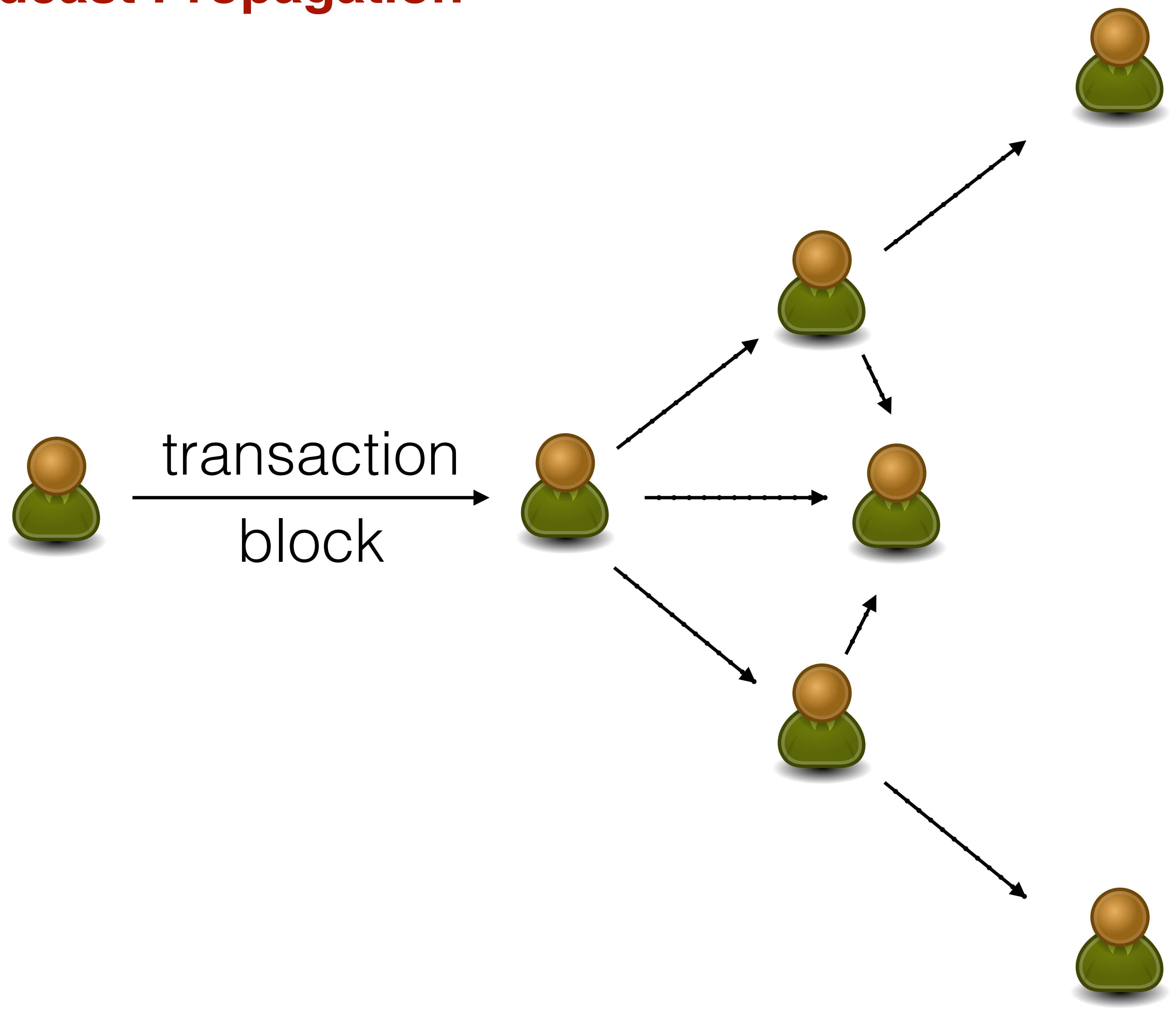
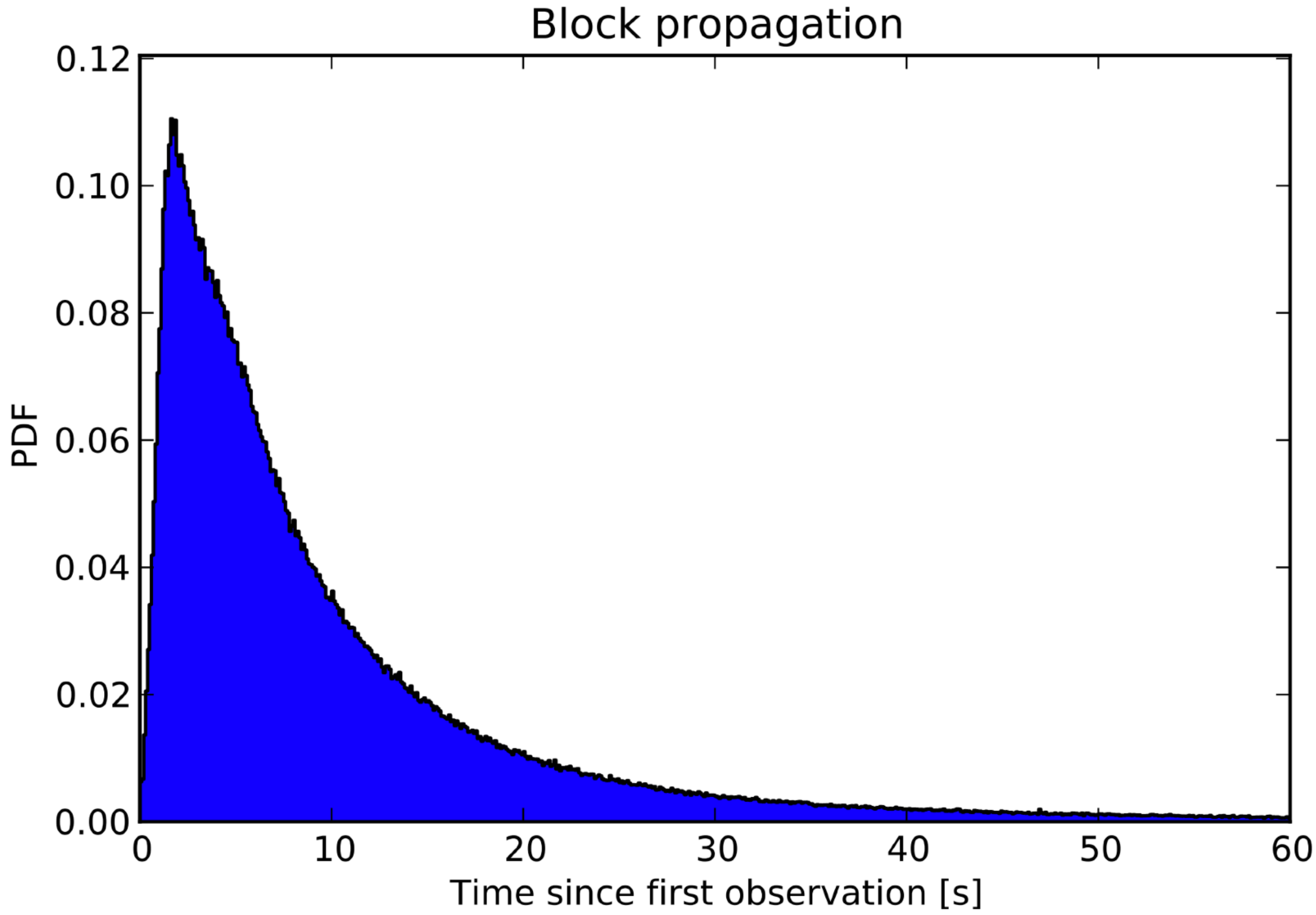
Network Gossip Protocol

Broadcast Propagation

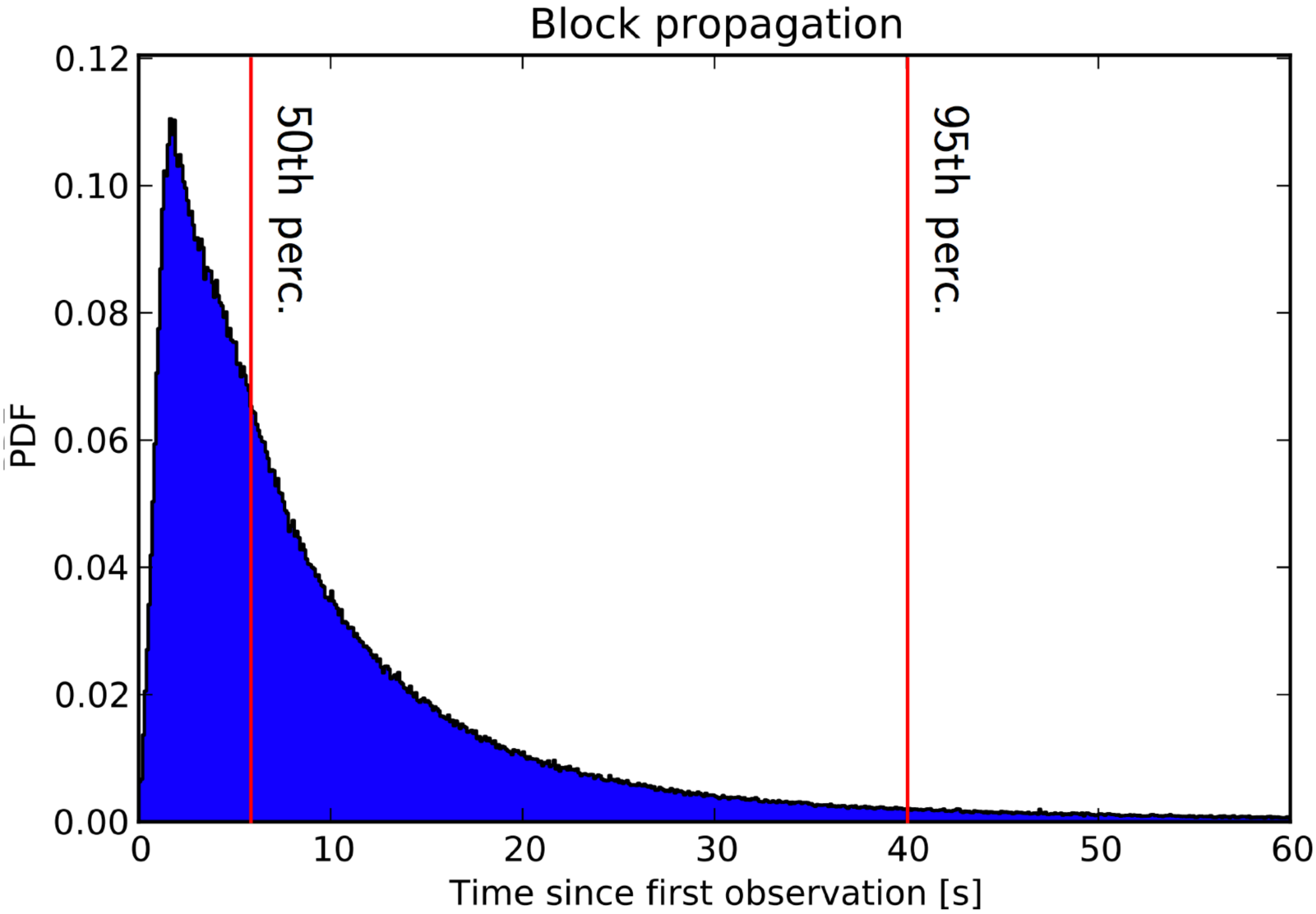


Broadcast Propagation



* Christian Decker et al., Information Propagation in the Bitcoin Network

Broadcast Propagation



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Propagation Methods

Standard

- Send first the hash of an object, transaction/block
- Recipient requests the object
- Sender transmits the object

Send Headers

- Send first the block header (no more block hash)
- Then block

Unsolicited Block Push

- Miners can push a block directly, without pushing the header

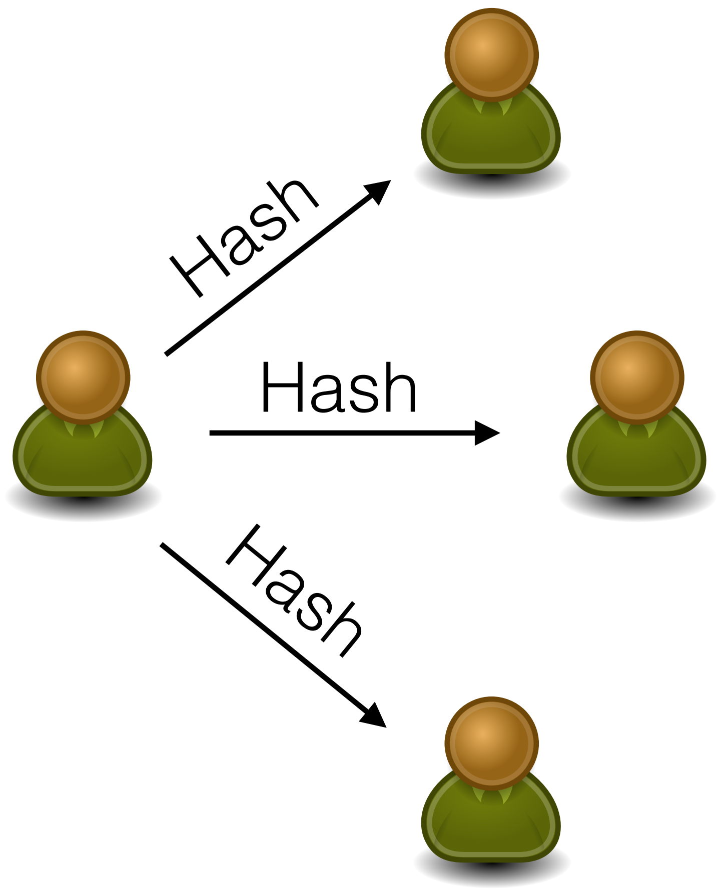
Fibre (Fast Internet Bitcoin Relay Engine) Network

- Optimized network for miners

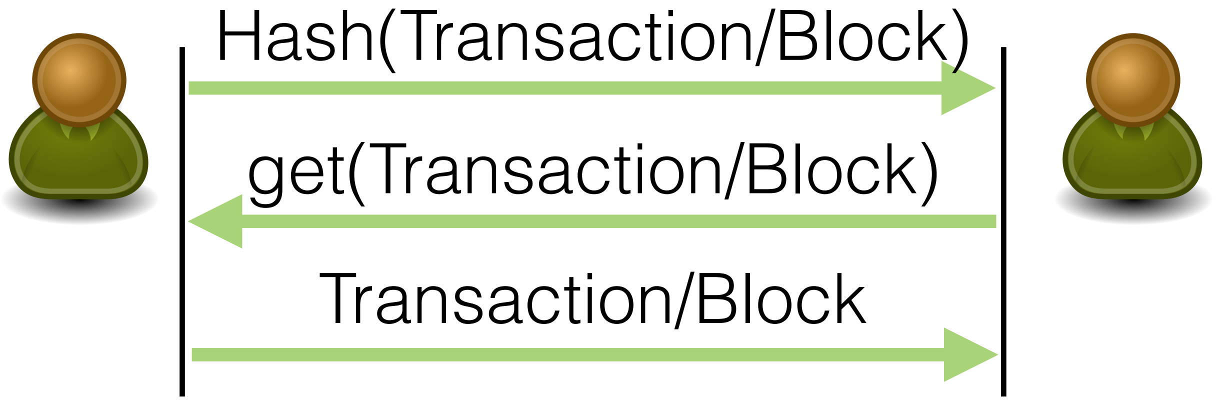
Standard Transaction/Block advertisement

1. Transaction/Block hash broadcast

2. Transaction/Block request

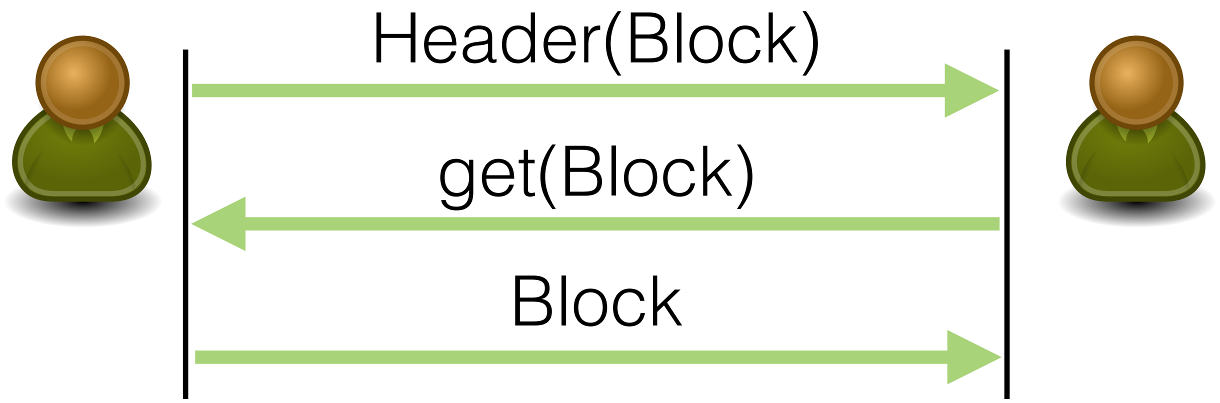


Broadcast



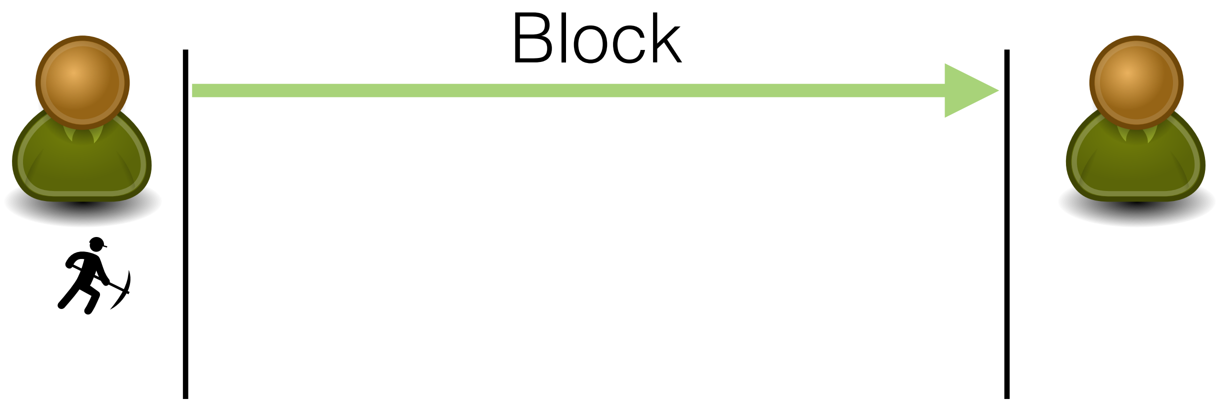
Request from only 1 peer!

Send Headers Block advertisement



Header in Bitcoin about 80 bytes,
hash about 36 bytes

Unsolicited Block Push



Nobody else knows about the block

Bitcoin Fibre

- Fibre node sends a short block sketch
  - List of short hashes, lengths
- Receiver can reconstruct block based on memory pool and construct a block with holes
- Fibre sender breaks block into chunks and sends error correction data
  - Receiver can reconstruct block, without the sender knowing what’s missing.
- Once received and reconstructed the block, the fibre node emits novel chunks —> no redundancy.
- UDP based —> no ramp up

https://github.com/bitcoin/bips/blob/master/bip-0152.mediawiki