PRACTICAL: 5

AIM:

Block.one: Getting Started with The EOSIO Blockchain

THEORY:

EOSIO is a next-generation blockchain platform designed to support scalable, secure, and high-performance decentralized applications (dApps). Developed by Block.one, EOSIO features a unique consensus mechanism called Delegated Proof of Stake (DPoS), enabling high transaction throughput and low latency, which makes it ideal for enterprise-grade applications.

An EOSIO blockchain is a deterministic state machine that stores transactions in cryptographically linked blocks. Each new block references the hash of the previous block, making the chain immutable and tamper-proof. EOSIO supports smart contracts and is designed to be flexible and modular.

EOSIO uses DPoS to achieve consensus. In this model:

- Stakeholders vote to elect block producers (delegates).
- These producers are responsible for validating transactions and producing blocks.
- The model ensures decentralization while maintaining high performance and fast block times.

Accounts and Wallets

- An **account** in EOSIO is a named identity that interacts with the blockchain by sending or receiving actions and transactions.

- Each account is associated with a set of **public/private keys**.

- A **wallet** securely stores these keys and is required to sign blockchain transactions.

- Permissions can be configured hierarchically, allowing fine-grained control over account actions.

Node Types

- **nodeos**: The core daemon of an EOSIO node that processes blockchain data.

- **keosd**: The wallet manager responsible for managing keys and signing transactions.

- **cleos**: A command-line interface tool used to interact with nodeos and keosd.

CODE:

```
•   sudo apt update
•   curl -LO https://github.com/eosio/eos/releases/download/v2.1.0/eosio_2.1.0-1-ubuntu-
    20.04_amd64.deb
•   sudo apt install ./eosio_2.1.0-1-ubuntu-20.04_amd64.deb
•   nodeos –version
```

- cleos version client
- keosd -v
- nodeos -e -p eosio --plugin eosio::chain_api_plugin --plugin eosio::history_api_plugin --contracts-console >> nodeos.log 2>&1 &
- tail -f nodeos.log
- cleos wallet create --name my_wallet --file my_wallet_password
- cat my_wallet_password
- cleos wallet list
- cleos wallet open --name my_wallet
- cleos wallet unlock --name my_wallet --password YOUR_PASSWORD
- cleos wallet import --name my_wallet --private-key 5KQwrPbwdL6PhXujxW37FSSQZ1JiwsST4cqQzDeyXtP79zkvFD3
- curl -LO https://github.com/eosio/eosio.cdt/releases/download/v1.8.1/eosio.cdt_1.8.1-1-ubuntu-20.04_amd64.deb
- sudo apt install ./eosio.cdt_1.8.1-1-ubuntu-20.04_amd64.deb
- eosio-cpp –version
- cleos wallet open --name my_wallet
- export wallet_password=$(cat my_wallet_password)
- echo $wallet_password
- cleos wallet unlock --name my_wallet --password $wallet_password
- cleos create key --file my_keypair1
- cat my_keypair1
- cleos wallet import --name my_wallet --private-key YOUR_PRIVATE_KEY
- cleos create account eosio bob YOUR_PUBLIC_KEY

OUTPUT:

Figure 1:Start the Lab

Figure 2:Create an instance

Figure 3:Change operating system to linux

Figure 4:Click SSH for my-vm-1

Figure 5:Install the EOSIO platform

Figure 6: Run a local single node blockchain

Figure 7:Create wallet

Figure 8:Add the EOSIO system account private key to the new wallet

Figure 9:Install the EOSIO Contract Development Toolkit (CDT)
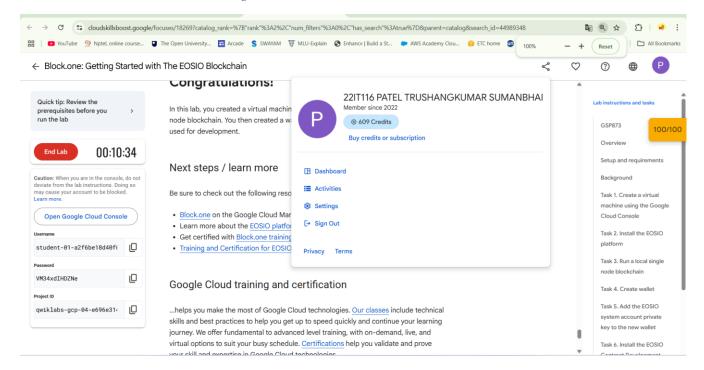
Figure 10:Create a blockchain account

Figure 11:End Lab

LATEST APPLICATIONS:

- Decentralized Finance (DeFi)
- Supply Chain Management
- Digital Identity & Voting
- Gaming and NFTs

LEARNING OUTCOME:

In this practical, I learned how to set up a single-node blockchain, manage wallets and keys, and create blockchain accounts. I also gained an understanding of consensus mechanisms like DPoS. Additionally, I was introduced to smart contract development tools, which will help me in real-world blockchain application development.

REFERENCES:

1. https://www.cloudskillsboost.google/focuses/18269