
Deep Dive on Ethereum
BLOCKCHAIN
- Rishi Cherukuri

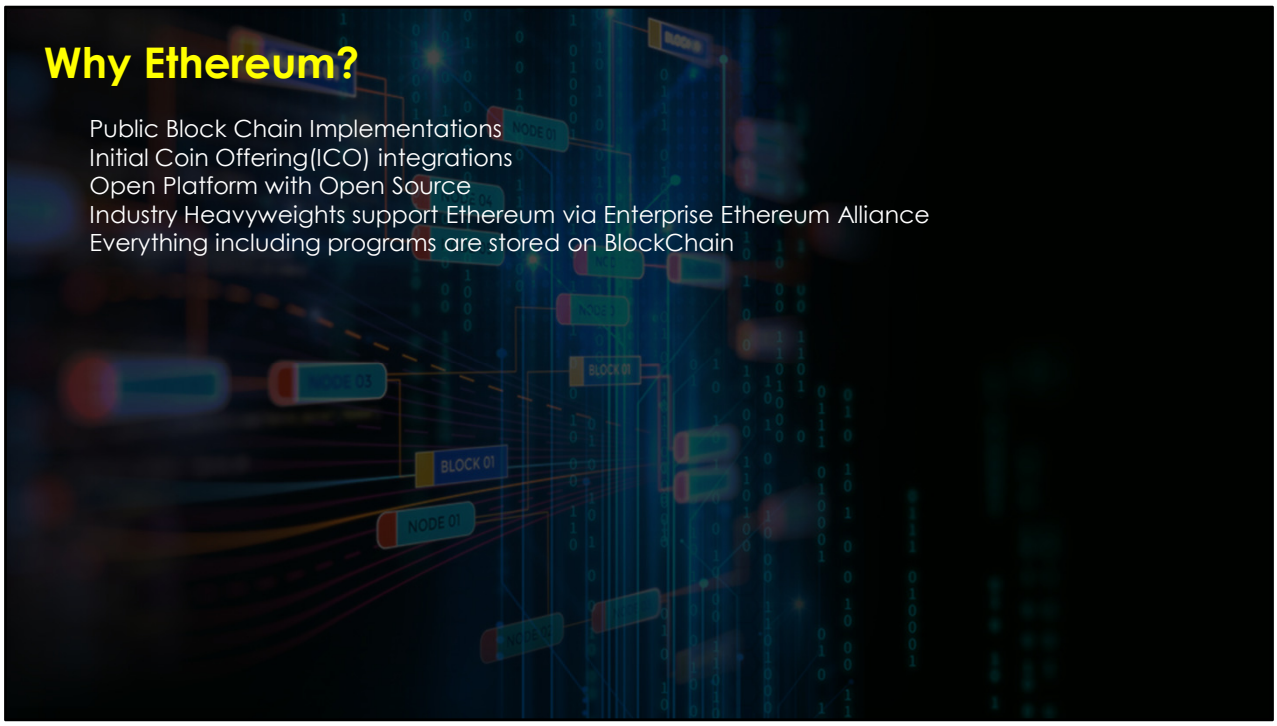
Welcome to the Journey of Deep Dive on BlockChain

- Recap / Quiz
- Why Decentralization
- Decentralization Implementations
  - BlockChain
  - Tangle
  - HashGraph
- Why BlockChain
- Why Ethereum
- What is Ethereum
- Ethereum Terminology
- Implementing a Smart Contract
  - Understanding Remix
  - Which editor to use for programming in Solidity
- Deploying to Ethereum Test Networks
- Understanding the interaction with BlockChain

https://tokenmarket.net/ico-calendar
https://coinmarketcap.com/

Recap / Quiz

- What is a Block?
- What is a Hash?
- Why is it called a BlockChain?
- What is the difference between permissioned and public BlockChain?
- What is Proof of Work?
- Why Decentralization?
- What are various Decentralization Technologies available?
- Is BlockChain a better choice?
- When do we need to choose between Hyperledger & Ethereum?

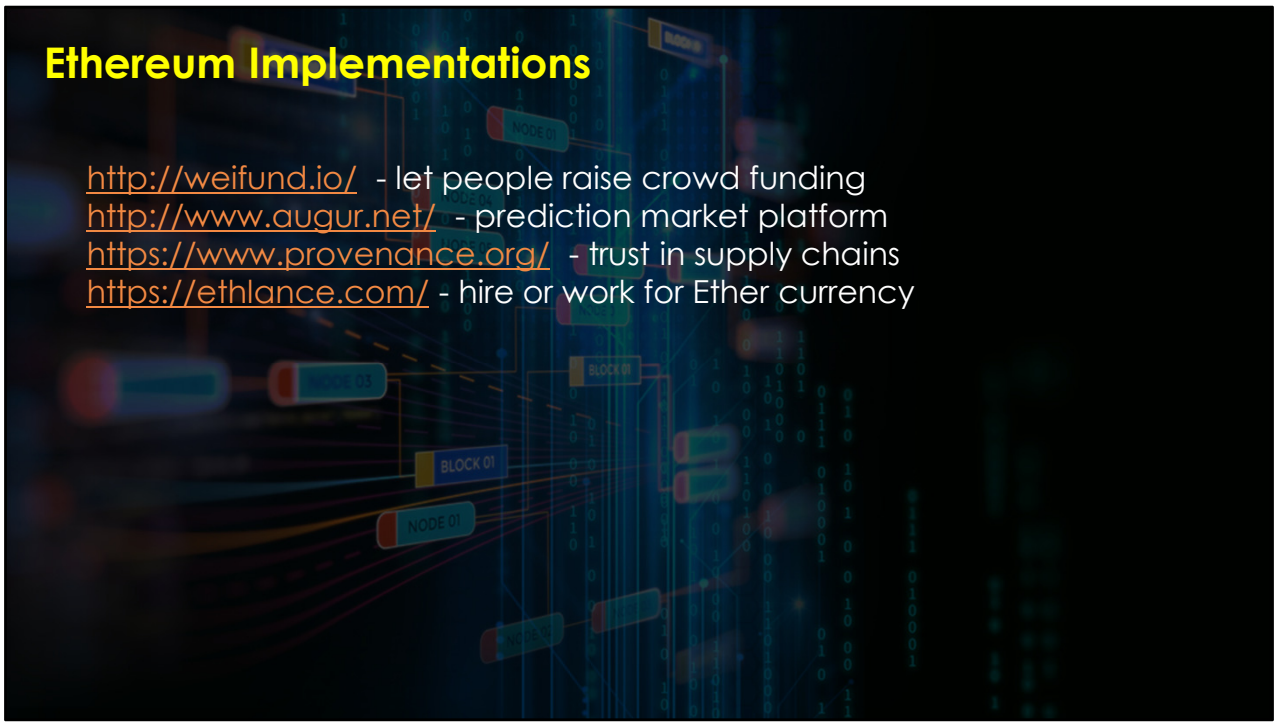


Some references discussed during the meetup:

Ethereum Devcon 1 - Understanding the Ethereum Blockchain Protocol - Vitalik Buterin
https://www.youtube.com/watch?v=gjwr-7PgpN8
Decentralizing Everything with Ethereum's Vitalik Buterin
https://www.youtube.com/watch?v=WSN5BaCzsbo

Ethereum Implementations

http://weifund.io/ - let people raise crowd funding
http://www.augur.net/ - prediction market platform
https://www.provenance.org/ - trust in supply chains
https://ethlance.com/ - hire or work for Ether currency



What is Ethereum?

- ❑Ethereum BlockChain is a transaction-based state machine
- ❑Easily build decentralized applications using BlockChain
- ❑Ethereum Virtual Machine is a Turing complete language
- ❑Capabilities
  - ❑Host decentralized applications (DApps)
  - ❑Smart Contracts that allow business logic to be deployed
  - ❑Server less Computing
    - ❑Decentralized Computer
  - ❑Browsers like Mist and Apps like MetaMask can interact with Ethereum BlockChain
- ❑Components
  - ❑accounts
  - ❑state
  - ❑gas and fees
  - ❑transactions
  - ❑blocks
  - ❑transaction execution
  - ❑mining
  - ❑proof of work

Ethereum WhitePaper - https://github.com/ethereum/wiki/wiki/White-Paper

Ethereum Terminology

Language / Stack	Purpose
Ether	Crypto currency used for paying for smart contracts to run
Solidity (sol)	Smart Contract programming language
Geth, eth, pyethapp	The main Ethereum software written in different languages
Ethereum Virtual Machine	Decentralized computation
Swarm & Whisper	File Storage and communication protocols
Truffle	Smart Contract Framework offering templates for building smart contracts
TestRPC/Ganache	Local Ethereum BlockChain network, where we can use fake Ethers
Kovan, Rinkeby, Ropsten	Test Ethereum BlockChain network, where we can use fake Ethers
Web3 JS	Ethereum JavaScript API

Solidity Docs - https://solidity.readthedocs.io/

Prerequisite Setup Instructions:
https://code.visualstudio.com/
https://www.npmjs.com/package/node-windows
http://truffleframework.com/ganache/
http://truffleframework.com/tutorials/how-to-install-truffle-and-testrpc-on-windows-for-blockchain-development
https://github.com/ethereum/go-ethereum/wiki/Installing-Geth

Smart Contract?

- A programmable class that can interact with BlockChain and holds an account controlled by code

Hands-on

- Programming a simple SmartContract with Remix IDE
- Learning to use GanacheMetaMask
- Reviewing the basics about
  - EVM, ByteCode, Application Binary Interface(ABI)

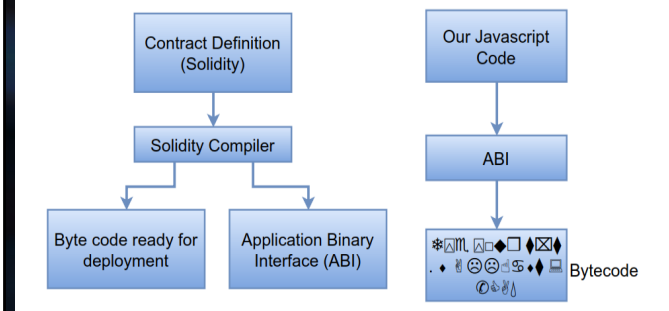
https://remix.ethereum.org/

Inbox Smart Contract

```
pragma solidity ^0.4.23;

contract Inbox {

    string public message;

    function Inbox(string initialMessage) public {
        message = initialMessage;
    }

    function setMessage(string newMessage) public {
        message = newMessage;
    }

    function getMessage() public view returns (string){
        return message;
    }
}
```

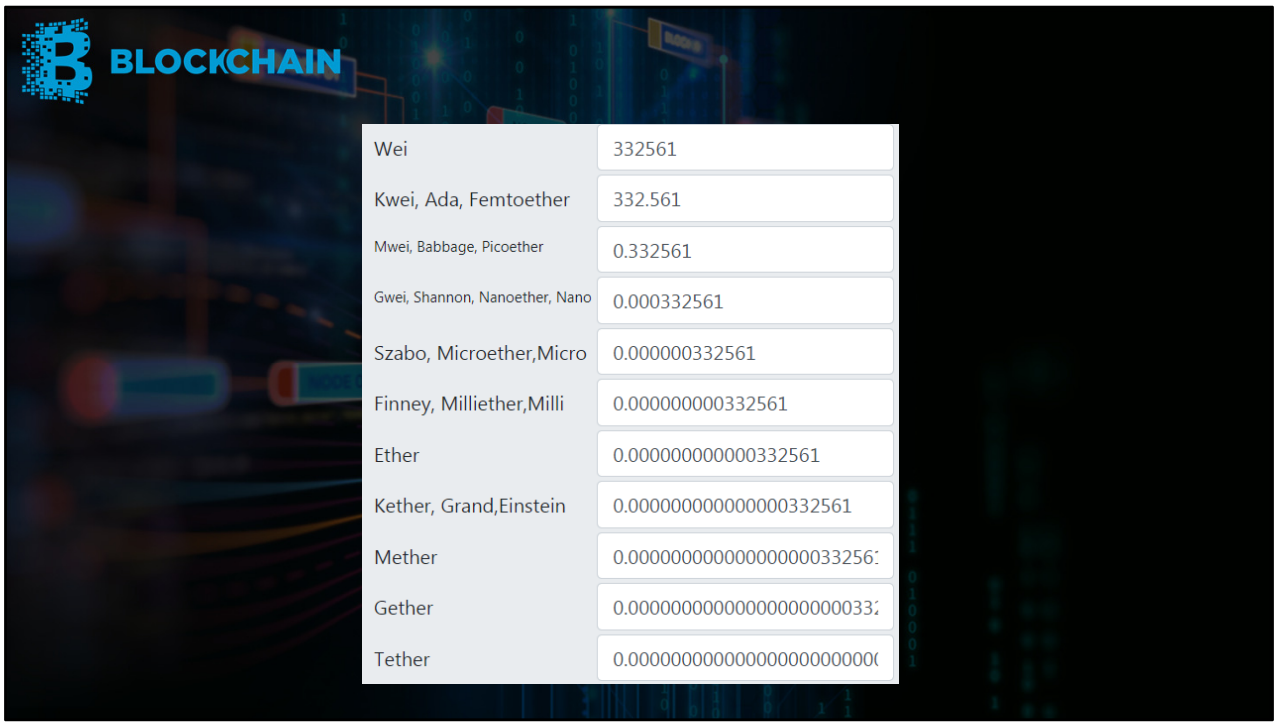
https://remix.ethereum.org/

BLOCKCHAIN

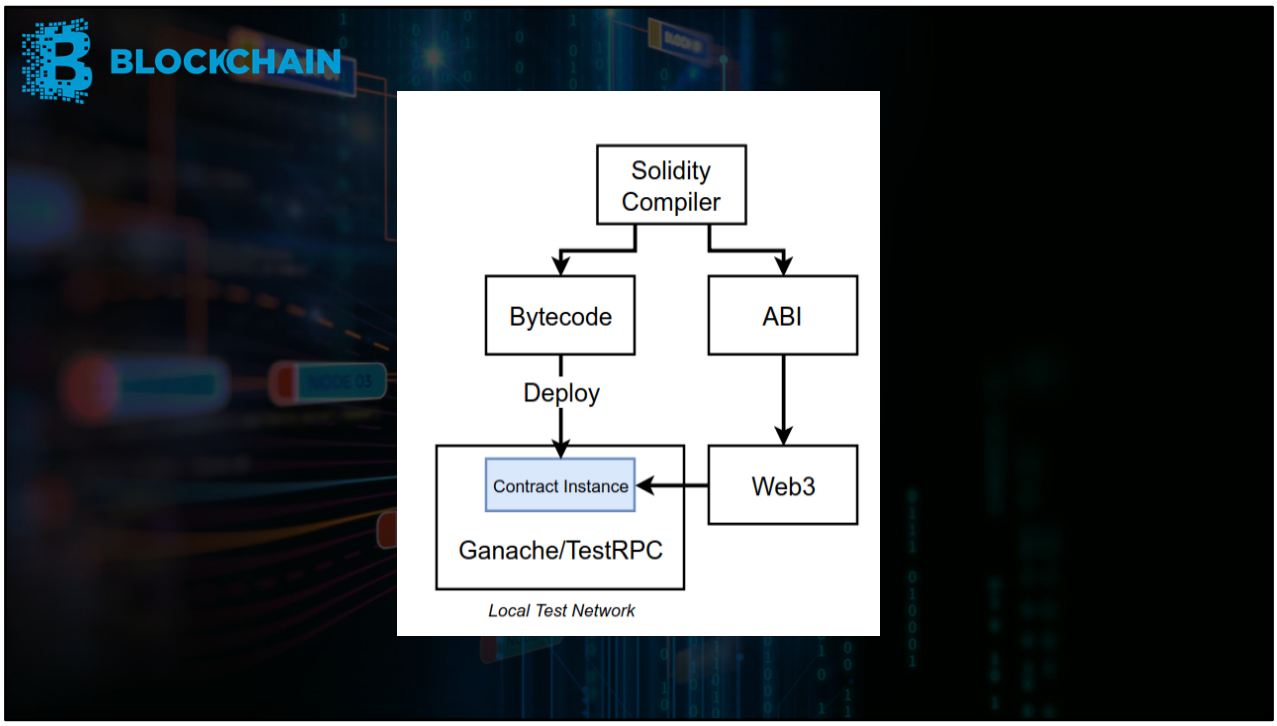


External to External Account Transaction

nonce	How many times the sender has sent a transaction
to	Address of account this money is going to
value	Amount of 'Wei' to send to the target address
gasPrice	Amount of Wei the sender is willing to pay per unit gas to get this transaction processed
startGas/gasLimit	Units of gas that this transaction can consume
v	Cryptographic pieces of data that can be used to generate the senders account address. Generated from the *sender's* private key.
r	
s	



https://etherconverter.online/


BLOCKCHAIN
Solidity Compiler
Bytecode
ABI
Deploy
Contract Instance
Web3
Ganache/TestRPC
Local Test Network


BLOCKCHAIN
Thank you
Nagarro, CoderPlex & BlockChain4All community
NODE 01
NODE 04
NODE 05
BLOCK 01
NODE 01

Questions?