T Pay

The distributed/decentralised payment alternative

By Team glyph

Features of Application

Consistency

System design and details

Performance

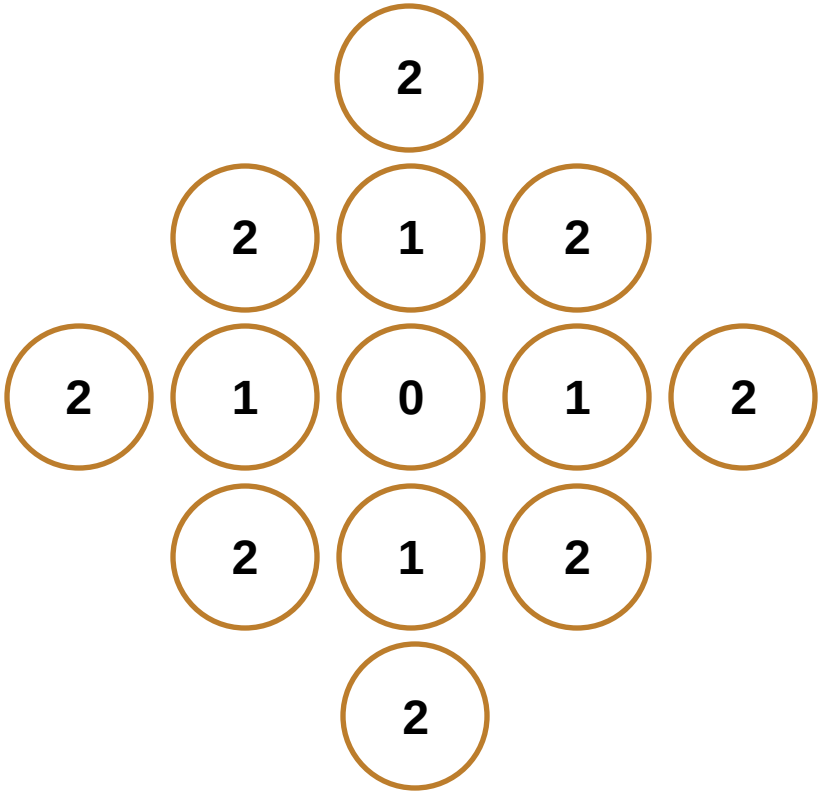
Deployment and benchmarks

Quirks

Additional features of application

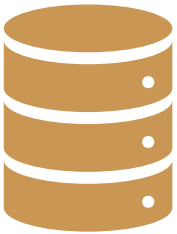
Weighted Network

- Created system from the ground up and does not use any scaling/storage software
- Allows for distributed networking without the need for computationally expensive proofs



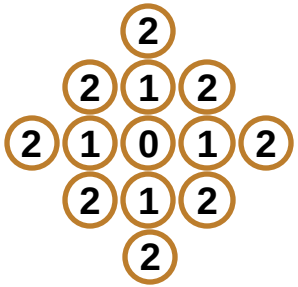
Comparisons

Single Database



Unable to scale and handle high throughput

Weighted Network



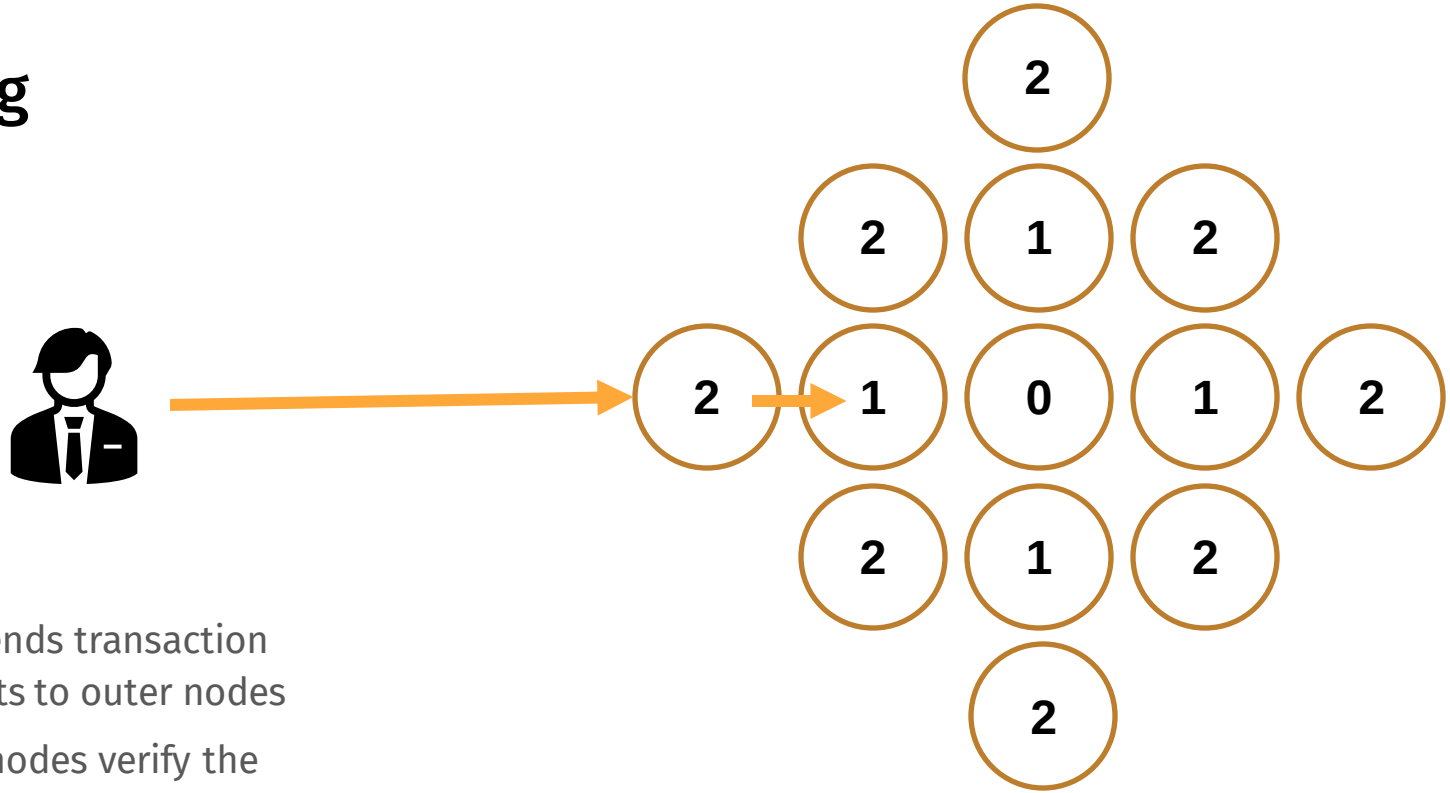
No expensive proofs needed, Easily scalable due to distributed nature

Decentralised Net

(e.g. Bitcoin)

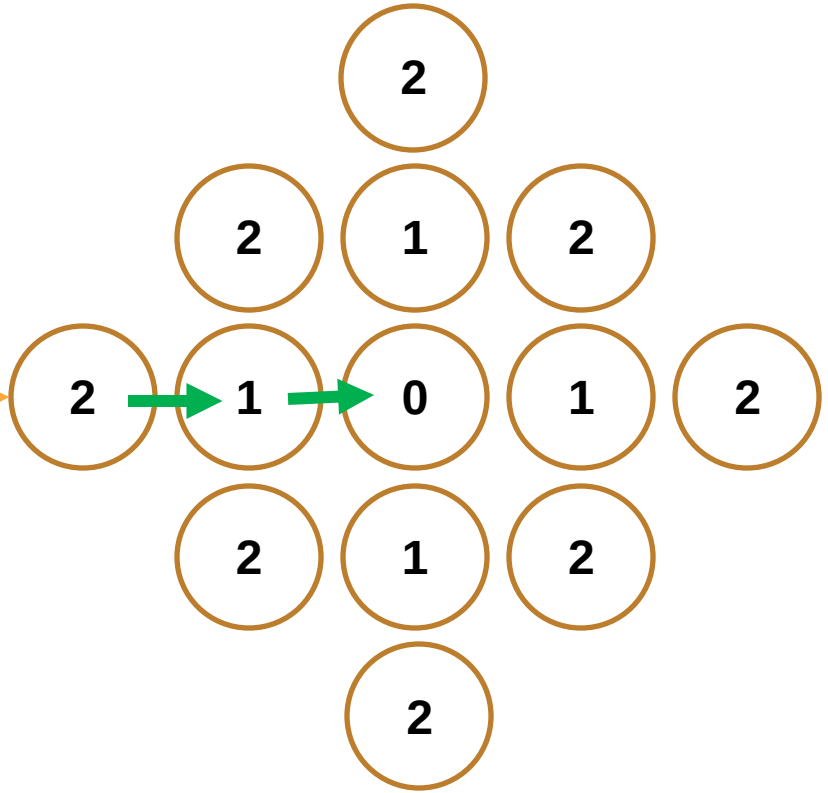
Expensive proofs like Proof of Work requires a long time before transaction propagation

Writing



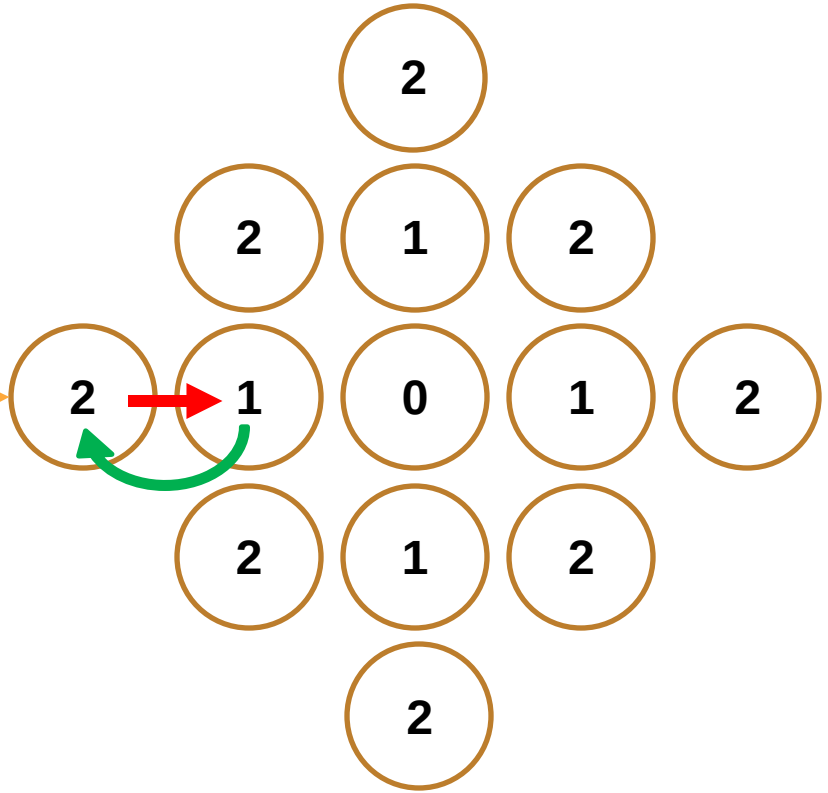
- User sends transaction requests to outer nodes
- Outer nodes verify the validity of transaction and propagate it to inner nodes

Writing (Correct case)



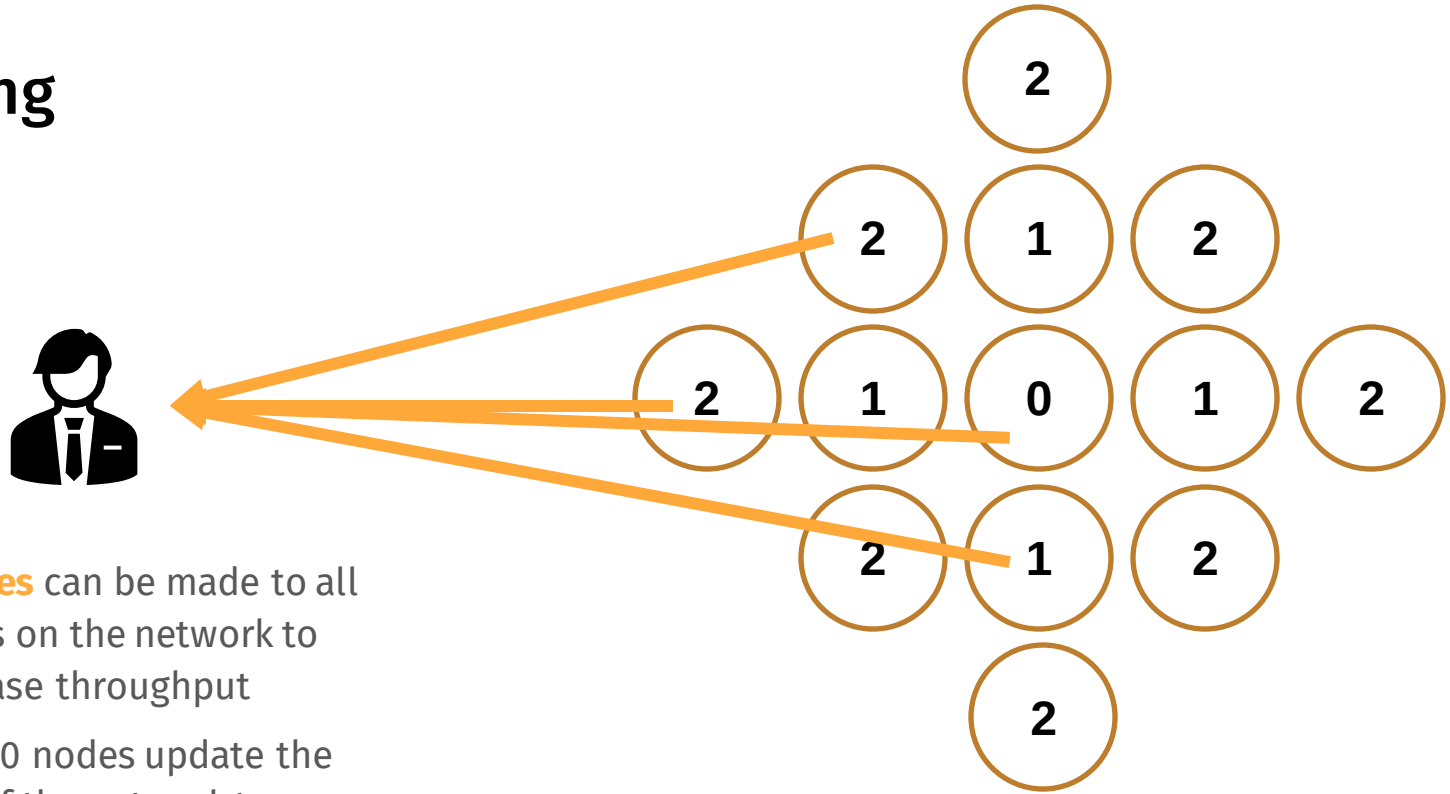
- If the transaction is valid, it is propagated to the master node(s) at ‘Level 0’
- All nodes will fall back to the master configuration in case of errors

Writing (Wrong case)



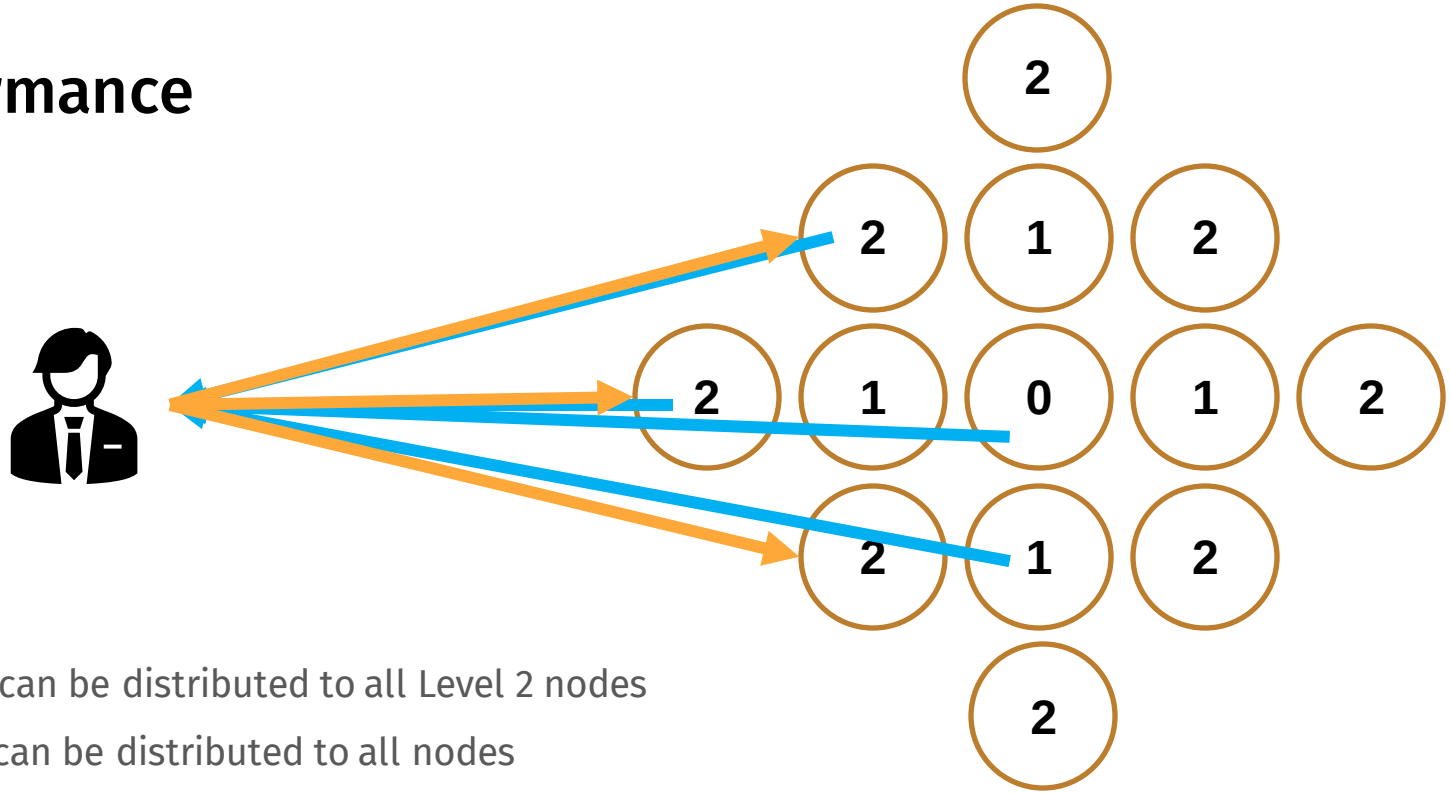
- If the transaction is invalid, it means the Level 2 node is not in sync with the Level 1 node
- Level 2 node will get latest version of ledger from Level 1 node and sync accordingly

Reading



- **Queries** can be made to all nodes on the network to increase throughput
- Level 0 nodes update the rest of the network to maintain consistency

Performance



- **Writes** can be distributed to all Level 2 nodes
- **Reads** can be distributed to all nodes
- Distributed networking for increased throughput

Benchmark Results

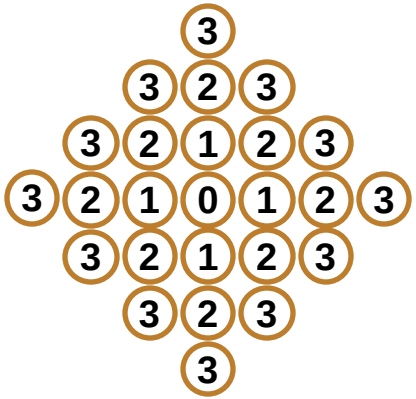
25K+

Reads per Second
per Server

1K+

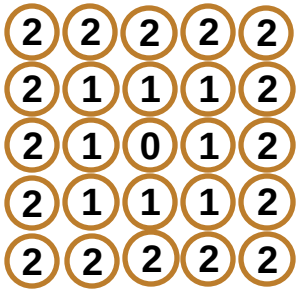
Writes per Second
per Outer Server

Scaling Methods



Increase the number of layers

Increases reliability at the cost of increased latency and slowdowns

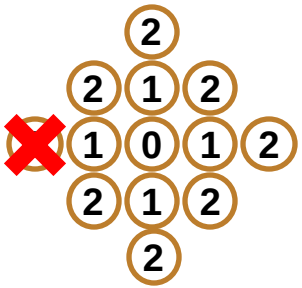


Increasing the number of nodes

Increases throughput but at the cost of increased volatility and inconsistency

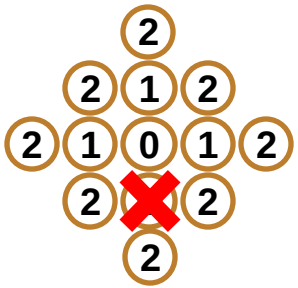
System Failures

Level 2 Node



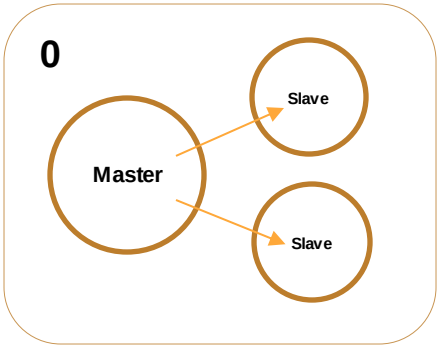
Other Level 2 Nodes available for read/write requests

Level 1 Node



Other Level 1 Nodes can verify and propagate transactions

Level 0 Node



Master Node has copies, which automatically replace Master Node in crash

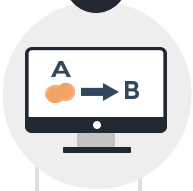
One More Thing – Cryptography!

Cryptography implemented with ECDSA to verify that transaction requests come from user and not from third party

Public key is matched with username and a hash of the transaction is signed to authorise it

Roadmap

1

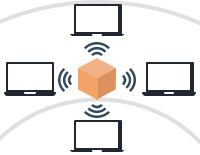


Deploy more nodes to increase capacity

2

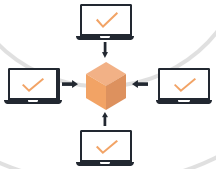
Switch to Rust/C++ for speed

3



Add one more layer of nodes for stability

4

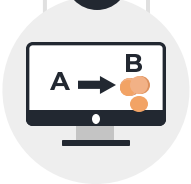


Add more secure cryptography

5

Switch to consensus-based masters

6



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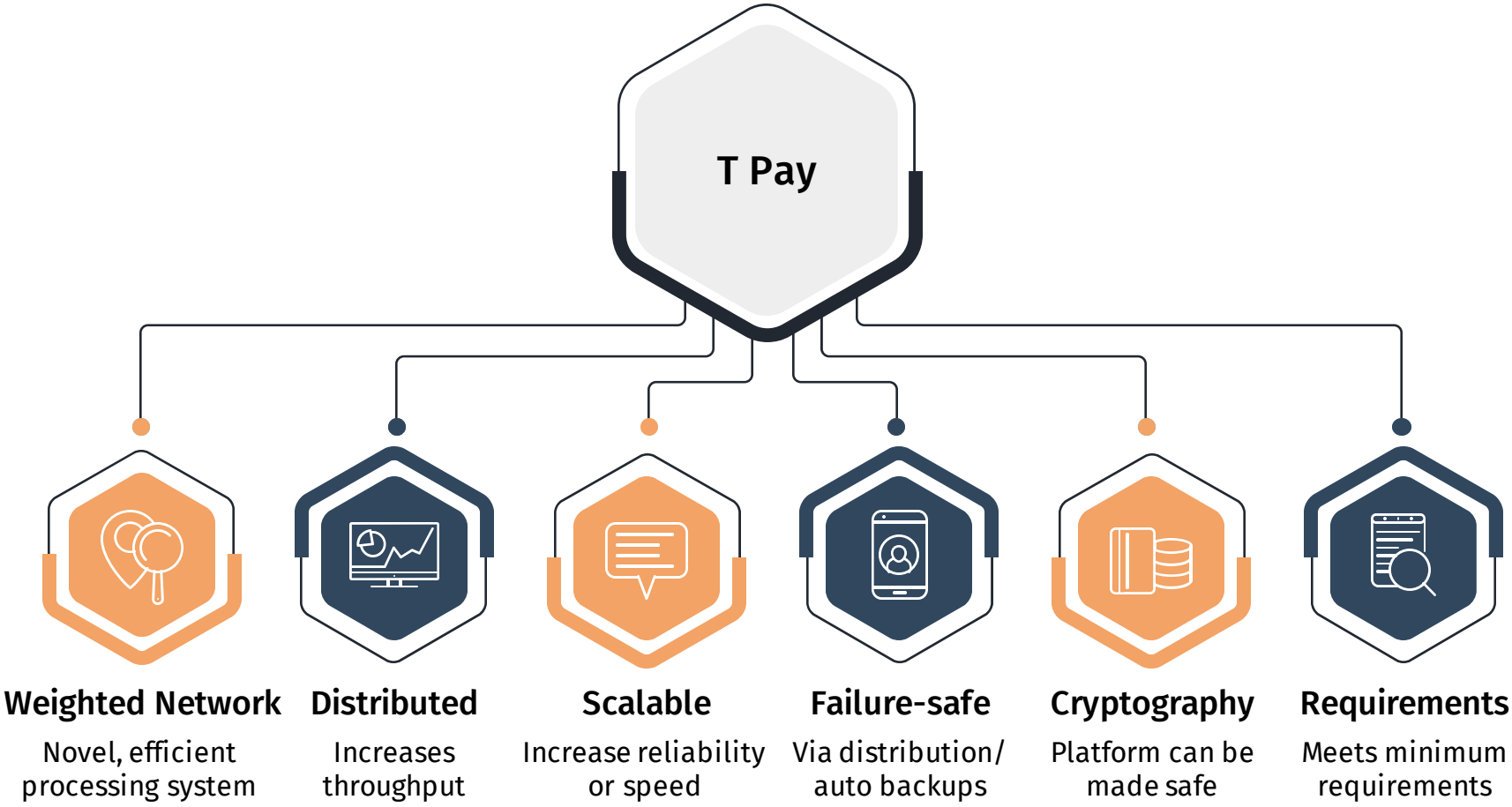
T Pay
Weighted Network
Novel, efficient processing system
Distributed
Increases throughput
Scalable
Increase reliability or speed
Failure-safe
Via distribution/ auto backups
Cryptography
Platform can be made safe
Requirements
Meets minimum requirements