Chintai 賃貸

Decentralised Peer-to-Peer EOS Token Leasing

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ABSTRACT – the EOS.IO decentralized peer-to-peer blockchain is due to launch in June 2018. While the underlying software is being written and released by block.one, it is for the community to build, own and maintain many of the crucial tools required for the EOS ecosystem to achieve its full potential and efficiency. Examples include the recent release of in-browser EOS wallet Scatter (N.S. James, Jan 2018), with other "EOS Essentials" in development.

Chintai is envisaged to sit alongside other EOS Essentials as a community owned dApp solution for efficient token leasing, providing the means by which EOS token holders can lease out their tokens on one side, and for dApp creators to rent tokens for required bandwidth in return. A number of disparate projects may be forming across the community to develop token leasing markets, and all have mentioned end user fee models as the means of funding them.

We propose a different approach that provides a highly liquid, transparent token leasing market, and which gives fair market value to all participants regardless of token size holding or token size requirements. This will be free to use for both sides as a crucial means of ensuring full market efficiency, functioning and price discovery without transaction fee or pool distortion.

1. INTRODUCTION

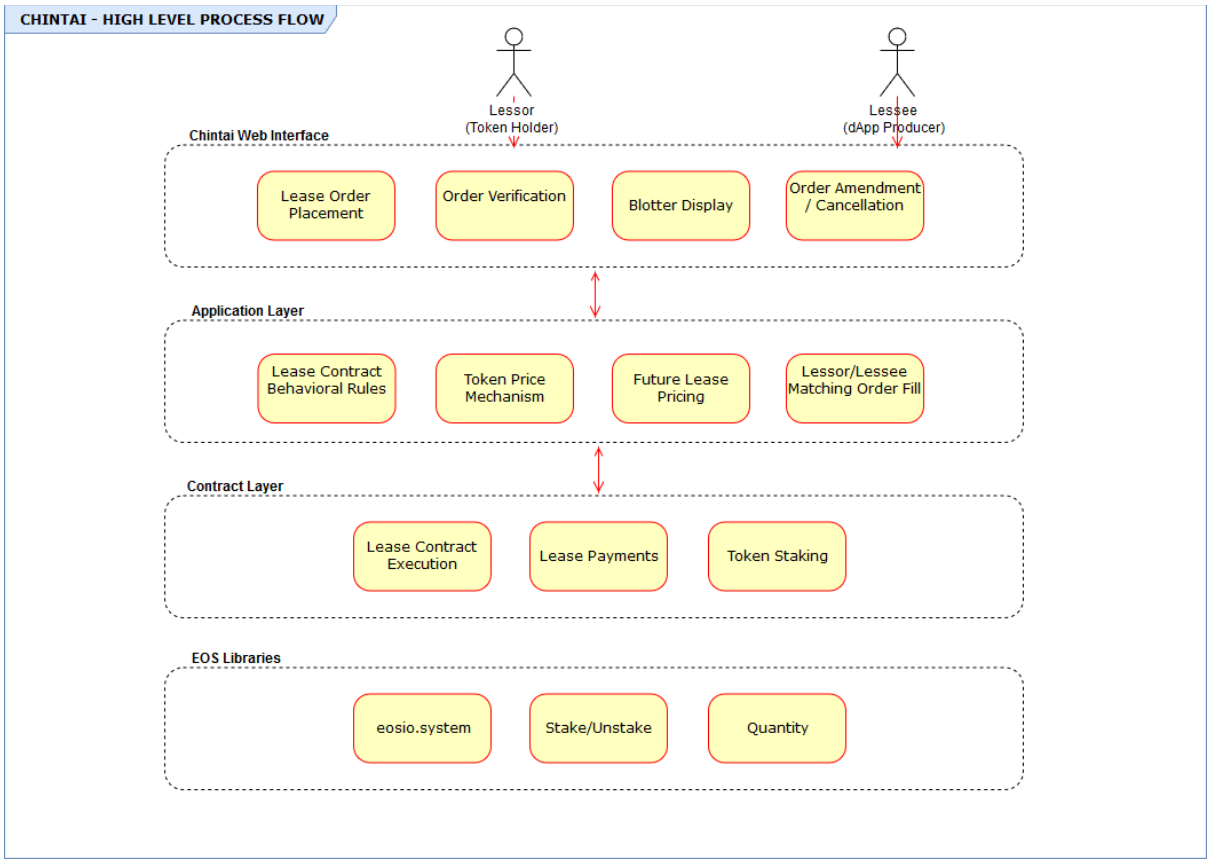
The EOS.IO blockchain will be a Decentralized Autonomous Company/Organisation (DAC/DAO) that uses Delegated Proof of Stake (Larimer, 2014) as the means for scalable, secure block production and feeless transactions, funded through a defined annual inflation paid to the block producers. The role of the EOS token in the ecosystem is to guarantee a minimum percentage of system bandwidth to the token holder proportional to the number held, and in practical terms is therefore required by the dApp producer in order to run their application on the EOS blockchain.

A key aspect of this mechanism is the concept of *token leasing* as a means of enabling dApp producers to buy EOS bandwidth without holding EOS tokens. This provides a flexible means for token holders to productively utilize spare tokens, and gain additional income

simultaneously for dApp producers to buy bandwidth without tying up excessive investment capital in EOS tokens if not required.

What is needed is Chintai, a community owned, decentralised marketplace for EOS token leasing, which is free for both token holders and dApp users to use, and provides secure lease market pricing without distortion by size of token market holding or requirements. This will utilize a Chintai token which provides a mechanism for the most popular dApps to be prioritized with staked bandwidth through price and security, but ensures that all dApp producers and token holders are able to access equivalent token lease pricing as determined by market supply and demand, without transaction cost distortions disincentivizing low volume leasing.

2. HIGH LEVEL OVERVIEW



3. MARKET MAKING AND PRICE DISCOVERY

Chintai will operate a price discovery process through the Chintai token cycle bidding, which determines the lease market price through the interactions of *lessors* (token holders) and *lessees* (typically dApp producers). Lease pricing in EOS.IO will in part be determined by the value placed by dApp holders on securing guaranteed bandwidth for the achievement of their goals, as outlined in the subjective theory of value (Jevons, Walras, Menger).

The absence of transaction costs in the platform is designed to ensure that individuals on both sides are able to rapidly take action based on all relevant information, without fee distortion, and ensure this is quickly reflected in the EOS lease market price.

The Chintai price discovery process will further be impacted by:

- Lessor numbers and token quantities (total available supply)
- Lessee numbers and token requirements (total available demand)
- Bidding and settlement processes
- Liquidity
- Timeliness
- Reliability
- Current bid price
- Current offer price

Note that cost of execution will not be a factor due to the proposed model unless there is a funding deficit in a cycle – see Payment Mechanism section for details.

Price discovery should therefore be understood in the context of the EOS token lease market to not be a valuation mechanism, but rather an aggregator of sentiment primarily based upon supply and demand. This is a critical role for the efficient functioning of EOS.IO because this feeds into the executed token lease contract, and ultimately the cost of a given dApp to a producer or potentially end user, as this will be influenced by the leasing market price and have knock on effects throughout the entire ecosystem.

4. ORDER MANAGEMENT & EXECUTION

We envisage Chintai having an interface designed for effective usability for all users, which includes two visual market and personal order 'blotters' with the books of existing market and personal orders: open, partially filled, fully filled, categorised relating to their stake time / lease contract expiry. The current lease market cost/reward per token for daily, weekly, monthly, quarterly and annual lease staking will be displayed for convenience, and accessible as default 'standard' options when placing orders as the lessor or lessee.

a. FULL FILLS

Full fill orders will be viewable in the account holder order history for an auditable record.

b. PARTIAL FILLS

Partial fill orders will be viewable in the account holder order history and order blotter to provide clarity that this order is open and actively being filled.

c. OPEN ORDERS

Open fill orders will be viewable in the order blotter.

d. LARGE ORDERS: ALGORITHMIC EXECUTION

For very large lease orders (defined as too large to fill at once), be they by the lessor or lessee, Chintai will apply simple algorithmic execution to break down into child orders for smaller fills out to the market over time. This will enable the large token holders and dApp producers to place their orders without requiring manual amendments to adjust for size and market monitoring.

e. EXPIRY

Default lease contracts by the lessor and lessee will have an agreed expiry date, at this point bandwidth will be removed from the staked lessor and returned to the lessee. Due to the impact on both sides of this, consideration will need to go towards optional alerting and auto-renewal (see next section).

Conceivably a defined expiry date could be extended later to include a *perpetuity lease*, with an agreed periodic review (e.g. monthly, annually) which sets the price in-line with market rates or with an agreed inflation increase such as 5% annually. Such instruments we anticipate will only come about as a result of community feedback and demand as the EOS token leasing market expands in the years ahead.

f. AUTO-RENEWAL

All lease contracts have a defined end date as part of the price discovery process, however an option will be available to both lessees and lessors to auto-renew at expiry on the same terms (at the current market lease rate), or with an agreed percentage increase in price per renewal cycle.

g. FORWARD LEASES

Distributed App owners may additionally have the requirement to book additional bandwidth for a future date period, for example for a planned marketing campaign. In this instance Chintai will initiate a forward leasing contract, which includes an agreed forward price, further analysis is required but this may utilize the standard market forward pricing:

$$F_0 = S_0 * e^{rT}$$

Where F = the leasing contract forward price, S = the current cycle token lease spot price, e = the mathematical constant, and T = delivery date

5. PAYMENT MECHANISM

The current leasing spot price and payment mechanism for Chintai will be through a value transference utility ‘Chintai token’, issued as a means of exchange to transfer from the lessee to lessor. The token will be created with zero initial supply; at the end of each quarter cycle (defined as weekly), a Chintai token is created per token leased to a dApp and given to the lessor. At the end of each cycle (defined as one month), the lessee must purchase all of the Chintai tokens created in that cycle for their lessor(s) with EOS.

The purchase price of Chintai tokens is at any price the lessee sees fit provided it is 1 Larimer or above (>=0.0001 EOS per token) in order to retain the lessors they have for the next cycle. Prior cycle token pricing will form the basis of pricing offers, along with anticipation of future dApp requirements and EOS.IO bandwidth usage. If the lessee underpays within a specified time period, they forfeit all of their lessors (token holders staking them), and suffer reputational damage and other potential consequences at arbitration, making them unlikely to be staked in future. If the lessee bids to pay below market rate for the next cycle, they will lose lessors to alternative dApp providers as a consequence. This provides a price discovery mechanism inherent in the end of cycle token

clearing process, and means unsuccessful dApps will over time not have revenue to be able to compete to secure lessors to lease bandwidth competitively.

Chintai tokens are intended to be non-transferrable, and during the purchase back process are burned. Note that lessors can never lose their EOS tokens.

Alternative payment on Chintai could take place through:

1. An EOS 'escrow' facility that locks up lessee (dApp holder) EOS tokens for use as payment during the contract lease term with periodic payments as agreed. This requires EOS tokens to be purchased therefore for the bandwidth lease cost only.
2. Other crypto-currencies such as BTC, LTC or ETH, or even fiat currencies – this adds to complexity requiring inter blockchain communication and/or financial institution payment facilities that mean we recommend this option is only considered if required by the community in future iterations of Chintai.

6. OPEN SOURCE

We propose that Chintai is a community owned, developed and run dApp, and therefore that all code is open source, which additionally means complete transparency in the price discovery process.

7. FEES & FUNDING

In order to ensure that Chintai does not have any end user transaction costs, we propose that one or more block producers sponsor the ongoing running costs of this dApp, along with future development post-launch. EOS42.io if selected as a BP will fully fulfil this role, or along with any other BP candidates that also support this funding proposal; multiple BP candidates with equivalent community focus have expressed an interest in supporting this feeless token leasing market model for EOS.IO.

In order to prevent a critical dependency by Chintai on BP funding, we propose that functionality is built into the Chintai lease contract in the event of a cycle funding deficit to enable a percentage of all EOS allocated to the lessors to be awarded to the dApp itself – this is set to zero as default when fully funded. During a funding deficit, this activates for a lease cycle equivalent to: X funds for period received, e.g. X + 10 funds for period required, then 10 is equally taken from every stake as a fee to fill. This is essential to ensure that Chintai can fully fund ongoing development requirements, never fails and is capable of withstanding a Sybil attack.

8. OTHER EOS BLOCKCHAINS & TOKENS

EOS.IO will have a 'main chain' which Chintai will launch on, but there are expected to be multiple other EOS chains – some public and some private – which will be launched over time and used for a variety of applications and sales. It is expected that with interblockchain communication and token transfer, Chintai will be able to service these EOS token leasing requirements for other chains. In addition many dApps will launch their own tokens on EOS (note: ERC-20 equivalent), some of which may have functionality that would also benefit

from a leasing market. Both aspects we recommend are considered within the technical design of Chintai as potential future requirements by the EOS.IO community.

9. EOS LEASE CONTRACT

The latest EOS.IO code base related to what lease functionality exists is located here:

https://github.com/EOSIO/eos/tree/master/contracts/eosio.system

As non-fungible assets, payment for staking (leasing) will need to be a layer of code that handles the time-based nature of the leasing contract agreed, and utilize EOS.IO deferred payments functionality to allow daily through to annually. As such this will require a contract to be built on top of the eosio.system functionality that handle aspects of the lease agreement such as payment and time.

10. ADVANCED LEASING CONTRACTS

In the longer term, we envisage that there will be demand for additional lease terms and features, which include perpetuity leases, and fixed lease terms to 'lock in' a rate over a given period. Other features covered elsewhere in the paper of relevance include the concept of auto-market renewal, which in practical terms is the issuance of a new contract between both parties on the same terms at the current market lease rate.

11. ETHICAL LEASING

Further consideration should be made by the EOS community to other potential long-term requirements from token lessors, including relating to ethics. The breadth of distributed applications possible on EOS.IO means that sites such as gambling will inevitably feature and are in development. For those therefore with ethical objections, there may be a demand to enable lessee categorization, although this is not anticipated to be within any initial dApp release due to the complexity and privacy issues related to this.

12. STORAGE LEASING

The token leasing market as discussed in this whitepaper relate to EOS.IO bandwidth only. There is another form of token staking that will be part of the ecosystem which is for storage. While leasing or delegating of RAM space is not possible, there is potential for IPFS to become a delegated resource. The EOS community may wish to consider storage leasing as additional functionality for Chintai in future releases, which would require updating of each hash to associate with the new key and would require parallel processing.

13. BAD ACTORS

Consideration needs to be made with regards to potential bad actors involved in the EOS.IO token leasing market. Examples would include deliberately posting high volume, low value lease transactions that place unnecessary load and burden or potentially even impacting

performance and BP support costs. Another would be staking an excessively high amount of tokens to a single dApp such that network guarantees for others becomes expensive.

Solutions will include the ability to identify and ban such actors, to lock accounts or prevent more than a particular number of orders being placed in a given time period, although we recommend the community gives this subject particular consideration during design.

14. IDENTITY

We propose that identity throughout the EOS.IO ecosystem will be strengthened through building a *web of trust*, and that this will subsequently be of benefit to applications include Chintai. In theory, optional verification could also be added if the community determine this adds value, such as relating to ethical leasing.

15. DISPUTE RESOLUTION & ARBITRATION

Bad actors in the EOS token leasing market need to be swiftly identified and dealt with, however inevitably other disputes will arise with regards to leasing agreements. Examples would include the automatic lease renewal option being selected unintentionally, or a lessee placing an order for a term and rate not intended. Access to the EOS arbitration system is therefore required; we propose any order will have the opportunity to select and be passed to an arbitration system in the event of dispute. The cost element of this service will covered by the Chintai payment token pool.

16. EARLY GOVERNANCE

We propose an early governance structure for this project, which can be flexibly adapted as more resources from the community join the development of Chintai both for the initial June release and future iterations.

- Chintai Project Management/Design Leads – David Kalin, David Packham
- Chintai Technical Leads – César Rodríguez, Nathan James

17. PROPOSED ROADMAP & NEXT STEPS

18. CHINTAI RESOURCES

Whitepaper link: https://github.com/eos42/Chintai/Chintai_whitepaper.pdf

Github: https://github.com/eos42/Chintai

Telegram: @ChintaiEOS

Community Website: www.chintai-eos.io