OPEN MAINFRAME PROJECT

State of the Open Mainframe Project

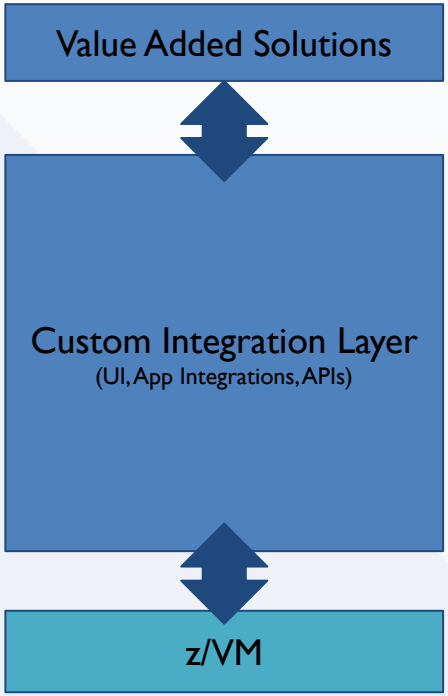
John Mertic and Len Santalucia

8 years
16 hosted projects
80 funded mentees
41 supporting organizations
1,800+ code contributors
53,000,000+ code contributions

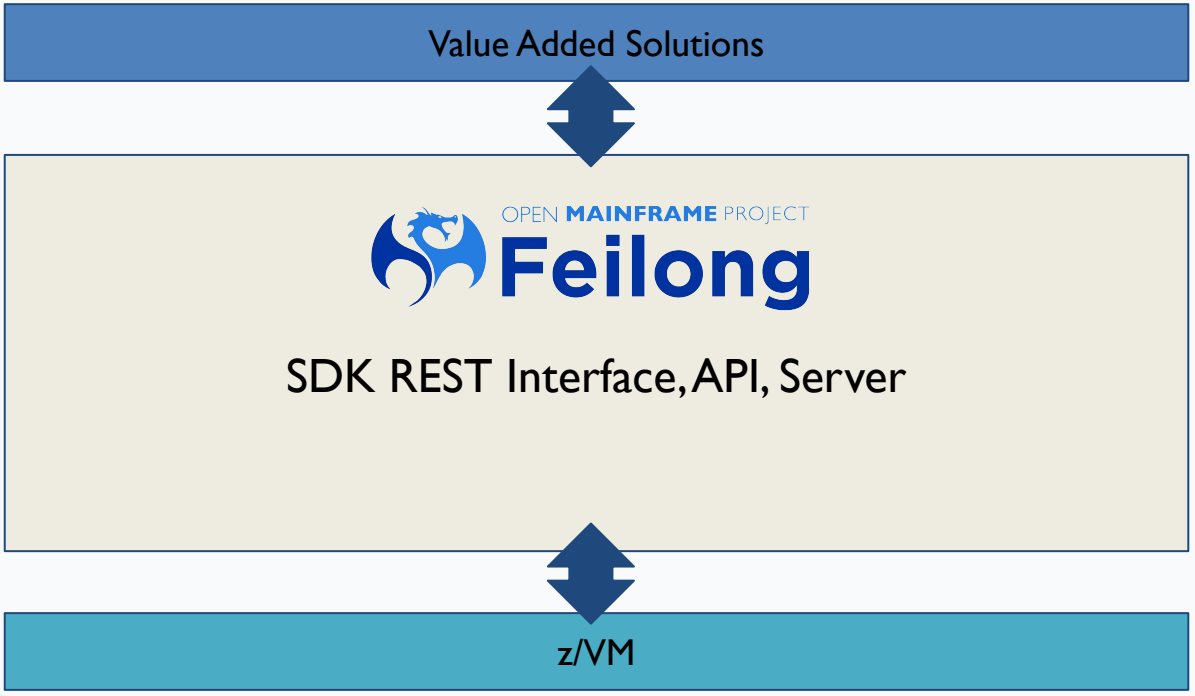
Why is this all important?

We have an opportunity to create a sustainable mainframe ecosystem for generations to come

Example: Leveraging Feilong create efficiencies



Without Feilong
Full stack supported and developed; expensive R&D and hard to scale



With Feilong
Vendor/Customer focus on Value Added Solutions, leverage Feilong development

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

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Open Mainframe Project is a pre-competitive platform that enables cooperation and leveraged development.

But what does that mean?

Cost to create Feilong

Total Physical Source Lines of Code (SLOC)

91,717

Development Effort Estimate

21.82 (261.84) *Person-Years (Person-Months)*

*(Basic COCOMO model, Person-Months = 2.4 * (KSLOC**1.05))*

Schedule Estimate

1.38 (16.59) *Years (Months)*

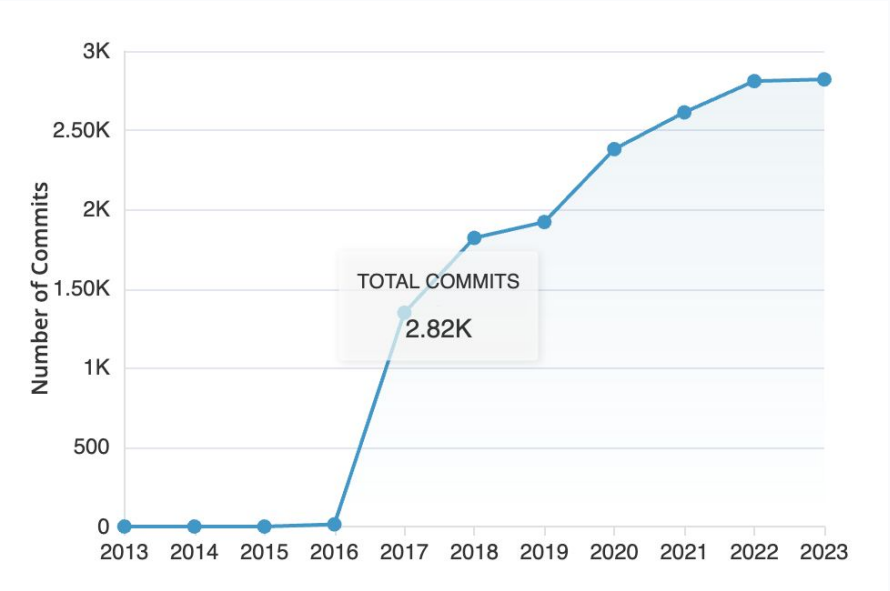
*(Basic COCOMO model, Months = 2.5 * (person-months**0.38))*

Total Estimated Cost to Develop

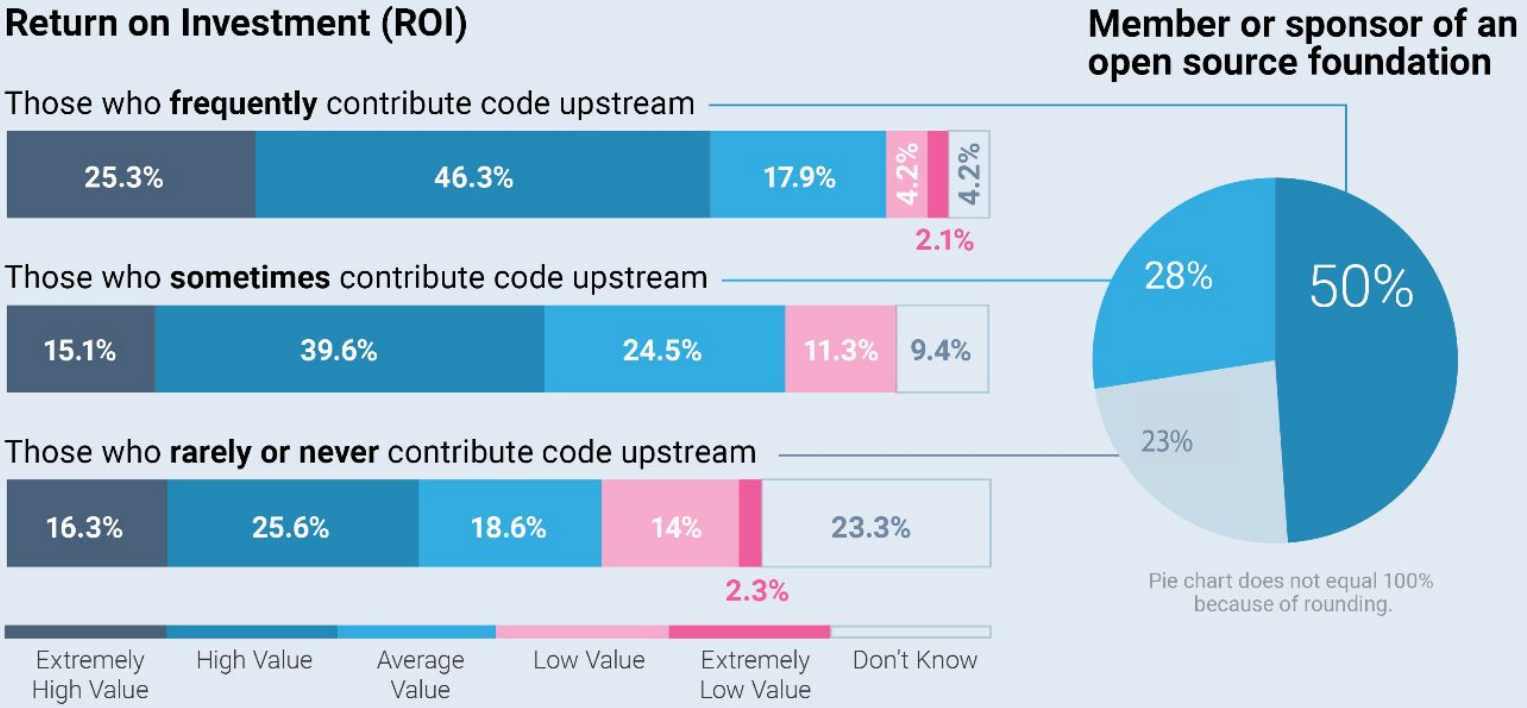
$2,947,620

(average salary = $56,286/year, overhead = 2.40).

generated using [David A. Wheeler's 'SLOCCount'](#)



Frequent Contributors Get High ROI From Open Source Foundation Membership



Source: "Open Source Programs in the Enterprise - 2020" Survey.
Is your company a member or sponsor of an open source foundation(s)? (e.g., Linux Foundation, Apache Foundation, Eclipse Foundation, OpenJS Foundation) If yes, how valuable is the support and return on your investment you have received from these open source foundations?
Frequently contribute code upstream, n=95; Sometimes contribute code upstream, n=53; Rarely or never contribute code upstream, n=43.

Value of leveraging development

Let's say an organization accounts 30% of contributions (3x multiplier in value as a leading organization[1])

This means the organization invested…

- 6.55 years of developer effort
- $884,286 of R&D costs

and leveraged (3x multiplier[1])…

- **65.46 years** of developer effort
- **$8.8M** of R&D costs

7x R&D ROI

(1) *Source: https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/developer-velocity-how-software-excellence-fuels-business-performance*

But there are more benefits than just pure R&D

- Leadership
  - Top contributing organizations in best position to drive ecosystem direction.
  - End-users more likely to work with vendors who are primary contributors and invest in upstream projects.
- Supply chain efficiencies
  - License and security vulnerability management done in upstream project
  - Partner and developer onboarding can leverage broad community versus specific vendor resources.
- Vendor-neutral outreach and training
  - Technology enablement done at project level
  - Vendor can focus on specific value adds.

Typical ROI 5x-40x

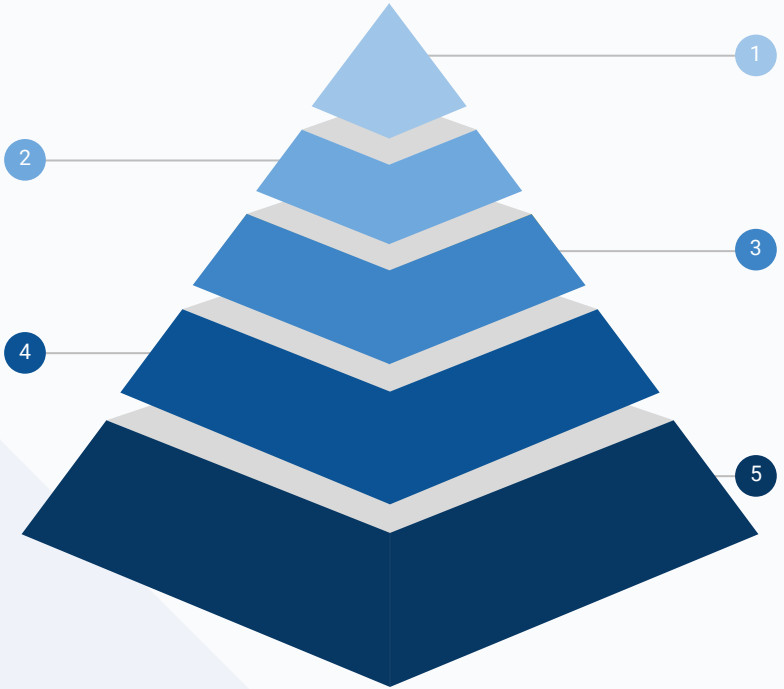
dependent on membership, staff, and product investment

Open source is more than just code.

Sustainable open source development requires everyone to be a part.

IBM z16 image used with permission by International Business Machines Corporation 2022

Doing open source alone hits a glass ceiling



Glass ceiling for project investment and adoption
in the absence of a fair governance and safe haven for the project's assets

Managing projects assets
As project grows, it is unclear who should own legal and administrative tasks that are essential to the health of the project

Developed for a specific product needs
The open source spinoff is a result of wanting to build an ecosystem and collaborate on building a platform

Governance challenges
No formal governance, governance favors the creators of the project, project backer dominating dev and governance

Fragmentation
Lack of integration
Lack of cross pollination across projects

Building sustainable open source ecosystems is a full cycle…

Successful projects depend on members, developers, standards and infrastructure to develop products that the market will adopt.

…and has a lot of moving parts

Support and Resources

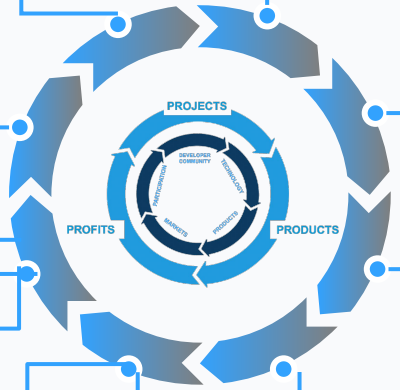
Self Service
- FAQ
- Forum
- Knowledgebase
- Onboarding

Community/Responsive
- Slack/IRC
- Email
- Stackoverflow
- IT operations/Release Mgmt

Value
- Define problem project/code solving
- Recruit widely deployed projects/communities
- Curate projects with natural adjacency to existing project
- Demonstrate where project fits in to broader tech innovation

IT Beyond Github
- CI/CD technical architecture design
- CI environment delivery
- Release engineering services
- Project planning, build & system go-live
- Suite of tools: Security, Crowdfunding , Meetup, Insights, Org Dashboard, Individual Dashboards, etc.

Neutral Management
- Provide home for IP assets
- Define a governance structure for decisions
- Separate business decisions from technical
- Curate sense of identity superseding individuals or firms



Community Programs
- Advocate/Influencer Programs
- Rewards/Recognition
- Startup/Incubator Engagement
- Student programs
- PR/AR

Developer Recruitment and Relations

In person
- Meetups
- Events
- Hackathons
- 3rd Party Events
- Evangelism

Online
- Email lists and calls/meetings
- IRC/Slack
- Github, Gitlab, etc.
- Stackoverflow
- 3rd party repos

Technical
- Code samples
- Getting started guides
- How to's/FAQ
- API/SDK

Standards
- IPR Monitoring
- Document prep & advancement
- Liaison programs
- Conformance programs

Research
- Data-driven insights
- Whitepapers & reports
- Quantitative analysis
- Infographics
- Open data

Communications
- Social media
- Blogs
- Webinars
- Newsletters
- Announcements

Training

Engage
- Massive Open Online Course (EdX)
- Webinars
- Snackable learning

Train
- eLearning
- Classroom learning
- Subscription learning

Certify
- Skills based testing
- Ongoing engagement

Enter Open Mainframe Project

Open Mainframe Project believes…

- ➔ that leading organizations leverage their **technology infrastructure as a competitive advantage**.
- ➔ that the mainframe design principles of **security, stability, scalability, and performance are important** to these leading organizations
- ➔ **having the mainframe interoperable** in a hybrid infrastructure enables leading organizations to realizes it's benefits.
- ➔ technical advancements that are needed by the mainframe community can be **better achieved through open source**.

OPEN MAINFRAME PROJECT

Vision

The mainframe is an active, integrated, and essential part of modern enterprise IT, consumable by mainstream developers and users, and driven by a vibrant open source community.

Mission

To achieve the vision of the Open Mainframe Project by…

Setting a high bar for application development on the mainframe through documentation, API development, and a security-first approach.

Showcase the mainframe of today to both the mainframe ecosystem as well as the broad enterprise IT community.

Enable the mainframe to be more consumable by developers with a transparent experience in leveraging the value propositions of the mainframe.

Ensure the mainframe aligns well in the changing enterprise IT landscape of cloud-native and DevOps.

Open Mainframe Project enables this innovation

Active

- ADE
- COBOL Programming Course
- GenevaERS — The Single-Pass Optimization Engine
- Zowe

Incubation

- Ambitus
- CBT Tape
- COBOL Check
- Feilong
- Education
- Software Discovery Tool
- Tessia

Sandbox

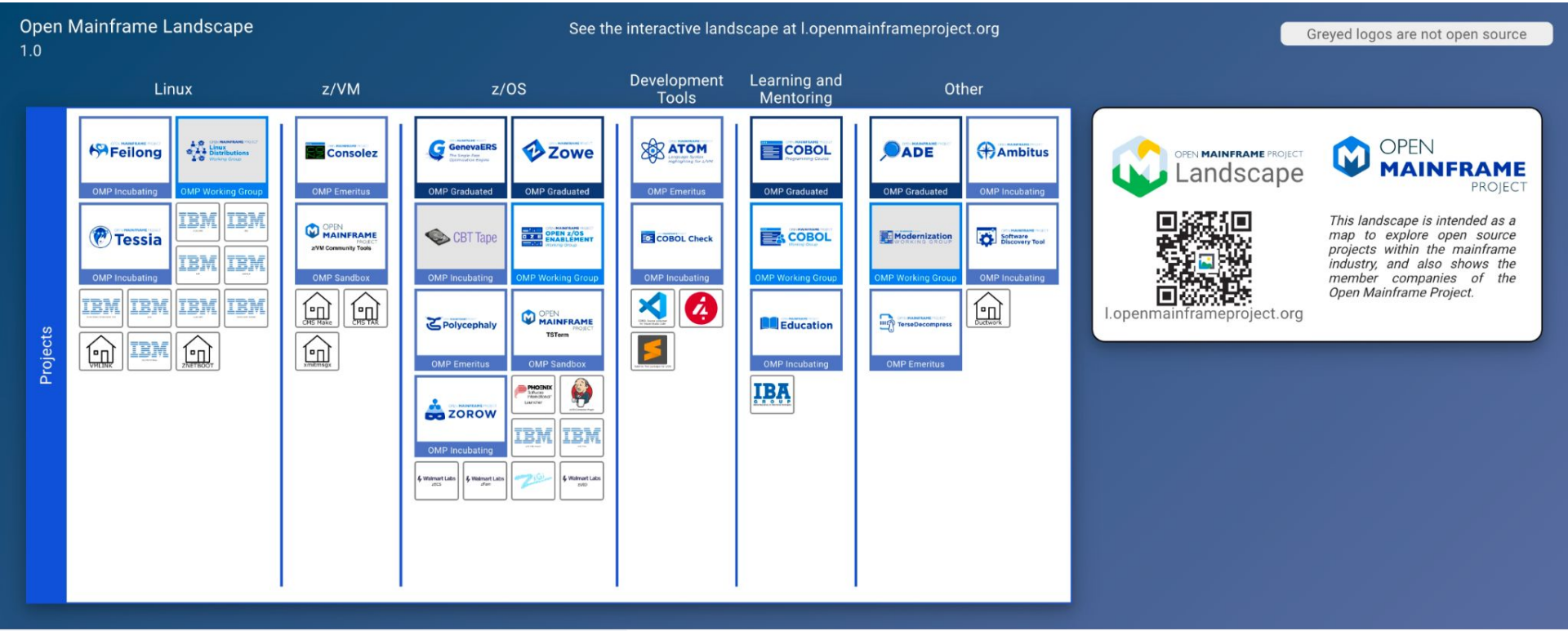
- TSTerm
- z/VM Community Tools

Working Groups

- COBOL Working Group
- Linux Distributions Working Group
- Modernization Working Group

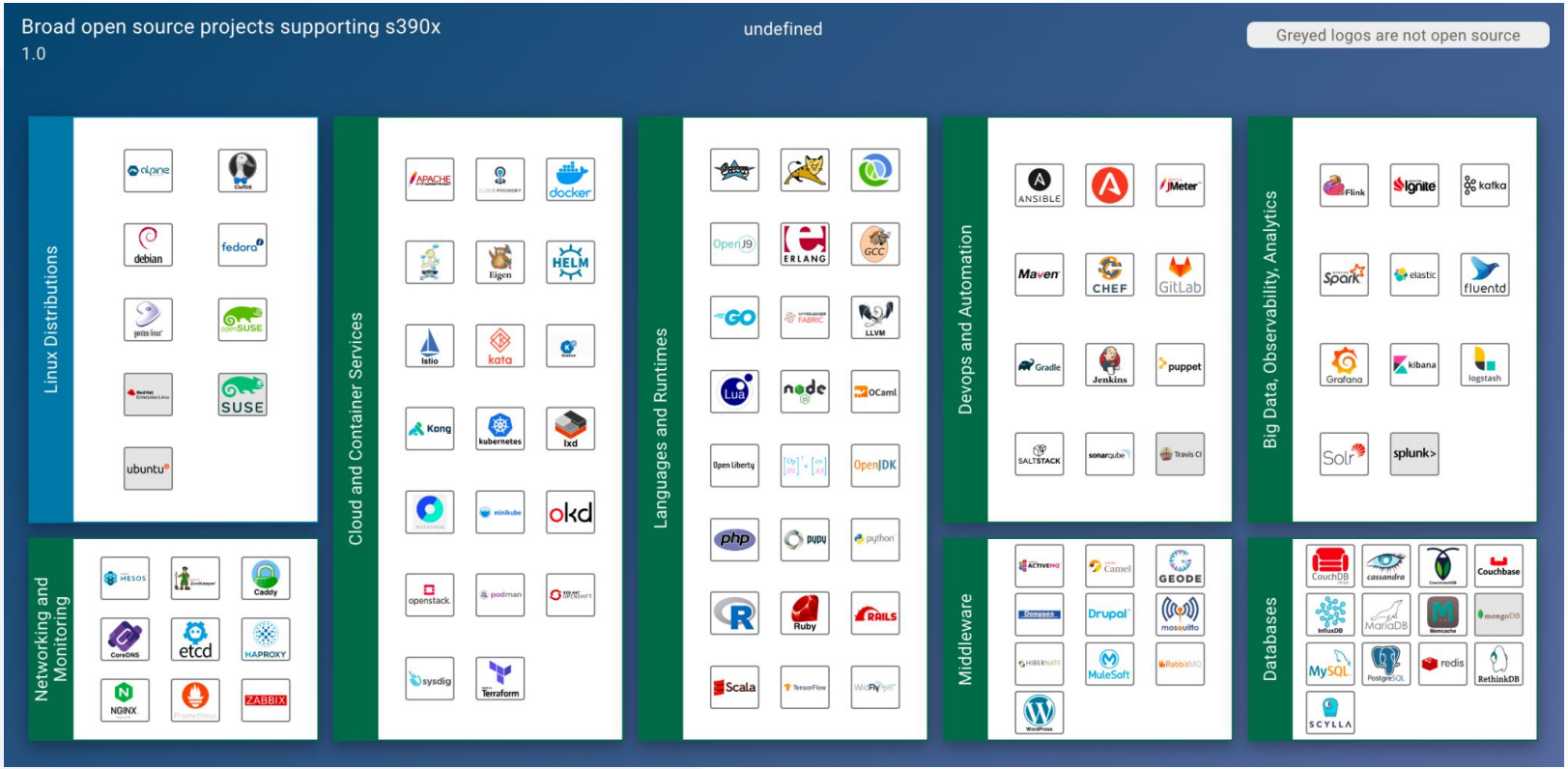
Learn about all Open Mainframe projects at https://www.openmainframeproject.org/projects

Landscape of open source projects only on mainframe



Source: https://landscape.openmainframeproject.org/fullscreen

Broad open source supported on mainframe



Source: https://landscape.openmainframeproject.org/fullscreen/open-source

What is the Open Mainframe Project enabling in 2023?

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Enabling innovation by connecting z/OS to enterprise devops with Zowe

Major Problem

Modernize integration with z/OS based applications and services

Bridge the talent gap by enabling modern development stacks on z/OS

How We Innovated

2018 Open Mainframe Project added Zowe from contributions from Broadcom, IBM, Rocket Software

2019 Zowe reached 1.0, launched Zowe Conformant to enable downstream ecosystem; investments in collaboration, ecosystem development, and infrastructure

2021 Zowe formed TSC to have technologists lead project direction; launched Zowe Support Conformant Program

2022 Zowe 2.0 release

2023 Zowe grows focuses on security and training

Results

60,000+ Commits, 1000+ contributors all time

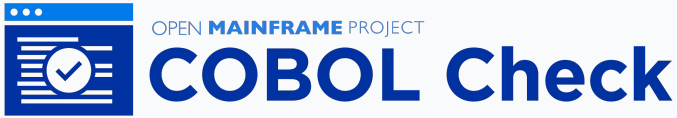
38% of mainframe customers using Zowe in production; 31% planning to in the next year (source Arcati Mainframe Yearbook 2023)

50+ Zowe Conformant offerings, 3 Zowe Conformant Support Providers

7000+ completed Zowe training offered by Interskill

New project contributions from BMC, IBA Group, Vicom Infinity, and others, has grown codebase

Enabling innovation by modernizing COBOL



Major Problem

COBOL talent is critical to our society, and the need has amplified in the COVID-19 pandemic.

Enabling the next generation to have COBOL skills done in isolation, causing repeated efforts and lower uptick.

COBOL lacking tools that align with modern development

How We Innovated

Launched COBOL Programming Course as an open source project in April 2020, teaching COBOL development using VS Code and Zowe.

Created collaboration forums and ways that COBOL talent can advertise their availability

Launched COBOL Working Group to bring together leaders in thinking about the future of COBOL

COBOL Check project launched, bringing TDD practices to COBOL

Results

"Calling all COBOL Programmers" forum has had over 1.9k individuals make themselves available since April 2020

COBOL Programming Course GitHub repo has 2.5k stars and 500+ forks, along with 22 contributors from several organizations, continuing to evolve with deeper level COBOL training content

COBOL Working Group getting broad feedback on the future direction of COBOL

COBOL Check a step forward in modern dev practices and being integrated into VS Code and COBOL Programming Course curriculum.

Enabling innovation by creating a hub for Linux on Z and z/VM community

Major Problem

Users want to manage their mainframes with the same modern cloud technologies used across the enterprise.

z/VM integration with technologies such as OpenStack have long been a challenge.

Contribution base was IBM only, making it challenging to get wider adoption

z/VM lacked a sustainable hub for community tools and utilities

Linux distributions supporting s390x mainframe

How We Innovated

2019 Open Mainframe Project added Feilong

2020 Software Discovery Tool and Tessia added as a projects

2021 z/VM Community Tools forms as a Sandbox project, Linux Distributions Working Group formed

Results

Central repository for open source on mainframe developed, tracking across all major distributions (http://sdt.openmainframeproject.org)

Sustainable and coordinated maintainership for s390x Linux distributions, including Alma Linux, Debian, Fedora, and openSUSE amongst others.

Central hub being developed for z/VM tools and utilities for easier discoverability.

Enabling innovation with the next generation

Major Problem

Aging tenured mainframe talent, with a growing mainframe talent gap and skills decline in next generation talent.

Needing to help connect students with opportunities in mainframe, aligning the interests in open source

How We Innovated

Launched first mentorship program in 2016 with 7 mentees.

Connected within the mainframe and broad open source community to ensure mentorship work has upstream project value.

Enabled universities to also leverage the program within class work; successful with VCU and Western University (Ontario)

Results

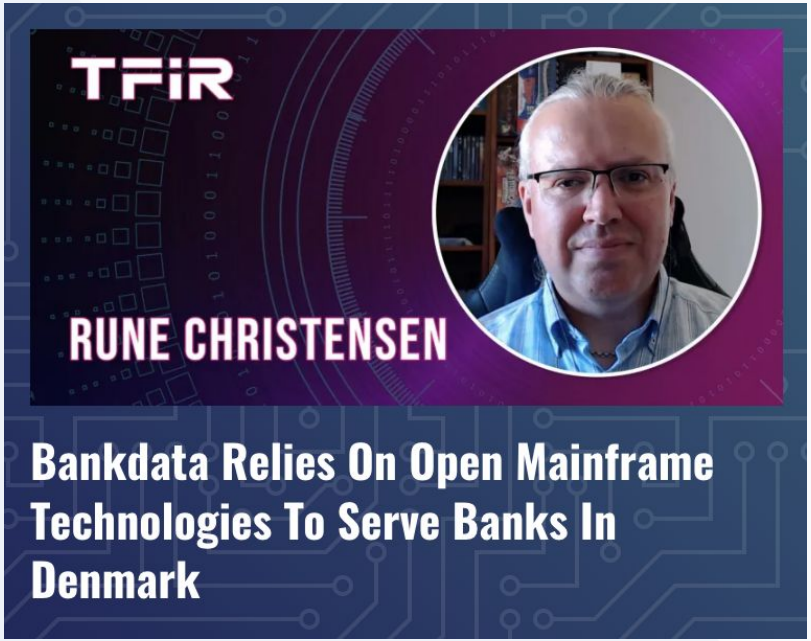
70+ mentees completed the program, with broader classwork focus reaching 100s more.

Upstream work has included ports of Alpine Linux, contributions to HyperLedger, OpenStack, CloudFoundry, Kubernetes, and more.

Several mentees are now employed in mainframe roles with IBM, SUSE, ADP, and more.

Enabling Innovation for end-users

bankdata



Bankdata Open Mainframe Stack

Developer Enablement

OPEN MAINFRAME PROJECT COBOL *Programming Course*

Agile / Test Driven Development

OPEN MAINFRAME PROJECT COBOL Check

Systems Integration/Deployment

OPEN MAINFRAME PROJECT Zowe

Read the Bankdata story at https://www.openmainframeproject.org/blog/2022/12/16/open-mainframe-use-case-bankdata

Enabling innovation through diversity and inclusion

Watch the "Making our Strong Community Stronger" series on [Open Mainframe Project's Youtube Channel]

Blog DEI Diversity Diversity & Inclusion

What inclusion means to me and how to get started

Written by Maemalynn Meanor, Senior Public Relations Manager at The Linux Foundation Diversity and inclusion...

maemalynn
April 23, 2021

Blog DEI Diversity Diversity & Inclusion
Equity & Inclusion

My favorite Mainframe and Six Women Building It

Written by Tina Tarquinio, Making Our Strong Community Stronger Panelist and Product Management Executive for...

Open Mainframe Project
November 12, 2021

Blog DEI Diversity Diversity & Inclusion

Women in Technology Continue to Grow in Numbers and Contribution

Written by Saghi Amirsoleymani, Vice President, WW Cross Brand, Rocket Software Rocket Software is a...

Open Mainframe Project
May 26, 2021

Read about diversity in mainframe on [Open Mainframe Project's Blog]

Enabling innovation by telling the “mainframer” story

- Monthly interview series that highlights diversity in mainframe
- Showcases why people have mainframe in their careers and their views of the technology and career field
- Read and listen at openmainframeproject.org/podcast

Listen on Apple Podcasts

LISTEN ON STITCHER

LISTEN ON Spotify

Enabling innovation by providing an “open” mainframe

Hosted by Marist College, and through the donation of hardware by Broadcom Mainframe Software, the Open Mainframe Project has a mainframe resource available to **any** open source project looking to support Linux on s390x, z/OS, or z/VM.

Enabling community through a focal event for open source on mainframe

Open Mainframe Summit is the annual event that brings together the open source and mainframe ecosystems, discussing projects, trends, and executive insights.

In 2023 we align with key industry events to bring this innovation to end-users, helping them leverage and engage the open innovation happening in mainframe.

OPEN MAINFRAME SUMMIT

Las Vegas - September 11th

New York - November 1st

More at openmainframesummit.org

Getting involved in Open Mainframe Project

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Contribute to our projects - anyone can!

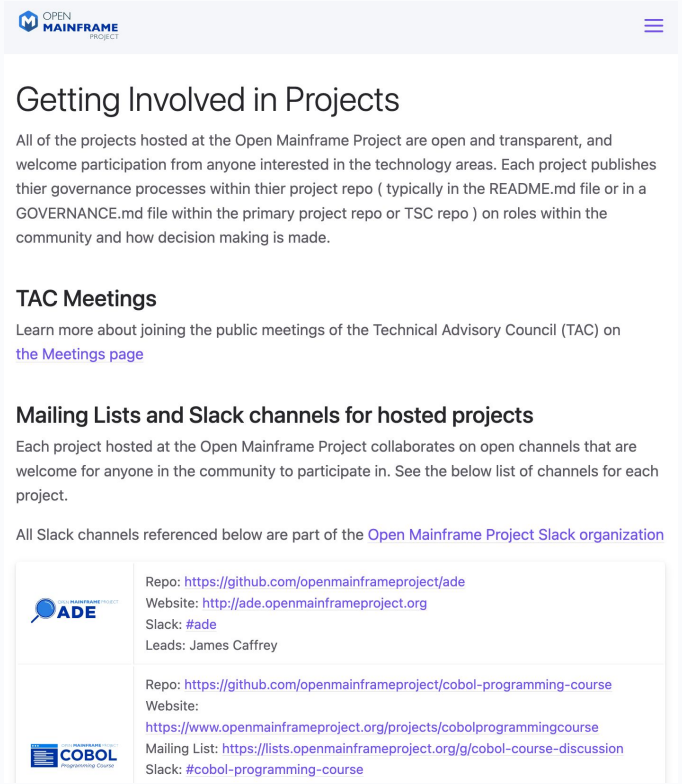
Contribute to an existing project:

- Submit a PR with a bugfix or new feature
- Pick existing GitHub issue as a sample project
- Integrate with a new app / contribute plugin
- Help improve project documentation
- Submit additional test cases
- Join the TSC discussion: dev mailing list, conf calls

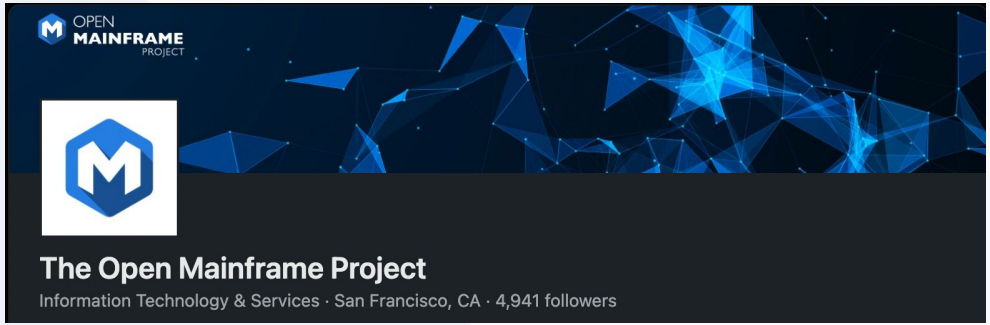
Get involved with the TAC or Working Group:

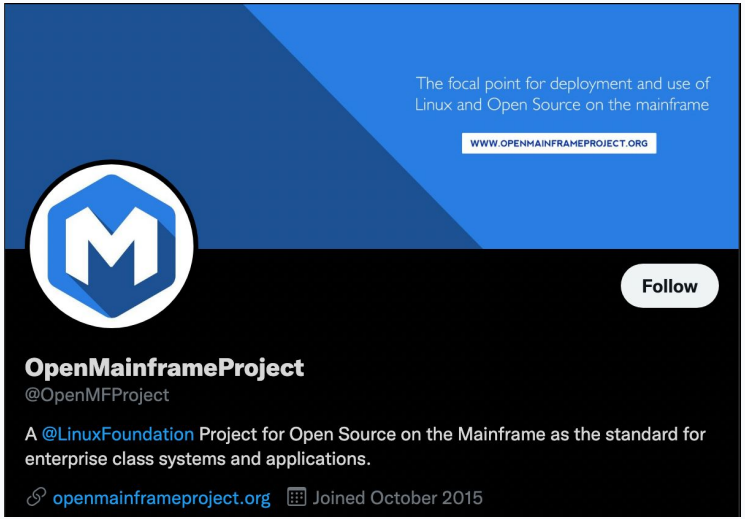
- DevOps / CI expertise always useful
- Interest / expertise in security especially welcome
- Join the TAC discussions: mailing list, conf calls, working groups

More information at
tac.openmainframeproject.org/engagement



Stay updated on the latest news





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Member organizations

Learn more about membership at openmainframeproject.org/join

Learn more about the Open Mainframe Project

- Discover and participate in any of our 18 hosted projects and working groups at openmainframeproject.org/projects
- See the breadth of open source on the mainframe at l.openmainframeproject.org
- Take part in our upcoming events and webinars at openmainframeproject.org/events
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Thank you!

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