Networking

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

LF NETWORKING

Support from carriers handling 70% of mobile subscribers

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

Every relevant public cloud provider now supports Kubernetes

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

Support from OEMs covering 50% of global auto shipments

Blockchain

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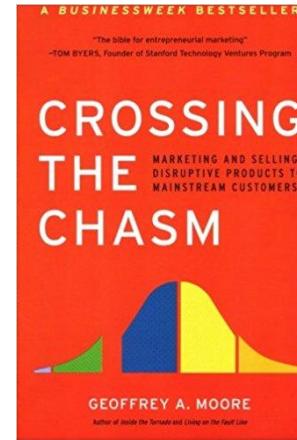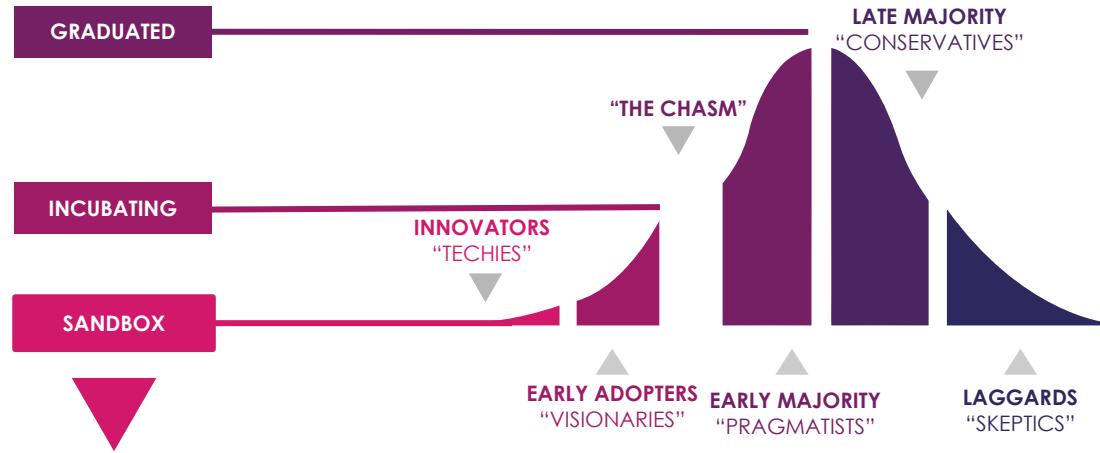
HYPERLEDGER

50% of the Fortune Top 50 enterprise blockchain deployments use Hyperledger

Web

Node.js and other projects are the application development framework for next generation web, mobile, serverless, and IoT applications.

GraphQL

OpenJS Foundation

Node.js packages are downloaded over 1 billion times per day

CNCF Project Maturities
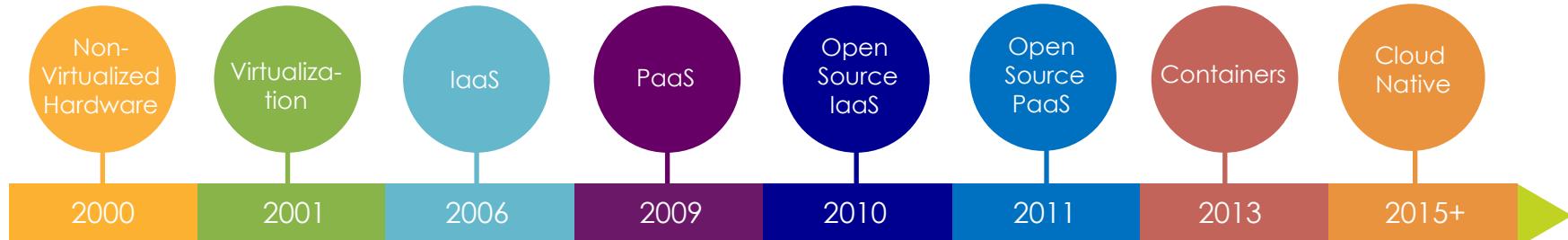
GRADUATED

INCUBATING

SANDBOX

LATE MAJORITY
"CONSERVATIVES"

"THE CHASM"

INNOVATORS
"TECHIES"

EARLY ADOPTERS
"VISIONARIES"

EARLY MAJORITY
"PRAGMATISTS"

LAGGARDS
"SKEPTICS"

A BUSINESSWEEK BESTSELLER

"The bible for entrepreneurial marketing"
–TOM BYERS, Founder of Stanford Technology Ventures Program

CROSSING THE CHASM

MARKETING AND SELLING DISRUPTIVE PRODUCTS TO MAINSTREAM CUSTOMERS

GEOFFREY A. MOORE

Author of *Inside the Tornado* and *Living on the Fault Line*

SANDBOX

spiffe	SPIRE	cloudevents	TELEPRESENCE	OPENMETRICS	cortex	Buildpacks.io	Falco	Dragonfly	Virtual Kubelet
Identity Spec	Identity	Serverless	Tooling	Metrics Spec	Monitoring	Packaging Spec	Container Security	Image Distribution	Nodeless
KubeEdge	BRIGADE	Network Service Mesh	OpenTelemetry	OpenEBS	Thanos	flux	STRIMZI	in-toto	KubeVirt
Edge	Scripting	Networking	Telemetry Spec	Storage	Monitoring	GitOps	Kafka Operator	Security	VM Operator

|

From Virtualization to Cloud Native

CLOUD NATIVE COMPUTING FOUNDATION

kubernetes

- Cloud native computing uses an open source software stack to:
  - segment applications into *microservices*,
  - package each part into its own *container*
  - and dynamically *orchestrate* those containers to optimize resource utilization

Non-Virtualized Hardware	Virtualiza-tion	IaaS	PaaS	Open Source IaaS	Open Source PaaS	Containers	Cloud Native
2000	2001	2006	2009	2010	2011	2013	2015+

Sun microsystems vmware aws HEROKU openstack CLOUD FOUNDRY docker CLOUD NATIVE COMPUTING FOUNDATION

Cloud Native Trail Map

Trail Map: l.cncf.io

CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape l.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 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

v20190821

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 Graduated
fluentd — CNCF Graduated
OPENTRACING — CNCF Incubating
JAEGER — CNCF Incubating

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

envoy — CNCF Graduated
CoreDNS — CNCF Graduated
LINKERD — CNCF Incubating

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.

CNI — CNCF Incubating
Open Policy Agent — CNCF Incubating

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.

Vitess — CNCF Incubating
ROOK — CNCF Incubating
etcd — CNCF Incubating
TiKV — CNCF Incubating

8. STREAMING & MESSAGING
When you need higher performance than JSON-REST, 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.

gRPC — CNCF Incubating
NATS — CNCF Incubating

9. CONTAINER REGISTRY & RUNTIME
Harbor is a registry that stores, signs, and scans content. You can use alternative container runtimes. The most common, both of which are OCI-compliant, are containerd and CRI-O.

containerd — CNCF Graduated
HARBOR — CNCF Incubating
cri-o — 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

2019-09-09T16:47:14Z f16e508

Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io

App Definition and Development

Database — **Streaming & Messaging** — **Application Definition & Image Build** — **Continuous Integration & Delivery**

Orchestration & Management

Scheduling & Orchestration — **Coordination & Service Discovery** — **Remote Procedure Call** — **Service Proxy** — **API Gateway** — **Service Mesh**

Runtime

Cloud Native Storage — **Container Runtime** — **Cloud Native Network**

Provisioning

Automation & Configuration — **Container Registry** — **Security & Compliance** — **Key Management**

Platform

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

PaaS/Container Service

Observability and Analysis

Monitoring

Logging

Tracing

Chaos Engineering

Serverless

See the serverless interactive display at s.cncf.io

Members

Kubernetes Certified Service Provider

Kubernetes Training Partner

Special

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 COMPUTING FOUNDATION

CLOUD NATIVE Landscape

Redpoint Amplify

CNCF Cloud Native Interactive Landscape

The Cloud Native Trail Map (png, pdf) is CNCF's recommended path through the cloud native landscape. The cloud native landscape (png, pdf), serverless landscape (png, pdf), and member landscape (png, pdf) are dynamically generated below. Please open a pull request to correct any issues. Greyed logos are not open source. Last Updated: 2019-07-2 22:17:13Z

You are viewing 1,158 cards with a total of 1,725,127 stars, market cap of $10.38T and funding of $57.68B.

Try it now at https://l.cncf.io ![Tweet] 694

| Landscape | **Card Mode** | Serverless | Members |

No Grouping (1158)

Sidebar

🔄 Reset Filters

Grouping
No Grouping ▼

Sort By
Stars (high to low) ▼

Category
Any ▼

CNCF Relation
Any ▼

License
Any ▼

Organization
Any ▼

Headquarters Location
Any ▼

Example filters:

Cards by age
Open source landscape
Member cards
Cards by stars
Cards from China
Certified K8s/KCSP/KTP
Cards by MCap/Funding

⬇ Download as CSV

KubeCon CloudNativeCon
Nov. 18 - 21 San Diego, CA

KubeCon CloudNativeCon
March 30 - April 2 Amsterdam

Cards

Kubernetes	Elastic	Netdata	Ansible	Redis	Serverless
Kubernetes ⭐55,292	Elastic ⭐42,628	Netdata ⭐39,579	Ansible ⭐38,340	Redis ⭐37,543	Serverless ⭐30,993
Cloud Native Computing Foundation (CNCF)	Elastic — MCap: $7.09B	Netdata	Red Hat — MCap: $33.43B	Redis Labs — Funding: $146.6M	Serverless — Funding: $13M

Grafana	No Code	Dubbo	etcd	Prometheus	Traefik
Grafana ⭐29,826	No Code ⭐29,736	Dubbo ⭐27,880	etcd ⭐26,033	Prometheus ⭐25,134	Traefik ⭐23,355
Grafana Labs — Funding: $1.23M	No Code	Apache Software Foundation	Cloud Native Computing Foundation (CNCF)	Cloud Native Computing Foundation (CNCF)	Containous — Funding: $1.06M

Apache Spark	Kong	RethinkDB	gRPC	GitLab	Sentry
Apache Spark ⭐22,617	Kong ⭐22,580	RethinkDB ⭐22,388	gRPC ⭐22,130	GitLab ⭐21,901	Sentry ⭐21,457
Apache Software Foundation	Kong — Funding: $69.1M	Linux Foundation	Cloud Native Computing Foundation (CNCF)	GitLab — Funding: $168.2M	Sentry — Funding: $26.5M
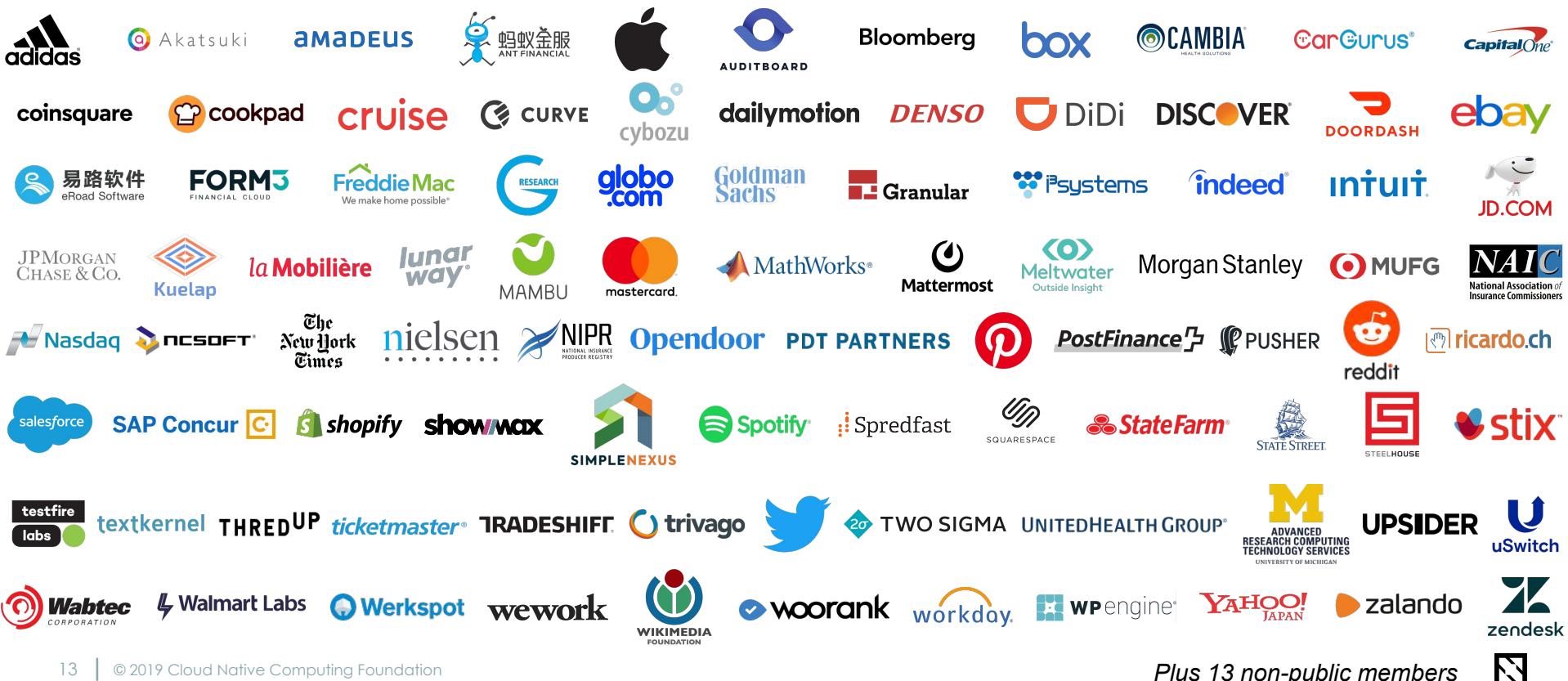
100+ Companies in the End User Community

Plus 13 non-public members

CNCF Cloud Native Definition v1.0

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.

CNCF Cloud Native Definition v1.0 (Español)

Las tecnologías "Cloud Native" empoderan a las organizaciones para construir y correr aplicaciones escalables en ambientes dinámicos modernos, como lo son hoy las nubes públicas, privadas o hibridas. Temas como contenedores, mallas de servicios, microservicios, infraestructura inmutable y APIs declarativas son ejemplos de este enfoque.

Estas técnicas permiten crear sistemas de bajo acoplamiento que son resilentes, administrables y observables. Combinado con técnicas de automatización robusta les permite a los ingenieros realizar cambios de alto impacto de manera frecuente y predecible con un mínimo esfuerzo.

La "Cloud Native Computing Foundation" busca impulsar la adopción de este paradigma mediante el fomento y mantenimiento de un ecosistema de proyectos de código abierto y neutro con respecto a los proveedores. Democratizamos los patrones modernos para que estas innovaciones sean accesibles para todos.

PULL REQUESTS WELCOME! (correr?)

EVERYONE'S EXCITED ABOUT

KUBERNETES

Why is everyone excited about Kubernetes and cloud native?

k8s = Greek for "pilot" or "helmsman of a ship"

kubernetes.io
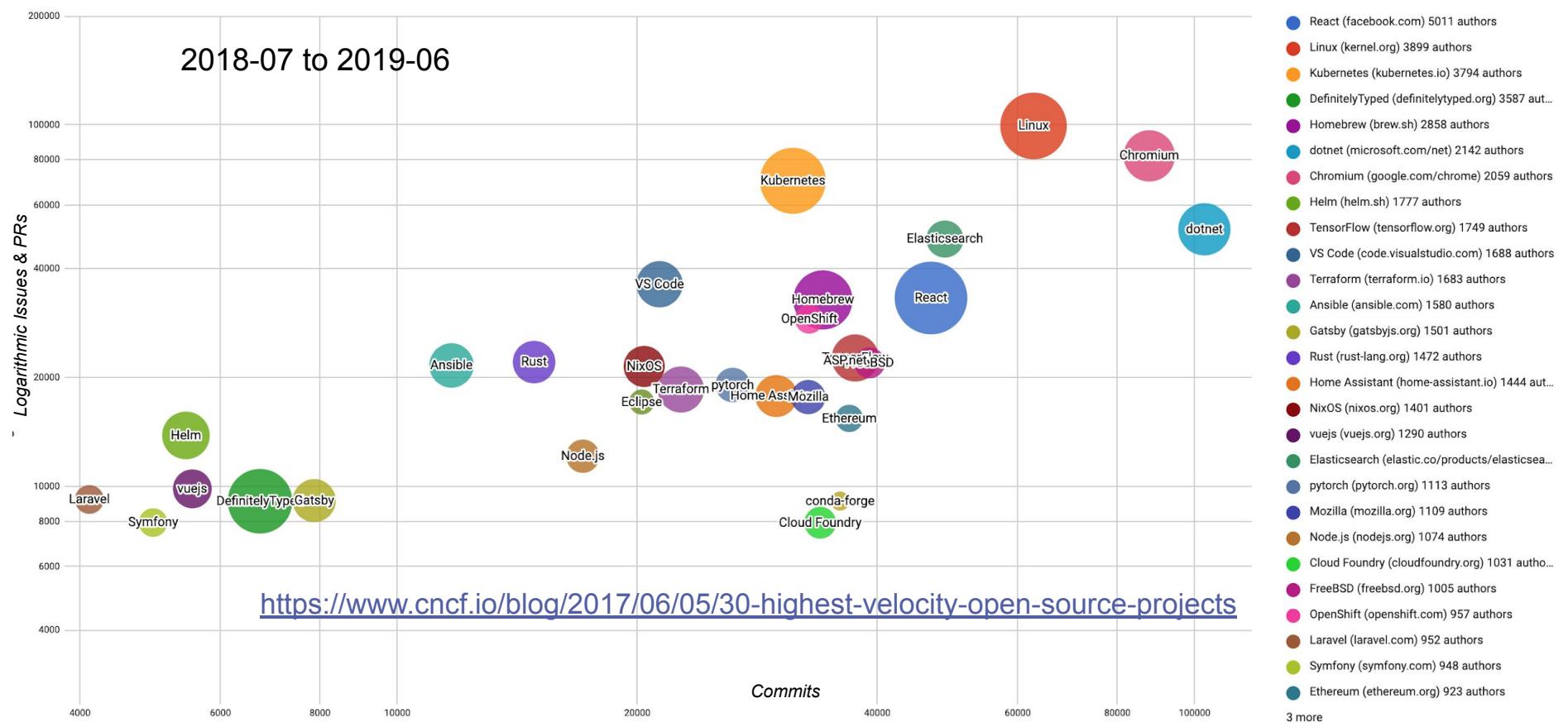
Why Orgs Are Adopting Kubernetes + Cloud Native

1. **Better resource efficiency** lets you to run the same number of services on less servers
2. Cloud native infrastructure enables **higher development velocity** – improving your services faster – with lower risk
3. **Cloud native promotes multi-cloud** (switching between public clouds or running on multiple ones) and hybrid cloud (moving workloads between your data center and the public cloud)

Kubernetes: HIGH Velocity Open Source Project!

2018-07 to 2019-06

https://www.cncf.io/blog/2017/06/05/30-highest-velocity-open-source-projects
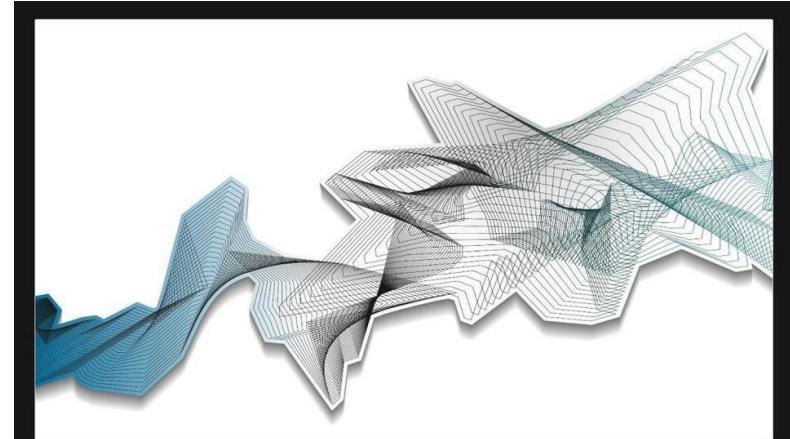
What does Kubernetes actually do?

› One thing: Abstract away the underlying hardware. A**bstract away the concept Node**.

› Principle: Manage your applications like Cattle (generic, bulk operations) instead of like Pets (every operation is customized with care and love for the individual)

› **Kubernetes is the Linux (POSIX) for distributed systems.**

› In the same manner Linux (an OS) abstracts away the hardware differences (with different CPU types, etc.), Kubernetes abstracts away the fact that you have thousands of nodes in the node pool and provides consistent UX and operation methods for apps

› **You DECLARE the desired state, Kubernetes makes the desired state the ACTUAL STATE!**

Kubernetes: "Simple" like Git :)

› <u>Pod</u>: The basic and atomically schedulable building block of Kubernetes, represents a single instance of an application in Kubernetes. **Each Pod has its own, uniquely assigned and internal IP. Pods are mortal.**

› <u>Deployment</u>: Includes a Pod template and a replicas field. Kubernetes will make sure the actual state (amount of replicas, Pod template) always matches the desired state. When you update a Deployment it will perform a "rolling update".

› <u>Service</u>: Selects Pods by a matching label selector and provides a stable, immortal way to talk to your application by using the internal IP or DNS name.

› <u>Namespace</u>: A logical isolation method, most resources are namespace-scoped. You can then group logically similar workloads and enforce different policies.


Version Control
Git gets easier once you get the basic idea that branches are homeomorphic endofunctors mapping submanifolds of a Hilbert space.
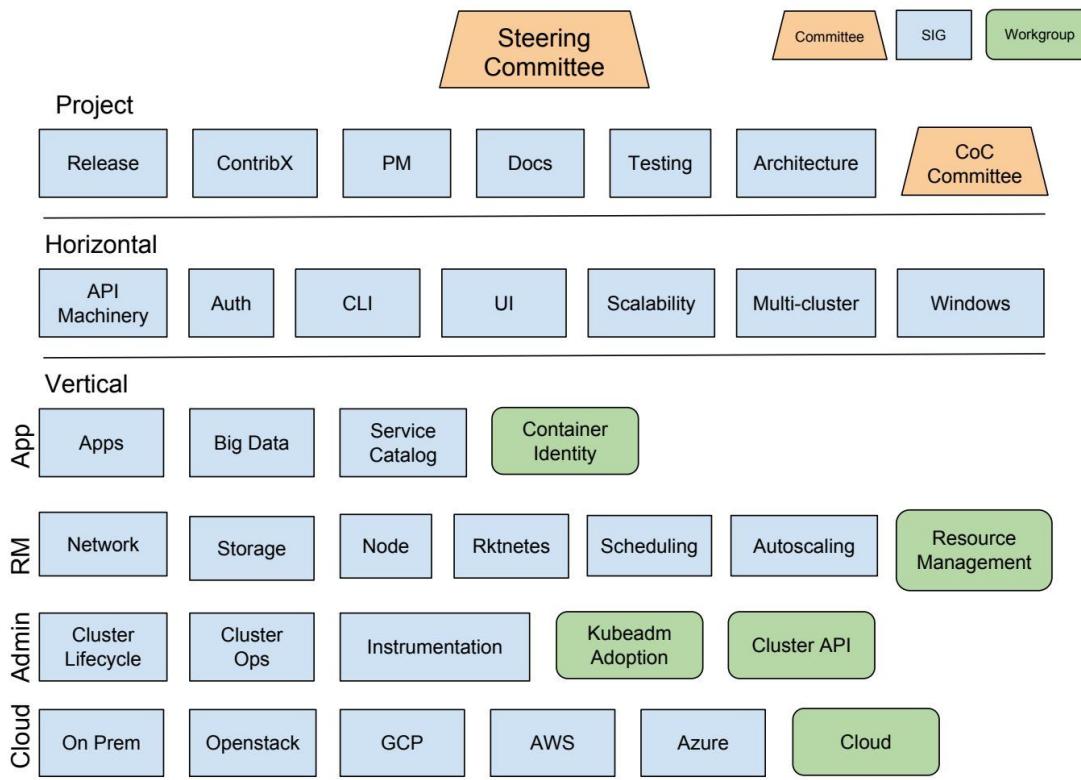
Kubernetes Features

› **Self-healing**: Restarts containers that fail, replaces and reschedules containers when nodes die, kills containers that don't respond to your user-defined health check, and doesn't advertise them to clients until they are ready to serve

› **Automatic binpacking**: Automatically places containers based on their resource requirements and other constraints, while not sacrificing availability. Mix critical and best-effort workloads in order to drive up utilization and save even more resources.

› **Horizontal scaling and autoscaling**: Scale your application up and down with a simple command, with a UI, or automatically based on CPU usage or custom metrics

› **Automated rollouts and rollback**s: Kubernetes progressively rolls out changes to your application or its configuration, while monitoring application health to ensure it doesn't kill all your instances at the same time. If something goes wrong, Kubernetes will rollback the change for you.

› **Service Discovery and Load Balancing**: No need to modify your application to use an unfamiliar service discovery mechanism. Kubernetes gives containers their own IP addresses and a single DNS name for a set of containers, and can load-balance across them

› **Storage Orchestration**: Automatically mount the storage system of your choice, whether from local storage, a public cloud provider such as GCP or AWS, or a network storage system such as NFS, iSCSI, Gluster, Ceph, Cinder, or Flocker

› **Batch Execution**: In addition to services, Kubernetes can manage your batch and CI workloads, replacing containers that fail, if desired

How does Kubernetes Development Work? SIGs!

Special Interest Groups manage Kubernetes' various components and features:
https://kubernetes.io/community

All code in the Kubernetes Github organization should be owned by one or more SIGs;

SIGs and WGs have regular (often weekly) video meetings where the attendees discuss design decisions, new features, bugs, testing, onboarding or whatever else that is relevant to the group. Attending these meetings is the best way to get to know the project

Learning Kubernetes? Trying Kubernetes Out?

- [Play with Kubernetes](#) right away in your browser! (also see the [Docker version](#))
- **Create a single-node cluster on your laptop or workstation with [KIND](#)** (or minikube)
- Create a real cluster with only a couple of commands with [kubeadm](#)
- Create a ready cluster on AWS with [kops](#)
- Create a Kubernetes cluster on GCE with [GKE](#)
- Try one of 80+ Certified Kubernetes Offerings:
  – [cncf.io/ck](#)

Training and Certification

Training

- Over 76,000 people have registered for the free Introduction to Kubernetes course on edX
- Over 8,800 people have registered for the Kubernetes Fundamentals course

Certification

- Over 8,300 people have registered for the Certified Kubernetes Administrator (CKA) online test
- Over 2,800 people have registered for the Certified Kubernetes Application Developer (CKAD) online test

Kubernetes Certified Service Provider (KCSP)

A pre-qualified tier of vetted service providers who have deep experience helping enterprises successfully adopt Kubernetes through support, consulting, professional services and/or training.

Benefits

- Placement at the top of https://kubernetes.io/partners/
- Monthly private meetings with cloud native project leaders, TOC members, and representatives from the Governing Board
- Access to leads from the kubernetes.io for end users looking for support

Requirements

- Three or more certified engineers
- Business model to support enterprise end users
- Be a CNCF member

https://www.cncf.io/certification/kcsp/
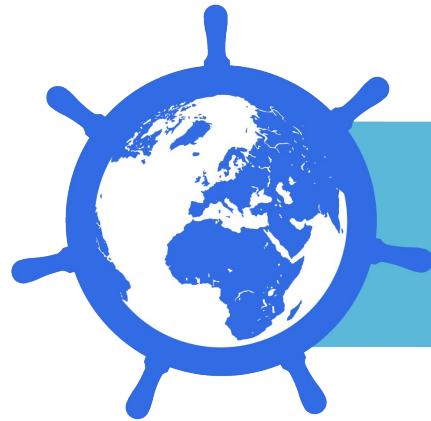
108 Kubernetes Certified Service Providers (KCSP)

KubeCon + CloudNativeCon

- North America 2019
    - [San Diego](): November 18-21, 2019

- Europe 2020
    - Amsterdam: March 30 - April 2, 2020

- China 2020
    - Shanghai: July 28-30, 2020

- North America 2020
    - Boston: November 17-20, 2020

kubecon.io

Kubernetes Forums

- [Seoul](#) Dec 9-10, 2019; [Sydney](#) Dec 12-13, 2019
- 2020 plans: Bengaluru & New Delhi, Tel Aviv, **Mexico City** & Sao Pãulo, Tokyo & Singapore, Seoul & Sydney
- Two-day events with a target audience of 1,500

[Prospectus](#)

Open Source Tips + Tricks

CLOUD NATIVE
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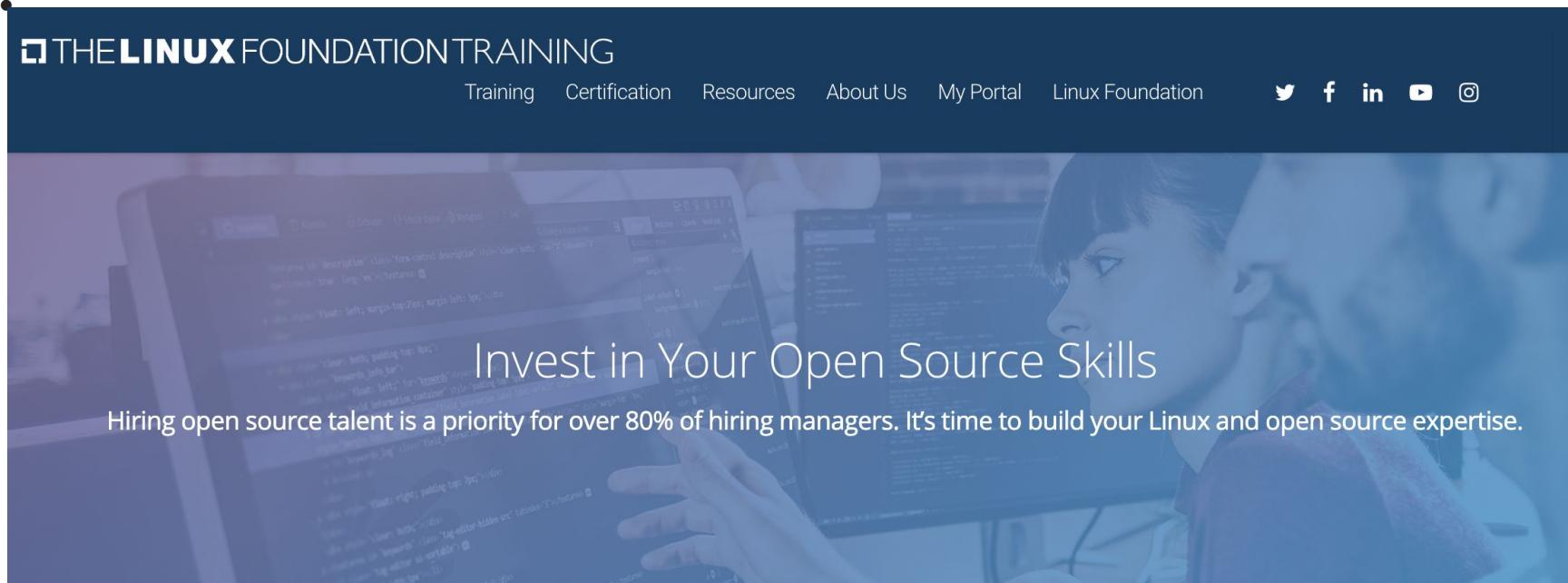
FYI: Scholarships at ALL KubeCons + LF Events

- All LFevents (https://events.linuxfoundation.org) offer scholarships!
  - Open Source Summit Europe: Registration Scholarship link: https://events.linuxfoundation.org/events/open-source-summit-europe-2019/attend/scholarships/
  - Linux Security Summit Europe Registration Scholarship link: https://events.linuxfoundation.org/events/linux-security-summit-europe-2019/attend/scholarships/
  - KVM Forum Registration Scholarship link: https://events.linuxfoundation.org/events/kvm-forum-2019/attend/scholarships/
  - Open FinTech Forum Registration Scholarship link: https://events.linuxfoundation.org/events/open-fintech-forum-2019/attend/scholarships/
  - For Travel Funding, they can apply here: https://events.linuxfoundation.org/travel-fund-request/
  - Observability Practitioners Summit - Diversity Scholarship Link: https://www.surveymonkey.com/r/Q7Y2SHL
  - Kubernetes Forum Seoul - Diversity Scholarship Link: https://www.surveymonkey.com/r/QX2VT25
  - Kubernetes Forum Sydney - Diversity Scholarship Link: https://www.surveymonkey.com/r/NXHXW5L

Intro To Open Source Training
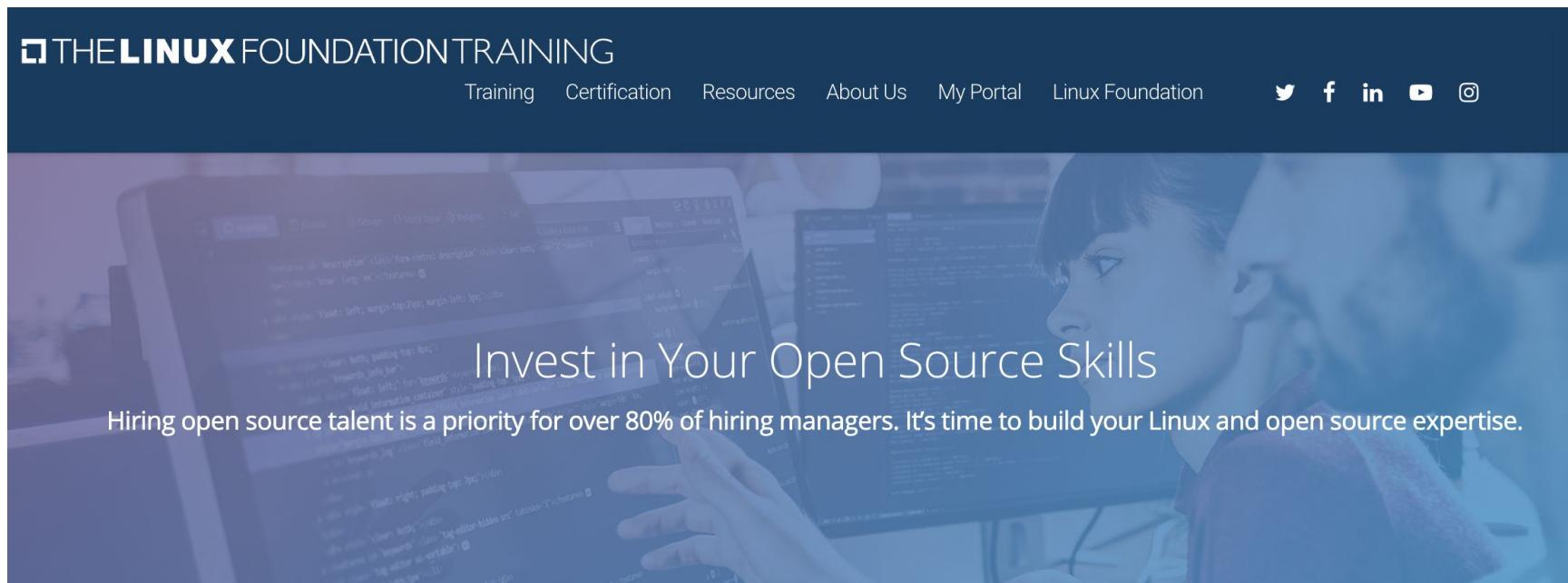
- https://training.linuxfoundation.org/training/beginner-guide-to-oss-development-lfc102/
- https://training.linuxfoundation.org/training/compliance-basics-for-developers/

LF Training + Certifications Discounts for COSS

- https://training.linuxfoundation.org/
- **CCOSS50: Good for 50% off anything in our catalog. Expires Sept 19th**

CII Best Practices Badging for Projects

- Initiative launched in May 2016 to raise awareness of development and governance steps for better security outcomes

- The badge makes it easier for users of open source projects to see which projects take security seriously

- 1,000+ projects registered for the badge

- While only 10% of the projects successfully pass, every one of them made an improvement to achieve a badge

https://www.coreinfrastructure.org
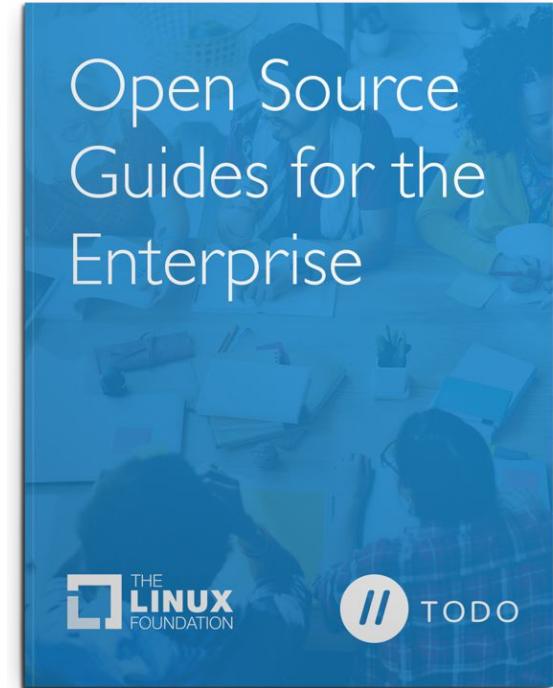
Open Source Guides!

- Developed in collaboration with TODO Group

- Leverage best practices to run or start an open source project within your organization

- Topics include:
  - Starting an Open Source Project
  - Archiving an Open Source Project
  - Creating an Open Source Program
  - Tools for Managing Open Source Programs

- https://www.linuxfoundation.org/resources/open-source-guides

Open Source Guides for the Enterprise

THE LINUX FOUNDATION

TODO

Kubernetes + CNCF Community Resources

› Follow the Kubernetes blog, YouTube channel & Twitter feed

› Do as 10000+ others and take the free edX "Introduction to Kubernetes" course

› Join 50000+ others in the Kubernetes Slack: http://slack.k8s.io

› Prep for and take the Certified Kubernetes Administrator exam

› Join a Special Interest Group and attend the weekly meetings

› Kick the tires with Kubernetes on your machines with minikube or kubeadm

› Check out the weekly Kubernetes Community Meeting at Zoom

› Read the in-depth analysis of the Kubernetes ecosystem ebook by The New Stack

Say Hello to CNCF Staff: 30+ Employees

- 30+ full time professional staff to sustain the CNCF community (200 employees part of LF)
- https://www.cncf.io/people/staff/ (60% women on staff)

Jessie Adams-Shore
Public Relations Manager

Jessie is a Public Relations Manager at CNCF.

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Julie Dam
Content Manager

Julie manages the end user case study program for CNCF.

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Kate Qiu
Sponsorship Fulfillment Coordinator

Kate is a Sponsorship Fulfillment Coordinator at The Linux Foundation, helping with the fulfillment of sponsorship benefits for Kubecon + CloudNativeCon events.

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Katelin Wussow
Business Development Manager

Katelin comes to the Linux Foundation from the largest privately held tech firm in the world, Dell Technologies. Beginning her career in inside sales from EMC2, now DellEMC, Katelin has always been a top performer focused on helping her clients evolve.

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Kathy Osweiler
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Kathy is an Event Partnership Specialist at The Linux Foundation managing sponsorship sales for KubeCon+CNCF events.

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Event Manager

Katie has an Event Manager for The Linux Foundation since 2014 for The Linux Foundation's Collaborative Projects.

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Katie is a Public Relations Manager for CNCF.

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Keith Chan
CNCF China Director

Keith (Chan Chak Fai) has been in IT industry for more than 20 years. He is born in HK and holds an MBA degree from UK. He started his IT journey from involving in IP stack network to focusing on IT security solution since 1997.

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Thank you!

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