



Dispelling the Myths around Open Source

Len Santalucia

Chief Technology Officer at Vicom Infinity, A Converge
Company

Chair of the Open Mainframe Project Governing Board

@LenSantalucia

@Openmfproject

Successful open collaboration ecosystems comes down to four core factors.

Neutrality

No one company or organization can “take it away” from the community that forms around a project.

IP Clarity

Removal of IP uncertainty enables anyone to get involved as a contributor or implement as a user.

Open Governance Do-ocracy

The most successful projects that have stood the test of time have neutral, open governance models where those who do the work make the decisions in a defined governance model.

Financial Support Ecosystem

Encouraging academic, government, and commercial engagement in leads to jobs, faster adoption, new contributions and features that address new use cases.

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 realize its benefits.
- technical advancements that are needed by the mainframe community can be **better achieved through open source.**





OPEN MAINFRAME PROJECT

The Open Mainframe Project was founded in **2015**, as a focal point for deployment and use of Linux and Open Source in a mainframe computing environment.

Open Mainframe Project hosts **18** projects and working groups and is supported by **40** organizations.

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 Open Mainframe Projects (4)



Incubation Open Mainframe Projects (7)



Sandbox Open Mainframe Projects (5)



Open Mainframe Project Working Group (3)



Learn about all Open Mainframe projects at <https://openmainframeproject.org/our-projects/>

The LF's
Support
Programs help
communities
succeed.

Developer Community

Release & Infrastructure Support

CI/CD, release engineering, infrastructure, collaboration tools, DNS/web

Developer Engagement

Dev Summits, meetups, events, Hackathons for maintainers and extended dev community

Mentorship

Upskilling for better careers, expanding the pool of developers and next generation leaders

Commercial Ecosystem

Talent & Skills Development

Educational engagement, training courses, professional certifications

Neutral Venue, Global presence

Nonprofit entity, leadership and managers to engage on issues/ideas, neutral governance templates, global entities

Open Standards

Open specifications, ISO standardization path

Resource Funding Options

Ability to infuse resources into a community

Project Maintainers

Security

Security audits, best practices, badges and scanning tools

Facilitation

Neutral managers available to facilitate development and execution on priorities

Project Advocacy

PR/AR, social media, blogs, videos, content creation highlighting their project

OSPO & Legal Professionals

Analytics & Insights

Project health and dependability metrics

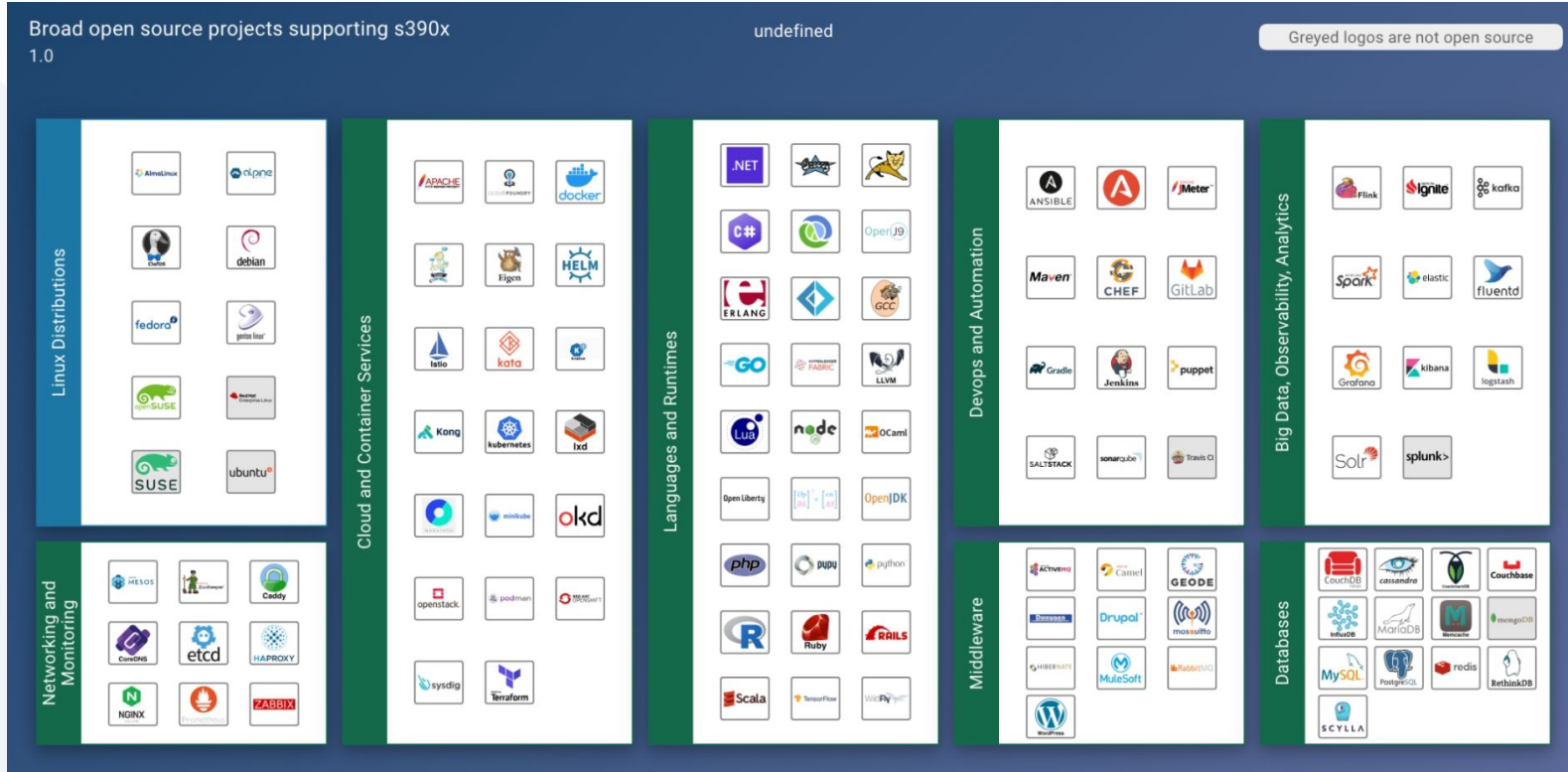
OSS Management

TODO Group OSPO peer engagement, OSPO best practices and guides, Legal Summit and peer engagement

Compliance

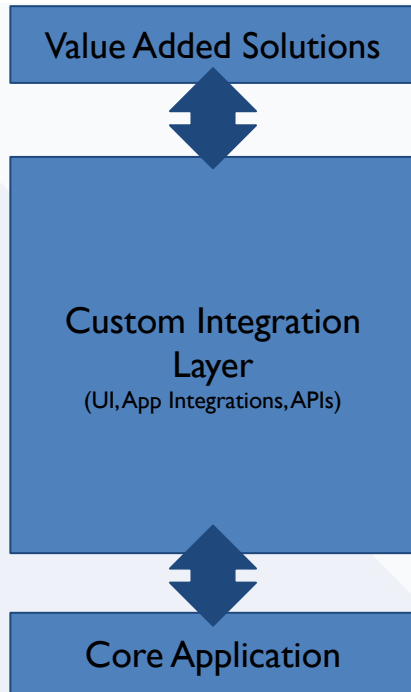
Process guides, license scanning, export control management, tools for internal use

Broad Open Source Supported on Mainframe



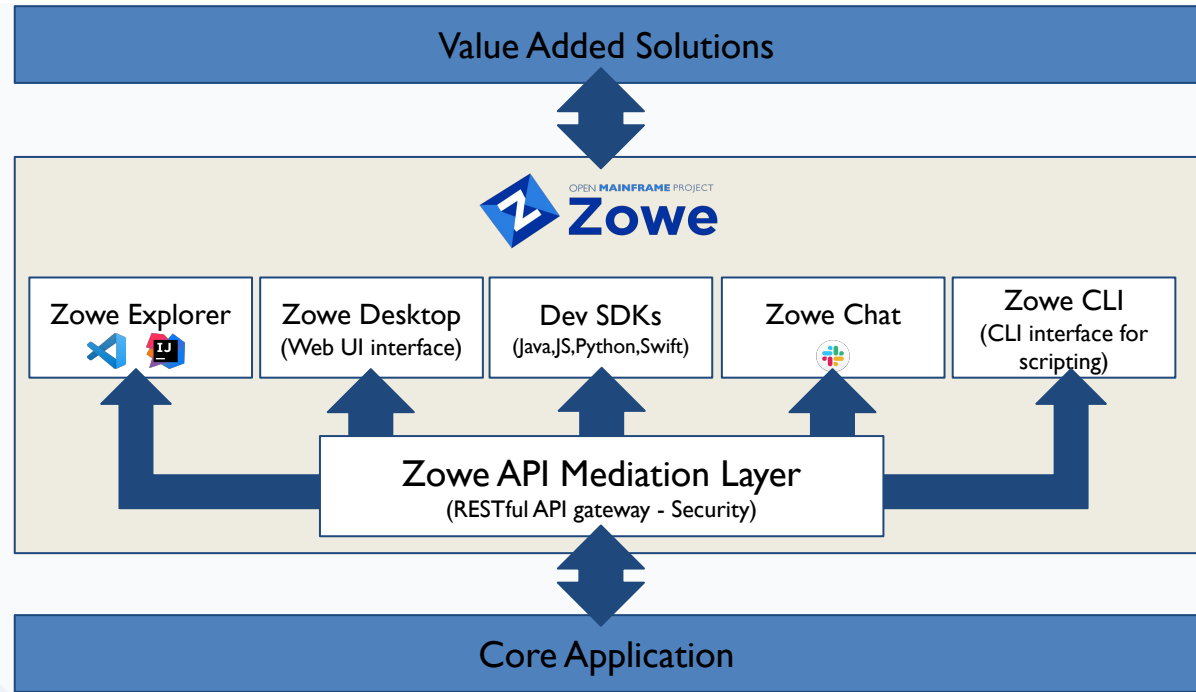
Source: <https://landscape.openmainframeproject.org/fullscreen/open-source>

Example: Leveraging Zowe Create Efficiencies



Without Zowe

Full stack supported and developed;
expensive R&D and hard to scale



With Zowe

Focus on Core Application and leverage Zowe
components to better integrate with DevOps workflows

Cost to Create Zowe



Total Physical Source Lines of Code (SLOC)

272,536

Development Effort Estimate

64.81 (777.68) Person-Years (Person-Months)

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

Schedule Estimate

1.70 (20.46) Years (Months)

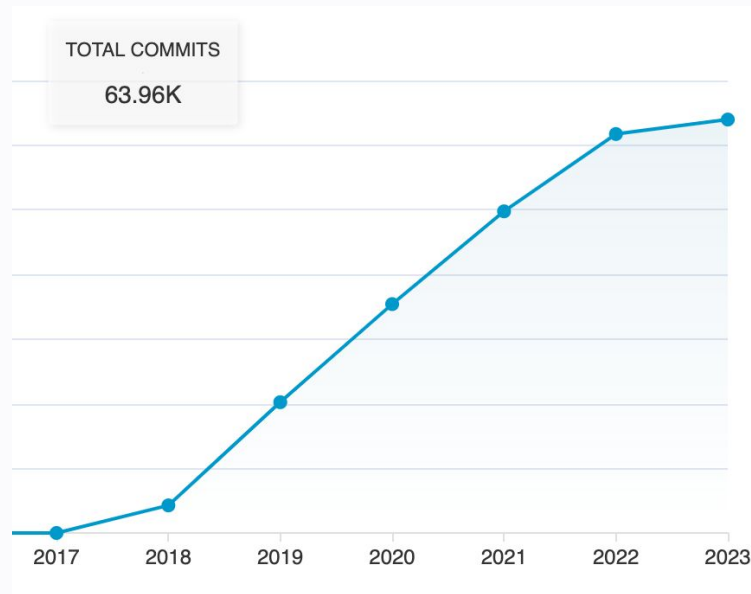
*(Basic COCOMO model, Months = 2.5 * (person-months**0.38))*

Total Estimated Cost to Develop

\$8,754,452

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

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

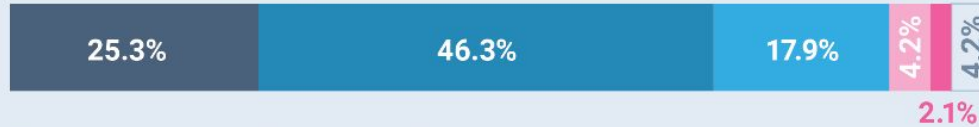


Frequent Contributors Get High ROI From Open Source Foundation Membership

Return on Investment (ROI)

Member or sponsor of an open source foundation

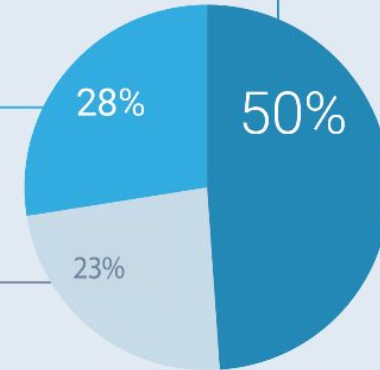
Those who **frequently** contribute code upstream



Those who **sometimes** contribute code upstream



Those who **rarely or never** contribute code upstream



Pie chart does not equal 100% because of rounding.

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 for
30% of contributions (3x multiplier in value as
a leading organization⁽¹⁾)

This means the organization
invested...

- 19.2 years of developer effort
- \$2.6M of R&D costs

and leveraged (3x multiplier⁽¹⁾)...

- **175.2 years** of developer effort
- **\$23.6M** of R&D costs

9x 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 Mainframe Project Enables Innovation

Enabling Innovation by Connecting z/OS to Enterprise Devops



Major Problem

Modernize integration with z/OS based applications and services

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

Lack of cross-enterprise testing tools that properly supported z/OS.

Open source support for z/OS was vendor-centric and development efforts disconnected.

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

2020 Ambitus joins the Open Mainframe Project

2022 Zowe 2.0 release

2023 Galasa joins the Open Mainframe Project

2024 z/OS Open Tools joins the Open Mainframe Project as zopen community

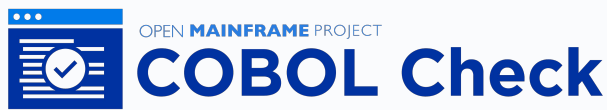
Results

60,000+ Commits, 1000+ contributors all time
85% of mainframe customers using Zowe in or planning to use Zowe by end of 2024 (source Arcati Mainframe Yearbook 2024)

50+ Zowe Conformant offerings, 3 Zowe Conformant Support Providers, 7000+ completed Zowe training offered by Interskill

New project contributions from BMC, Phoenix Software, Vicom Infinity, and multiple customers, has grown codebases of these projects.

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

[Zorse](#) launched to provide a high-quality, openly licensed dataset of COBOL code to train LLMs

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.

Isolated efforts in education created duplicated efforts in education.

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)

Mainframe Open Education project launched in 2021 to create standard hub of educational materials for mainframe.

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.

Collaborations between Broadcom, IBM, Kyndryl, and more have built a base of common mainframe educational materials, free to use and openly licensed.

Sustainable home for critical mainframe open source efforts.



CBT Tape



Major Problem

CBT Tape, a staple of mainframe programmers and operators for over 50 years, lacked a sustainable home and infrastructure to support it.

GenevaERS development was stalling internally at IBM, and needed a home to bring together more constituents and build a community around.

“Mainframe Modernization” loosely defined, causing marketing confusion.

How We Innovated

CBT Tape and GenevaERS join the Open Mainframe Project in 2020.

Modernization WG launched in 2022

Results

Strong contributor base to both projects.

CBT Tape gained mainframe infrastructure for development and testing, which has gained more contributors since joining.

Modernization WG defining modernization patterns for consistent, vendor-neutral education.



Innovation Enablement is More than Code

Enabling Innovation Through Diversity and Inclusion



A REAL CONVERSATION TO ACCELERATE OUR WAY FORWARD

MAKING OUR STRONG COMMUNITY, STRONGER: A COLLABORATIVE INITIATIVE
Webinar: How Personal Experiences Shape Corporate Inclusion
April 28th 2021 | 11:00 CST / 12:00 EST

MODERATOR
Dr. Gloria Chance
President/CEO
Peak Performance Psychologist
Innovation & Creativity Expert
Author
Former CEO

Ashley Peterson
Product Marketing Manager,
IBM Z and LinuxONE
IBM

Jeff Henry
VP, Strategy, Product Mgmt
& Design, Mainframe
Software Division
Broadcom

Sharra Owens-Schwartz
Inclusion, Diversity and Equity
Senior Director
Rocket Software

Jerry Chuaypradit
Manager, IBM Z Enterprise
& Networking Solutions
IBM

A REAL CONVERSATION TO ACCELERATE OUR WAY FORWARD

MAKING OUR STRONG COMMUNITY, STRONGER: A COLLABORATIVE INITIATIVE
Webinar: Unmasking Our 'Whole Self' - Can We Create Inclusive,
Psychologically Safe Spaces in the Workplace?
July 28th 2021 | 9:00 PDT / 12:00 EDT

MODERATOR
Dr. Gloria Chance
President/CEO
Peak Performance Psychologist
Innovation & Creativity Expert
Author
Former CEO

Allyson Cook
Program Lead, Customer
Engagement Programs
Broadcom

Tina Tarquinio
Principal Client Services,
Unity Program Test Lab
IBM

Kevin Norlin
Chief Revenue Officer
Rocket Software

Earl Dixon Jr.
Principal Client Services,
Unity Program Test Lab
IBM

A REAL CONVERSATION TO ACCELERATE OUR WAY FORWARD

MAKING OUR STRONG COMMUNITY, STRONGER: A COLLABORATIVE INITIATIVE
From Educators to End Users: Leveraging Holistic Approaches
and the Importance of Belonging Across the Tech Ecosystem
February 23rd 2022 | 9:00 PDT / 12:00 EDT

MODERATOR
Dr. Gloria Chance
President/CEO
Peak Performance Psychologist
Innovation & Creativity Expert
Author
Former CEO

Chineu Ibeh
Corporate Vice President,
Enterprise Compute
Division
New York Life

Byron Smith
Sr. Mainframe Security Program
Systems Technology Building
Officer
NET Scans

Gina Bullock, PhD
Assistant Professor
North Carolina A&T State
University

Nicole Newbold
Seniority-Spanned Engineer,
Infrastructure, Operations and
Cloud (ISCIO)
Charter Schools

Sponsored by: Broadcom, IBM, Open Mainframe Project, Rocket Software, TechChannel & Virtual2 Computing.



[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 Saghii Amirsoleymani, Vice President, WW Cross Brand, Rocket Software Rocket Software is a...



Open Mainframe Project
May 26, 2021

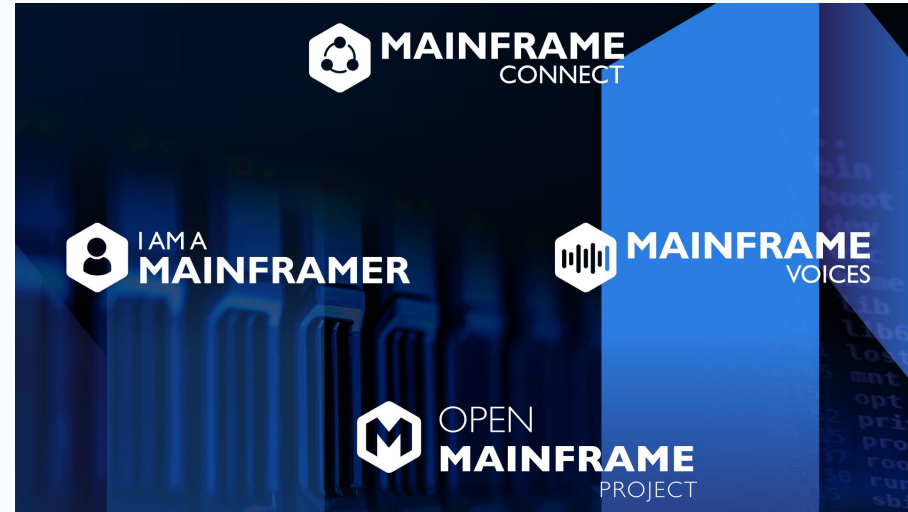
Read about diversity in mainframe on [Open Mainframe Project's Blog](#)

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

Enabling Innovation by Telling the “Mainframer” Story



- “I am a Mainframer” is a podcast that showcases the different paths to mainframe careers that includes detailed experiences and tips for success.
- “Mainframe Voices” is a video series that features one theme or question and a diverse group of experts sharing their insights and experiences.
- Read, watch or listen at openmainframeproject.org/podcast



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



Getting Involved in Projects

All of the projects hosted at the Open Mainframe Project are open and transparent, and welcome participation from anyone interested in the technology areas. Each project publishes their governance processes within their project repo (typically in the README.md file or in a GOVERNANCE.md file within the primary project repo or TSC repo) on roles within the community and how decision making is made.

TAC Meetings

Learn more about joining the public meetings of the Technical Advisory Council (TAC) on [the Meetings page](#)

Mailing Lists and Slack channels for hosted projects

Each project hosted at the Open Mainframe Project collaborates on open channels that are welcome for anyone in the community to participate in. See the below list of channels for each project.

All Slack channels referenced below are part of the [Open Mainframe Project Slack organization](#)

| | |
|--|--|
| The logo for the ADE project, featuring a blue circle with a white 'A' and the text 'ADE' below it. | Repo: https://github.com/openmainframeproject/ade Website: http://ade.openmainframeproject.org Slack: #ade Leads: James Caffrey |
| The logo for the COBOL project, featuring the text 'COBOL' in a blue box with 'OPEN MAINFRAME PROJECT' below it. | Repo: https://github.com/openmainframeproject/cobol-programming-course Website: https://www.openmainframeproject.org/projects/cobolprogrammingcourse Mailing List: https://lists.openmainframeproject.org/g/cobol-course-discussion Slack: #cobol-programming-course |

Connect with Open Mainframe Project!



And sign up for the [Open Mainframe Project newsletter](#) to keep up to date on project happenings