



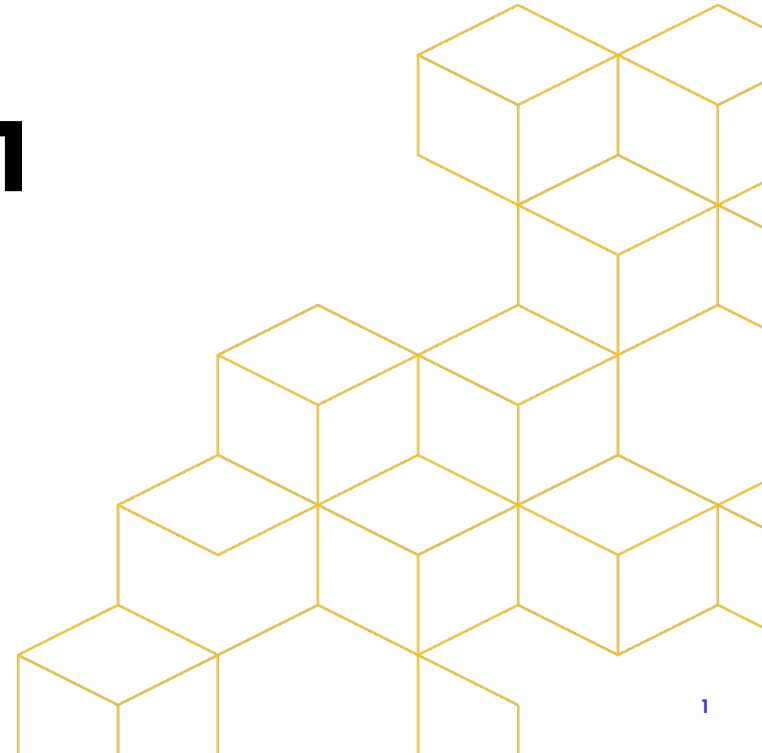
**HYPERLEDGER  
FIREFLY**

# Hyperledger FireFly v1.1

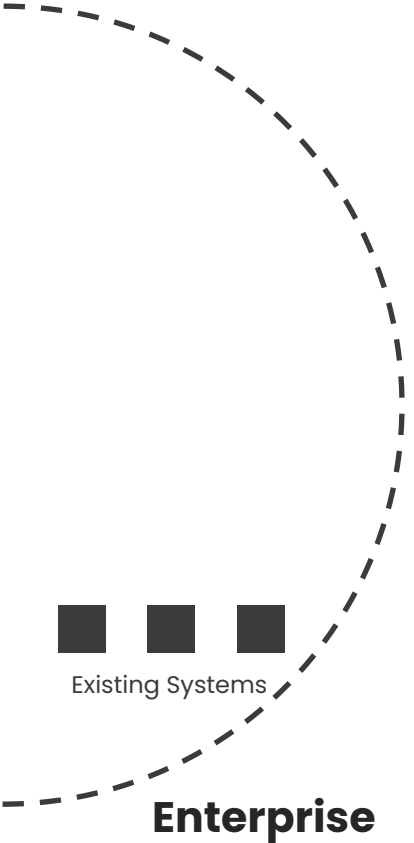
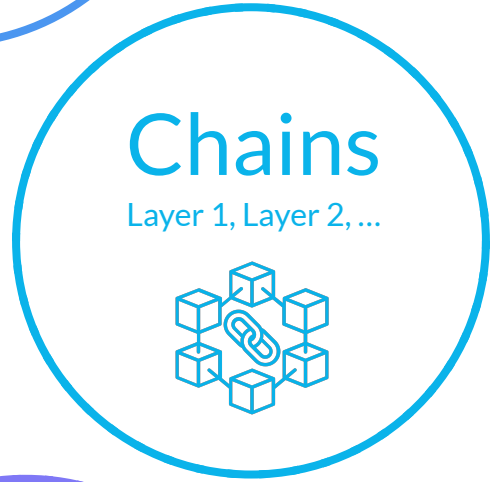
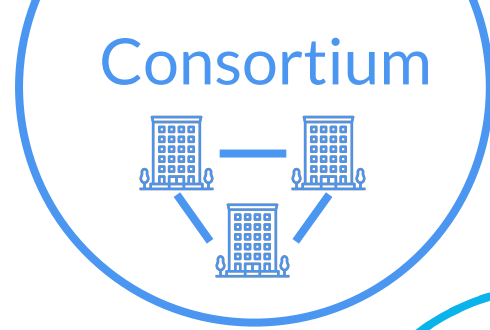
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Public Sector SIG Presentation

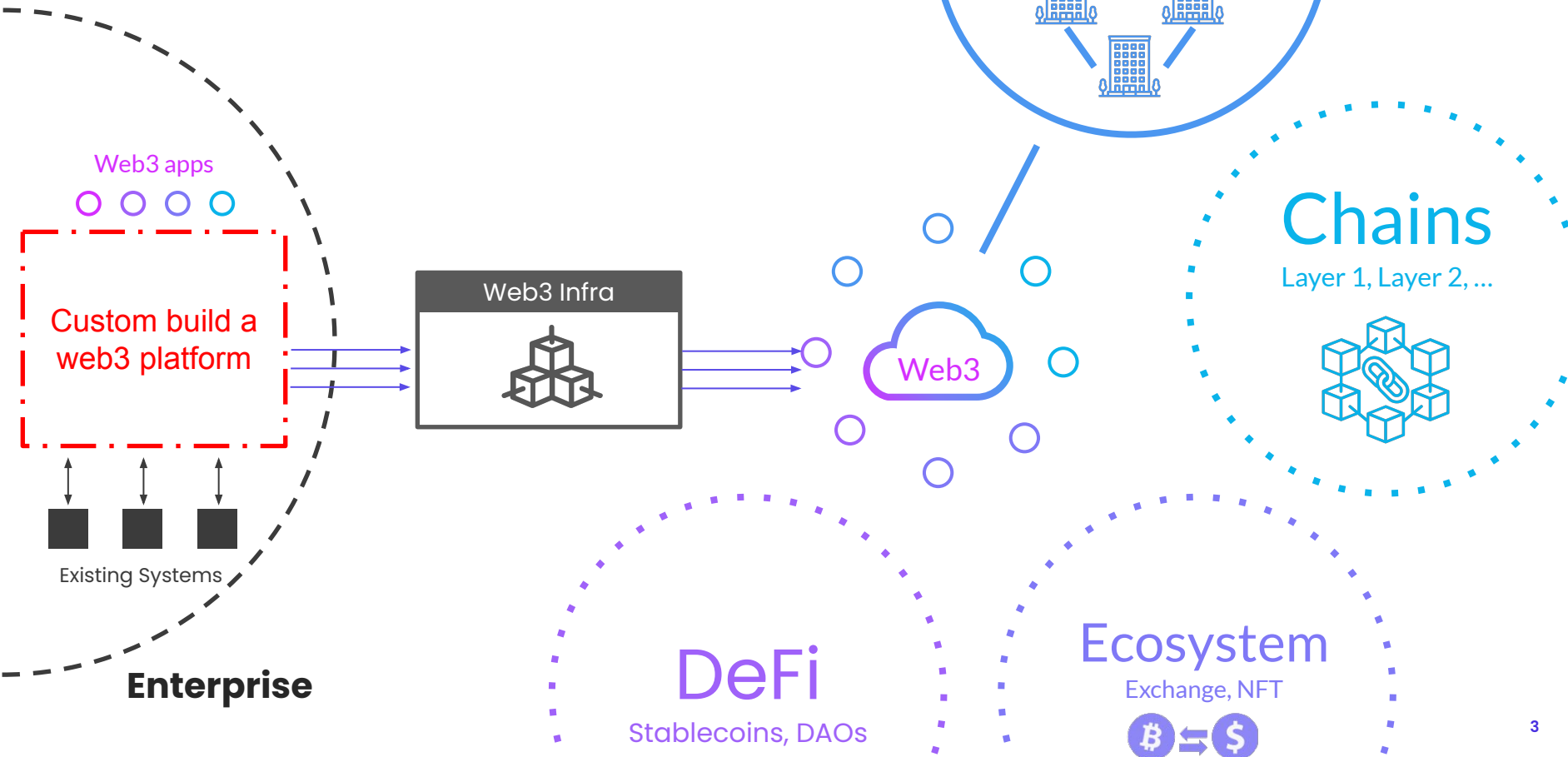
September 2022



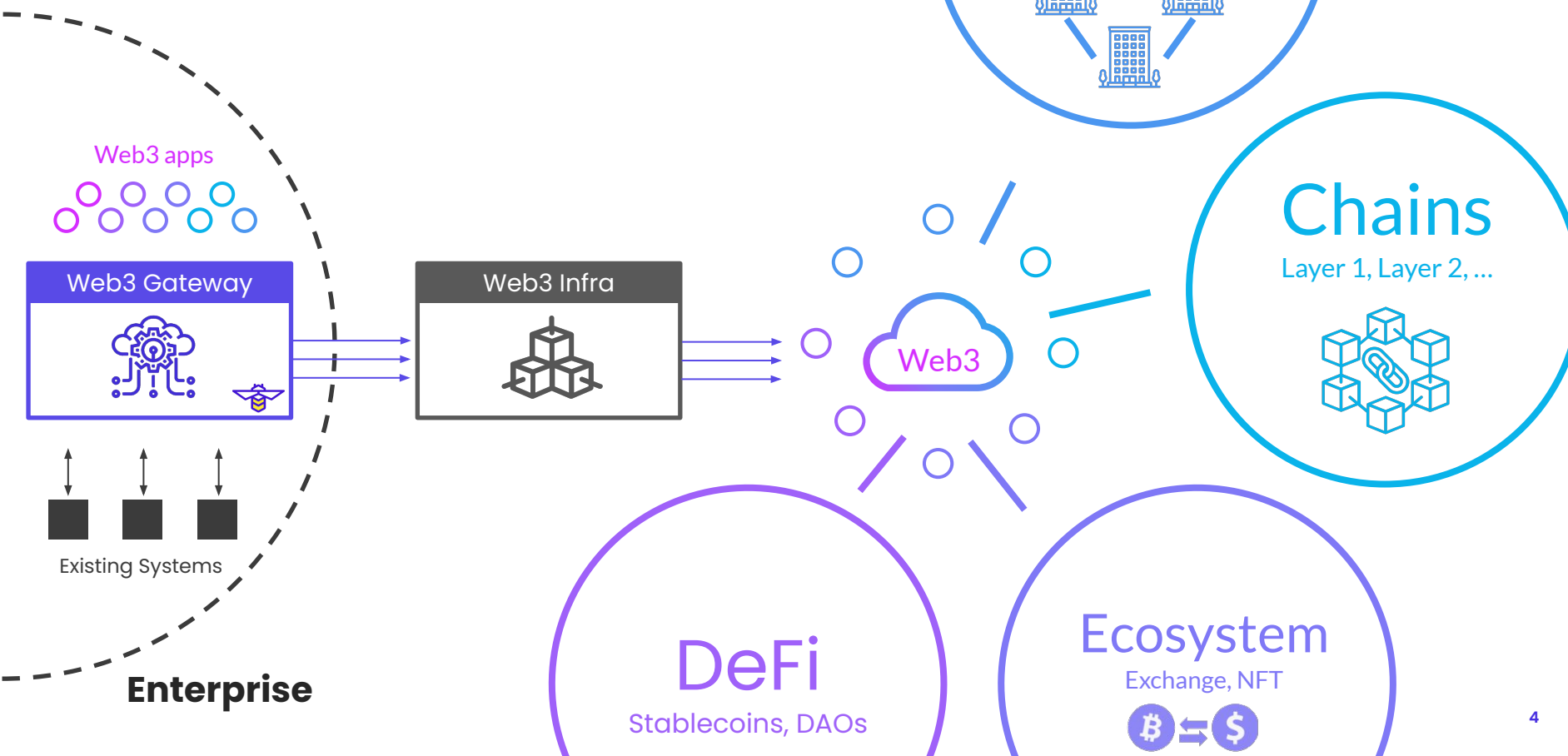
# Web3 Landscape



# Web3 Landscape - Gen 1



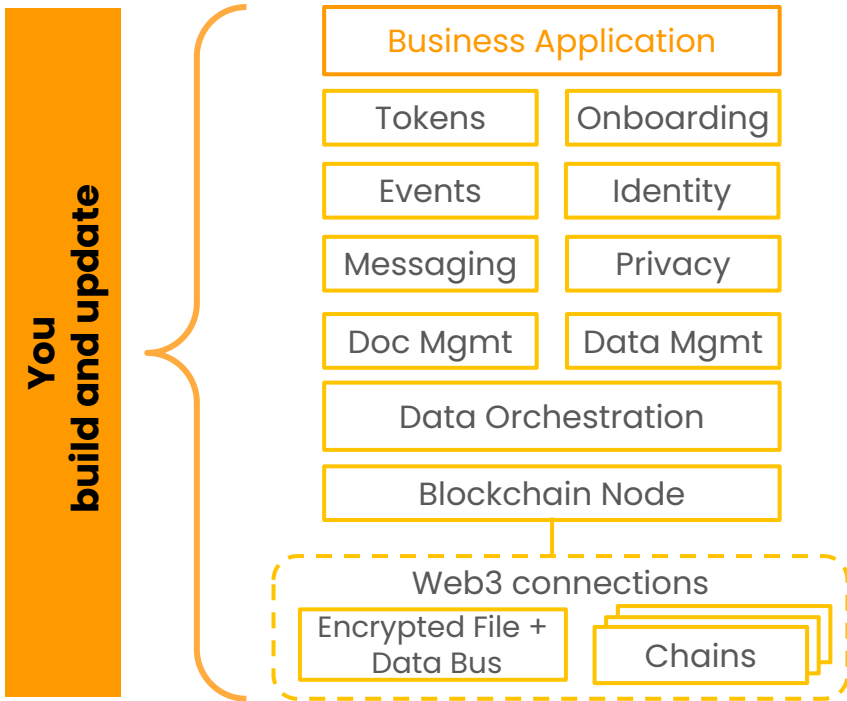
# Web3 Landscape - Gen 2



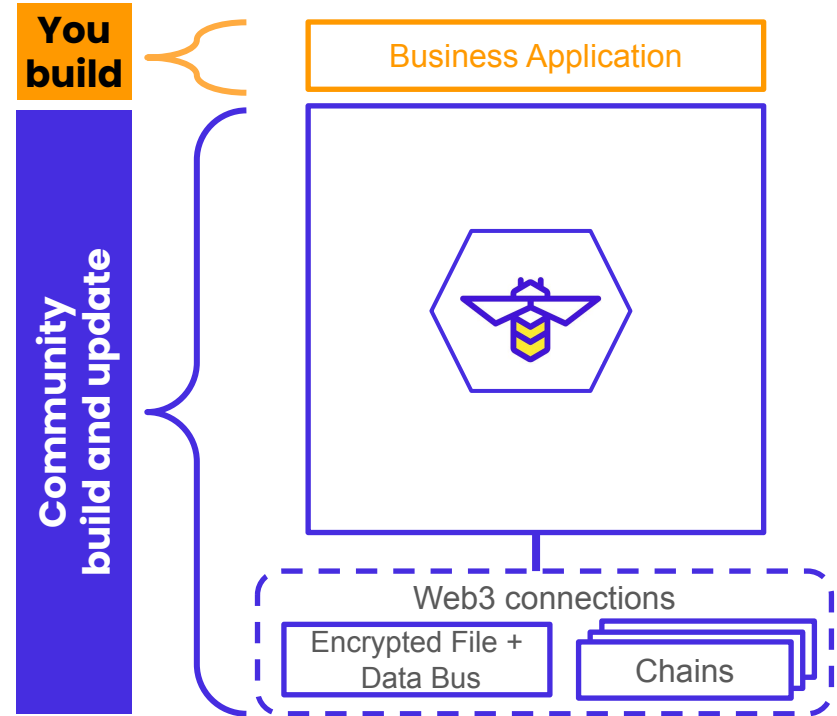
# Build Web3 apps without reinventing the wheel

*FireFly's gen2 approach eliminates custom code and plumbing*

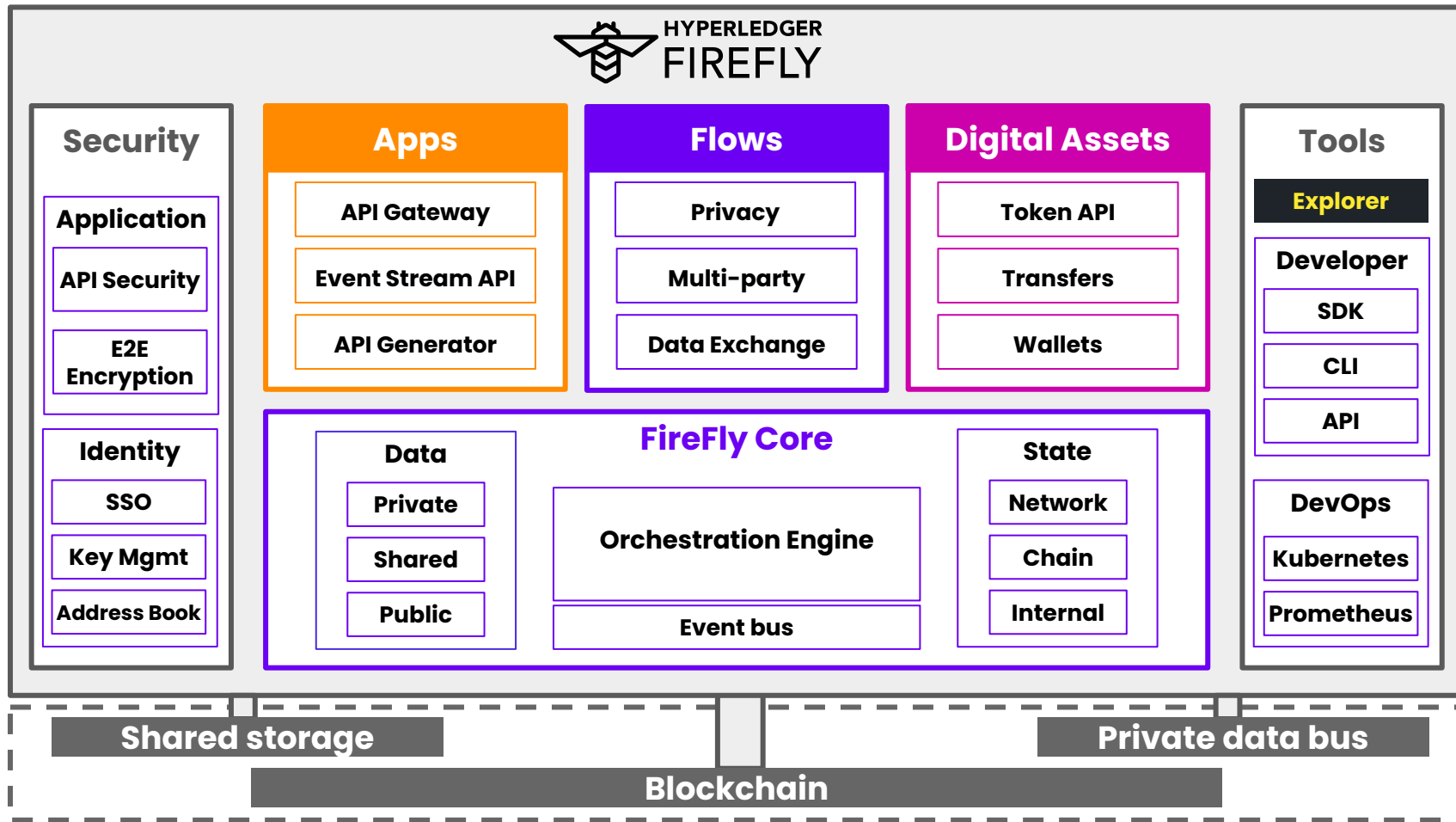
## Without FireFly



## With FireFly

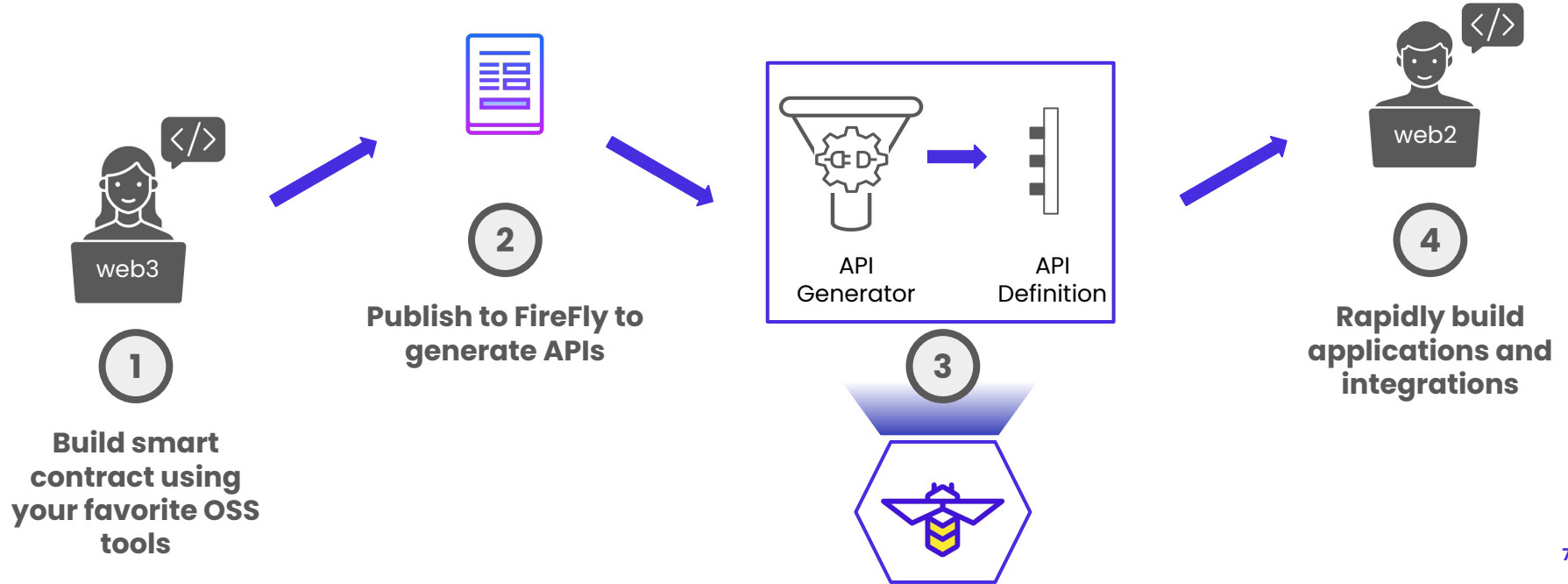


# Hyperledger FireFly



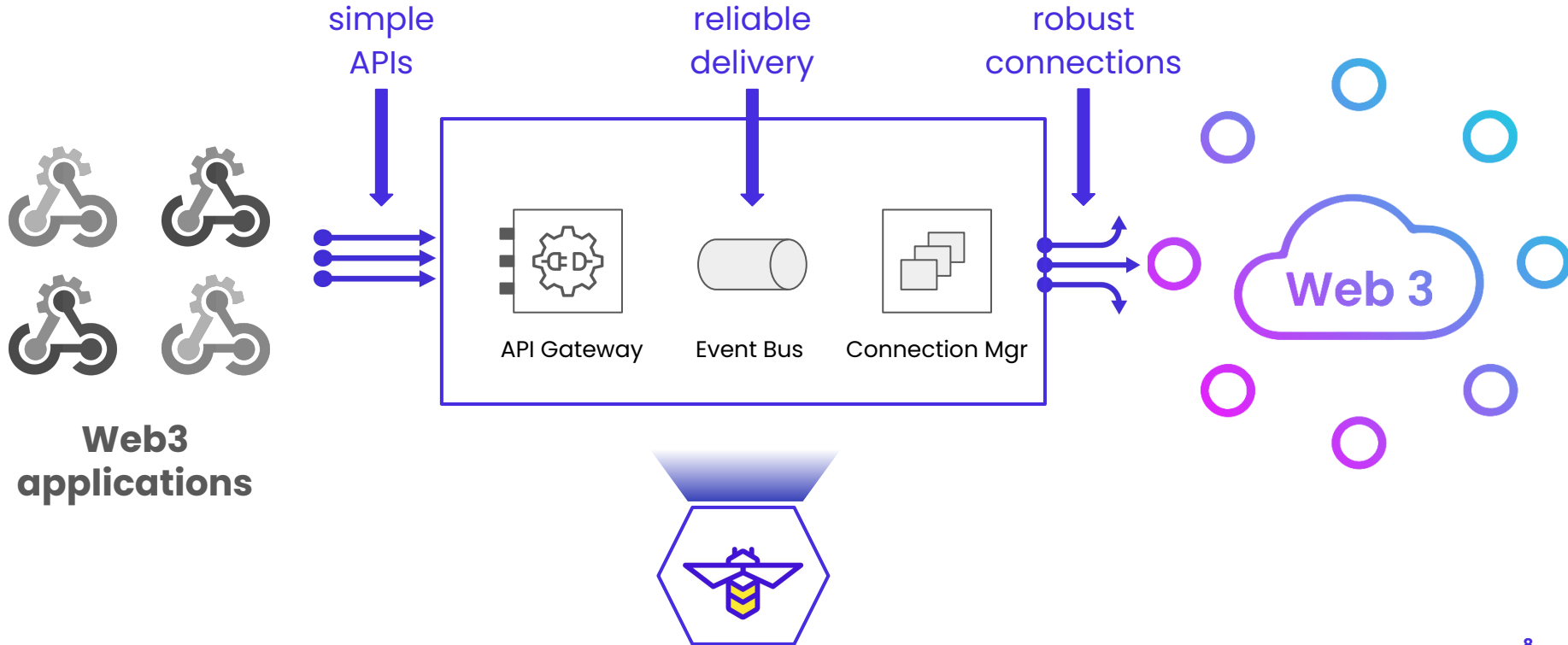
# Build Web3 apps quickly

## *FireFly turns smart contracts into APIs*



# Deploy Web3 apps to production

*FireFly is your gateway to Web3*





# Data Flows - on and off chain

*FireFly has a complete stack for consortium B2B networks*

## Document Transfer

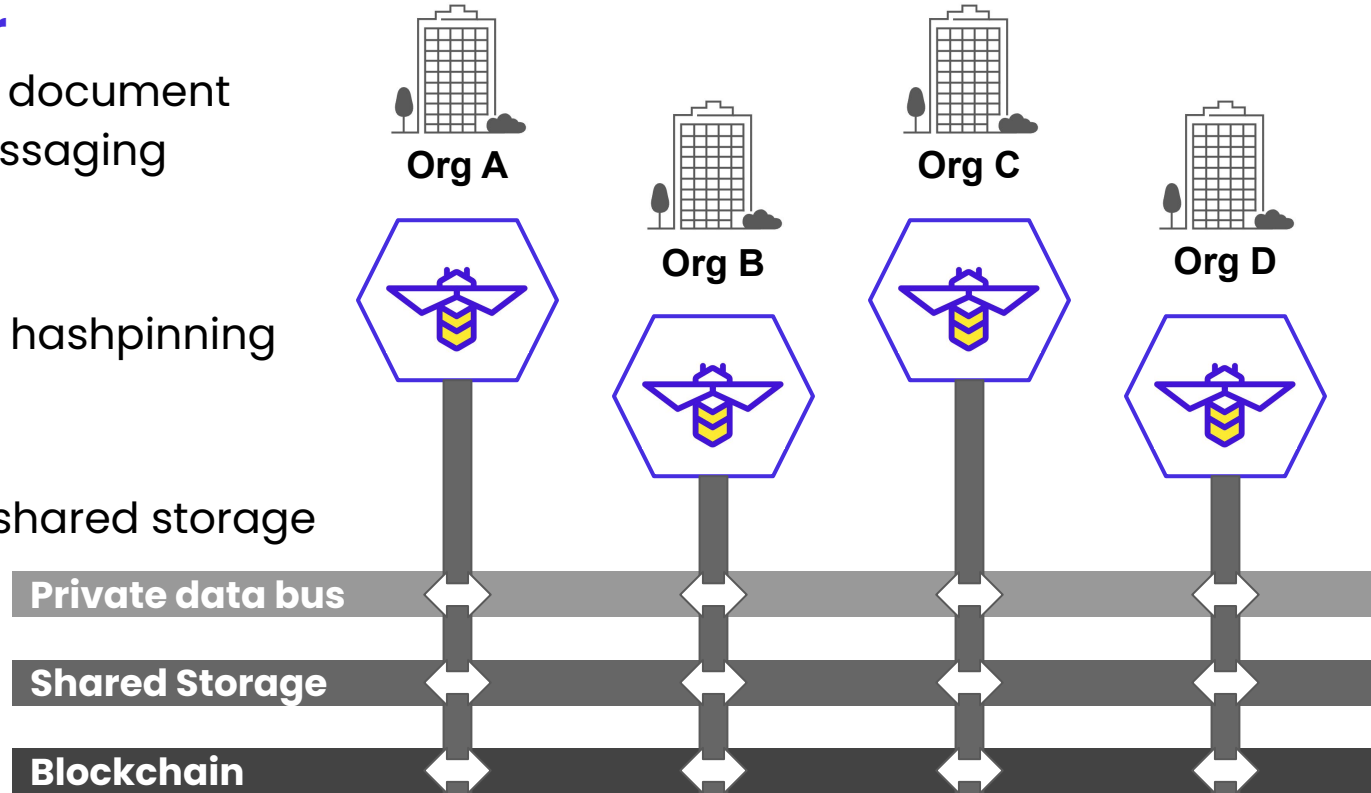
Native off-chain P2P document transfer and B2B messaging

## On Chain Proofs

Automatic on-chain hashpinning

## Shared storage

Native IPFS-backed shared storage



# Manage digital assets at scale

*FireFly can manage tokens at institutional scale*

## Token API

Native support for coins and NFTs  
Mint, burn, transfer, check balance

## Token history & audit trail

Tracks token history and lineage  
in a fast-query database

## Simple wallet integration

Easily integrate enterprise wallets  
for institutional custody

The screenshot shows the Hyperledger FireFly web interface. The main content area displays details for the 'ACME\_COIN' pool. The interface includes a sidebar with navigation options like Dashboard, Activity, Blockchain, Off-Chain, Tokens, Pools, Balances, Approvals, Network, My Node, and Docs. The main content area displays details for the 'ACME\_COIN' pool, including its ID, standard (ERC1155), connector, and state (CONFIRMED). It also shows a table of 'Accounts in Pool' with columns for KEY and BALANCE, and a table of 'Transfers In Pool' with columns for ACTIVITY, FROM, TO, AMOUNT, BLOCKCHAIN EVENT, SIGNING KEY, and TIMESTAMP.

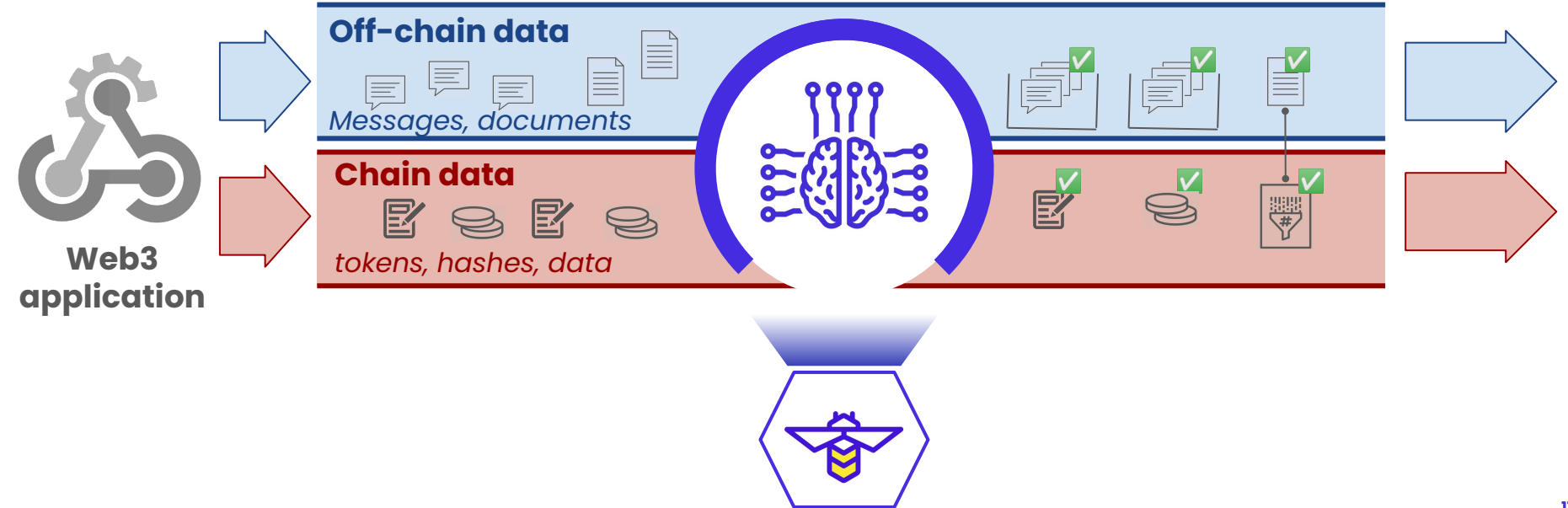
KEY	BALANCE
0xe12...f36e1	4
0x931...382d6	5

ACTIVITY	FROM	TO	AMOUNT	BLOCKCHAIN EVENT	SIGNING KEY	TIMESTAMP
Burn	0xe12...f36e1	0x000...00000	1	2f116...1ac71	0xe12...f36e1	3 minutes ago
Transfer	0x931...382d6	0xe12...f36e1	5	a6c36...7f202	0x931...382d6	3 minutes ago
Mint	0x000...00000	0x931...382d6	10	4e418...adfee	0x931...382d6	4 minutes ago

# Orchestrate event-driven flows

## Orchestration Engine

- ✓ Reliable delivery
- ✓ State management
- ✓ Batching
- ✓ Event correlation
- ✓ Sequencing
- ✓ Retry
- ✓ Routing
- ✓ Error Handling



# Data Management on FireFly

## Chain state

Block event index  
Transaction index

## Network State

Network map  
Org Address Book  
Chain Connection Mgmt

## Network Data

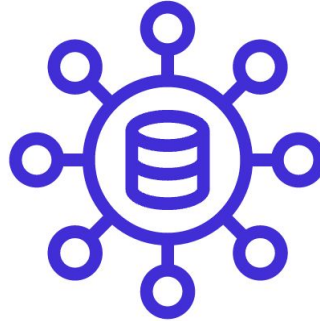
B2B data store  
Shared storage  
Common data formats

## Core Data Store

Structured data  
Unstructured data  
Data validation  
Origin audit trail

## Digital Asset Manager

Token API  
History and Audit Trail  
Coin balance



# FireFly has a complete set of tools

## Explorer

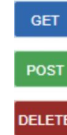


The screenshot shows the FireFly Explorer dashboard for ACME Company. It features a sidebar with navigation options: Dashboard, Activity, Blockchain, Off-Chain, Messages, Tokens, Network, My Node, and Documentation. The main dashboard includes several key sections:

- Blockchain Summary:** TX: 231, EVENTS: 652
- Off-Chain Summary:** IN: 1126, OUT: 754
- Tokens Summary:** TRANSFERS: 59, MINT: 18, BURN: 12
- Operations Summary:** BLOCKCHAIN: 14, MESSAGES: 14, TOKENS: 17
- Event Types:** A bar chart showing the frequency of Blockchain (yellow), Messages (orange), and Tokens (purple) events over a 24-hour period.
- Network Map:** A visual representation of the network nodes and their connections.
- My Node:** Details for the current node, including Node Name (data\_consortium), Node ID (0750b4fe-98f0-4de...), Org Name (acme), Org ID (acb38ed2-0a0d-4L...), Profile (member), and Profile Endpoint (https://dataexchan...).
- My Recently Submitted Transactions:** A list of transactions with details like To=Org2, From=Org3, and their status (Pending).
- Recent Network Events:** A list of events such as PRIVATE MESSAGE BATCH, TOKEN TRANSFER, and BLOCKCHAIN EVENT.

## Developer

**CLI**

**API**

**SDK**


## DevOps

**Logs + Metrics**
**kubernetes**




## Runs on Kubernetes

- ✓ Use your favorite DevOps tools
- ✓ Easy for developers
- ✓ Faster to production

## Cloud Ready

- ✓ Ready for public
- ✓ Roll out in your private cloud
- ✓ Hosting options available through HL vendors

## Designed to scale

- ✓ microservice architecture
- ✓ Stateless design
- ✓ Achieve HA and scalability

# FireFly project at a glance



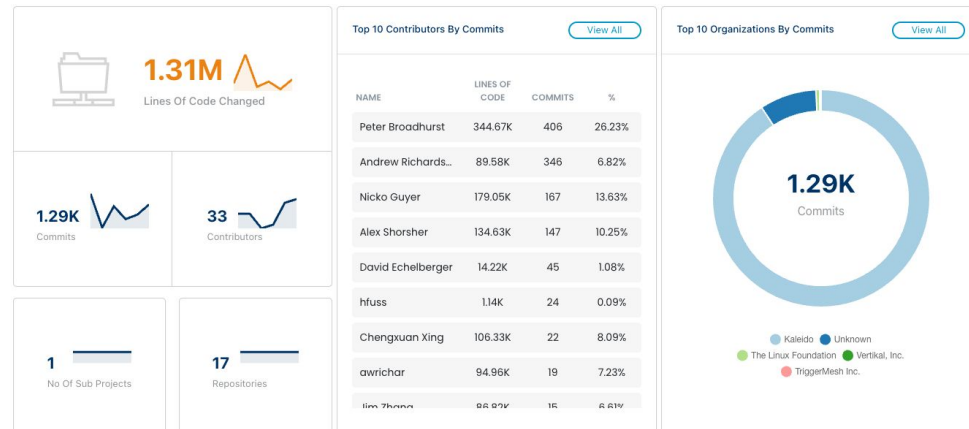
## FireFly High Level Timeline

- 2015–2021
  - Gen 1, pre-FireFly costly enterprise projects “reinventing the wheel” over and over again
- June '21 – FireFly Lab launched
  - New Hyperledger Lab
  - Initial contribution of 75k lines of code from Kaleido
- September '21 – Incubation Status
  - Moved to incubation status
- April '22 – FireFly 1.0
  - v1.0 launch – ready for production
  - Over 200k lines of code across 12 repos
- September '22 – FireFly 1.1
  - Public chain support
  - Over 1000 new commits since 1.0

## v1.1 by the numbers

**586k**  
Lines of code

**19**  
Repos



# FireFly - What's New in v1.1



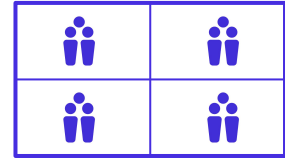
## Gateway Mode

*Connect to many chains with auto-indexing of activities*



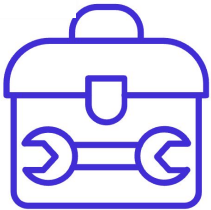
## Public EVM Chain Support

*EVMConnect manages complex public chain connections*



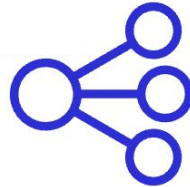
## Namespaces

*Multi-tenant FireFly nodes support isolated use cases*



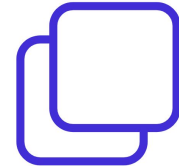
## Connector Toolkit

*Quickly build custom connectors*



## Pluggable API Security

*Plug in your own API security*



## Mass Scale Tokens

*Support many parallel copies of token plugins for mass scale*



# FireFly Blockchain Connector Framework



## Smart Contract Interfaces

EVM (ABI)

Fabric Chaincode

...

## Token Standards

ERC 20

ERC 721

ERC 1155

UTXO

...

## Blockchain Connector API

Microservice approach - allows blockchain connectors in any language

Transaction  
Submission

Transaction  
Tracking

Event Listeners

Event Delivery

## Policy Engines

Gas price

Resubmission

## Connector Toolkit

80% of the code - chain agnostic

Transaction  
Monitor

Nonce  
Management

Confirmation  
Manager

Event  
Streams

Transaction State

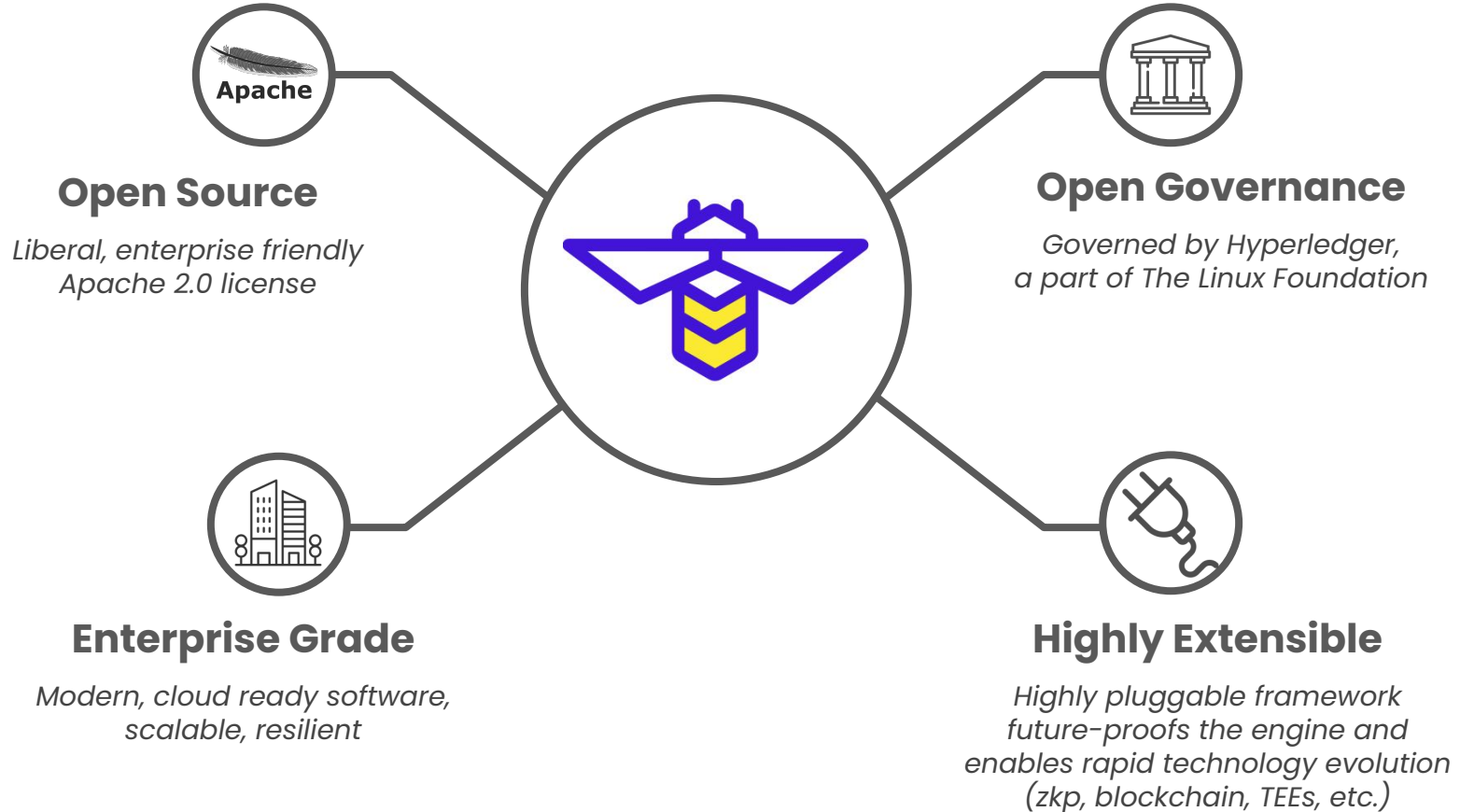
Event Checkpoint State

## Connectors

EVM Based

UTXO Based

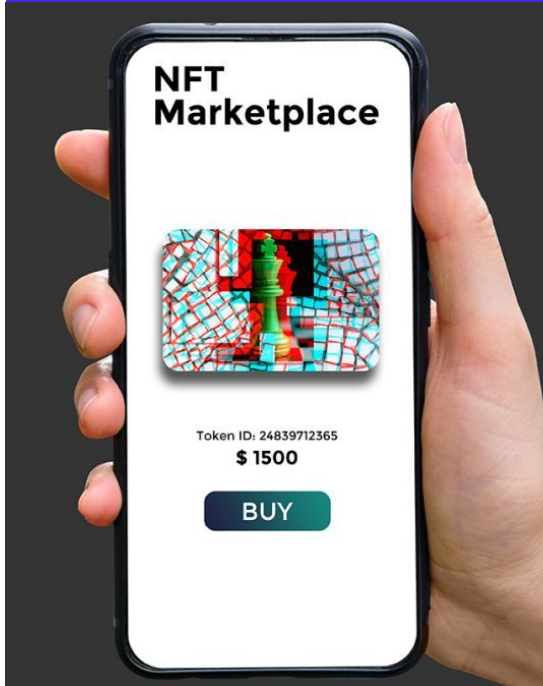
# Enterprise Ready Open Source



# What will you do with FireFly?



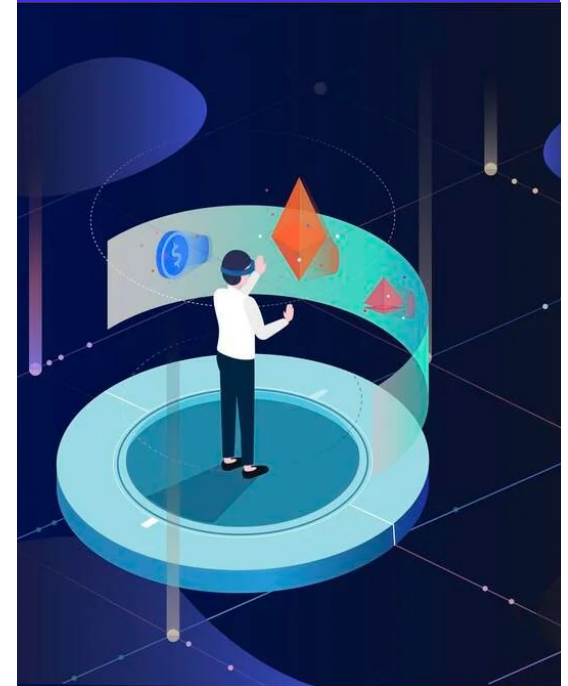
## Offer new Digital Experiences



## Modernize legacy B2B data flows

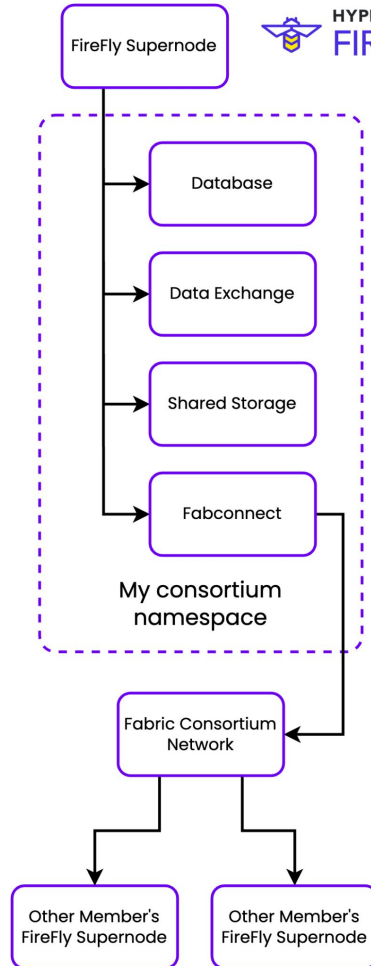


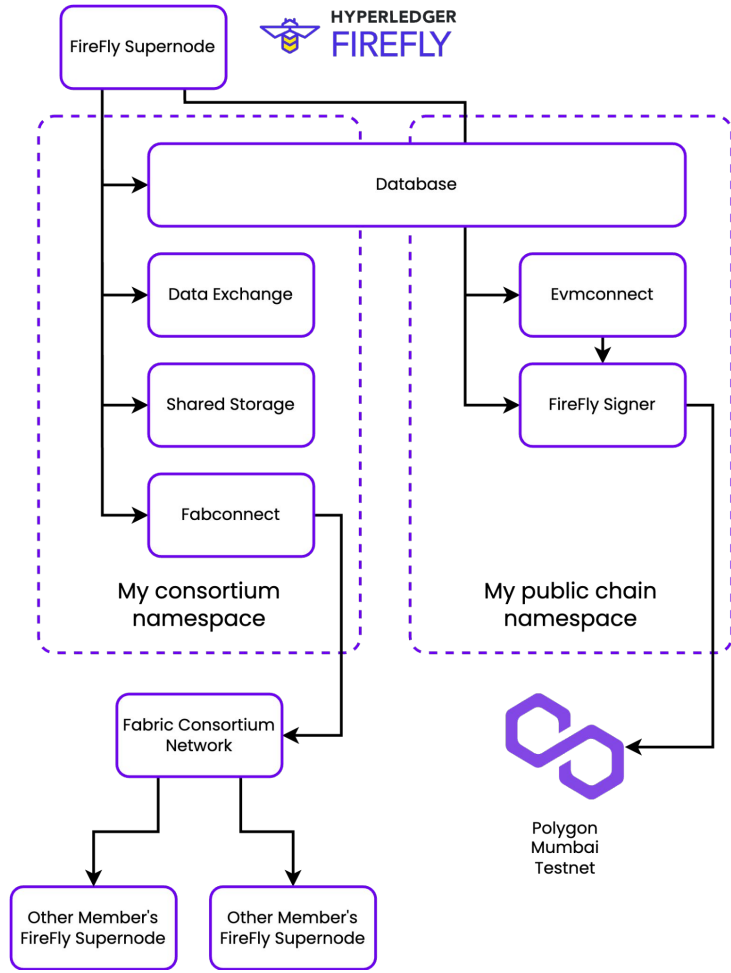
## Find new business opportunities





**Developer Experience  
+  
Live Demo**





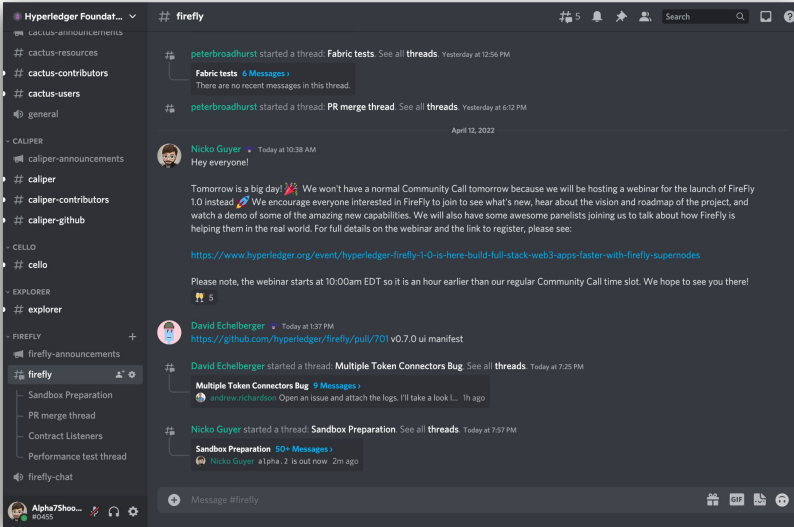
# Join the FireFly Community



All are welcome!

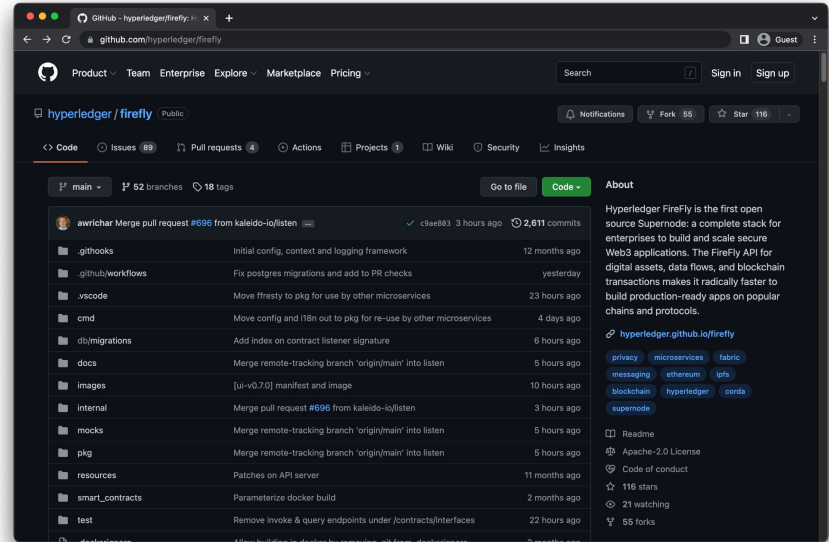
Join the conversation on Discord

<https://discord.gg/Fy7MJUqw86>



Join the activity on GitHub

<https://github.com/hyperledger/firefly>





**THANK YOU**