Hyperledger Financial Services Besu Workshop

eThaler

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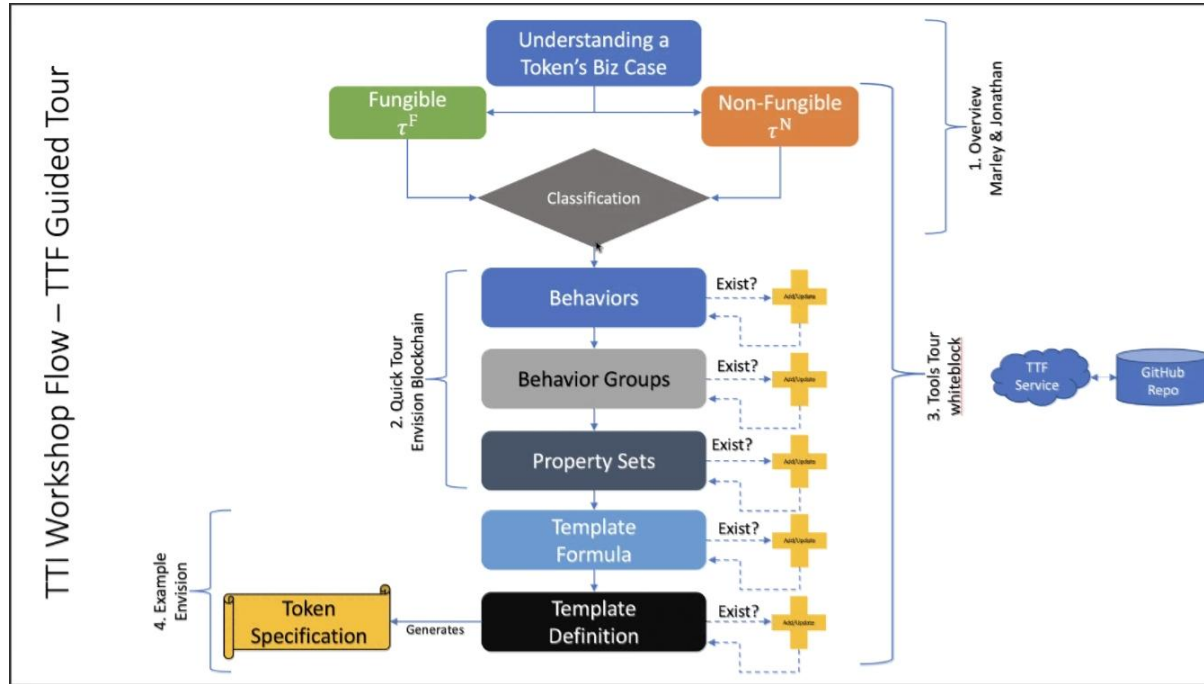dlt.
nyc

Why the name eThaler?

From https://en.wikipedia.org/wiki/Thaler
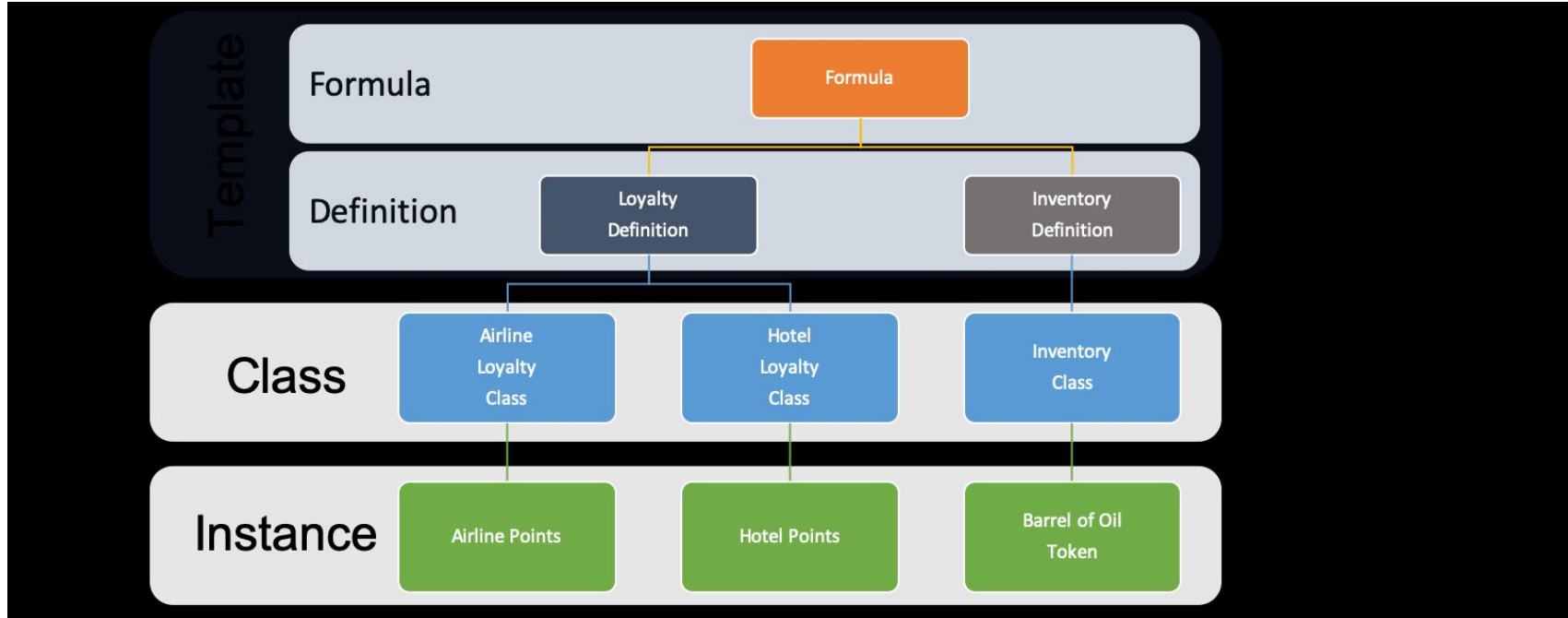
The **thaler** /ˈtɑːlər/ was a silver coin used throughout Europe for almost four hundred years. Its name lives on in the many currencies called *dollar* and the Samoan tālā, and, until 2007 also in the Slovenian tolar.

TTF Flow

TTF Abstraction layers

eThaler- wholesale

- Issued by a Central Bank
- Issued only to Institutions with Fed accounts- Dealer Banks
- Constitutes a prepaid value (electronic money) without interest
- Used by commercial banks to pay each other (peer to peer)
- Redeemable at Central bank and increases reserves
- Not used by retail consumers
- AccountBased
- Upto 4 decimals
- Held through a digital wallet

TTF-Artifact- Formula

Formula: "tF{d,t,p,c,SC}"

    Business Description: It is **fractional,** by setting the **Decimals** property on the **divisible** behavior. A token can be **minted** or **burned.** Before executing transfer, burn or mint operation check if they are within the **compliance** regulations. **Pausable** for possible freezing of movement and all other operations because of discovered bugs or upgrade. **Compliant** for KYC or Registration.

    Business Example: Enables the issuance of regulated electronic money by the central bank (mintable and burnable only by Central bank) and its practical usage in real financial applications.

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eThaler-Artifact-Formula: details

tF - Fungible token This is a Token with **Variable Supply Fungible** where an initial supply can set at creation and then supply can be added and removed from the total based on need.

d - Divisible

t - Transferable

c - Compliant Before executing Pause, transfer, burn or mint operation check if they are within the **compliance**

p - Pausable **Pausable** for possible freezing of movement.

SC (m, b) A token can be **minted** or **burned.**

    m - Mintable

    b - Burnable

R - Roles

Current Status

1. Create a simple token definition
2. Model it in TTF Syntax
3. Setup project in labs
4. Create a Besu implementation ([ERC-1155](#)) - see what the latest variants are and what protection they provide
5. Besu testnet
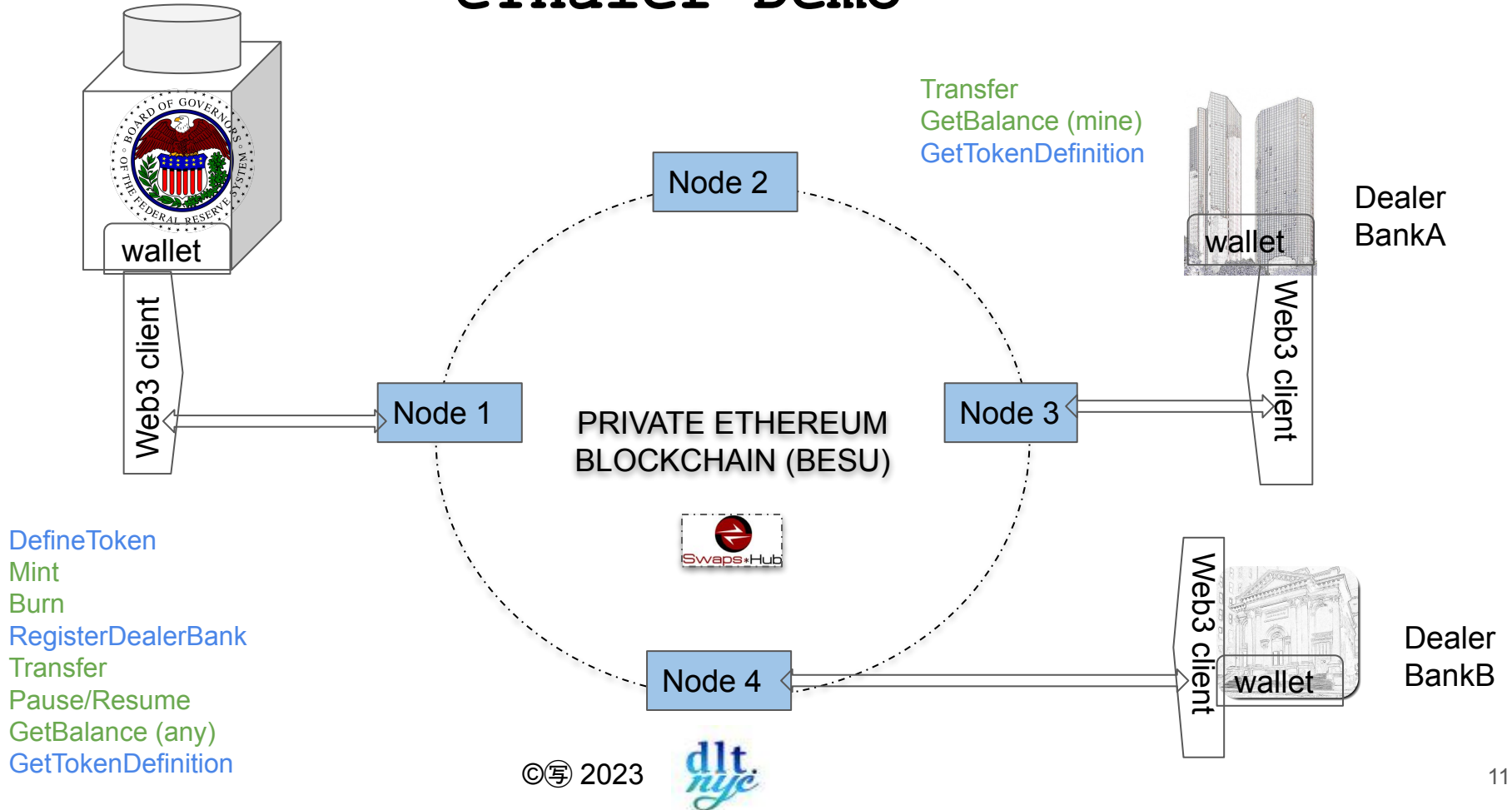
ERC 1155

```
struct TokenDetails {
        uint256 id;    // token Id    (must be unique)
        string name;    // simple name of the token (it may not be unique)
        uint8 decimals;    // number of decimals
        bool   isPaused;  // can be paused (true) and resumed (false) by owner
of this contract
        string TTF_url;    // url to the TTF definition of this token
        Roles.Role   registeredDealers; // Everyone must register first to
initiate token transfers
    }
```

CM SIG eThaler- Roles

Behavior	Central Bank	Dealer Bank
RegisterUser	Yes	No
Define (ERC 1155)	Yes	No (now)
Mint	Yes	No
Burn	Yes	No
Transfer	Yes	Yes
Pause & Resume	Yes	No

eThaler Demo

Transfer
GetBalance (mine)
GetTokenDefinition

Dealer
BankA

Node 2

Node 1

PRIVATE ETHEREUM
BLOCKCHAIN (BESU)

Node 3

Node 4

Dealer
BankB

wallet

wallet

wallet

Web3 client

Web3 client

Web3 client

DefineToken
Mint
Burn
RegisterDealerBank
Transfer
Pause/Resume
GetBalance (any)
GetTokenDefinition

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References

1. Besu Github

2. TTF public github

3. BIP 1155

4. Hyperledger labs eThaler

5. Bharathan, Vipin and Pillai, Manivannan, Central
   Bank Digital Currency: Towards A Composable
   Standards-Based Implementation (October 18, 2022).