LightPaper

Version 1.0

We believe in trust-free collaboration.

We are building an open, decentralized and community driven protocol for smart contract hosting where businesses, developers and enthusiasts share solutions and grow the network's value exponentially.

Blockchain is a technology that has vast potential, but it remains one that has yet to fully deliver on its promise.

Predominantly built on open-source code, blockchain proposes a new way of storing information, one that preserves privacy, offers unparalleled security and does not require powerful centralized entities to govern and secure it.

The first iteration of blockchain emerged in 2009 with Satoshi Nakomoto's whitepaper, detailing the concept of Bitcoin. Since then, blockchain has been continuously refined and improved, with developments such as smart contracts allowing the technology to expand its use cases to include intellectual property ownership (NFTs), decentralized finance (Defi) and countless others.

However, like all technologies, blockchain is in a continuous state of flux, relentlessly evolving. The ability of the technology to eventually deliver on it's promise is dependent on it doing so.

t3rn (pronounced ‘tern’) addresses some of the core issues in blockchain technology and open-source development.

Blockchains operate in silos and interaction between individual blockchains has proven to be a considerable challenge for the industry, while the open-source development model does not fairly reward the developers that are its foundation.

t3rn is a smart contract hosting platform that offers an innovative solution to interoperable smart contact execution through our unique Gateway and Circuit solutions. The protocol can not only act as a bridge between two independent blockchains but can also enable chains of executions across several blockchains, while the fail-safe mechanisms that are built in, ensure any failed interoperable transaction can be reverted across all of the blockchains in a multi-chain transaction, therefore guaranteeing successful execution.

Smart contracts stored on the t3rn platform can be used by anyone, while the developers that contribute smart contracts to the open-source repository may choose to get remunerated anytime their code executed. This offers a new vision of open-source development, one that adequately rewards developers based on how often their contributions are utilized.

t3rn presents a natural and inevitable evolution of blockchain technology and open-source software, one that is tailored to facilitate collaboration and built to benefit all participants.

t3rn facilitates trust-free collaboration between blockchain projects and paves the way for a fairer open-source model for developers.

Interoperable

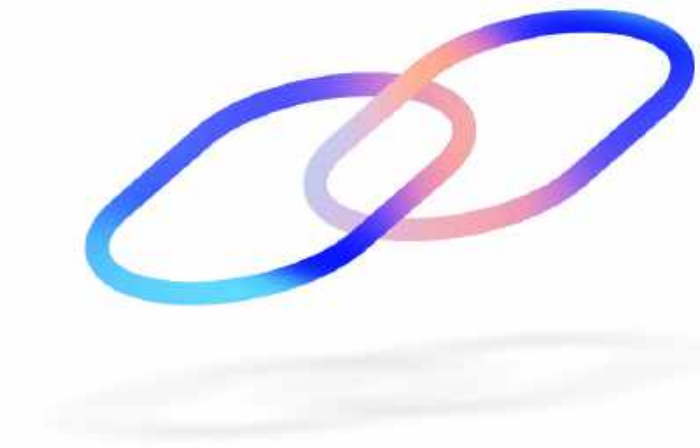
Multi-chain made easy

“t3rn has been developed to make blockchain interoperability simple and accessible.”

When designing the t3rn platform a core objective was to make deploying smart contracts that could execute on multiple different blockchains no more difficult than it is to deploy a simple smart contract on Ethereum.

Smart contracts written in the most widely adopted programming languages are compatible with t3rn, including Solidity, ink!, WebAssembly as well as anything that compiles to WASM.

The t3rn protocol has been shaped around the values that interoperability should be easy, accessible and inclusionary.



Bridge to the future

“Blockchain is moving towards interoperability, t3rn has been created to ensure that all projects are a part of this interconnected future.”

Blockchains will be able to seamlessly interact with one another. Projects that are unable to become a part of this interoperable ecosystem risk being left behind as the technology develops and platforms and services become interconnected.

Achieving blockchain interoperability is not easy, it has challenged the industry for years. Viable solutions for interoperability have emerged but they are not without their difficulties, including limitations on which blockchains these solutions work with and the need to migrate whole networks in order to use them.

Thanks to its flexible architecture, t3rn is not limited in which blockchains it can integrate with. Smart contracts uploaded to the t3rn platform do not need to be rewritten, with no network migrations needed either.

t3rn has been built to ensure that no project is left behind as blockchain technology matures and steps into an interoperable future.

Fail-Safe

Transaction insurance

t3rn ensures that users' funds are never at risk during a multi-chain transaction.

Validators are an important part of the t3rn ecosystem as they confirm interoperable transactions and receive rewards for doing so. However, to ensure honest behaviour a validator must always be staking twice the value of the transaction that they are approving.

Should it be proven that a validator acted dishonestly, the user would receive the validators stake, equal to twice the value of their transaction, minus a 10% reward for the individual who reported the malicious behaviour.

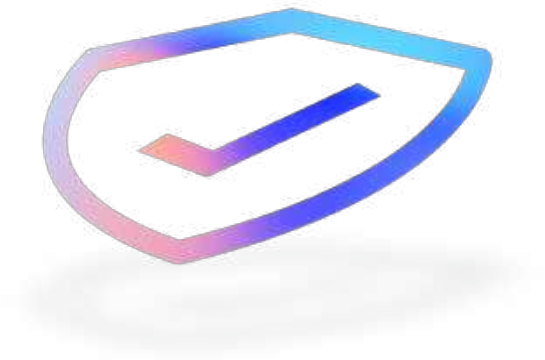
The t3rn protocol has been specifically designed to ensure interoperable execution, while always safeguarding users.

Three stage execution

Multi-chain execution poses a significant challenge because of the need to be able to absolutely guarantee successful execution across multiple blockchains. t3rns unique solution ensures successful execution can be guaranteed every time.

Smart contracts uploaded to t3rn are made composable, meaning they are detached from their data and hosted on the t3rn Gateway. As a result, interoperable execution can be divided into three key stages: execute, revert and commit. This ensures that a multi-chain transaction can always be reversed until the final ‘commit’ signal is given. The results of a multi-chain execution from the Gateway are compared to those on the Circuit, before being confirmed by validators.

This unique three step process, reinforced by double checking executions against Circuit, is how t3rn solves one of the foremost challenges in blockchain technology.



Composability

Smart contract repository

The t3rn platform offers a smart contract repository, which offers a novel approach to open-source development, one that is designed to reward participants.

Currently, developers that contribute to open-source repositories do not participate in the economic success of the projects that they support, the main beneficiaries of open-source development are project founders or cryptocurrencies miners, it is a flawed model.

On the t3rn platform, developers that contribute to the open-source smart contract repository can choose to be remunerated whenever the smart contracts that they contributed are executed. Smart contracts executed on the t3rn platform are also stored in the repository and become available to users.

The goal of the t3rn platform is to democratize smart contract deployment through a community driven ecosystem that makes smart contracts easy and accessible for everyone, while initiating a narrative shift about how open-source development can be improved.

t3rn exists to facilitate trust-free collaboration in a way that benefits everyone, be that between encompassing blockchain projects or individual developers.

Gateway

Gateway is an access point to t3rn, connecting blockchains and enabling interoperable execution.

Gateways (of which there are three unique types: extrinsic programmable, intrinsic programmable and transaction-only) are designed to integrate with any blockchain with relative ease. For example, the transaction-only Gateway has been created to allow t3rn to work with blockchains that lack smart contracts altogether, such as Bitcoin.

Smart contracts hosted on t3rn are detached from their data (binaries). Gateways host and executes these binaries, holding back execution results until the last 'commit' signal is given.

Circuit

Deriving its name from the electronic component and operating in a similar manner, Circuit enables the connection of the different elements within t3rn.

Circuit maintains the state needed on the network to make interoperable smart contract execution possible, storing a registry of rules, actors, services and contracts involved in composable execution.

When a smart contract is executed on a Gateway, validators on the Circuit re-execute every execution step carried out on that Gateway, comparing and confirming results to ensure successful and proper execution every time.

Circuit provides acts as a connector of the key parts throughout the t3rn product and acts as a circuit-breaker, should an interoperable transaction be improperly executed.

Network Participants

Requesters

Requesters create, sign and submit interoperable transactions, either directly to the Circuit or dispatch it via Gateway.

Collators

Collators produce block candidates to pass to the Validators for verification and include the block reward for their services paid in TRN tokens, as per the Polkadot architecture. Collators also have the authority to slash the staked tokens of Validators that act dishonestly.

Relayers

Observe changes in the blockchains involved in an interoperable execution and provide proofs of correct execution to the Circuit.

Validators

Validators act as the Execution Agents on the t3rn network, staking TRN tokens and collecting rewards for executing transactions.

Nominators

Nominators can stake TRN tokens on behalf of Validators and share in the economic gains of the Validators.

Fishermen

Observe and report any misbehaviors on the part of Validators, receiving a 10% reward of any wrongful transaction that they prevented.

The t3rn token

Cross-chain execution fees

The TRN token will be used to cover fees for cross-chain execution and act as a common medium of exchange for interoperable transactions.

Open-source repository

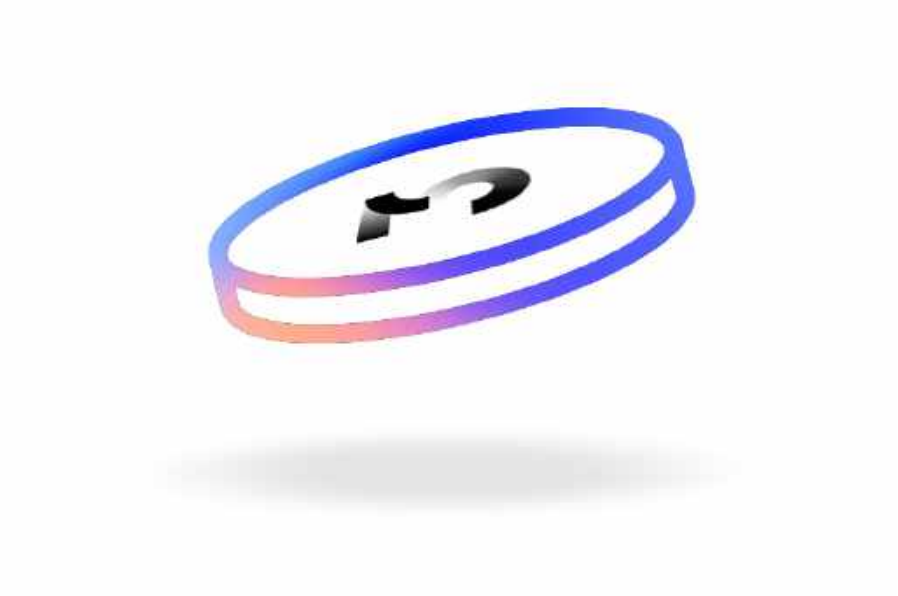
Developers who contribute smart contracts to the t3rn open-source repository for others to use can choose to be paid in the TRN token every time their code is deployed, offering a fairer open-source model that is powered by the TRN token.

Network incentives

The t3rn community can earn tokens by participating in the network by staking their tokens or providing liquidity.

Governance

TRN token holders will be able to vote on important issues like network upgrades and future developments.



Polkadot & beyond

Parachains

t3rn will operate as a parachain on the Polkadot network.

The unparalleled security provided by Polkadot will mean that t3rn is never a potential weak point or attack vector during an interoperable transaction between blockchains, while offering unrivalled network stability.

t3rn will be one of the projects that bring interoperability to blockchain, starting with the ecosystem where t3rn will operate, Polkadot.

Partners

The initial development of t3rn was made possible through the pioneering Web3 Foundation.

The Foundation provided a grant to the team to prove how t3rn can offer a viable solution to the problem of cross-chain smart contract execution.

The grant spanned four distinct milestones and concluded with the team delivering a full proof of concept to the Web3 Foundation, proving that t3rn is a solution to the long-standing problem of blockchain interoperability.

t3rn is also a proud member of the Substrate Builders Program, a Parity initiative to support the most promising projects building with Substrate.

t3rn works closely with the best projects in the Polkadot ecosystem to bring their offering beyond Polkadot, through t3rns unique solution to cross-chain execution and trustless collaboration.

t3rn

Join the community

Telegram

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