Petros Gerogiannis, Dimitris Vorgias, April 2025

Problem

- Modern apps = dozens of microservices communicating over the network.Producing reliable, secure traffic between Kubernetes services is still manual.
- Traffic is unencrypted, observability is poor.
- Traditional metrics focus on pods and nodes, not request latency or success rates.
- Developers must add retry logic, metrics and TLS by hand → slow & error-prone.
- No unified way to express traffic policies across all namespaces.

The Solution: Service Mesh

- Add Linkerd to your cluster with a single command.

  Automatic sidecar (proxy) injection gives every pod:

  - Transparent mTLS with automatic certificate rotation
  - Built-in retries, timeouts, load-balancing
  - Zero-config “golden metrics”(latency, success rate, RPS) for every service pair

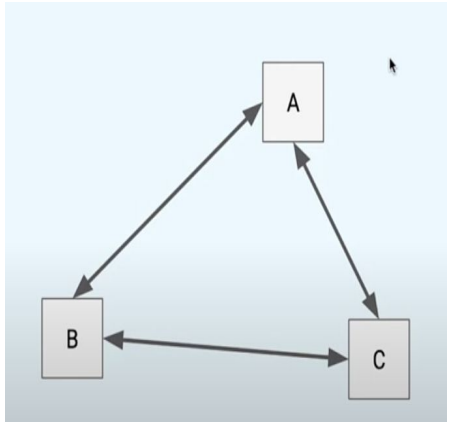
- Uniform layer lets operators observe, secure, and control every request.

How it works

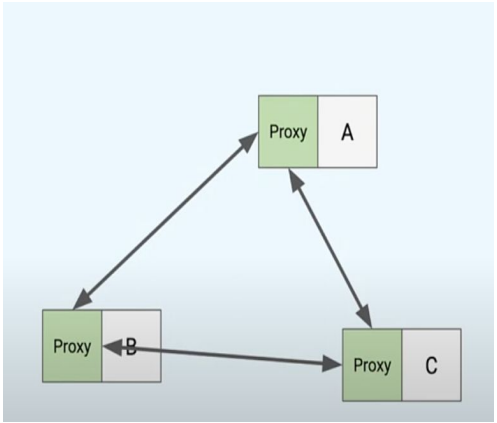
- Tiny Rust-based data-plane sidecar (proxy) runs next to each pod (≈ 10 MB).Uses a purpose built proxy (lightweight).
- Central Go control-plane manages identity, policy and telemetry.
- Uses Kubernetes Service Discovery(no extra agents or side networks).
- Designed for zero-config onboarding: apps don’t need code changes or language-specific libraries

How Service Mesh works

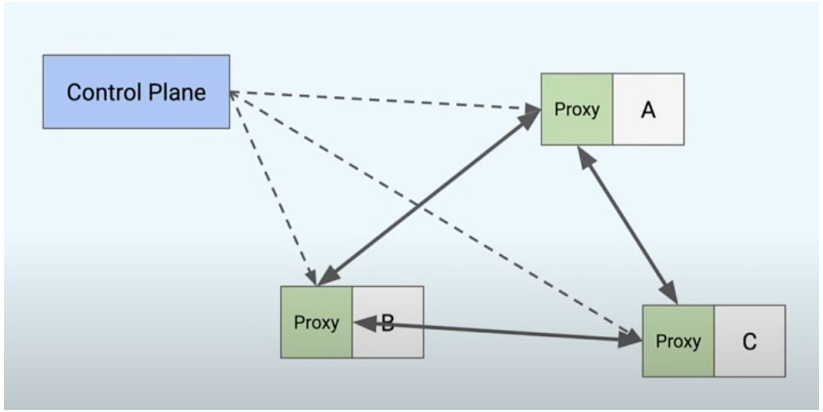
No Service Mesh



Data plane



Control plane



Traction

- Created at Buoyant in 2016; open-sourced the same year.
- Adopted by CNCF (incubation) → graduated July 2021

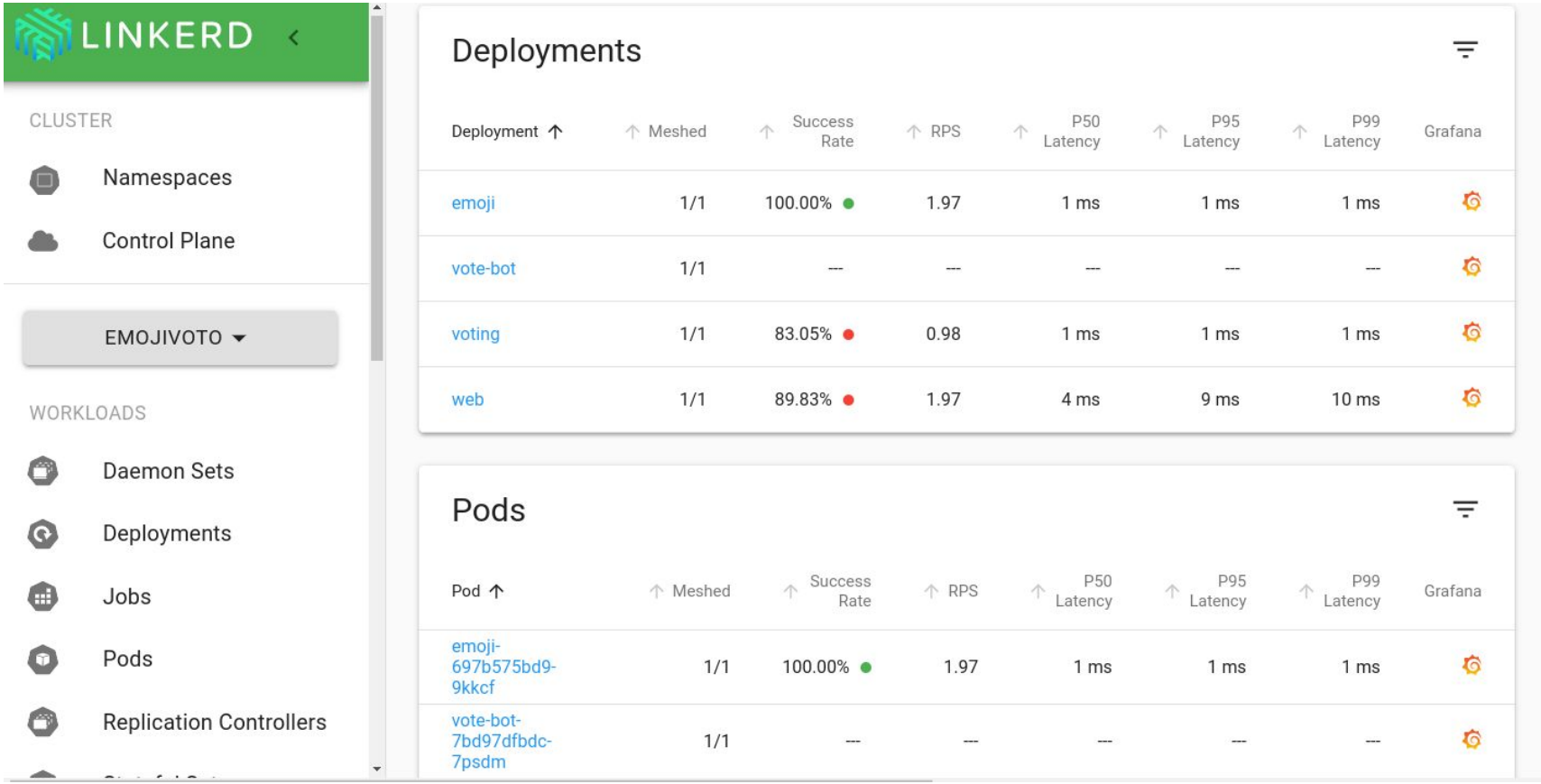
- 20k+ GitHub ★, 200+ contributors

- Widely used by companies like Microsoft, Expedia, Adidas, H-E-B

- Weekly community meetings.Linkerd-specific events at KubeCon, Linkerd-Day, and ServiceMeshCon

The plan

- Keep Linkerd small, fast and simple—Rust data-plane, Go control-plane
- Continue security audits (passed two CNCF audits so far)
- Grow community via slack, docs, Linkerd Academy, Linkerd-Day
- Focus roadmap on:
  - Policy v2 (fine-grained authn/authz)
  - Gateway API integration
  - Ambient mesh research (sidecar-less)



Linkerd metrics dashboard

Closing

Linkerd is the de-facto standard for zero-config, ultra-light service mesh on Kubernetes

Ships encryption, reliability and observability out-of-the-box—so teams can focus on writing code, not wiring networks

Visit https://linkerd.io/2.18/getting-started/ for documentation.