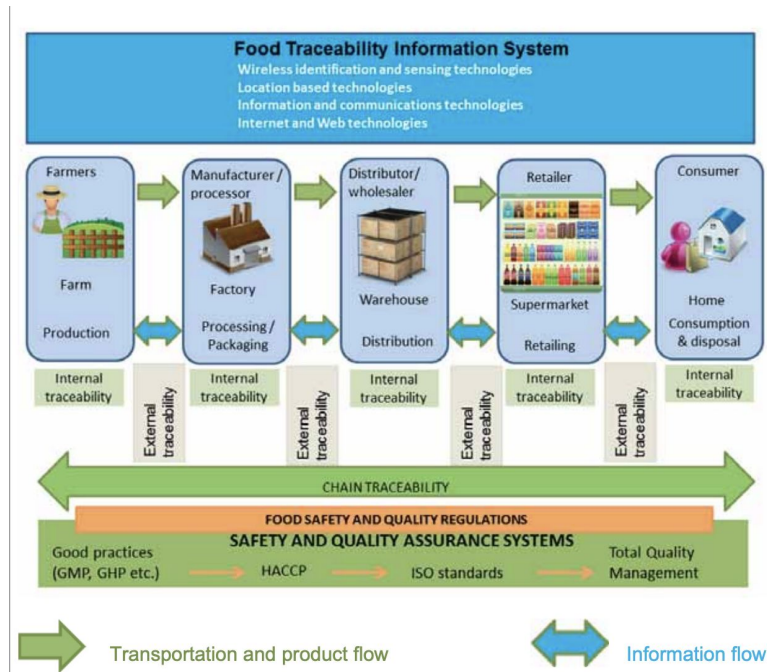# DLT x Food Traceability

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Traceability use case in the agricultural sector

Food Traceability Information System
Wireless identification and sensing technologies
Location based technologies
Information and communications technologies
Internet and Web technologies

Farmers	Manufacturer / processor	Distributor/ wholesaler	Retailer	Consumer
Farm	Factory	Warehouse	Supermarket	Home
Production	Processing / Packaging	Distribution	Retailing	Consumption & disposal
Internal traceability	Internal traceability	Internal traceability	Internal traceability	Internal traceability

External traceability

CHAIN TRACEABILITY

FOOD SAFETY AND QUALITY REGULATIONS
SAFETY AND QUALITY ASSURANCE SYSTEMS

Good practices (GMP, GHP etc.) → HACCP → ISO standards → Total Quality Management

Transportation and product flow

Information flow

Solution in the literature

- 4 roles
- Core functionality is to be able to trace the steps of a given product, that will be called "Item", from the production by the farmer to the purchase of the final consumer
- 7 functions and 12 steps describe the state of the item in the supply chain

Technologies used in the project

Solidity and Ethereum

Ethereum is an implementation of the blockchain model, which uses the Proof of Stake schema. New block every 12 seconds.

Solidity is a programming language for smart contracts.

Kurtosis

Kurtosis is an architecture simulator and deployer.

It needs the Docker engine and it simulates both the execution clients and consensus clients

Hardhat

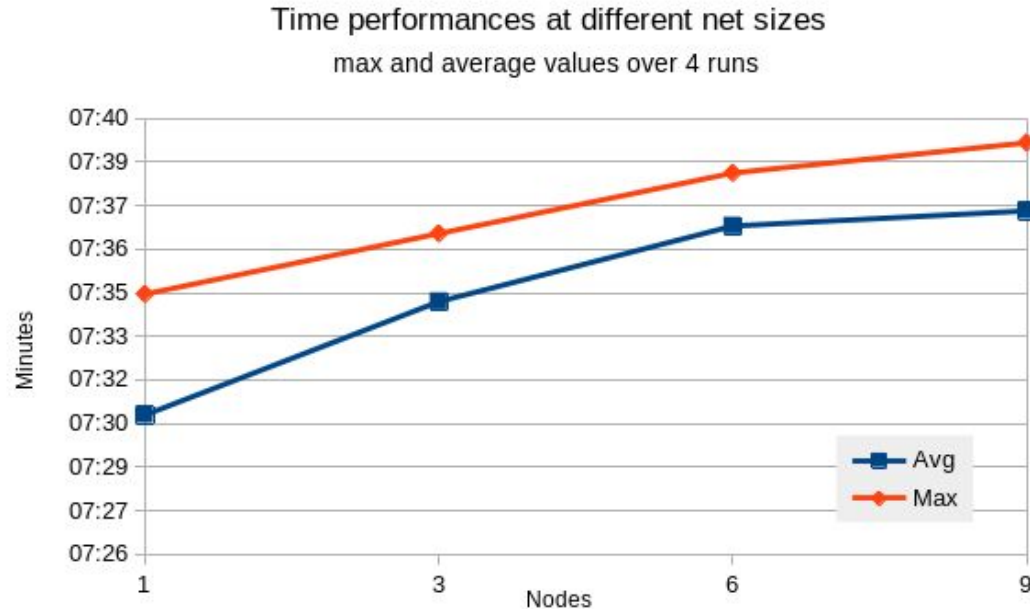Hardhat is the module that interacts with the execution client, injects requests, transactions, and obtains information
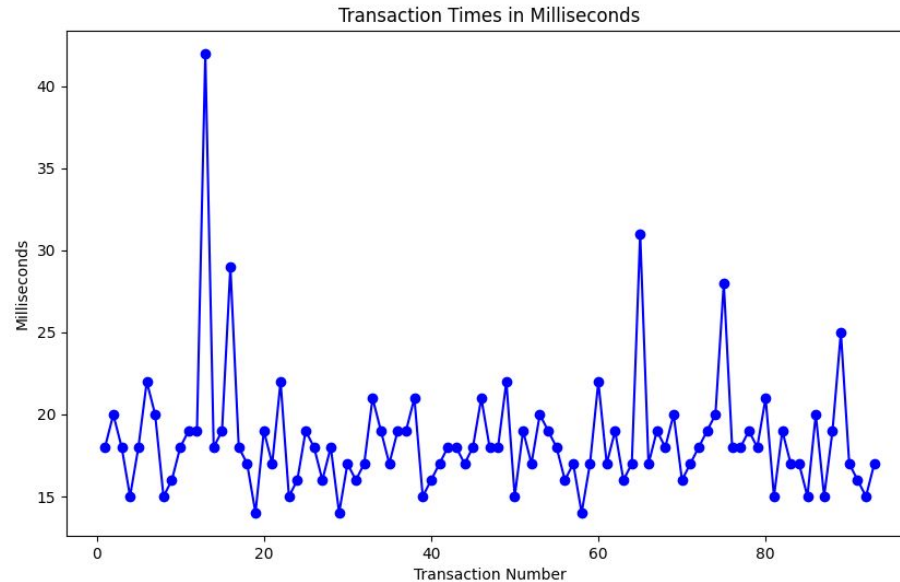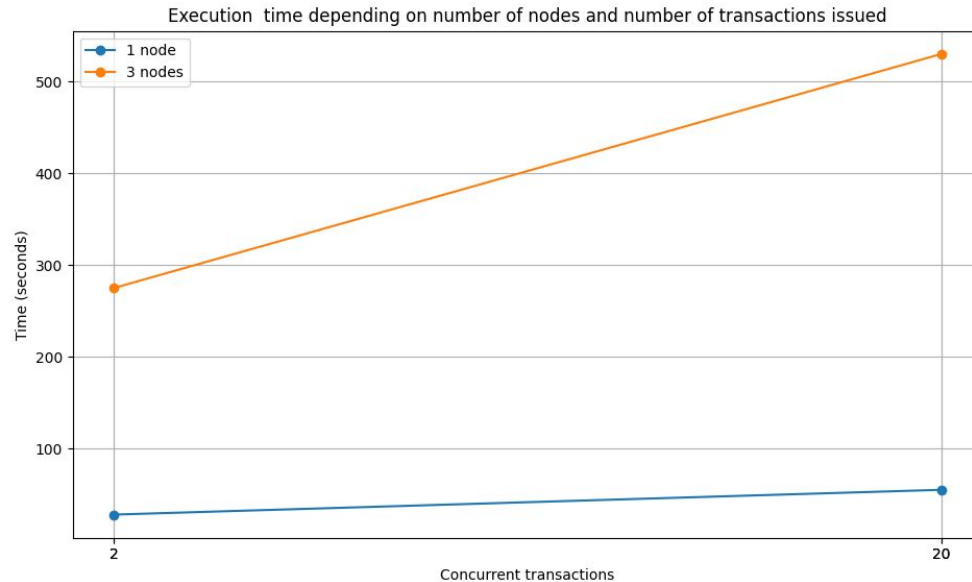
Performance evaluation

Performance tests with different network sizes

Time performances at different net sizes

max and average values over 4 runs

Performance evaluation on number nodes issuing transactions

Transaction Times in Milliseconds

Performance test with concurrent transactions

Comments and limitations

- We couldn't run all the tests because the available hardware was strongly limited
- We witnessed an increase in execution time when the net grows

Thank you for your attention