



University
of Basel

Center for
Innovative Finance



Bitcoin, Blockchain and Cryptoassets

The Bitcoin Network

Prof. Dr. Fabian Schär
University of Basel

Release Ver.: (Local Release)

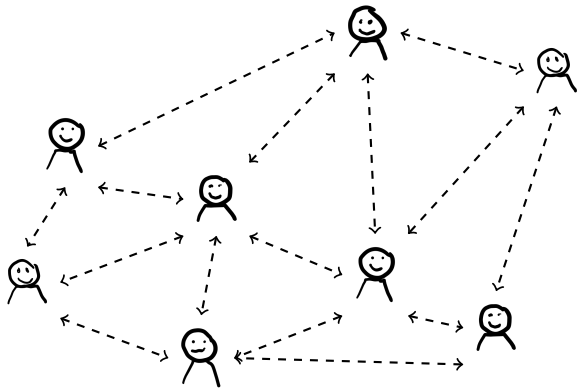
Version Hash: (None)

Version Date: (None)

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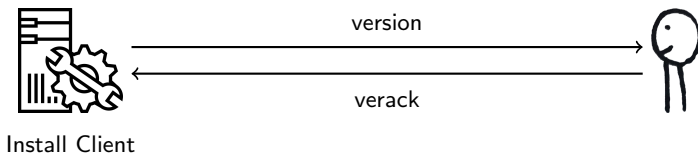


Bitcoin is a Peer-to-Peer Network



In the Bitcoin network, participants are called **nodes**.

Joining the Network



After the initial handshake, we request a list of IP addresses and connect to additional peers.

Functionality of a Full Node

Core Functionality



Copy of Ledger



Verify



Relay

Optional Functionality

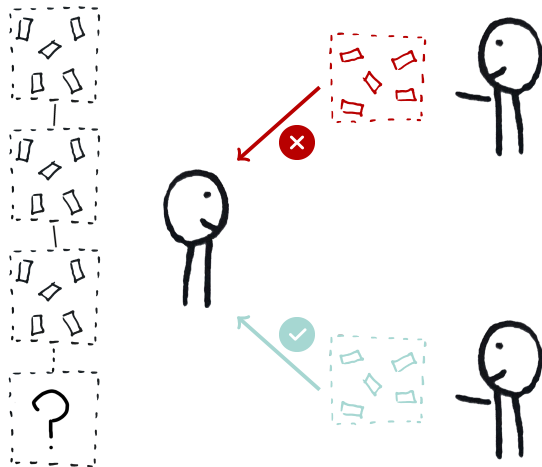


Wallet

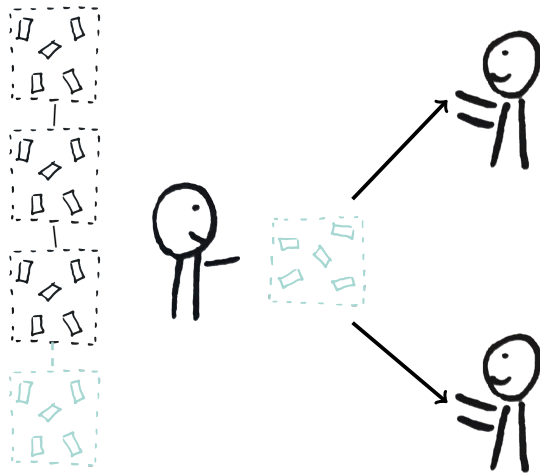


Mining

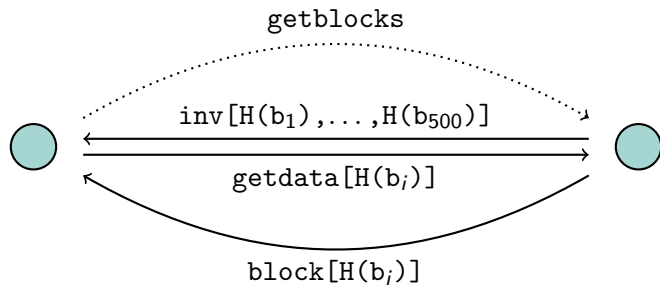
Verify New Blocks



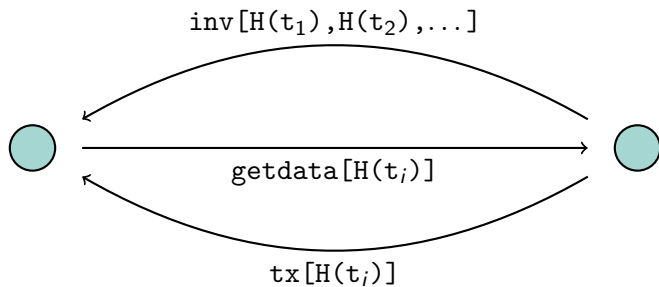
Relay Verified Blocks



Exchange of Blocks



Exchange of Transactions



Wallet Functionality



Encrypted Keystore



Balance



GUI

Mining Functionality

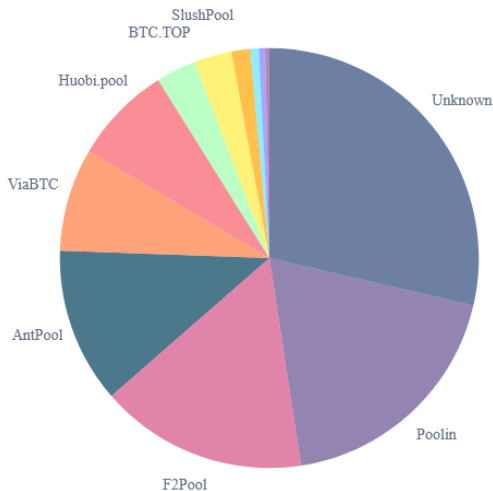


Assemble Blocks



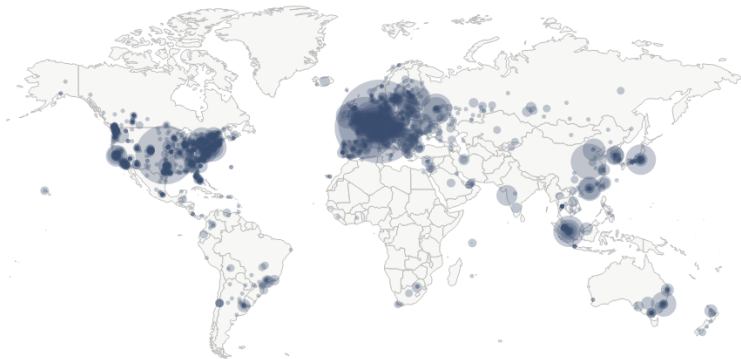
Compute

Pool Mining



Source: <https://blockchain.info/pools>, March 2021

Node Distribution



Source: <https://bitnodes.io/>, March 2021

- ~ 50% of nodes in Europe
- ~ 20% of nodes in the USA

Historic Number of Full Nodes

Dec 2013: \sim 15,500 full nodes

Dec 2015: \sim 5,500 full nodes

Mar 2017: \sim 6,500 full nodes

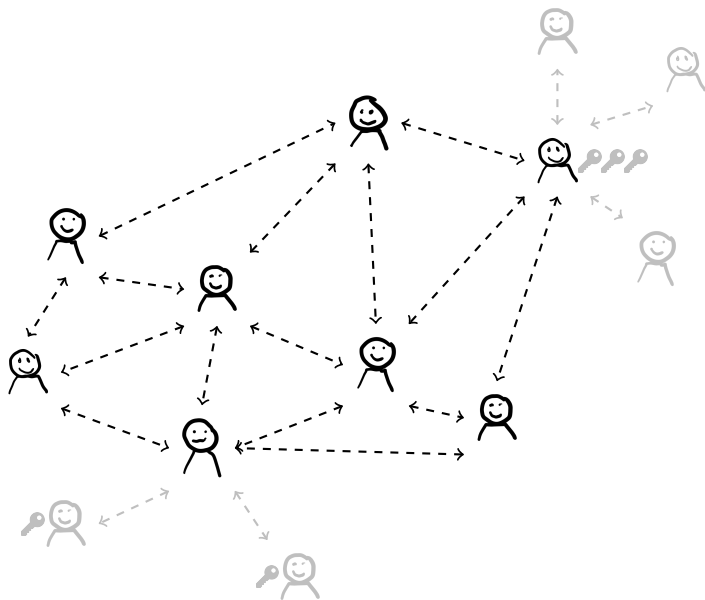
Mar 2019: \sim 10,400 full nodes

Mar 2021: \sim 10,200 full nodes

Motivations for running a full node:

- Independence
- Direct access to data

Extended Network



Mobile Options

Running a node on a mobile device is challenging.



Storage Capacity



Bandwidth



Battery

There are compromises to retain some independence.



SPV Client



Trusted Node