TAP Discussion

3/21/2023

TAP

- TAP is simple and well designed
  - Streamlined solution for a constrained problem
- Pre-reading on Notion discussed SNARKs and other high-powered techniques
  - When the TAP slides were delivered mid February they were devoid of the complicated techniques!
  - Applaud the scrapping of the complicated solutions for simple ones

- Bottom line on TAP
  - Solid, simple design with no major flaws
  - The devil is in the details
    - The remaining slides talk about some of those details

Receipts and RAVs Contain the Same Information

- The TAP slides do not clearly highlight the differences between the two
  - It is clear they need the same information, but depending on implementation details it can be done right OR wrong
- There is a serious problem if they cannot be distinguished
- There is no problem if they are distinguishable
  - No problem provided all the right checks are done
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- Solution
  - Make sure they cannot be confused
  - Make sure the description outlines the difference

On Demand Processing of RAV Requests

- Gateways process any RAV request without question
  - RAV request content is fluid
  - No memory of what has already been processed
- Pro: Indexer can fix some errors due to late receipts
  - Indexers are intended to keep only a limited amounts of receipts. However, they do not need to forget anything
  - Indexer may resubmit a RAV request that includes straggler receipts
- Con: The number of RAV requests can get out of hand
  - No cost to the Indexer
- Solution
  - Rate limit the Gateway
  - Sign the RAV requests

Receipt Collisions

- The TAP slides mention that if two receipts collide, there is a method for resolving the problem/reissuing non-colliding receipts
- When Gateway and Indexer are honest, collision repair makes sense
  - Depending on details of the timestamp and random nonce, it should never occur in practice
- Dishonest players may be able to exploit the repair protocol
  - Depending on implementation details, the ill gotten gains might be small or large
  - To create an unexploitable collision repair protocol would require far, far more effort than it is worth
- Solution: Just Say No
  - Under honest conditions, collisions occur so infrequently that… if it happens, assume malicious activity

Efficiency

- Several discussions were entered having to do with protocol efficiency
  - No real conclusions except things work well as they are
  - However, the discussions did illuminate a deficiency in the TAP slides
- There is a difference between the logical and physical topologies
  - Logically: Within an allocation there are only two entities… a gateway and an indexer
  - Physically: Within an allocation there may be many of each
  - Considerations of both topologies must drive any discussions concerning efficiency
- The TAP slides completely bypass any mention of the physical topology
  - Future revisions should outline in greater detail the whats, whos and hows of communication