

Meeting of the LF AI & Data Technical Advisory Council (TAC)

July 28, 2022

 LF AI & DATA

Antitrust Policy

- › Linux Foundation meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.
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Recording of Calls

Reminder:

TAC calls are recorded and available for viewing on the [TAC Wiki](#)

Reminder: LF AI & Data Useful Links

- › Web site: lfaidata.foundation
- › Wiki: wiki.lfaidata.foundation
- › GitHub: github.com/lfaidata
- › Landscape: <https://landscape.lfaidata.foundation> or <https://l.lfaidata.foundation>
- › Mail Lists: <https://lists.lfaidata.foundation>
- › Slack: <https://slack.lfaidata.foundation>
- › Youtube: <https://www.youtube.com/channel/UCfasaeqXJBCAJMNO9HcHfbA>
- › LF AI Logos: <https://github.com/lfaidata/artwork/tree/master/lfaidata>
- › LF AI Presentation Template: https://drive.google.com/file/d/1eiDNJvXCqSZHT4Zk_-czASlz2GTBRZk2/view?usp=sharing

- › Events Page on LF AI Website: <https://lfaidata.foundation/events/>
- › Events Calendar on LF AI Wiki (subscribe available): <https://wiki.lfaidata.foundation/pages/viewpage.action?pageId=12091544>
- › Event Wiki Pages: <https://wiki.lfaidata.foundation/display/DL/LF+AI+Data+Foundation+Events>

Agenda

- › Roll Call (2 mins)
- › Approval of Minutes from previous meeting (2 mins)
- › Outreach speaking opportunity (2 mins)
- › FATE Incubation Project proposal – Henry Zhang – 20 minutes
- › Using LFX Insights by Jen Shelby (LF) 15 mins
- › LF AI General Updates (2 min)
- › Open Discussion (2 min)

TAC Voting Members - Please note

Please ensure that you do the following to facilitate smooth procedural quorum and voting processes:

- Change your Zoom display name to include your First/Last Name, Company/Project Represented
 - example: Nancy Rausch, SAS
- State your First/Last Name and Company/Project when submitting a motion
 - example: First motion, Nancy Rausch/SAS

TAC Voting Members

Note: we still need a few designated backups specified on [wiki](#)

Member Representatives (9 out of 17 required for quorum)

Member Company or Graduated Project	Membership Level or Project Level	Voting Eligibility	Country	TAC Representative	Designated TAC Representative Alternates
4paradigm	Premier	Voting Member	China	Zhongyi Tan	
Baidu	Premier	Voting Member	China	Ti Zhou	Daxiang Dong, Yanjun Ma
Ericsson	Premier	Voting Member	Sweden	Rani Yadav-Ranjan	
Huawei	Premier	Voting Member	China	Howard (Huang Zhipeng)	Charlotte (Xiaoman Hu) , Leon (Hui Wang)
Nokia	Premier	Voting Member	Finland	@ Michael Rooke	@ Jonne Soininen
OPPO	Premier	Voting Member	China	Jimin Jia	
SAS	Premier	Voting Member	USA	*Nancy Rausch	JP Trawinski
ZTE	Premier	Voting Member	China	Wei Meng	Liya Yuan
Acumos Project	Graduated Technical Project	Voting Member	USA	Amit Kumar	Prasanna Kulkarni
Adversarial Robustness Toolbox Project	Graduated Technical Project	Voting Member	USA	Beat Buesser	
Angel Project	Graduated Technical Project	Voting Member	China	Bruce Tao	Huaming Rao
Egeria Project	Graduated Technical Project	Voting Member	UK	Mandy Chessell	Nigel Jones, David Radley, Maryna Strelchuk, Ljupcho Palashevski, Chris Grote
Flyte Project	Graduated Technical Project	Voting Member	USA	Ketan Umare	
Horovod Project	Graduated Technical Project	Voting Member	USA	Travis Addair	
Milvus Project	Graduated Technical Project	Voting Member	China	Xiaofan Luan	Jun Gu
ONNX Project	Graduated Technical Project	Voting Member	USA	Alexandre Eichenberger	Prasanth Pulavarthi, Jim Spohrer
Pyro Project	Graduated Technical Project	Voting Member	USA	Fritz Obermeyer	

*Current TAC Chairperson

Minutes approval

Approval of June 30, 2022 Minutes

Draft minutes from the June 30th TAC call were previously distributed to the TAC members via the mailing list

Proposed Resolution:

- › That the minutes of the June 30th meeting of the Technical Advisory Council of the LF AI & Data Foundation are hereby approved.

Outreach opportunity

 OLF AI & DATA

OSS EU in Dublin Mini-summit Speaking Opportunity

- › There is an opportunity to speak as a representative of LF AI & Data at the upcoming OSS EU in Dublin, Ireland
- › Date/Time: Monday, September 12th, 2022 from 2:00-5:30 pm IST (UTC+1)
- › Proposed agenda and more info can be found at this link: [Agenda](#)
- › Please contact Erin Thacker ethacker@linuxfoundation.org if you are interested

FATE Project

 OLF AI & DATA

Proposal for FATE to join LF AI & DATA

The logo for FATE (Federated AI Technology Enabler) features the word "FATE" in a bold, italicized, yellow font. The letters are composed of several overlapping, semi-transparent yellow shapes that create a sense of depth and movement.

Federated AI Technology Enabler

Henry Zhang

FATE TSC Board Member, Development Committee Chair

Agenda

01

**FATE OSS
Community**

02

03

FATE: The world's first open source community of federated learning

FATE OSS community is the platform of privacy preserving and federated learning for developers, contributors, users and partners. It is the first industrial grade federated learning framework. The vision of the community is "Open source, open community and co-innovation".

FATE

Federated AI Technology Enabler

Vision: Open source, open community and co-innovation

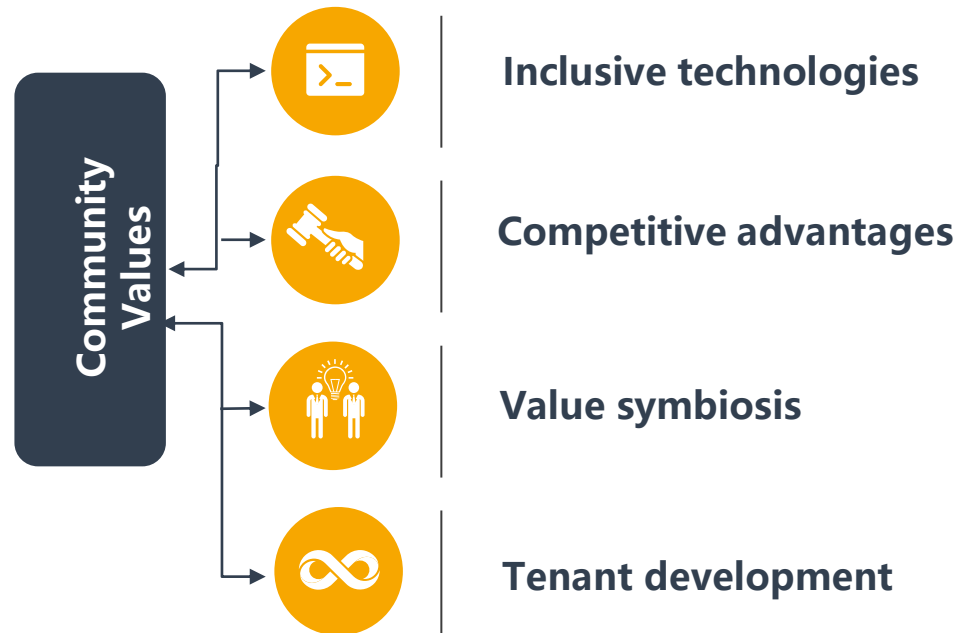
4000+ engineers and developers

1000+ enterprises, 400+ Universities

4400+ GitHub Stars

188.24K Lines of code

2.79K Pull Requests



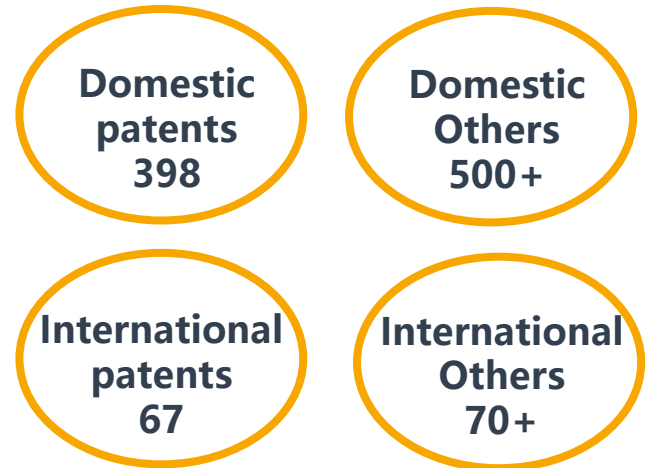
FATE Overview

- Industrial federated learning system
- Effectively assists multiple organizations in data usage and federated modeling
- Actively promotes federated learning industry ecosystem



Design Principals

- Federated algorithms with high performance
- Multi-party secure computing protocols
- Cross-domain interactive management
- Auditing for governance requirements



From the survey of the **China Academy of Information and Communications Technology (CAICT)**, **55%** of privacy computing products in China are based on OSS projects, the majority of which are FATE.

Governance Model

Technical Steering Committee (TSC)



Technical Steering Committee

FATE technical leadership team, is responsible for long-term development plan and community guidelines.

Dev. specialty Committee

The project development leadership team, which is responsible for delivering FATE OSS development with high quality.

Ops. specialty Committee

FATE operational team, includes 5 subgroups: standardization, events & activities, self-media, PR, and outreach.

Sec. specialty Committee

FATE security and compliance team, is responsible for community technical security supervision, OSS security compliance management

Specialty Committees



Technical Steering Committee Chairs



TSC Chair

Qiang Yang

- **AAAI/ACM/CAAI/IEEE/IAPR/AAAS Fellow**
- **Chair Professor, Department of CSE, HKUST**
- **Chairman of Hong Kong Society for Artificial Intelligence and Robotics**
- **Chair of Investment Technology League ACM TIST, IEEE TRANS on BIG DATA Founder and Chief Editor**



TSC Honorary Chair

Jie Tang

- **ACM/IEEE Fellow**
- **Professor and Deputy Head of Computing Science Department, Tsinghua University**
- **National Outstanding Youth, Outstanding Youth Scholar Award**
- **300+ papers, ACM SIGKDD Test-of-Time Award winner**
- **Chief editor of IEEE T. on Big Data, AI OPEN**

Technical Steering Committee

TSC Board



Key contributors

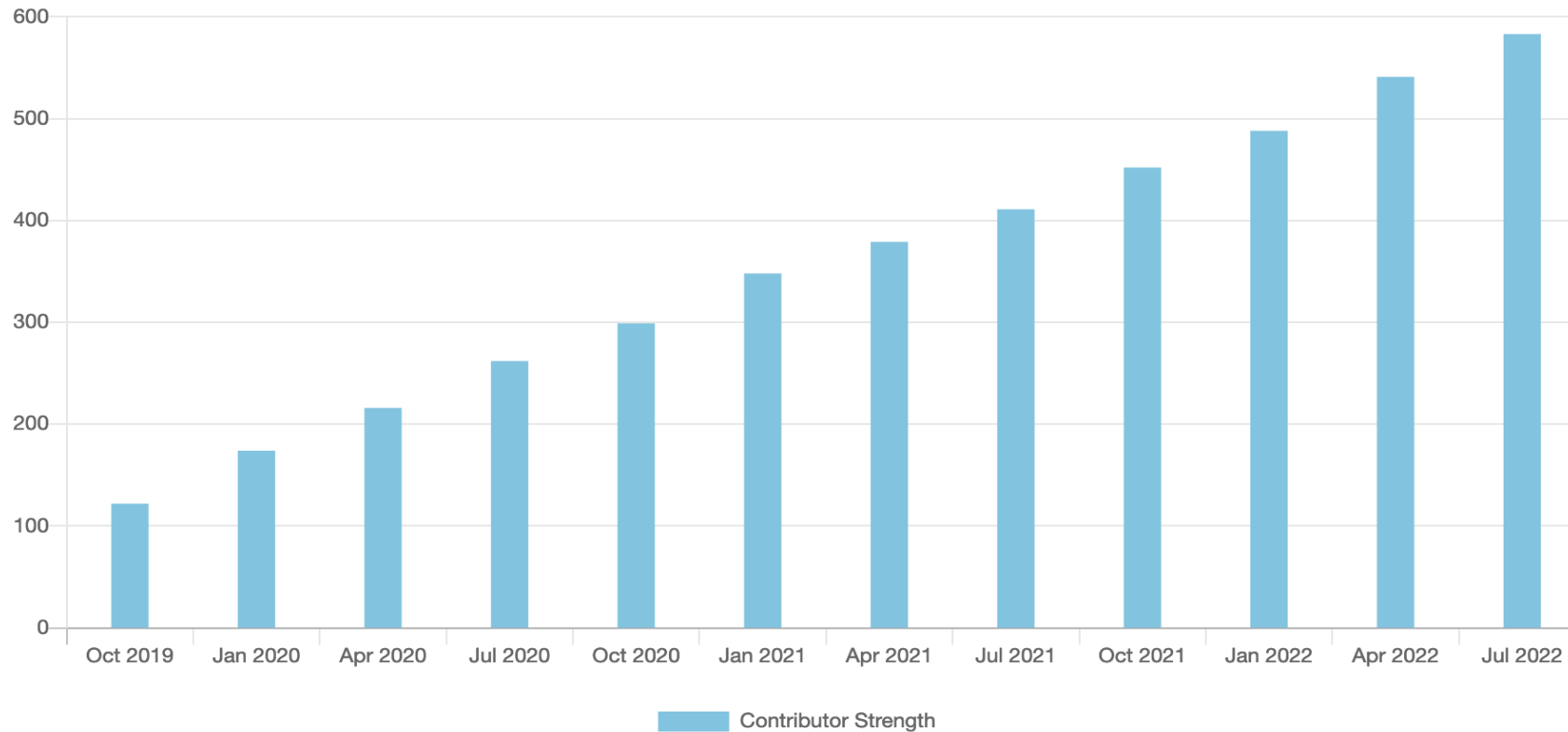


TSC Maintainers

Maintainer name	Affiliation
Dylan Fan	WeBank
Chris Huo	CCBFT
Rade Liu	Tencent
Yang Liu	Independent
Zotrseeew Ma	WeBank
Layne Peng	VMware
Chuang Zhang	Independent
Peng Wang	EB China Tech
Runyuan Wang	BOC
Wenbin Wei	WeBank
Anying Xu	ABC
Jarvis Zeng	WeBank
Henry Zhang	VMware
Junxue Zhang	Cluster
Qing Zhang	China Telecom
Yongkai Zhou	China UnionPay

Contributor Strength

- The contributor strength increased by 377% during the last 3 Years.

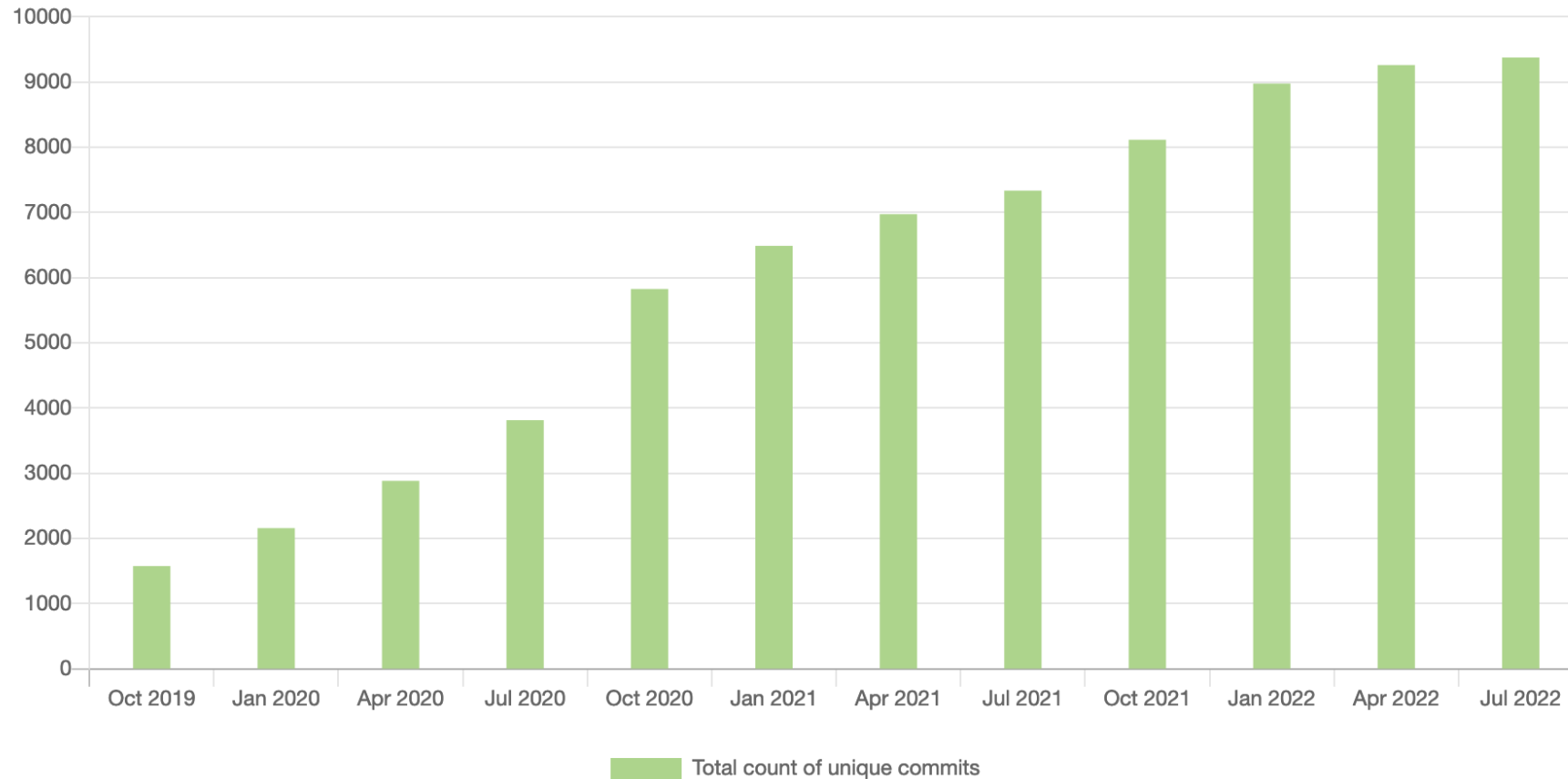


Source: https://insights.lfx.linuxfoundation.org/projects/federatedai%2Ffederatedai-fate/dashboard;quicktime=time_filter_3Y

Commits Growth



A growth of 494.92% in the total commits during the last 3 Years.



Source: https://insights.lfx.linuxfoundation.org/projects/federatedai%2Ffederatedai-fate/dashboard;quicktime=time_filter_3Y

Why Join LF AI & Data

- FATE has been an OSS project hosted by Linux Foundation since 2019
 - Vendor-neutral
 - Transparent and open governance model
 - Community collaboration
- FATE well aligns with LF AI & DATA's mission on building and supporting an open AI and data community.
- To further increase the contributor and user base around the globe
- To better collaborate with other projects and members in the AI and data space
- To focus and take leadership in federated learning and data privacy protection area

Proposal for FATE to become an incubation project under LF AI & DATA

- FATE has a large number of users and contributors in the community
- Some enterprises already deployed FATE in production
- Three major contributors: WeBank, VMware, Clustar

- Need more involvement from the community for broader adoption and finally reach the stage of graduation

Proposal : <https://github.com/lfai/proposing-projects/blob/master/proposals/FATE.md>

Potential collaboration with projects hosted by LF AI & DATA

- Kserve: already leverage KServe to serves federated learning models.
- ONNX: FATE's models can be converted to ONNX format for broader use
- Horovod: distributed training in federated learning
- OpenDataology: compliance of dataset licenses of multiple data sources.
- Substra: federated learning task orchestration

Agenda

01

02

03

**FATE Framework
and Practice**

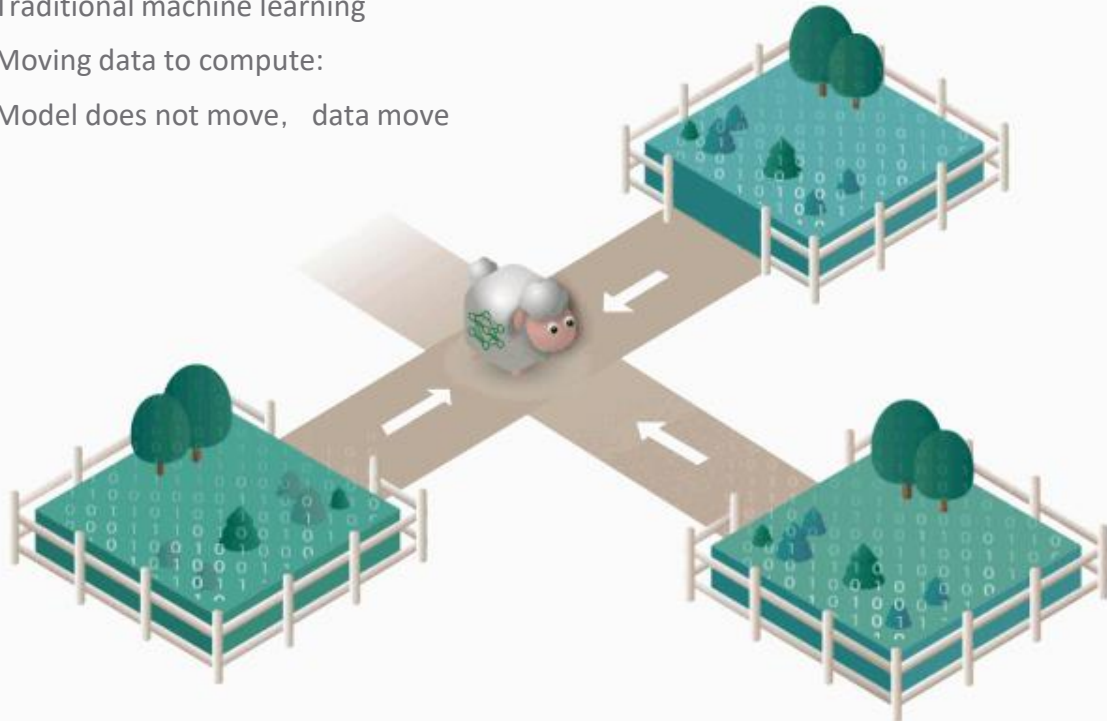
Federated learning: Paradigm shift - moving compute to data

- Optimized model built from data of multiple organizations or from different places
- Preserve data privacy and confidentiality
- Communication cost reduction

Traditional machine learning

Moving data to compute:

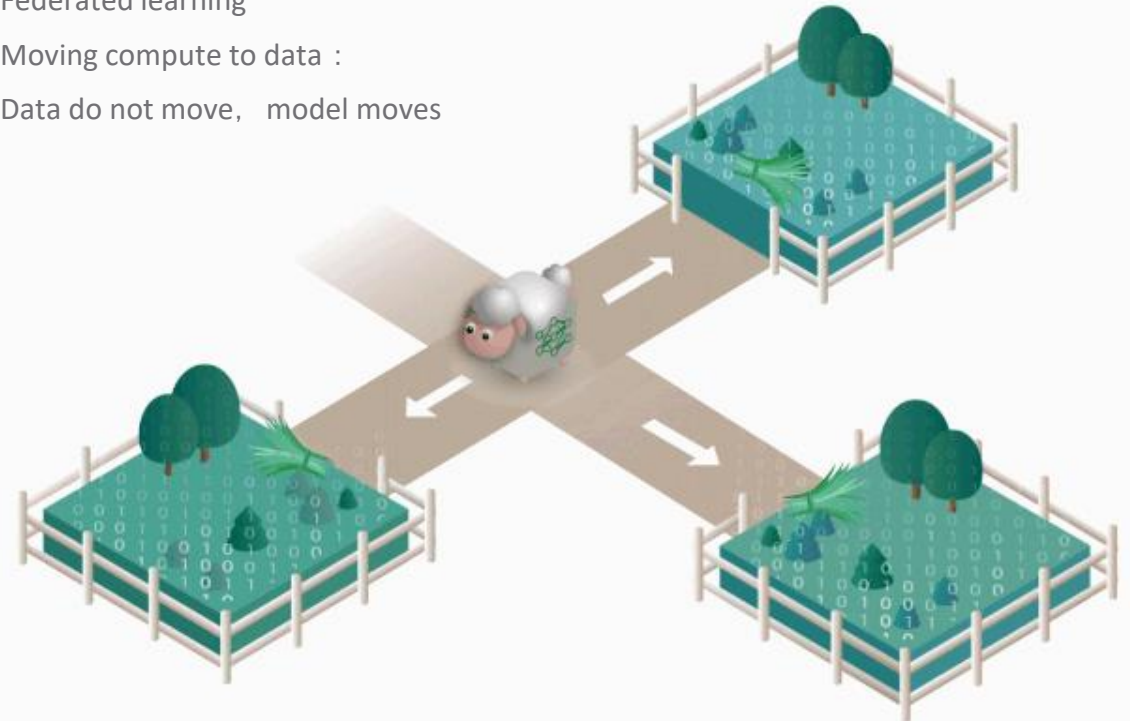
Model does not move, data move



Federated learning

Moving compute to data :

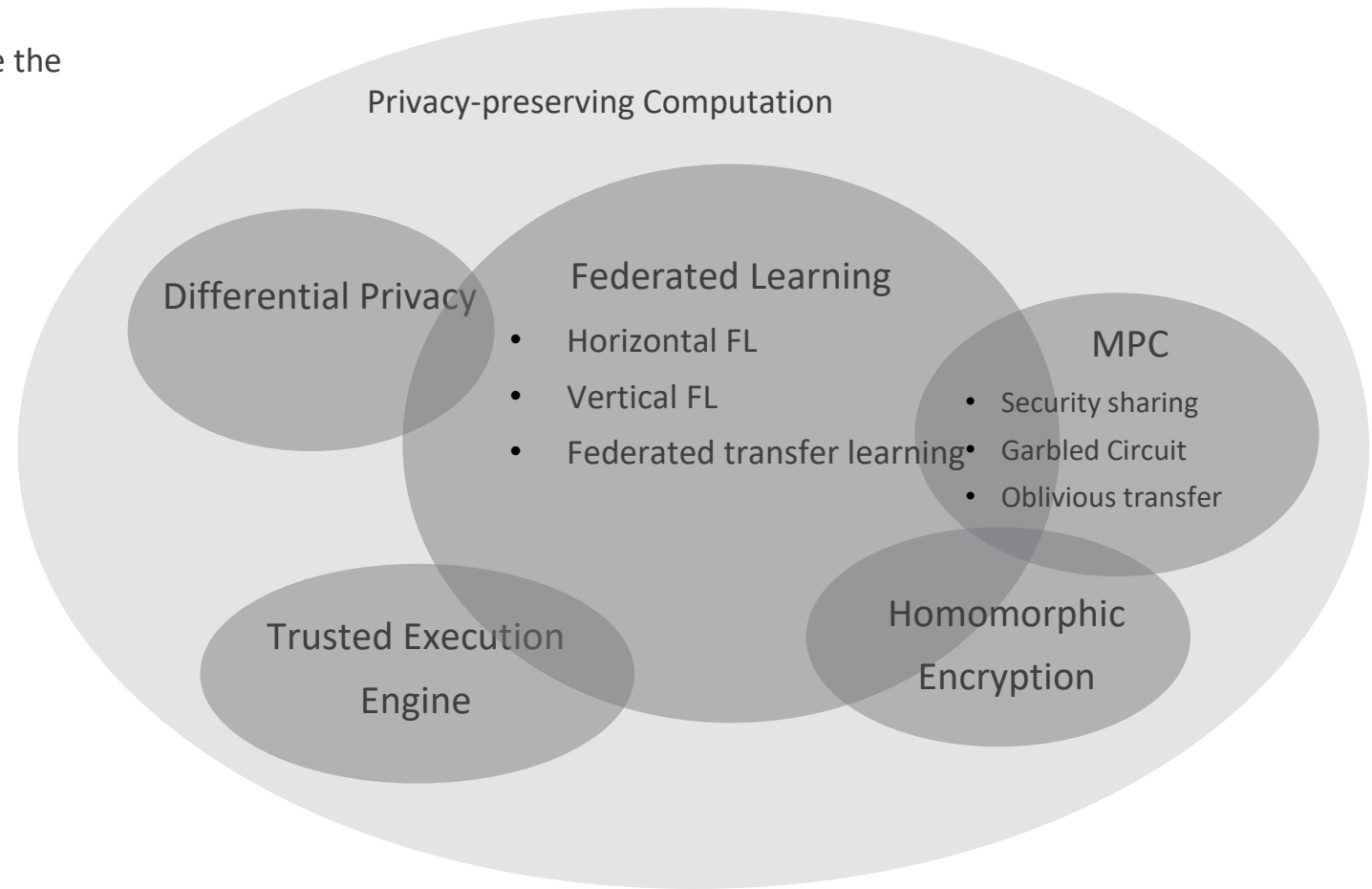
Data do not move, model moves



(Source: Federated Learning (Synthesis Lectures on Artificial Intelligence and Machine Learning) , Qiang yang , *et al.*)

Security and privacy preserving in federated learning

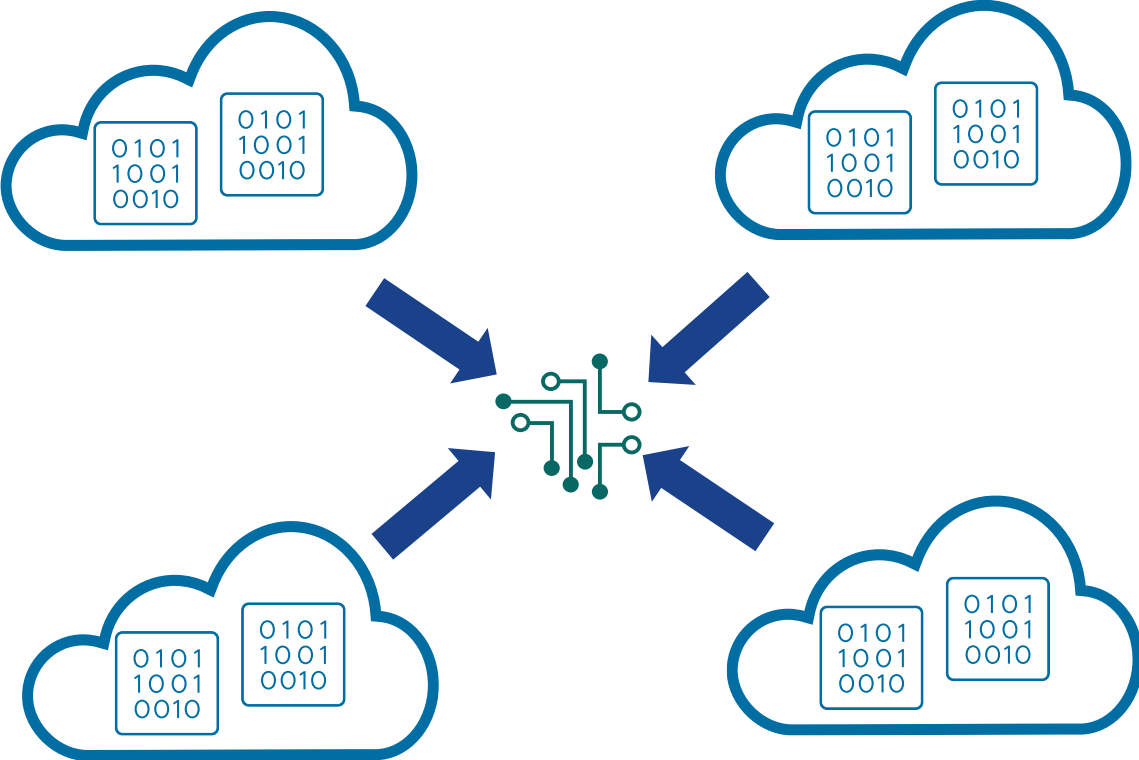
- Federated learning is a subset of machine learning;
- Federated learning uses different technologies to preserve the privacy:
 - Homomorphic encryption
 - TEE
 - Differential privacy
 - MPC



(Source: Privacy-preserving Computing, Chen Kai, Qiang Yang, First Edition, PHEI, 2022)

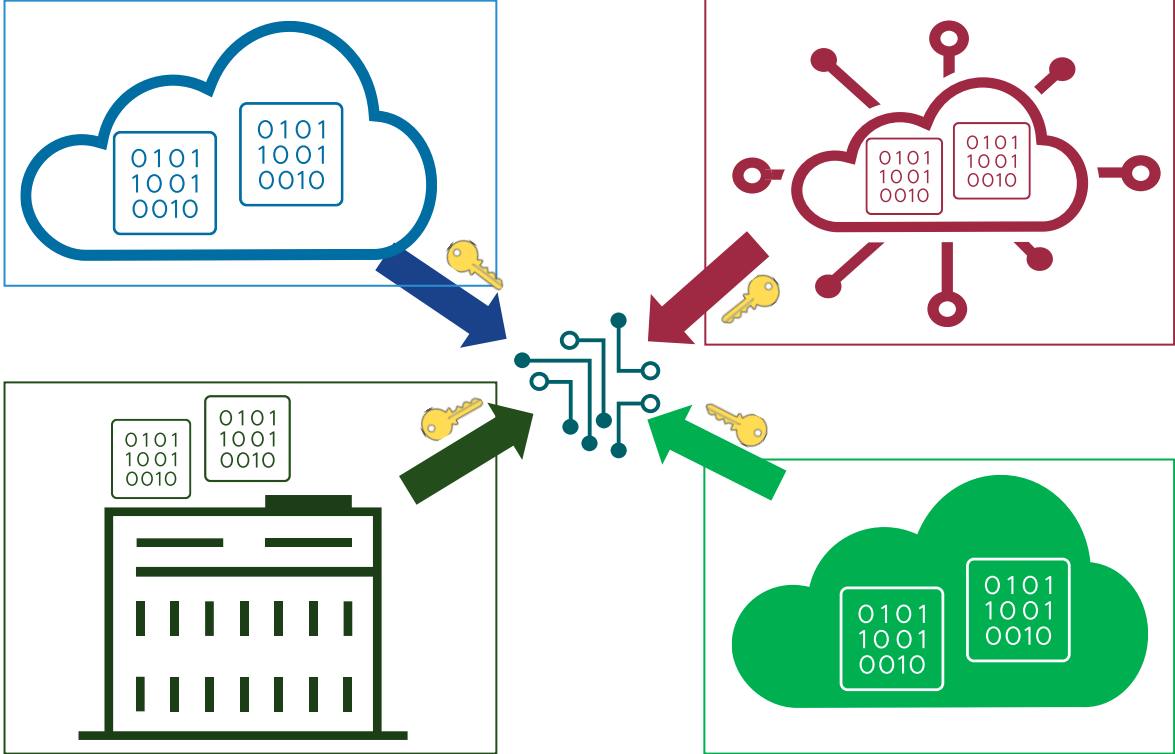
Federated learning for organization(s)

Data from multi-cloud



FL for an organization

Data from multi-org, multi-geo, or edge devices



FL for Multiple organizations of a federation

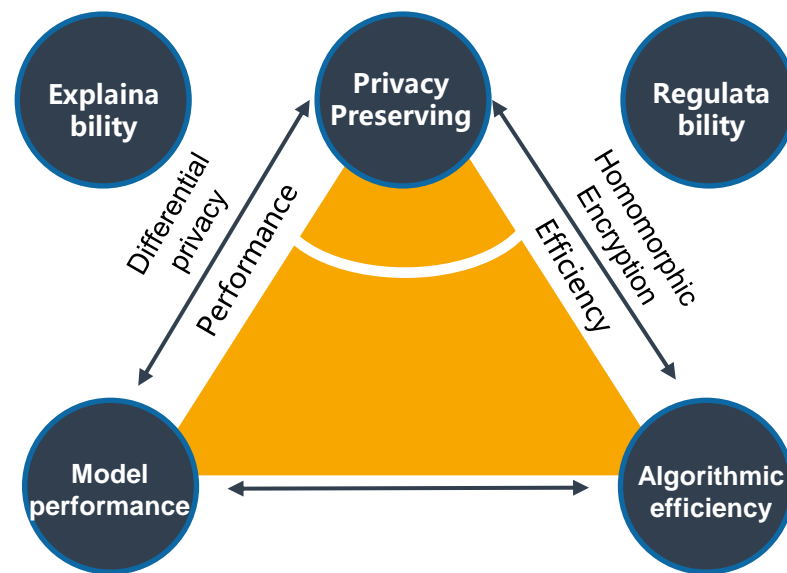
Trustworthy Federated Learning

Trustworthy Multi-party Distributed ML Paradigm

Raw data, and private params of models are not movable and visible.

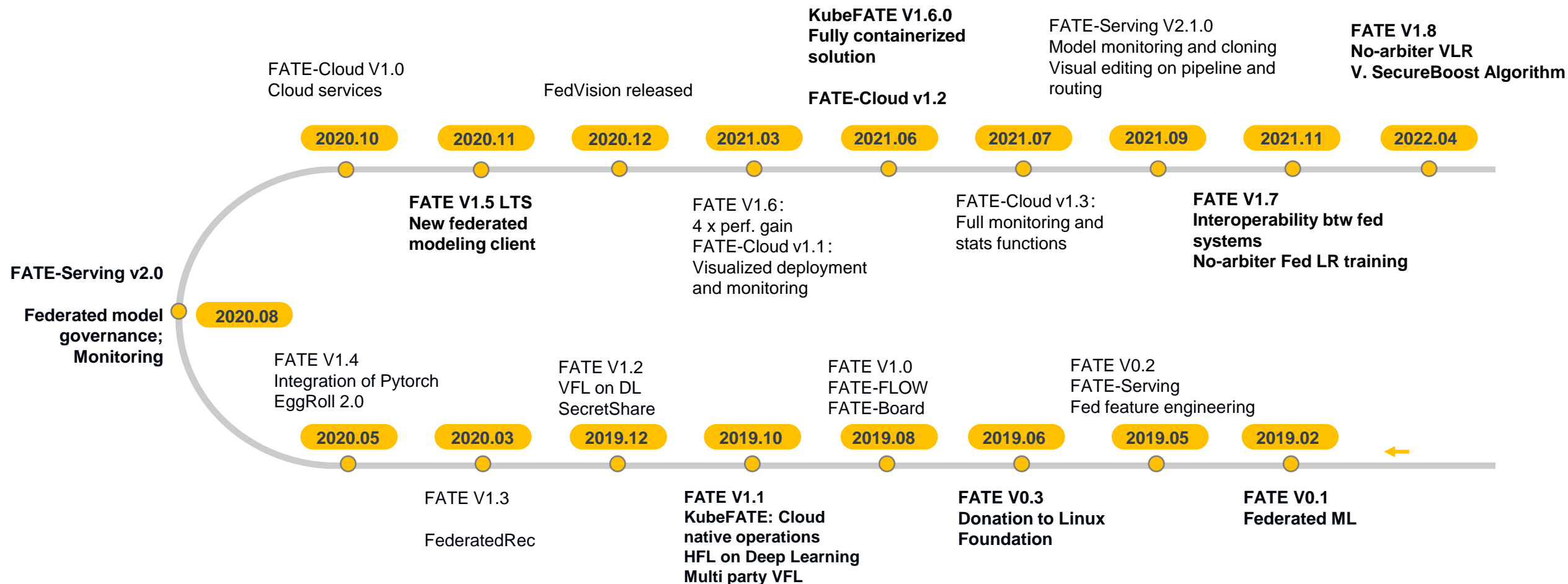
Features

- Provable security and privacy preserving
- Provable capability of anti-attacks
- Model efficiency
- Result explainability
- Model regulatability

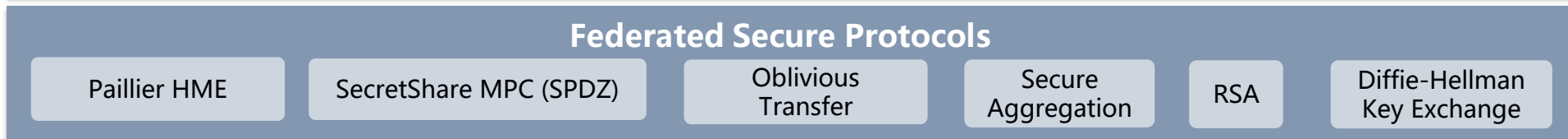
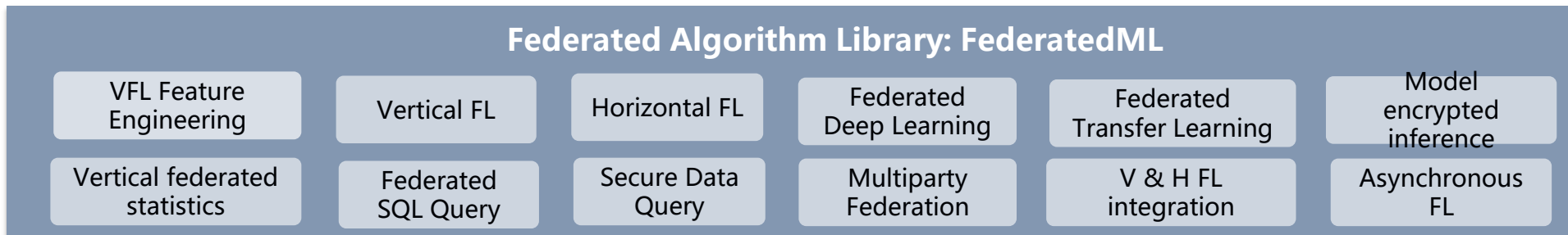
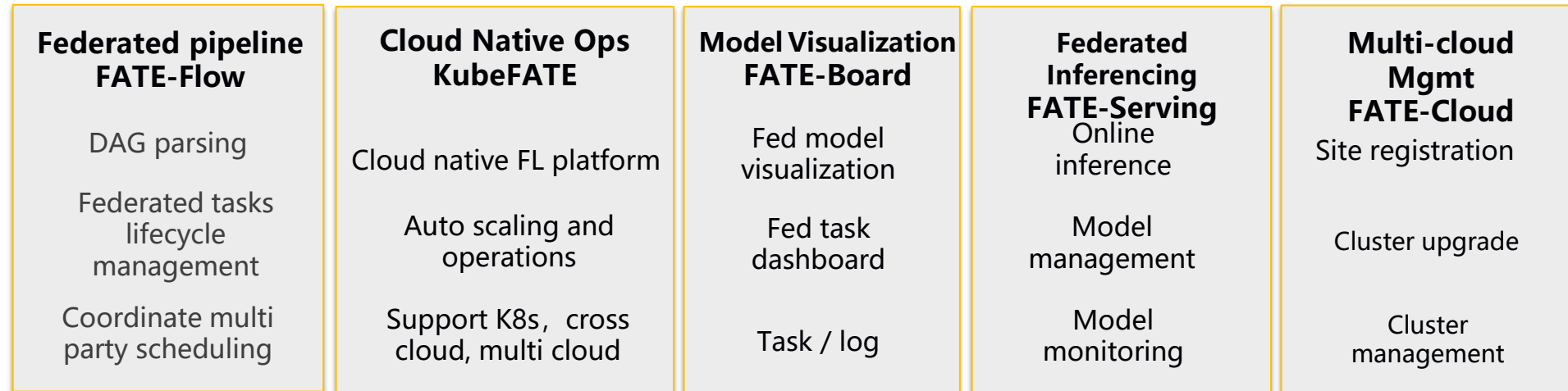


FATE: Built-in algorithms for major industry scenarios

- 30+ releases
- 30+ algorithms
- OSS community for 3+ years



FATE Frameworks



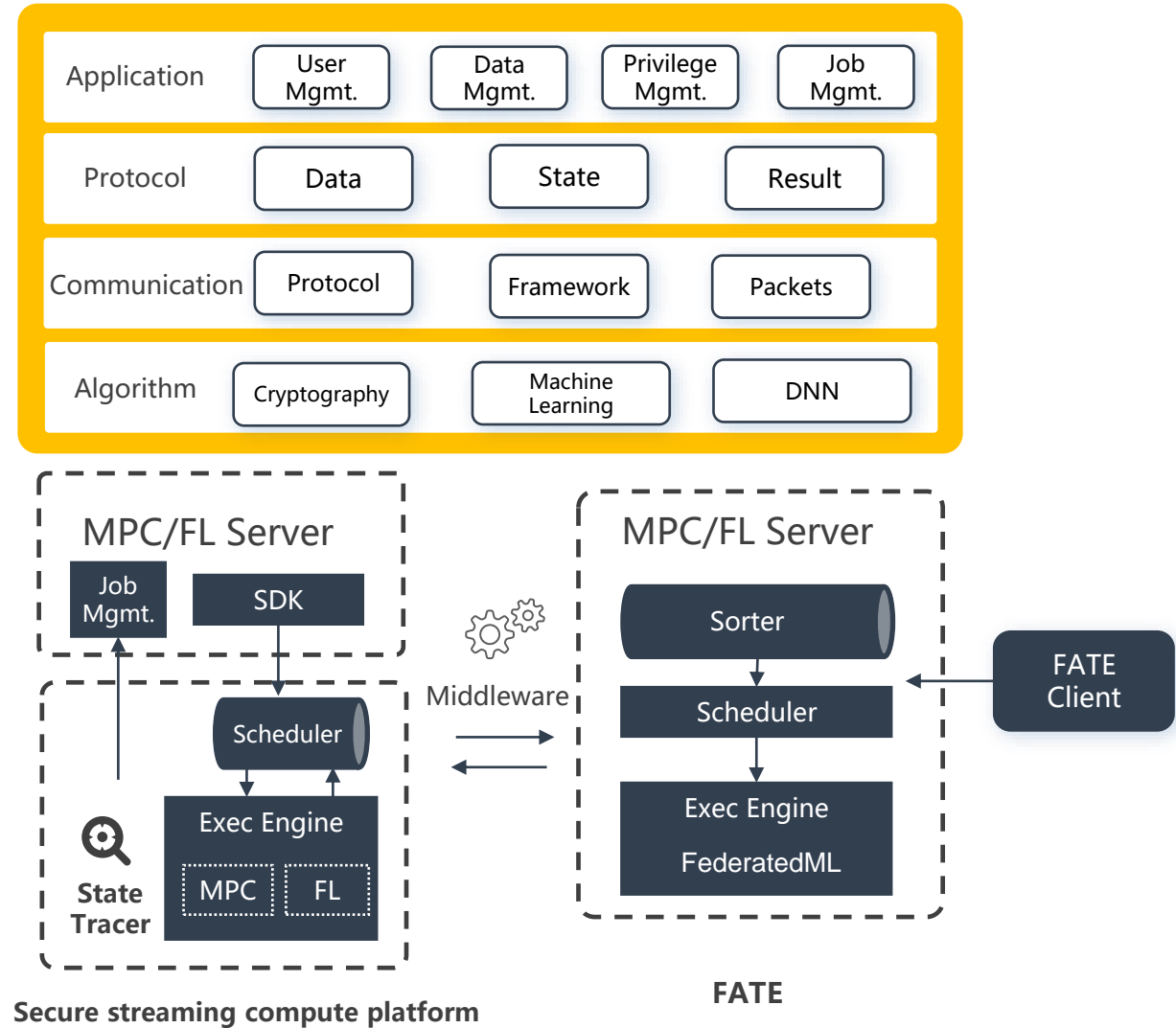
Tensorflow / Pytorch (Deep Learning)
EggRoll / Spark (Distributed Computing Frameworks)

Multi-party federated communication

Case study #1: Interoperability of Heterogenous Platforms in a Telco

Features:

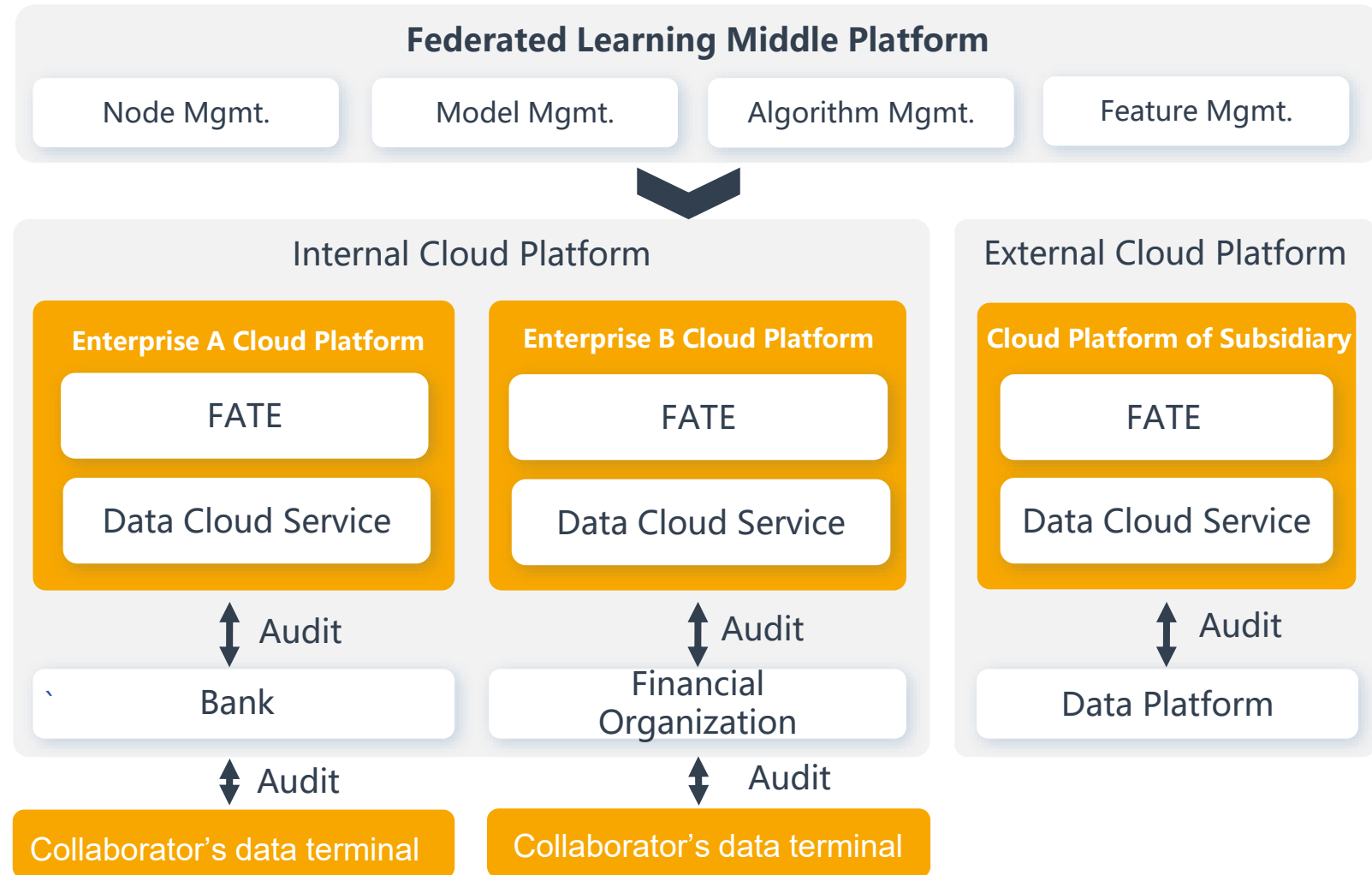
- Lightweight middleware integration
- Low coupling, replicability, scalability
- Heterogenous
- Interoperability



Case study #2: Cross-organization big data collaboration of an Enterprise

Features:

- Federated learning based collaborative middle platform
- Big data collaboration between different business subsidiaries in the parent group company



Agenda

01

02

03

Ecosystem

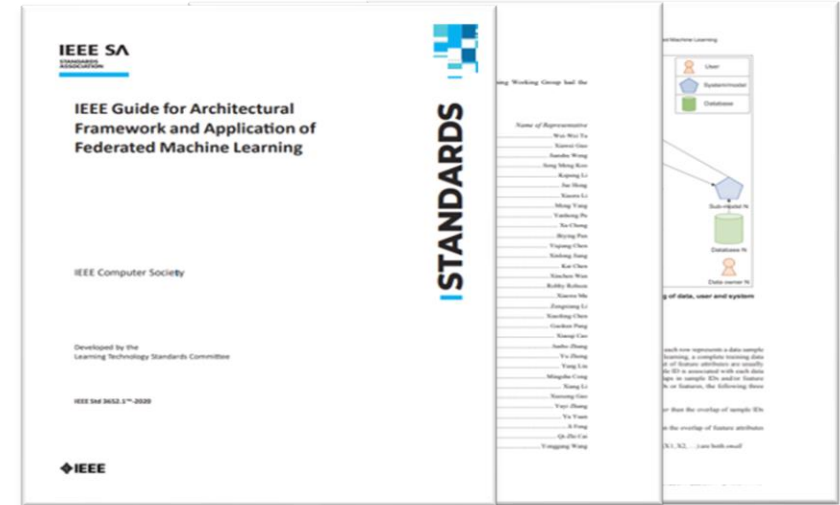
Standardization

Published Standards

- IEEE P3652.1 *Guide for Architectural Framework and Application of Federated Machine Learning*
- China Communications Standards Association group standard *Technical requirements and test methods for data circulation products based on federated learning*
- AIOSS *Information Technology Services Federated Learning Reference Architecture*

Drafting Standards

- Security standards for federated learning: IEEE2986, led by China Telecom
- Financial industry standard: *Federated Learning Financial Application Technical Specification*
- Communication Industry Standard (CCSA-TC1/TF1): *Technical Requirements and Test Methods for Security Evaluation of Federated Learning & Federated Learning Cross-Framework Interoperability Technical Requirements*
- CCSA-T601: *Federated Learning Cross-Platform Interoperability Standard*



Publications



Governance and Co-innovation

01

**Internationalized
Governance Model**

02

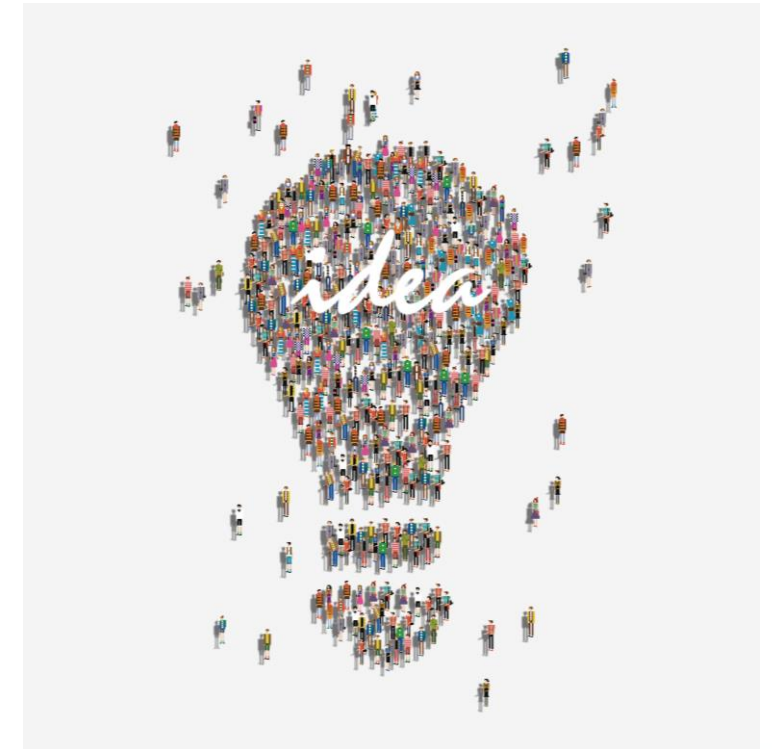
**Open and transparent
development process**

03

**Regular community
development meeting**

04

Multiple participating channels



**Welcome all users
and developers**

Community and Ecosystem



有奖调研 | FATE V1.7版本用户满意度调研问卷

FATE开源社区 2022-03-15 17:00



Online & Offline Tech Salons and Summits

- National industry summits
- FATE [LIGHT UP] open classes for community

Releases and User Experience Survey

- 3 major releases each year
- User requirement collection of each release
- User feedback surveys and investigations

Community Building and Motivation

- Wechat, email group, etc.
- Active participation recognition:
 - Certificate of Honor
 - Top 10 Contributors of the Year
 - Vitality Star of the Year
 - Community Star of the Month

Get Involved with FATE



FATE Wechat public
account



FATE Wechat
assistants

FATE email groups

User: Fate-FedAI@groups.io

Maintainers: FedAI-maintainers@groups.io

Dev. specialty committee: Fate-dev-core@groups.io

Ops. specialty committee : FATE-operation@groups.io

Sec. specialty committee : FATE-security@groups.io



@FATEFedAI

Blog: <https://medium.com/@FateFedAI>

TAC Vote on Project Proposal: FATE

Proposed Resolution:

The TAC approves FATE Project as an incubation project at the sandbox level of the LF AI Foundation.

Using LFX Insights

Jen Shelby

Upcoming TAC Meetings

 **DLF** AI & DATA

Upcoming TAC Meetings

- › August 11: Open Dataology from BAAI
- › August 25: Available

Please note we are requesting special topics for future meetings.

If you have a topic idea or agenda item, please send agenda topic requests to tac-general@lists.lfaidata.foundation

Open Discussion

 **OLF** AI & DATA

TAC Meeting Details

- › To subscribe to the TAC Group Calendar, visit the wiki:
<https://wiki.lfaidata.foundation/x/cQB2> _____
- › Join from PC, Mac, Linux, iOS or Android: <https://zoom.us/j/430697670>
- › Or iPhone one-tap:
 - › US: +16465588656,,430697670# or +16699006833,,430697670#
- › Or Telephone:
 - › Dial(for higher quality, dial a number based on your current location):
 - › US: +1 646 558 8656 or +1 669 900 6833 or +1 855 880 1246 (Toll Free) or +1 877 369 0926 (Toll Free)
- › Meeting ID: 430 697 670
- › International numbers available: <https://zoom.us/u/achYtcw7uN>

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