

The Linux Foundation

Keith Chan,
CNCF, Greater China Director
Hyperledger, Greater China Director
Linux Foundation APAC Strategic Director

Why Open Source

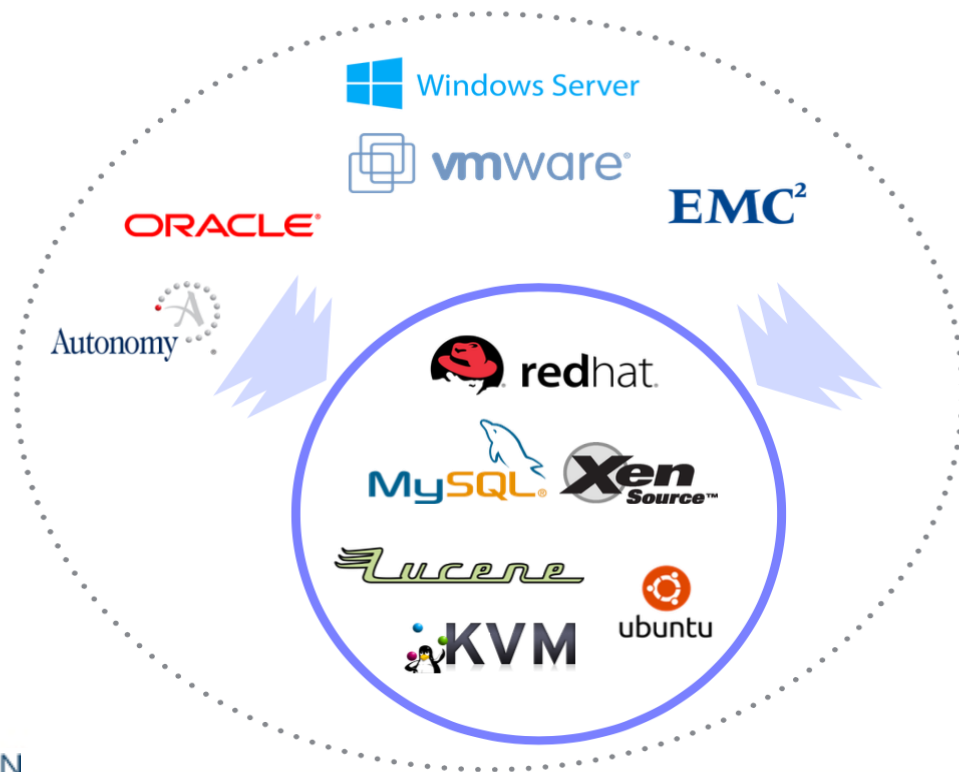
Open · Ecosystem · New Value

The background is an abstract composition of vibrant purple and blue hues. It features a series of diagonal streaks and a grid-like pattern that creates a sense of depth and movement, resembling a digital or architectural space.

The importance of Open Source

We are entering a new phase of software
development

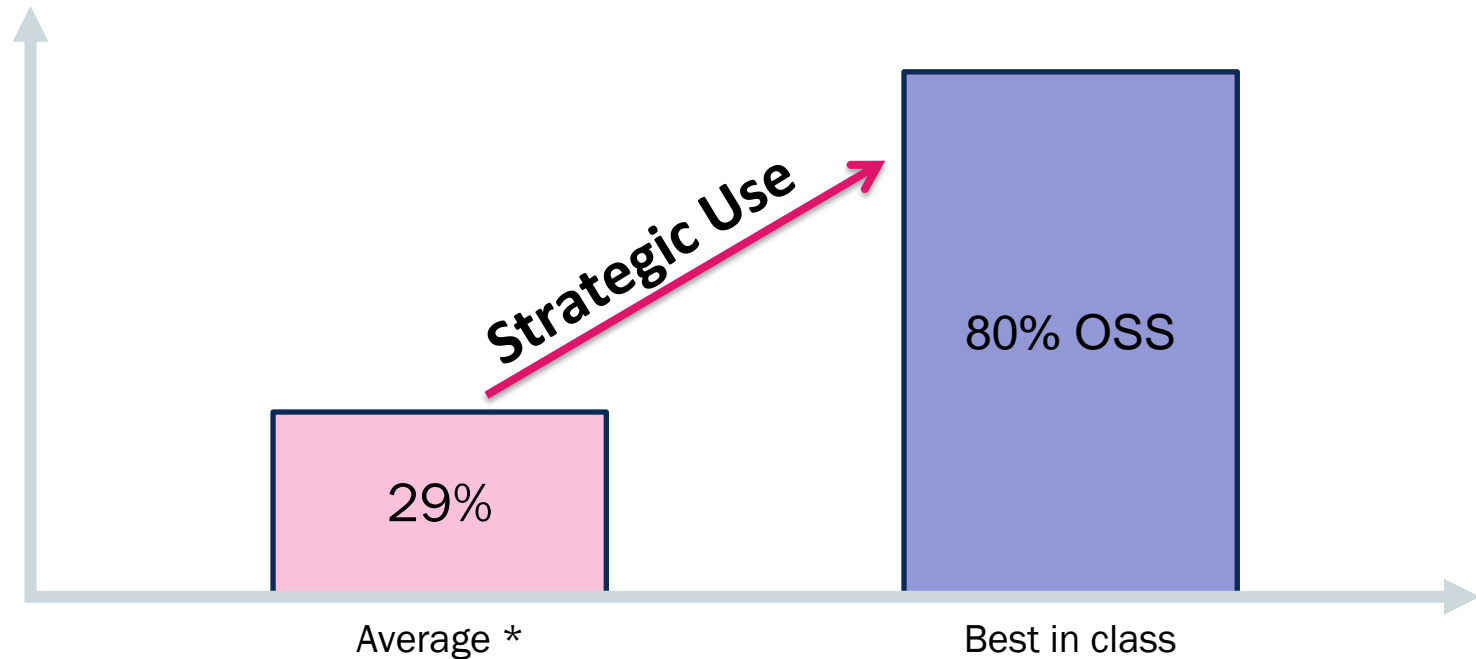
First Generation: Emulating Proprietary Software, Smaller Market/Commercial Dollar Potential



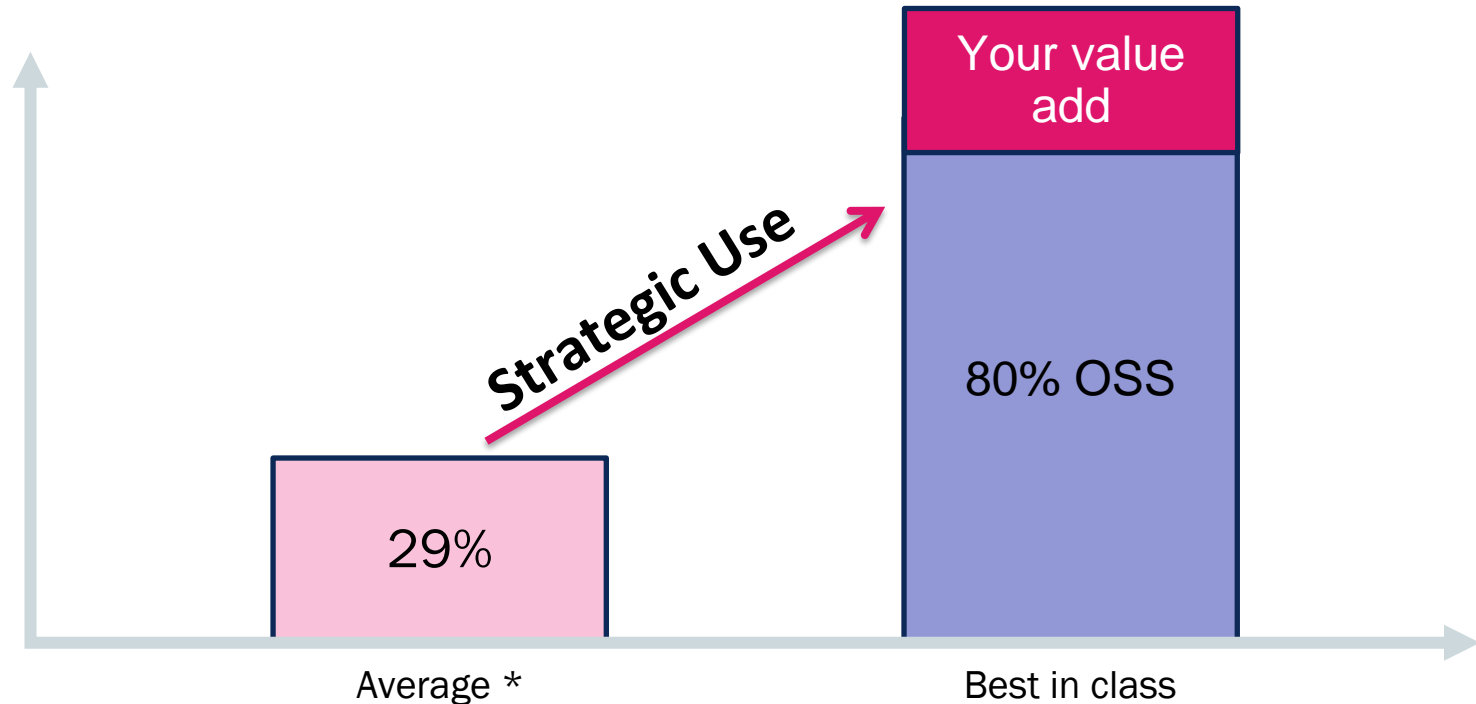
New Generation: Novel Functionality - Creating New Value and Opening New Markets



Most of the code in modern technology systems comes from outside any single company.



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Organizations are getting to market faster and becoming more efficient through open source shared R&D.

Are you ready?

The cloud runs on open source.

Are you ready?

The best tech talent are open source developers.

Are you ready?

Your operations team is installing open source software.

Are you ready?

The future is open source.

Are you ready?



Organizations that don't harvest this shared innovation will be unable to compete: they will be late to market, waste R&D funds, and unable to innovate alone.



Ecosystem

Foundations enable ecosystems by creating trust

Sustainable projects have a developer community whose technology is used in commercial solutions that profit businesses, who in turn participate and reinvest back into the project and hire developers to work in the community.



Today the Linux Foundation is More than Linux!

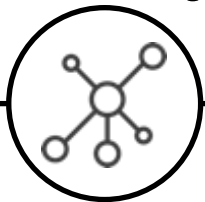
Security



We are securing the internet as home to world's largest certificate authority securing 100M web sites.



Networking



We are home to 8 of the top 10 open source networking projects in the world backed by the majority of global network providers.



Cloud



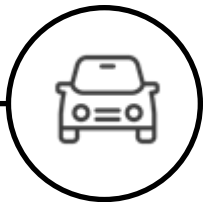
We are creating a portability layer for the cloud, driving standards and developing reference tools for cloud native development.



kubernetes



Automotive



Our Automotive Grade Linux platform is backed by 12 automakers and is either in or slated for production in millions of vehicles worldwide.



Blockchain

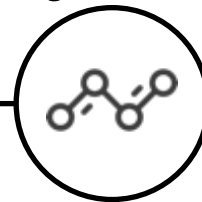


We are creating a permanent, secure distributed ledger that makes it easier to create cost-efficient, decentralized business networks.



HYPERLEDGER

Edge/Embedded



We are creating projects used in building the majority of embedded linux distributions and rationalizing edge computing.



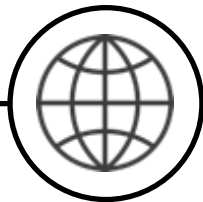
Zephyr™



PROJECT



Web



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



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The power of Open Source:

2018 – A year of Open Source

In 2018, open source drove more than US\$65B in commercial open source software mergers, acquisitions, and IPOs — a significant tipping point in 20 years of open source software development.



2018 in Review — A Year of Open Source



100+ projects under Linux Foundation creates the following:

Largest Shared Technology Investment

The Linux Foundation supports the creation of sustainable open source ecosystems by providing financial and intellectual resources, infrastructure, services, events, and training. Working together, The Linux Foundation and its projects form the most ambitious and successful investment in the creation of shared technology.



16B USD

Estimated development cost of the 100+ world's leading projects hosted at The Linux Foundation



1 Million

Open source professionals have enrolled in our free open source training courses



10 / 10

Largest cloud service providers are Linux Foundation project contributors and members



Events

Why Organizations Are Adopting 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 allows multi-cloud (switching between public clouds or running on multiple ones) and hybrid cloud (moving workloads between your data center and the public cloud)

Cloud Native Computing Foundation (CNCF)

- Non-profit, part of the Linux Foundation; founded Dec 2015
- Cloud Native Open Source Projects Umbrella

Graduated CNCF Projects (3)



Envoy

★ 7,545

Cloud Native Computing
Foundation (CNCF)



kubernetes

Kubernetes

★ 45,262

Cloud Native Computing
Foundation (CNCF)



Prometheus

Prometheus


















★ 20,745

Cloud Native Computing
Foundation (CNCF)

Cloud Native Computing Foundation (CNCF)

- Cloud Native Open Source Projects Umbrella













Incubating CNCF Projects (17)

 CNI Container Network Interface (CNI) Cloud Native Computing Foundation (CNCF) ★ 1,709	 containerd Cloud Native Computing Foundation (CNCF) ★ 3,249	 CoreDNS Cloud Native Computing Foundation (CNCF) ★ 3,028	 etcd Cloud Native Computing Foundation (CNCF) ★ 21,749	 fluentd Cloud Native Computing Foundation (CNCF) ★ 7,124	 gRPC Cloud Native Computing Foundation (CNCF) ★ 18,466
 HARBOR Harbor Cloud Native Computing Foundation (CNCF) ★ 6,313	 Helm Cloud Native Computing Foundation (CNCF) ★ 8,992	 JAEGER Jaeger Cloud Native Computing Foundation (CNCF) ★ 6,700	 LINKERD Linkerd Cloud Native Computing Foundation (CNCF) ★ 4,779	 NATS Cloud Native Computing Foundation (CNCF) ★ 4,963	 Notary Cloud Native Computing Foundation (CNCF) ★ 1,612
 OPENTRACING OpenTracing Cloud Native Computing Foundation (CNCF) ★ 1,488	 rkt Cloud Native Computing Foundation (CNCF) ★ 8,336	 ROOK Rook Cloud Native Computing Foundation (CNCF) ★ 3,922	 TUF The Update Framework (TUF) Cloud Native Computing Foundation (CNCF) ★ 811	 Vitess Cloud Native Computing Foundation (CNCF) ★ 7,038	

Cloud Native Computing Foundation (CNCF)

- Cloud Native Open Source Projects Umbrella

Cloud Native Sandbox Projects (12)

 Buildpacks.io Buildpacks Cloud Native Computing Foundation (CNCF) ★ 163	 cloudevents CloudEvents Cloud Native Computing Foundation (CNCF) ★ 748	 cortex Cortex Cloud Native Computing Foundation (CNCF) ★ 844	 Dragonfly Dragonfly Cloud Native Computing Foundation (CNCF) ★ 2,771	 falco Falco Cloud Native Computing Foundation (CNCF) ★ 1,143	 Open Policy Agent Open Policy Agent (OPA) Cloud Native Computing Foundation (CNCF) ★ 1,607
 OPENMETRICS OpenMetrics Cloud Native Computing Foundation (CNCF) ★ 449	 spiffe SPIFFE Cloud Native Computing Foundation (CNCF) ★ 348	 SPIRE SPIRE Cloud Native Computing Foundation (CNCF) ★ 305	 Telepresence Telepresence Cloud Native Computing Foundation (CNCF) ★ 1,415	 TiKV TiKV Cloud Native Computing Foundation (CNCF) ★ 4,160	 Virtual Kubelet Virtual Kubelet Cloud Native Computing Foundation (CNCF) ★ 1,412

CNCF Projects from China

3 projects have been contributed to CNCF by Chinese companies



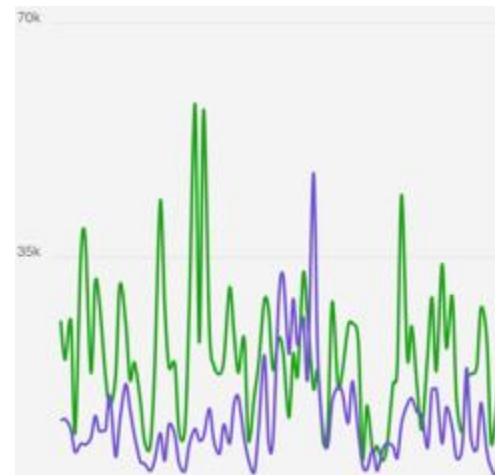
Kubernetes in Search Trends

Google Trends



Kubernetes OpenStack Mesos Docker Swarm Cloud Foundry

WeChat



July-18 Aug-18 Sept-18
Oct-18

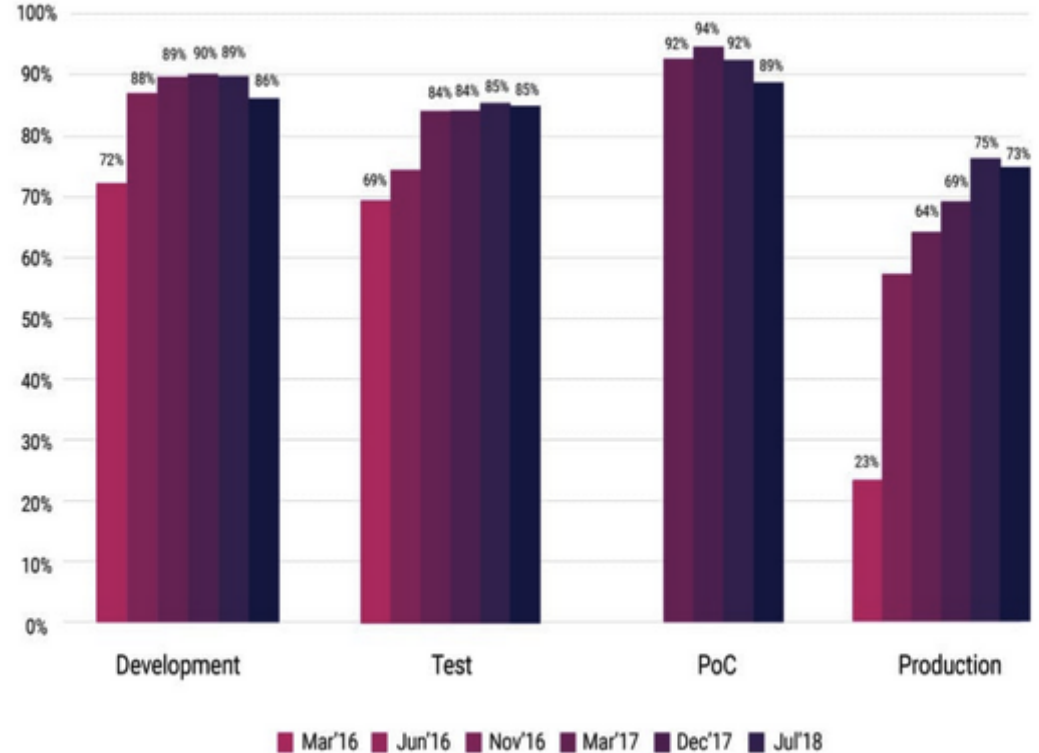
Kubernetes OpenStack

Growth of Cloud Native Technologies

CNCF Survey: Use of Cloud Native Technologies in Production Has Grown Over 200%

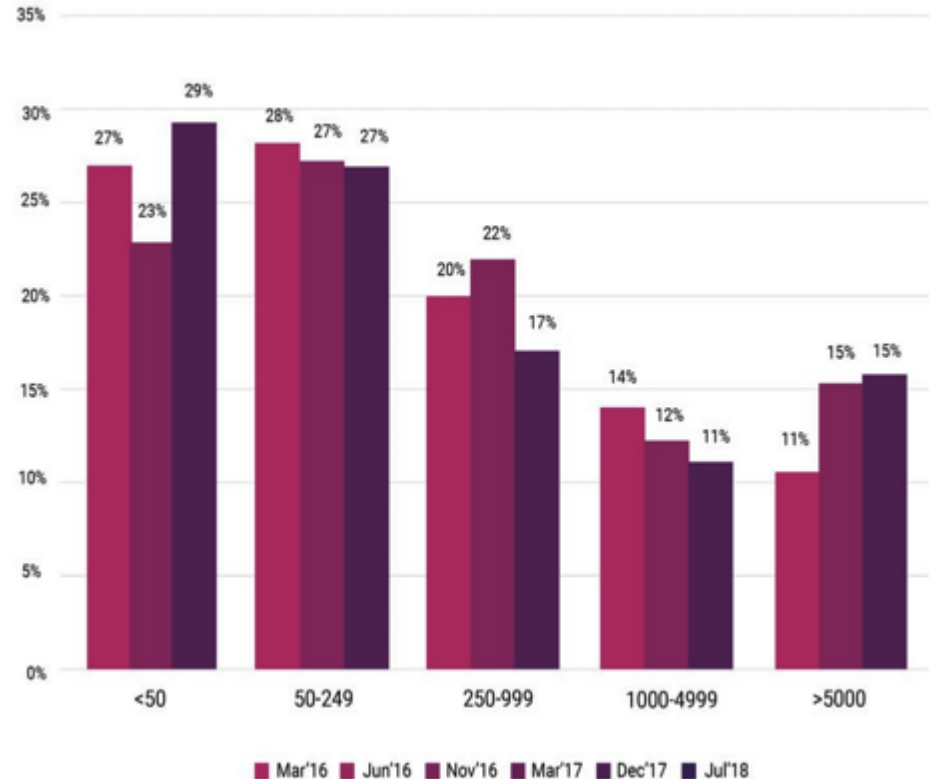
Growth of Container

73% of respondents are currently using containers in production today



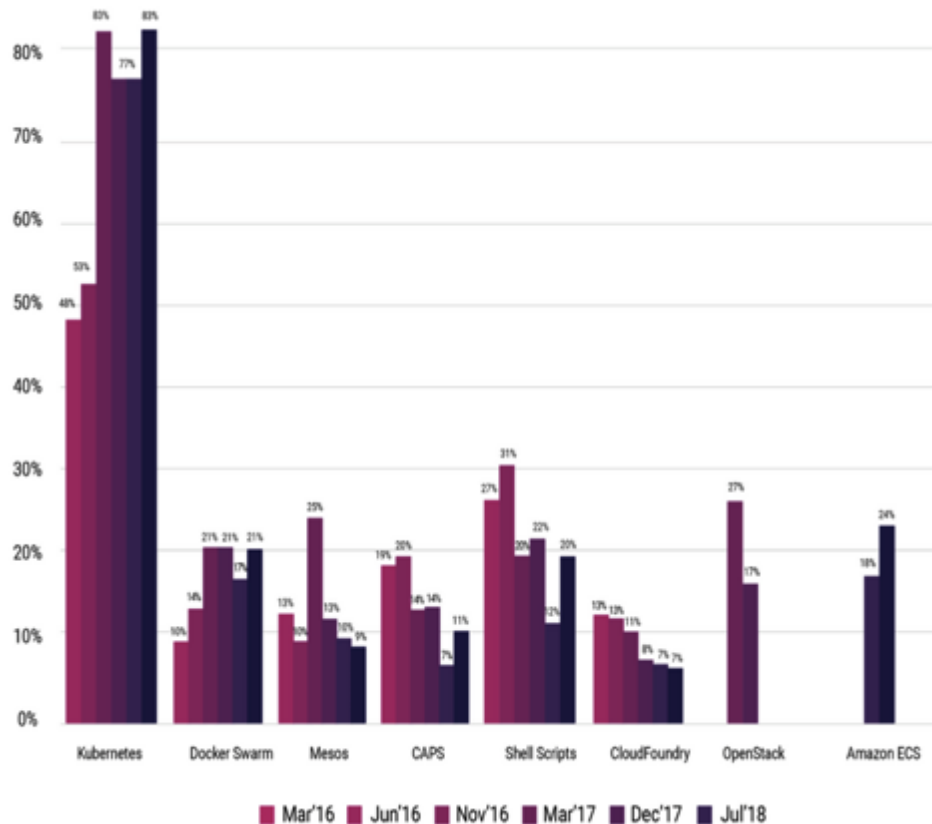
No. of Containers are running

- 29% running less than 50,
- 50-249 (27%),
- 250-999 (17%)
- 15% running more than 5,000 containers.



Kubernetes is the key container management tool

As for container management tools,
Kubernetes remains the leader with 83%



300+ companies around the world have joined together

Platinum Members



Gold Members



End User Members



End User Supporters

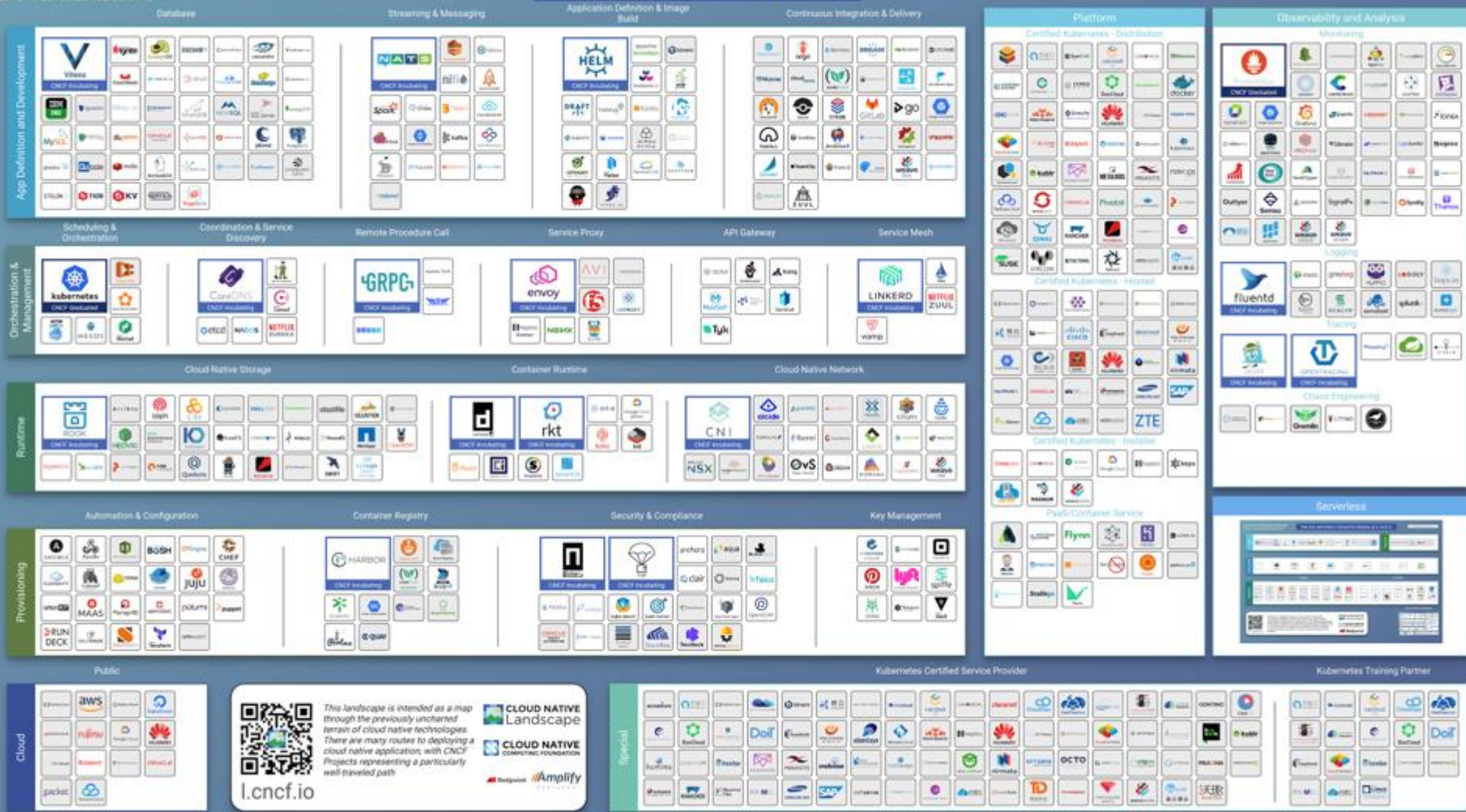


Academic/Nonprofit



A big End User community





The Cloud Native Trail Map

Trail Map: l.cncf.io



Hyperledger is a collaborative and
global open source software
community, hosted by The Linux
Foundation, **advancing
blockchain technologies for
business.**



HYPERLEDGER
BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

The Hyperledger Greenhouse



HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Community Stewardship and Technical, Legal, Marketing, Organizational Infrastructure

Frameworks



**HYPERLEDGER
BURROW**

Permissionable smart
contract machine (EVM)



**HYPERLEDGER
FABRIC**

Permissioned with
channel support



**HYPERLEDGER
INDY**

Decentralized identity



**HYPERLEDGER
IROHA**

Mobile application
focus



**HYPERLEDGER
SAWTOOTH**

Permissioned &
permissionless support; EVM
transaction family

Tools



**HYPERLEDGER
CALIPER**

Blockchain framework
benchmark platform



**HYPERLEDGER
CELLO**

As-a-service
deployment



**HYPERLEDGER
COMPOSER**

Model and build
blockchain networks



**HYPERLEDGER
EXPLORER**

View and explore data
on the blockchain



**HYPERLEDGER
QUILT**

Ledger interoperability



HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

View on demand video: [Blockchain Projects and Working Groups by Hyperledger](#)

Hyperledger Momentum



2.5

Years since launch



47K



5

Tools



5

Frameworks



2

1.0 Production Releases



260+

Members
(50+ in China)



8

Active Community
Working Groups



100+

Meetups
Worldwide



30K

Meetup
Participants



2,000+

Media Clips Per Month



HYPERLEDGER
BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Trending Industries



Financial Services

The most immediate business opportunities are to use business blockchains to track and trade stocks and bonds with reduced risk and time, and increased transparency.



Supply Chain

Blockchain technologies will lead to greater efficiency, as well as safer and more ethical standards through the ability to prove the veracity of transactions to all stakeholders.

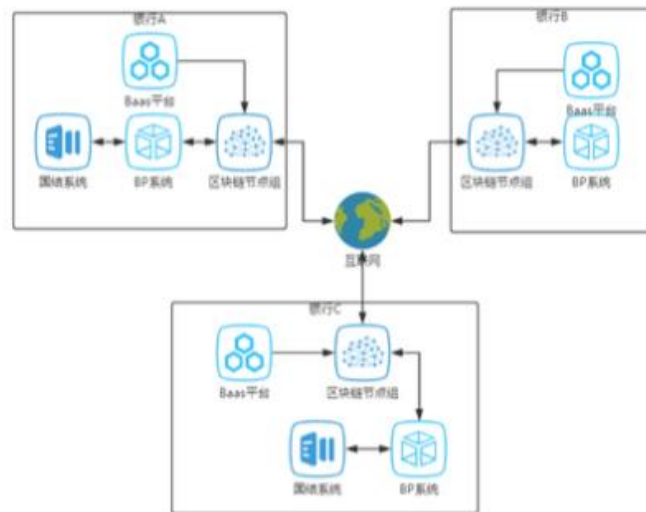


Healthcare

Business blockchains are giving the healthcare industry a chance to reinvent what historically has been a thorny problem: sharing patient data records between organizations.

China's First Blockchain L/C Info Transmission System

- China Minsheng Bank and China CITIC Bank jointly developed an open, standard and regulatory compliant domestic L/C transmission platform using blockchain
- Banks involved include **China Minsheng Bank, China CITIC Bank, Bank of China and Suning Bank**
- On first day of production over RMB100 million of L/Cs processed. Now supporting billions of business daily.
- Removed need for SWIFT in China domestic L/C settlement and enabled the creation of an independent and domestic-controlled L/C exchange system
- Improved user experience, supporting a Chinese UI tailored to domestic business requirements
- Incorporated the whole L/C process, shortening delivery time, with improved efficiency and security



LegalXchain Judicial Consortium Chain

- LegalXchain is a blockchain based Judicial Consortium Chain
- It is a unified, standard and reliable judicial data storage platform for seamless sharing of documents between different organisations in the Judicial process
- It is used by 8 authoritative judicial units e.g. IP360, notarial offices, forensic institutions, courts etc.
- Broadly used in legal industry, users include legal technology companies, Internet companies, lawyers, judicial authorities etc.
- Various legal business scenarios are supported e.g. judicial business, data validation, electronic forensics, intelligent electronic signing and online notary
- The platform currently has more than 10 million legal sensitive documents and unstructured data (video, image files etc.).
- Original data is double encrypted by China SHA512 and SHA256 algorithm



First Blockchain Rice Traceability and Safety Platform

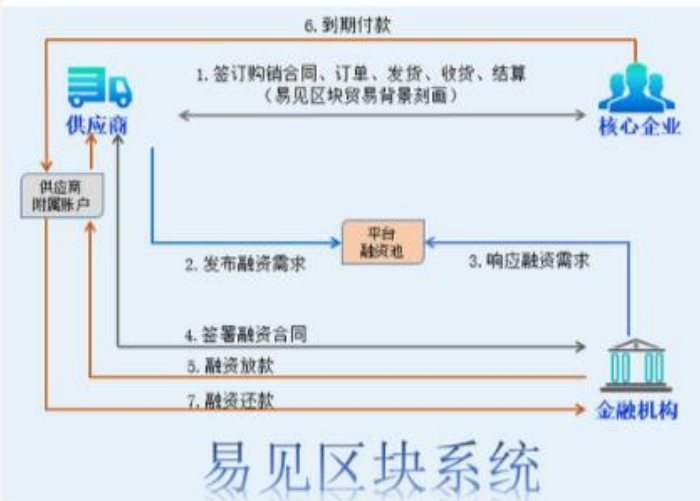
“Blockchain Big Farm” is the first blockchain rice traceability platform in China

- The platform provides provenance, traceability and transparency of information in the rice supply chain, all the transactions can be seen and validated via QR Code.
- Consumers are reassured, due to blockchain technologies, as companies cannot change the information in a bid to hide the true origin of the rice
- This platform collected data from different sources including over 30,000 farmers, 12.96 million mu (亩) of farm land, more than 400,000 planters
- Shan Liang Taste (善粮味道) good quality rice are available on major eCommerce platforms
- The platform was developed by ChainNova and Shan Liang Taste (善粮味道) for the Beidahuang Group (北大荒) who distributes over 10% of the rice production in China, it focuses on high quality rice



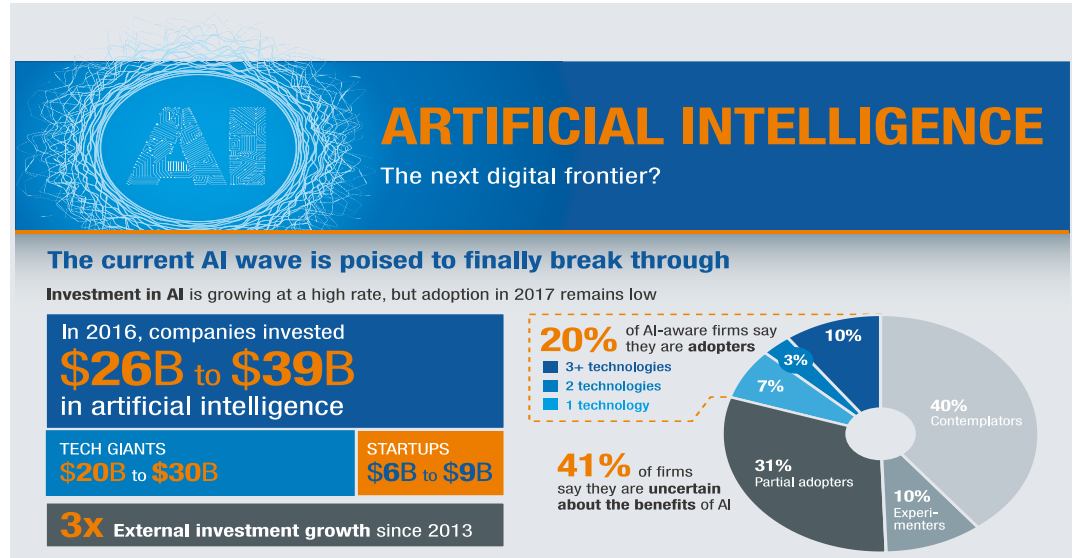
E-Visible Supply Chain Finance

- An IOT and blockchain integrated application enables the creation of traceable data, as well as visibility and control of capital during the whole trading process
- Since the platform launched in April 2017, cumulative amount invested on E-Visible Blockchain Platform over RMB 4.2 billion, in which financial institutions have invested over RMB 1.3 billion and registered 166 enterprise users.
- Whole trading process is recorded which enables financial institutions to quickly identify qualified capital for investment and provide relevant tools for after-loan management
- Enables financial institutions to provide credit and structural financing to qualified capital thereby expanding their financing channels



Artificial Intelligence (AI) Landscape

- Lack of a unified framework for AI / Deep Learning.
- No common AI/Deep Learning ecosystem
- Deployment of AI/Deep Learning research environments and apps remains difficult
- Most deployments of AI/Deep Learning focused in speech and image processing.
- Pressing need for general AI/Deep Learning tools and data models in healthcare, advertising, IoT, Networking and other sectors



Source: "Artificial Intelligence The Next Digital Frontier?", McKinsey & Company, June 2017

How Do We Make Deep Learning Accessible?

Build a worldwide community of users, maintainers and developers of Open Source tools and data models to deliver Deep Learning that is easy to implement and use.

Open Source Projects in LF Deep Learning Foundation (and more in coming)



Acumos AI



Angel



EDL

Elastic Deep Learning



TARS and TSeer Form Open Source Project Communities Under The Linux Foundation to Expand Adoption and Pace of Development

Initially developed and used by Tencent for the past 10 years, remote procedure call framework TARS and name service discovery and scheduling framework TSeer are now available freely under open source licenses





UNIVERSAL

MULTI DOMAINS

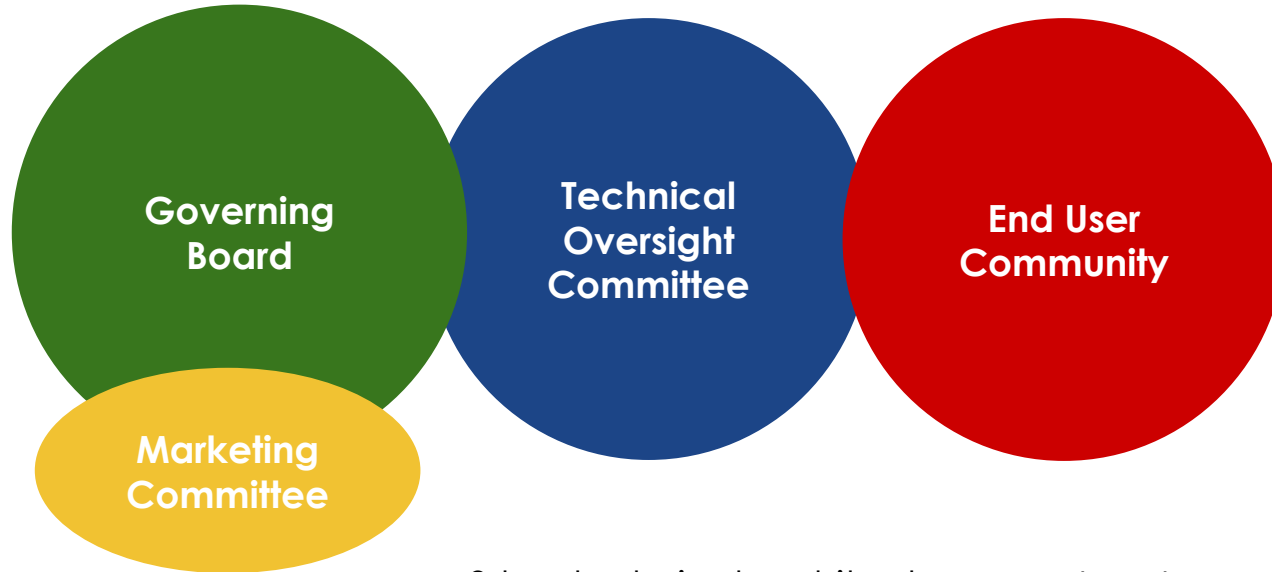
OpenMessaging is vendor-neutral and language-independent, provides industry guidelines for areas of finance, e-commerce, IoT and big-data, and aimed to develop messaging and streaming applications across heterogeneous systems and platforms.

LEARN MORE



How to create New Value and maintain Continuous Growth

Foundation Structure



- Mainly vendors
- Fund the organization
- Marketing and strategic direction

- 9 top technical architects
- Admit new projects
- Acts as a resource to projects

- Real end users of these technologies
- Communicate back requirements
- And good and bad experiences

Example: Certification

- How can Kubernetes users be confident that their suite of applications will deploy correctly onto a given Kubernetes implementation?
- Software conformance ensures that every vendor's version of Kubernetes supports the required APIs. It guarantees interoperability from one Kubernetes installation to the next.
- <https://www.cncf.io/certification/software-conformance/>



Example: Certified Service Provider

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.

Requirements

- Three or more certified engineers
- Demonstrable activity in the Kubernetes community including active contribution
- Business model to support enterprise end users

<https://www.cncf.io/certification/kcsp/>



Continuous Talent Development

- Certified Kubernetes Administrator (CKA)
 - Over 1,500 registrations already
 - <https://www.cncf.io/certification/expert/cka/>
- Certified Kubernetes Application Developer (CKAD)
 - Certifies that users can design, build, configure, and expose cloud native applications for Kubernetes
 - <https://www.cncf.io/certification/expert/cka/ckad/>



Example: Face to Face Community development: KubeCon + CloudNativeCon



KubeCon + CloudNativeCon China 2019



KubeCon



CloudNativeCon

China 2019

Returning to Shanghai June 24-26, 2019

Summary

Creating sustainable open source projects requires **real work**

Governance and Membership	<ul style="list-style-type: none">• Incorporation, Tax status, Bylaws, Member Agreements, Anti-trust, etc.• Ongoing business development and membership recruitment
Development Process	<ul style="list-style-type: none">• Technical Decision Making• Project Life Cycle• Release Process
Infrastructure	<ul style="list-style-type: none">• Custom infrastructure using open source best practices• Security and reliability
Ecosystem Development	<ul style="list-style-type: none">• Marketing• Events• Training
IP Management	<ul style="list-style-type: none">• Code Provenance and License compliance• Trademark management• Legal defense and Collaboration

Linux Foundation Project Hosting Requirements*

The project must:

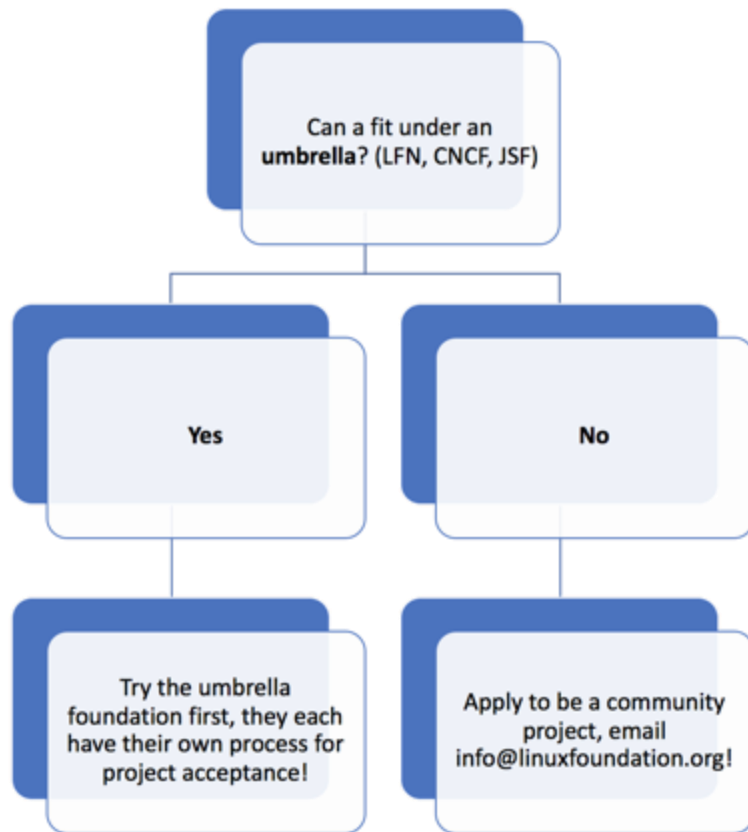
- ❑ use an approved OSI open source license;
- ❑ be supported by a LF member;
- ❑ allow neutral ownership of project assets such as a trademark, domain or GitHub account (the community can define rules and manage them);
- ❑ technical do-ocracy and separation of business governance from technical governance (we're flexible on the model) clearly documented in a charter;
- ❑ allow anyone to participate in the technical community, whether or not a financial member or supporter of the project

Bringing a Project to the LF in a Simple Flowchart



Umbrella Community + Funding

These projects support several technical projects under the same funding structure and are focused on a technology area. This allows the community to pursue a strategic vision across a spectrum of opportunities while balancing demands on resources. Examples of these projects include: Automotive Grade Linux, Cloud Native Computing Foundation, Hyperledger, LF Deep Learning Foundation, and LF Networking.



Learn from Peers: TODO Group

- › Leverage best practices to run or start an open source program/project:

- › <https://todogroup.org>

- › Topics include:

- › Creating an Open Source Program
 - Tools for Managing Open Source Programs

- › Measuring Your Open Source Program's Success

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



创建一个开源项目



创建一个开源项目

了解如何建立一个管理内部开源应用与外部贡献的项目。

[查看指南](#)



开源管理工具

发现可用于追踪和管理开源项目的各种工具。

[查看指南](#)



评估开源项目的成功

详细了解如今顶尖组织评估其开源项目与开源贡献的投资回报率方式

[查看指南](#)



开源开发人员招募

了解公司可以如何通过创建开源文化，来招募开发人员或培养内部人才。

[查看指南](#)



参与开源社区

理解将内部开发人员资源致力于参与开源项目的重要性，以及如何最好地实现它。

[查看指南](#)



开源代码的使用

确保贵组织在整合开源代码与您的商业产品连结时，履行其法定义务。

[查看指南](#)

管理贵组织中的开源项目



启动一个开源项目

了解关于如何启动您自己的开源项目的流程、预算和法律考虑等方面的技巧。

[查看指南](#)



提升开源项目的开发影响力

了解您和您的公司可以改善您的内部开发流程，并准备为对贵公司最为重要的开源项目做贡献。

[查看指南](#)



开源指南阅读清单

21本由TODO Group成员推荐的开源项目经理必读书目

[查看指南](#)



关闭一个开源项目

了解关于如何关闭或撤离开源项目的建议。

[查看指南](#)

向上游贡献代码的最佳方式

Ibrahim Haddad博士@IbrahimAtLinux

在您的组织内部：

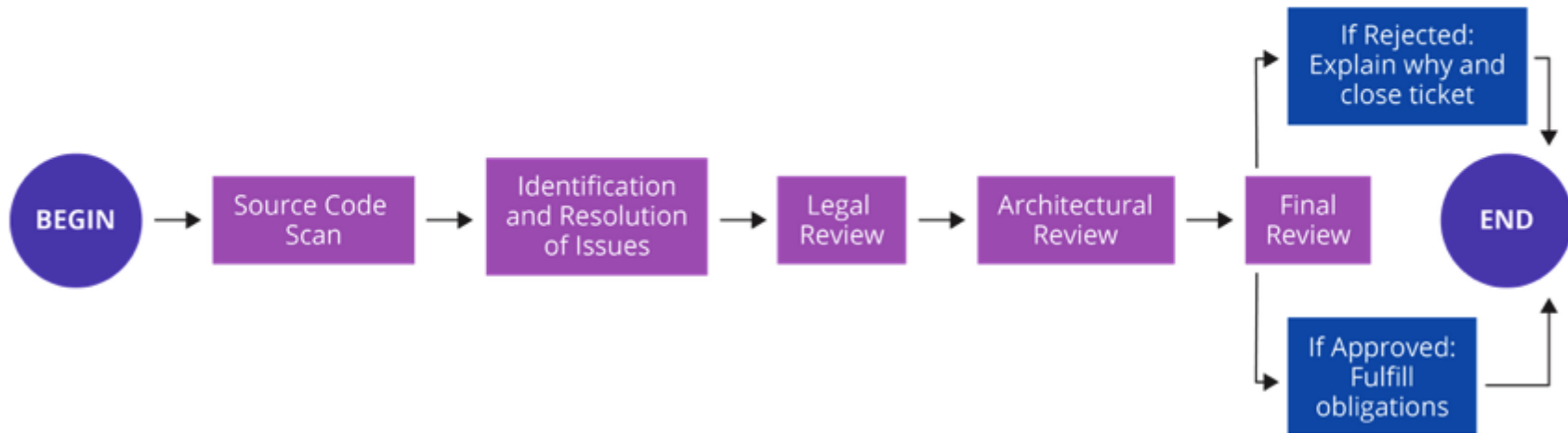
- 基于正当理由而决定向上游贡献。
- 设计和执行代码时，要考虑到上游。
- 采取“上游优先”政策。先将补丁提交给上游，然后再在自己的下游产品中使用补丁。
- 保持您的开发人员一直参与到开源项目中，即使是软性参与。

面向项目外部：

- 确保您的贡献对他人是有用的。
- 遵循恰当的编码风格。
- 参与项目提交过程的工作。
- 提供关于您的贡献的文件与说明。
- 听取反馈并采取相应行动。
- 保持耐心并反复修改代码直至被接受。

合规地使用开源项目

下图展示了一个合规使用过程的简单视图。实际上，这个过程本质上更具有迭代性。请记住，这些阶段仅适用于说明目的，可能需要根据公司自身需求和开源项目配置进行相应的修改。



Thank you.

CNCF 中国公众号

