RSS3: The Open Information Layer

Natural Selection Labs

***Abstract*—Inspired by the original RSS Standard, this paper presents RSS3, Open Information Layer for the Open Web. The paper serves as an enhanced version of our initial whitepaper titled "RSS3: A Next-Generation Feed Standard." Following the release of our initial whitepaper, we have adhered to its proposed architecture to conduct experiments and advance the development of the RSS3 Network. The Network has transformed into what is now known as the Open Information Layer, reflecting the evolving dynamics of the Open Web. This paper summarizes our research and development progress since then, providing insights into RSS3's vision and its decentralization architecture.**

I. Introduction

II. Open Information Layer

The Open Information Layer (OIL) is a conceptual layer that is formed by two sub-layers: the Data Sub-layer (DSL) and the Value Sub-layer (VSL). Information from permissonless data sources on the OIL flows openly without any restrictions.

III. Data Sub-layer

The DSL is responsible for information life cycle management, which includes indexing, transformation, storage, dissemination, and consumption [1]. The DSL is formed by two components (see section III-A and section III-B), and uses the Unified Metadata Schemas (UMS) (see section III-C) to structure the information.

A. Serving Node (SN)

An Serving Node (SN) is responsible for indexing, cleaning, storing, and ultimately serving the Open Information to the end users. Each SN operates a number of workers that index and structure information from Permissionless Data Source (PDS), stores the information, and provides interfaces for access.

B. Global Indexer (GI)

An Global Indexer (GI) is responsible for facilitating coordination among SNs and engaging with the VSL, and performs the following functions:

1) A load balancer and query router for end users to retrieve information from SNs.
2) A supervisor for SNs to ensure the quality of service.
3) A settler for submitting work and slash records to the VSL.

C. Unified Metadata Schemas (UMS)

Open Information, indexed from multiple PDSs, is structured by SNs into the UMS format for interoperability.

PDSs use different data structures, within a PDS, there might be multiple products, services and protocols that leverage a different data structure to suit their needs. This means limited interoperability, and developers need to look into each and every data structure, when it comes to building. This lack of standardization means developers must investigate each unique structure individually when building applications, which is not scalable.

The UMS addresses this issue by offering a unified set of data structures that serve as an abstraction. This abstraction simplifies the integration process, making it more manageable and scalable for developers to work with data across various data sources.

For the complete set of the UMS, refer to https://docs.rss3.io/docs/unified-metadata-schemas.

IV. Value Sub-layer

V. Incentive

A. Incentivization

The RSS3 Network, on the other hand, will be rewarding network participants with the profit of the network generated from advertising, value-added services, social economic activities, etc.

B. Staking and Slashing

C. Incentive Pool

1) Operator Pool:

2) Reward Pool:

VI. Scalability

VII. Conclusion

At the heart of Natural Selection Labs, we firmly believe in the freedom of information distribution: No organizations or authorities shall prohibit the free exercise of the right of people to create, store, and distribute their information.

Glossary

Data Sub-layer (DSL)
: A decentralized network where the Open Information flows from its source to its destination.

Global Indexer (GI)
: A Data Sub-layer component that facilitates coordination among Serving Nodes and engages with the Value Sub-layer.

Open Information Layer (OIL)
: Formed by a Data Sub-layer and Value Sub-layer.

Open Web (OW)
: The next-generation Internet where information flows openly without any restrictions, as it is supposed to be.

Permissionless Data Source (PDS)
: A repository of data that can be accessed without the need for authorization or authentication.

Serving Node (SN)
: A Data Sub-layer component that indexes, cleans, stores, and ultimately serves the Open Information to the end users.

Unified Metadata Schemas (UMS)
: A unified set of data structures for interoperability.

Value Sub-layer (VSL)
: A blockchain where the value created by Open Information activities is recorded and distributed.

REFERENCES

[1] National Institute of Standards and Technology. Information life cycle. https://csrc.nist.gov/glossary/term/information_life_cycle, 2016.