Day 16 Blockchain Bootcamp(33 minutes)

The Big Picture

* Geth -> command line tool for Go – Ethereum
* How Geth works
* -> Geth trys to find other blockchain nodes and fine them
* It will open javascript josno rpc to connect to node.
* Conneect to other nodes.
* Replicates blockchain on computer.
* The download works similar to torrent, piece are downloaded from other nodes in network.
* Geth syncs in a full sync -> block header, block odies, all historical transactions and takes forever to process and finish
* A fast sync block headers + block bodies.
* Last 1024 transactions. Downloads all blocks, takes a few hours.
* Light sync -> Will take latest snapshot of state.
* Less secure but much faster
* Much less space.
* Synchronized in minutes.

Javascript JSON RPC

* All blockchain nodes offer this functionality
* With json rpc, or the inter process communication(IPC) Communicate through a file or pipe. Hlepful thorough geth instance.
* RPC through http, use a browser to communicate with eth.
* The web3 js library communicate with blockchain node
* Web3.eth.getAccount -> communicate through http-rpc to get blockchain node.
* All the ide’s connect via a http-rpc
* GETH will give you access through json rpc. Connect between dev and blockchain.

How to download GETH

* GETH does not have upgrade methanisms, check for new version when having connection issues.
* You don’t need GETH tools when downloading it. Best preference to install installer.
* GETH is command line tool.

What happens when you open GETH without additional parameters

* Start block synchronization from network, and download the blocks to your hard drive
* About 2 mb per block
* The first mode is fast sync
* When first ran it will be fast mode.
* Only the last 1024 transactions
* Can download geth in a light mode
* You get the latest state of blockchain on computer.
* It takes about 1 week to download full-sync mode.
* Where you would fine downloaded blocks,<username>/ AppData/Roaming/Etherereum/geth/chainData
* GETH allows to work with private network or blockchain. Only Ethereum protocol implementation. Where you can create your own blockchain. Mine own ether, and play around without paying money.

Log Output Geth Gives You

* Amd64 Is the right geth version not amd32 since it has problems. Stops running due to memory issues when mining or importing new blocks
* No updating mechanisms, keep your geth up to date.
* If version is outdated, might not be able to connect to main network
* ChainID -> 1,2, 3 cannot be used to connect to mainnet
* Check if Ethereum is running properly in private network if chain id in command line output is the same as genesis json file.
* If you want connect to geth, connect using the ipc file. Check log output for ipc file.
* If can’t see rpc-http endpoint, did not run geth with the right parameters.

Where the data is stored by default in Geth

* Can remove geth directory. DO NOT DELETE keystore directory.
* **When you create a new account, it will create a new private key. It will be in the keystore directory.(BACKUP THIS DIRECTORY INCLUDING ALL YOUR PRIVATE KEYS)**

How to attach to running GETH instance

* You can connect to geth instance via a IPC file.
* Geth attach will set geth to a client mode.
* Do the geth attach ipc:/<ipc file path>
* For windows at the time of these notes it is geth attach ipc://./pipe/geth.ipc

Working with Javascript/JSON api

* When connect to ipc file, can access different modules such as admin.
* Personal.newAccount() -> javascript function that will create a new account with passphrase on your private blockchain network.
* Each file format in keystore directory -> Date--<Ethereum Address>
* It is how it interacts with accounts in ehtereum console.
* It is sameway a website communicate with blockchain.
* Can create new accounts on website
* 1. Connect to blockchain node, 2. Use javascript commands, 3. Send transactions or call data from other blocks in blockchain node.
* A computer screen capture

  Description automatically generated with medium confidence
* Go Ethereum repository, you can find a list of management apis.
* Can list or create accounts.
* Can start a miner or stop a miner
* Use the JSON-RPC api.
* It uses the eth endpoint.
* RPC methods to interact with blockchain
* Eth\_syncing -> The whole interaction with blockchain happens in ui, this is where web3.js comes.
* It will interact with blockchain from browser.