A Standard Technology for Distributed Ledger Using Openchain

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Abstract - *The blockchain is used for the purpose of solving the peer-to-peer security and a new paradigm for providing the finite source in a digital medium without a central party. But it still doesn't solve the problem of scalability, the time needed for doing the proof of work since it's an open source to the public. Due to these set of issue, it makes really difficult to maintain a distributed ledger for a private organization using blockchain. This research work aims to solve it by providing private blockchain network for the organization and help them remove the latency cost for the transaction. The paper aims to discuss the way to construct an openchain instance, deploy your own private sidechain and manage it.*

*Keywords***:** Blockchain, scalability, proof of work, Openchain, Instance, Transaction.

1. INTRODUCTION

During the classical times, ledgers where the centre of the Growing pecuniary activities such as to recording assets or payments and to buy or sell contract deals. These were recorded scripts on clays and stone, but with start of new dawn of technologies it has changed the way to maintain ledgers. Although the invention of computers and the Internet provides the process of record keeping with great convenience, the basic principle has not been changed - ledgers are usually centralized.

In a distributed ledger is a general agreement of replication, sharing and synchronization of data which is spread across multiple nodes in the network. Thus which signal to non-centralized data storage. Using a consensus algorithm, any changes to the ledger are reflected in the copies. The security and accuracy of the ledger are maintained cryptographically according to rules agreed by the network. One form of distributed ledger design is the blockchain, which is at the heart of Bitcoin. Blockchain is a list of records also called block, these blocks are always growing, secured through cryptography and linked. But still with the raising growth in blockchain the problem is it not feasible for organization to use this open source blockchain for maintaining their private ledgers. So to overcome this, Openchain is what that can bring the private organization to have their own private blockchain. Openchain provide an extremely high scalability, with no mining fee and immutability by creating hash of the entire ledger. The best advantage it provides that the organization can entirely can set those rules for their product they want without having any interference from outside world.

The openchain consist of the observer and the validator which all in together help in creating the DLT.

2. SUMMARY CONTENT

The previous section offers various discussions of current research and provides conclusion. Chapter 3 is about existing DLT system with blockchain, chapter 4 about proposed systems, chapter 5 is methodology, chapter 6 system evaluation, chapter 7 is the conclusion of the paper and finally, chapter 8 is about references.

3. EXISTING SYSTEMS

The existing DLT [1] has a number of drawbacks that prevent it from being used as a generic platform for distributed ledger across the globe. One notable drawback is the scalability issue.

The existing public blockchain consensus protocols (e.g., Bitcoin, Ethereum, and Ripple etc.) require that all those fully participating node in the network needs to process every transaction, which results in low throughput in a transaction and high traffic in a network. Although some possible approaches (e.g., SegWit [5], Plasma [6], Cardano [7], etc.) have been proposed to address this issue, there is no systematic solution to this issue, and the approach proposed for one blockchain may not be suitable for another blockchain. In addition, this is related to another important issue of existing DLT, ossification, meaning that it is difficult to make changes after a DLT is deployed.

The unclear governance of blockchain is another reason of problem in the system since there is no one responsible for transaction happening on the chain since it shared by lot of different organizations and for the highly regulated services like financial services it is a big issue to be solved.

Last problem we is that in a public blockchain you may have to share the infrastructure with companies that might not be related to you and those companies might be competing for the same resources like the us, so that might drive the cost up for no benefit to the organization.

To overcome these problems for private organization open chain is what they need to maintain their distributed ledger without have to face the problem from public blockchain.

4. PROPOSED SYSTEM

Openchain is a private chain software, the idea behind it is that any organization can take the software can deploy it in their organization to create their own blockchain so that they become administrator of that blockchain and they can, then setup some rules based on the business requirements they have.

Organizations which are looking manage their digital assets in a much secure, scalable and robust way can just follow these simple steps.

a) Instance of an Openchain can be created and deployed very quickly in some matter of seconds.

b) Rules of the ledger and transaction can be defined by the administrator/ validator of an instance.

c) After rules for the instance are defined the observer or the end user of the software can then transact value to the ledger according to the defined rules in a secure manner.

d) Every transaction on the ledger is digitally signed, similar to that of bit coin.

After the creation of the private blockchain the organization can bring the customers and the users to the blockchain and they can start transacting.

There would different types of blockchain uses through it few of the examples are show in the examples below with figures.
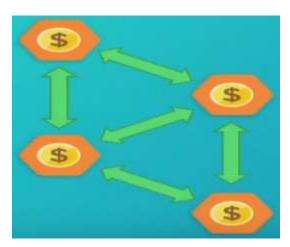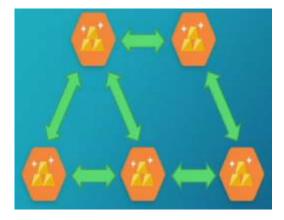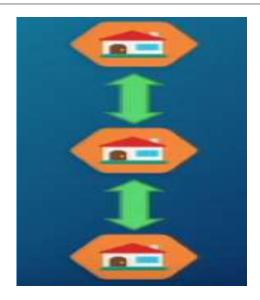

Fig-1 Currency-based chain

Fig-2 Gold bullion chain

Fig-3 Property registry

5. METHODOLOGY

To implement an open chain server to your financial project can be done in some easy simple steps:

a) Firstly we need to install Docker to your system.
  ➢ wget -qO- https://get.docker.com/ | sh

  After installing Docker install Docker Compose.

  ➢ apt-get install python-pip
  ➢ pip install -U docker-compose

b) Clone the openchain/docker repository from GitHub, and copy the configuration files from the templates provided.

  ➢ git   clone
    https://github.com/openchain/docker.git
    openchain
  ➢ cd openchain
  ➢ cp   templates/docker-compose-
    direct.ymldocker-compose.yml
  ➢ mkdir data
  ➢ cp templates/config.json data/config.json

c) Start the server
  ➢ docker-compose up –d

To check whether the server is running properly or not use:

  ➢ docker logs openchain-server

```
sandeep@Sandeep-work MINGW64 ~/openchain (master)
$ docker logs openchain-server
info: General[0]
      [2018-03-02 14:16:08Z] Starting Openchain v0.7.1
info: General[0]
      [2018-03-02 14:16:08Z]
info: General[0]
      [2018-03-02 14:16:09Z] Stream subscriber disabled
info: General[0]
      [2018-03-02 14:16:09Z] Anchoring disabled
Hosting environment: Production
Content root path: /openchain
Now listening on: http://0.0.0.0:8080
Application started. Press Ctrl+C to shut down.
Application is shutting down...
info: General[0]
      [2018-05-27 09:09:32Z] Starting Openchain v0.7.1
info: General[0]
      [2018-05-27 09:09:33Z]
info: General[0]
      [2018-05-27 09:09:43Z] Starting Openchain v0.7.1
info: General[0]
      [2018-05-27 09:09:43Z]
info: General[0]
      [2018-05-27 09:09:44Z] Stream subscriber disabled
info: General[0]
      [2018-05-27 09:09:44Z] Anchoring disabled
Hosting environment: Production
Content root path: /openchain
Now listening on: http://0.0.0.0:8080
Application started. Press Ctrl+C to shut down.
```

d) Configure the admin keys update data/config.json and add it to the admin_addresses list:
  ➢ // ...
    "admin_addresses": [
    "<your_address_here>"
    ],
    // ...

e) After Configuration the client can be used for generating seeds and derives into an address.

f) Controlling the server by restarting server:
  ➢ docker-compose restart

```
sandeep@Sandeep-work MINGW64 ~/openchain (master)
$ docker-compose restart
Restarting openchain-server ... done
```

To stop it, use:

  ➢ docker-compose stop

```
sandeep@Sandeep-work MINGW64 ~/openchain (master)
$ docker-compose stop
Stopping openchain-server ... done
```

6. SYSTEM EVALUTAION

Advantages

(a) Digital signatures which provides non-repudiation. It's important so that we use the chain as evidence in court if we need too.

(b)   Immutability and transparency which is key to blockchain and this provides settlement finality which is extremely important in capital market

(c) Openchain differentiate itself in two points

  • Performance: in term of Scalability openchain can process thousands of transaction per second on commodity hardware such as a normal laptop and lot more on a dedicated hardware like a cluster of dedicated hardware, in terms of latency we can process transaction in about 10 milliseconds in average which is extremely fast.

  • Compliance : open chain is very flexible it has lot of API so that u customize the way the chain operates so you can program a lot of different rules into it for example AML and kyc but obviously more advanced things as well.

Disadvantages

(a) Trust on validator is one of the biggest problems an observer node or users can face. The trust issues can creator doubts in the customers mind.

(b) Since openchain is a private chain network it can be difficult for other private chain to accept the rules and the validator or administrator can denied the transaction between two different private chains if it doesn't fit to the rules.

7. CONCLUSIONS

The openchain provide a new building block to the DLT and a key to bring more out of blockchain. It provides real-time transaction confirmation, free transaction since there is no miners subside and by skipping the inefficiencies of the proof-of-work. The most important feature of openchain it provides a level of privacy which is completely customizable,transparent and public to the private firms.

Openchain is still growing with all new solution it can bring to DLT and can provide the financial organization with most profits by just simply providing blockchain disruption to its best use.

8. REFERENCES

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