UniCon: A Scalable and Universal Architecture for Content Management

1 Problem statement

Current content-sharing platforms are either sector-specific in which big corporations own the control and data of its users [1], or decentralised and exchanging Non-Fungible Tokens (digital content).

The four main problems of current decentralised solutions are:

- Non-universal content
- Non-scalable with high transaction fees blockchain [2]
- Non-verified identities
- Dependency to Ether coin

2 Research Question & Methodology

The main **research question** is:

How can we design a universal and scalable content-sharing architecture with verified Self-Sovereign Identities (SSI) and generic coin transfer?

The **methodology** is:

- Evaluate current centralised and decentralised content-sharing platforms
- Design the universal and scalable architecture
- Prototype the skeleton of such architecture
- Execute a first scalability evaluation on the new architecture

3 Solution

- **Universal content:** Digital and physical items
- **Generic digital coin:** Possibility to use any digital coin, including stablecoins
- **Accountability-based blockchain:** fraud prevention rather than fraud detection approach
- **Verified Digital Identities:** Trusted third-party identity verification

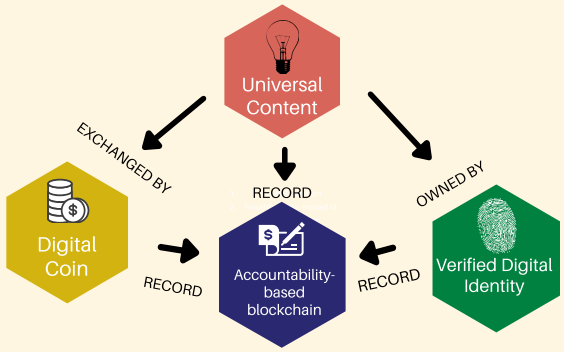

Figure 1: Four pillars of the architecture and their interaction

4 System architecture of the prototype

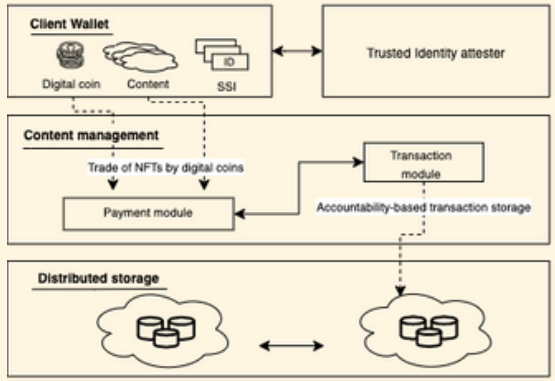

Figure 2: System architecture of the prototype of UniCon

5 Experimental Results

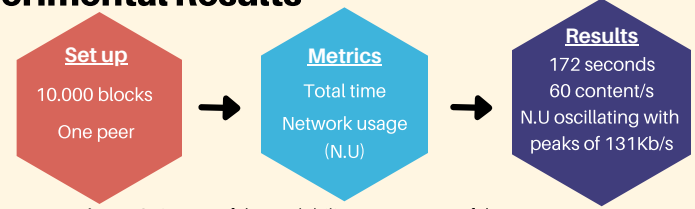

Figure 3: Stages of the scalability assessment of the prototype

6 Conclusion

We have **shown UniCon** is:

- Universal
- Generic in terms of coin
- Self-Sovereign Identity compliant
- Scalable*

We can conclude that with adequate scalability, UniCon has the potential to reach **mass adoption.**

*Scalability has been tested with regards to one peer, a further multi-peer scalability assessment is needed to evaluate the ability of UniCon to cope with mass adoption

7 References

[1] M. R. Wigan and R. Clarke, "Big Data's Big Unintended Consequences," in Computer, June 2013

[2] Qin Wang, Rujia Li, Qi Wang, and Shiping Chen. Non-fungible token (nft): Overview, evaluation, opportuni-ties and challenges, 2021

TU Delft Blockchain Lab

Pablo Rodrigo
P.RodrigoValero@tudelft.nl

Supervisor: Martijn de Vos
Responsible professor: Johan Pouwelse