

# Quiz for Section 2 – Ethereum Nodes and Networks

## What are Ethereum Nodes?

- a. **Programs implementing the Ethereum Protocol to talk to each other and JSON-RPC interfaces to talk to the outside world**
- b. A Java-Script library to compile and run Solidity Code
- c. A Framework for deploying and running smart contract in a decentralized way

## To communicate with an Ethereum node via JavaScript

- a) **The library you use must make use of the JSON-RPC Interface of an Ethereum Node**
- b) Must Implement the Ethereum Protocol to connect to other Ethereum Nodes
- c) Must use Web3.js, which is closed source to communicate to other Ethereum Nodes

## It's possible to access the blockchain via an Ethereum Node

- a) Only via JavaScript because there is the proprietary Web3.js library
- b) **by any programming language, as long as it adheres to the JSON-RPC standard**

## A Private Network is

- a) A side Channel to the Ethereum Main Net which costs less gas to run smart contracts
- b) **A Network running only in a private area, where people cannot join freely and openly**
- c) An exact clone of the Rinkeby Test-Network which can be started as virtual machine in the Azure Cloud

## For Rapid Development Cycles it's good

- a) To deploy to the main-network as quickly as possible
- b) **To use in-memory blockchain simulations, because mining works instantaneously**
- c) To use a private network at all times, because this is the closest you get to the real network

## Go-Ethereum vs. Ganache

- a) Both are the same, just implemented in a different language
- b) **With Go-Ethereum you get a real blockchain node where you can create your own local private network, connect to Test-Networks or the Main-Net, while with Ganach you get an in-memory blockchain simulation**
- c) With Ganach you get a real blockchain node where you can connect to the Test-Networks Rinkeby and Ropsten

## Topic: Block Timestamp

- a) Because the timestamp is based on the timezone of the miner it changes the difficulty continuously to reflect network latency.
- b) **The timestamp can be influenced by a miner to a certain degree but it's always independent from the time-zone.**
- c) The timestamp can't be influenced by a miner and is generally considered safe to be used for randomness on the blockchain.

## Block Difficulty

- a) The Block Difficulty is determined by the Ethereum Committee every fortnight to reflect the average amount of transaction and it cannot be influenced by the network itself.
- b) The Block Difficulty increases when the time between mined blocks is below 10 seconds, while it decreases when the time is above 20 seconds.**
- c) The Block Difficulty increases when the time between mined blocks is below 20 seconds, while it decreases when the time is above 60 seconds

## Ethereum Nodes

- a) Must implement the Ethereum protocol and external access can only be done via the proprietary Ethereum Libraries like Web3.js
- b) Must Implement the Ethereum Protocol and a JSON-RPC to talk with clients**
- c) Must implement Web3.js to interact with Websites

## When a new block is mined

- a) A list of transactions as well as uncles is incorporated in the block. All gas that is used during those transactions is added to the miners balance. Also the block reward is added to the miner. Then the same transactions are run again by every participating node in the network to achieve consensus.**
- b) A list of transactions is incorporated in that block. Gas used during the execution is attached to the executing contracts while the block reward is automatically spread across the mining pool to ensure a fair spread. Consensus is reached by a special form of hash code.