

\$SUPRA Token Utility

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Abstract

Supra is a cross-chain IntraLayer protocol enabling automation across Web2 and Web3 via highly secure and scalable smart contract interoperability. This network is powered by the \$SUPRA token, which is the denominated measure for the exchange of value and services on the network, and the primary tool for harmonising heterogeneous incentives of participants. In this note, we highlight the network's overarching vision and the utility of its token.

1 Motivating Vision

Imagine a vast, ever-evolving organism like a human being, but not just any organism - a digital organism. That is the all-encompassing Digital Finance Ecosystem (DFE). Its organs serve their own unique functions, representing different blockchains and digital systems. Just like in other complex organisms, these organs need to interact and coordinate with each other to maintain homeostasis, a stable internal environment that's essential for its survival and growth. One of the ways in which we aim for this to be achieved is through connection to the coordination layer - Supra's IntraLayer, which is meticulously designed to bolster the growth potential of this unique organism. Acting as its central coordination system, Supra's IntraLayer aims to connect to all organs in a hub-and-spoke pattern in order to effectively drive sustainable development and foster dynamic growth for the entire digital economy.

Enabling the organism are its sensory organs, receiving data and stimuli from its surroundings, assisting the organism to navigate the environment - functions that are served by Supra's oracle service. This oracle service is constantly scanning and perceiving the environment and communicating it back to Supra's blockchain infrastructure and eventually to the relevant organs. This flow of information is facilitated by Supra's bridge service, which is akin to the central nervous system, transmitting vital information between Supra's and other blockchains, enabling communication and coordination between different parts of the DFE organism.

This organism needs an interconnected command centre to coordinate all its

activities, integrate incoming sensory information, and harmoniously respond. This command centre, i.e., the brain, is Supra's IntraLayer smart contract platform and automation service. It not only receives and processes information received from Supra's Oracle and bridge services but also formulates strategies and transmits decisions and actions to the relevant organs. Interconnecting the brain and the central nervous system is Supra's automation service, which can be thought of as the spinal cord, responsible for reflexivity - regulating actions and reactions based on pre-specified triggers, enabling us to call our organism an intelligent one.

This organism's blood, which is the specialized fluid, is akin to digital assets transporting nutrients to enable the exchange of value. Like blood, these diverse digital assets comprise red blood cells, white blood cells, platelets, and plasma proteins. Like white blood cells, some of these digital assets help secure their respective networks from attacks (in the form of economic security via staking). Like red blood cells, some of these digital assets transport oxygen (value) and waste products (penalties) to the relevant parts. Like platelets, some of these digital assets act as the governance mechanism, ready to form a clot and prevent excessive bleeding. Like plasma, these assets act as the medium of exchange for information carrying the nutrients between relevant parts. These multi-faceted digital assets flow throughout the system using Supra's interconnected liquidity pools, which can be thought of as the organism's interconnected blood vessels residing in each organ.

By constricting and dilating these blood vessels, Supra's IntraLayer's awareness of the cross-chain state enables blood to be pumped and regulated to the individual organs and other blockchains. Supra's decentralised cross-chain Automated Market Maker (AMM) and the money market protocols are the embodiment of these analogies.

Therefore, much like a living organism, Supra's network uses its harmoniously interconnected components, i.e., the "vascular system", "nervous system", "brain", and "sensory organs", to support the organism's smooth functioning, well-being, and evolution in the ever-changing landscape of the new-age digital economy.

2 The System

We now consider how various modules of our blockchain network can come together to help achieve the vision outlined in the preceding section. First and foremost, Supra's network represents a fundamental evolution of blockchain technologies, which has heralded the advent of novel vertically integrated systems wherein a singular network efficiently caters to a plethora of services for its stakeholders. Furthermore, such a network necessitates a harmonised value control, regulation, and exchange framework that adeptly coordinates among its diverse services, thereby guaranteeing the network's long-term viability. With

its envisioned role as an IntraLayer network, Supra seeks to become the value and data aggregator for the fragmented digital asset world, facilitating the creation of novel value that is otherwise lost or left unmonetised in the cracks.

The existence of this fragmentation in the digital finance world, and beyond, can be understood from three broad lenses:

- **Data:** The lack of native communication and synchronisation between blockchain networks and other non-native sources of data creates significant limitations on the development of multi-system, multi-chain use cases. In the current smart contract platform architectures, individual contracts are responsible for managing their own internal state, such as tracking account balances. These contracts do not naturally synchronise their state with external systems, including non-native blockchains. Consequently, this data fragmentation not only imposes limitations on application logic but also results in an inferior user experience and brings into question the wide-scale usability of those systems as execution layers.
- **Value:** The fragmentation of value restricts the seamless flow of financial assets between different blockchains, as without bridges, assets held within a specific blockchain can only be utilised within decentralised applications (dApps) *native* to that particular blockchain. This limits the potential value creation that every unit of capital can create, thereby limiting the potential for the wider DeFi industry.
- **Liquidity:** Liquidity fragmentation, which arises partly due to value fragmentation, stands as a significant challenge within the DeFi space. While the first two challenges primarily stem from difficulties in cross-chain communication, liquidity fragmentation encompasses both cross-chain and single-blockchain environments. Presently, DeFi experiences a state of fragmented liquidity, which is also unpredictable and costly to unify. Market-making strategies reliant on 50/50 paired liquidity provision prove expensive for liquidity providers and pose the risk of impermanent loss. Additionally, the reliance on external sources for liquidity introduces an ongoing state of uncertainty. In the current DeFi landscape, capital lacks inherent ties to protocols and gravitates towards the highest short-term returns, which is detrimental to new protocols seeking stability of capital to realise its true potential, instead of focusing on actions aimed at attracting short-term capital.

To address these issues, our platform aims to act as a *clearing layer*, enabling aggregation of the state information from different blockchains but in a trustless and fully automated manner. The platform is made up of the following two building blocks, which are facilitated using the \$SUPRA token, that we present in the next section. This asset is used for the staking, gas fee, governance, and assurance of the network and helps convert a multi-objective optimisation problem to one focused on a single objective with multiple levers.

Our infrastructure has two key building blocks:

1. **IntraLayer Network Infrastructure:** Supra, a multi-purpose network, seamlessly accommodates diverse functionalities within its infrastructure, offering a comprehensive range of vertically integrated services to cater to various requirements. With this construction and architecture, Supra possesses a strong advantage in facilitating multifaceted services due to several compelling reasons.
 - (a) Supra’s innovative oracle service plays a pivotal role in establishing a secure connection between different blockchains and external systems. By acting as a trusted connection conduit, Supra ensures the reliable and tamper-proof transmission of data and information across these interconnected entities, enhancing overall system integrity.
 - (b) Supra’s cross-chain bridge serves as a crucial component that enables the secure generation and verification of cross-chain messages. This capability allows for the validation of data and transactions between different blockchains, bolstering trust and interoperability among disparate systems.
 - (c) Supra’s high throughput and low finality blockchain network manifests as an efficient execution layer, contributing to the overall transactional efficiency of the system. By enabling swift processing of transactions and reducing the time required for finality, Supra not only enhances the speed of operations but also paves the way for the automation of complex transactional logic, driving increased cost efficiency and productivity, whilst maintaining full decentralisation. Furthermore, Supra’s smart contract platform serves as a powerful tool for interacting with and managing communications between external blockchains and systems. Through the execution of programmable contracts, Supra facilitates seamless cross-chain integration and coordination.
 - (d) Supra’s automation service introduces fully automated and decentralised transaction scheduling, which empowers its users to execute transactions based on complex conditions, without any human intervention.
 - (e) Supra’s Distributed VRF Service acts as a cost-effective and secure source of randomness, catering to a range of use cases, from Web3 gaming to DeFi.
2. **Financial Infrastructure (~ the vascular system):** As detailed in the preceding section, the vascular system of the organism parallels the liquidity network in our context. This Supra-managed liquidity network epitomises a series of interconnected liquidity pools, residing in multiple digital ecosystems. It operates as an indispensable facet of the overall ecosystem, not just enabling the transfer of value between distinct networks, but crucially facilitating price discovery and protection of liquidity.

This financial module of our infrastructure is seamlessly integrated with the network services and has the effect of extending its utility through its four key components which can aid complex financial operations, and are natively supported by the network in a highly synergistic way with the Supra's IntraLayer offerings. Altogether, we envision the proposed DeFi protocols combined with network service, to act as a single unified infrastructure, which can help extend the role of Supra smart contracts, by converting them into universal financial controllers, which route data, commands, and liquidity across the entire digital finance space. These proposed decentralised financial controllers can interact with interconnected systems such as other public blockchains, consortium networks, and legacy financial systems.

- (a) The Dynamic Function Market Maker (DFMM) is a novel Automated Market Maker (AMM) protocol, which is firmly integrated with the network's bridge infrastructure and facilitates cross-chain value transfers by connecting liquidity pools of the networks residing on different blockchains. This protocol offers innovative features and capabilities, enhancing the efficiency and effectiveness of decentralised trading. It provides a dynamic function for liquidity provision, optimizing market depth and minimising slippage for traders, and mitigating operational risks stemming from improper inventory management. These functionalities, in turn, aid in a constructive discovery of an asset's fair value.
- (b) The fiscal policy framework is a decentralised and automated mechanism tailored specifically for Supra's networked economy. This framework, which is intricately tied to Supra's network infrastructure, facilitates effective service price discovery and fiscal budgeting, ensuring stability (including fiscal sustainability) and economic efficiency within the whole network. Simply put, it is designed to synchronise the economic interests of both service providers and network users, fostering a harmonious and productive interaction across all parties involved.

By automating fiscal decision-making processes, it enables efficient allocation of resources and promotes economic growth. A part of our fiscal policy is the network-owned liquidity which serves as a non-transitory source of liquidity for the system. This liquidity will be accumulated by the network through its organic use. This effectively fulfils a self-propagating cycle, which commences with this non-transitory source of liquidity acting as a stabilising feature, perhaps leading to an increased demand causing to further catalyze accrual of network-owned liquidity, and potentially even being seen as a *meaningful competitive advantage against other networks*.

- (c) The Dynamically Structured Pool Protocol (DSPP) is an insurance mechanism designed to assess and structure risk. This protocol

offers advanced risk management tools, allowing users to mitigate potential losses and protect their assets through an optional service, adding an extra layer of protection for users of various services of the Supra network, such as the Oracle and Bridge services. This strategic deployment of the insurance protocol enhances economic assurances and provides robust mechanisms to bolster confidence in the economic security of the overall infrastructure. By providing a comprehensive risk assessment framework, the DSPP protocol enhances the overall security and reliability of the infrastructure.

- (d) The Money Market Protocol (MMP) system is a modular system built upon the foundation of the other DeFi protocols and Supra's IntraLayer. It fosters increased efficiency and augments the sophistication of financial management within the liquidity network. The MMP integrates and leverages the functionalities of the aforementioned protocols, creating a cohesive ecosystem that offers a wide range of decentralised financial services. This modular approach allows for flexibility, scalability, and interoperability within the infrastructure, thereby opening up the space for Supra to fundamentally re-envision concepts of cross-chain and cross-system interoperability in the digital finance space.

In the following section, we now describe the network's token, \$SUPRA, which enables all operations in the network.

3 The \$SUPRA Token

The \$SUPRA token represents the specialised fluid transporting nutrients and value throughout our ecosystem. It harmonises heterogeneous objectives of individual parts and reinforces the ecosystem's value proposition as an IntraLayer protocol with true potential to evolve and grow organically.

This asset serves many objectives, which we list and elaborate on in this section. It is employed as: (i) a staking token, fortifying the network's economic security guarantees; (ii) a work token, bestowing the right upon its owners to contribute work to a decentralised network; (iii) a gas fee coin, facilitating transactions within the network; (iv) a subscription coin, granting access to discounted service prices; (v) a data access coin, unlocking valuable insights; and (vi) a governance token, empowering the community with decision-making capabilities.

3.1 Staking Token

In Supra, staking is the act of depositing and locking a certain amount of its native token into a designated smart contract or protocol with the objective of validating or securing transactions and services on the network. The act of locking in the asset while performing a sensitive task means that the respective

agent is “staking” their capital. Malicious actions can lead to financial losses through slashing, a mechanism that reduces their stake, and indirectly impacts the value of the staked asset due to the negative impact their attack could have on the network as a whole. This naturally cultivates an environment where key agents of the network behave in accordance with the public interest, decentralising the source of truth and cutting off centralized guarantors.

Therefore, for the entire suite of our IntraLayer services, we mandate staking by our service providers and guarantors, which acts as a deterrent against malicious activity and ensures that staking dynamics help identify the best service providers. This approach stands in stark contrast to the majority of L1 networks, which offer a singular service and use staking exclusively for securing that specific service. Mandating staking is particularly important in Supra’s unique position as an IntraLayer system, where guarantors act as crucial agents for the liquidity network, facilitating secure management of financial resources across multiple blockchains. Our multi-faceted approach not only enhances network security but also fosters synergy among the various services, paving the way for innovation and scalability.

3.2 Work Token

The use of an asset as a work token grants its holders the right to contribute services to the network and earn appropriate rewards. These services could include the provisioning of computational resources, validation of transactions, and availment of storage space, all of which require the use of the \$SUPRA token to operate. In this context, it is particularly noteworthy that, unlike other blockchain networks where the native token’s utility is confined to its own ecosystem, Supra’s multifaceted services can be made available in all major networks, which broadens its reach. Therefore, as Supra’s services have wide-ranging applications, our system’s utility extends to a wide range of networks where these services can be deployed.

The requirement to own \$SUPRA to provide work reinforces the objective to align incentives of varied stakeholders. This requirement incentivises the service providers to increase the demand for the services of the Supra network, which is driven by the quality of the services they provide. Additionally, ownership of the \$SUPRA token acts as a safeguard against potential attack vectors, discouraging indiscriminate initiation of service nodes (spam), and ensuring network stability and security.

3.3 Gas Fee Token

Gas fee is the cost paid by users of a blockchain network to incentivise agents to validate transactions. In our network, users deploy the \$SUPRA token to pay for its services, including but not limited to the Oracle service, VRF service, bridge service, automation service, value transfer, and smart contract transactions.

To protect service providers’ computational resources, we first and foremost mandate the payment of the fee at the point of inception, i.e., when a transaction is proposed, to avoid situations where a service provider is needlessly burdened with futile tasks. Additionally, the gas fee is structured in a way that deters a user from overusing duplicated storage, an invaluable commodity in any blockchain-based consensus system. Furthermore, we impose a limit on the computational actions a single transaction and task can perform, effectively circumventing potential attacks rooted in endless executions. Finally, \$SUPRA can also be applied to pay for services in all networks where Supra is integrated, which is in contrast to most other blockchain networks where the native token is limited for users to pay for L1 services only on their own network.

3.4 Subscription Token

To incentivise more committed patronage, Supra also seeks to offer a subscription service where holders can lock the \$SUPRA token. This will reduce the circulating supply and progressively utilise the locked assets to pay for network services at a discounted price.

We envision that the discount rate for the subscription plan will depend on the number of locked assets (LA) and the duration of time they are locked for (LT).

$$D_{u_e} = \beta_e \times \left(\frac{LT_u - LT_{min_e}}{LT_{max_e} - LT_{min_e}} \right)^p \times \left(\frac{LA_u - LA_{min_e}}{LA_{max_e} - LA_{min_e}} \right)^j, \quad (1)$$

where D_{u_e} is the discount rate received by user u in epoch e ; β_e is the subsidy rate applied in epoch e , which is based on the subsidy regimes incorporated as a part of fiscal policy to bootstrap the network; $p, j \in \mathbb{R}^+$ are system parameters reflecting the respective relationship between the locking time and locking amount with the discount rate; LT_{max_e} and LT_{min_e} are respectively the maximum and minimum subscription(lock-up) time; and LA_{max_e} and LA_{min_e} are respectively the maximum and minimum lock-up amounts that users can apply when subscribing for the services.

We’d also potentially permit subscribers of the service to delegate their locked \$SUPRA tokens to a different service provider in the PoS scheme, and therefore, enable subscribers to earn additional rewards for enhancing the game-theoretic security guarantees of the network. In essence, this approach allows for the subscribers to act both as guarantors of the network while also being a user of the service at a discounted rate.

3.5 Data Access Token

\$SUPRA, acting as an Oracle and bridge service provider, functions as a decentralised data marketplace, aggregating and providing access to real-world and blockchain-based

data from various providers. Possessing and utilising the \$SUPRA token grants an immediate license to access this rich dataset. Ownership of \$SUPRA to pay for services like data access simplifies the management of access rights and enables users to transfer access rights to another user using the same tokens.

As the blockchain economy expands and the array of data published by Supra becomes more extensive, the role of data access to real-time data streamed by Supra nodes could become increasingly critical for the next generation of blockchain applications, be they in DeFi, gaming, or other sectors.

3.6 Governance Token

Supra's blockchain ecosystem is comprised of a multitude of stakeholders, ranging from node operators, foundation members, and protocol developers to marketers, educators, and open-source contributors. This necessitates a systematic governance and management structure to affect key system parameters, and the network's fiscal policy, and make decisions with implications not just in the short term, but also in the network's medium and long-term horizon.

Instead of just using the network's own token, and enhancing the governance structure within this system, we plan to introduce soulbound NFTs that are capable of accruing reputation. This meritocratic approach promotes effective decision-making in the system. These soulbound NFTs become accessible after staking a predetermined quantity of \$SUPRA, acting as a commitment to the system's value and longevity. This ensures that only committed stakeholders can influence the system's governance, upholding the ecosystem's integrity and progress. Once the soulbound NFTs are granted, they can accrue a reputation based on the performance of their holders. Conversely, selling \$SUPRA would also lead to a proportionate loss of associated reputation.

We envision this to help decentralise the decision-making process and ensure that power is never concentrated in the hands of a few. It additionally ensures that any agent's reputation is a result of a range of performance metrics, not necessarily proportionate to their ownership of the network's native token. This, above all, ensures that Supra's operational principles are not at odds with the motivating ethos that is at the heart of our industry, which is that power and decision-making should never be concentrated. Importantly, this also reduces the possibility of governance-related attack vectors and bolsters both network security and sustainability.