



Poseidon Chain Technical WhitePaper

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Abstract

Enterprise level innovation is often an difficult and iterative process; entrepreneurs have established existing business models and being using them for decades. There have been proven to be no exceptional case for enterprises to develop under modularization. In this paper, we present a public infrastructure enables, incentivizes and modularize enterprise development. This infrastructure is composed of 1. Interoperability to help enterprises to interact easily and 2. Authenticity to ensure efficient governing system and 3. Extensibility to help iterate it with scalability.

I. PREFACE

This is intent to be a enterprise summary of how Poseidon is likely to pivot to in the blockchain paradigm with some rationale as why the direction is sensible. This is not intended to be a specification, formal or otherwise. It is not intended to be comprehensive nor to be a final design. It is not intended to cover non-core aspects of the framework such as APIs, detailed plans and usages. This is notably experimental; ideas and frameworks will likely to be changed. Large portion of this paper will be revised as experimental evidence.

II. INTRODUCTION

In 1913, Henry Ford invented the very first moving assembly line for mass production of the entire world. His innovation reduced the time it took to build a car from more than 12 hours to two hours and 30 minutes.

The great invention of assembly line have been implied extensively in clothing, food, and political systems. This system have never been proven to be used with enterprise level innovation due to 3 primary reasons:

1. Security: Flows of goods, services and finance reached \$26 trillion in 2012, or 36 percent of the global GDP, and it is expected to reach \$54 trillion by 2025. With tremendous good and services are being traded rapidly across the world, the global landscape and security of data flow becomes a challenge.
2. Destitution of Infrastructure: The development of IoT, Artificial Intelligence, Blockchain and Machine Learning is critical to the modern enterprise environment. In which, some of these tools have not been massively adopted due to lack of infrastructure.
3. Isolatability: Enterprises often live in ivory towers and avoid changes for stability.

Corporations such as KodaK, Nokia and Yahoo are considered to be anachronistic due to adjustable traditional models. In today's society, new business models and ideas are being created instantaneously. As such, harvesting innovation and reward both consumers and entrepreneurs become critical to productivity. KodaK is just one of many well established corporations fail anachronistically, and it is very clear current centralized system does not reflect the needs of enterprises.

Poseidon provides a public trusted infrastructure based on blockchain to incentivizes collaboration. Rather than discourage enterprises to build businesses in an iron ivory tower, Poseidon allow different parties to interact under a highly trusted environment with strong fundamental technical support.

III. ISSUES

A. Unequal Resource Distribution

Enterprises and individual entrepreneurs are being driven out of the market. Companies such as Amazon, Ebay and Alibaba dominate over ½ of global online retail markets. In addition, these online retail giants hosted and manipulated consumer purchase data to influence consumer purchase decisions and manufacture products with highly interested rate and put private labels. It is nearly impossible for smaller, underdeveloped enterprises to outcompete against these monstrosity acts.

Innovation at the enterprise level is hindered by this high friction of monopolization. It is time for a technical revolution from the basic level to transform the current business structures and encourage enterprises to innovate and break the barriers of entry.

B. Untrusted Environment

Organizational network identity is often missed in the traditional business environments. Enterprises are unable to trust third parties to intervene with transactions. This problem is common and reflect the frictional difficulties current enterprises are facing. Some of the general solutions to help business better organize and identify risks are often centralized.

IV. POSEIDON: PLAN FOR SMART ENTERPRISE

Project Poseidon is built to provide a decentralized platform to serve the modern enterprise with lower cost and a more effective “assembly” system. Poseidon is an upgradable system and can support the introduction of new functionality. Poseidon is built base on three crucial parts:

- Extensibility to support extensive enterprises on chain and off chain, technically, Poseidon needs to have mass data processing capacity and industrial level TPS.
- Unity to ensure low cost and high efficiency, including but not limited to efficient governance mechanism, eliminate forking and dynamic cost synthesis.
- Intercorpability to create an developers and enterprises friendly environment.

A. Extensibility and Integration

Poseidon achieves scalability as the same magnetite as the mainstream IoT systems by supporting massive data processing utilizing distributed performance systems.

a) Data Processing

Under the traditional data processing history, the relational data processing based on relational algorithm is very mature, and been proven to be effective. However, building relational data sets using blockchain have often times been a challenge. Poseidon developes a new data processing architecture. Which would be more suitable to store fragmented data on blockchain and provide a more rational data operational system. This will be achieved under two specific orders: storge and identify.

b) Decentralized Storage

Under this new architecture, Poseidon creates a new data processing structure, this structure is divided into three parts to describe data storage system: Schema, Relation and Data. Where Schema is used to describe data, Data is used for actual storage, and Relation is used to describe data relations.

c) High-performance relational query engine

Based on this general data model, Poseidon will also build a set of query engines implementing the relational algebra, which will translate the query instructions into the query engine through the interpreter to perform the retrieval of the actual data, and optimize the index creating process, data queries and retrieve metadata from memory to greatly reduce the time of performing semantic checks during the query.

B. Enterprise Transaction Per Second (TPS) Performance

The main performance bottleneck often encountered by these blockchain projects is the difficulty of concurrent computing. Ripple uses multithreading but separates jobs by modular only. The actual block “packing” process is still being executed sequentially. This does not improve performance in the core blockchain ideology; and introduced a lot of synchronization work, resulting far away from partial computation capabilities.

Poseidon uses a Lock-free smart contract execution architecture in a multicore environment for concurrency. On the basis of this architecture, Poseidon implements a new multi-level smart contract to execute at the code level using lock-free smart contract.

Poseidon will also execute these smart contracts based on Virtual Machine (VM), and run concurrently on multiple cores based on the new data fragmentation model. Poseidon will implement a multi-core shared lock-free data access interspace, and divide data into pieces simultaneously. Combining these two parts, Poseidon is able to increase TPS by hundreds of times realistically.

C. Efficiency

The development of industry has a very similar pattern using Moore’s Law. Given the cost unit is exponentially declining, while the requirement for data processing and management increases exponentially as well. Poseidon uses these metrics listed below to ensure true efficiency enterprise level infrastructure.

a) Governance

Poseidon provides a highly efficient voting system, which including two factors: Nomination and Voting.

Poseidon creates a decentralized voting system, in which all POSE(Poseidon Native Token) holders have the ability to vote. Users vote through a smart contract built into the system, and the voting results will automatically complete within a limited time frame.

b) Nodes

Poseidon users may vote randomly at a specific time frame, and vote for primary nodes and reserve nodes. Primary nodes will be responsible for ensuring stable

operations of the network, these primary nodes will also be responsible for verification of transactions and birth of new blocks. Reserve nodes will need to replace primary nodes and ensure all operations are stable.

c) Resolution

Poseidon will achieve a resolution process organization system (RPOS). Upon a motion being processed, there will be three levels of voting take place: 1) The Poseidon WAVE foundation Council Cabinet. 2) All of the primary nodes and 3) primary nodes and the reserve nodes. If the motion still is not resolved, then this particular motion will be moved to the entire community for further negotiation.

D. Technical Scalability

In order to fulfill the complexity needs of enterprises, Poseidon will use Wasm (WebAssembly), since it is generally considered to become a replacement of EVM. Poseidon will also integrate QuickJS for the extensive functionality complement.

QuickJS is the smallest and fastest embeddable Javascript engine and support ES2019 completely. It will greatly increase the friendliness to its developers.

In addition, Poseidon will also achieve the following:

- Storage Security and smart contract development will be sustainable.
- Support 32-bit and 64-bit integer arithmetic, support CPU instructions and remove floating point arithmetic to achieve certainty.
- Compile and execute smart contracts into binary files for distribution and execution based on compiler optimization.
- Smart Contract sharding and efficient virtual machine loading.

Based on such an intelligent searching engine, Poseidon will support a wide variety of developing languages, including but not limited to C, C++, GO, Java, Javascript, Python, Rust and even fresher language such as Kotlin.

Poseidon will also provide a series of standardized modules, tools for developers to develop on Poseidon.

V. CONCLUSION

This paper have clearly outlined a direction Poseidon may take. Enterprise level blockchain is inevitably going to change the existing business structures. Under such protocol, participants can work in massive collaborations without the traditional centralized oppression. We have identified the basic design and discussed the strengths and limitations, this paper will not define where Poseidon will land, however, it is confident to say the least, Poseidon may very well be the ultimate enterprise level solution in the future for business over all.