Blockchain Mall Project
Professor: Kal Bugrara
Date: 3/28/2018

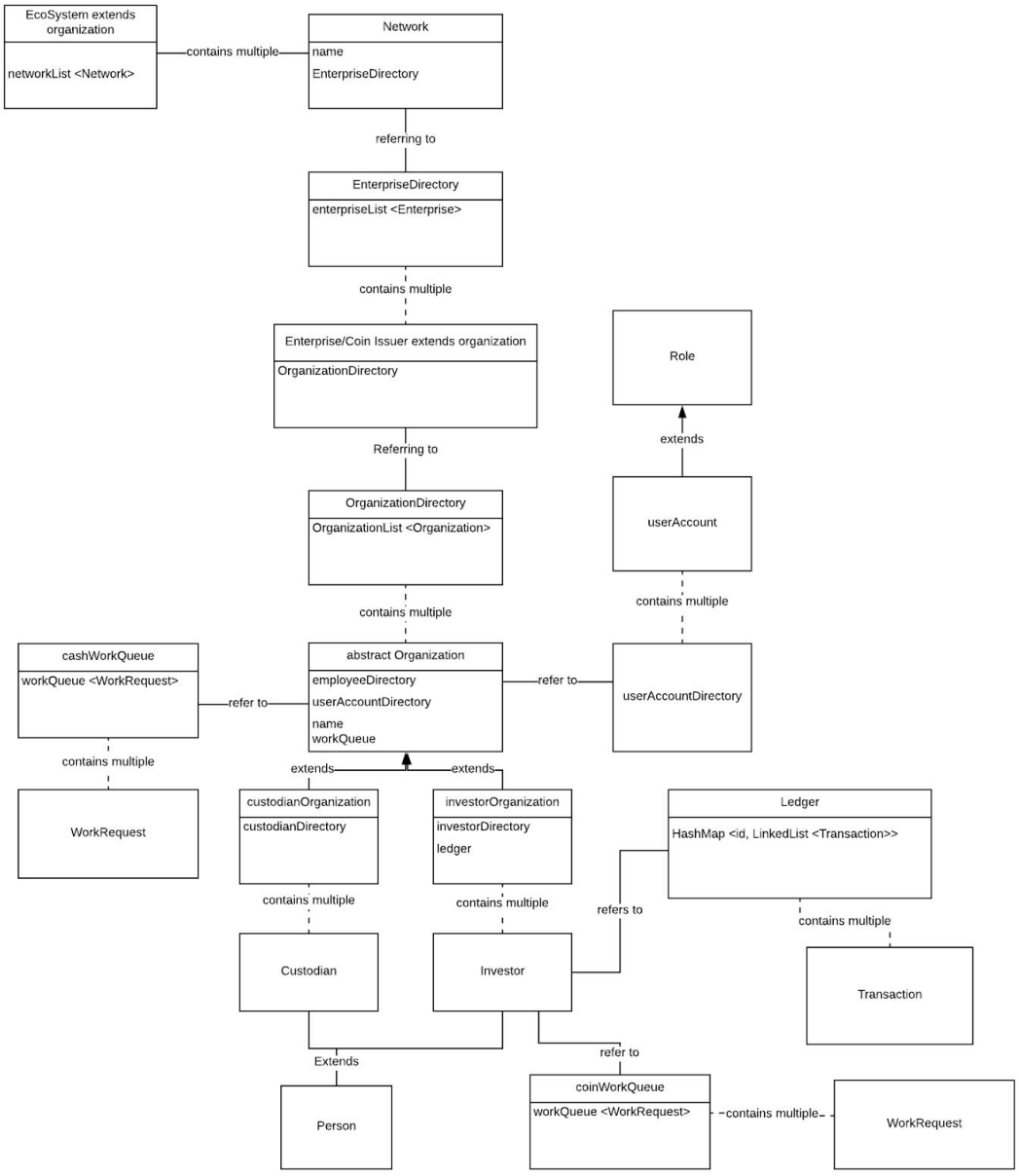
Jianxi Li
Haoqi Huang
Ruifeng Wang

Final Project Proposal

Introduction

The purpose of this project is to create an online trading center of a secure digital currency called CNMB coin,where users could browse the CNMB market chart,easily and securely buy and use CNMB with bank account, or play a role as miner by validating trading and earning bonus. To monitor bugs of blockchain and the application, there are some actors as supervisors.

Architecture diagram



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Key Functionality

Two major functions will be provided by this application: P2P transaction for digital currency trade, and cash-to-CNMB coin transaction. P2P transaction takes place between each investors on the application, investors could send or request certain amount of coins from or to each other, which is going to use the Blockchain technology. For blockchain technology, we will use hash map to simulate the process of creating a block and adding a new block to the existing block. The hash map is filled by a combination of key indicator and a linked list object, and the linked list object will contain all the transactions. The other function is for investors to purchase coins using cash through custodian.

Account and UI creation

At the start page, all users have to sign in or create an account. When creating accounts, a user are supposed to provide contact email,set password and attach the account with a valid bank number.After registration, a user enters the login credential and the system will validate the user name/password combination, and then, check if the identification of the user (user or supervisor). Supervisor roles are not open to regist.

A business class is used in this project to demonstrate the Singleton programming style and meanwhile, to have a better management over the classes and access what we need a lot easier. When the application runs, the first thing it does is to create an instance and only one single instance of the business class, whose contracture creates the instances of Ecosystem class that contains many networks by an networkList amd Enterprise Directory class, which we will use to manage different tasks for different actors. Buy using the business class, we could ensure that we only have one instance.

Furthermore, once the business class is instantiated, it will invoke two methods to set CNMB and run the digital currency system.

Digital currency design

The blockchain is a public ledger that records CNMB transactions. A novel solution accomplishes this without any trusted central authority: the maintenance of the blockchain is performed by a network of communicating nodes running CNMB software.In other word,users would not have their ‘wallet’ anymore.Every user would have a pocket book that contains all transaction history and changes dynamically,which records how many CNMB each user own.In a word,user class extends from role and have a attribute called pocket.Each block of Blockchain is simulated by the key of hashmap. As for the value, we would store a linked list. Each transaction will be store in one node of the linked list. Once a new block created, the new transaction will record in the new block until the next new block was created.

Trade and validation mechanism

If a trade happens,the user or organization who pay the CNMB will broadcast his/her requests to all users,which in java is traverse all users in user directory and system would create a hash code as the trade key if this user is able to sent this many and the trade is valid.Only if the right hash code is mined by the miner using mining function the trade will be made and all request is recorded in workqueue.

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Market simulation and miner bonus issue

CNMB are created as a reward for a process validating trading known as mining.They can be exchanged for other currencies.In our program we would have some miners to help to record the transaction and create new blocks. When a transaction begin, all of the miners begin to verify it, when the first miner verified this traction, he will get some benefit from this transaction. The amount of the bonus depend on the number of coins contain in this transaction. So miners will always verify the transaction which contains large amount of coins if the miner is rational.

Also the miner will help to generate the block by calculating the hashcode of recent blocks, once it meet the right hashcode, a new block will link to the previous one. And our system will give this miner some bonus. However, the bonus will decay in every minute(actually it decays in every 4 years).

As for the Market simulation, we will have different market and each market have the same organization: admin organization and user organization. Only after registered in the organization, the customers(user) can make the Bitcoin transaction between users or buy Bitcoins directly from the enterprise by money. Also the customer can exchange their Bitcoin to money by enterprise.

Additional feature

In order to create a trade environment that suitable for users,we plan to add some Java swing api like Jfree to create CNMB price change chart for user make decisions.

Summary

This project includes basic features of Cryptocurrency CNMB,issuance,trade and Cash exchange,and creates service like exchange transaction guarantee.Limited by Java swing,all progress is taken asynchronously.

Reference

1.https://en.wikipedia.org/wiki/Bitcoin#Blockchain
2.*Bitcoin: A Peer-to-Peer Electronic Cash System* by Satoshi Nakamoto