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Rental Property:A decentralized App on Ethereum Blockchain

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Property Rental Agreement on Ethereum Blockchain

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Abstract

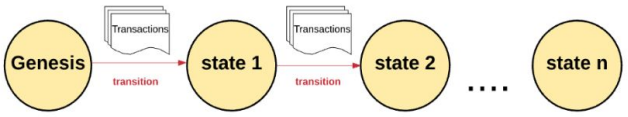
"Rent.Property" is a decentralised application for Renting flats and apartments on cheap rates.The verification for the apartments and flats have been long unsolved problem due to the fact that the trust is not been developed by the two properties.With the help of decentralised app,every customer can be aware of the properties sold and buyed and can be validated easily.

Introduction

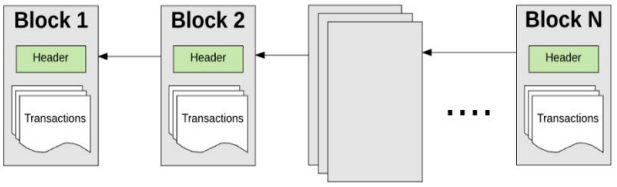
A blockchain is digitalised, decentralised, public ledger of all cryptocurrencies transaction. A blockchain is a "cryptographically secure transactional singleton machine with shared-state." where Cryptographic secure means the digital currency which is used for transaction is created and secured by complex algorithms which is very hard to break. The Transactional Singleton machine means that there is single instance of machine responsible for all transactions. And, the Shared State means that global picture of the blockchain is shared with everyone.

A blockchain was first coined by Satoshi Nakamoto in 2008.It was implemented as a core component of bitcoin,which acts as public ledger for all transaction which happens in global digital world.

The Ethereum blockchain is basically a transactional based state machine. We start with "Genesis state" which is basically start state.whenever any transactions takes place the state is changed to some final state.At this point, the final state is current state of Ethereum.



Each state of Ethereum has many transaction. These transaction are grouped into blocks. A block contains the details of transaction and various other properties. It is also linked with other previous blocks.



To change the state of the machine, a transaction must be valid. Now, for valid transaction it has to go to the process of mining. Mining is when a group of nodes expand their resources to create a valid transaction.

Smart Contract: Smart contracts are software programs which runs on blockchain technology. The idea is when we do something or something happens on smart contract, it triggers something else.

Smart Contract are programs that can start any function if they are acted upon. With Regular Contracts it is always not feasible to rely upon the third parties for verification. With Banks, we have to trust the banks for storing money

and data. With documents we have to trust Lawyer or Notary for validation.

With the combination of Blockchain technology and smart contract,the need for the third party validation has been eliminated, instead of storing all the data on one server, every computer in the blockchain environment holds the data to validate.

The data after the transaction is valid is put into the blocks and are stored in the blockchain. After getting stored in blockchain, it is there permanently and cannot be altered. Also all the blocks are public and transparent which means that anyone can validate the data which is being held by the blocks.

Benefits of Smart Contract:

- *Trust and Speed:* Without the third party, it is very fast and convenient for the process to follow.
- *Backup:* All the information is not stored in central server and every Computer in the environment has the copy of thetranscation, it makes impossible for the data to lose.
- *Security:* Since all the computers have the data copy, if someone wants to change the date it has to change the data in all computers which is very infeasible.
- *Low Cost:* There is no middle men allowed which affects the cost of the process making it very cheap.

Tools Used: The APIs and Tools used are:

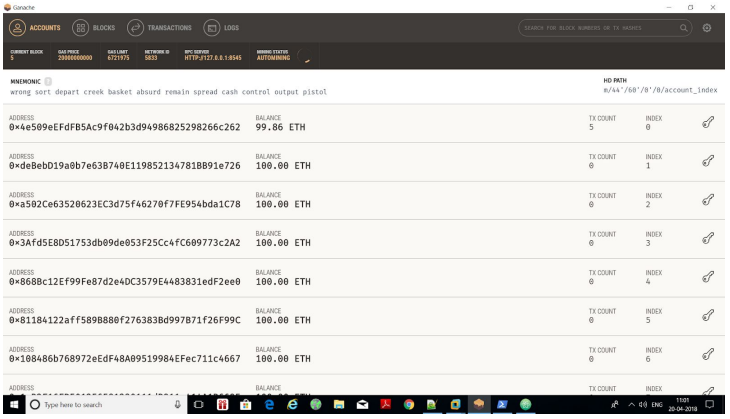
- Web3.js
- Npm for Windows
- Ganache
- Windows Powershell
- Solidity API
- Truffle
- Metamask

Implementation

1) Setting the Environment:

For the decentralized application to work first we have to create a blockchain environment in the localhost. Ganache is Private Blockchain which can be used to run test, execute commands and see how the chain works.

Ganache provides 10 user accounts each encrypted with private key and each account has 100 dummy *ether* to begin. It runs on localhost with port *8545* and network ID as provided by the user.



After the environment has been set up we need to deploy our smart contract into the blockchain environment. We Use Windows Powershell to deploy the contract.

Truffle is a world class development environment, testing framework and asset pipeline for Ethereum, aiming to make life for an Ethereum developer, easier. It manages the contracts artifacts. It includes support for custom deployments, library linking and complex Ethereum application.

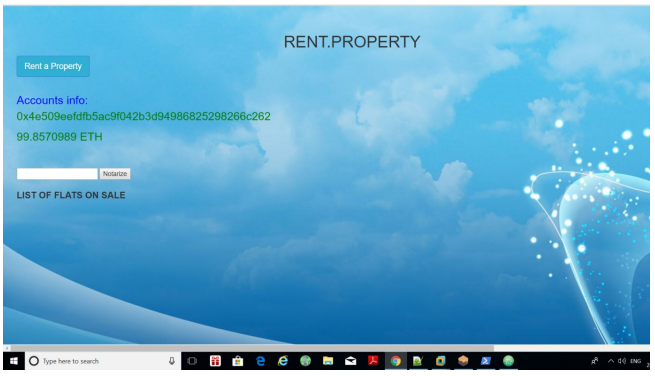
Metamask is an google chrome extension which is used to navigate between different user.

The *NPM* module in Windows Powershell to download any dependency which the application might need.

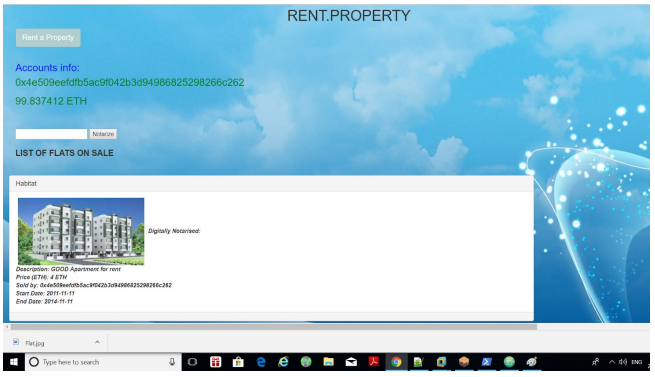
For the development, we used Python as language and ATOM as its IDE.

2) Running the Application:

Using the Powershell and Truffle, compile the application,open the browser to see the front end of the decentralized application.



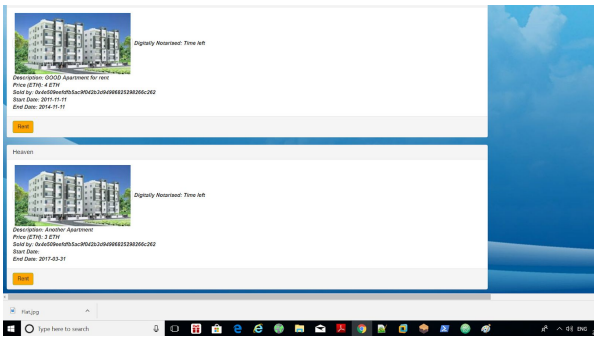
Rent Property button lets the user add the flat on Rent.



Notarize Button Lets the user to Notarize the Flat with Some ID so that it can be verified for authentication.

After Notarising the Flat the user cannot resell the flat to any other buyer.

The Rent Button disappears if the account is not seller account or the flat has been buyed.



Accounts info gives the details of the account which currently the user has.

3) Features of the Application:

1) User can put up an ad to rent the flats or apartment for the required price.

2) User can buy the flat on rent till its time expires.

3) As soon as the tenure is over, the ad is automatically removed.

4) User can see his account details.

5) If the flat has already been rented, it cannot be put up again for sell.

6) User, after buying the flat, can Notarize it based on its ID which will guarantee that the property has been sold.

7) Multiple users can put the ad for property and anyone can buy it.

References

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