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White Paper
Tectum Blockchain 4.0

Preamble

In an era where technological advancement and digital transformation are redefining the landscape of industries, Tectum 4.0 emerges as a groundbreaking solution that promises to revolutionize blockchain technology. As the fastest blockchain in the world, Tectum 4.0 is not merely an incremental improvement but a paradigm shift that unlocks unprecedented opportunities for innovation, efficiency, and scalability.

This white paper presents a comprehensive exploration of Tectum 4.0's architecture, capabilities, and the visionary roadmap that lays the foundation for its future utilization. With its unparalleled speed and performance, Tectum 4.0 is poised to address the growing demands of a rapidly evolving digital economy, facilitating seamless transactions and real-time data exchanges across a multitude of sectors.

Our vision extends beyond mere transactional efficiency; it encompasses a holistic approach to harnessing the power of blockchain for societal benefit. We foresee Tectum 4.0 becoming a cornerstone for decentralized applications (dApps), smart contracts, and digital asset management, fostering an ecosystem where innovation thrives. From payments , financial services and supply chain management to healthcare and beyond, Tectum 4.0 is designed to catalyze transformational change, driving sustainable growth and enhancing user experiences.

As we delve into the intricacies of Tectum 4.0, we invite stakeholders, developers, and visionaries to join us on this journey towards a future where blockchain technology empowers individuals, businesses, and communities alike. Together, let us unlock the true potential of Tectum 4.0 and shape a decentralized future that is fast, secure, and inclusive.

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I. Blockchain 4.0 network structure

Tectum node 4.0 is the basic node deployed by users of the Tectum network on their own resources. With it, users can utilize basic Tectum network functions such as:

- creation of custom tokens;
- creation of TET coin transactions;
- creation of user token transactions;
- viewing the TET coin transaction ledger;
- viewing the user custom token ledger;
- creating a seed-phrase pair of keys;
- staking to become a validator or archiver;

Tectum node validator - these are basic nodes whose users have staked TET coins to become validators and earn profits. After staking, the basic node receives additional functionality - it becomes possible for it to validate the authenticity of transactions from the basic nodes.

Tectum node archiver is a special node that ordinary users cannot own in the initial stages of the blockchain's existence. Later on, these nodes will be selected through a ranking system from the node holders. Their tasks include:

- initial validation of transactions;
- subsequent distribution of transactions between validators;
- verification of approvals from validators;
- sending the validated transaction to the Key Archiver;
- sending verified validation transactions from validators to the Key Archiver;
- calculating the fee share for validators based on the staked TET coins at their addresses;
- creating transactions to transfer the commission to the validators' accounts and allocating the commission to the Key Archiver;

Tectum key archiver - is the most important node in the Tectum network, as it logs all failed transactions from archivers into blocks. It is the last node that lacks validation capability; it can only log transactions failed by others into blocks. These nodes will be selected from the node archivers using a rating system.

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II. The operation of the blockchain 4.0 network

BLOCKCHAIN CONSENSUS

Consensus in the blockchain is achieved through validators, archivers, and a Key Archiver. Because the system has a single point of blockchain formation, it implements consensus building through all nodes - specifically, the Key Archiver.

1. Basic (core) nodes are only responsible for providing basic blockchain functionality to network users:

- creation of transactions of transfers and staking;
- verifying and viewing the registry;
- creation and management of new tokens;

2 . Validators are exclusively engaged in the validation of signed transactions received from the archiver and delivering information back to the archiver regarding the results of the validation.

3. Archivers, unlike other nodes, have more responsibilities and are engaged in the following tasks:

- the collection of signed transactions;
- initial validation of transactions;
- selection of validators for validation;
- distribution of transactions to validators;
- collection of validation transactions from validators;
- creation of transactions for the distribution of fees for validators and themselves;
- handing over fully validated transactions to the Key Archiver;
- reward transactions;
- source transactions;
- validation transactions;

4. The Key Archiver is involved in the following tasks:

- forming blocks from validated token and TET transactions and adding them to the token transaction chain (1 block per transaction);
- forming blocks from validated transactions of staking and termination of validator activity and adding them to the chain of staking transactions (1 block per transaction);
- forming blocks from validated transactions and adding them to the validation chain (4 blocks per transaction);
- forming blocks from validated commission transfer transactions and adding them to the commission chain (4 blocks per transaction);

CONSENSUS ALGORITHM

1. When a Tectum Node 4.0 signs and sends a transaction to transfer TET tokens or coins to the Tectum network, it is picked up by one of the Tectum Node Archivers, which performs the initial validation of the transaction.

2. After successful validation, the Tectum Node Archiver selects three Tectum Node Validators at random and sends them the transaction for validation.

3. Tectum Node Validators validate transactions and send signed validation transactions back to the Tectum Node Archiver. If one of the validators does not respond within a specified time, the archiver simply drops the connection to it and sends the transaction to another validator. This process continues until three signed validation transactions are received.

4. The Tectum Node Archiver collects signed validation transactions from three Tectum Node Validators and generates transactions to issue the rewards. For the validators, the Archiver calculates the rewards from the transaction fee based on the number of TET coins staked. For the Archiver itself, the reward does not come from the transaction fee but from the number of new tokens minted as specified in the transaction fee.

5. After all transactions have been generated, the Tectum Node Archiver sends all transactions to the Tectum Key Archiver to form blocks from these transactions and write them to the chains.

6. After the blockchain update, all other nodes load the updated version of the blockchain and validate it. If there are inconsistencies in the blockchain, nodes do not update their registry but remain on the previous version until they receive a valid update.