Introduction to Smart Contracts On Ethereum

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Ethereum Blockchain - Quick Refresher

- Supports the blockchain concepts similar to Bitcoin : validates, stores, and replicates transaction data on many computers around the world (Distributed Ledger).
- Ethereum is also a **decentralized platform that runs smart contracts**: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference.

Ethereum Blockchain - Quick Refresher (contd)

- Ethereum's currency is ETH . ETH ownership is tracked in the Ethereum blockchain using Accounts.
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Units in Ethereum		
Unit	Number per ETH	Most appropriate uses
Ether (ETH)	1	Currently used to denominate transaction amounts (eg 20 ETH) and mining rewards (5 ETH)
finney	1,000	
szabo	1,000,000	Currently the best unit for the cost of a basic transaction, eg 500 szabo
Gwei	1,000,000,000	Currently the best unit for Gas Prices eg 22 Gwei
Mwei	1,000,000,000,000	
Kwei	1,000,000,000,000,000	
wei	1,000,000,000,000,000,000	The base indivisible unit used by programmers

Ethereum Blockchain - Quick Refresher (contd)

- Two kinds of accounts in Ethereum:
  - Accounts that store ETH that you and I can own. Eg: https://etherscan.io/address/0x50261871a86dad1bd25008c5f31cfd92303d9dec (not my account though I would like some of those Ethers)
  - Accounts that store ETH but also have code (smart contract) in them. Eg: https://etherscan.io/address/0xbb5Ed1EdeB5149AF3ab43ea9c7a6963b3C1374F7#code (this is the smart contracts powering cryptocelebrities.co)

Common Smart Contracts

- Build a cryptocurrency token on top of Ethereum (eg, Fungible Tokens/ICOs)
  - Implemented using standard token contract called ERC20
- Build collectible / digital asset platform (eg., crypto kitties, crypto celebrities)
  - Implemented using Non fungible token contract called ERC723

Smart Contract with Solidity

Step-by-Step Instructions:

https://github.com/Tri-Valley-Blockchain/blockchain-playground/blob/master/ethereum/hello_world/Instructions.md

Deconstructing Crypto Celebrities

Smart Contract:
https://etherscan.io/address/0xbb5Ed1EdeB5149AF3ab43ea9c7a6963b3C1374F7#code

Annotated Smart Contract:

https://github.com/Tri-Valley-Blockchain/blockchain-playground/tree/master/ethereum/deconstructing-cryptocelebrities

APPENDIX

Links

http://solidity.readthedocs.io/en/develop/contracts.html - Solidity Docs

https://rinkeby.etherscan.io/ - Rinkeby Etherscan

https://remix.ethereum.org/ - Remix Solidity IDE

https://gist.github.com/chandraonline/8a0bd4a6e83fa8a72c7cf2379df10bb5 - Useful Docker Aliases.

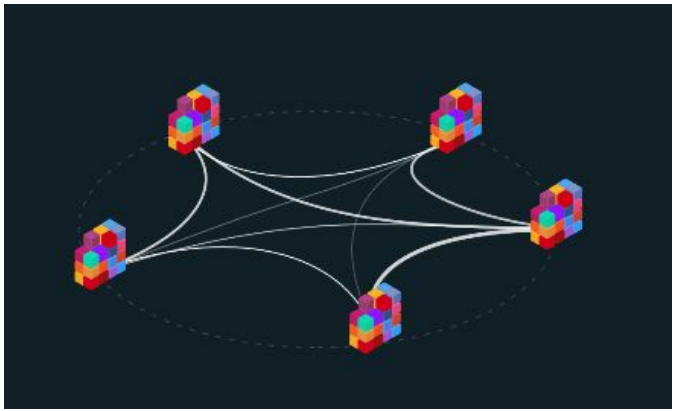
Add your public address: https://goo.gl/aN1ncg

Intro: Ethereum Blockchain as an application platform

Ethereum is a **decentralized platform that runs smart contracts**: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference.

On traditional server architectures, every application has to set up its own servers that run their own code in isolated silos, making sharing of data hard. If a single app is compromised or goes offline, many users and other apps are affected.

On a blockchain, anyone can set up a node that replicates the necessary data for all nodes to reach an agreement and be compensated by users and app developers. This allows user data to remain private and apps to be decentralized like the Internet was supposed to work.



Source: https://ethereum.org/