



# How to build an AI Platform with reliable open sources

*Thor Chin*

*Chief Architect*

*Akraino TSC, BluVal FP PTL*



# What can you learn from this presentation?

- Open Source Benefits
- How to find out good open source
- How to make sure your open source is reliable
- A successful story about building an AI Platform with open source
- Give you confidence to use open source on your production site



# Why Open Source?





Standing on the shoulder of  
the giant





# What Does Openness Mean?

- Open Source
- Open Design
- Open Development
- Open Community



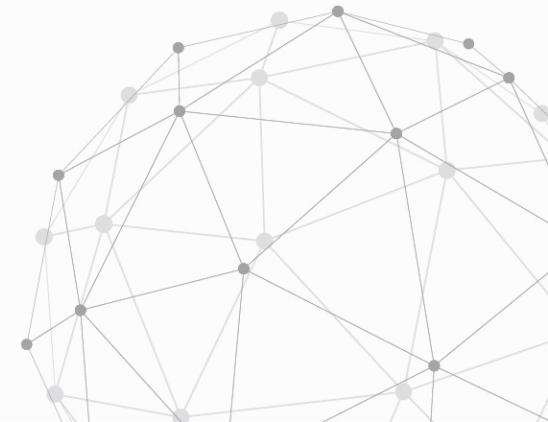
# Open Source Benefits

- Leverage Open Source
- International Trend
- International Requirement
- International Business Opportunity
- Learn from International Open Source Company  
(include process, Tech,...etc.)



# How to Contribute?

- Architecture Design
- Spec. Design
- Blueprint
- Join Discussion
- Commit Code
- Code Review
- Testing
- Project Management
- Process Define
- Marketing Support





# Where to get materials from open source?



ari

# Ask Google???

A screenshot of a web browser displaying the Google search homepage. The address bar shows 'google.com'. The main search bar contains the query 'open source'. A dropdown menu below the search bar lists several related search terms: 'open source', 'open source 中文', 'open source software', 'open source license', 'open source erp', 'open source 歐體', 'open source project', 'open source code', 'open source ptt', and 'open source video editor'. At the bottom of the search bar interface are two buttons: 'Google 搜尋' and '好手氣'.

關於 Google Google 商店 Gmail 圖片 ⋮

open source

- open source
- open source 中文
- open source software
- open source license
- open source erp
- open source 歐體
- open source project
- open source code
- open source ptt
- open source video editor

Google 搜尋 好手氣

回報不適當的預測查詢字串

台灣

廣告 商業 搜尋服務的運作方式

隱私權 服務條款 設定



# Linux Foundation



**CLOUD NATIVE  
COMPUTING FOUNDATION**



CD.FOUNDATION



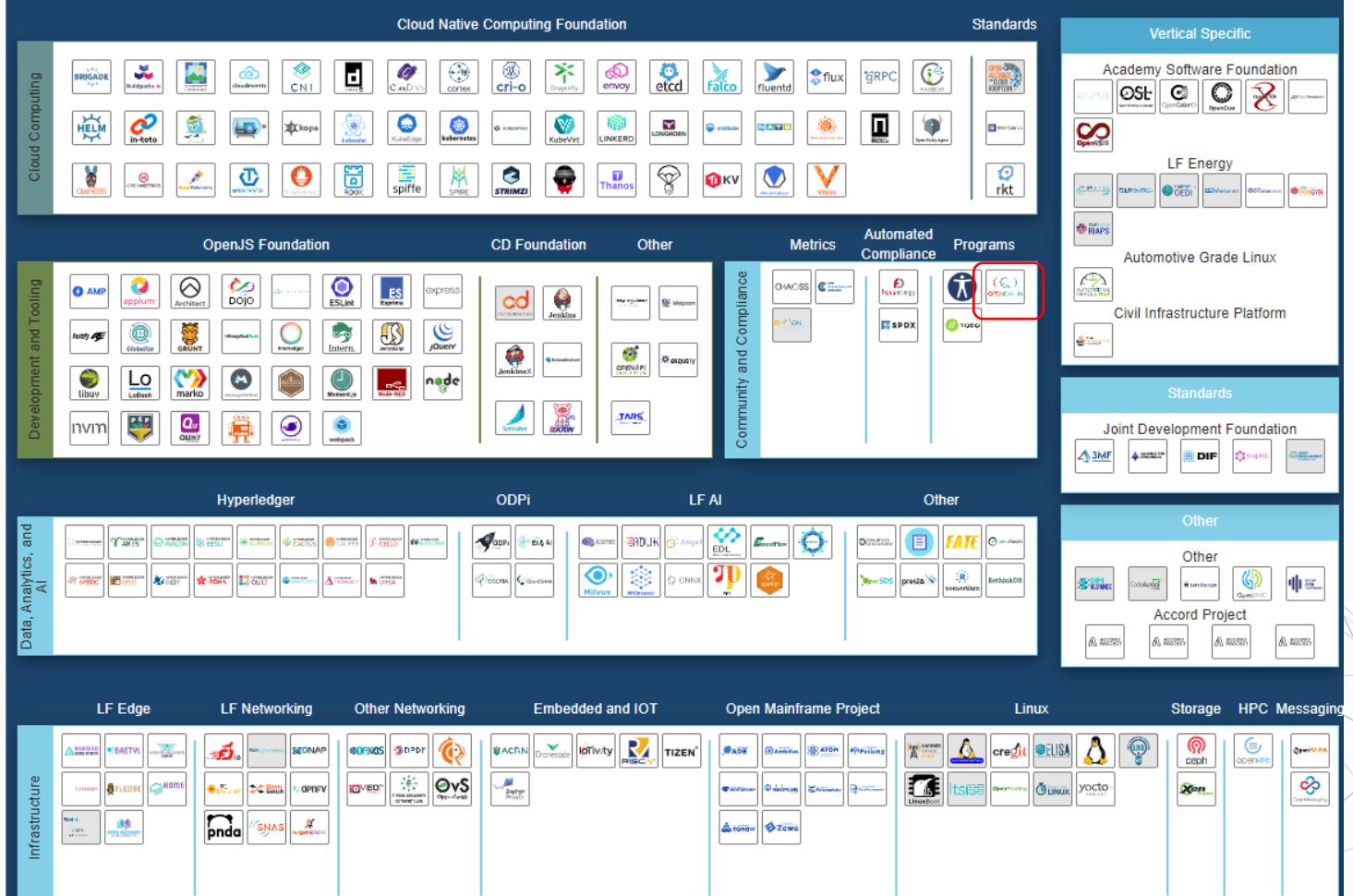


© 2020 ini

## Landscape

## Card Mode

## Members



ari

landscape.linuxfoundation.org/?selected=open-chain-project

# LF Interactive Landscape

The Linux foundation landscape (png, pdf) is dynamically generated below. It is modeled after the CNCF landscape and based on the same open source code. Please open a pull request to correct any issues. Greyed logos are not current.

17.02.18:48Z

You are viewing 226 cards with a total of 1,453,776 stars and funding of \$3M.

Landscape Card Mode

Reset Filters

Grouping N/A

Sort By N/A

Category N/A

LF Relation Any

License Any

Organization Any

Headquarters Location Any

Example filters:

- OS cards by age
- Cards in categories
- Cards by stars
- Group by location
- Group by license
- OS cards by latest commit

Download as CSV

KubeCon CloudNativeCon North America 2020

Virtual IN MEMORY OF DAN KOHN CREATOR OF THE LANDSCAPE

## OpenChain Project

Linux Foundation

Community and Compliance • Programs

Openchain node reference implementation.

Website [openchainproject.org](https://openchainproject.org)

Repository [github.com/openchain/openchain](https://github.com/openchain/openchain) ⚡ 452

Crunchbase [crunchbase.com/organization/linux-foundation](https://crunchbase.com/organization/linux-foundation)

LinkedIn [linkedin.com/company/the-linux-foundation](https://linkedin.com/company/the-linux-foundation)

Twitter @linuxfoundation Latest Tweet this week

First Commit 6 years ago Latest Commit 4 years ago

Contributors 1 Headcount 101-250

Headquarters San Francisco, California

LF Subsidiary Project LF Project Open Source Software License Apache License No CII Best Practices C# 100% Protocol Buffer <1%

Tweet 0

Commits



1 Mar May Jul Sep Nov Jan Mar

### Tweets by @linuxfoundation

The Linux Foundation Retweeted

Chariot Solutions @ChariotSolution 30 Years of Linux and Open Source Software - Where do we go from here? A free webinar with @nithvaruff. Chair

LF Edge LF Networking Other Networking Embedded and IOT Open Mainframe Project Linux Storage HPC Messaging

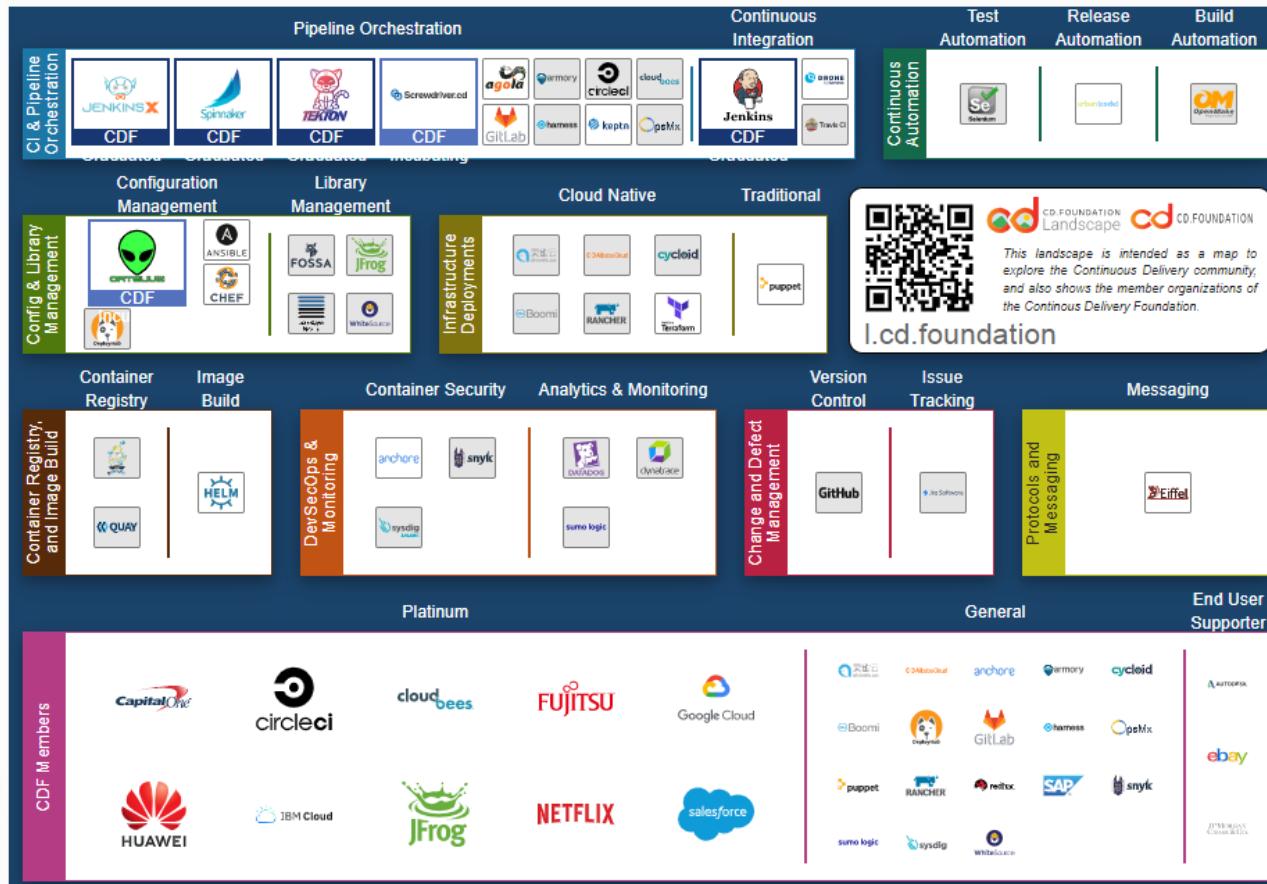
Infrastructure



# CDF Landscape

Landscape

Card Mode



# CNCF Landscape

Landscape   Card Mode   Serverless   Members

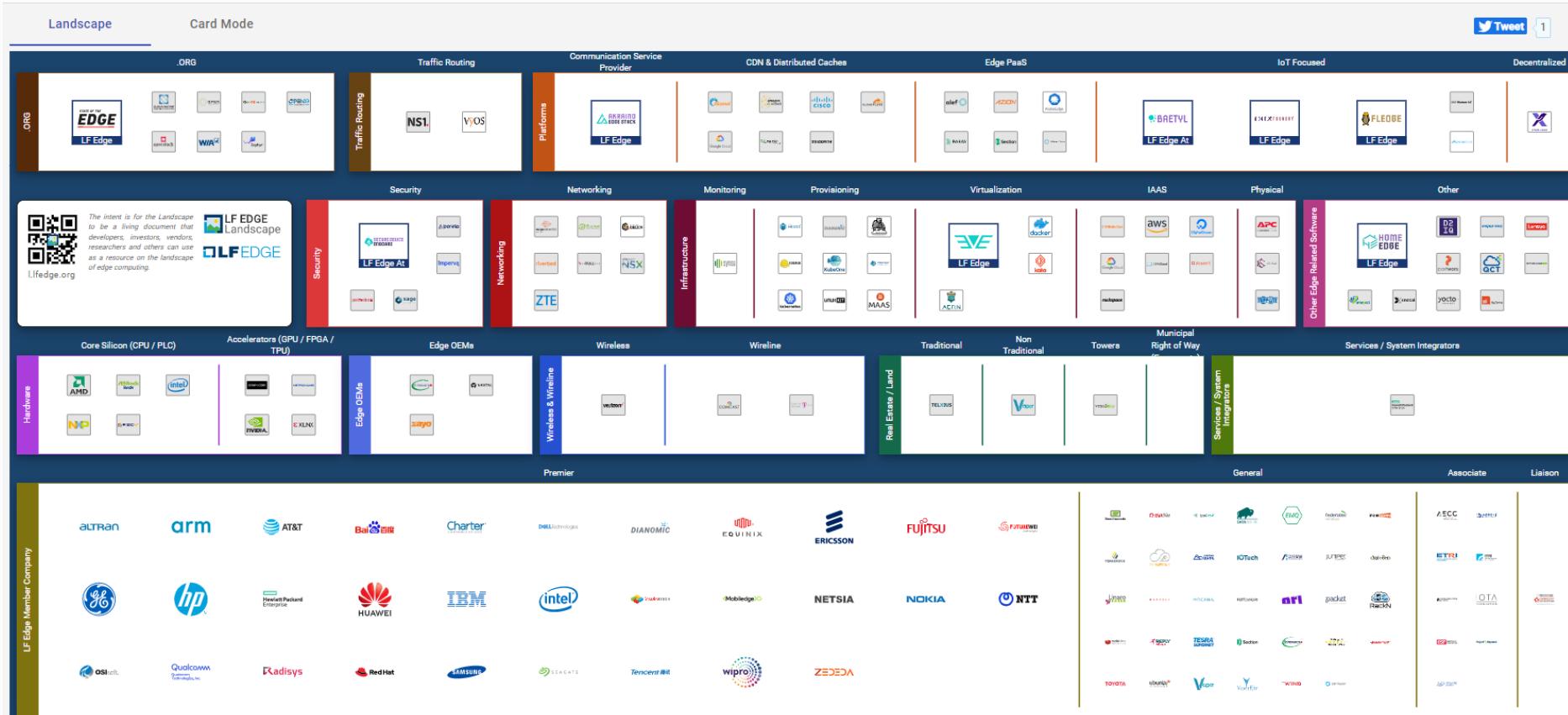
The CNCF Landscape map is a comprehensive visual representation of the cloud native technology ecosystem. It is organized into several main sections:

- Database:** Includes projects like Redis, MySQL, PostgreSQL, MongoDB, and Oracle.
- Streaming & Messaging:** Includes Apache Kafka, Apache Flink, Apache Nifi, Apache Beam, and Apache RocketMQ.
- Application Definition & Image Build:** Includes Helm, Dockerfile, Jenkins, and CircleCI.
- Continuous Integration & Delivery:** Includes Argo, Flux, and GitHub Actions.
- Platform:** Certified Kubernetes - Distribution (AWS, Azure, Google Cloud), Monitoring (CloudWatch Metrics, Prometheus, Grafana), Logging (CloudWatch Logs, Logstash, Fluentd), Tracing (CloudWatch Metrics Insights, Jaeger, Zipkin), and Chaos Engineering (Chaos Mesh, Kubernetes Taints).
- Observability and Analysis:** Includes Thanos, Cortex, and SigNoz.
- Scheduling & Orchestration:** Kubernetes (CNCF), Apache Mesos, Apache YARN, and Apache Spark.
- Coordination & Service Discovery:** CoreDNS (CNCF), etcd, and Consul.
- Remote Procedure Call:** gRPC (CNCF) and Thrift.
- Service Proxy:** Envoy, AVI, BFE, clikr, Kong, and Istio.
- API Gateway:** Kong, Istrio, and Tyk.
- Service Mesh:** Linkerd (CNCF), Istio, and Kuma.
- Cloud Native Storage:** ROOK (CNCF), Ceph, and OpenShift.
- Container Runtime:** CRI-O (CNCF), Docker, and Kata Container.
- Cloud Native Network:** CNI (CNCF), OVS, DPDK, and SR-IOV.
- Automation & Configuration:** Kubernetes (CNCF), Ansible, Chef, Puppet, and SaltStack.
- Container Registry:** Docker, Quay, and Artifactory.
- Security & Compliance:** Open Policy Agent, Falco, and FOSSA.
- Key Management:** Spiffe (CNCF) and Althena.
- Provisioning:** Kubeflow (CNCF), Jenkins, and Terraform.
- Kubernetes Certified Service Provider:** A large grid of logos for various service providers.
- Kubernetes Training Partner:** A large grid of logos for training partners.
- Members:** A large grid of logos for CNCF members.

**Special:** Includes a QR code linking to [l.cncf.io](https://l.cncf.io), a note about the landscape being a map through uncharted terrain, and a mention of CNCF Projects.



# LF Edge Landscape





# LF Edge Landscape

Landscape      Card Mode

Stage 1 At Large (2)

**BAETYL**  
Baetyl ★ 1,368  
LF Edge

**SECURE DEVICE ONBOARD**  
Secure Device Onboard ★ 3  
LF Edge

Stage 2 Growth (4)

**FLEDGE**  
Fledge ★ 12  
LF Edge

**HOME EDGE**  
Home Edge ★ 16  
LF Edge

**STATE OF THE  
EDGE**  
Open Glossary of Edge Computing ★ 112  
LF Edge

**Project EVE**  
Project EVE ★ 160  
LF Edge

Stage 3 Impact (2)

**AKRAINO  
EDGE STACK**  
Akraiño 0  
LF Edge

**EDGE X FOUNDRY**  
EdgeX Foundry ★ 627  
LF Edge

LF Edge Members (75)





# LF AI Landscape

Landscape      Card Mode      LF AI Members

Premier

AT&T      Baidu      ERICSSON      HUAWEI      NOKIA

Tech Mahindra      Tencent      ZILLIZ

ZTE

General

Didi      IBM      TransPerfect      orange      redhat      iStudio      inwinSTACK

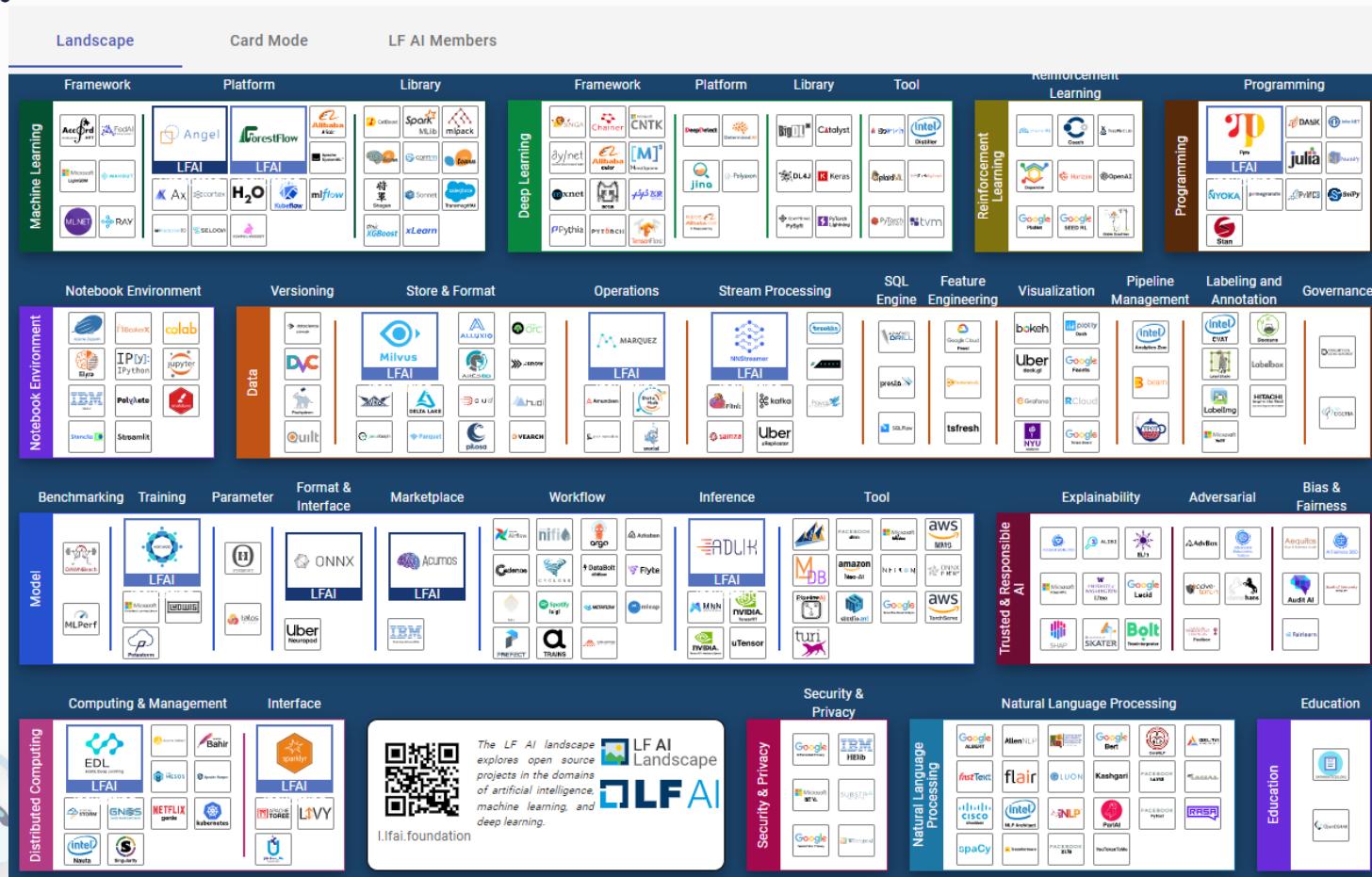
Associate

AI for People      AIRBUS      ETL      MAIEI      NYU      Presidio Graduate School      PSIT





# LF AI Landscape





# LF AI Landscape

Landscape    Card Mode    LF AI Members

Graduated LFAI Projects (3)



**Acumos** ★ 10  
LF Artificial Intelligence Foundation



**Angel** ★ 5,917  
LF Artificial Intelligence Foundation



**ONNX** ★ 8,767  
LF Artificial Intelligence Foundation

Incubating LFAI Projects (9)



**ADLIK** ★ 120  
LF Artificial Intelligence Foundation



**EDL** ★ 91  
(Elastic Deep Learning)  
LF Artificial Intelligence Foundation



**ForestFlow** ★ 35  
LF Artificial Intelligence Foundation



**Horovod** ★ 9,665  
LF Artificial Intelligence Foundation



**MARQUEZ** ★ 330  
LF Artificial Intelligence Foundation



**Milvus** ★ 3,777  
LF Artificial Intelligence Foundation



**NNStreamer** ★ 256  
LF Artificial Intelligence Foundation



**Pyro** ★ 6,347  
LF Artificial Intelligence Foundation



**sparklyr** ★ 744  
LF Artificial Intelligence Foundation

[Twitter](#)



# LF Networking Landscape

Landscape

Card Mode

Members



Infrastructure - LF Networking (9)



FD.io  
LF Networking



LF Networking  
LF Networking



Open Network  
Automation Platform  
LF Networking



OpenDaylight  
LF Networking



OpenSwitch  
LF Networking



OPNFV  
LF Networking



PNDA  
LF Networking



SNAS.io  
LF Networking



Tungsten Fabric  
Tungsten Fabric



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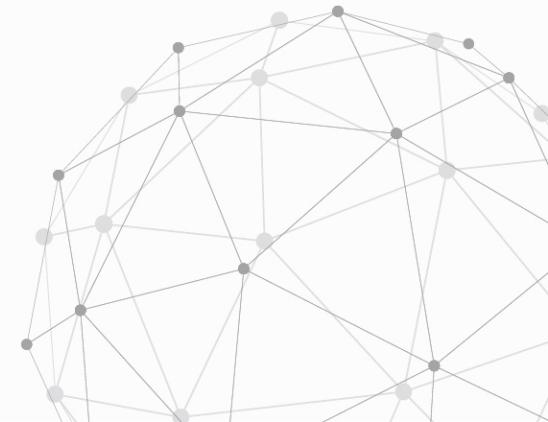




# How to use open source to build an AI Platform

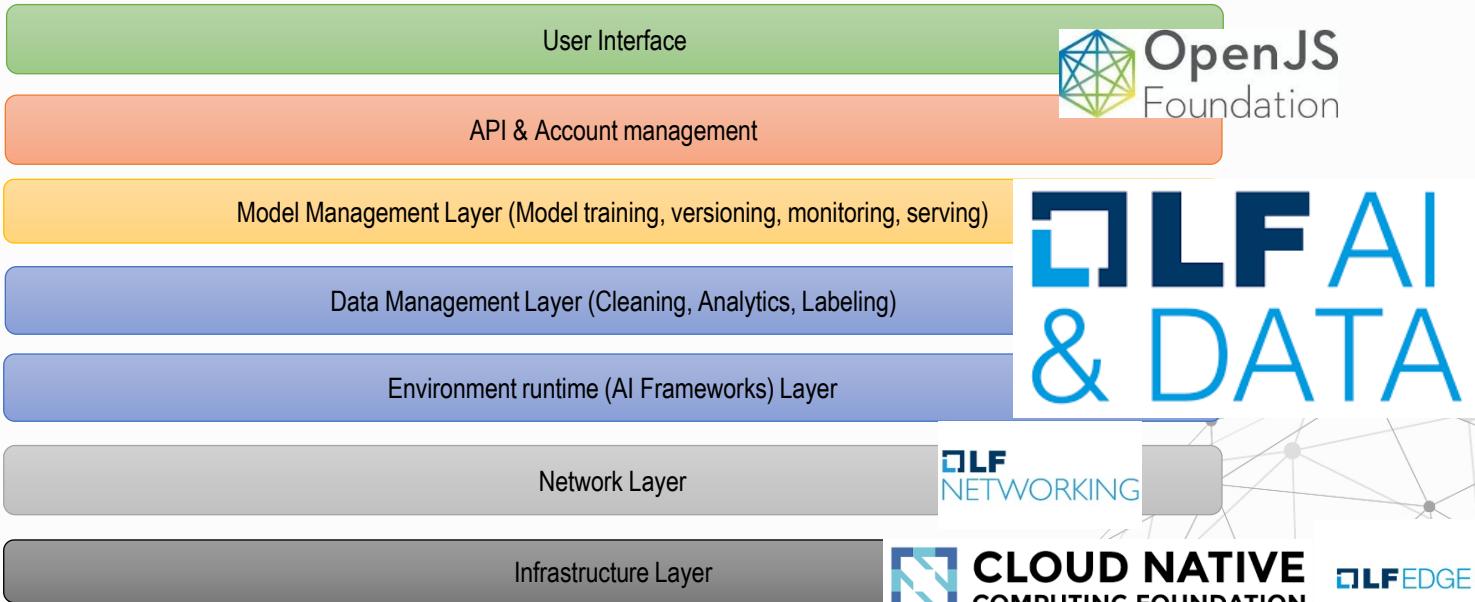


- Define your target customer
- Define your use case
- Define your scope
- Define your Architecture



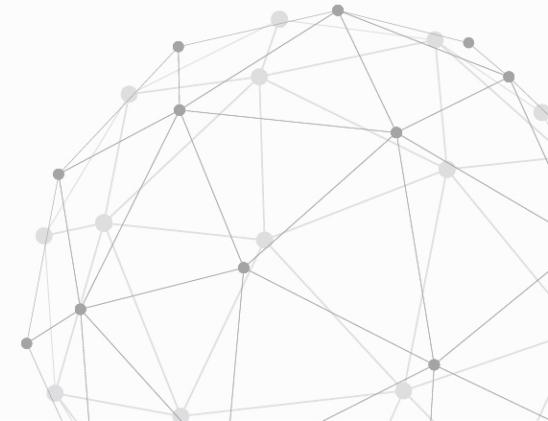


# The AI Platform Basic Architecture

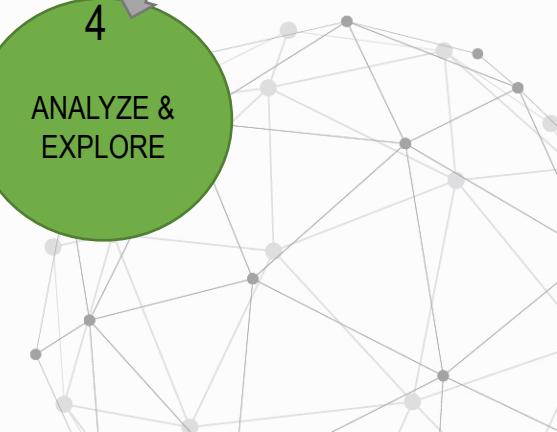
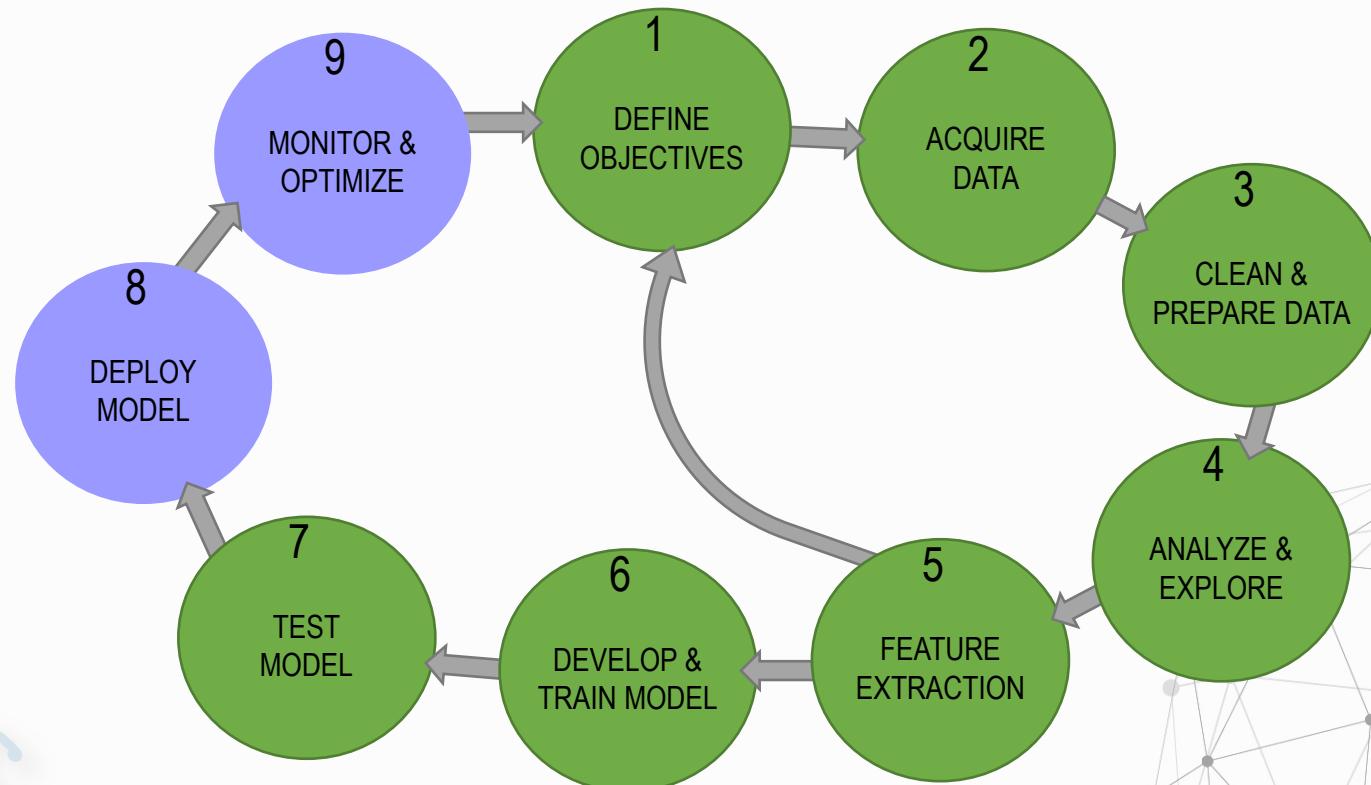




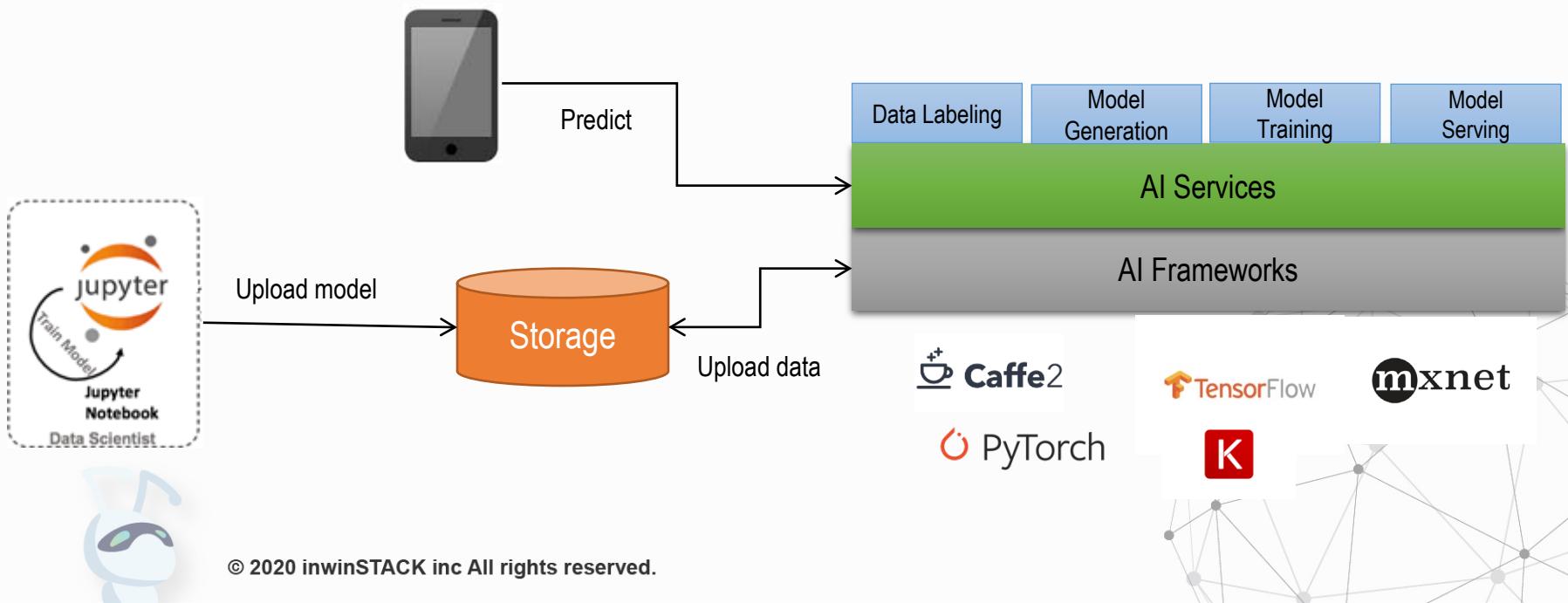
# Take our use case for example



# Machine Learning Lifecycle Management

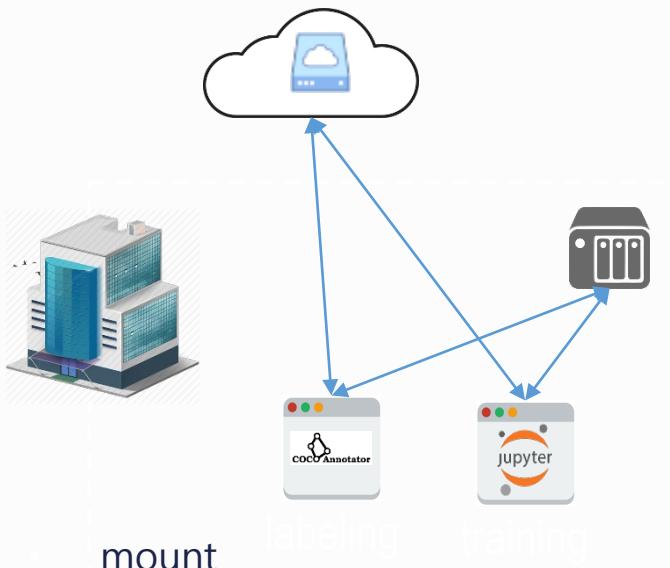


# AI Environment Runtime Use Case





# Fast Provisioning Use Case



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CATALOG

Software

Add

tensorboard

tensorflow

tensorflowkepler

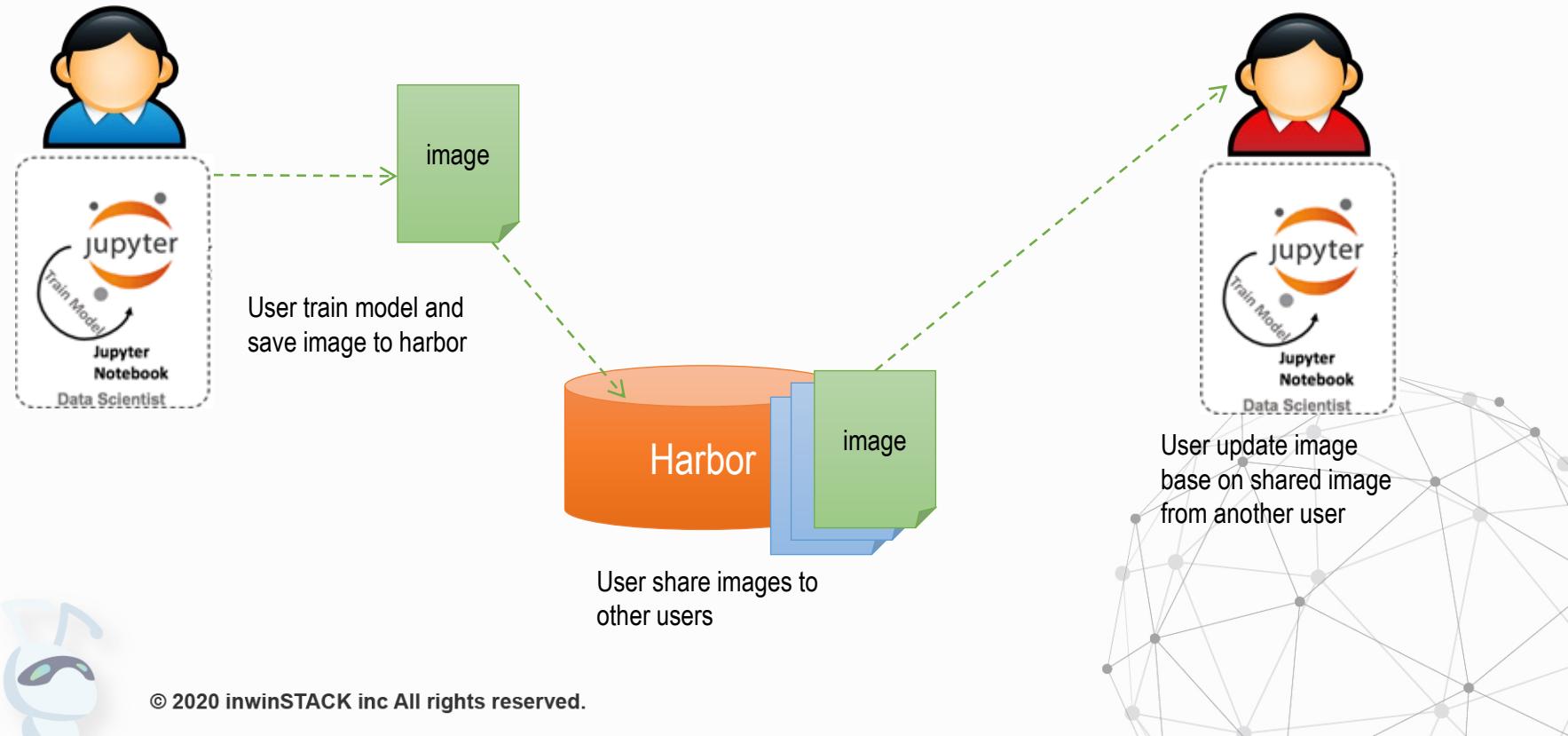
pytorch

pytorchshare

Hello, admin

One Click

# Collaborative Development Use Case





# Streamline your process Use Case

Traditionally, you need to design your code and if there is any dependency during the AI Training, your have to wait...

```
File Edit View Run Kernel Tabs Settings Help
+ □ Launcher CH02.ipynb Python 3
Name Last Modified
coco a month ago
DRD_Data a month ago
mlruns a month ago
pipelines 3 hours ago
QQQ 13 days ago
ryan2 a month ago
ryan3 a month ago
ryan4 a month ago
tensorboard a month ago
01-MP-monite... 11 days ago
abctd 11 days ago
speedrun_tens... a month ago
taxicab-pipeli... 3 hours ago
CH02.ipynb in a few seconds
4. Create a Neural Netowrk
[9]: from keras import models
from keras import layers

network = models.Sequential()
network.add(layers.Dense(512, activation='relu', input_shape=(28 * 28,)))
network.add(layers.Dense(10, activation='softmax'))

5. Compile NN
[10]: from keras import optimizers

# All parameter gradients will be clipped to
# a maximum norm of 1.
sgd = optimizers.SGD(lr=0.01, clipnorm=1)

network.compile(optimizer=sgd,
                loss='mean_squared_error',
                metrics=['accuracy'])

6. Prepare train and test data
[11]: train_images = train_images.reshape((60000, 28 * 28)) #reshape 是 NumPy 的方法
train_images = train_images.astype('float32') / 255

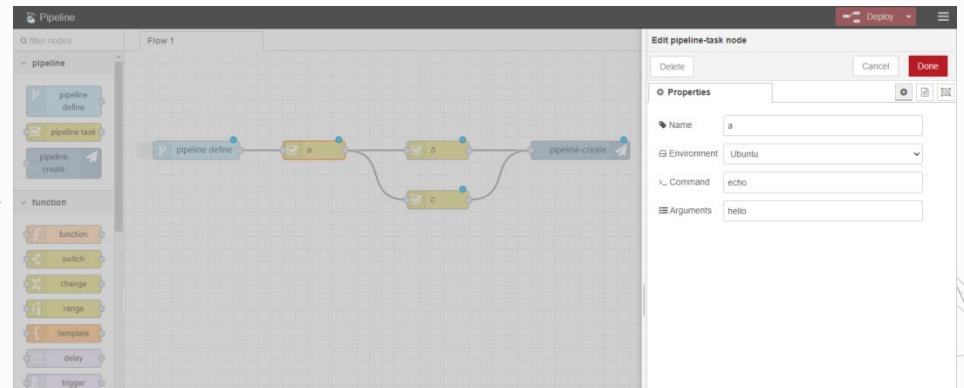
test_images = test_images.reshape((10000, 28 * 28))
test_images = test_images.astype('float32') / 255

7. Prepare label
[12]: from keras.utils import to_categorical
train_labels = to_categorical(train_labels)
test_labels = to_categorical(test_labels)

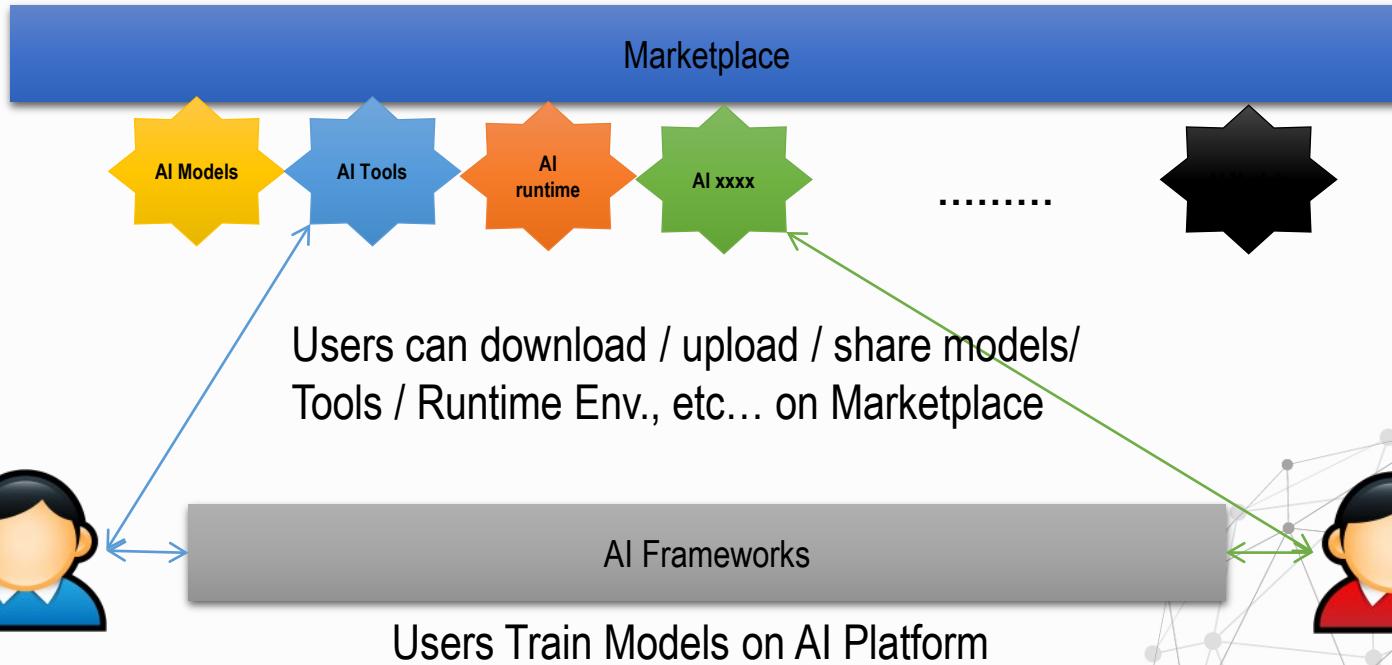
8. Train NN
[13]:
```

Saving completed Mode: Command ↵ Lin 2, Col 14 CH02.ipynb

After using pipeline tools, you can automatically run your training code even if your process have any dependency.

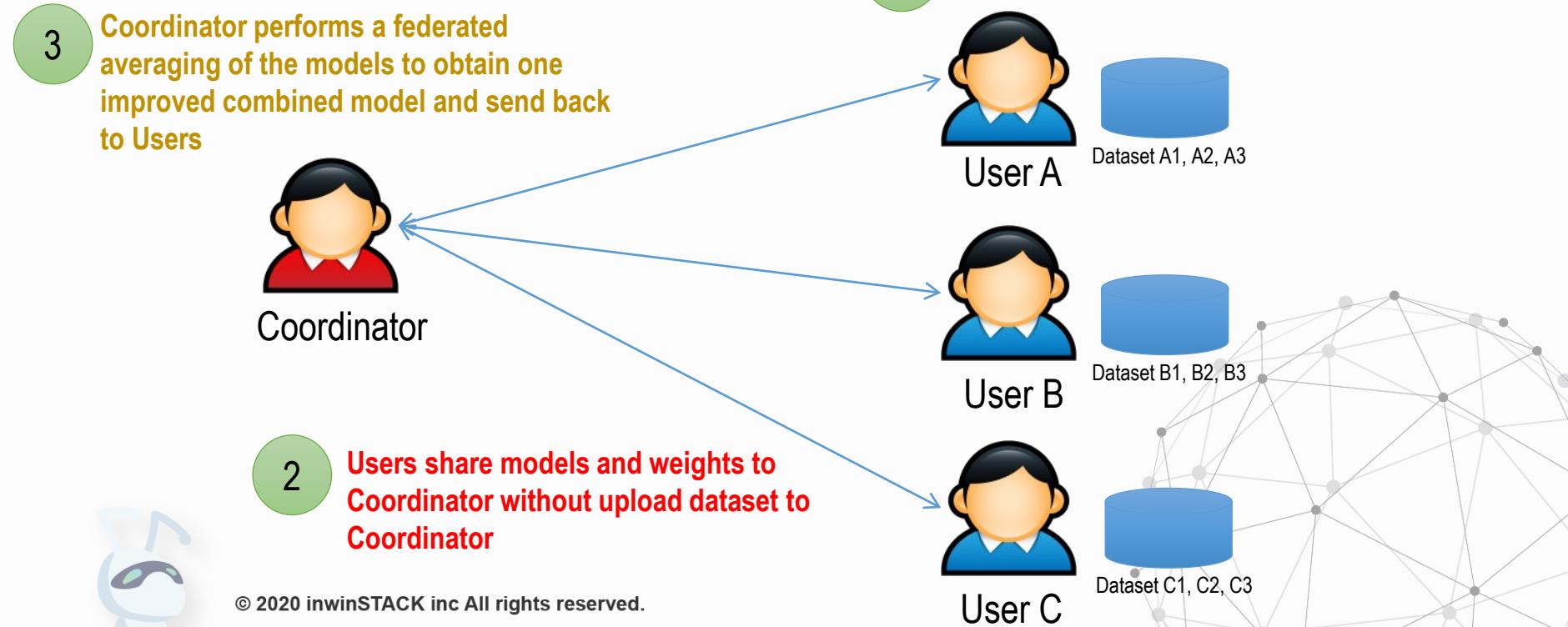


# Marketplace Use Case



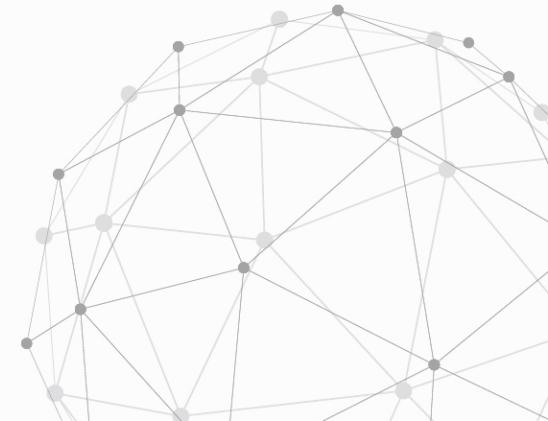
# Federated Learning Use Case

After several rounds, User A, B, C will get a better model with higher accuracy and Coordinator will get the best Model with the highest accuracy



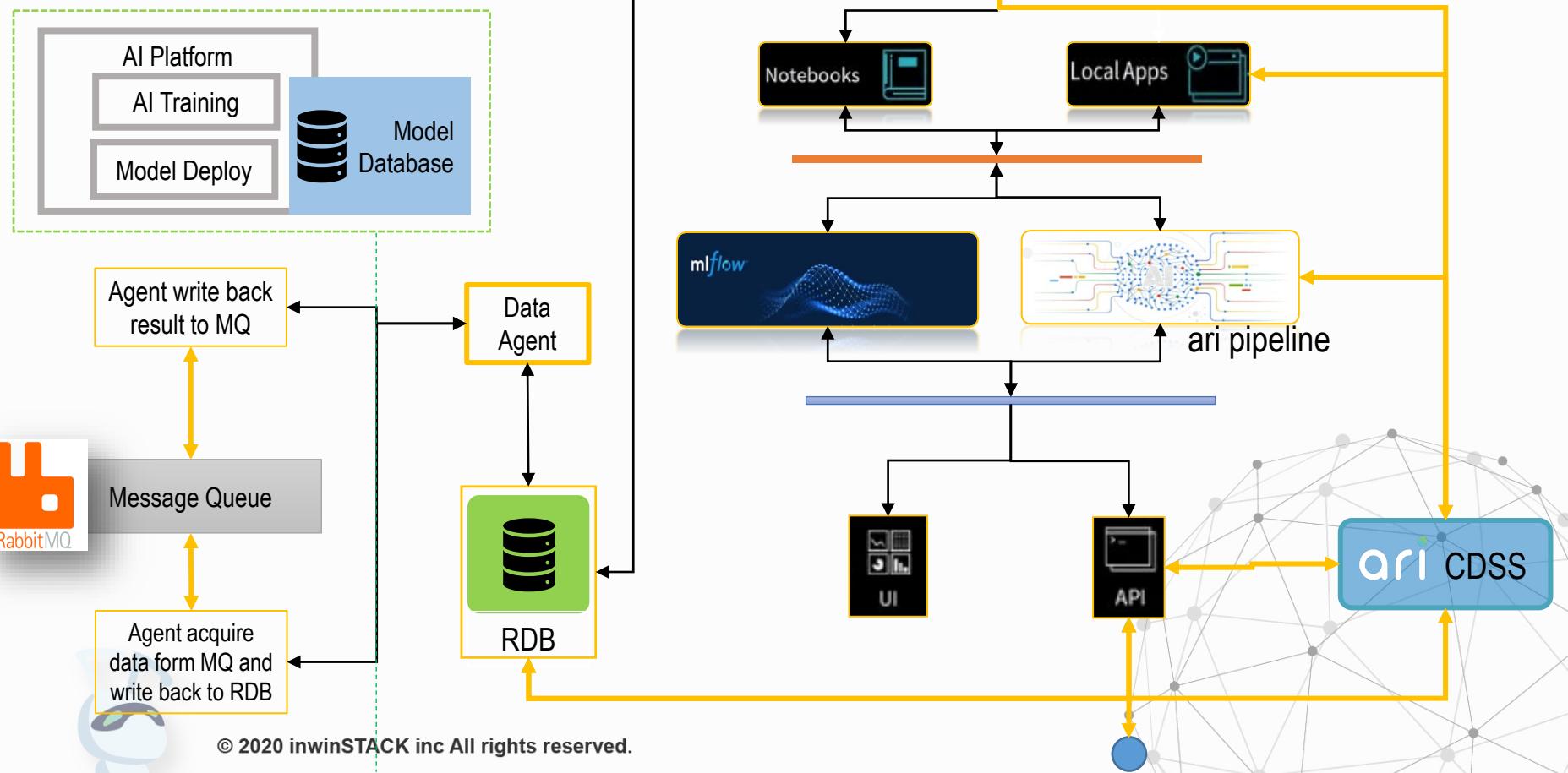


# Real Case for Healthcare Scenario integration



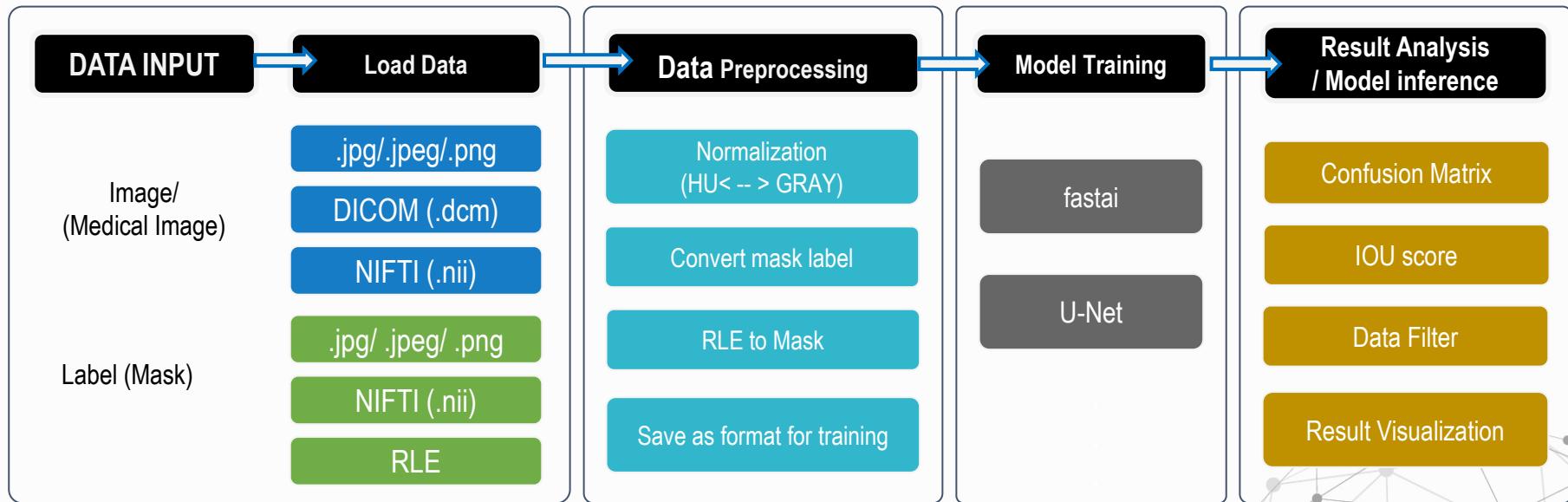


# Healthcare Use Case





# Healthcare with Lifecycle Management Use Case





# How to guarantee your open sources are reliable?



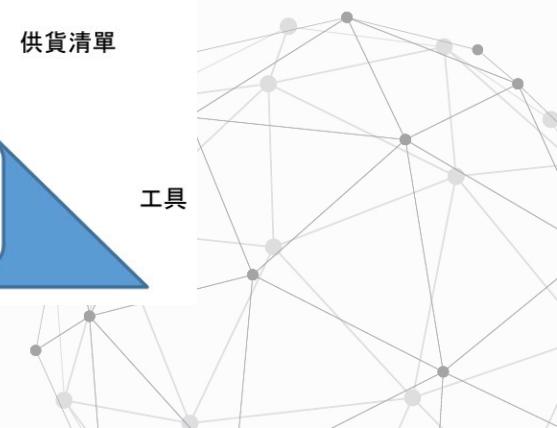
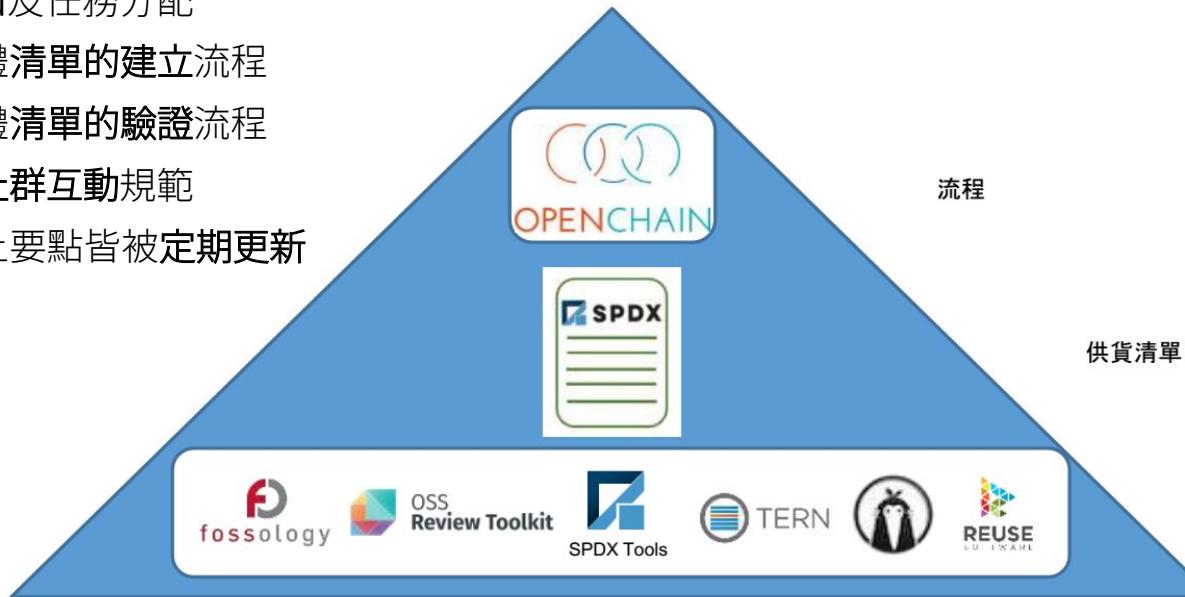
# OPENCHAIN

We define effective open source compliance



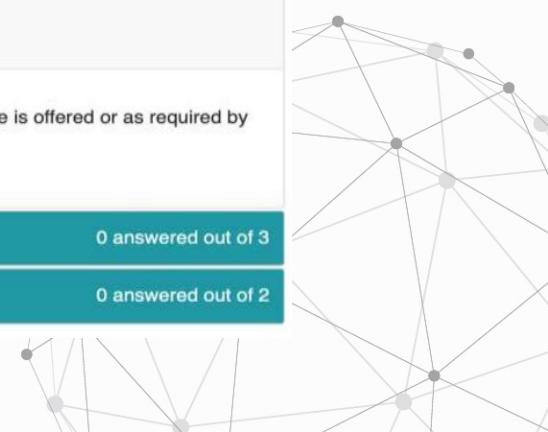
# Open Chain and Scanning Tools

- 1、開源政策書建立框架
- 2、聯絡窗口及任務分配
- 3、開源軟體清單的建立流程
- 4、開源軟體清單的驗證流程
- 5、與開源社群互動規範
- 6、確認以上要點皆被定期更新



# Self-Certification

|   |                      |
|---|----------------------|
| ▶ G1: Know Your Open Source Responsibilities  | 0 answered out of 12 |
| ▶ G2: Assign Responsibility for Achieving Compliance  | 0 answered out of 8  |
| ▶ G3: Review and Approve Open Source Content  | 0 answered out of 8  |
| ▼ G4: Deliver Open Source Compliance Artifacts  | 0 answered out of 3  |
| <p><input type="radio"/> Yes Do you have a documented procedure that describes a process that ensures the Compliance Artifacts are distributed with Supplied Software as required by the Identified Licenses?</p> |                      |
| <p><input type="radio"/> Yes Do you archive copies of the Compliance Artifacts of the Supplied Software?</p>  |                      |
| <p><input type="radio"/> Yes Are the copies of the Compliance Artifacts archived for at least as long as the Supplied Software is offered or as required by the Identified Licenses (whichever is longer)?</p>    |                      |
| ▶ G5: Understanding Open Source Community Engagements   | 0 answered out of 3  |
| ▶ G6: Adherence to the Specification Requirements   | 0 answered out of 2  |





# Get Open Chain Certification

← → C openchainproject.org



Adopt Resources FAQ Community Partners News About



## Publicly Announced ISO/IEC 5230 or Equivalent Programs





# Not only Participate but also Contribute!

← → ⓘ Ifanalytics.io/projects/fedge%2Fkraino-edge-stack/dashboardv=global%2Fdocumentation%2Confluence%2Foverview

Return to CommunityBridge Website [Twitter](#) [Facebook](#) [LinkedIn](#) [YouTube](#)

Projects Admin Sign In [Get Help](#)

### Activity By Organization Per Day

The chart displays the total activity count per day, broken down by organization. The y-axis represents the count from 0 to 160, and the x-axis shows dates from April 26 to July 7, 2020. The legend includes: Unknown, ARM, Intel Corporation, Huawei Technologies Co., Ltd., Equinix, China Mobile Co., AT&T Services, Inc., Tencent Holdings Limited, Baidu, The Linux Foundation, irwinSTACK, ByteDance, Red Hat Inc., REBACA, Futurewei Technologies, Enea, and Trinoma Networks.

### Editors By Organization

A donut chart illustrating the proportion of editors from various organizations. The largest segments are Unknown (orange), ARM (yellow), and Intel Corporation (blue).

### Top Organizations

| Organization                           | Page Edits | New Pages | Comments | Blog Posts | Attachments | Last Action Date |
|--|------------|-----------|----------|------------|-------------|------------------|
| Unknown                                | 347        | 44        | 6        | 0          | 31          | Jul 17th 2020    |
| ARM                                    | 234        | 49        | 0        | 0          | 123         | Jul 16th 2020    |
| Intel Corporation                      | 210        | 7         | 61       | 0          | 18          | Jul 16th 2020    |
| Huawei Technologies Co., Ltd.          | 158        | 20        | 0        | 0          | 45          | Jul 4th 2020     |
| China Mobile Communication Company Ltd | 129        | 3         | 0        | 0          | 24          | Jul 16th 2020    |
| Equinix                                | 106        | 10        | 2        | 0          | 49          | Jul 17th 2020    |
| The Linux Foundation                   | 93         | 1         | 0        | 0          | 0           | Jul 16th 2020    |
| AT&T Services, Inc.                    | 83         | 14        | 0        | 0          | 29          | Jul 16th 2020    |
| Tencent Holdings Limited               | 82         | 7         | 0        | 0          | 14          | Jul 16th 2020    |
| irwinSTACK                             | 79         | 0         | 0        | 0          | 13          | Jul 7th 2020     |

### Top Editors

| Editor              | Page Edits | New Pages | Comments | Blog Posts | Attachments | Last Action Date |
|---------------------|------------|-----------|----------|------------|-------------|------------------|
| Tina Tsou           | 228        | 49        | 0        | 0          | 123         | Jul 16th 2020    |
| Aaron Don Williams  | 150        | 25        | 2        | 0          | 11          | Jul 17th 2020    |
| Abhijit Dasgupta    | 122        | 16        | 0        | 0          | 25          | Jun 19th 2020    |
| Oleg Berzin         | 106        | 10        | 2        | 0          | 49          | Jul 17th 2020    |
| bpreston            | 93         | 1         | 0        | 0          | 0           | Jul 16th 2020    |
| Igor Duarte Cardoso | 83         | 4         | 3        | 0          | 3           | Jun 18th 2020    |
| Thor Chin           | 79         | 0         | 0        | 0          | 13          | Jul 7th 2020     |
| Feng Yang           | 66         | 7         | 0        | 0          | 11          | Jul 16th 2020    |
| hanyu ding          | 65         | 1         | 0        | 0          | 18          | Jul 16th 2020    |
| Randy Stricklin     | 58         | 0         | 0        | 0          | 5           | Jul 13th 2020    |

Export: Raw [Raw](#) Formatted [Formatted](#)

A network graph visualization showing connections between entities. Nodes are represented by circles of varying sizes, and edges represent relationships between them. A red box highlights the entry for Thor Chin in the Top Editors table.





# Thank You



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[facebook.com/inwinstack](https://facebook.com/inwinstack)



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[www.inwinstack.com](http://www.inwinstack.com)

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