

# Ledger

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in case of you haven't install readme addon, your can read [pdf](#) version of README

[./doc/README.md.pdf](#)

## Requirements

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### Original Requirements

- Assuming authentication and authorization are provided, the current microservice does not take them into consideration.
- Assuming this is a new application, so do not consider any other legacy data.
- Assuming only support US dollar currency, all of assets amount is US currency.
- Assuming asset amount not consider changes.
- Assuming app is able to move to another owner's account wallet and it can not move from different types of wallets (e.g. can not move stock wallet asset to currency wallet).
- Assuming there has a special system account "A000000000" support negative number, handle cross third party system incoming and outgoing movement.  
for example, a customer account "ABCDE001" received 100.00 dollar transfer from Paypal. the data looks like following:

```
account A000000000
    currency wallet asset amount += -100.00
account ABCDE001
    currency wallet asset amount += 100.00
```

### Questions

#### Non-functional

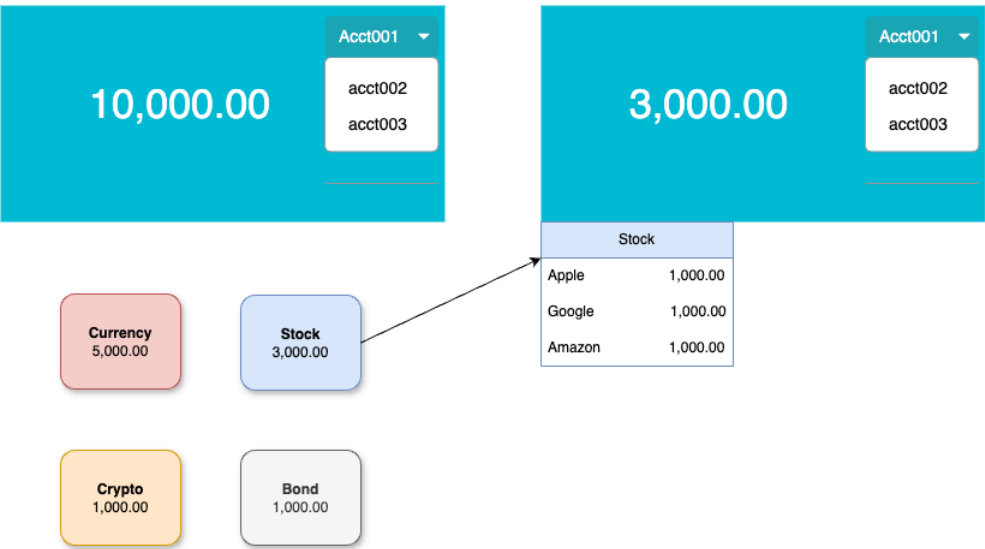
- high-availability
  - scalability
  - eventually consistency
  - security
- clients can only operate their own accounts

#### Capacity

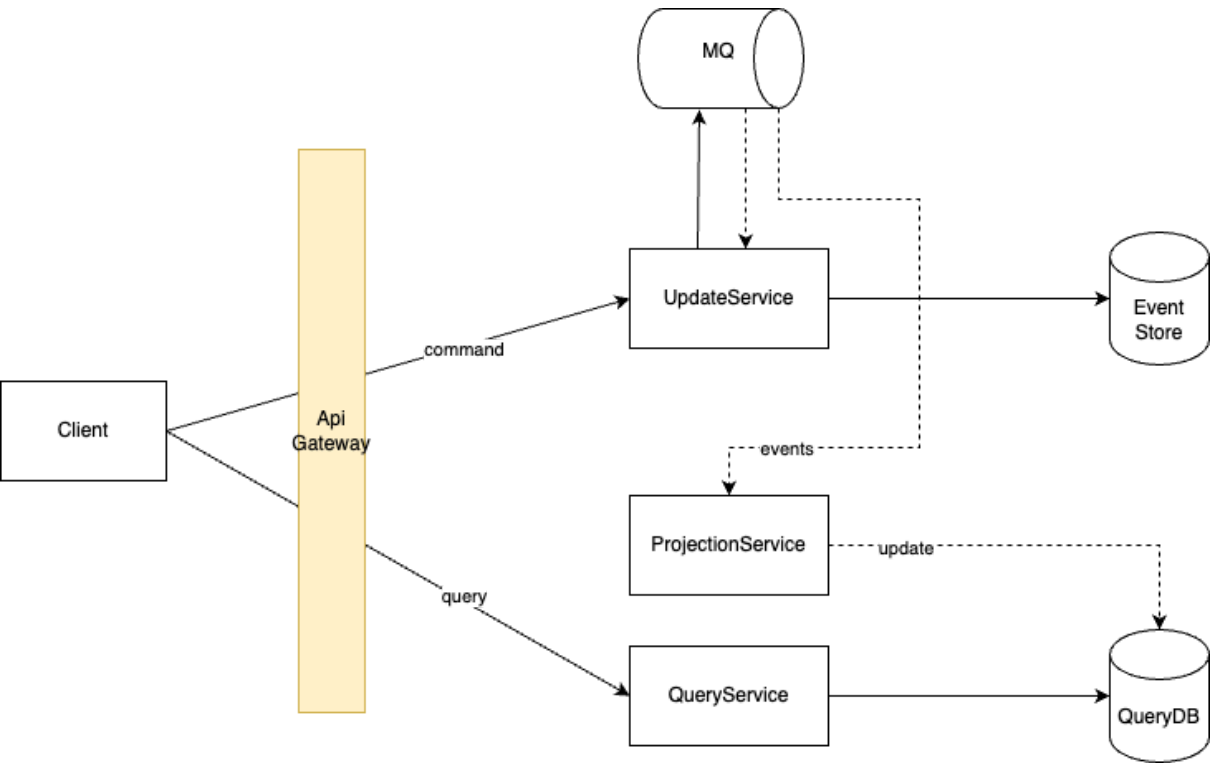
- Assuming Daily Active Users 10 Million, each user make 2 transfer and 10 queries per day.
- TPS = 250
- QPS = 1250

# Design

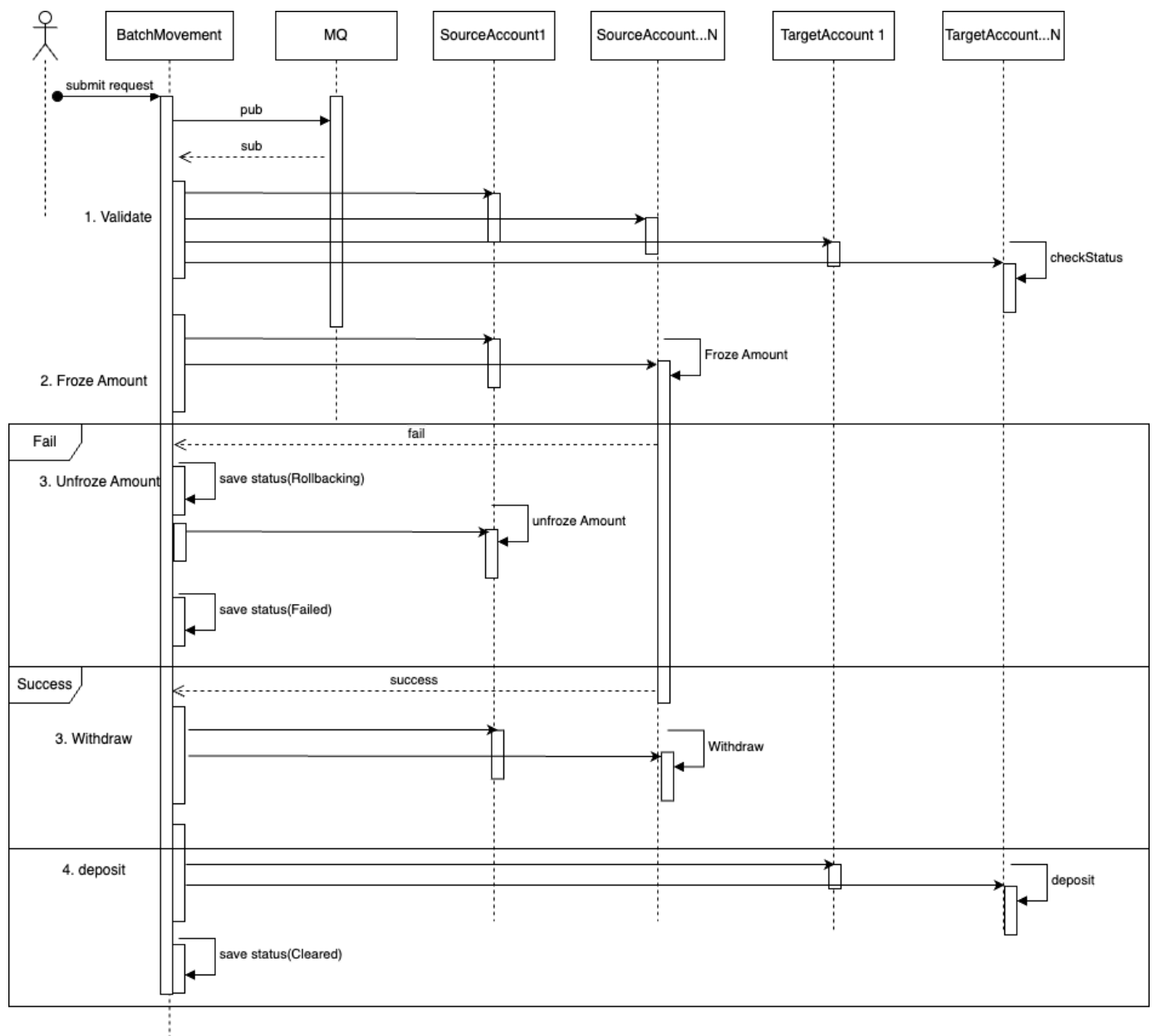
## UI diagram



## System diagram



## Movement Sequence diagram



## Data structure

```
ledger
  userId
  accounts
    account1
      accountId // shard key
      wallets
        currency // wallet
        asset1 (amount, type)
        asset2
      crypto
        asset3
      stock
      bond

    account2
    ...
```

# Api design

Movement			^
POST	/movements	batch move	v
Account			^
POST	/accounts	open an account	v
GET	/accounts/{accountId}/wallets/{walletId}/balance	request any historical balance of a wallet.	v
DELETE	/accounts/{accountId}	close an account	v
Ledger			^
GET	/Balance	Ledger Balance	v

# Application Getting Started

please view [./ledger-service/README.md](#)