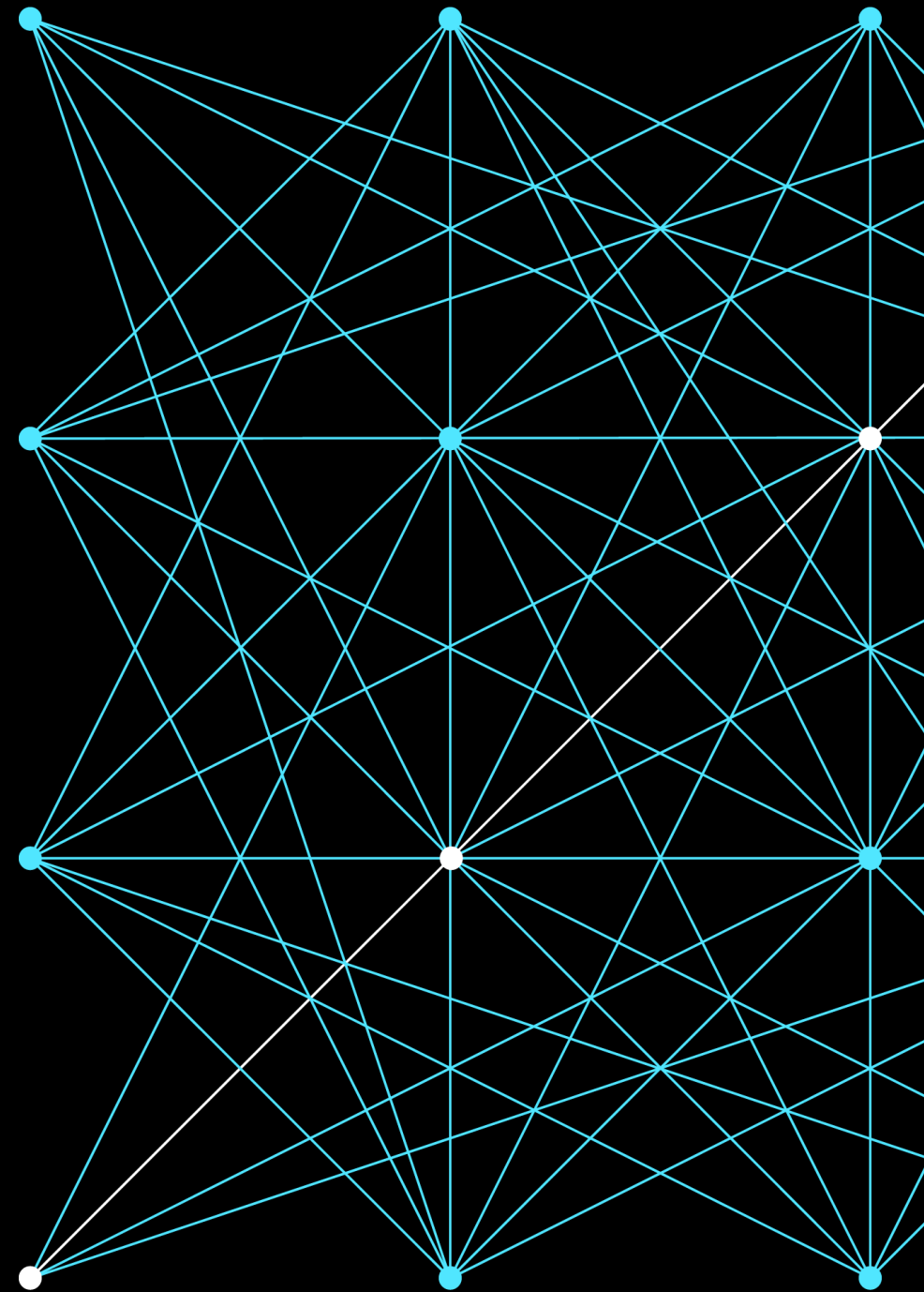


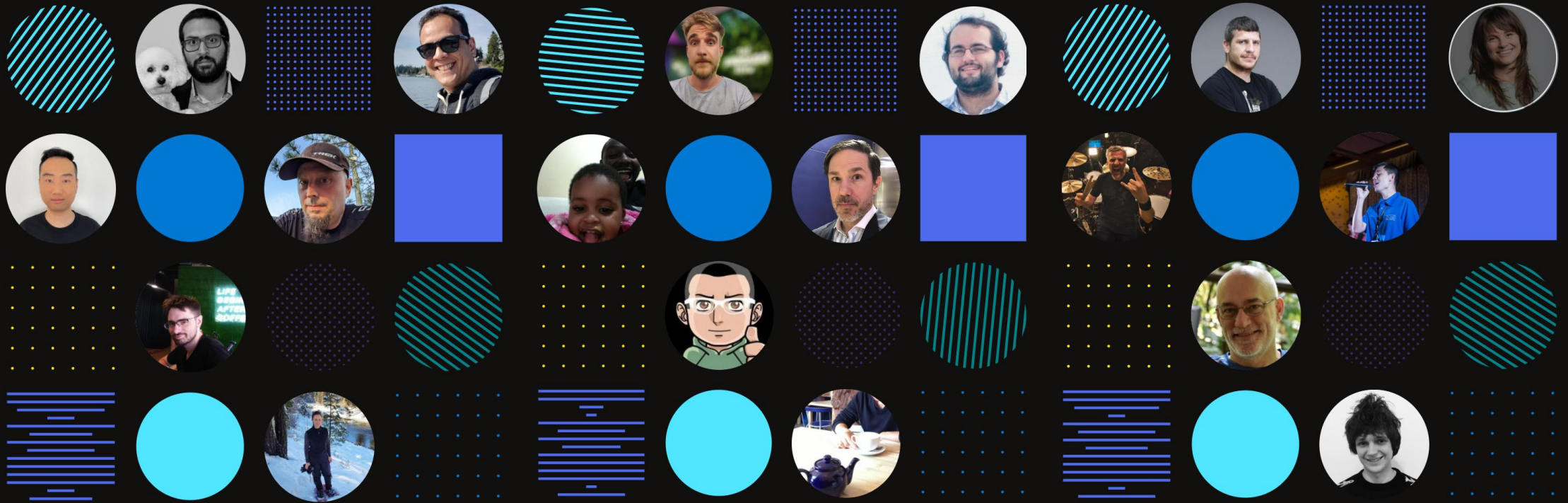


Microsoft + Open Source + SDV

Uli Homann
Corporate VP & Distinguished Architect
Cloud + AI engineering
Microsoft Corp.
ulrichh@microsoft.com



Building together in open source



Open. Collaborative. Flexible.



Tech companies born with an open source mentality get it. It's our ability to work together that makes our dreams believable and, ultimately, achievable. We must learn to build on the ideas of others"

—Satya Nadella, CEO
Microsoft



Open source is changing software development

> 80%

of companies say they've
increased the usage of open
source in the past year¹

78%

of code in codebases was
open source²

96%

of applications leverage open
source²

¹Perforce 2023: OS Report 2023 - OpenLogic by Perforce

²Synopsys 2022: Open Source Security and Risk Analysis

Open source is the biggest differentiator for organizations

30%

more innovative

+20%

developer satisfaction
and retention rates

A woman with curly hair is shown in profile, sitting at a desk in a dimly lit office. She is looking at a computer monitor and has her hands on a keyboard. The office environment includes several other computer monitors and desks in the background. The overall atmosphere is quiet and focused.

How Microsoft does open source

Open source is at the core of Microsoft

150k

Unique open source components

>52k

Microsoft employees have
GitHub accounts associated
with Microsoft identity

11.8M

components in use

Microsoft's contributions to open source



Linux

Linux Integration Services
IPE
LISA testing framework
SMB3/CIFS & NFS



Cloud Native

Moby & Kubernetes
Dapr & OAM
Akri
Helm & CNAB
Open Service Mesh
KEDA



Data + AI

Spark & YARN
PostgreSQL
Pandas
TensorFlow
ONNX



Languages

Node.js
Python
Rust
Go
PHP
Java (OpenJDK)



Web

TypeScript
Webpack
Babel
Vue.js
Bootstrap
Svelte

Microsoft's Open Source Software Policy

Company-wide documented policy to make it easy for Microsoft developers to use open source



Using
open source

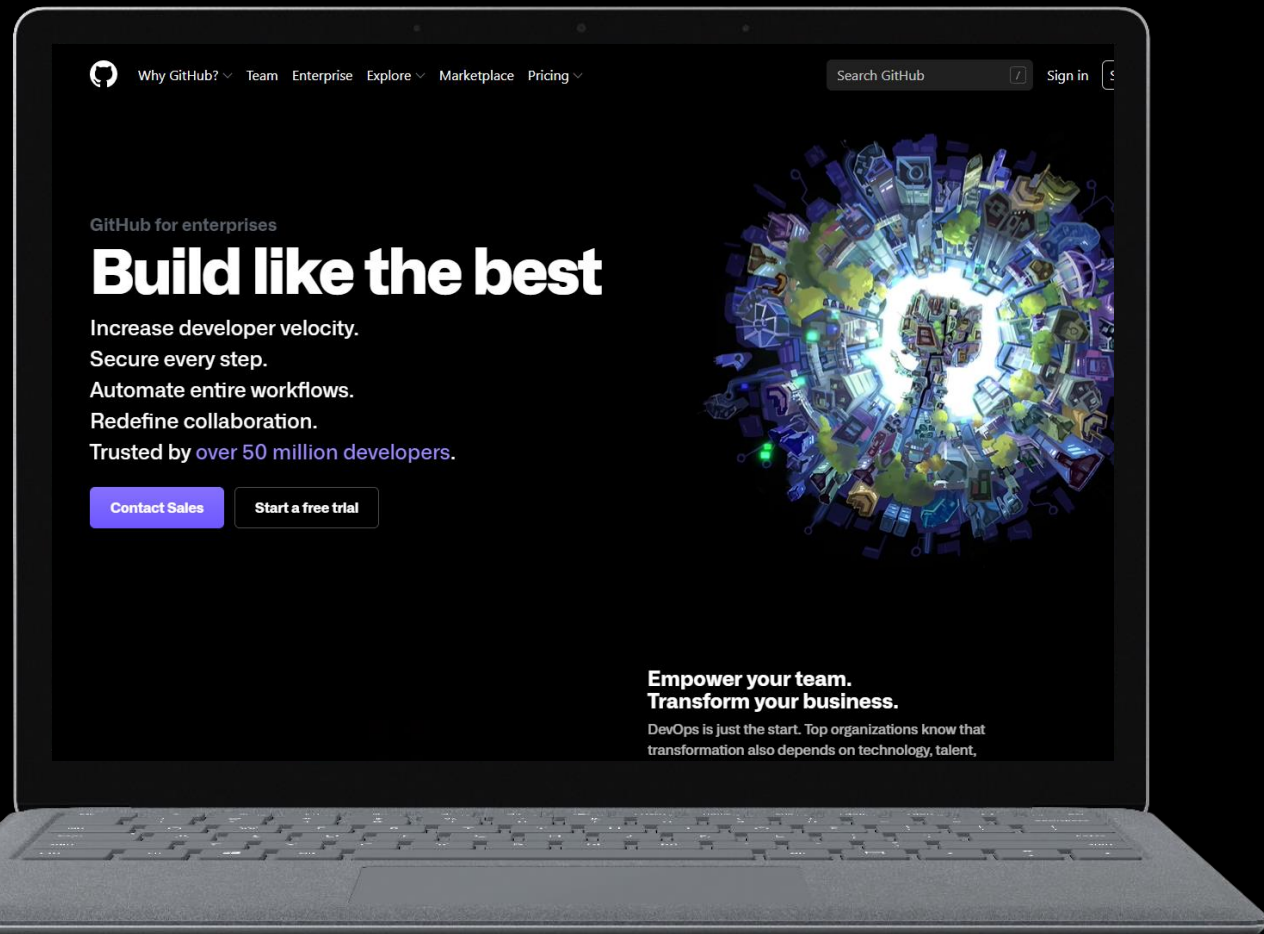


Contributing
to open source



Releasing open
source software

We share some of our policy publicly on the opensource.microsoft.com site under "Our program"



Extensive set of tools and services to help us do this

Open Source Compliance Tools

GitHub Enterprise

GitHub Actions and Azure Pipelines

Component Governance

GitHub bots

Self-service GitHub open source portal

ClearlyDefined

CLA Assistant

GitHub Data Crawling

Business Review process in Azure Boards

Foundations



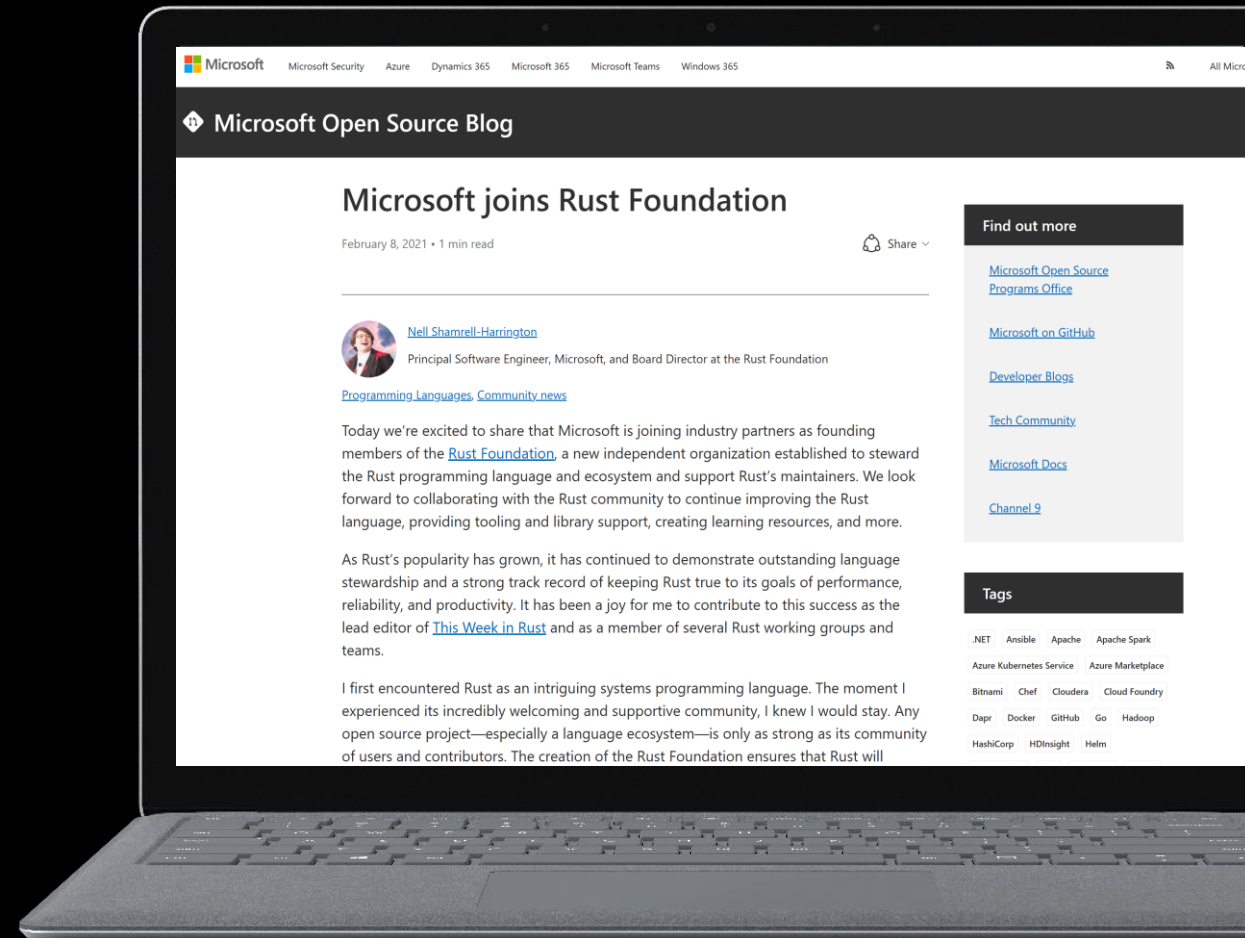
Alliance for Open Media



<https://opensource.microsoft.com/ecosystem/>

Microsoft joins Rust Foundation

Microsoft is joining industry partners as founding members of the Rust Foundation, a new independent organization established to steward the Rust programming language and ecosystem and support Rust's maintainers.



Source: <https://cloudblogs.microsoft.com/opensource/2021/02/08/microsoft-joins-rust-foundation/>

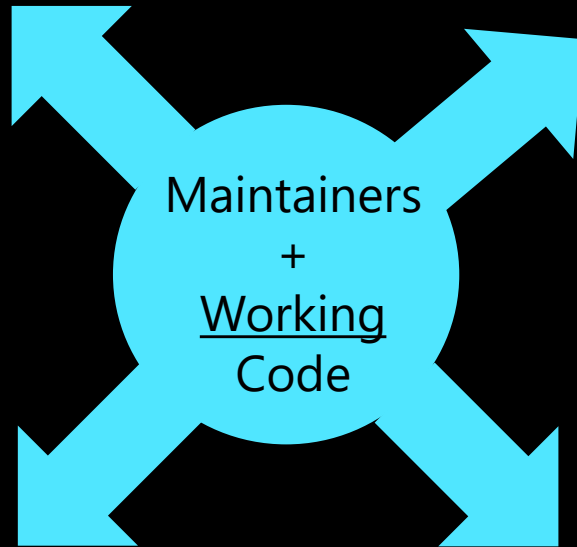
Open-Source Partner Engagement

How does an open-source project work?
Why do you build an open-source community?

Maintainers Share Innovation Outbound

Published outbound using an open-source license

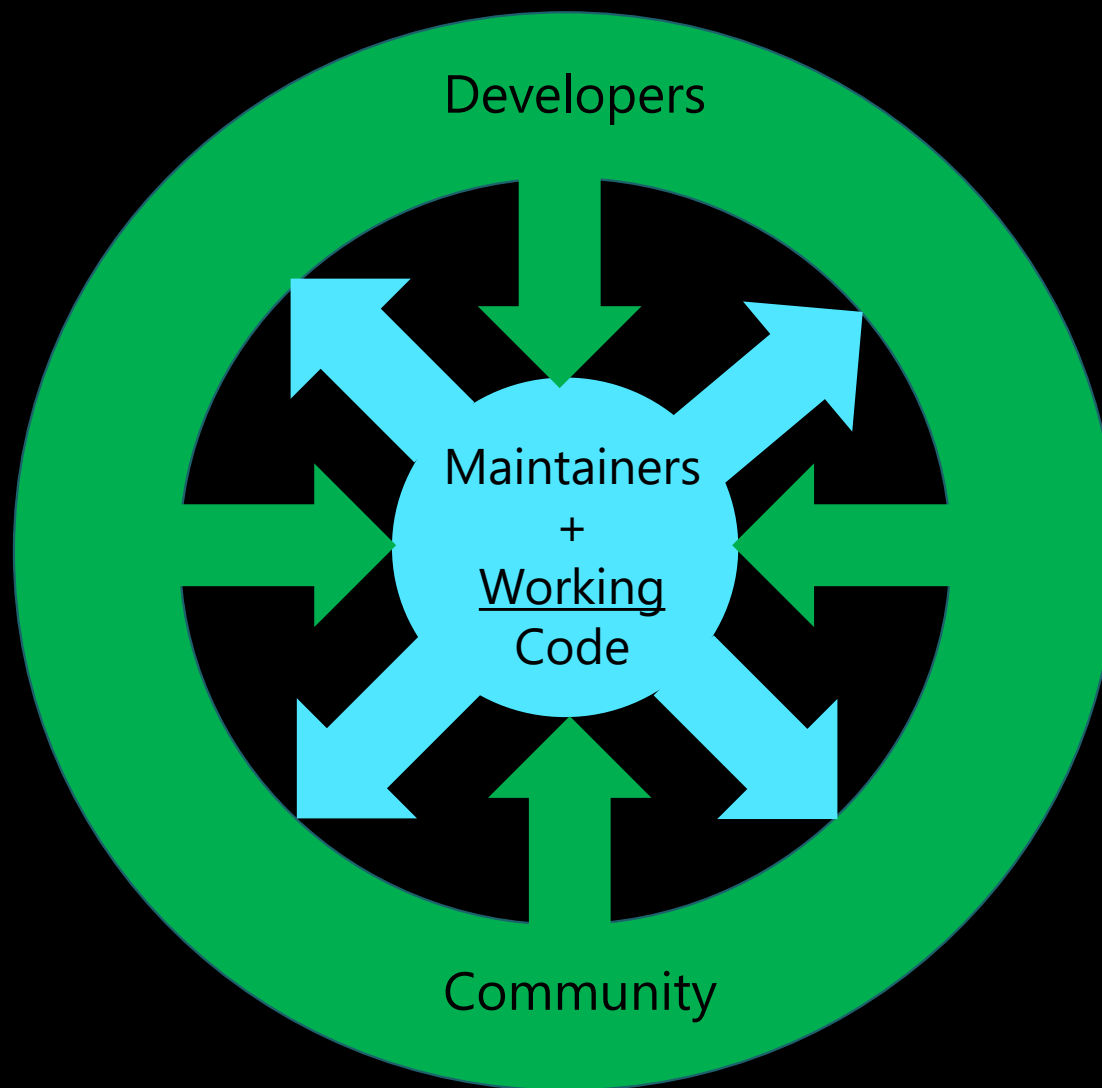
There can be NO expectation of anything in return



Projects have culture;
Governance is the documentation of that (software) culture

Building Community Captures Innovation Inbound

There can be no expectation of anything in return, but building community can enable and encourage contribution – capturing inbound innovation back to the project



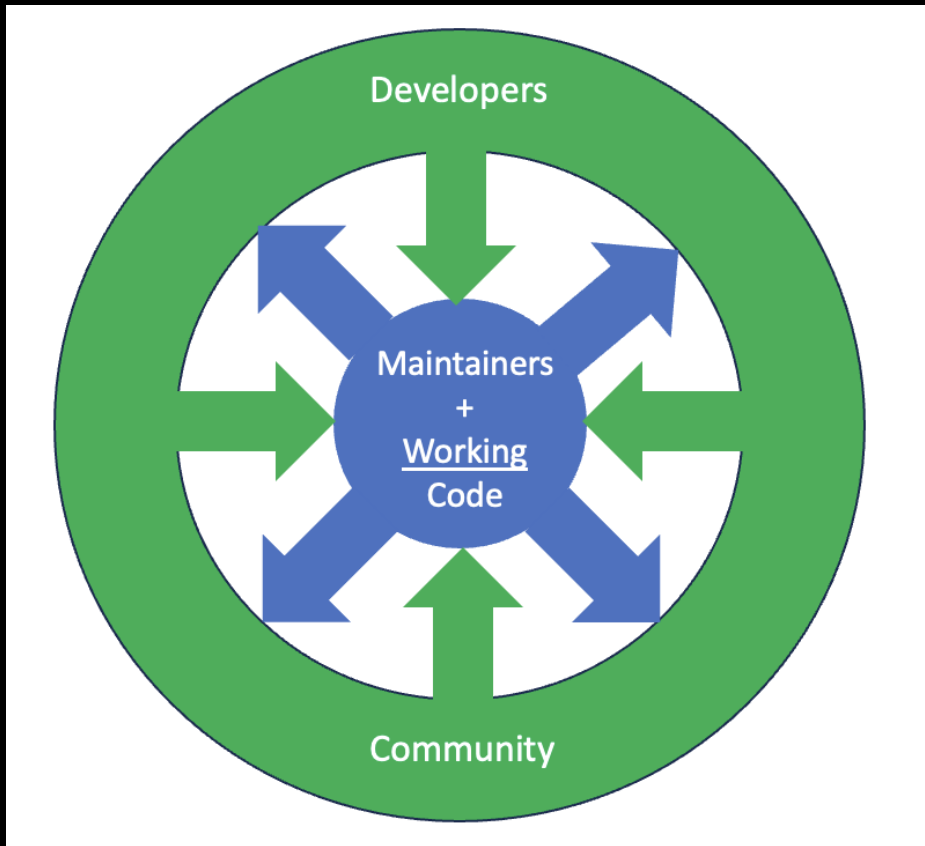
Communities can evolve their governance (e.g., Kubernetes vs Linux)

A black and white photograph of John F. Kennedy speaking at a podium. He is wearing a dark suit, a light-colored vest, and a patterned tie. He has his eyes closed and a serious expression. The podium has several microphones. In the background, a crowd of people is visible, some looking towards the speaker. The text "There is NO Community Except for the one you build" is overlaid in white, bold, sans-serif font across the center of the image.

**There is NO Community
Except for the one you build**

Why do we build nonprofits?

Project Growth Hits a Natural Ceiling Based on Risk



Building the
Software
Sharing Innovation
Outbound

Building the
Community
Capturing Innovation
Inbound

Two Problems Occur For Small Projects:

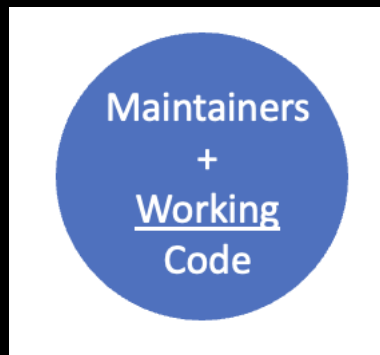
1. Personal liability becomes a problem for Maintainers
2. Companies engaging to consume/contribute need more ownership stability/neutrality and provenance

Two **Different** Problems Occur With Industry Partner Projects:

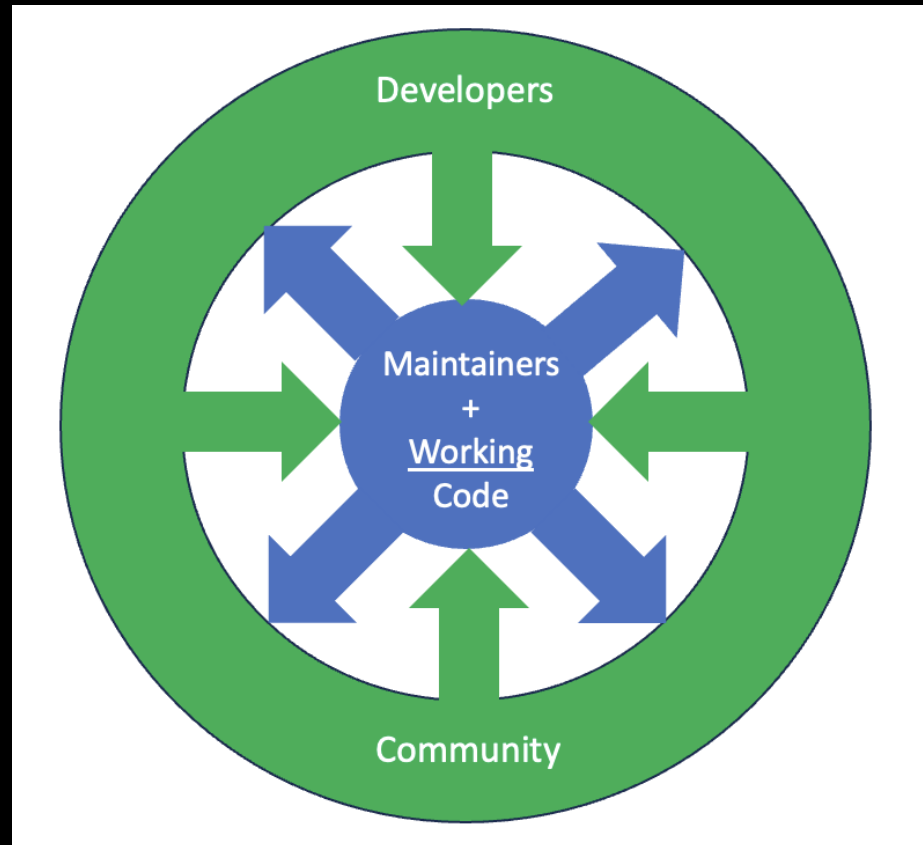
1. The originating company **may** need to signal neutrality (giving up asset control) via a neutral non-profit third party
2. Partners may need anti-trust protections in place to hold discussions

Solve for these Risk Problems with Nonprofits

Nonprofits provide legal structure for managing risk together



Building the
Software
(Sharing Innovation
Outbound)



Building the
Community
(Capturing Innovation
Inbound)



Building the Non-
profit
(Remove Risk, Hold Assets,
Collect and Distribute Funds,
Anchor the message with
partners)

The logo for the Eclipse Foundation. It features a stylized orange crescent moon on the left side. To the right of the moon, the word "ECLIPSE" is written in a large, bold, grey, sans-serif font. A registered trademark symbol (®) is located at the top right of the letter "E". Below "ECLIPSE", the word "FOUNDATION" is written in a smaller, bold, orange, sans-serif font.

ECLIPSE®
FOUNDATION

ESDV - Microsoft Contributions and Engagements

1 OSS Contributions

SDV.DEV

Modern DevOps with GitHub and Azure ARM64

SDV.OPS

Observability & Monitoring Control Plane

SDV.EDGE

Eclipse Chariott*
Eclipse Ibeji*
Pub/Sub Service
Cloud Sync Digital Twin

2 Co-Dev Collaboration



uProtocol

SDV for Construction Vehicles:
In-Vehicle Edge
Middleware & Cloud & Twin



Digital Auto

Mercedes-Benz Tech Innovation

Seat Massage Use Case with Eclipse Chariott



ARM Modern DevOps

3 Community Leadership

- SDV Landscape
- SDV Platform Distribution
- SDV Reference Architecture
- Vehicle SW Orchestration & Scheduling
- Programming Models
- Confidential Computing
- Observability & Monitoring
- Testing & Validation

Nadella on Partners

"It's a great reminder I think of what's unique and core to Microsoft. These 400,000 partners who are going to create 10M+ jobs over the next 4 years, and for every dollar Microsoft makes, there's ten dollars that's made in the partner ecosystem. ... We are very, very anchored as a platform company. **Our job number one, two, and three is to create more opportunity for our partners.**"

– Satya Nadella, July 2021, 'Inspire' Bloomberg interview

<https://www.bloomberg.com/news/videos/2021-07-14/microsoft-ceo-nadella-on-developing-tools-for-hybrid-work-video>