



# PANTOS

## KEY FACTS

### WHITE PAPER 7 FACTSHEET

- The prototype published in September is a blockchain relay that enables clients (e.g., smart contracts) on one blockchain to verify the inclusion of transactions on some other blockchain in a completely decentralised manner.
- While no trust in a centralised party is required, the prototype depends on the continuous participation of off-chain clients.
- To encourage off-chain clients to participate, we enhance the prototype with an incentive structure.
- With the incentive structure in place, the daily operational costs of the prototype vary between 522.46 and 5224.43 EUR depending on the gas price. This is 6 times cheaper than traditional blockchain relays.
- The prototype can now act as the basis for the development of cross-blockchain token transfers as envisioned by TAST.

#### **PANTOS' VISION**

Pantos aims to create a cross-blockchain token. Such a token allows users...

...to hold different denominations of the same token on different blockchains at the same time,

...and to freely transfer tokens between blockchains in a completely decentralised manner.

A cross-blockchain transfer of tokens from blockchain A to blockchain B requires tokens to be destroyed (or "burnt") on blockchain A before being created (or "minted") on blockchain B.

Hence, when transferring tokens from blockchain A to blockchain B, blockchain B needs to be able to verify that a "burn" transaction has been executed on blockchain A (i.e., a transaction burning the same amount of tokens on blockchain A) before (re-)creating the same amount of tokens on blockchain B.

#### **The Incentive Structure**

The prototype that we explained in the 6th white paper relies on off-chain clients continuously submitting block information of the source chain to the destination chain, as well



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as on clients disputing any submitted illegal block headers. Header submissions and disputes incur costs to off-chain clients, these need to be compensated.

We propose an incentive structure that rewards clients for submitting and disputing block headers. Clients are required to deposit a stake on the destination chain before being able to submit block headers of the source chain. If a client submits an illegal header, the client loses a fraction of the provided stake in case the header is successfully disputed. This fraction is sent as a reward to the client that disputed the header. While discouraging off-chain clients to submit illegal headers, this punishment motivates honest clients to dispute illegal headers in order to receive the stake.

Whenever a block header is used for verifying the inclusion of some transaction, the submitter of the header is rewarded with a fee. This way, off-chain clients are incentivised to relay block headers of the source blockchain to the destination blockchain, keeping the system alive.

## Preliminary Analysis

The original idea of relay schemes has been around for some time. However, traditional relays perform a full validation of each received block header which may cause high costs. Our prototype mitigates this issue by optimistically accepting block headers after a light validation and by enabling clients to dispute block headers they deem illegal. The following table outlines the estimated operational costs of both a traditional relay and the prototype devised within TAST. Generally the effective cost varies depending on the specified gas price. When compared to traditional relays, our prototype is about 6 times cheaper.

System	Costs/Submitted Header (EUR)	Costs/Day (EUR)
Traditional Relay	0.55 – 5.46	3146.85 – 31465.51
TAST Relay	0.09 – 0.91	522.46 – 5224.63

## Conclusion

With the incentive structure in place, the prototype will now act as the basis for the development of cross-blockchain token transfers as envisioned by TAST. Additionally, we will seek to further decrease the operational costs of the prototype.