Request Network

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1. Executive Summary

On the Bittensor[1] Protocol, validators not only verify the work done by the miners; they are also the "storefronts" or public-facing entities on the network. Current access to these storefronts is limited, and due to the lack of standardization, access to these storefronts is wildly inconsistent.

Taoshi's Request Network (RN) is a first-of-its-kind platform and standard that incentivizes validators to receive and fulfill third-party requests. Doing so will bring the value of subnets to third parties, increasing the overall Bittensor network usage, thus making the network more valuable. Additionally, the Request Network not only provides validators with a financial incentive but also allows them to properly assess the value of each subnet based on tangible returns, allowing them to prioritize various subnets. Doing this will also improve the health of the ecosystem.

The Request Network will facilitate a new era of data accessibility and monetization within the Bittensor ecosystem. By enabling seamless data exchange between validators and consumers, the platform will unlock the untapped potential of subnets, driving innovation and value creation across various industries. The Request Network's open-source architecture and flexible design will ensure its adaptability to the evolving needs of the Bittensor community and the wider data market.

2. Introduction

Due to the nature of the Bittensor ecosystem, competition exists at nearly every layer. Miners compete against other miners to produce the best result, validators compete against other validators to correctly grade and verify the results, and finally, subnets compete to provide value to validators and miners, thus getting a higher delegation.

In further continuation, the Request Network aims to add another layer of competition, at the consumer level. Third parties will select the best storefront (validators) that serves their purposes. These incentivized storefronts will in turn benefit the ecosystem as a whole.

The introduction of the Request Network marks a significant milestone in the evolution of the Bittensor ecosystem. By providing a standardized and incentivized platform for data exchange,

the Request Network will foster a vibrant and thriving marketplace where validators can monetize their services, and consumers can access high-quality, specialized data. This symbiotic relationship will drive network usage, attract new participants, and enhance the overall value proposition of the Bittensor protocol.

Moreover, the Request Network's potential extends beyond the immediate Bittensor community. As the platform matures and gains traction, it has the potential to attract a diverse range of industries and use cases, positioning Bittensor as a leading provider of decentralized solutions. The Request Network's success will not only benefit the Bittensor ecosystem but also contribute to the broader adoption and growth of decentralized technologies and data-driven innovation.

3. Problem Statement

The current landscape of Bittensor requires an outside entity to contact and vet a known validator, and said validator would need appropriate infrastructure to facilitate transfer of services. Outside entities may include those who require heavy data usage, rate limiting, low latency, and more. Such infrastructure may prove to be cumbersome for validators to implement.

As the Bittensor network evolves, it's important to note that the changes in rewards are designed to maintain a fair and balanced system. Over time, the emissions provided to validators will continue to diminish. This adjustment ensures that miners and validators are both rewarded appropriately, with miners receiving more rewards, and validators being offered fewer rewards.

This is a natural progression as miners do much of the heavy lifting. Subnets will become more challenging to compete in (higher cost of resources) and need further incentive to respond to requests.

Furthermore, the lack of a standardized and user-friendly platform for accessing subnet data creates significant barriers for potential consumers. Third parties interested in utilizing the valuable data generated by Bittensor subnets often face challenges in discovering relevant data sources, establishing trust with validators, and negotiating the terms of data exchange. This fragmented and inefficient process hinders the adoption and utilization of Bittensor data, limiting the network's potential for growth and impact.

Moreover, the absence of a clear incentive structure for validators to serve and monetize their data further compounds the problem. Without a reliable mechanism to earn rewards for their services, validators may lack the motivation to invest in the necessary infrastructure and resources to support third-party requests. This not only undermines the overall health and

sustainability of the Bittensor ecosystem but also restricts the flow of valuable data to external entities that could benefit from it.

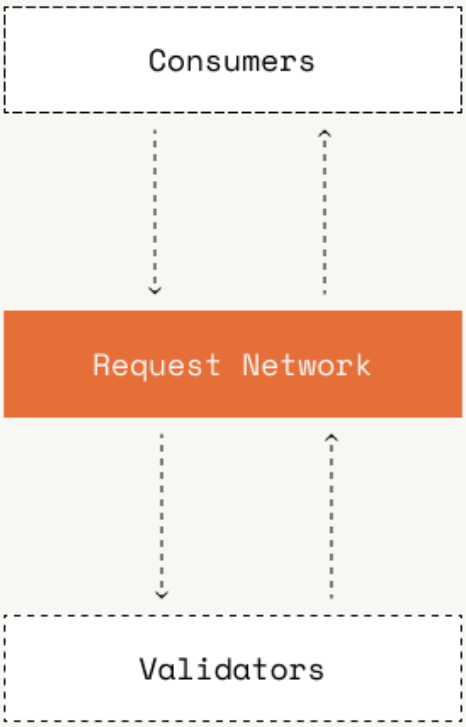
To address these critical issues and unlock the full potential of the Bittensor ecosystem, a comprehensive solution is needed. The proposed solution should streamline the data exchange process, provide a user-friendly interface for consumers, offer a clear incentive structure for validators, and ensure transparency and accountability.

4. Problem Solution

To address these critical issues, Taoshi proposes the development of the Request Network. The Request Network is an open-source platform designed to enable third parties to buy and receive data provided by validators, allowing third parties to use subnet data and incentivizing validators to give data in return for stablecoins as payment. The core architecture of the Request Network consists of three essential pillars:

1. **Validators:** Entities that verify and offer data for sale.
2. **Consumers:** Third parties who offer incentive and utilize data via the Request Network.
3. **Request Network:** The underlying protocol that facilitates secure and efficient transfer between validators and consumers.

In the following sections, we will provide a concise overview of the key characteristics and roles of each component within the preliminary system to be developed at Taoshi.



4.1 Validators

Validators play a crucial role in the Request Network by verifying and offering data for sale to consumers. They serve as the primary data providers and act as the "storefronts" for third parties seeking access to valuable subnet data. Key responsibilities and characteristics of validators within the Request Network include:

1. **Service Verification:** Validators are responsible for ensuring the accuracy and integrity of the services they provide to consumers. They must implement robust verification mechanisms to maintain the trust and reliability of the Request Network.
2. **Service Availability:** Validators must ensure that the data they offer is readily available and accessible to consumers through the Request Network.
3. **Pricing and Incentivization:** Validators have the flexibility to determine their own pricing models for the data they provide. They can set competitive prices based on factors such as data quality, uniqueness, and demand. Validators are incentivized to participate in the Request Network as they can earn stablecoins as payment for their services.
4. **Reputation Management:** Validators must maintain a strong reputation within the Request Network to attract consumers and establish long-term relationships. Factors such

as data quality, reliability, and responsiveness to consumer requests contribute to a validator's reputation.

5. **Customization and Flexibility:** Validators have the option to customize their offerings and tailor their services to specific consumer requirements. They can choose to specialize in certain types of data or cater to specific industries or use cases, depending on their expertise and the demands of the market.

By participating in the Request Network, validators gain access to a broader consumer base and have the opportunity to monetize their data assets. They play a vital role in bridging the gap between the Bittensor ecosystem and external entities seeking valuable subnet data.

4.2 Consumers

Consumers are third-party entities that receive subnet data from the Validators via the Request Network. They play a crucial role in the ecosystem by driving demand for data and providing financial incentives to validators. Key characteristics and roles of consumers include:

1. **Service Acquisition:** Consumers utilize the Request Network to access and acquire valuable subnet data from validators.
2. **Pricing and Payment:** Consumers agree to the pricing terms set by the validators for the desired data. They provide financial incentives in the form of stablecoins to the validators in exchange for access to the data. This creates a direct financial relationship between consumers and validators.
3. **Service Utilization:** Consumers integrate the acquired subnet data into their own systems, models, or applications. They leverage the data to enhance their operations, gain insights, or develop innovative solutions. The Request Network enables consumers to access a wide range of high-quality data sources to support their specific use cases.

By participating in the Request Network, consumers gain access to a diverse range of subnet data, enabling them to enhance their models, drive innovation, and unlock new opportunities. The Request Network provides a streamlined and efficient mechanism for consumers to discover, acquire, and utilize valuable data assets from trusted validators.

4.3 Request Network

The Request Network (RN) serves as the critical infrastructure layer within the Bittensor ecosystem, enabling seamless and secure interactions between validators and consumers. As a peer-to-peer platform, the RN is designed to streamline the process of data exchange, ensuring that transactions are not only efficient but also adhere to the highest standards of security and compliance.

1. **Marketplace:** The Request Network provides a marketplace where validators can list their available data offerings, and consumers can browse and discover relevant data sources. The marketplace allows for easy navigation, search functionality, and filtering options to help consumers find the data they need efficiently.
2. **Handshake Mechanism:** The Request Network facilitates the initial connection and agreement process between validators and consumers, managing the exchange of API keys and terms efficiently. This streamlined process ensures a smooth and secure interaction between the parties involved.
3. **Payment and Incentive Coordination:** The Request Network coordinates the payment and incentive mechanisms between validators and consumers. It ensures that the agreed-upon financial transactions are executed securely and transparently. Stablecoins are used as the primary means of payment, providing stability and mitigating the risks associated with cryptocurrency volatility.
4. **Data Transfer and Delivery:** The Request Network provides the necessary infrastructure and protocols to facilitate the efficient transfer and delivery of data from validators to consumers. It ensures that the data is transmitted securely and reliably, maintaining the integrity and confidentiality of the information exchanged.
5. **Analytics and Reporting:** The Request Network offers analytics and reporting capabilities to provide valuable insights to both validators and consumers. Validators can access aggregated network transactions and revenue data, enabling them to track their performance and make data-driven decisions. Consumers can monitor their data acquisition activities and gain insights into the effectiveness of their data-driven strategies.

The Request Network is designed to be an open-source platform, allowing for flexibility and customization. Validators and subnet owners have the freedom to tailor the platform to their specific needs, such as spinning up or down services, setting pricing models, and integrating additional features or functionalities.

By providing a robust and reliable infrastructure, the Request Network enables the efficient and secure exchange of data between validators and consumers. It serves as the backbone of the data ecosystem, facilitating the growth and adoption of data-driven solutions within the Bittensor network and beyond.

5. Potential Use Cases

The Request Network enables a wide range of potential use cases, leveraging the power of Bittensor subnets to provide valuable data to various industries and sectors. Some of the potential use cases include:

1. **Financial Services:** Subnets such as Taoshi or SN8, focused on financial data, such as stock market predictions, sentiment analysis, and economic indicators, can provide

valuable insights to financial institutions, investment firms, and traders. The Request Network enables these entities to access real-time, high-quality financial data to inform their investment strategies and decision-making processes.

2. **Large Language Models:** Subnets dedicated to large language models, for example, can provide access to powerful natural language processing capabilities. Through the Request Network, developers, researchers, and businesses can leverage LLM-based services for tasks such as text generation, sentiment analysis, language translation, and chatbot development. This subnet can democratize access to advanced language technologies, fostering innovation in content creation, customer support, and linguistic research.
3. **Decentralized Storage:** Subnets focused on decentralized storage solutions can offer secure, reliable, and censorship-resistant data storage services. By integrating with the Request Network, this subnet can enable users and businesses to store and retrieve data decentralized, ensuring data privacy, integrity, and availability.
4. **Healthcare and Life Sciences:** Subnets specializing in healthcare data, such as medical research, clinical trials, and patient data analysis, can benefit healthcare organizations, pharmaceutical companies, and research institutions. The Request Network allows these entities to access anonymized and aggregated healthcare data, facilitating drug discovery, personalized medicine, and improved patient outcomes.
5. **Marketing and Advertising:** Subnets focused on consumer behavior, social media trends, and advertising effectiveness can provide valuable data to marketing agencies, brands, and advertisers. The Request Network enables these entities to access rich consumer insights, helping them optimize their marketing campaigns, target the right audiences, and measure the impact of their advertising efforts.
6. **Supply Chain and Logistics:** Subnets specializing in supply chain data, such as inventory levels, shipping routes, and demand forecasting, can benefit logistics companies, manufacturers, and retailers. The Request Network allows these entities to access real-time data on supply chain operations, enabling them to optimize their processes, reduce costs, and improve efficiency.
7. **Environmental Monitoring:** Subnets focused on environmental data, such as climate patterns, air and water quality, and ecological indicators, can provide valuable insights to governments, environmental organizations, and sustainability-focused businesses. The Request Network enables these entities to access accurate and timely environmental data, supporting initiatives related to climate change mitigation, resource management, and environmental conservation.

These are just a few examples of the potential use cases for the Request Network. As the Bittensor ecosystem continues to evolve and new subnets emerge, the range of use cases will expand, providing even more opportunities for data-driven innovation and value creation across diverse industries and domains.

The Request Network serves as a catalyst for unlocking the potential of Bittensor subnets, enabling seamless data exchange between validators and consumers. By facilitating access to high-quality, specialized data, the Request Network empowers organizations to make informed decisions, drive innovation, and solve complex challenges in their respective fields.

6. Future Development

The first iteration of the Request Network will bring core functionality, facilitating seamless data transfer between validators and consumers. However, several potential improvements could further enhance the quality of the platform. Outlined below are a few of them, in no particular order.

6.1 Validator Enhancements

The Request Network is an open-source platform primarily serving validators; as such, validators need as much information as possible on the usage of their RN. Taoshi UI and UX enhancements will provide a much-needed synthesis of their RN's performance, such as tracking aggregated network transactions and revenue, i.e., how many fulfilled transactions and how much revenue was received across Bittensor.

Taoshi is leading the charge in development of the Request Network; however, as an open-source platform, the Request Network allows users to modify the code according to their specific requirements.. Should a validator choose not to customize the code themselves the Request Network should be customizable allowing validators and subnet owners the freedom to spin up or down any service they'd like, paid or unpaid.

6.2 Subnet Inheritance

The Subnet owner can pre-define services that all validators then automatically inherit.

6.3 Consumer Enhancements

An integral part of the Request Network the consumers, or third parties interested in data from a particular subnet can seamlessly use the RN to connect to trusted sources. Due to the financial mechanisms via the consumer validator relationship, consumers should have as much information possible regarding their relationship with a validator.

6.4 Reputation and Feedback System

The Request Network should incorporate a reputation and feedback system that allows consumers to rate and provide feedback on the quality of data and the performance of validators. This information should be made available to other consumers, helping them make

informed decisions when selecting validators. The reputation system also incentivizes validators to maintain high standards of service and data quality.

7. Conclusion

The Request Network will provide a long-term solution to the data access problem and enable an entirely new ecosystem to form around high-quality data sources. Validators will have a new opportunity to monetize and distribute incentives throughout the network.

The introduction of the Request Network represents a pivotal step forward for the Bittensor ecosystem. By creating a standardized and incentivized platform for data exchange, the Request Network will unlock the true potential of subnets, enabling seamless collaboration between validators and consumers. This will foster a thriving marketplace where data is valued, monetized, and utilized to drive innovation across various industries.

Moreover, the Request Network's open-source architecture and flexible design ensure its adaptability to the ever-evolving needs of the Bittensor community and the broader data market. As the platform matures and attracts a diverse range of participants, it will contribute to the growth and adoption of decentralized technologies, positioning Bittensor as a leader in the decentralized data solutions space.

The benefits of the Request Network extend beyond the immediate Bittensor ecosystem. By providing access to high-quality, specialized data, the platform will empower organizations across industries to make informed decisions, develop innovative solutions, and tackle complex challenges. The Request Network will serve as a catalyst for data-driven breakthroughs, fostering collaboration and knowledge sharing on a global scale.

As we move forward, the success of the Request Network will rely on the collective efforts and commitment of the Bittensor community. By actively participating in the platform, providing valuable data, and continuously improving the network, we can create a robust and sustainable ecosystem that benefits all stakeholders.

In conclusion, the Request Network represents a transformative initiative that will reshape the landscape of data accessibility and monetization. By leveraging the power of decentralized technologies and the Bittensor protocol, we are creating a future where data is democratized, value is fairly distributed, and innovation knows no bounds. Together, we can unlock the full potential of the Request Network and drive the evolution of the Bittensor ecosystem and beyond.

Bibliography

1. Bittensor. (2023). Bittensor Documentation.