Introducing Hyperledger FireFly

Exec Summary

Hyperledger FireFly Proposal

HL FireFly is a Multi-Party System - for enterprise data flows

- A larger system around a blockchain
- Think docker → kubernetes
- Multi-protocol blockchain support
- Highly pluggable and extensible by design (open, future-proof, etc.)

No more plumbing to build on enterprise blockchain

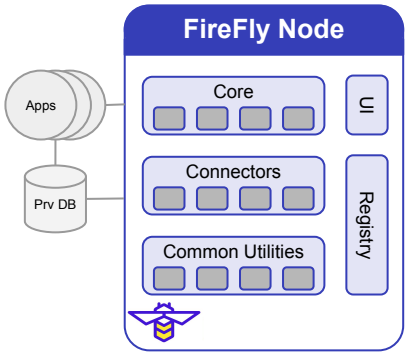
- The right mix of distributed and decentralized technologies all pre-integrated into an end-to-end system: blockchain, messaging, connectors, pluggable compute, identity registry

Hyperledger is the right place for FireFly

- Large, ambitious, pluggable project aiming to simplify building and running enterprise blockchain projects
- Compliments many HL projects: Fabric, Besu, Indy, Cactus/Weaver, etc
- Keys to success: open governance, broad participation, market-driven evolution

Strong starting point for the project

- Seed contribution from Kaleido
  - 3 years of engineering
  - Production code that Fortune 500 customers actively run on
  - 6 years of enterprise blockchain learnings
- Kaleido founders have 60+ years core systems experience, veterans of enterprise OSS, cloud native architecture, etc



Timing & Next Steps

Hyperledger FireFly Timeline

May: Proposal review, feedback and vote

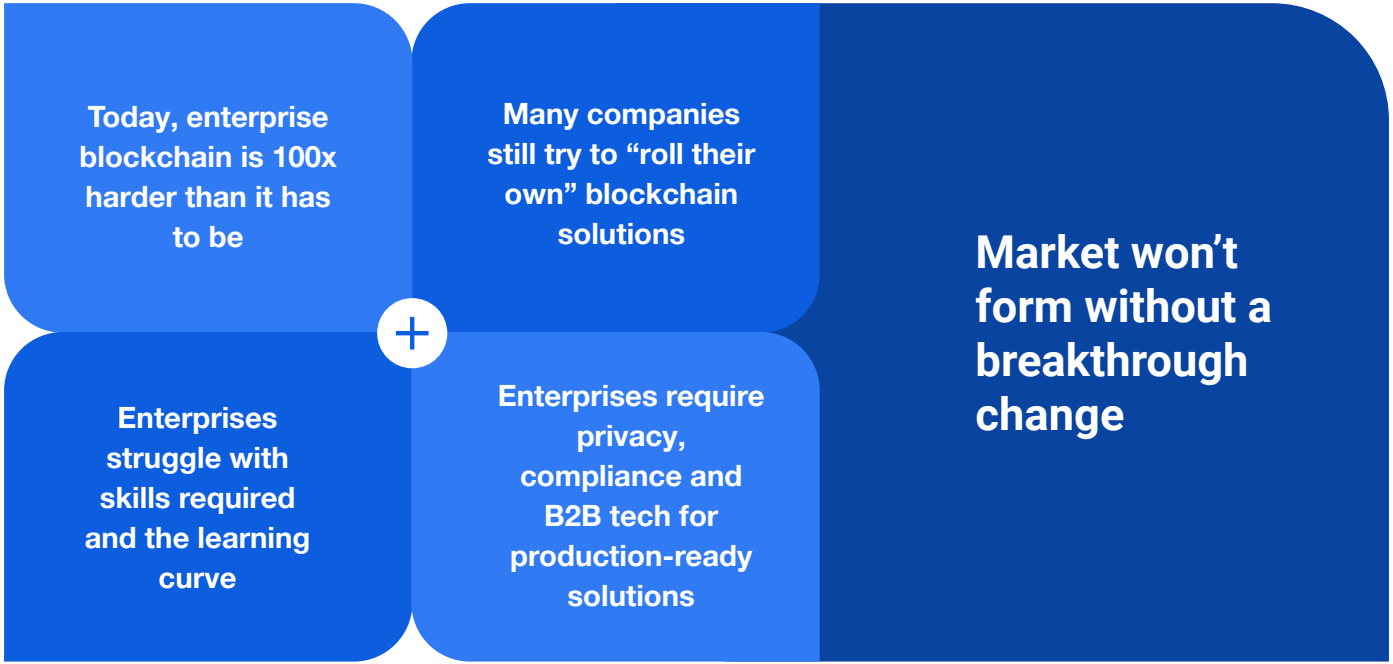
- Code is available for review
- Feedback on proposal is much appreciated
- Aiming for a vote at TSC meeting on May 27th

June: HGF Announcement and Launch

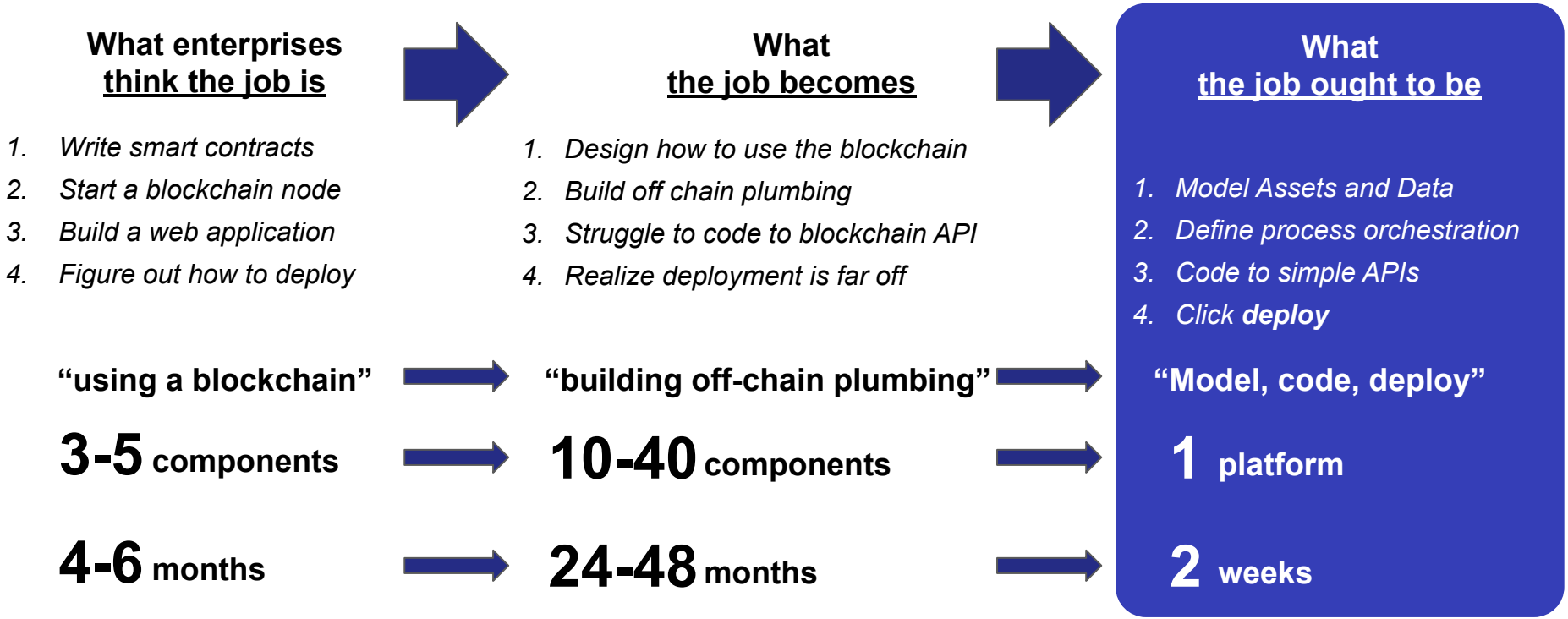
- Formally announce at HGF June 8th
- Live community
- Workshop on June 11th

Problem statement

What's holding the enterprise blockchain market back?

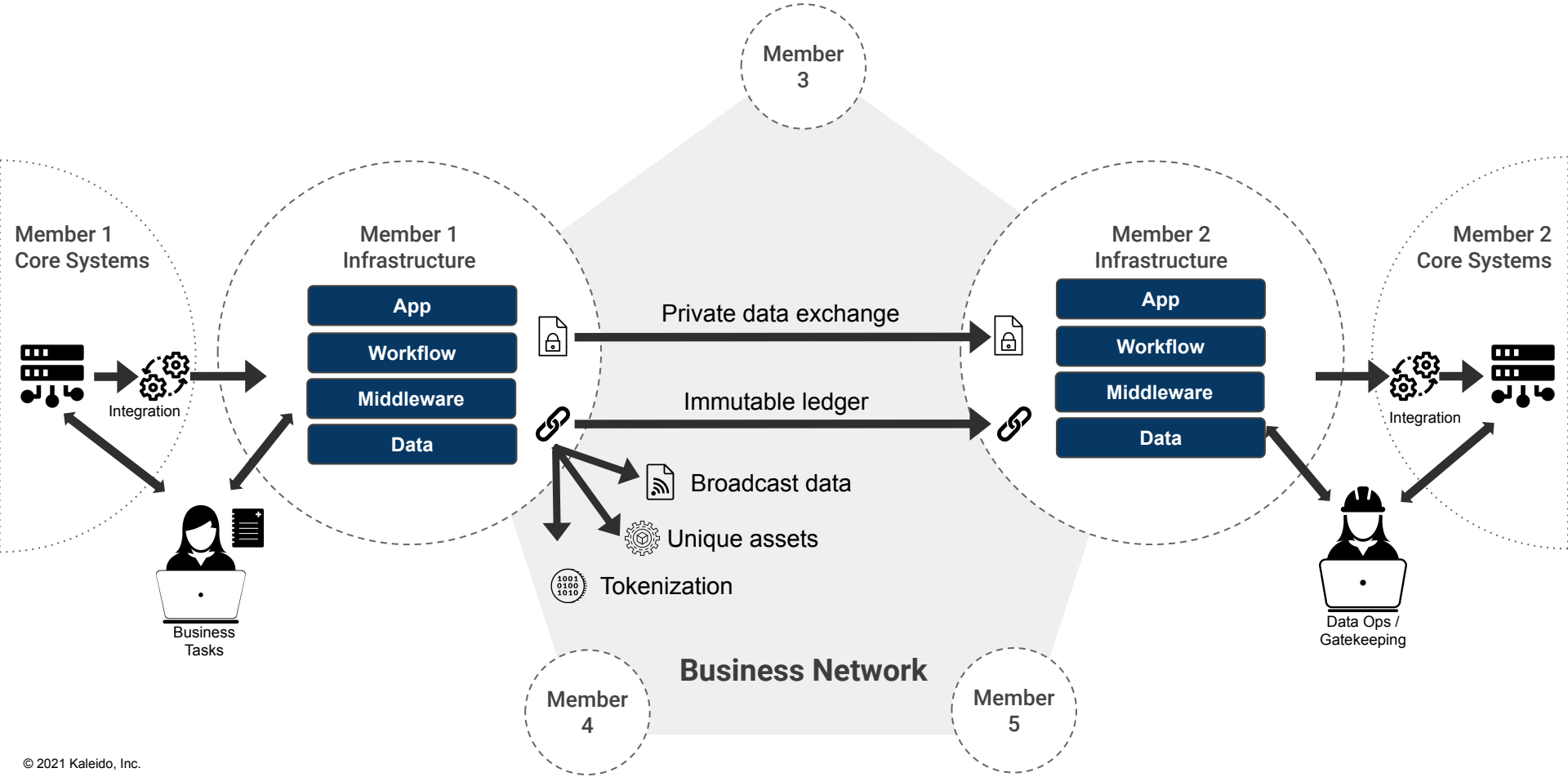


Building your first enterprise blockchain use case

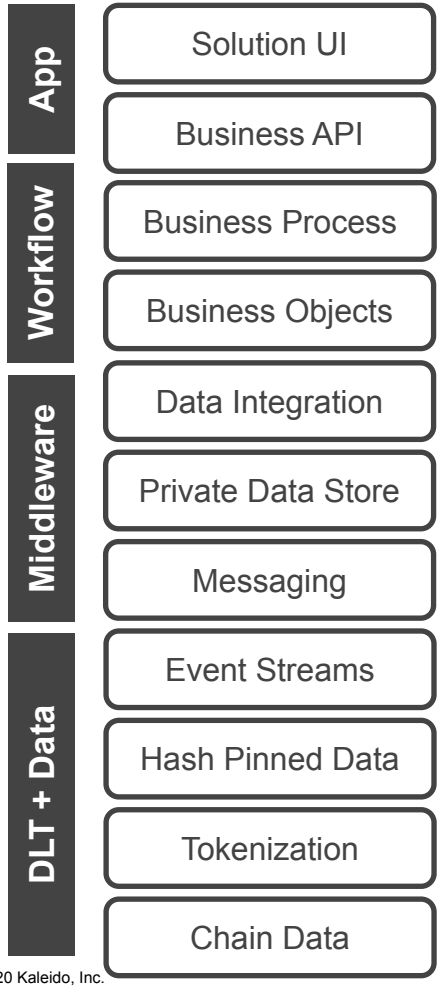


Today it's 10-100x too difficult because the whole problem is much larger than the blockchain

Typical Enterprise Blockchain Network



Anatomy of a typical enterprise blockchain app



- Unique to each use case - development can be optimized through re-use
- Modern Web/Mobile UI - including business and operational tasks
- API enabled - bi-directional for both actions and live events
- SSO / OAuth security integration, and other customization plug-points

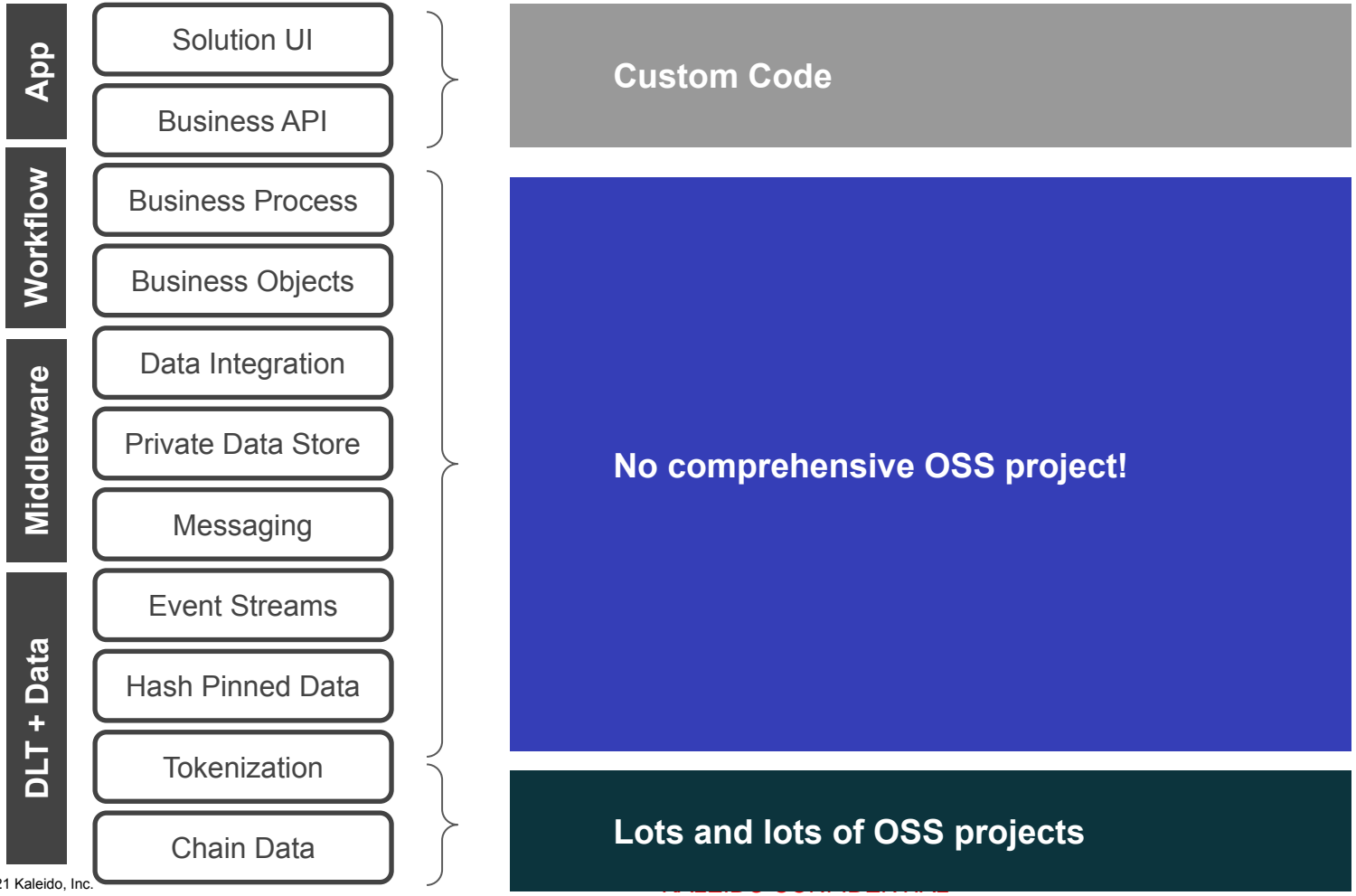
- Multi-party agreed processes and data structures - “rules of the road”
- Classification of data - canonical formats, and data privacy
- Authentication rules for multi-party data exchange

- Real-time integration to back-end systems - to “pull” data into the network
- Transform and load data to canonical form - to “push” data into the network

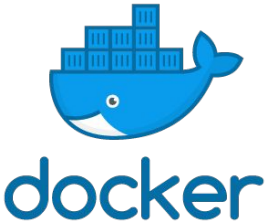
- Fast indexed access with rich-query, and storage for large attachments
- Unique view of the network: public data + my private data sent & received
- End-to-end encrypted transfer of data backed by strong identity

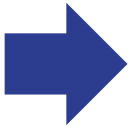
- On-chain logic driven by reliable transaction streaming
- Off-chain logic driven by reliable event streaming
- Minimal on-chain storage of data, and simple proof/state transition logic
  - For performance & data sensitivity - regulatory and competitive
- Distribution of large data blobs to all participants
  - Off-chain p2p filesystem, with hash pinning
- All-party blockchain allows global state, such as tokens & identity
- Private transaction + anonymity features mask visibility as required

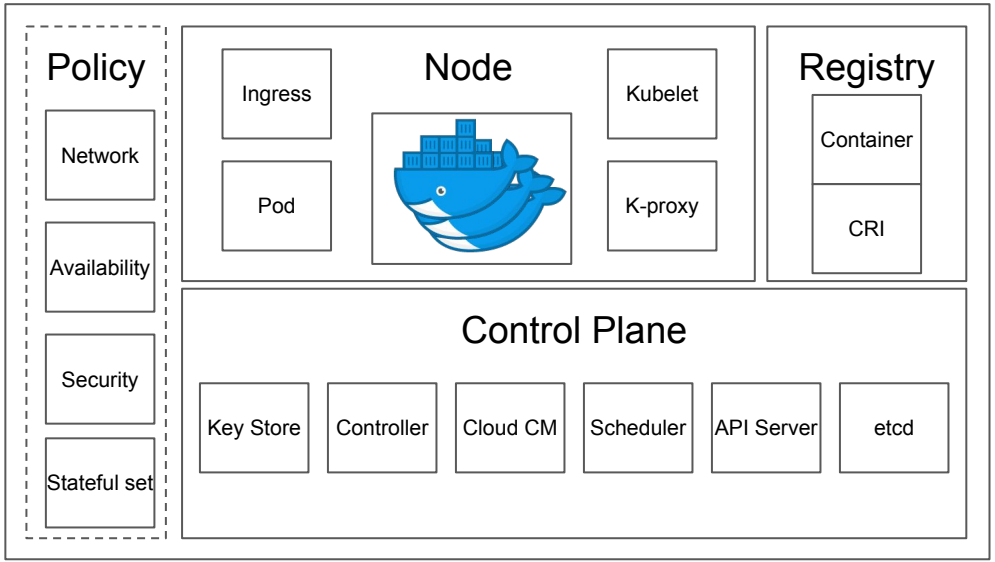
Anatomy of a typical enterprise blockchain app



An analogy: Docker & Kubernetes







kubernetes

The breakthrough

- All software fitting into the same uniform box
- Standardize the hardest parts of software management

The problem

- Many missing functional pieces in order to standardize
- Standardize the hardest parts of software management

Introducing Hyperledger FireFly

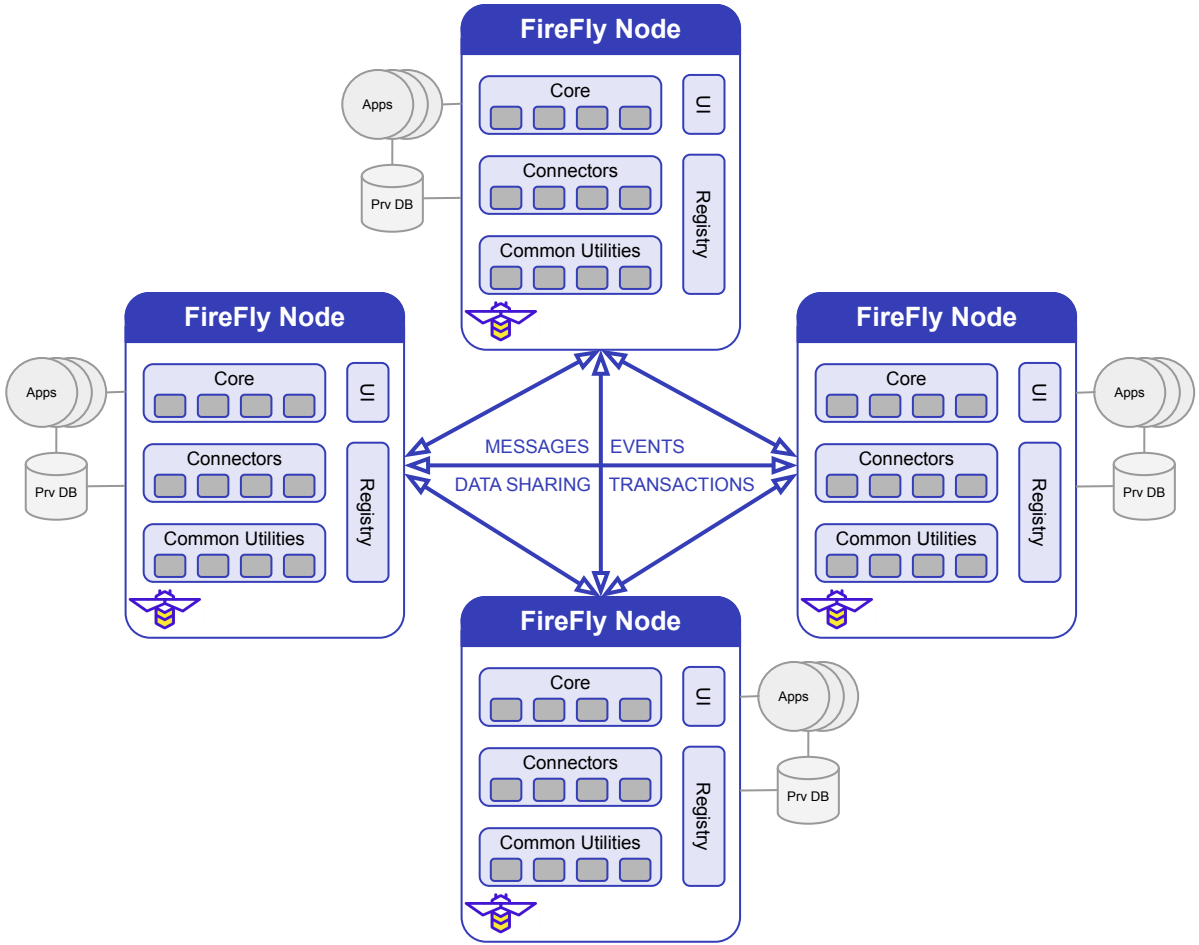
Multi-Party System
for enterprise data flows

Easily create cross-org data flows
Distributed, event-driven system makes building robust flows easy

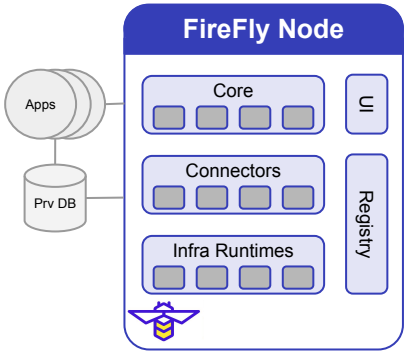
A flexible technology framework
The right mix of distributed and decentralized technologies: blockchain, messaging, connectors, pluggable compute, identity registry

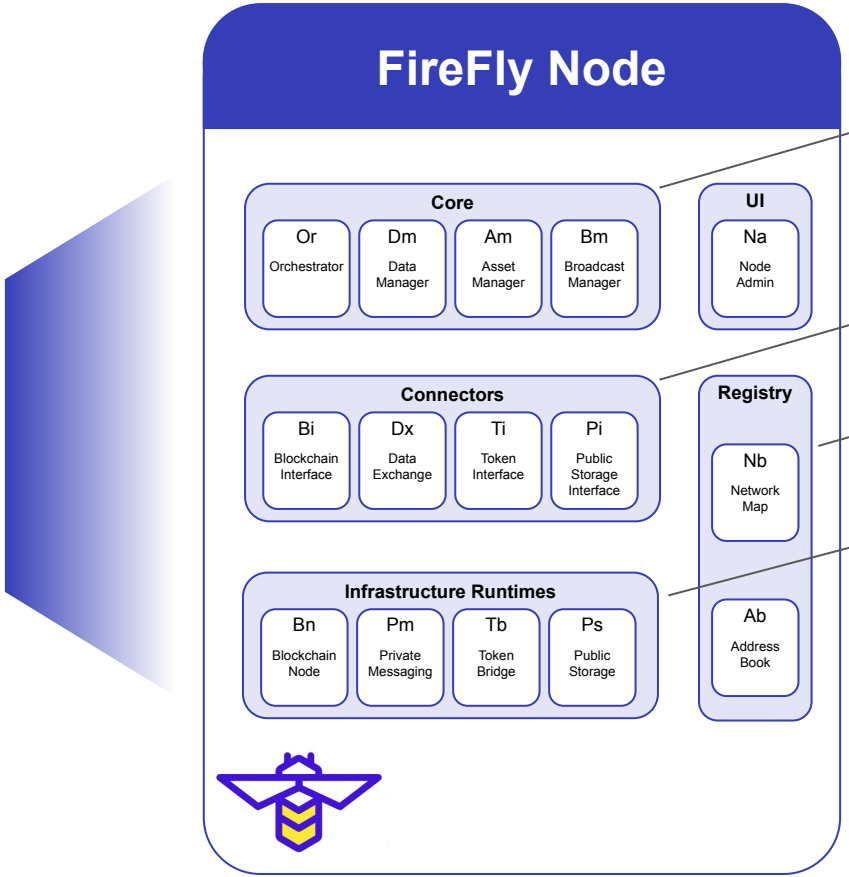
Built in network management tools
A distributed registry for member management, a UI console for node administration

Reliable and robust programming model
Define assets, data schema, event handling flows, and messages all configurably pinned to blockchain ordering and immutability



The FireFly Node





Core

- Active engine which your apps use to interface with the system. Maintains private data storage.
- Manages the lifecycle of assets and data
- Dispatches actions and processes events

Connectors

- Abstract away the complexity of reliable, coordinated flows across heterogeneous runtimes

Registry

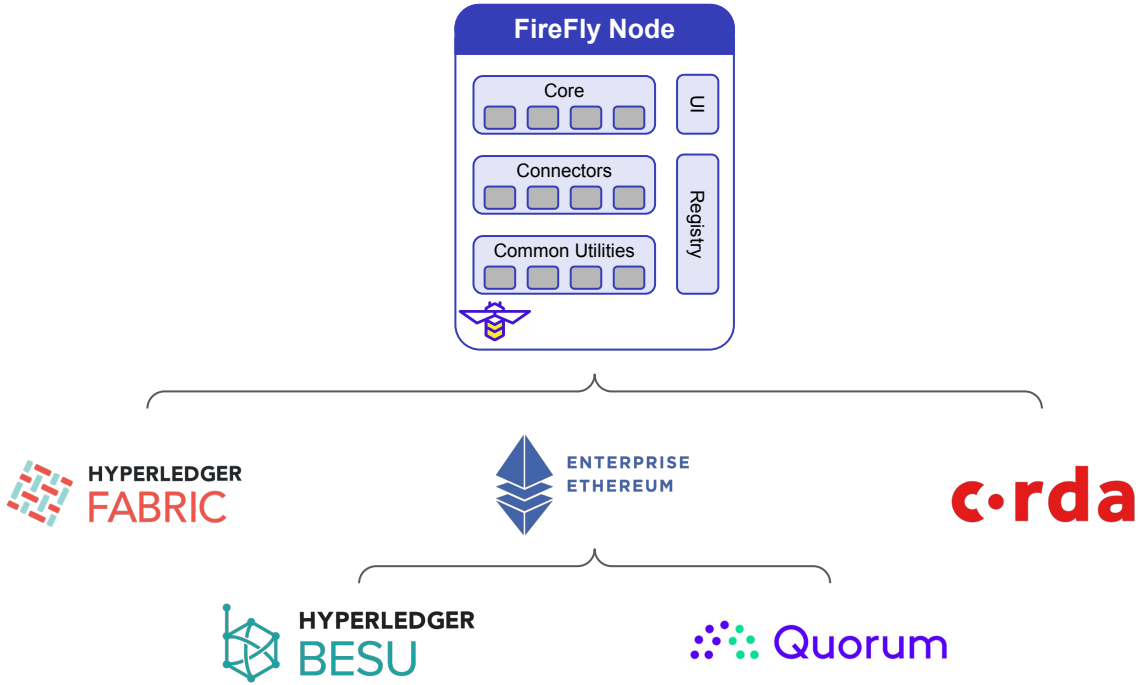
- Maintains the identity and connectivity info of the network members

Infrastructure Runtimes

- Pluggable implementations of multi-party collaboration across transactions, data, and messages
- Many compute types (blockchain, low code, TEE, zkp, etc.)

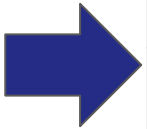
Pluggable Blockchain Protocol

Choose from the popular "big 3" enterprise blockchain protocols



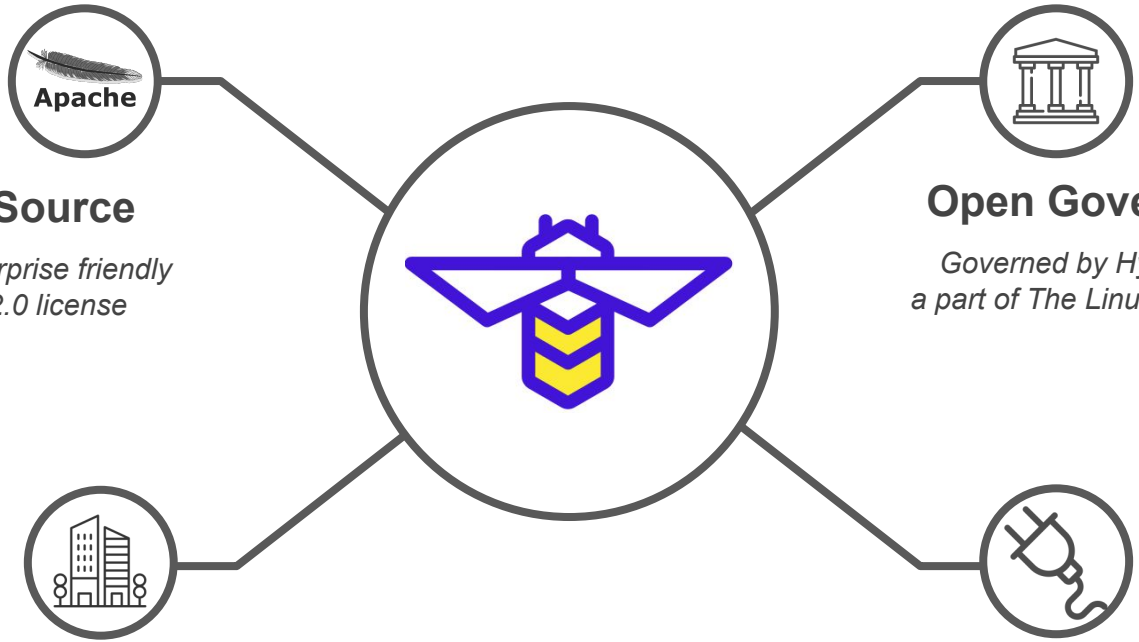
FireFly & Blockchain: The Golden Usage Pattern

How FireFly leverages blockchain	
Transactions	• Global ordering • Finality
Data	• Data immutability (hash pinning) • Schema definition and lifecycle
Process Orchestration	• Sequencing • Triggering • Trusted event-driven coordination
Digital Assets, Tokens, NFTs	• Conservation of value • Double spend protection • Lineage of ownership • Data Immutability
Identity	• Digital signatures • Ownership Proofs



How FireFly extends blockchain	
Transactions	• Generated simple REST APIs • Built-in operations for common enterprise patterns
Data	• Messages & Documents • Private Off Chain Transfer • Efficient Broadcast of large data • Rich query, fast search cache
Process Orchestration	• Reliable event streaming for triggering • Pluggable decision/authorization logic • Extensible off-chain logic execution engines
Digital Assets, Tokens, NFTs	• Asset Lifecycle Management • Built-in operations for common enterprise patterns
Identity	• Identity Registry • Address book • Transport encryption keys

Enterprise Ready Open Source



Open Source

Liberal, enterprise friendly
Apache 2.0 license

Open Governance

Governed by Hyperledger,
a part of The Linux Foundation

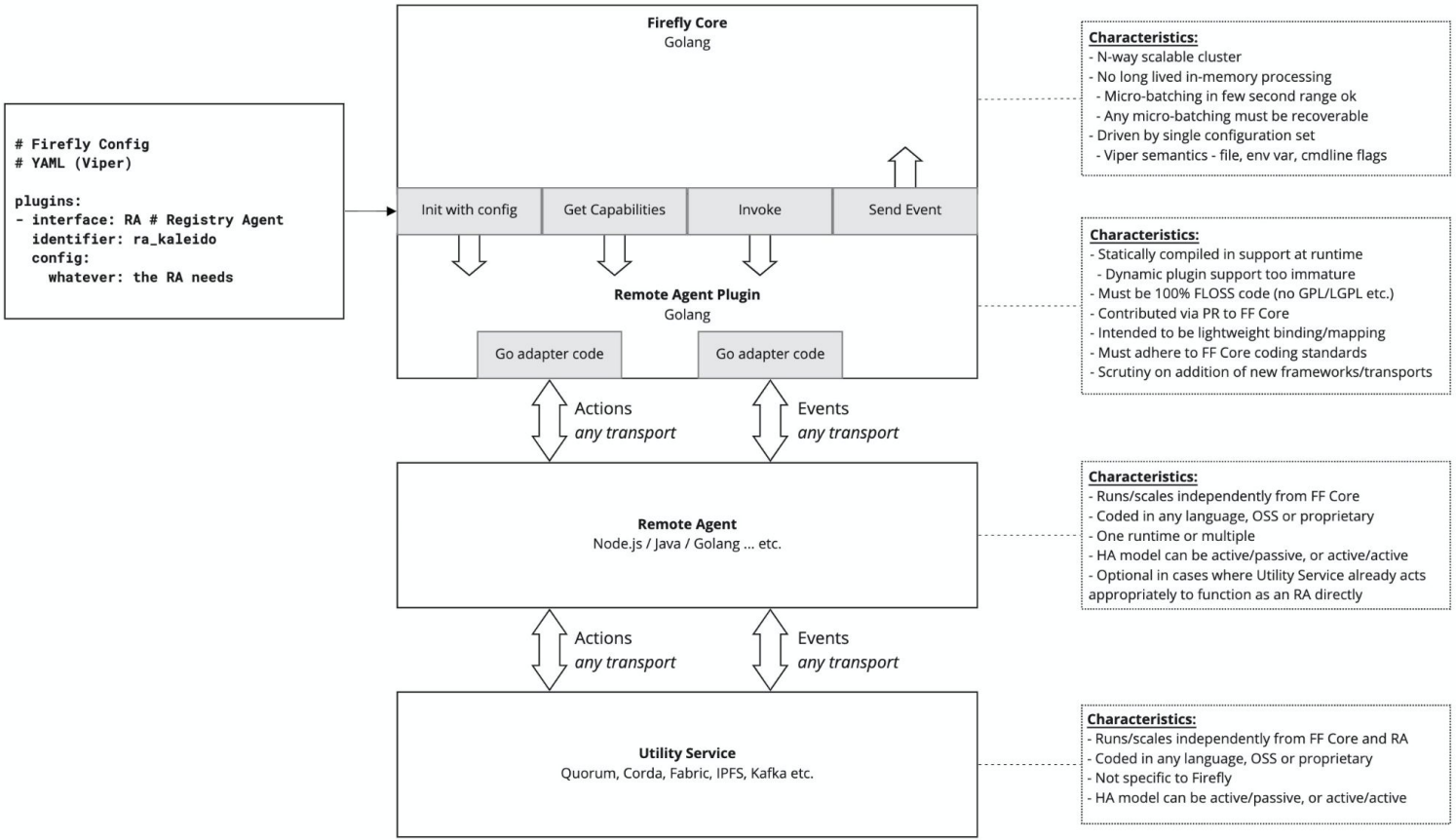
Enterprise Grade

Modern, cloud ready software,
scalable, resilient

Highly Extensible

Highly pluggable framework
future-proofs the engine and
enables rapid technology evolution
(zkp, blockchain, TEEs, etc.)

FireFly Interfaces



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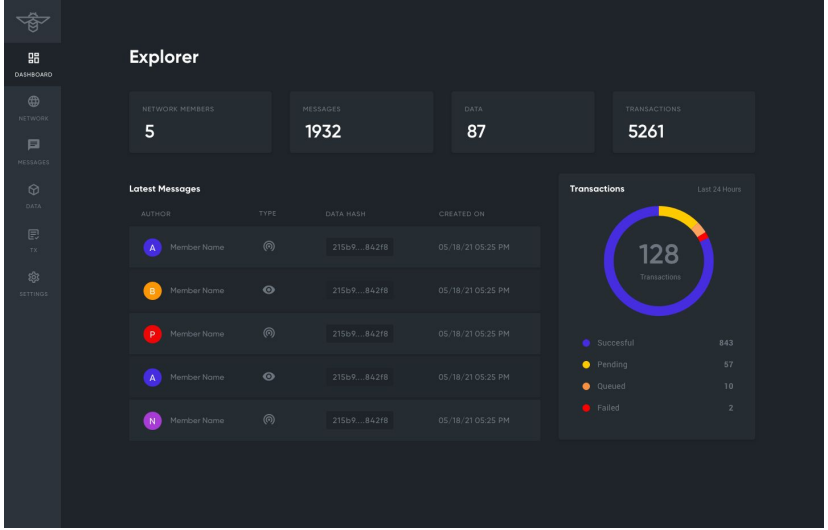

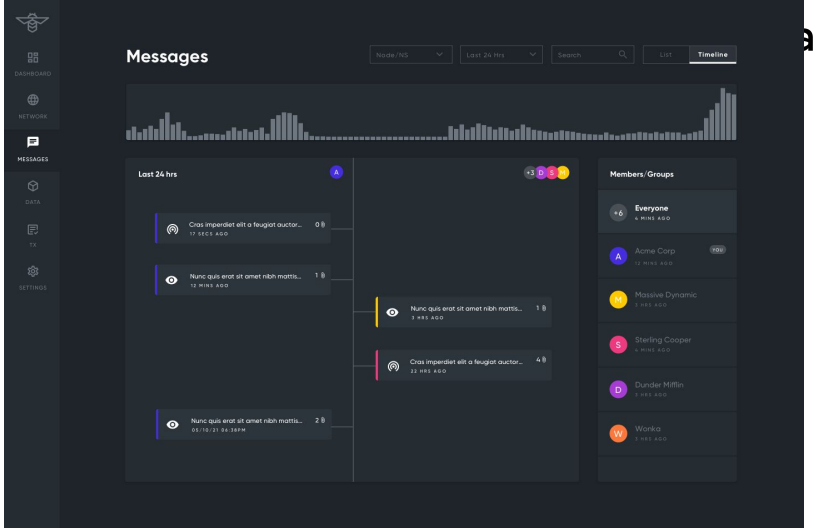

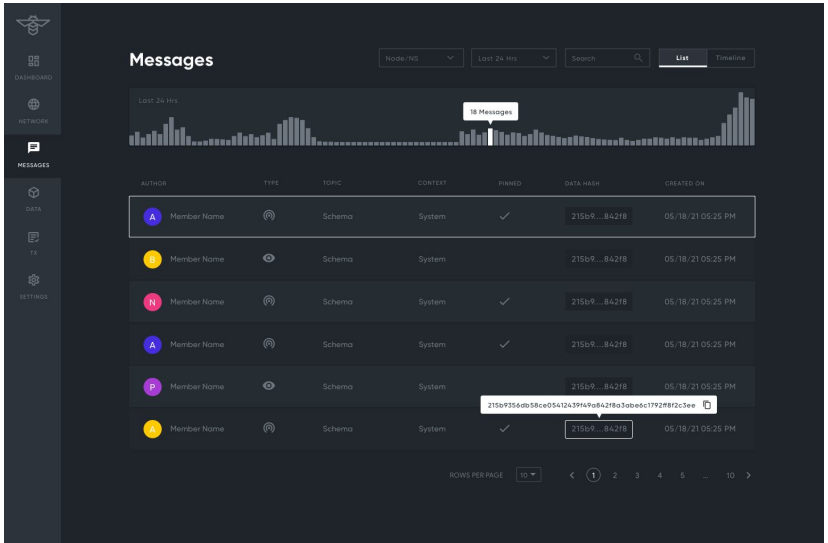

Plug-and-Play Services

Standalone services in the Kaleido catalog:

- App2app messaging
- Document exchange
- On Chain Registry

Kaleido Asset Trail

Refactored with a core ‘brain’ component that made it simple to build complete applications

Hyperledger FireFly

Latest generation re-engineered from the ground up (inc. move from TypeScript->Go) to improve developer experience, runtime performance, and extensibility

Fully pluggable architecture, designed for open community engagement

Additional projects included: Blockchain connectors, CLI, UI

THANK YOU