THE **LINUX** FOUNDATION

Annual Report 2024

Accelerating Industry Innovation

www.linuxfoundation.org

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Introduction

Reflections from our Executive Director

Over the past year, we've witnessed tremendous change in the open source landscape: change that drove growth in open source innovation, change that generated important discourse in open source standards and regulation, and change that validated the critical role the Linux Foundation plays in supporting the open source ecosystem.

Central to this exciting evolution are the members, partners, developers and community whose investment, involvement and passion push open source forward. Here are just a few of the biggest open source changes, challenges and successes in 2024.

In the past twelve months, the Linux Foundation, with help from many open source stakeholders, mustered credible and well-resourced forks of two critical open source software projects — Valkey and OpenTofu. The fork is the "nuclear option" for open source, but it must be a viable option for forks to effectively deter bad behavior by corporations and investors who view open source merely as a go-to-market method. Thanks to all of you, the

"Right to Fork" is now a tangible counterweight against arguments for arbitrary license changes. This will make open source more stable, reliable, and acceptable for enterprises, governments and other large users. Projects like OpenTofu, OpenBao, Valkey, and OpenSearch show that, when it comes to software freedom, the power is in the hands of the community. Even prominent industry analysts are calling out neutral foundations, like ours, as the way forward—proving once again that open source is here to stay, and it's evolving in the right direction.

On the economic front, a Harvard study recently highlighted the impact of open source on the global economy, pegging it at a whopping $8.8 trillion in supply side value — a figure that many have underestimated for far too long. As stewards of some of the world's largest open source projects, the Linux Foundation community played a non-trivial role in this resounding economic success story. We can see from our project velocity trackers that open source growth is not slowing down. I firmly believe open source software will eclipse $20 trillion in total economic value by 2030.

Dollar value isn't the only metric of success, of course. The role of open source is also to improve lives, by accelerating innovation and opportunity. Thanks to our members, more than 850 participants have graduated from the Foundation's mentorship programs, which continue to educate a new generation of open source contributors,providing skills that will give them a path to good jobs. LF Education is our fastest-growing segment. This year, the team,

working closely with project and foundation sponsors, added more than 30 new courses and 10 new certifications across a wide range of disciplines. To bring greater recognition to the value of certifications, CNCF launched the Kubestronaut program recognizing individual outstanding achievements and fostering goodwill. There are already more than 840 recognized Kubestronauts from countries around the world.

Security has also been front and center this year, especially with our work at the Open Source Security Foundation (OpenSSF). We're steadily moving toward a future where open source software (OSS) is more trusted, secure, and reliable. We're shaping that future by making it easier to sustainably secure the development, maintenance, release, and consumption of the OSS we all depend on. Producers of OSS (of all skill levels) will have the ability to proactively and retroactively address both existing and emergent security threats through low-friction tooling automation, education, and actionable guidance. Consumers of OSS will be able to verify digital signatures and receive machine-readable attestations, including provenance.This collaborative vision enables individuals and organizations in a global ecosystem to confidently leverage the benefits and meaningfully contribute back to the OSS community. It's an ambitious goal—but one we're making serious headway on.

In the fall of 2024, we launched LF Decentralized Trust as an umbrella foundation for projects seeking to create digital systems of trust to ensure

what we see is real and that the people we're interacting with are who they claim to be. With AI becoming a commodity, deepfakes will only grow both in frequency and sophistication. Fortunately, the adoption of C2PA — the Coalition of Content Provenance and Authenticity — by major AI providers has been nothing short of astounding. We can now see a future where it's simple to verify the provenance and validity of every piece of content and media that we consume.

Part of our job is to make the future happen faster. This is why we focus on the most innovative areas of open source: RISC-V, the open source ISA that's changing the future of semiconductors, WebAssembly, a runtime environment that's quickly becoming a global standard, and PyTorch, the framework powering so much of the work in AI today.

We will continue to look for the "next big thing" in open source technology and work to include these efforts in the Linux Foundation. Even though we are a non-profit, the LF is a living entity that thrives on growth. The best kind of growth is when we can help foster these types of innovative initiatives and bring our best practices to bear on nurturing and growing a community.

With our industry-specific efforts, we have made great progress bringing open source to the verticals that make up the fabric of our economy and civilization. LF Energy has been a hub of innovation, driving forward projects that support everything from electric vehicle charging to grid operations to synthetic training data. In the financial sector, the world's largest institutions are coalescing around open source through FINOS to standardize their systems, mutualize regulatory challenges, and share the costs of foundational software. In transportation, Automotive Grade Linux continues to steadily ship and improve as more and more automakers adopt AGL for core functionality on their vehicles. In telecommunications, we're on the brink of a fully interoperable, API-defined backbone for networking, driven by the standards developed right here at the Linux Foundation with the CAMARA Project.

While the past year boasted many achievements, there are still a number of hills to climb. Threats to open source remain, like proprietary licensing models such as Fair Source, that are "open washing" and casting doubt on the value of open source principles. As we saw with the sophisticated XZ Utils campaign to convince a maintainer to hand over a key project to a bad actor resulting in a nasty compromise, creating mechanisms of trust to better safeguard supply chain security is increasingly necessary. The open source community has had to defend developers and open source companies from a constant threat of blunt-instrument regulation that, while well inten-tioned, would have stifled open source innovation.

The big opportunity ahead of us? The convergence of open source and standards development. We've already seen the power of standardized open source software, especially when it's shepherded by neutral foundations like ours. But for open systems to truly thrive, they need solid, interoperable standards. The way the world creates those standards today could be much better. We believe that applying open source approaches to standards development will increase participation and reduce the "standards capture" by large incumbents. This will be a major focus of the Linux Foundation in 2025.

I want to extend a heartfelt thank you to all of you for your ongoing support. The Linux Foundation has grown and prospered because of the dedication of our community, through thick and thin. We're at a watershed moment in open source, and your commitment has made all the difference.

Thank you for walking this path with us.

Jim Zemlin
Executive Director
The Linux Foundation

Board Chair Update

Welcome to the 2024 Linux Foundation Annual Report. This report marks my seventh year as Board Chair of the Linux Foundation. A lot can change in seven years. In the last 10 years I have gone on to creating or growing three different Open Source Program Offices in three very different companies. That period roughly covers my tenure as the leader of OSPOs at Comcast and then Amazon, where I lead the Open Source Program Office (OSPO). When I first started down the OSPO path, such bodies were a relative novelty. Last year, LF Research studies revealed that two-thirds of organizations have OSPOs, an exciting trend and something to be celebrated.

In my travels I meet representatives from hundreds of OSPOs from universities, regional governments, and many more major corporations. I knew the OSPO had truly arrived when I found myself participating in the OSPOs for Good symposium at the United Nations this past July. I bring this up because you, the members and sponsors of the Linux Foundation, have been a core driver of open source acceptance and maturation in both industry innovation and sustainability contexts.

Open source is now the dominant modality of software development. The rise of OSPOs is both a proxy for this and a signal that every organization and government needs an open source strategy and open source policies.

Increasingly, too, organizations need the expertise of OSPOs to navigate the complex new realities of open source. We have seen an increase in the number of abrupt license changes to open source projects that are controlled by single enterprises. In response, users and the Linux Foundation have organized resources to fork these projects. While forks have always been possible, the "Right to Fork" movement and more organized response changes the game and makes OSPOs more prominent players in organizing such efforts. A wave of new government regulations addressing perceived technology risks and anti-trust means that OSPOs must play a stronger role in advocating for open source. OSPOs also play a critical role in interpreting the new mandates for their CTOs, CIOs, and CISOs.

Then there is the discussion over open source AI, training data, and content provenance. OSPOs are a voice of reason in this debate, which touches every company deploying machine learning tools based on open foundational models like Llama created by projects or other companies. Lastly, open source supply chain security is a growing priority due to increased risks and the growing presence of open source software in all applications. OSPOs work closely with CISOs and organizations like OpenSSF to drive adoption of supply chain tools and weave the best security practices into the full software development lifecycle.

All of this brings me back to the Linux Foundation and your essential role as members. The open source model writ large only works in an environment of high engagement. OSPOs are a bellwether. The Linux Foundation is another one, closely linked to OSPOs. Thanks to you, we have continued to grow our membership numbers. We continue to set records for event attendance. We have continued to add new projects at an impressive clip and the Linux Foundation has become the preferred home for coordinating forks of important projects that have experienced license changes, all thanks to your support.

Equally important, your support has allowed us to rapidly expand our training and certification offerings and grow our mentorship programs, ensuring a large pipeline of talent to continue to sustain and nurture open source development for the future. As the largest open source technology foundation in the world today, it is not an exaggeration to say your support — both in terms of direct funding and by giving your employees time to make code contributions—is responsible for trillions of dollars of software value and a growing majority of the world's most critical software.

None of this is possible with you and your continued efforts. Supporting OSPOs is just one manifestation — one I know well and see first-hand. There are numerous other modalities of support, such as open source events, research, and advocacy. All of them are critical. Thank you so much for your help in all its forms in making 2024 yet another banner year for the Linux Foundation and for open source. The best is yet to come.

Nithya Ruff
Chair of the Board of Directors,
The Linux Foundation

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Thank you to our Members

In 2024, the open source community faced fresh challenges, including tightening regulations, economic uncertainties, and continued geopolitical tensions. Despite these obstacles, our project communities flourished, in no small part thanks to the support we receive from Linux Foundation members.

As we move into 2025, our focus remains steadfast on providing developers and project communities with the tools, community events, training, research, and open governance frameworks that ensure thriving open source ecosystems. Your support, through membership, governance, and code, enables us to continue this important work.

Thank you for your dedication. Together, we are building the technological foundation of the future.

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Lowe's Companies, Inc.
LPI.org
LSD OPEN
Lucidity.cloud
LucidPoint, Inc.
Lumigo Ltd
Lutech Advanced
    Solutions S.p.A.
LY Corporation

M

MacStadium
MagicOrange Group
    Limited
Mainsail Industries
MangoBoost, Inc.

ManTech International
    Corporation
Mantech Solution
Marvell Semiconductors
    Ltd
Maryville Consulting Group
Massdriver Inc
MasterCard Incorporated
Matrix I.T CloudZone LTD
MATRIXX Software
MatX
Mavenir Systems, Inc.
MavenSolutions
Maxon Computer GmbH
Mazda Motor Corporation
MBDA Italia S.p.A
McKinsey & Company, Inc
Mecha Systems
MediConCen Limited
MegazoneCloud
Meinberg Funkuhren
    GmbH & Co KG
Memfault Inc
Memphis.dev dba Stretch,
    Inc.
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    Innovation GmbH
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Micas Networks Inc.

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    plc
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Micron Technology
Micware Co. Ltd.
Middleware
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Milligan Partners
MIllPont
mimik Technology Inc
Minio, Inc
MIPS Tech LLC.
Mirantis, Inc.
Miraxia Edge Technology
    Corporation
Mitsubishi Electric
    Corporation
Mitsubishi Motors
    Corporation
Mod Tech Labs
mogenius
Molex
Moment Technologies, Inc.
Monostream AG
MontaVista Software, LLC
Moody's
MoonLight Marketing
Morgan Stanley
Morpheus Data
Motorola Solutions
Moxa Inc.
Mozilla Corporation
MSys Technologies
MyFitnessPal LLC

N

N3XGEN Smart
    Information Technology
    EST
NAMUTECH Co., Ltd.
Nanjing eCloud
    Technology Co., Ltd.
Napatech
NatWest
Navimentum Information
    System Co., LTD.
NAVIS-AMS
NDrive Navigation
    Systems SA
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NearForm Ltd
Nearmap Australia Pty Ltd
NEC Networks & System
    Integration Corp.
Neo4j, Inc.
NEOS
NetApp, Inc.
Netdata
Netflix, Inc.
Netgate
Nethopper LLC
Netris, INC.
NETSIA Inc.
Netweb Technologies
Neural Magic
NeuReality Ltd
NeuroBlade
Neuroglia
New H3C Technologies
    Co., Ltd

New Relic, Inc.

nexB Inc.

NextBillion.ai

NGINX International
    Limited

ngrok

NHN Corporation

Nikon Corporation

NIO

NIPA

Nippon Seiki Co. Ltd.

Nirmata, Inc.

Nissan Motor Co., Ltd.

NodeShift

Nokia Corporation

nops.io

Nordic Semiconductor ASA

Northflank Ltd

Notarize, Inc. d/b/a
    Proof.com

NovaGlobal Pte Ltd

NTT Corporation

NTT DATA MSE
    CORPORATION

nudgebee

Numascale

Numbers

NuNet

Nutanix, Inc.

Nuvitek

Nuvotex GmbH

NVIDIA Corporation

NXP Semiconductors
    Netherlands B.V.

O

Octopus Deploy PTY Ltd.

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OKESTRO

Okta Inc.

Ollama

Omnistrate

Oodle AI, Inc.

Opaque Systems Inc.

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    Development Lab
    (OSADL) eG

Open Source
    Consensus(Shanghai)
    Network Technology
    Co., Ltd

Open Source Consulting Inc.

OpenAI Inc

OpenMetal.io

OpenNebula

OpenOps

OpenSynergy GmbH

Operant

OpsLevel

OpsMx

OpsNow Inc.

Orange SA

ORCASIO, INC

Orkes Inc

Ortec Finance

Osaka NDS Co., Ltd.

OSNEXUS

OSSO B.V.

Oteemo Inc.

Oticon A/S

OTOY, Inc.

Otterize

Overlai LLC

OVH SAS

Ownera

P

Palark GmbH

PalCNetworks

Palo Alto Networks

Paramount Software
    Solutions Inc.

Parler Cloud Technologies

Parsolvo

Partisia

Patchstack O√ú

Pay-i Inc

PBG Consulting

Pelanor

Peloton Interactive

Penten

PepperData

Percepio AB

Percona

PerfectScale

Peridio

Permify

Permit.io

Phoenix Software
    International

PHYTEC Technologie
    Holding AG

Pickford

Ping An Technology
    (Shenzhen) Co., Ltd

PingCAP

Pionative

Pioneer Corporation

Pionix GmbH

Pipekit Inc

PlanetScale, Inc.

Plat'Home Co., Ltd

Platform9 Systems, Inc.

Platformatic

plural

plusserver

PLVision Corporation

Point72, L.P.

PointFive US Inc

Polar Signals Inc

Polygon Labs Services
    (Switzerland) AG

Port

Portainer.io

Portal26

Posedio — Professional
    Cloud Consulting

Posit

Postman

Praetorian Security Inc

Precisely Holdings, LLC

Precision Innovations Inc

Preferred Networks, Inc.

Prescient Security

Presidio Inc

Previder

Priceline.com LLC

Print2Block

Prodigy Education

Prodvana

PRODYNA SE

Profisea

Progressive Insurance

Proofcraft Pty Ltd

ProSiebenSat.1 Tech
    Solutions GmbH

ProsperOps

Protect AI

Provectus IT Inc

ProximaOps LLC

PS Internet Company LLP

PTV Group

Publicis Groupe

Pulumi

Pure Storage

Puzzle ITC GmbH

pwc

Q

QANplatform

QAware GmbH

Qiming Information
    Technology Co., Ltd.

QingCloud Technologies
    Corp.

Quali

Quality Cloud Corp.

QualitySoft Corporation

QUANTUM C&S

Qubex

Quesma

Quilyx

Qumulo

QuSecure Inc

R

R3 LLC

Rackner

Rackspace US, Inc.

Radisys Corporation

Rafay Systems, Inc.

Raft

Raincoat

Raintank, Inc. ? Grafana
    Labs

Randstad Digital Germany
    AG

rapid cycle solutions

RapidAPI

RapidFort, Inc.

Rayls Foundation

RBC Capital Markets, LLC

re:cinq

RealCloud

Reality Defender

RealTheory Inc

Recurve

Red Kubes BV

Redeploy

Redocly Inc

Redpanda Data

Redpill Linpro

REGnosys Limited

Release Technologies, Inc.

Reliance Jio Infocomm
    Limited

Replicated, Inc.

Resolve Technology

ResolveA√≠

Restate

reThought Flood — Flood
    Insurance Done Right

ReversingLabs

Revolgy

Ricoh Company, Ltd.

Rig

Ripple Labs Inc.

RISCstar Solutions

Rivos Inc

RNG Technology

Roadie

Robin Systems, Inc

Robotec.ai sp. z o. o.

Robusta.dev

Rocket Software, Inc.

Rockwell Automation

RodeoFX

Roku, Inc.

Root

Rootly, Inc.

Royal Dutch Shell

RTE (Reseau de Transport dElectricite)

RTX

Ruijie Networks Co., Ltd

RX-M, LLC

S

S&P Global Inc.

SAIC Motor Corporation Ltd

Salesforce.com, Inc.

Salience Labs

Salsify

Sambanova Systems

Sanborn

SANCLOUD LTD

SandboxAQ

Sanofi

SAP SE

SAPEON

Sartura

SAS Institute Inc.

Sateliot

Savoir-faire Linux

Scala Computing

Scalar

ScaleOps

ScaleUP

Scaleway

Scarf Systems, Inc

Schneider Electric

Schwarz IT KG

Science Applications International Corporation

Scotiabank

Scott Logic Ltd

ScoutAPM

SDAX Exchange Pte Ltd

Seafarix

Seagate Technology LLC

Seal Software (Shenzhen) Co.,Ltd.

Searce

Second State

Secondfront

Sedai

SEIYAJ TECH

Selective Insurance Group

Semios

Senofi

Sense Reply

Sentry Software

Seowon Information Co., Ltd.

SerNet GmbH

ServeTheWorld AS

servicememe

SERVICEWARE

SETIT Solutions

Shabodi

Shandong Cvicse Middleware Co., Ltd.

Shanghai Mandao Technology Co., LTD

Shanghai Yunsilicon Technology Co.,Ltd.

Shanghai Yunzhou Information Technology Co. Ltd (ZStack)

SHE BASH

Shenzhen Wise2C Technology Co.,Ltd

ShineSoft Co. Ltd.

Shopify Inc.

Shoreline

Shutterstock, Inc.

SICPA SA

SideFX

Sidero Labs

Siemens AG

sifamo

SiFive

SIGHUP s.r.l.

Signadot

Silicon Laboratories Inc.

Silicon Studio Corporation

Simba Innovation

Simplyblock

Sirius XM Radio Inc.

SK hynix Inc

SK Telecom

Skyloud

SmartBear Software, Inc.

SmartCirqls Infotech Private Limited

SmartContract Inc.

Smartiful, Inc.

Snowflake Inc.

Snyk Limited

Socionext Inc.

Socket

socradev Gmbh

SoftBank Corp.

Software Mind

Software Safety Technology co., Ltd

SoftwareONE AG

SoKube

SolidRun Ltd

Solo.io, Inc.

Sonatus, Inc.

Sonatype, Inc.

SORAMITSU CO., LTD.

Southworks

Spacelift, Inc.

SpacemiT (Hangzhou) Technology Co. Ltd

Sparkfabrik srl

Sparkgeo

Spatial

Speakeasy Development, Inc.

Spectro Cloud, Inc.

SpeedScale

Spirent Communications Inc

Splunk Inc.

Spotify AB

Springer Nature

Sprint Corporation

Spyderbat

Squarespace, Inc.

SQUER Holding GmbH

stack.io

StackGen

stackgenie

Stacklet

Stacklok

Stackwatch Inc

State Street Bank and Trust Company

Stateful

Staubli Corporation

STCLAB

Steamhaus

Stellar Development Foundation

Stellate

StepSecurity

Sternum

STMicroelectronics International N.V.

Storm Reply srl.

StorPool Storage AD

Stratascale

Strategic Blue

Stratox Cloud Native

Strava

Structsure, LLC

Styra Inc

Sudo Information Technology Co. Ltd.

Sumo Logic, Inc.

Super Micro Computer, Inc.

Super Protocol

Supercritical

SuperOrbital, LLC.

Surveil

SUSE LLC

Suzhou Beyondcent & Software Co., Ltd. (BoCloud)

Suzhou Centec Communications

Suzuki Motor Corporation

SVA System Vertrieb Alexander GmbH

Svix

Swisscom

Symbotic

Symphony Communication Services LLC

Synax GmbH

Synechron, Inc.

Syngenio

Synopsys, Inc

Syntasso

Synyega

Sysdig, Inc.

SysEleven GmbH

SYSGO GmbH

T

TAC Security Inc

taikun.cloud a.s.

Tangoe US , Inc.

Taplytics

Tata Communications Limited

Tata Consultancy Services Limited

TDT AG

Tech Mahindra Limited

technative

Technology Innovation Institute

Telechips, Inc.

Telecom Italia Mobile (TIM) S.p.A.

Telefonica, S.A.

TELUS Corporation

Temporal Technologies Inc

Tenable, Inc.

TenneT

Tenstorrent

TeraSky

Ternary

Terramate

Tesla, Inc .

TestifySec

Testkube

Tetrate.io

Teuto.net Netzdienste GmbH

Texas Instruments Incorporated

Thales SA

Thavron Solutions

The 4th Paradigm Technology Co., Ltd

The Constant Company, LLC / Vultr

The Foundry Visionmongers Limited

The Guild

The Qt Company Oy

The Scale Factory Limited

The Walt Disney Studios

Thornstein Groep

Thought Machine Group Limited

ThoughtWorks, Inc

Thunder Software Technology Co. Ltd.

Tidelift, Inc.

Tietoevry

Tigera, Inc.

Timesys Corporation

Timspirit

TmaxCloud

TO THE NEW

TomTom International B.V.

Trace Machina — Simulate Robotic Systems

Trace3

Traceroute42

TradeHeader

Traefik Labs SAS

Trail of Bits

Travelping GmbH

Trenchant Limited (trading as G-Research)

Trend Micro Incorporated

Treyee

Trimble Inc.

Tripadvisor LLC

TripleID Solutions

True B.V.

Truepic, Inc.

Trustwise

Tsavorite Scalable Intelligence, inc

Turk Telekom√°nikasyon A.S.

turntabl

Tuxera Inc.

Tyk Technologies Ltd.

U

U.S. Bank

Uber Technologies Inc.

UBS AG

Ufi Space

Ultraviolet Consult DOO

UMB AG

UNIBERG

Unicloud Tech Co., LTD.

Unikraft GmbH

Union.ai

Unravel

Unryo Inc

Upbound, Inc.

UpCloud Ltd

Upsider

Uptycs, Inc.

USU GMBH

Utilidata

UtilityAPI

UTMStack

Uturn Data Solutions

V

VA Linux Systems Japan K.K.

Validation Cloud

ValueMentor

Valve Corporation

Vantage

Vates

Vattenfall Eldistribution AB

Vaxowave

vbrick

VDURA

Veea Inc.

Vega Cloud Inc

Velocity

Ventana Micro Systems

VeriSilicon, Inc.

Veritas Automata

Verizon Corporate Services

Vertice

VES LLC

VEXXHOST, Inc.

VicOne Inc.

VictoriaMetrics

Videndum Media Solutions Spa

Virasemi Inc

Virtasant

Visa Inc.

Vivendi

vivo Mobile Communication Co., Ltd.

VNC Automotive Limited

Vodafone Group Plc.

Volkswagen Aktiengesellschaft

VSHN AG

W

W?t? FX Limited

Walmart Inc.

Wanchain

Wargaming.net Limited

WattCarbon

Wavecon GmbH

Wavelabs

Wegmans Food Markets

Wellington Management Company, LLP

Welotec

WeScale SAS

Western Digital Corporation

WhaTap Labs Inc

Wherobots, Inc

Whirlpool Corporation

Whitestack LLC

WhizUs GmbH

WIIT AG

Wind River Systems, Inc.

Wing Programming Language [Monada EBS LTD]

Wipro Limited

Wistron Corporation

Witekio Holding

Wiv.ai

Workday, Inc.

WorldTech IT LLC

Worley Limited

WPP plc

WSO2 LLC.

X

x-cellent technologies GmbH

x-ion GmbH

Xero Limited

xFlow Research.com

xgeeks

Xi'an Tieke Jingwei Information Technology Co.,Ltd. (CARS)

Xosphere

Xsight Labs

Y

Y√§RKEN

Yazaki Corporation

Yellowbrick Data

YLD! Limited

Yotascale

Yovily

Z

ZEDEDA, Inc.

Zeeve Inc

Zenduty

Zenosic

Zesty Tech Ltd.

Zettabytes, Inc.

Zilliz

Zoi

Zoniqx Inc.

Zoss Team, LLC

Zouz

ZTE Corporation

Zuplo Inc

ZutaCore

The Linux Kernel Organization

In tandem with security, nurturing open source innovation to create a better world is at the heart of the Linux Foundation's activities. In 2021, we celebrated the Linux kernel's 30th birthday. Three years later, Linux remains among the top three global open source projects in terms of development velocity. Each release results from the work of thousands of contributors worldwide and many organizations. The kernel community actively maintains a steady flow of innovative improvements to expand the footprint of Linux and enhance its capabilities.

CVE announced on February 13, 2024, that kernel.org is a CVE Numbering Authority for any vulnerabilities in the Linux kernel as listed on kernel.org, excluding end-of-life versions. The Linux Kernel documentation states the following on CVEs:

"The Linux kernel developer team does have the ability to assign CVEs for potential Linux kernel security issues. This assignment is independent of the **normal Linux kernel security bug reporting process**. A list of all assigned CVEs for the Linux kernel can be found in the archives of the linux-cve mailing list, as seen on **https://lore.kernel.org/linux-cve-announce/**. To get notice of the assigned CVEs, please **subscribe** to that mailing list."

Linux kernel maintainers and developers got together in Vienna in September for the Maintainer Summit, Kernel Summit, and Linux Plumbers conferences to discuss a range of technical topics. The Linux kernel community created a maintainer list to be able to reach all current maintainers, should there be a need to communicate something of importance to the entire kernel maintainer community.
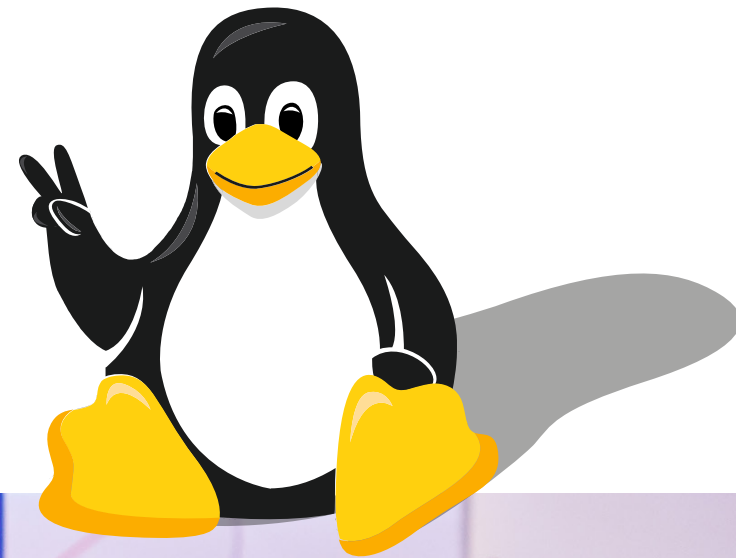
Serving Nearly 1,300 Open Source Project Communities


Project technical segment
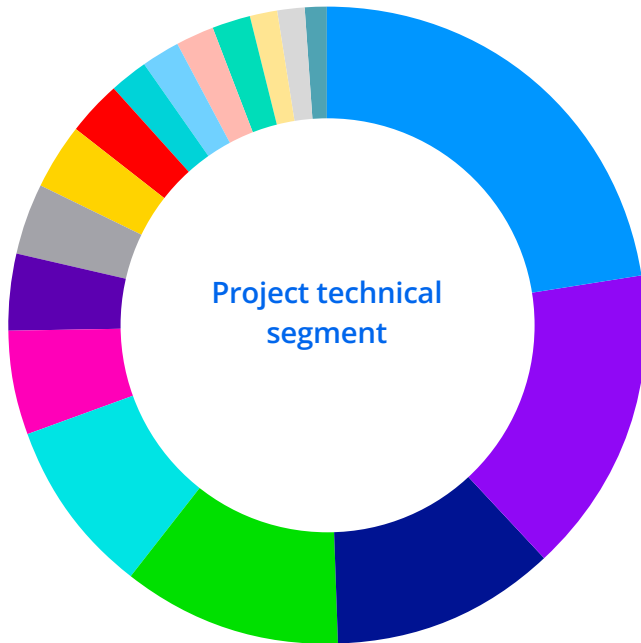
- Cloud, Containers, & Virtualization **23%**
- Networking & Edge **15%**
- AI, ML, Data & Analytics **11%**
- Web & Application Development **11%**
- Cross-Technology **9%**
- Privacy & Security **5%**
- Blockchain **4%**
- IoT & Embedded **4%**
- DevOps, CI/CD, & Site Reliability **3%**
- Open Source & Compliance Best Practices **3%**
- System Administration **2%**
- Storage **2%**
- Linux Kernel **2%**
- System Engineering **2%**
- Open Hardware **1%**
- Safety-Critical Systems **1%**
- Visual Effects **1%**

Project type
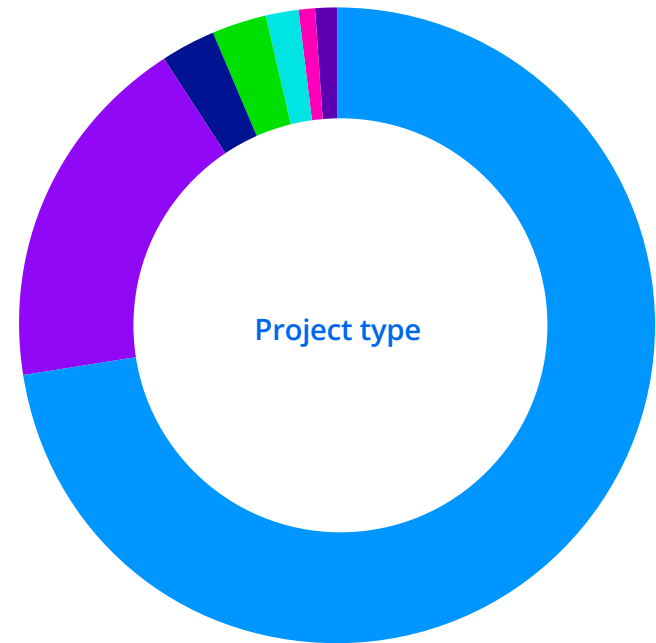
- Open Source Software **73%**
- Open Standard / Specification **18%**
- Community Initiative **3%**
- Open Data **3%**
- Open Hardware **2%**
- Open Governance Network **1%**
- Peer Network **1%**

By the numbers: The Linux Foundation 2024

1.7 billion lines of code generated.
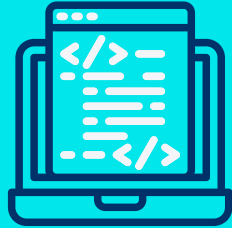
17.6K organizations contributed to Linux Foundation open source projects.

LF Training & Certification enrolled **204K** learners.

71,101 developers actively contributing

14.5K active member contributions

LFX Security detected 16,040 code vulnerabilities.

1,906 members supported the Linux Foundation.

The Linux Foundation hosted **219 events** with **70K+ attendees** from **162** countries, over **9k** organizations.

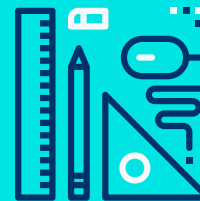LF Education: **49.5K certifications,** representing a **33% increase**.

The Linux Foundation hosted **88 webinars** with **12,879 attendees.**

The Linux Foundation hosts over **1000 open source projects**.
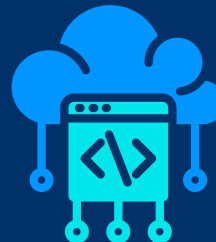
The Linux Foundation open source community contributed to over **4.2 million project builds**.

Accelerating Community Engagement

Deepening Impact with Standards and Specifications

Open source–compatible standards and specifications development are top of mind for many of our communities. Participating in this ecosystem, whether by contributing to upstream specifications, creating open source implementations of open standards, or developing and advancing their own specifications, helps technologies stabilize and mature in order to reach their full potential.

To achieve those goals, projects are using the Joint Development Foundation (JDF) and the Community Specification License (CSL) for developing specifications and other technical deliverables that are complementary to their open source activities. These hosting structures enable quick-start momentum for technical activities by using widely adopted IP and governance policies.

To illustrate this interest, several core Linux Foundation communities, including FinOps Foundation, FINOS, GraphQL Foundation, LF Decentralized Trust, LF Energy, OpenSSF, and Tazama, have paired with JDF or CSL specification efforts. We expect to see similar programs in place for all LF's core communities by the end of next year. To support these new groups, we have been growing our standards practitioners team and developing resources such as the Standards & Specifications Forum at Open Source Summit, standards-centric webinars, and training materials.

Our standards and specifications projects enjoyed wide success in 2024. In addition to launching new efforts, such as App Defense Alliance (application security) and Margo (industrial automation for edge deployments), we shipped highly anticipated spec releases, such as:

▶ Open Container Initiative specifications Image v1.1, Runtime v1.2, and Distribution v1.1

▶ FinOps Open Cost and Usage Specification v1.0

▶ C2PA Content Credentials 2.1

▶ Overture Maps Schema v1.2

▶ SPDX v3.0

▶ Trust Over IP Trust Spanning Protocol Implementor's Draft v1.0

Many, many more specifications are under active development and at varying stages of advancement. Projects are reaching greater levels of consensus than ever before using wide review techniques and building strong bonds with other standards develo-

pment organizations or industry consortia. Liaison agreements, MOUs, partnership programs, and open source collaborations are enabling more cross-organizational collaboration between open source and open standards organizations, putting the best and brightest ideas together for a common cause.

Our communities have been hard at work developing solutions that address critical social issues and/or meet compliance requirements. Security, supply chain management, content provenance, and sustainability technologies will continue to be key focus areas for many of these groups as they work to ship specs and tools that address tomorrow's problems on today's timeline. The Linux Foundation's standards team is very proud to stand behind these projects and looks forward to empowering them further in the years to come.

Policy Stewardship in Europe, and Beyond

Open source technology is transforming Europe's digital landscape by driving innovation, enhancing security, and fostering collaboration across various sectors.

As European industries and public institutions increasingly rely on open source solutions, its role has become pivotal in addressing complex challenges such as cybersecurity, digital sovereignty, and the ethical development of artificial intelligence (AI). Linux Foundation Europe plays a crucial role in this ecosystem by supporting and advancing open source initiatives, facilitating cross-border cooperation, and promoting best practices.

LF Europe helps to bridge gaps between organizations, communities, and policymakers, ensuring that there is an integration of open source principles into Europe's digital strategies. By hosting events like the **webinars on the E.U. Cyber Resilience Act's impact on open source development**, **business engagement**, and the **Open Source Software Stewards and Manufacturers Workshop**, LF Europe highlights the importance of policy stewardship. These discussions are essential for understanding how regulations influence open source contributions and how businesses can adapt. Why is policy stewardship important? This is because open source thrives on openness and freedom, which requires safeguarding through thoughtful regulation.

LFX: Understanding Code Contributors and Velocity Through Data

We know that the strength of any open source project depends on its contributors and speed of work. Over the past year, we've focused on supporting them by leveraging data. Our platform has enabled **784,054 contributing developers** and **19,442 contributing companies** to actively improve **14,930 repositories**, collectively making **12.7M commits.**

Listening to What Maintainers Need

Open source maintainers want:

- ▶ More time to work on open source projects.

- ▶ Better tools and processes to streamline their work and bring on new contributors.

Many developers work on open source projects in their off-hours—late at night or on weekends, indicating insufficient workday time for these contributions. With data, we've opened conversations with employers to provide more dedicated time.

We've also improved tools for maintainers to develop projects efficiently. Each week, **31.6M lines of code** are added and **12.52M lines** removed, ensuring infrastructure and compliance. We've also raised **$3.3M** through **LFX Crowdfunding,** supported **10.7K mentees**, added **54,835 CLA contributors**, and hosted **27K meetings.** These improvements let maintainers focus on building better open source projects.

LFX Insights: Helping Projects Stay Healthy

[LFX Insights](#) helps maintainers understand the health of their projects with real-time data on code velocity, new contributors, documentation quality, security, and legal compliance. We've monitored **2.65M pull requests** and overseen **4M builds** to ensure smooth workflows, detected **555,121 vulnerabilities**, and recommended **89,248 fixes**, fixing **92,892 vulnerabilities** to ensure that our projects are secure.

This data allows maintainers to clearly see the overall health of their projects and take action. Our platform's insights also helped us detect and address **1.34M logged issues** across projects supporting **29,929 community meetings** to maintain strong collaboration.

Taking Action with Data

[LFX Insights](#) provides actionable insights. For example, if code velocity slows down, maintainers can identify bottlenecks.

Proactive Support

At the Linux Foundation, we actively engage with maintainers and communities. When we see a problem, we step in to help, whether it's fixing a security issue, improving documentation, or advocating for more developer support.

THE LINUX FOUNDATION | Education
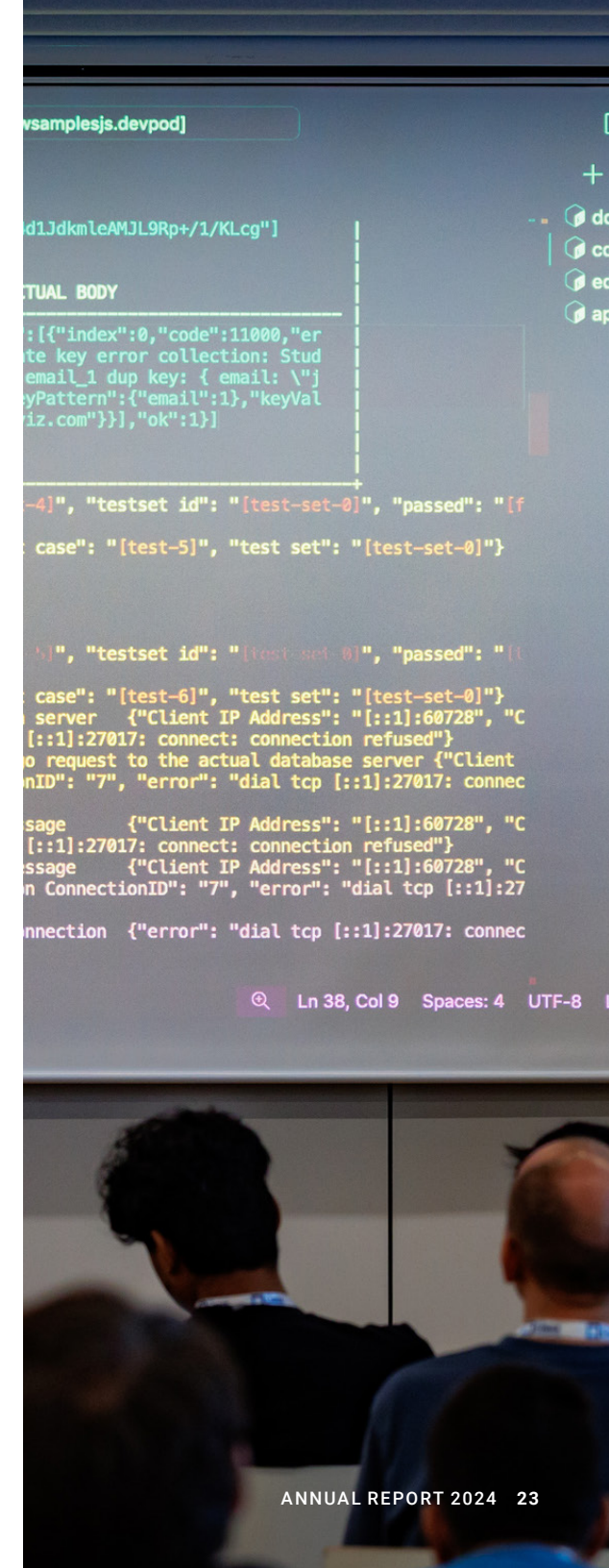
Linux Foundation Training & Certification is now Linux Foundation Education. The evolution of technology has always been about what technology enables all of us to do. Educational technology has evolved significantly during the last several years, and we are positioning ourselves to take full advantage of the new innovations in learning tech, enabling us to do more to help the tech community learn, grow, and succeed.

LF Education

Accelerating Workforce Growth

Continuing a trend we saw last year, organizations are increasingly upskilling and cross-skilling to address technical talent gaps. This recognizes the value of investing in existing staff and the challenges of finding, onboarding, and retaining the right external candidates. Organizations increasingly agree that talent is something you should build as well as buy.

This aligns with another accelerating trend, the acceptance of real-life experience and certifications as proof of knowledge and skills for non-degreed candidates. Unsurprisingly, demand for cloud, DevOps, cybersecurity, and AI/ML talent continues to grow.

GenAI continues to drive intelligent automation across the workforce, with organizations planning to use it for data analysis and reporting, IT infrastructure monitoring, and software development. While some organizations are reducing head count due to GenAI, many are planning to maintain or increase their overall technical head count.

Taking a step back to the big picture, the major trends we have seen for more than a decade continue. The pace of technological evolution continues to accelerate along with the challenges of identifying, recruiting, retaining, and upskilling IT talent. It appears, however, that organizations are shifting their approach, carefully replacing the hire-at-all-costs perspective with an approach focused on identifying smart, talented IT professionals and providing them with the tools they need to keep themselves—and the organizations they work for—along, if not ahead of, the curve.

Scholarships

In 2024, we awarded more than 500 scholarships to individuals from 111 countries in memory of Shubhra Kar, Linux Foundation's CTO. Hundreds more scholarships were awarded via partnerships with diverse nonprofits.

2024 Launches

Courses

- Creating Effective Documentation for Developers

- Remote Work at Scale

- Introduction to RISC-V

- Understanding Vulnerabilities & Security Threats

- Securing Coding Fundamentals

- Mastering Infrastructure Security: Strategies, Tools, and Practices

- Zero Trust Security with SPIFFE & SPIRE

- Introduction to DevOps & Site Reliability Engineering

- Mastering Kubernetes Security with Kyverno

- DevOps and Workflow Management with Argo

- Mastering Kubernetes Event-Driven Autoscaling with KEDA

- Introduction to AI/ML Toolkits with Kubeflow

- Dapr with WebAssembly

- Introduction to Nephio

- Leading High-Performance Working Group Meetings

- Istio Service Mesh Essentials

- Generative AI Prompt Engineering

- Machine Learning & AI Introduction

- Retrieval Augmented Generation (RAG) Introduction

- Threat Modeling: The Essentials Toolkit

- Hyperledger Fabric: Design, Develop & Deploy

- Cloud Cost Monitoring for FinOps with OpenCost

- Serverless & Event-Driven Applications with Knative

- Conversational AI: Risk Mitigation Strategies

- Evaluating Generative AI Solutions in the Workplace

- Linux Kernel Debugging

- Kubernetes Troubleshooting

Express Learning

- Scaling Cloud Native Applications with KEDA

- OpenAPI Fundamentals

- XSS Exploits & Defenses

- Introduction to the Common Domain Model

Certifications

LF Research

Now in its fourth year, LF Research has led dozens of studies across disciplines, geographies, and technologies, with over 25 unique reports published in 2024 alone! Today, our program features a standardized sponsorship offering, a new survey page to host LF and community surveys, and the LF Research Forum, a community of open source experts who contribute critical insight as survey respondents on a regular basis. Research highlights in 2024 include the following:
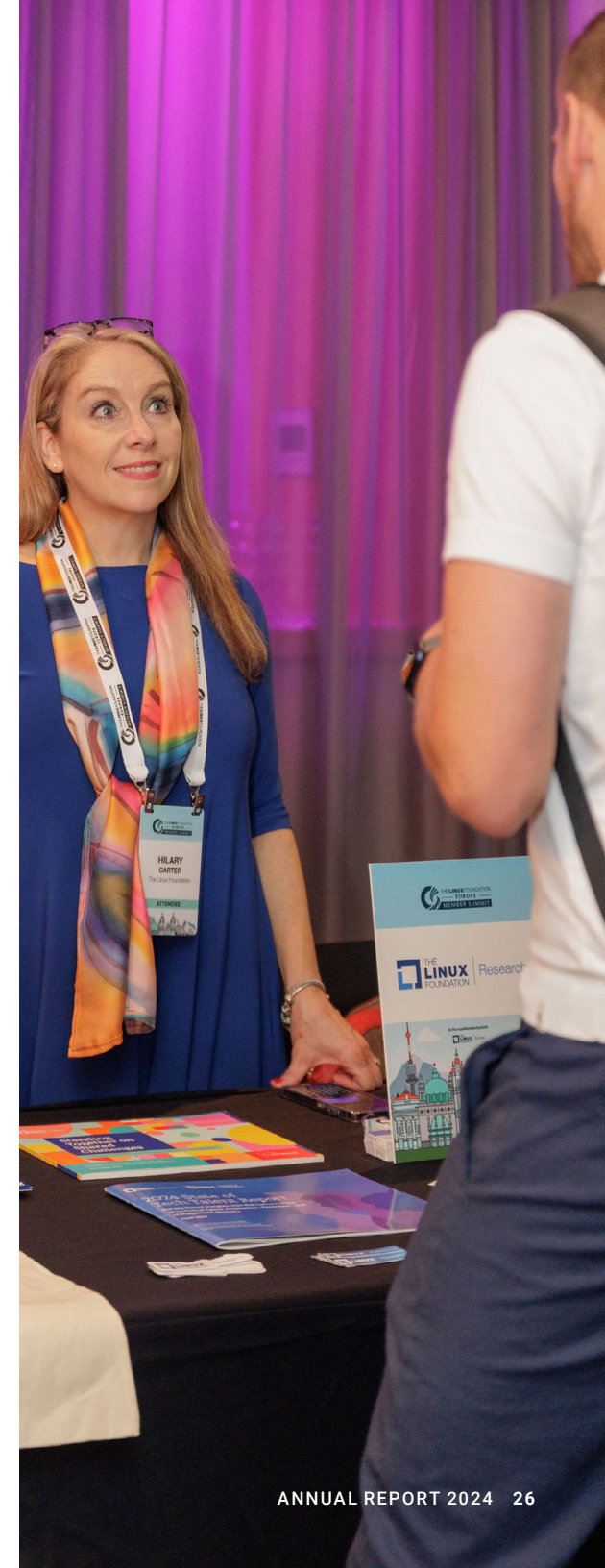
▶ Our academic collaboration continues with Harvard through the Census III & Open Source Funding projects;

▶ We partnered with OpenSSF and LF Education on a project to investigate gaps in cybersecurity training and identify what topic their next security course should cover;

▶ AWS commissioned a study to explore how to best invest in, grow, and position the OpenSearch project to support the needs of its community;

▶ Intel commissioned research to understand the specific needs and strategies that open source developers employ to advance their careers;

▶ We collaborated with stakeholders across the energy and healthcare sectors to produce qualitative research on interoperability for the Canadian energy grid and health data infrastructure;

▶ We worked with Futurewei and MIT to produce a report tracking open source technologies and the impact of AI on decentralized computing domains;

▶ We published year-over-year trend reports for FINOS in the financial services sector, LF Education on the state of tech talent, the TODO Group on the state of the OSPO, and across geographic regions (Europe, Japan, and worldwide); and

▶ We delivered key findings of our research at various conferences and in interviews, expanding our knowledge translation efforts in AI, cloud native confidential computing, and beyond!

As we look ahead to 2025, we look forward to tackling new and pressing research questions and to expanding our program and our community of collaborators to further engage government agencies, industry stakeholders, and the open source developer community.
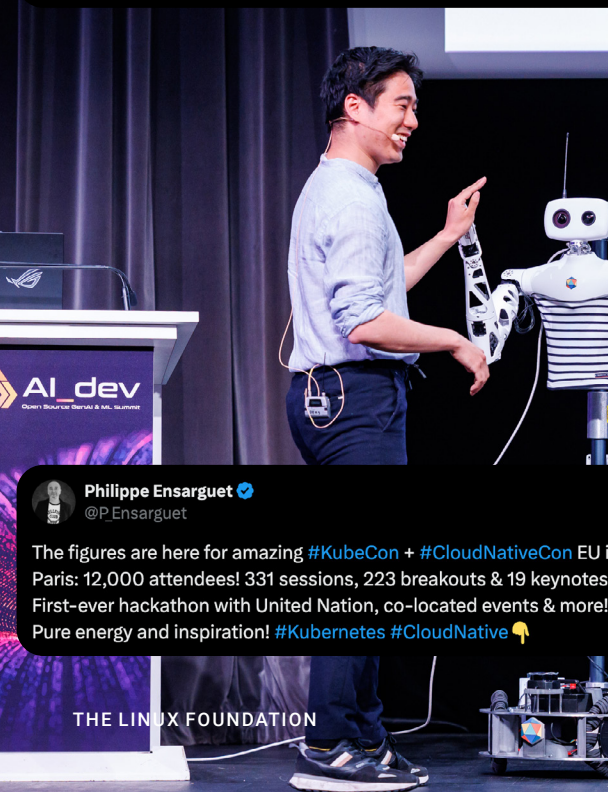
We would like to thank our community of study participants, sponsors, and readers for their commitment to making LF Research the definitive, community-led resource for open source insights in 2024 and into the future! We are grateful for your ongoing support.

LF Events

In 2024, Linux Foundation events continued to play a crucial role in growing and sustaining open source communities and projects worldwide, whether by gathering kernel maintainers to discuss the next release cycle, by bringing together European open source leaders to collaborate and discuss the CRA and other policy affecting open source, or by joining together 12,000 cloud native developers and community members from across the globe in person for deep technical dives and relationship building. These events not only foster deep collaboration and innovation but also significantly expand access to open source education and dialogue.

The full return to in-person events in 2024 has been particularly successful, with landmark gatherings such as **KubeCon + CloudNativeCon Europe 2024**, which set a new attendance record, and **PyTorch Conference 2024**, which saw nearly triple the registrations compared to 2023, reflecting the rapid growth of AI and machine learning communities around open source technologies.

The **OpenSSF** continued its upward trajectory in 2024 with a series of **SOSS Community Days** worldwide, culminating in the **SOSS Fusion conference** in Atlanta in October. This series has been instrumental in advancing education and security practices across the open source landscape.

The **first AI_dev Europe** conference in June 2024 also marked a key event, attracting over 600 developers eager to engage with open source AI, GenAI, and ML technologies. This event was a significant milestone for the open source AI developer community.

KubeCon + CloudNativeCon + Open Source Summit China 2024, held in Hong Kong for the first time, brought together attendees from China, Thailand, India, and across Asia, creating a powerful forum for regional and global open source leaders. The event demonstrated remarkable growth, especially from regions that were previously underrepresented.

While the Linux Foundation reduced the number of virtual events, it has continued to provide widespread access to conference sessions through its YouTube channels. As of September 2024, the Linux Foundation and its projects have a combined total of over **366,000 subscribers** and have garnered nearly **1.9 million views** between January and September 2024, primarily of conference content offered openly to anyone around the globe.

These numbers highlight the ongoing demand for open source knowledge, enabling developers and community members from around the world to access critical discussions and educational content even if they cannot attend in person.

Despite economic challenges, **2024 saw a return to pre-pandemic attendance levels** for many events, underscoring the enduring importance of these gatherings for fostering vibrant and innovative open source ecosystems.

Frantisek (Frank) Borsik
@FBorsik

To see #LinuxKernel expert @paulmckrcu responding to a question from #Linux #Kernel expert @edumazet - is a thing of beauty! ONLY possible at @linuxplumbers 2024 by @linuxfoundation and the like ✋ #LinuxPlumbers #OpenSource #FLOSS #latency #OSSummit #LinuxFoundation

Philippe Ensarguet ✔
@P_Ensarguet

The figures are here for amazing #KubeCon + #CloudNativeCon EU in Paris: 12,000 attendees! 331 sessions, 223 breakouts & 19 keynotes. First-ever hackathon with United Nation, co-located events & more! Pure energy and inspiration! #Kubernetes #CloudNative 👇

Mentorship

Open source software is the backbone of our world infrastructure in financial, healthcare, and telecommunications sectors and critical Internet infrastructure. As a result, ensuring that these communities are healthy and sustainable for the long term is paramount to keeping this infrastructure working. Our responsibility as maintainers and contributors is to invest in the future by empowering the next generation of open source developers. It is difficult for thinly stretched experts to take on mentoring roles; however, it is important to the continued success and health of the communities.

Equitable access to learning resources is a barrier for many new developers. Making access to learning equitable is essential to attract and retain new open source talent to keep communities healthy. Empowering aspiring open source developers to have agency over their learning and skill development is important.

We at the LF have recognized that access to resources is a barrier, and we have designed our programs with that in mind. Our all-remote, open-to-all full-time and part-time mentorships, webinars, and training resources enable women and people with work–life balance challenges to overcome the barriers to learning. The **LFX Mentorship programs** spanning a wide range of LF projects and technologies, have been training the next generation of open source developers since its inception in 2019. As of this writing, we have received 14.9K applications, accepted 1.2K candidates, and had 864 participants graduate from the programs. We have paid $2M in stipend payments. Except for a small number of

unpaid programs, most of our programs pay a stipend to learn. Our mentorship programs are open to all, allowing students and developers to advance their careers and expand their skills in technical areas of interest.

Empowered Learning

We look at mentoring from a broader perspective, offering structured mentorship programs as well as mentoring in our **LF Live: Mentorship Series** inter-active webinars. These webinars offer opportunities for new developers to learn from experts in various technical areas. These webinars are free for anyone to attend, and we are offering them to support the development of skills and further empowerment of the community. We archive past webinars, and they are available as a self-learning resource for developers.

2024 Highlights

Applications came from all corners of the globe, spanning all the continents.

LFX Mentorship Showcases are held at Open Source Summits across the globe in collaboration with the LF Events. Our 2023 graduates showcased their mentorship projects and the skills they learned at the LFX Mentorship Showcases. The Linux Foundation provided funding to enable the graduates to connect with developers and communities.

▶ OSS NA—**The LFX Mentorship Showcase**, Monday, April 15, 2024

▶ OSS China—**The LFX Mentorship Showcase**, Thursday, August 22, 2024

▶ OSS Europe—**The LFX Mentorship Showcase**, Monday, September 16, 2024

▶ OSS Japan—**The LFX Mentorship Showcase**, Monday, October 28, 2024
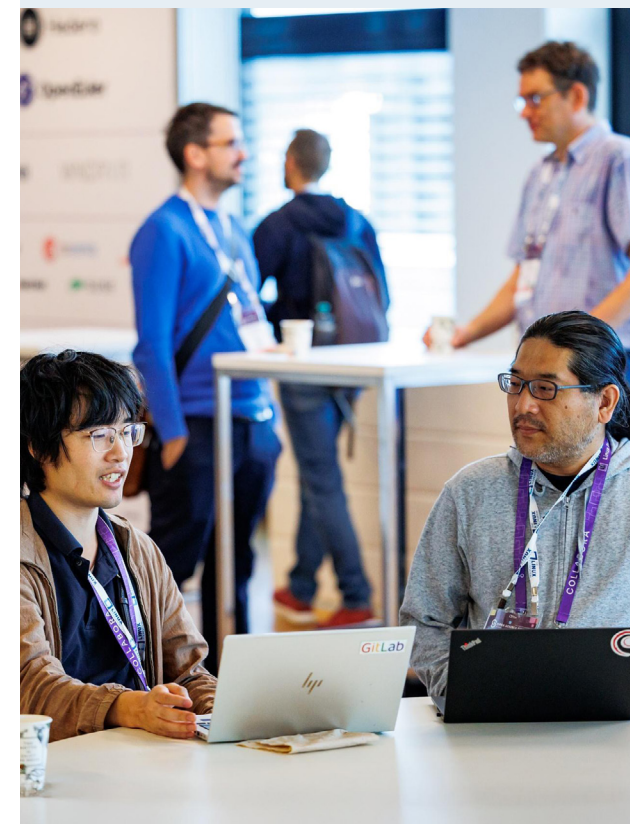
Growing LF Charities

In 2024, LF Charities furthered its charitable mission, proudly launching two transformative open source initiatives — Tazama and Project Jupyter — and facilitating philanthropic support for open source. Each of these formations demonstrates the LF's commitment to leveraging collaborative technology to address critical societal challenges and inequalities.

Tazama: A Revolutionary Approach to Fraud Prevention

Launched in February 2024, Tazama is an innovative open source software solution designed for real-time fraud prevention in digital payments. Supported by the Bill & Melinda Gates Foundation, Tazama addresses the staggering $1 trillion lost to online fraud in 2022[1]. Traditional proprietary solutions often come with high costs and limited accessibility, particularly affecting developing economies. Tazama provides a scalable, cost-effective, easy-to-implement alternative that democratizes access to advanced fraud management tools.

The project focuses on fraud detection, anti-money laundering compliance, and monitoring digital transactions, with architecture emphasizing data sovereignty, privacy, and transparency — aligning with global governmental priorities. Collaborations with organizations like BankservAfrica and IPSL

are assessing Tazama's effectiveness in real-world scenarios, ensuring it meets the diverse needs of Digital Financial Services Providers. Tazama invites engagement from central banks, regulators, and mobile payment providers to further its mission.

Project Jupyter: Strengthening Interactive Computing

In October 2024, LF Charities announced that it would host Project Jupyter under its umbrella, offering improvements for the project's sustainability and governance. Jupyter has become a vital tool for interactive computing, data science, artificial intelligence, and research, with millions relying on its capabilities. Transitioning to LF Charities marks a pivotal moment for Jupyter, as LF Charities provides increased support to ensure its long-term viability. With interactive notebooks and standards, Project Jupyter fosters collaboration across diverse fields, allowing users to explore data dynamically and integrate AI into workflows.

Both Tazama and Jupyter exemplify LF Charities' mission to leverage open source technology for societal betterment, fostering community engagement and innovative solutions for today's pressing challenges.

1   Global Anti-Scam Alliance, 2024. Global Anti Scam Summit: Turning the tide on scams. https://www.gasa.org/global-anti-scam-summit-2023.

Protection Against Patent Aggression

This year the open source community witnessed an uptick in activity from non-practicing entities (NPEs), commonly known as patent trolls, targeting open source project innovation within and beyond cloud native. In response, the Linux Foundation and Cloud Native Computing Foundation (CNCF) expanded their partnership with Unified Patents to enhance protection and mitigate costly and unwarranted aggression from NPEs for our members in a significant way. The partnership with Unified Patents began in collaboration with Open Invention Network, IBM, and Microsoft in 2019. The extended benefits aim to curb the increasing risk of frivolous patent litigation targeting open source project communities and hurting organizations of all sizes, which then jeopardizes innovation and collaboration within the community.

Through this partnership, LF and CNCF members—more than 1,400 companies—will benefit from various resources depending on their membership level, including annual NPE risk analyses, patent portfolio assessments, and access to Unified's PATROLL prior art bounty program. They will also receive updates on NPE activities and opportunities to participate in royalty-free licenses from settlements, and attend in-person events.

As cloud native and open source technologies evolve, proactive measures against patent trolls become increasingly essential to ensure the ongoing innovation and productivity of the open source ecosystem.

This collaborative initiative strengthens the collective defense strategy of the LF and CNCF, equipping members with the necessary tools to navigate the complex landscape of patent threats, and it's a development that we hope our members will take full advantage of.

Spheres of Impact

The Right to Fork

The "right to fork" has always been an option of last resort but an important one nonetheless. Over the past year, the Linux Foundation assisted communities seeking support and a neutral home in order to exercise their right to fork. Over the last year, these vibrant, energetic communities have shown that it is possible to sustain forks where all parties can collaborate under neutral terms and a true open source license without use restrictions.

Until recently, many considered the right to fork an empty threat. Over the last five years, however, several software companies have unexpectedly changed the license for their open source projects to more restrictive licenses. Often, these new models promise "sustainability," "fairness," and more as a means to "remedy" open source. They come with catchy websites and brands such as "business source," "fair source," "commercial source," or what we generally call all of these non–open source licenses: "source available." While it is within a company's right to change direction, it has a crippling effect on the external contributors and the community of users who took a dependency on that software. They trusted that company to operate a project under an open source license. Commercial entities and users dependent on that software suddenly face a deadline to pay for a commercial license or migrate. Many chose to fork the previous open source version of the project and migrate.

The rapid emergence of **OpenTofu**, **OpenBao**, and **Valkey** as recently forked projects has established a new reality for companies contemplating a license

switch. These forks set a clear precedent for quickly creating a viable community and ecosystem. The Linux Foundation provided the projects with a neutral home, best practices, templates, operational guidance, events, legal support, marketing, and technical infrastructure and support for growing their community.

The emergence of well-orchestrated and well-supported forks also transforms the communities to become more open to contributors of all stripes, absent the pure profit motive. For example, some companies had a reputation for being unfriendly to community contributions or resistant to features that they wanted to retain for enterprise customers. Having a neutral community enabled many existing contributors and non-contributors to show up and contribute more—the results are amazing.

The announcements of OpenTofu and OpenBao came shortly after HashiCorp decided to relicense its popular Terraform and Vault codebases under a closed source license. HashiCorp's relicensing event disrupted many users and open source project communities that depended on those codebases. OpenTofu is an open source infrastructure-as-code platform that offers a community-driven alternative to Terraform, providing features for managing cloud infrastructure with a focus on maintaining open governance and stability. OpenBao, a project under LF Edge, is an open source, community-driven alternative to Vault for managing, storing, and distributing sensitive data such as secrets, certificates, and encryption keys. As these open source projects

"The right to fork open source code is at the core of open source licensing. All open source licenses grant the right to fork their code, that is to start a new development effort using an existing code as its base. Thus, code forking represents the single greatest tool available for guaranteeing sustainability in open source software. In addition to bolstering program sustainability, code forking directly affects the governance of open source initiatives. Forking, and even the mere possibility of forking code, affects the governance and sustainability of open source initiatives on three distinct levels: software, community, and ecosystem."[2]

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2   Nyman, L. and J. Lindman. 2013. Code Forking, Governance, and Sustainability in Open Source Software. Technology Innovation Management Review. January 2013: 7-12.

Available at: https://timreview.ca/sites/default/files/article_PDF/NymanLindman_TIMReview_January2013.pdf

"On the software level, the right to fork makes planned obsolescence, versioning, vendor lock-in, end-of-support issues, and similar initiatives all but impossible to implement. On the community level, forking impacts both sustainability and governance through the power it grants the community to safeguard against unfavourable actions by corporations or project leaders. On the business-ecosystem level, forking can serve as a catalyst for innovation while simultaneously promoting better quality software through natural selection. Thus, forking helps keep open source initiatives relevant and presents opportunities for the development and commercialization of current and abandoned programs."[3]

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3   Nyman, L. and J. Lindman. 2013. Code Forking, Governance, and Sustainability in Open Source Software. Technology Innovation Management Review. January 2013: 7-12.

Available at: https://timreview.ca/sites/default/files/article_PDF/NymanLindman_TIMReview_January2013.pdf

started to grow in popularity and adoption among developers, HashiCorp incorrectly accused OpenTofu of copyright infringement, and the community quickly responded with full transparency, debunking the false claims. And in March of this year, the Linux Foundation announced the formation of the Valkey project following the license change of Redis to "dual source-available."

The right to fork is not just a 2024 trend. Just over three years ago, ElasticSearch changed the license for its popular codebase to a closed source license. Amazon AWS forked the ElasticSearch codebase to create **OpenSearch** and invited others to participate. OpenSearch received tremendous growth during this time from community participants, including a double-digit number of maintainers from outside AWS, resulting in two major and 19 minor releases, and 700 million downloads. A single-vendor-sponsored open source project achieved all these amazing milestones. In September, AWS worked with its community to transition OpenSearch to a neutral governance structure under the Linux Foundation, setting up future opportunities for further scale and putting the future of the project into the hands of the community.

During his **keynote at Open Source Summit Europe**, Gabriele Columbro offered the following: "Having an open source project stewarded by a foundation means that there is very little chance that the project will change its license over time, and if that happens, it will be because of consensus of the governing bodies of the project community, certainly not the decision of a single member, so effectively this allows open source to stay open,

forever. An open source license on its own is not enough."

2024 has shown that neutral, community-driven governance for a project truly matters. The foundation model ensures that intellectual property has neutral governance, aligns with the community's needs, offers lower risk for organizations taking a dependency on the open source project, and aligns forked projects more closely with the community's interests.

In September, the Valkey project released version 8.0, reflecting the strength of support and rapid innovation through a commitment to open source collaboration. The growth of Valkey, OpenTofu, OpenBao, and OpenSearch represents an important counterbalance to the single-vendor relicensing situation. The communities that are dependent on those projects have taken a stand to invest and keep projects they're all dependent on truly open source. The community now has a clear playbook for ensuring innovation continuity by organizing in response to license changes and demonstrating that open source projects can thrive independently of any single corporate entity. As open source evolves, the right to fork will remain a crucial mechanism for preserving trust in open source software and ensuring that its future remains community driven.

Confronting Security Challenges in All Forms

Open source software security and supply chain resilience are critical focus areas for the global tech community. With attacks increasing in both volume and sophistication, even targeting schools, hospitals, and municipalities the world over, software security has become closely tied to physical security and well-being. In the face of ongoing challenges, projects and teams across the Linux Foundation community continue to drive several key initiatives aimed at strengthening software security posture through collaboration.

Many will remember 2024 as a year defined by hackers who showed new levels of creativity in attempting to take over open source projects through sophisticated, multi-party social engineering attacks. We witnessed bad actors pairing complaints and comments, telling maintainers they had to move faster, with seemingly well-intentioned community members with no track record of trusted contributions offering to ease maintainers' burdens. This situation came to a head when the XZ Utils project was compromised, and a hard-to-detect backdoor was installed in the project code. Thankfully, because of a thoughtful, paced release process, the compromised packages were contained to a narrow distribution, as the Open Source Security Foundation (OpenSSF) describes in this report.

But XZ Utils was not an isolated incident. One credible takeover attempt within an OpenJS Foundation project, home to JavaScript-critical technologies that support the web ecosystem, was intercepted. Consequently, the OpenJS Foundation and OpenSSF jointly responded by creating new guidance for recognizing and mitigating social engineering threats within open source projects, a great example of their ongoing support of the open source community.

What's the lesson? Reputation and trust have never been more important among open source contributors. We learned that we need to do a better job of understanding contributors' track records and motivations, especially in the absence of knowing contributors' identities.

Another security arena where Linux Foundation projects made notable progress is in the development and maturation of Software Bill of Materials (SBOM) standards and tools. The System Package Data Exchange (SPDX) project released its 3.0 standard, a milestone that introduced profiles for popular use cases such as AI/ML modeling, dataset provenance, security, software build attestation, and licensing. Updated validation and migration tools, as well as porting libraries, have been released with it as well. The OpenSSF also released new tools to simplify SBOM usage, including Protobom (cross-standard SBOM management), SBOMit (verification and attestation), and bomctl (a format-agnostic management tool supporting complex operations on many SBOMs).

A companion piece of SBOMs is code signing and provenance, which the Sigstore project leads. Over the course of the year, the project added support for multiple programming languages (Java and Go) and expanded verification to popular package

management tools (NPM and Homebrew). This progress moves closer to a future where all code has attestations and is verified before deployment. **Alpha Omega**, another important initiative under OpenSSF, provided grants to support the development of security tools such as Typomania, which detects typosquatting in Rust crates. The grants also helped improve the security of critical projects such as Node.js, jQuery, Apache Airflow, PyPI, and Homebrew.

AI security is emerging as the next critical frontier in both cyberattacks and defense. DARPA's AI Cyber Challenge (AIxCC), launched in partnership with OpenSSF, has driven significant innovation in this space, offering a $29.5 million prize pool to winning teams. Launched in 2023, the AIxCC project showcased results at Black Hat USA 2024, where semifinalists presented technologies designed to automate the identification and patching of software vulnerabilities, secure supply chains, and defend against zero-day exploits. These AI-driven approaches represent a transformative shift in cybersecurity.

With quantum computing rapidly moving from the lab to production, post-quantum cryptography (PQC) is an essential focus. In February, the Linux Foundation launched the **Post-Quantum Cryptography Alliance (PQCA)** to address the challenges of quantum computing, which has the potential to break current cryptographic systems. The PQCA's mission is to design cryptographic algorithms that can withstand quantum attacks, ensuring the security of open source projects well into the future.

Equally important for building a secure future is education. Teaching developers how to code more securely by default is a critical priority. An OpenSSF survey of 400 developers found that educational programs that emphasize functionality over security are a hindrance to security awareness. This leads most professionals (69%) to learn security on the job. However, to achieve familiarity with security best practices in this way requires at least five years, and it is not always successful. Other challenges included lack of time (58%) and lack of knowledge of quality security training courses (44%). To begin addressing this issue, the OpenSSF created a free course on secure software development, which is also available on the EdX platform. This year, we added labs to this course. Since its inception, more than 25,000 individuals have enrolled in some version of this course. We encourage all software developers to consider taking our free **Developing Secure Software (LFD121)** course or one of the many other excellent courses we offer. This only scratches the surface. The **OpenSSF** hosted and contributed to many **events**, created and expanded its **guides**, added new projects, and raised awareness (e.g., through its **blog**). Foundations and projects across the Linux Foundation took steps to improve the security of the software they steward.

Without security and trust, none of the progress in open source will be sustainable or reliable. Fortunately, through these efforts, the community is making significant strides toward a future where open source software is transparent, verifiable, and trustworthy.

To learn more about the full scope of security-focused projects, initiatives, and resources at the Linux Foundation, including guidance on reporting vulnerabilities within projects, visit **LF Security**.

Accelerating Cloud Infrastructure

Sustained innovation over time is the hallmark of enduring open source technology, and cloud computing is solidifying its place in this category. Now 10 years old, Kubernetes continues to be the core driver of growth for the **Cloud Native Computing Foundation (CNCF)** and the cloud native community. Ranking just behind Linux in velocity, based on tracked commits and contributors, it stands out among foundation projects. Other notable CNCF projects, such as OpenTelemetry, Argo, Istio, Backstage, and Prometheus, also rank highly in velocity, placing them among the top 20 projects within the Linux Foundation.

Growth is important, but so are resilience and reliability.

This year, the CNCF community further emphasized the importance of project continuity when its own project, Flux, required support following the closure of its primary corporate sponsor. Thanks to CNCF and its community of contributors, cloud native technology has become the dominant approach to modern application and infrastructure deployment.

Equally important as innovation is maximizing the value of cloud spend. Over the past year, the **FinOps Foundation** has made remarkable strides, growing to over 150 members—including all of the top clouds—and gaining the participation of 48 of the Fortune 50. FinOps, a well-established operational framework, creates a culture of collaboration across engineering, finance, and business teams to maximize the value of cloud. In October, the U.S. Department of Defense formally adopted the FinOps Framework by order of the CIO of the Pentagon. The release of the FinOps Open Cost and Usage Specification 1.0 in mid-2024—with immediate support from AWS, Microsoft, Google, and Oracle Cloud—marked a significant milestone, with an aim to normalize cloud billing data across platforms to drive decision-making and, ultimately, more value from cloud.

Industries such as telecommunications—through LF Networking—and financial services—via the **Fintech Open Source Foundation (FINOS)**—have embraced cloud computing as an integral part of their operations and innovation. FINOS, for example, made notable progress with its **Common Cloud Controls** standards. These standards provide a unified set of cybersecurity, resilience, and compliance controls across major cloud service providers, helping regulated industries such as financial services adopt cloud computing more safely.

Continuous delivery, a crucial advancement driven by cloud native technology, has liberated developers, DevOps, and PlatformOps teams from the complexities of monolithic architectures. The transition to microservices and serverless has enabled faster, more predictable software deployments without compromising application delivery. Since inception, the **Continuous Delivery Foundation (CDF)** has been at the forefront of this movement, with Jenkins growing even more vital for build automation and Spinnaker leading the way in cross-cloud continuous delivery. Innovative approaches such as Tekton aim to simplify the CD process and make it more modular. Over the past year, CDF experienced rapid growth in membership and community engagement, with the discipline of CD becoming more central to cloud native deployments. Additionally, CDF is advancing the CDEvents standard, with version 0.4 released in the Spring of 2024. This open source standard will allow continuous delivery systems to share common definitions and methods across environments and disparate CI/CD pipelines—a critical maturity milestone for CD and companies using cloud native deployments.

These achievements across CNCF, FinOps, FINOS, and CDF underscore the continued evolution of cloud computing as a transformative force for industries. By fostering innovation, supporting critical projects, and establishing standards for cost management, security, and continuous delivery, these communities have cemented cloud native as the cornerstone for modern software development and infrastructure. As cloud adoption accelerates across industries, the Linux Foundation projects ensure that the cloud remains not only a platform for sustained innovation but also a mature, reliable, and secure environment for future growth.

Open Source at the Heart of AI Innovation

Artificial intelligence (AI) is rapidly moving from early adoption to mainstream and the Linux Foundation is playing a key role in guiding this shift by fostering a strong open-source AI ecosystem. The Foundation's efforts encompass core technologies, legal and IP frameworks, innovation sandboxes, and a newly launched series of conferences that unite the leading minds in AI and open source on a single platform. These initiatives are designed to ensure that AI's future remains grounded in open source principles.

PyTorch accelerated its growth this year. Contributions are up 133%, from 2 times more organizations worldwide. The project has seen 20% YOY growth in new repositories using PyTorch, and 30% increase in forks and users this past year. In addition, over 70% of AI research implementations are using PyTorch. The project enjoyed one of the three highest velocities in the Linux Foundation project universe, driven by rapid membership growth and the impressive participation of contributors looking to add additional functionality to the already expansive AI framework. The PyTorch core team pushed out numerous innovations to accelerate model construction and inferencing, with advances in quantization, checkpoints, and FlashAttention and memory tuning, among others. The PyTorch Tools ecosystem grew by over 25%, enhancing both software and hardware capabilities. Working with all major cloud service providers, dozens of major software vendors, and industry partners, PyTorch is setting a new bar for the pace and breadth of AI innovation.

Projects incubating in the **LF AI & Data** continued to multiply, with three notable additions in the summer of 2024 — **Delta Lake**, an open source storage layer that brings reliability to data lakes, **Unity Catalog**, a unified governance tool that provides fine-grained controls for data and metadata management, and **vLLM**, an open-source library for fast LLM inference and serving. These projects, in addition to 7 other new projects that entered the LF AI & Data incubation program in 2024, have thousands of enterprise users and are well established in the AI landscape, adding additional gravity to open source.

To counter restrictive licensing practices that hinder enterprise adoption, LF AI & Data welcomed the **Open Model Initiative** (OMI) as an effort under its Generate AI Commons to promote the development of high-quality, openly licensed AI models. OMI focuses on training generative AI models, establishing governance frameworks, creating shared standards for interoperability, and providing transparent datasets.

Enterprise adoption of open source AI is crucial to building a health open source AI ecosystem.

LF AI & Data launched **Open Platform for Enterprise AI** (OPEA) to create an open, multi-provider platform for building scalable AI systems on standardized frameworks. Now with more than 50 partners, OPEA focuses on integrating composable building blocks for generative AI, including large language models (LLMs) and retrieval-augmented generation (RAG) workflows, while providing standardized frameworks and architectural blueprints. OPEA's Demo-palooza event, showcasing 10 GenAI solutions, has been well received. **LF Networking** and **Automotive Grade Linux** are collaborating with OPEA to facilitate the smooth adoption of open-source AI in telecommunications and transportation. In financial services, **FINOS AI Readiness** is a dedicated initiative to prepare the industry for the safe and reliable deployment of GenAI.

In 2024, LF AI & Data also launched the **Generative AI Commons**, a collaborative initiative to promote developing and adopting efficient, secure, reliable, and ethical open-source generative AI. The initiative has already garnered strong interest, with over 80 organizations joining and participating in the various workstreams.

The LF AI & Data Generative AI Commons working group developed the **Model Openness Framework** (MOF), a three-tiered ranked classification system that rates machine learning models based on their completeness and openness. The MOF provides timely practical guidance for (i) model producers to enhance the openness and completeness of their publicly-released models, and (ii) model consumers to identify open models and their constituent components that can be permissively used, studied, modified, and redistributed.. The **Model Openness Tool** (MOT) provides a user-friendly reference implementation of the MOFand assigns a score based on the accessibility of model components and the chosen licensing. Currently, in beta, MOT reflects the Linux Foundation's commitment to reducing the complexity of operating open-source projects.

Additionally, extending from the Model Openness Framework, the LF AI & Data Foundation helped broaden the understanding, context, and nuance of different AI use cases by releasing a **community-driven definition** of open source AI models and open science AI models, two very different artifacts in this rapidly evolving space.

AI is the future, and open source is the way forward. The LF AI & Data communities are providing the guidance and energy needed to help us achieve this vision.

The Power of Open Data

In the age of AI, data is the new rocket fuel. All AI applications rely on models trained with a foundation of accurate, useful data. This point has been hammered home in 2024 by large AI model builders aggressively signing licensing deals with StackOverflow and Reddit, seeking to safeguard their right to train on high-quality data. The flipside of this trend is that more and more organizations are blocking access and requiring payment for training. The risk is that the best data goes to those with the deepest pockets, leaving the rest of the world "data poor."

Synthetically generated data offers hope. If tools can generate synthetic data that doesn't induce model collapse or inject uncertainty, then small amounts of high-quality open source data will go a long way. Alternatively, the community can secure large pools of open source data to ensure open access.

The **Overture Maps Foundation**'s (Overture) work in open data innovation is especially noteworthy. Geographical data is among the most important data sources affecting our lives and our daily user experiences. Launched in 2022, Overture's mission is to create reliable, easy-to-use map datasets to power current and next-generation mapping applications. Leveraging data from member contributions, civic organizations, and open data sources, Overture's open collaboration tackles the fragmented map data landscape. The foundation works with a "who's who" of tech powerhouses and geographical information systems specialists to create a viable alternative to proprietary map data vendors.

Over the past year, Overture released its first production-ready open map datasets, an astounding achievement given the short timeframe. The July 2024 General Availability datasets feature 2.3 billion unique building footprints and 54 million places of interest, covering critical map layers that the user can further enrich with external data through Overture's open data schema and other data. Overture also made an alpha release of over 200 million address records across 14 countries that developers can use in navigation, logistics, and local search applications. The alpha release allows the public to see the proposed schema. Feedback from this release will inform the schema evolution to ensure that it can work across a worldwide set of address data. Overture's Global Entity Reference System (GERS) assigns unique identifiers to entities within the data. With GERS IDs, developers can easily attach additional spatial data to entities and integrate various types of data, such as environmental factors, traffic, or property information.

Overture is widely used in production. Meta, for instance, switched its internal mapping solution over to Overture. Hundreds of millions of consumers see Overture map data if they use Facebook, Instagram, or WhatsApp. Microsoft uses data from Overture in its Bing and Azure maps, which consumers and businesses then use to create products. Esri uses the data to enhance its ArcGIS Living Atlas of the World with new 2D and 3D map layers. Membership growth has been exceptionally strong. The community-driven approach and continuous feedback loop ensure that Overture's datasets remain updated and adaptable to the changing needs of the digital world.

Other innovative LF data efforts include synthetic data. **LF Energy**'s **OpenSynth** offers a synthetic open source smart meter dataset to allow energy companies to perform energy modeling tasks with lower costs while ensuring consumer privacy. As technology grows more adept at consuming and using data for AI-powered applications, maintaining equal access to high-quality data becomes imperative for innovation. We are looking forward to working with the membership to make this a reality.

Building with Open Hardware and Infrastructure

In 2024, the Linux Foundation expanded our commitment to open hardware. By reducing the reliance on proprietary systems, open hardware standards enable developers and companies to customize and build solutions more efficiently and affordably.

We believe open standard hardware, powered by open source software such as Linux, **Zephyr** real-time operating systems (RTOS), and the **RISC-V** open standard ISA (instruction set architecture), is on the cusp of a significant breakout.

At the core of all open hardware is silicon. The open RISC-V standard ISA is now a comparable alternative to proprietary ISAs with a mature ecosystem and tooling that enables RISC-V usage for every conceivable semiconductor use case. In the past year, RISC-V International surpassed 4,500 members from 70 countries. RISC-V implementations are shipping at scale: Qualcomm has shipped over 1 billion devices that integrate RISC-V-based microcontrollers. A slew of well-funded startups are basing their entire chip designs on RISC-V. Meta is utilizing RISC-V for some of its in-house design. Google's Android operating system and Linux both have prioritized RISC-V support. The future of silicon is open, thanks largely to the success of RISC-V.

Among the highest velocity projects in the Linux Foundation, the Zephyr Project is one of the quiet successes that is powering the future of hardware. With a fast-growing and incredibly active community, Zephyr has rapidly matured in 2024, becoming more secure, flexible, and integrated into the broader embedded systems landscape, including its use as firmware for Intel processors and support of several ARM architectures. With the release of Zephyr 3.7 LTS, this RTOS introduced key features such as dynamic code loading, enhanced security, and expanded support for over 160 hardware platforms. Zephyr strengthened security in 2024 with enhanced software bill of materials (SBOM) generation and external security audits.

In "Big Iron," the **Open Mainframe Project** made strides toward integrating mainframes into distributed and cloud computing and improving the developer and DevOp experience. The **Galasa project** enables deep integration testing across platforms and technologies within a DevOps pipeline. It supports repeatable, reliable, agile testing at scale across your enterprise. Another high-profile project, **Zowe**, is an open source software framework that enables DevOps teams to manage, control, script, and develop on the Mainframe just like they do in the cloud. According to the **Arcati Mainframe Yearbook 2024**, 85% of mainframe organizations will adopt Zowe by the end of the year or have already adopted it into their modern enterprise solutions. With one of the most active mentorship programs in the Linux Foundation, Open Mainframe is a critical

component in bringing fresh talent into mainframes and making older but still critical languages like COBOL "cool" again.

Other hardware-focused projects made great progress in the last year. In 2024, **Dronecode** advanced open source drone hardware with new standards like the Pixhawk FMUv5X and Payload Bus and launched the PX4 Autonomy Development Kit. The **CHIPS Alliance** continued to make progress on multiple fronts, including language support, support for FPGAs, and support for the Caliptra Root of Trust.

The complexity of modern hardware requires collaborative efforts to develop robust software solutions. The **High Performance Software Foundation (HPSF)** launched in 2024 to build, promote, and advance a portable software stack for high-performance computing (HPC) by increasing adoption, lowering barriers to contribution, and supporting development efforts. Performance portability is key in HPC to enable the reuse of libraries and applications on the diverse architectures existing today and make software resilient to the rapid ongoing hardware architecture innovation. Initial HPSF projects include package and container management solutions.

Open hardware will win the battle for developer and designer hearts and minds for the same reasons open source software has succeeded — greater transparency, better security, and a higher pace of innovation, powered by community.

Accelerating Industry Innovation

Industry end-user communities are leading open source innovation by sharing the costs of common, pre-competitive, foundational technologies. Today, these communities exemplify collaboration and value mutualization among fierce competitors to an inspiring degree.

In the automotive industry, **Automotive Grade Linux (AGL)** continues to make progress toward mainstreaming open source as the core component of software-defined vehicles, with systems live in brands including Toyota, Honda, and Mercedes-Benz. In May, AGL went cloud native with support for AWS Graviton processors, allowing for virtual, streamlined development and testing of automotive systems. The new release also supports boards utilizing the RISC-V architecture and includes an updated version of Toyota's Embedded Flutter UI, further simplifying in-vehicle app development.

In the energy sector, **LF Energy** is pushing open source as a core element of technology for electrical utilities as well as energy policy. The TROLIE project was launched to accelerate the implementation of reliable, secure, and interoperable systems for the exchange of transmission facility ratings through an open conformance standard and software ecosystem, helping North American utilities meet the requirements of FERC Order 881. LF Energy also announced new projects for hazard and risk analysis, collecting data on U.S. residential incentive programs, digitizing substations, and more. In addition, the foundation has partnered with the U.S. Joint Office of Energy and Transportation (Joint Office) to build an open source reference implementation for electric vehicle (EV) charging infrastructure.

In motion pictures, the open source projects hosted by the **Academy Software Foundation (ASWF)**, including OpenColorIO, OpenTimelineIO, and OpenEXR, were used in major films and shows like Nimona, Oppenheimer, and Guardians of the Galaxy Vol. 3. ASWF also partnered with the **Alliance for OpenUSD** to promote the 3D content interoperability standard OpenUSD. In gaming, the **Open 3D Foundation** saw the release of its first mobile game, MadWorld, built on the O3DE engine.

In finance, **FINOS** released a cloud-based implementation of Digital Regulatory Reporting (DRR) using the Common Domain Model (CDM). This groundbreaking project significantly reduces the complexity of regulatory reports implementations by financial institutions. **Tazama**, an LF Charities project launched earlier this year, democratizes anti-fraud technology to reduce barriers to entry to alternative financial services providers with lower startup capital. This is particularly relevant in the developing world and for startups building payments infrastructure to better serve the world's unbanked populations.

Finally, **LF Networking** serves as the Collaboration Hub across the entire open network stack. With the world's top telcos participating in LF projects, it is advancing digital transformation via domain-specific AI, cloud native network functions, 5G/6G, open RAN, and more. Additionally, **CAMARA** brings global operators together with aggregators and hyperscalers to define a common set of industry APIs enabled across telco networks and countries. **SONiC**, the leading OS Network Operating System (NOS), allows cloud operators to share the same software stack across hardware, decoupling network software from its underlying hardware.

We are grateful that so many end-user members have become contributor–members, working toward upstream, vertical-specific solutions that enable faster innovation and better management of risk while driving enterprise bottom lines.

Stewarding the Foundations of Trust

Trust is the foundation of a healthy society, and as technology increasingly drives social, political, and economic interactions, it's critical to embed trust into these systems. Cyberattacks, AI-enabled deepfakes, and online fraud have eroded trust in technology and other aspects of our lives. The Linux Foundation believes that wide adoption of neutral, community-managed systems of distributed trust is necessary to address these growing risks to our collective happiness, prosperity, and safety.

In 2024, the Linux Foundation formed **LF Decentralized Trust** as a neutral umbrella organization for projects working toward distributed trust. The new foundation includes active projects from the Hyperledger Foundation and a growing ecosystem of projects focused on the next generation of decentralized trust applications for core social, financial, and political use cases. LF Decentralized Trust builds on the work and successes of the Hyperledger community while also incorporating new technologies. For example, Besu, a Hyperledger project now under LF Decentralized Trust, is the third most popular execution client for the Ethereum mainnet and has growing traction with major banks and financial services providers. To kick off the new foundation, Hedera donated Hiero, the software stack behind the blockchain and consensus engine of the enterprise-focused, high-throughput Hedera Network. We are optimistic that decentralized trust will enter the enterprise mainstream in the next few years, with LF Decentralized Trust leading the charge.

Alongside the meteoric rise of AI, we have experienced a similar rise in deepfakes. The cost of generating believable fake content of any type has fallen to nearly zero. The technology for generating lifelike deepfakes of voice, video, and images is now accessible to even the most nontechnical of users. Scammers using deepfake voice tools mimicking the CEO of car company Ferrari nearly convinced a firm financial executive to wire tens of millions to suspicious accounts. Similar attacks, including a sophisticated video fake that used face swapping in a Zoom meeting, have been more successful. India's National Stock Exchange (NSE) cautioned investors against deepfake videos posted on social media of its chief executive giving stock recommendations. A major presidential candidate in the United States posted deepfake images purporting to garner a recommendation from a famous music star. These are just a handful of examples.

To combat this, the Linux Foundation's **Coalition for Content Provenance and Authenticity (C2PA)** is becoming the standard for verifying content authenticity. Supported by major AI and media brands, C2PA enables publishers and consumers to trace the origin of media and is extensible to documents, emails, and other online content.

As financial services companies strive to compete, increasing liquidity—and efficiency—are priority focus areas. To support this effort, the **Global Synchronizer Foundation** is working to foster adoption and participation in the Canton Network, the first privacy-enabled interoperable blockchain

network, designed for regulated, real-world assets. Blockchain applications in the Canton Network can use the Global Synchronizer to enable atomic transactions across sovereign blockchains without sacrificing privacy or control.

In our vision of the future, authenticity will be a commodity, verified by distributed systems under the control of neutral entities such as foundations. This is the best path to building trust into technology and, by extension, our world and our lives.

Financial
Transparency

The Linux Foundation's revenue is derived from four main sources, Memberships and Donations, Project Support, Training and Certifications, and Event Registration and Sponsorship.

In 2024 we are forecasting revenues of over $292M. In 2024, the Linux Foundation is forecasting to spend nearly $300M supporting our mission.

Gross Revenue
$292,217,236

Expense Categories
$299,711,353
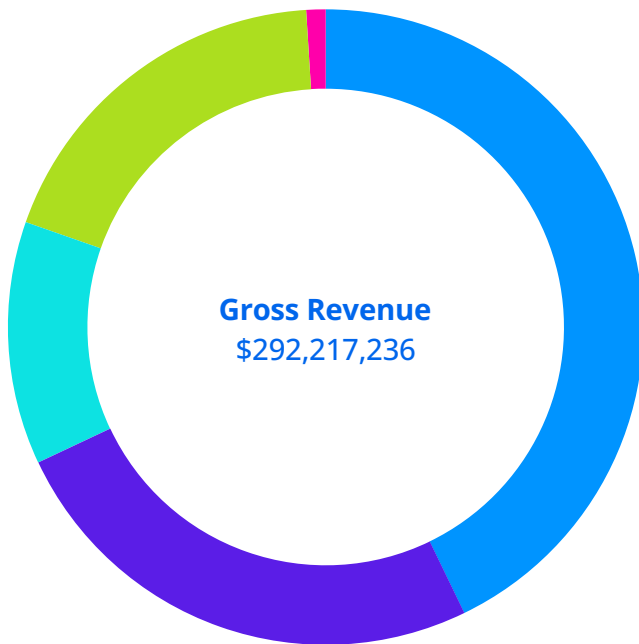
● **Membership & Donations**	$125,120,830
● **Project Services**	$73,573,044
● **Training & Certification**	$36,122,248
● **Event Sponorships & Registrations**	$54,533,169
● **Other**	$2,867,945
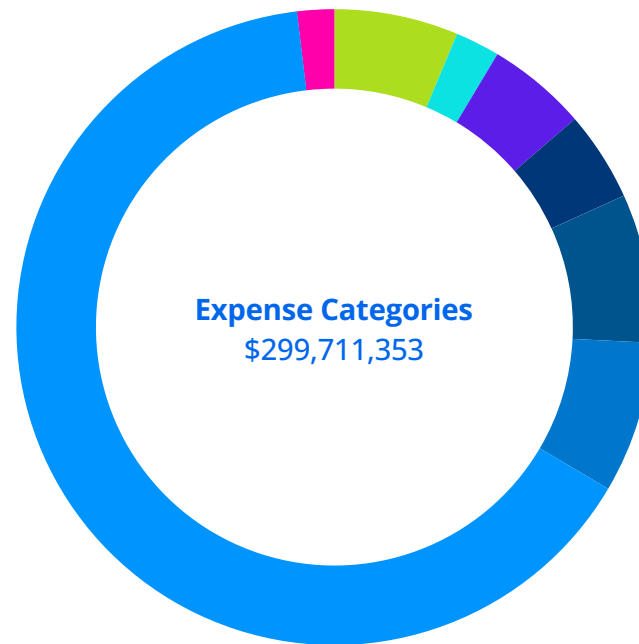
● **Corporate Operations**	$18,910,547
● **Linux Kernel Project**	$6,796,780
● **Event Services**	$15,197,168
● **Community Tooling**	$13,706,755
● **Project Infrastructure**	$22,695,205
● **Training**	$23,063,126
● **Project Support**	$193,704,610
● **International Operations**	$5,637,162

TRAVEL FUNDING

In our continued efforts to broaden accessibility to in-person events, we provided over:

$1.6M

in travel funding and registration scholarships

$1.1M

Travel Funding

Almost
1000

Registration Scholarships

75%

of funding went to diverse community members

THE LINUX FOUNDATION

About The Linux Foundation

The Linux Foundation is the world's leading home for collaboration on open source software, hardware, standards, and data. Linux Foundation projects are critical to the world's infrastructure including Linux, Kubernetes, Node.js, ONAP, OpenChain, OpenSSF, PyTorch, RISC-V, SPDX, Zephyr, and more. The Linux Foundation focuses on leveraging best practices and addressing the needs of contributors, users, and solution providers to create sustainable models for open collaboration. For more information, please visit us at linuxfoundation.org. The Linux Foundation has registered trademarks and uses trademarks. For a list of trademarks of The Linux Foundation, please see its trademark usage page: www.linuxfoundation.org/trademark-usage. Linux is a registered trademark of Linus Torvalds.

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