LEVERAGING ASYMMETRIC TRUST IN BLOCKCHAIN

Authors

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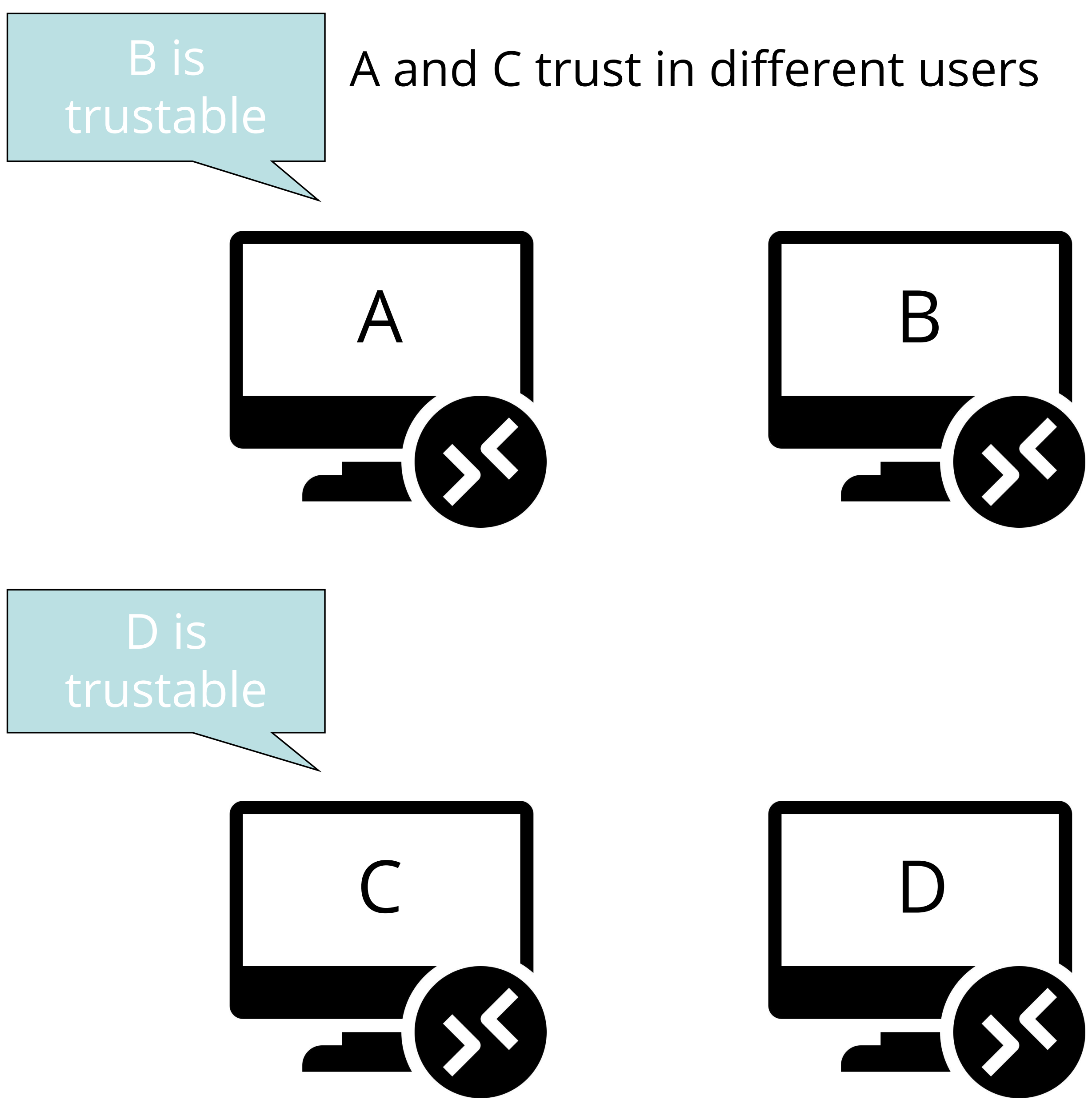
MOTIVATION

1. Increasing needs for open distributed network where anyone can freely join.
2. Different user has different trust on other users on the open network.
3. In traditional distributed protocol, users share the same trust assumptions.

—> Lead to the research of asymmetric trust.



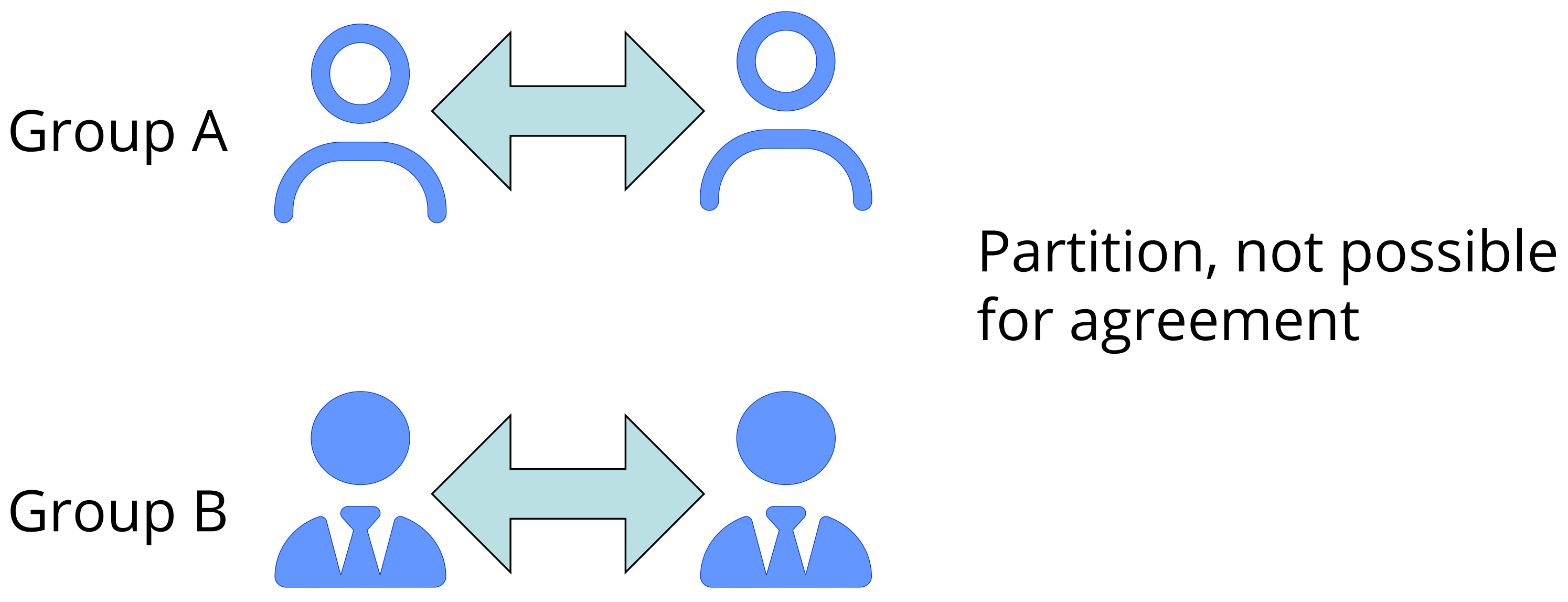
B is trustable

A and C trust in different users

D is trustable

OPEN QUESTIONS

1. What are the (minimal) conditions required to solve a problem in message-passing systems with asymmetric trust?
2. Can asymmetric trust make sense to shared-memory systems?
3. Can we find a recipe to transform symmetric trust to asymmetric trust solutions?

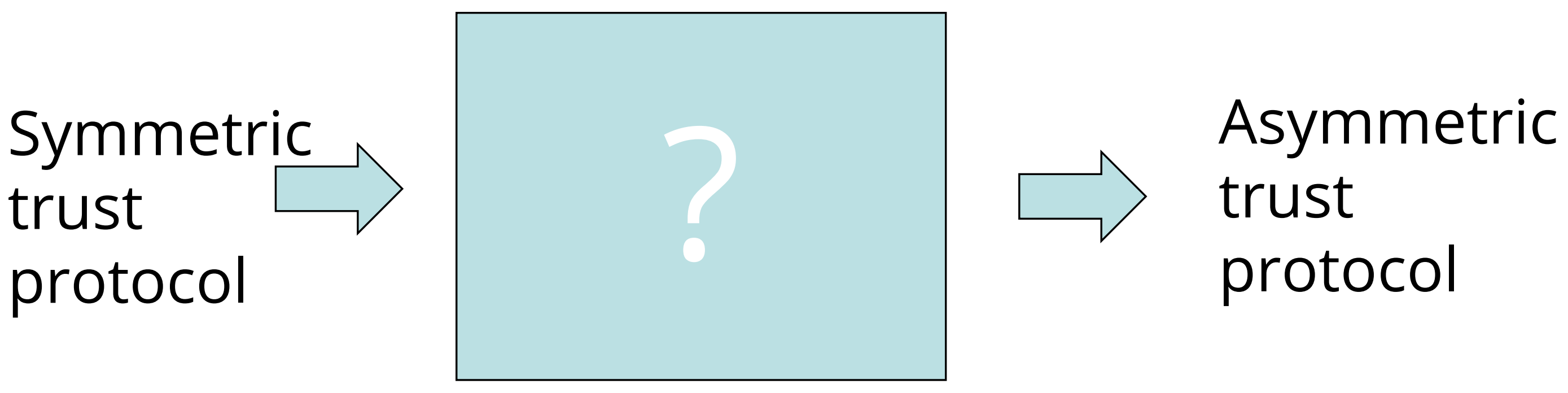


Partition, not possible for agreement

Two groups only trust users in the same group.

RELATED WORK

1. Existing consensus protocol
   - Ripple protocol by Ripple Labs. [1]
   - Stellar protocol by Stellar Development Foundation. [2]
   - However, it was shown that both protocols violate consensus when running with asymmetric trust. [3, 4]
2. Asymmetric distributed trust [5]
   - Introduce new model for asymmetric trust.
   - Formalize Byzantine quorum systems that allow subjective trust.
   - Introduce several protocols with asymmetric trust that generalize standard algorithms that require symmetric trust.



Symmetric trust protocol

?

Asymmetric trust protocol

Is there a generic transformation from symmetric trust to asymmetric trust protocol?

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[1] https://ripple.com/
[2] https://stellar.org/
[3] Chase, B., and MacBrough, E. "Analysis of the XRP Ledger Consensus Protocol." arXiv preprint arXiv:1802.07242, 2018.
[4] M. Kim, Y. Kwon, and Y. Kim, "Is Stellar As Secure As You Think?" arXiv preprint arXiv:1904.13302, 2019.
[5] C. Cachin and B. Tackmann, "Asymmetric distributed trust," in OPODIS, vol. 153 of LIPIcs, pp. 7:1–7:16, Schloss Dagstuhl - Leibniz-Zentrum f¨ur Informatik, 2019

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