Karlsruhe Institute of Technology

Decentralized Systems and Network Services
Research Group
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Do Payment Channel Networks Need a Blockchain?

Rethinking Blockchain Layers

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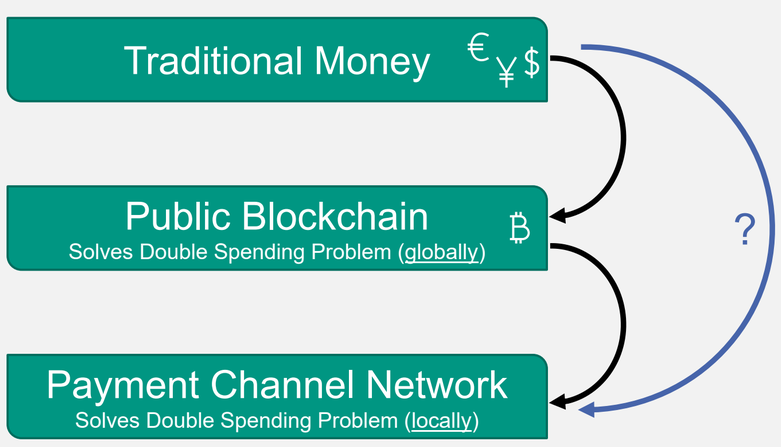
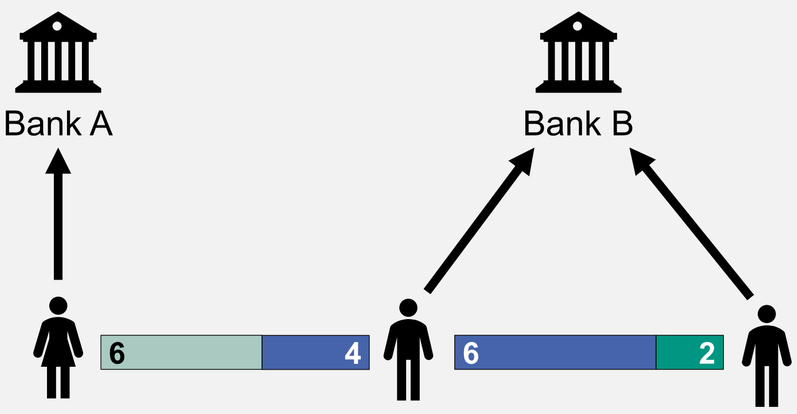


Blockchain cryptocurrencies and payment channel networks solve the problem of preventing double spends.

Can payment channel networks be used **without a blockchain** to create a “to some extent decentralized” architecture for digital payments?

How can **C**entral **B**ank **D**igital **C**urrencies allow for decentralized payments comparable to cash?

Scenario



Channel Protocol

Involved Parties

Create Channel — Alice, Bob, Bank A, Bank B

Banks create channel identifier, lock initial balances, sign initial state

Update Channel — Alice, Bob

Sign new state, send to other party

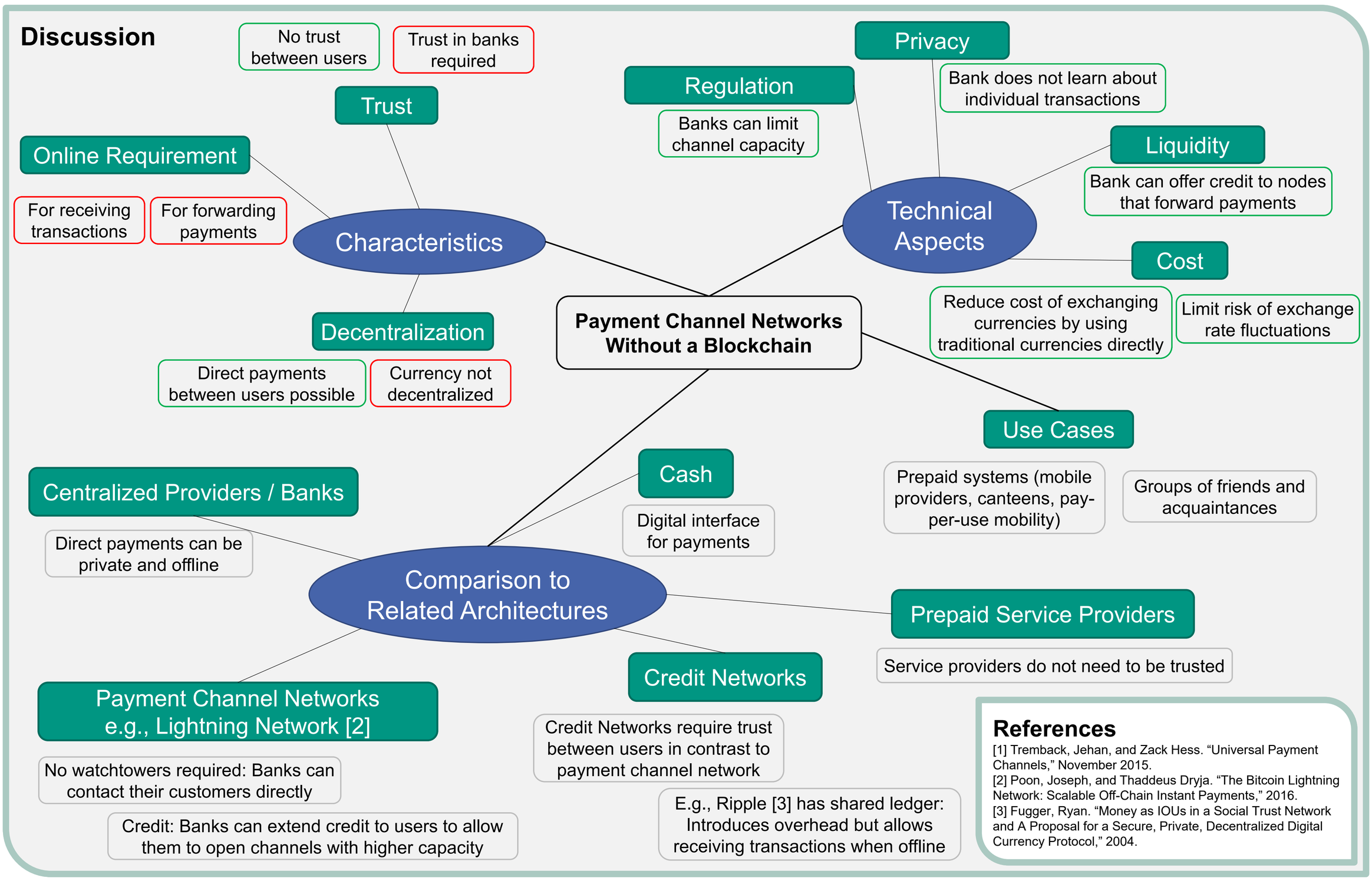
Close Channel — Alice, Bob, Bank A, Bank B

Send state to bank, wait for other party’s confirmation / timeout

Banks perform transfer between each other, update balances

Dispute: *Banks arbitrate, newest state wins*

Discussion



References

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