Non-monotonic Security Protocols and Failures in Financial Intermediation

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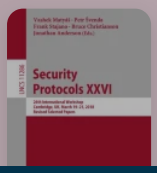

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design failures or wrong assumptions (such as Alice's own misbehavior). Security protocol designers can then focus on preventing or detecting misbehavior (e.g. double spending or double voting).

We argue that general financial intermediation (e.g. Market Exchanges) requires us to consider new form of failures where honest Bob's actions can make honest good standing. Security protocols must be able to deal with *non-monotonic security* and *new types of failures* that stems from rational behavior of honest agents finding themselves on the wrong side.

This has deep implications for the efficient design of security protocols for general financial intermediation, in particular if we need to guarantee a *proportional burden* of computation to the various parties.

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Notes

1. Obviously the server would have had more load than a client, but this only happens because the server participates to several authentications with several clients at once.

2. The largest claimed example is the Danish sugar beet auction where 1229 Danish farmers auctioned their production [3]. However, an actual technical reading of the paper reveals that there were only three servers performing MPC over the secret shares generated by the 1200 bidders. As we will illustrate in Sect. 3 it is actually a good example of a monotonic security protocol.

10. https://tickhistory.thomsonreuters.com.

11. In some cases this fixed order might interfere with the security goal, if the order of actions may leak some information on who started the process.

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