



Architecture Series

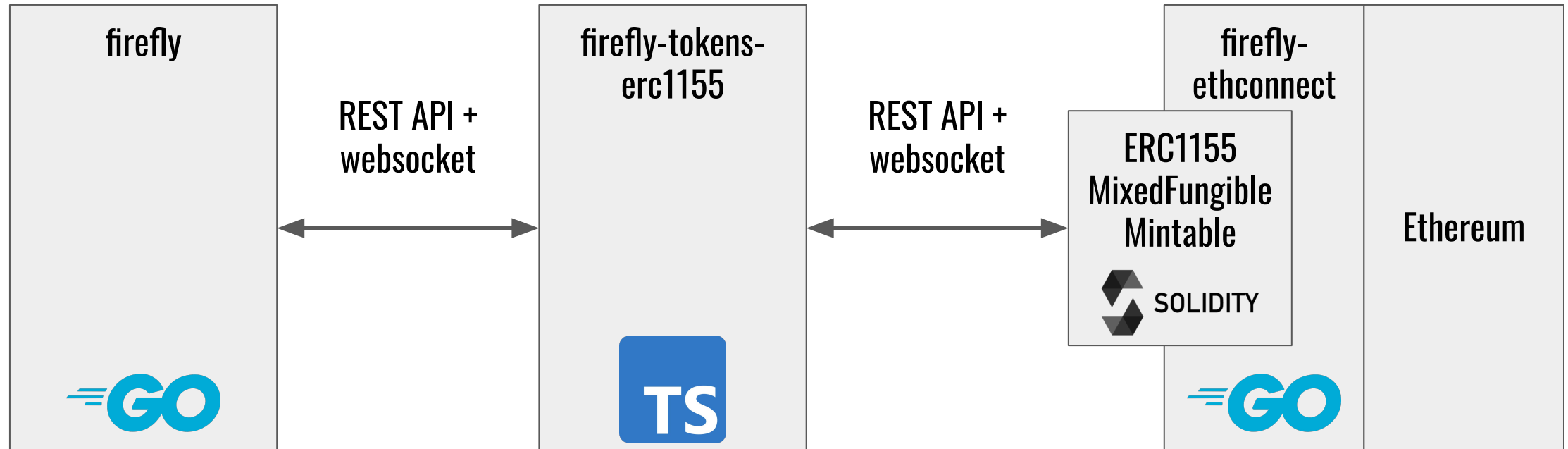
Tokens: Part 2 of ?

Community Call

14th September 2021



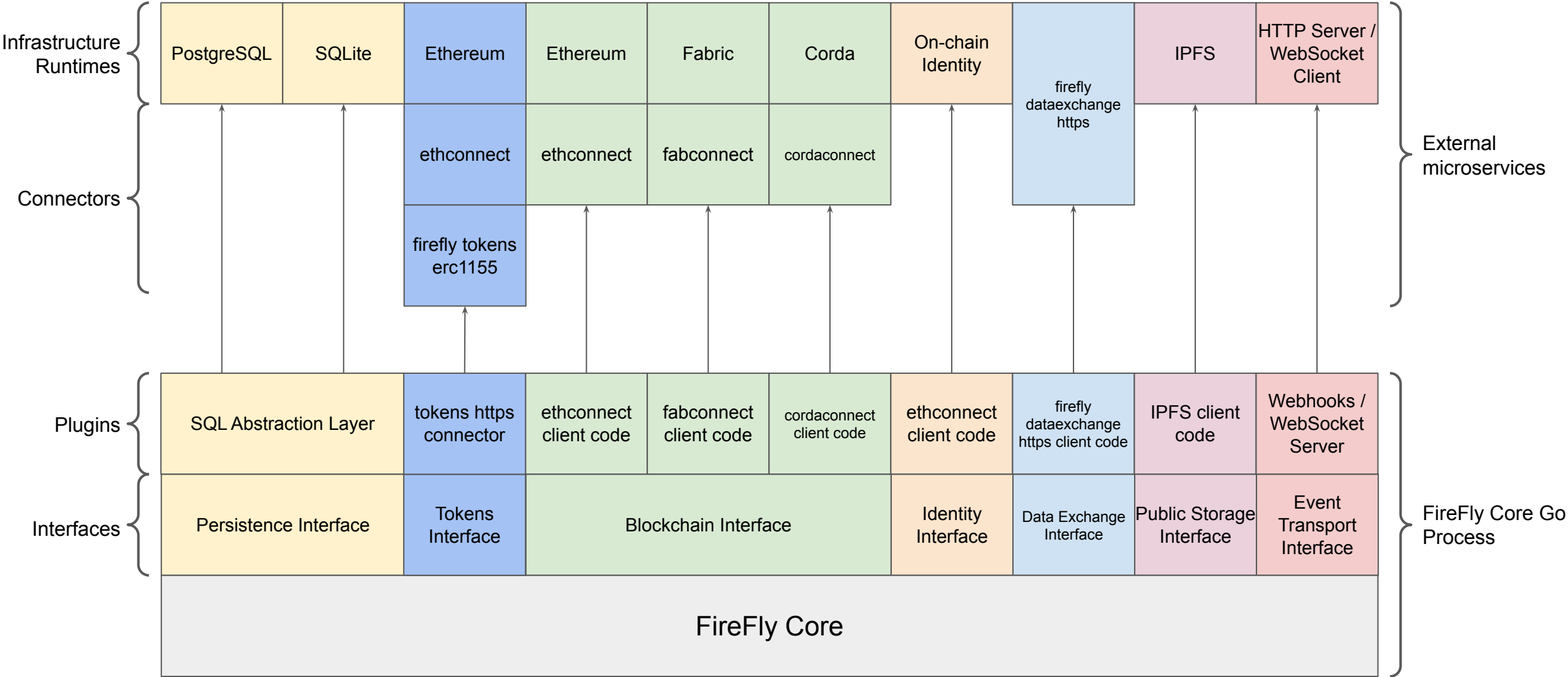
Tokens Stack



Current status:

- **firefly-tokens-erc1155** ready for basic use with pools, mint + transfer functionality
- **firefly-cli** stacks include tokens providers by default (as of v0.0.29)
- **firefly** supports creating token pools (mint + transfer still to be added)

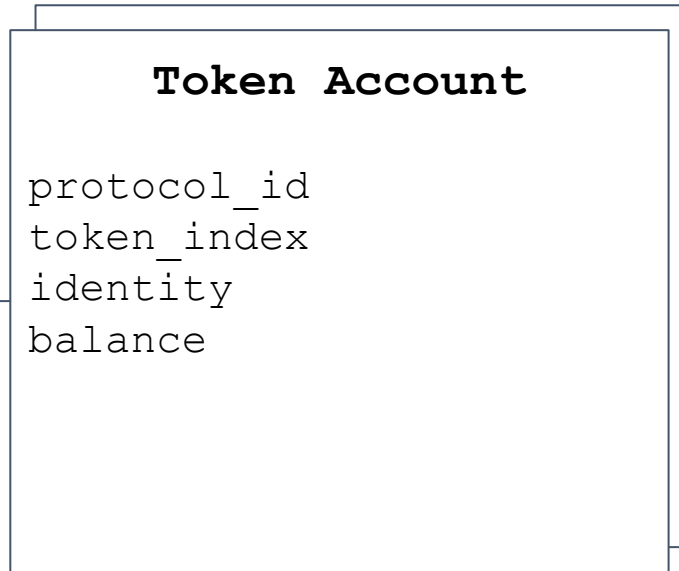
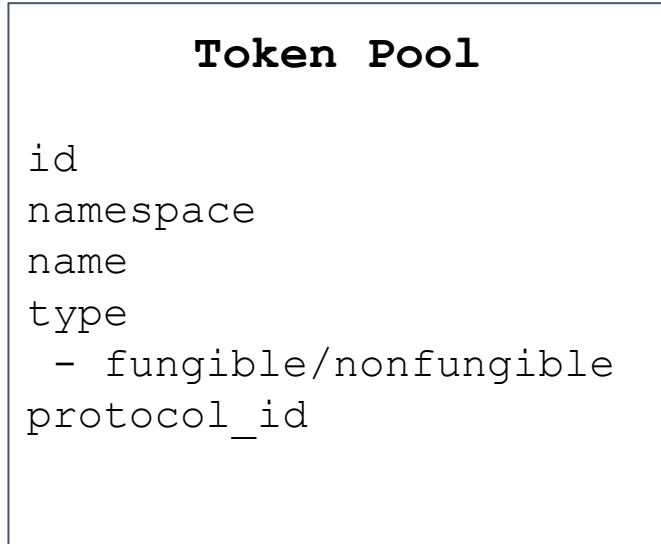
Architectural Layers



Token Connectors

- Currently there is one token connector microservice (**firefly-tokens-erc1155**) and one FireFly client plugin (**https**), designed to talk to each other.
- Other microservices (backed by different contracts) can be easily swapped in to talk to the same FireFly client plugin, as long they implement the same HTTPS + websocket protocol as the current connector.
- Microservices that use a different communication protocol will require a new FireFly client plugin as well.
- Assumption is that many real world projects will require custom token microservices to be plugged in.

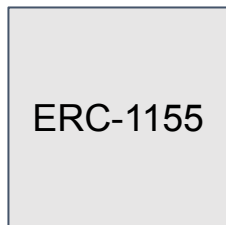
Token Entities



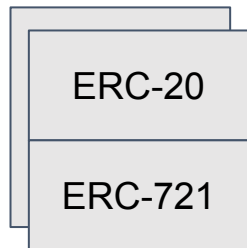
Can include many token connectors in a single FireFly stack, each with a corresponding connector plugin and a configurable name.

Pools and accounts can be created separately on each connector.

Token index allows for a pool to be optionally subdivided (for example, if a pool represents an class of non-fungible assets, each one may have a unique index). Usage is up to the connector.



OR

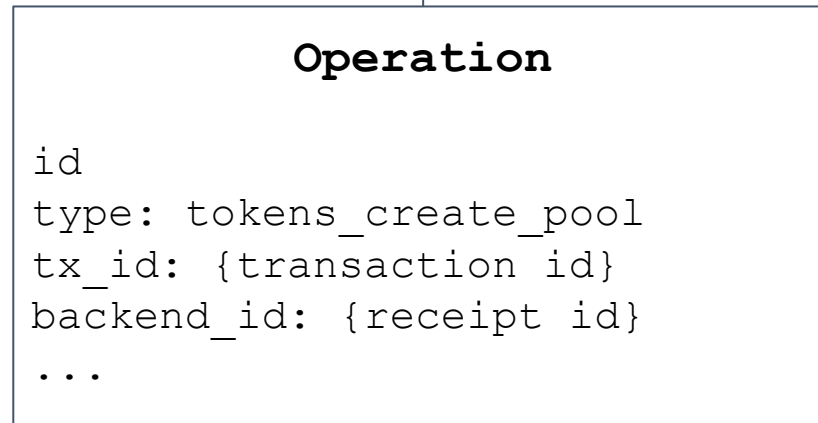
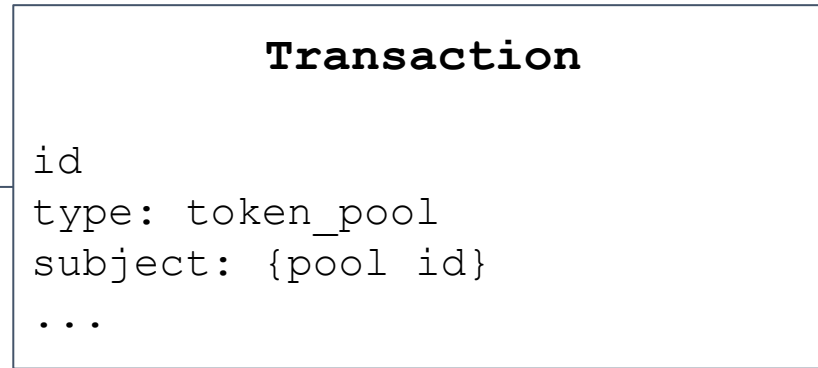


OR...

YAML configuration

```
tokens:
- name: erc1155
  connector: https
  url: http://localhost:3000
```

Token Pool - Related Objects



Transactions represent anything that gets pinned to a blockchain.

Operations represent any action performed on this node by a service external to FireFly.

Current FireFly APIs

GET /namespaces/{ns}/tokens/{type}/pools



POST /namespaces/{ns}/tokens/{type}/pools



GET /namespaces/{ns}/tokens/{type}/pools/{name}



GET /namespaces/{ns}/tokens/{type}/pools/{name}/accounts




Potential Future APIs

GET /namespaces/{ns}/tokens/{type}/pools/{name}/accounts/{identity}

POST /namespaces/{ns}/tokens/{type}/pools/{name}/mint

POST /namespaces/{ns}/tokens/{type}/pools/{name}/transfer

HTTPS Token Connector APIs

POST `/api/v1/init` Perform one-time initialization (if not auto-initialized) 

POST `/api/v1/pool` Create a new token pool 

POST `/api/v1/mint` Mint new tokens 

GET `/api/v1/balance` Retrieve a token balance 

POST `/api/v1/transfer` Transfer tokens 

GET `/api/v1/receipt/{id}` Retrieve the result of an async operation 



Side Quest: Enhancements to **ethconnect**

Two ways to map events back to the method calls that emitted them.

```
GET /contracts/{name}/{method}?fly-transaction={hash}
```

- Retrieve transaction details, including method name and input args

Event streams created with `{"inputs": true}`

- Include method name and input args with every emitted event

Useful since ERC1155 takes arbitrary `data` bytes as an extra arg to `mint`/`transfer` methods, but does not emit it on corresponding events.



Demo + Open Discussion

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