

A background image featuring a network diagram with blue lines connecting yellow nodes, set against a dark blue gradient.

L3AF LF Networking Induction Proposal

March 2022

 THE **LINUX** FOUNDATION

LFN Induction Request & Next Step

In October 2021 L3AF was announced as an open source project. Since becoming an LF project in July 2021 the L3AF community has been working to establish a functioning working group, clarify project goals, develop high level architecture, establish seed code, and groom the project for LFN umbrella entry as a Sandbox project.

Pursuant to [LFN Project Lifecycle](#) process L3AF has met the mandatory criteria for LFN Entry and formally requests entry under the LFN umbrella as a Sandbox project.

- ✓ Project Roles
- ✓ How people come to fill project roles.
- ✓ How people are removed from project roles.
- ✓ Who currently fills project roles.
- ✓ How disputes are definitively resolved (majority vote).
- ✓ How governance evolves over time.
- ✓ Top-level technical decision-making body for the project and TAC representative

Next Step:

- Governing Board review on 03/16/2022 (pending TAC decision)

Project Overview -



- › **Project name:** L3AF
- › **Project creation date:** July 19, 2021
- › **Project Background:**
 - › eBPF presents a new model which allows us to extend the kernel functionality through simple programs. These programs can be associated with desired kernel events, so they are executed whenever the event happens. eBPF has out of the box integrations with low level network hooks such as XDP/TC as well as probing mechanisms such as kprobes, uprobes and tracepoints. There can be a need to run numerous eBPF programs on a single node, and in a large/hyperscale environment, there are hundreds of thousands of nodes. Walmart developed L3AF to simplify the management and orchestration of multiple eBPF programs in such an environment. Essentially, L3AF was created to offer **complete lifecycle management of eBPF programs** in the kernel.
- › **Project Vision:**
 - › At L3AF, our vision is to also create a repository for eBPF programs, where users and developers can share their own signed eBPF programs and download eBPF programs from others. The L3AF platform can then be used to orchestrate and compose selected eBPF programs from the repository to meet several business needs. In this way, L3AF would provide developers with a cloud and vendor agnostic platform for adding capabilities to an operating system at runtime. We believe that the creation of such a fully integrated software ecosystem around eBPF will unleash its full potential for community adoption.

L3AF – Project Scope



› Project Functionalities

- › Industry first “eBPF Program as a Service” model, which allows us to run multiple independent eBPF programs in a chain
- › Simple APIs to add, remove and reorder eBPF programs on the fly
- › Distributed model to manage and configure eBPF programs on a per-node basis
- › Replace proprietary network applications and hardware with blazing fast eBPF code

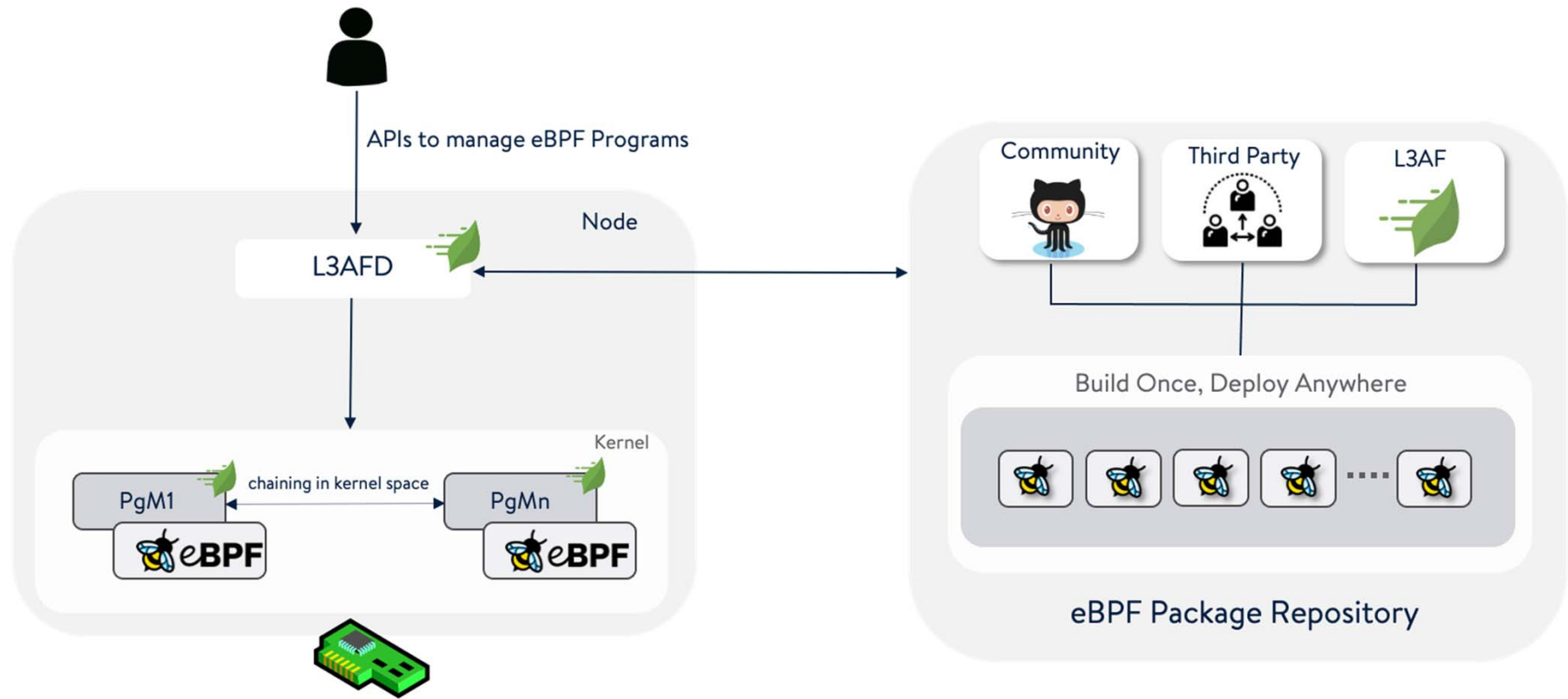
› Project Scope

- › L3AF develops software based solutions to implement eBPF programs that have the capability to instrument, inspect and interdict traffic; as well as provide enhanced performance observability and security. The open-source software developed within the project will leverage OSI approved licenses. The scope of the project includes but is not limited to:
 - Enabling member communities to align on the design, architecture and implementation requirements to orchestrate eBPF programs
 - Developing a repository of integrated, tested, and validated eBPF programs that can be leveraged and contributed to by the open-source community
 - Supporting open source eBPF communities, which includes influencing upstream projects
 - Supporting the mission, including documentation, testing, integration and the creation of other artifacts that aid the development, deployment, operation or adoption of the L3AF project.

› Partners

- › TSC members: Walmart, Microsoft, Wipro
- › Other Partners: Meta, Seekret, Vivo, Sartura, Cisco

L3AF – High-level Architecture



L3AF – Code Status



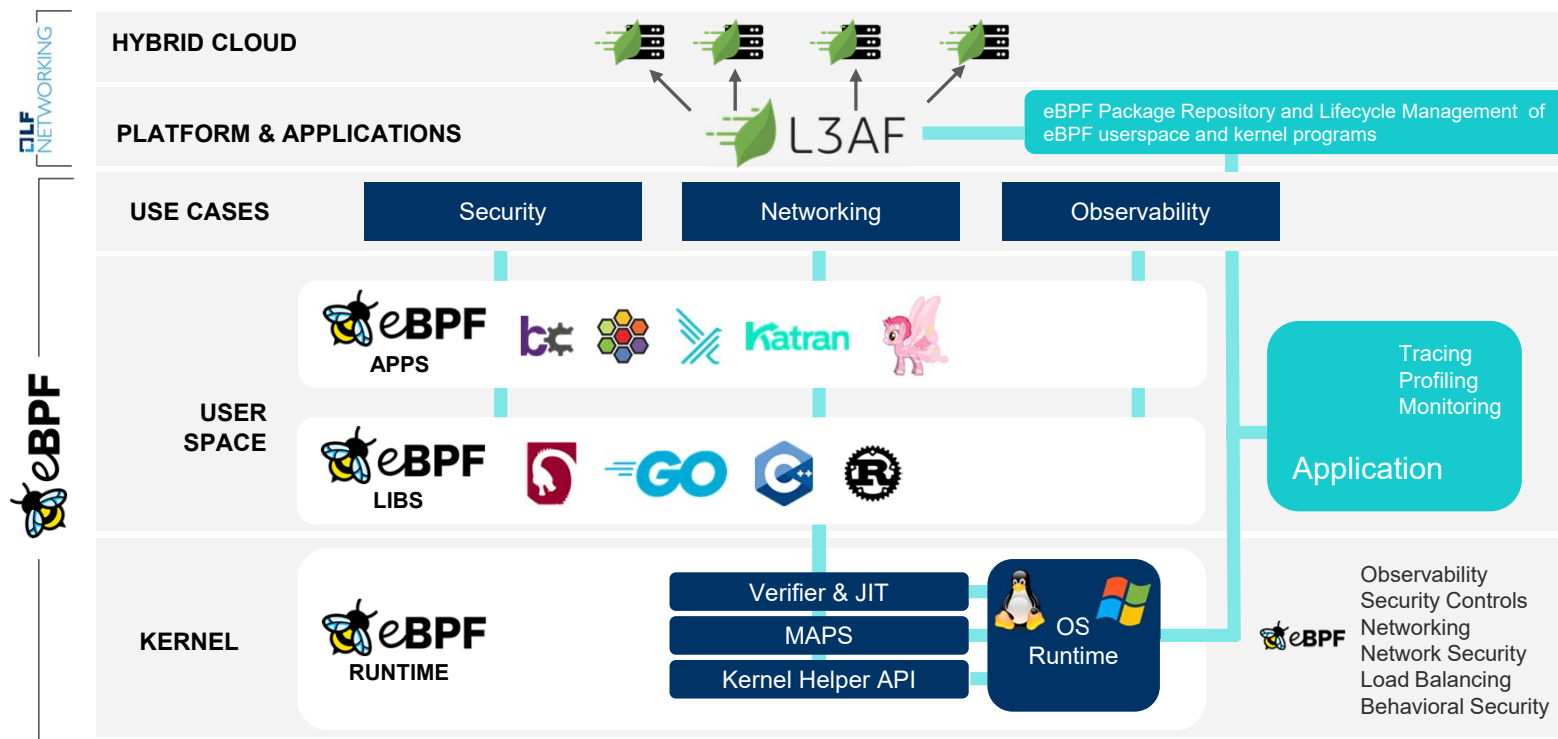
- › **Project name:** L3AF
- › **Project creation date:** July 19, 2021
- › **Project licenses:**
 - › GNU General Public License, version 2.0 (GPL-2.0) for code that runs in the *linux* kernel.
 - › Apache-2.0 for all contributions other than the above.
- › **Release Plan:**
 - › **Seed code dropped on 10/11/2021**
 - › GitHub location: <https://github.com/l3af-project>
 - › **Release Details**
 - › Release Engineering is tracked through [GitHub Projects](#).
 - › **Release Cadence**
 - › Active development is happening on the `main` branch, and a new version can be released from it every 10-12 weeks.
 - › [Semantic Versioning 2.0](#).

Community Health



- › Seed code dropped October 2021
- › TSC established
 - 4 TSC members from 3 separate companies
- › Weekly TSC meeting established
- › Mailing List Subscribers: 32 members & growing
- › Represented Companies/Entities: 8 (based on mailing list from formation through Feb 2022 and community meeting attendance)
- › Number of repositories: 6
- › Number of commits: 115 (lifetime)
- › Code Contributors: 14
- › GitHub Activity: 01/2021 through 02/2022: 2454 views, 295 unique visitors

L3AF- Potential Cross-Project Interaction



L3AF – Project Governance



- › [Project Governance](#) Wiki
- › [Governance Repo](#)
 - Working through Governance updates on Issues: <https://github.com/l3af-project/governance/issues>

L3AF - Infrastructure & Tooling

Uses modern LFX tooling platform and shared Confluence under LF Networking. No custom infrastructure.

- › **Bug tracker**
 - › GitHub Issues
- › **Chat tooling**
 - › l3afworkspace.slack.com
- › **Code repositories**
 - › GitHub - <https://github.com/l3af-project>
- › **Image repositories**
 - › GitHub Packages - <https://github.com/l3af-project>
- › **Workflow**
 - › GitHub Actions - <https://github.com/l3af-project>
- › **Code review**
 - › GitHub - <https://github.com/l3af-project>
- › **Projects Analytics**
 - › GitHub Insights
- › **Continuous Integration tooling**
 - › GitHub Actions - <https://github.com/l3af-project>
- › **Product Documentation**
 - › GitHub - <https://github.com/l3af-project>
 - › [L3AF Wiki](#)
- › **Mailing lists**
 - › groups.io
 - › main@lists.l3af.io
 - › l3af-tsc@lists.l3af.io
- › **Meeting calendars**
 - › groups.io:
 - › <https://lists.l3af.io/g/l3af-tsc/calendar>
- › **Meeting minutes and project documents**
 - › [L3AF Wiki](#)

L3AF – Roadmap (Technical & Community)

2021

- Establish working group & clarify goals – *Completed*
- Launch as LF unfunded project – July *Completed*
- Drop seed code – October *Completed*
- Launch as Open Source project – October *Completed*



2022

- Grow the Community
- Increase awareness and promote community engagement
- L3AF Badging Program
- Identify early adopters and prioritize feature requests
- [Make L3AF cross-platform](#)
- [Simplify eBPF program chaining](#)
- [Secure web APIs](#)
- [Consolidate eBPF program repos into an initial version of eBPF Package Repository](#)



2023

- Launch eBPF Package Repository v2
- Add support for observability in L3AFD (kprobes, tracepoints)

Thanks