

BitTorrent Chain White Paper

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1. Introduction

Blockchain technology has evolved at breakneck speed over the past decade, transforming from Bitcoin's single-chain to today's thriving multichain Web3 ecosystem. As decentralized finance (DeFi), NFTs, blockchain games, and decentralized autonomous organizations (DAOs) continue to gain traction, user demands more robust blockchain infrastructure, driving public chains to strive for higher performance, lower costs, stronger scalability, and multichain interoperability as their core competencies.

However, blockchain silos, cross-chain communication risks, and lack of standardized protocols continue hindering Web3's sustainable development. Mainstream blockchain networks, such as Ethereum, BNB Chain, and TRON, largely operate in isolation, relying heavily on centralized bridging solutions for cross-chain communication. This introduces security vulnerabilities and complicates asset management, further obstructing multichain collaboration and mass adoption.

To address these challenges, BitTorrent Chain (BTTC) introduces next-generation cross-chain infrastructure featuring a three-layer architecture built on Proof-of-Stake (PoS) consensus. Its independent middle-layer Delivery Chain enables secure asset and state synchronization across major blockchains, providing a unified, trustworthy interaction layer missing from today's multichain ecosystem. Through the integration of high-performance execution, efficient cross-chain communication, flexible governance, and economic incentives, BTTC strives to build a truly decentralized, open, and sustainable network for multichain collaboration.

2. Project Background

2.1 Challenges and Opportunities in a Multichain World

Web3 is entering a multichain era where user assets and application data are increasingly scattered across different blockchains, including Ethereum, BNB Chain, TRON, Polygon, and Arbitrum. This fragmentation has intensified blockchain isolation, leading to frequent security issues with cross-chain bridges, lack of standardized endpoints for state

synchronization, difficulty in liquidity sharing among multichain applications, and highly disjointed user experiences—now the primary barriers to Web3 mass adoption.

The critical questions are: How can we achieve secure, efficient cross-chain communication? How can we enable the seamless asset and state synchronization across multiple chains while preserving each chain's independence and security? The solution requires developing a neutral cross-chain infrastructure.

2.2 Design Principles

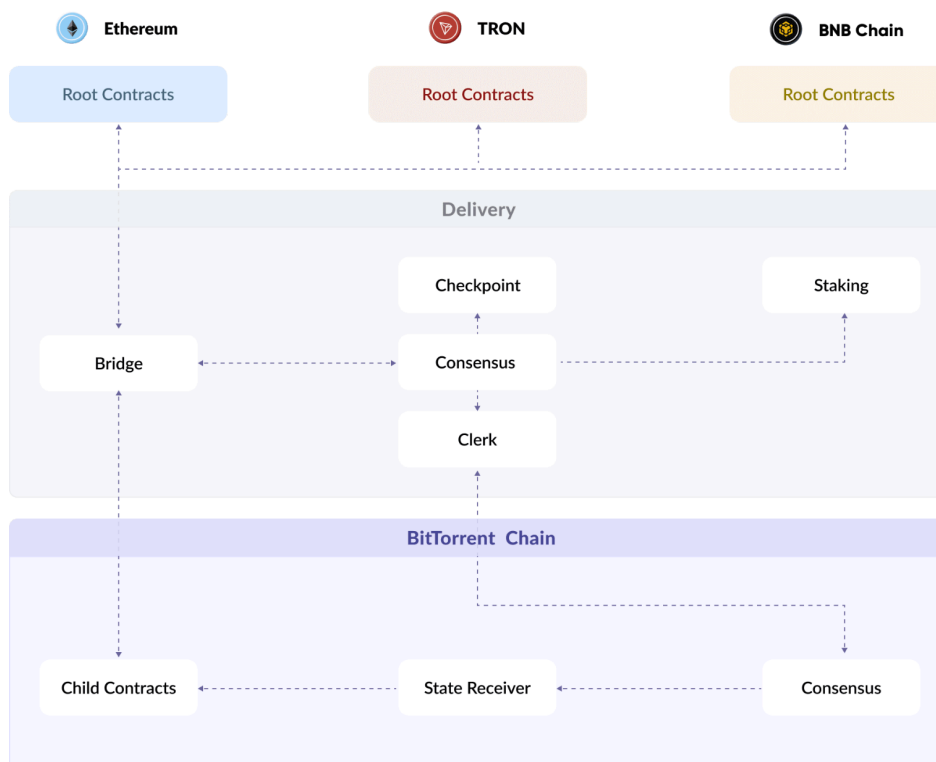
As essential BitTorrent ecosystem infrastructure, BTTC advocates the idea of "connection instead of custody" and centers its design around four core tenets: 1) Maintain **neutrality and interconnectivity**—connecting multiple heterogeneous public chains while achieving the coordinated state and asset synchronization without sacrificing main chain independence; 2) Adopt a **decentralized consensus mechanism**—securing the Delivery Chain through a PoS validator network to eradicate the potential risks of centralized nodes and multi-signature bridges; 3) Prioritize **high scalability**—supporting frequent state synchronization, rapid block production, and concurrent processing to meeting growing on-chain demand; 4) Introduce a **pluggable architecture**—achieving open governance and fair participation via validator mechanisms and delegation models.

Building a better cross-chain bridge isn't where we stop; instead, it marks our starting point to reshape ourselves into a **control layer for multichain operating systems**, providing state synchronization, security authentication, and protocol-based governance, serving as a crucial foundation for Web3 multichain collaboration.

3. Technical Architecture

BTTC employs a modular three-layer cross-chain operating system that handles state entry, consensus relay, and application execution. This decoupled architecture enables atomic synchronization, security verification, and rapid access to cross-chain assets and state, serving as the core infrastructure for large-scale cross-chain coordination. While independent, the three layers collaborate through event flows and checkpoints, each with their specific focus:

- **Root Contracts:** Cross-chain interaction entry points managing asset lockup/release and governance.
- **Delivery Chain:** Consensus and data relay hub ensuring atomic, verifiable state transmission.
- **BTTT Chain:** Smart contract execution platform enabling multichain asset deployment and interaction logic.



3.1 Root Contracts: Entry Point to Cross-Chain Interactions

Root Contracts serve as the cross-chain system gateway, deployed across multiple blockchains, including TRON, Ethereum, and the BNB Chain, to provide users access to state information and governance interactions. Through preset contracts, this layer handles asset lockup and release, validator governance, execution of the staking mechanism, and event logging, creating a trustworthy frontend interface for cross-chain operations.

The layer assumes three core functionalities: 1) Asset management: Native support to mainstream token standards (e.g., ERC-20, TRC-20, and BEP-20), enabling users to make cross-chain requests while automatically freezing or unlocking assets; 2) State traceability:

All state-changing actions (staking, unlocking, and cross-chain requests) are recorded in the blockchain event logs for tracking and off-chain auditing; 3) Governance mechanism: Validators are required to stake BTT and bind their unique NFT identities to contracts, with records available on-chain, to ensure compliant governance participation and signature, in addition to the uniqueness of identities.

Furthermore, the events in the Root Contracts layer—the input interface to the Delivery Chain—feature highly parsable, standardized formats, which enable the Delivery Chain to capture cross-chain signals accurately and generate state snapshots. This design establishes a consistent data framework for atomic synchronization and state verification in subsequent layers.

3.2 Delivery Chain: Consensus and Relay Hub

The Delivery Chain serves as the central hub of the BTTC architecture, functioning as a relay mechanism for state transmission between the main chain and destination chains. Built on the PoS consensus mechanism powered by Tendermint, it ensures that the signing, packaging, and broadcasting of cross-chain state snapshots achieve both fast finality and strong consistency.

The Delivery Chain monitors events triggered by the source chain contracts, such as asset locks, staking operations, and governance events, in real-time and abstracts them into structured state snapshots called "Checkpoints" after validating their legitimacy. These snapshots then achieve consensus through multi-signature validation across the validator network: only when more than two-thirds of nodes complete signing does a snapshot gain broadcasting authority, allowing the relay module to synchronize it to the destination chain for verification.

All checkpoint data packets contain event data, state roots, block heights, and validator signature sets. Destination chains perform Merkle and signature validation through on-chain contracts, ensuring states cannot be forged and processes remain auditable. Since the Delivery Chain doesn't process daily transactions and focuses solely on maintaining state consistency, it achieves an optimal balance between performance, security, and scalability.

3.3 BTTC Chain: Smart Contract Execution and State Destination

The BTTC Chain integrates multichain states and executes business logic, serving as the system's final state destination and application runtime platform. Fully compatible with the Ethereum Virtual Machine (EVM), it supports Solidity and the complete development toolkit (e.g., Remix, Hardhat, and MetaMask), enabling seamless migration of existing smart contract projects.

In terms of execution capabilities, the BTTC Chain provides a high-performance environment with 2-second block times and minimal gas costs, making it a perfect fit for blockchain games, payments, DeFi, and other scenarios that require frequent interactions and rapid responses. Its state execution module incorporates a modular extension mechanism for supporting future enhancements like nested rollups and state leasing. This ensures the continuous evolution of the contract system to better handle complex business scaling requirements.

As the state destination, the BTTC Chain receives checkpoint snapshots from the Delivery Chain, commits them to three main chains (TRON, Ethereum, and BNB Chain), and executes corresponding on-chain operations such as asset releases, smart contract triggers, or state updates. This design creates a complete closed-loop process covering state generation, consensus verification, and feature implementation, ensuring that cross-chain interactions are not only reachable and verifiable but also executable.

4. Key Participants

The stability, security, and effective governance of the BTTC network depend on the collaboration of multiple types of participants. With the on-chain contract logic and the PoS incentive mechanism as the basis, a balanced mechanism is established between "consensus core" and "ecosystem support". Each participating role has clearly defined responsibilities and functions, ensuring the optimal balance between high performance and decentralization.

4.1 Validator

Validators form the foundation of BTTC's consensus security and are responsible for signing cross-chain event states and reaching consensus on the Delivery Chain. As key

nodes ensuring trusted state synchronization across chains, validators must continuously participate in event monitoring, state snapshot generation, and distributed signing processes to guarantee data immutability and the strong finality of protocol behaviors.

To enhance network security and governance transparency, BTTC requires each validator to stake at least 1 trillion BTT tokens in the TRON main chain's Root contract and bind a unique NFT identity credential so as to create a traceable and governable node identity system. As nodes must maintain high availability, the system will continuously monitor their block production activity and signature completion rates to ensure network stability and security.

BTTC adopts a "one node, one vote" PoS mechanism in governance, where validators hold an equal voting weight regardless of their stake amount. This design effectively prevents governance concentration and strengthens the network's decentralized resilience from the source.

4.2 Block Producer

Blocks on the BTTC Chain are generated by a rotating group of block producers, who are dynamically selected from the network's validator nodes. Block producers handle essential functions including packaging transactions, broadcasting new blocks, executing contract logic, maintaining on-chain state, and coordinating with the Delivery Chain to complete cross-chain state transitions. Through a streamlined rotation mechanism, block producers package and broadcast blocks in sequence, maintaining low latency and high throughput while preventing transaction congestion and delays, which guarantees the network's overall performance.

4.3 Delegator

Delegators are typically ordinary BTT token holders who, while not directly running nodes, can participate in network consensus indirectly by delegating assets to trusted validators, thereby earning revenue shares. Delegators can freely choose validators and terminate their delegation at any time through the TRON Root contract, though the termination is subject to specific unlock periods to prevent arbitrage and liquidity risks. This mechanism effectively lowers the barrier for ordinary users to participate in network

consensus, expanding consensus layer participation while improving validator stability and overall network activity through the "voting equals trust" incentive model.

4.4 Developer

Developers are the core driving force behind innovation and application growth within the BTTC ecosystem. By building smart contracts and decentralized applications (DApps), they expand network functionality and unlock value. Leveraging BTTC's cross-chain compatibility with major networks like TRON, Ethereum, and BNB Chain, developers can architect multichain collaborative systems and deploy cross-chain protocols and composite DApps that enable seamless multi-source asset interactions.

BTTC maintains full compatibility with EVM standards and supports Solidity development, while seamlessly integrating with established Ethereum development tools, including MetaMask, Remix, and Hardhat. This compatibility minimizes migration costs for developers transitioning from existing Ethereum-based projects. To accelerate ecosystem growth, BTTC has implemented comprehensive developer support programs, including development grants, gas fee subsidies, one-click deployment frameworks, and smart contract audit services, all designed to streamline project incubation and expand ecosystem adoption.

4.5 Bridge Relayer

Bridge Relayers serve as critical infrastructure components that facilitate the transmission of inter-chain event data and status information, ensuring efficient and secure execution of cross-chain operations. These relayers encompass various types, including: technical service providers supporting decentralized cross-chain protocols, DApp developers operating proprietary cross-chain nodes with synchronization services, and specialized relayer service providers offering rapid confirmation mechanisms (such as LayerZero). Bridge Relayers collaborate closely with the Delivery Chain to transmit event data and validate cross-chain status updates, forming an essential component of BTTC's inter-chain liquidity infrastructure.

5. Cross-Chain Mechanism and Data Transmission Flow

Inter-chain operability represents the fundamental value proposition of the BTTC architecture. By implementing a three-layer decoupled synchronization model, BTTC delivers an inter-chain communication system characterized by atomic transactions, cryptographic verifiability, and high throughput. This system establishes a standardized relay protocol for asset transfers, cross-protocol collaboration, and state synchronization across chains. The following sections elaborate on data flow patterns and core component interactions within the system.

5.1 Overview of Cross-Chain Communication Flow

BTTC's cross-chain communication follows a standardized five-step process, ensuring consistency and security for each asset transfer and state update between source and destination chains. The implementation flow is as follows:

1. **Asset Locking**

Users initiating cross-chain asset transfers lock their assets on the source chain (such as Ethereum) into BTTC contracts, generating a cross-chain event.

2. **Event Monitoring**

Upon detecting the locking event, the Delivery Chain validates its legitimacy and retrieves related on-chain data.

3. **Checkpoint Signature**

Validators generate a state checkpoint based on event data and reach consensus through BFT multi-signatures from two-thirds of the validators.

4. **State Submission**

When checkpoints are submitted to main chains such as TRON, Ethereum, and BNB Chain, validation and processing procedures are executed within respective contracts.

5. **Asset Releasing/Minting**

Once the destination chain confirms the validity of the state, assets are released or minted on the destination chain.

The entire process is built around the Delivery Chain as a trustworthy relay mechanism without relying on centralized bridging or multi-signature custodial solutions, which significantly enhances security.

5.2 Checkpoint

In BTTC's architecture, the Delivery Chain periodically generates state snapshots, known as checkpoints, ensuring that the state data transmitted between chains is verifiable and tamper-proof. Each checkpoint contains metadata, including event logs from the source chain, state roots, blockchain heights, and aggregated signatures from the validator network.

The Delivery Chain utilizes Tendermint's BFT (Byzantine Fault Tolerance) consensus mechanism. In each period, more than two-thirds of the validators must sign the checkpoint, after which the system deems it a valid state and broadcasts it to the destination chain. Upon receiving the checkpoint package, contracts on the destination chain perform Merkle verification and signature validation to confirm its legitimacy.

This mechanism establishes a clear security boundary—the legitimacy of any cross-chain state update must be verified and confirmed on-chain; updates cannot be bypassed or modified, eliminating potential risks of single-point malicious actions or replay attacks. The checkpoint mechanism enhances the trustworthiness of data flow and guarantees atomic-level cross-chain state synchronization.

5.3 State Sync Model

While supporting asset transfers between chains, BTTC also enables structured synchronization of multiple forms of on-chain states, enabling general cross-chain deployments for complex protocols.

Unlike traditional bridging solutions that only handle token transfers, BTTC abstracts all on-chain events into structured Event Packets, covering various types including FT/NFT operations, contract storage states, DAO governance changes, and more. Each Event Packet generates a verification path on the Delivery Chain through Merkle Root or Hash Commitment, and is then packaged into checkpoints. Upon receiving the Event Packet, the destination chain validates the authenticity of the state through the Relay Proof module, ensuring consistency with the snapshot from the source chain and preventing replay attacks

or falsification. This model provides a universal and standardized approach for state translation, offering foundational support for building applications such as cross-chain order books, decentralized settlement networks, and governance synchronization protocols.

6. Consensus Mechanism and Security Model

The BTTC network's underlying security and reliability depend on its dual consensus architecture: the PoS-based Delivery Chain that guarantees cross-chain event signatures and the BTTC Chain that packages transactions and updates states through block producers. This architecture balances performance and resistance to malicious activities, enabling a reliable and smooth network operation.

6.1 PoS Consensus of Delivery Chain

On the Delivery Chain, all state synchronization and cross-chain asset operations must be confirmed through consensus among the validators. Each consensus round is initiated by a validator serving as the block proposer, followed by two rounds of voting (pre-vote and pre-commit) completed by all validators. When more than two-thirds of validators have signed, the state is considered an immutable final consensus result and broadcast across the network to all nodes.

Built on Tendermint's BFT architecture, the chain can tolerate up to one-third of nodes crashing or behaving maliciously without disrupting the network. Should faults exceed that threshold, consensus halts automatically, preventing incorrect data from reaching the ledger. By securing the stability, safety, and finality of cross-chain operations, this design underpins the Delivery Chain as the trusted core of the relayer service.

6.2 Block Production on the BTTC Chain

As the execution layer for smart contracts, the BTTC Chain uses a round-robin block production mechanism, organizing network cycles into spans and sprints. Each span consists of 100 sprints, and every sprint contains 64 blocks, producing a total of 6,400 blocks per span. Validator nodes take turns serving as block producers. Blocks are produced roughly every two seconds, making each sprint last about 130 seconds and each span

approximately 3 hours 36 minutes. This structured schedule ensures both network stability and high throughput.

Block producers bundle transactions into blocks, execute contract logic, update on-chain state, and coordinate with the Delivery Chain to complete state transitions and confirm events. If a producer misses several blocks in a row, an automatic failover removes it and promotes a standby validator, averting bottlenecks and single-point stalls. The mechanism delivers consistently high TPS and predictable block times, offering developers and users a reliable experience.

6.3 Signature Mechanism and Verification Path

To guarantee authenticity and tamper-resistance during cross-chain transfers, BTTC introduces a BFT-based multi-signature mechanism on the Delivery Chain. Each validator maintains a dedicated signer key that is separate from its owner key, strengthening key-management security and limiting governance risk in the event of key exposure.

State checkpoints must receive valid signatures from more than two-thirds of validator nodes before being packaged collectively into a state snapshot for submission. The use of the secp256k1 curve in all signatures guarantees compatibility with Ethereum, TRON, and other major networks, thus standardizing the verification of cross-chain signatures. Upon receiving a checkpoint, the destination chain verifies its integrity and legitimacy with Merkle proofs. Because every step runs on-chain with no external intermediaries or off-chain components involved, this completely eliminates vulnerabilities such as forged signatures, altered data, or replayed messages.

6.4 Defense Against Network Attacks

BTTC builds layered security into every stage of the cross-chain pipeline—from event creation and signature consensus to state validation—safeguarding both data integrity and network reliability. Acting as the command center of the relay service, the Delivery Chain forms the first line of defense against the most common cross-chain threats.

To prevent double-spending attacks, each cross-chain transaction is identified by a unique event ID within the source chain contract and must be validated by Delivery Chain validators through BFT consensus signatures. Any attempt to rebroadcast a transaction is

rejected due to event ID conflicts. To prevent replay attacks, the system verifies each event's timestamp and chain height, marking the event as invalid once it has been processed.

At the data transmission layer, all cross-chain checkpoints must be validated on-chain by the destination chain contract using Merkle paths and aggregated signatures. This strategy eliminates risks such as tampering and man-in-the-middle attacks from the outset, ensuring that transmitted data remains verifiable, tamper-proof, and immune to replay.

7. Economic Model and Token Design

BTTC's economic model is designed to foster a **self-sustaining, robust, and resilient incentive system resistant to centralized abuse**. By leveraging **staking mechanisms, transaction fees, delegation, and governance tools** built around the native token BTT, BTTC ensures sustained network security, active validator engagement, and dynamic ecosystem growth, delivering stable, long-term support for decentralized cross-chain architecture.

7.1 Core Token: BTT

The BitTorrent Token (BTT) serves as the foundational asset within the BTTC network, enabling essential functions including staking, incentives, and on-chain payments. Validator nodes must stake BTT to participate in consensus mechanisms. Cross-chain activities generate transaction fees and rewards that are paid in BTT, which also serves as the medium of exchange for on-chain interactions, smart contract deployments, and data storage. BTT maintains a fixed supply managed entirely by on-chain smart contracts, ensuring controlled inflation and full transparency in all economic activities.

7.2 Staking and Reward Mechanisms

BTTC uses a BTT-based staking framework for decentralized consensus and governance. Anyone looking to engage with network operations and earn rewards may choose to **stake BTT and run their own validator node, partner with others (see validator partnership model), or delegate tokens to participate in consensus**. Smart contracts handle all staking and rewards allocation on-chain, ensuring transparency,

fairness, and credibility. Staking rewards are capped and released annually at a preset rate. The BTTC 2.0 upgrade introduces dynamic controls that adjust release timing and allocation ratios based on network conditions and community governance. Smart contracts manage the entire incentive system without centralized oversight.

7.2.1 Validator Staking Mechanism

Validators are the key actors in the BTTC consensus layer. They sign cross-chain checkpoints on the Delivery Chain and take turns producing blocks on the BTTC Chain. To become a validator, participants must stake at least **one trillion BTT tokens** in the root contract on TRON MainNet and bind a unique NFT identity. Design highlights:

- **Equal Voting Weight:** Each validator gets one vote per node, regardless of stake size, preventing voting power concentration.
- **Lock-up & Exit Periods:** Lock-up and exit periods apply to BTT staking, preventing short-term arbitrage and frequent hops among validators.
- **On-Chain Transparency:** All staking and reward data is publicly available on-chain, providing full transparency for audits and community oversight.
- **Incentives:**
 - **Signature Rewards:** Validators earn a share of cross-chain transaction fees for signing checkpoints on the Delivery Chain.
 - **Block Rewards:** Validators earn a share of transaction fees when producing blocks on the BTTC Chain.
 - **Checkpoint Bonuses:** Once a checkpoint created on the Delivery Chain is successfully verified by the destination chain, the system grants extra rewards to **the validators who signed and submitted the proof for that round.**

Rewards are distributed via smart contracts, ensuring fairness and on-chain auditability.

7.2.2 Validator Partnership Model

To accommodate real-world scenarios where node operation and token capital are managed by different parties, BTTC natively supports a validator partnership model. This allows multiple addresses to jointly operate as a single validator node. Design highlights:

- **Multi-Address Collaboration:** Multiple addresses can stake collectively and be treated as one validator by the system.
- **Automatic Reward Distribution:** Rewards from signing and block production are automatically distributed based on each address's staking share.
- **On-Chain Execution:** Smart contracts manage reward payouts entirely on-chain, removing the need for external agreements and their associated risks.
- **Broad Applicability:** Ideal for collaborative setups involving DAOs, communities, node service providers, and stakeholders.

The validator partnership model only expands how validators organize; **it neither changes the governance framework nor introduces new roles**, yet it substantially boosts both flexibility and network decentralization.

7.2.3 Delegated Staking Mechanism

Through **delegated staking**, BTT holders can participate in network consensus and earn rewards, without the need to run a node themselves. Design highlights:

- **Flexible Delegation:** BTT holders can freely choose and delegate to validators via the TRON MainNet.
- **Reward Sharing:** Validators share their signing and block-production rewards with delegators **in proportion to each delegator's stake**.
- **Lock-up & Exit Periods:** Delegated tokens are locked up on-chain and remain locked until the exit period ends.
- **Value Drivers:** By reducing user entry hurdles, the mechanism strengthens validator network resilience and invigorates governance across the ecosystem.

While delegators do not run nodes themselves, they can **earn on-chain rewards through a staking model designed to be fair and transparent**.

7.4 Inflation Model

BTTTC's inflation model is designed to dynamically respond to changes in network scale and user activity. An initial annual inflation cap is set, while the actual inflation rate adjusts based on on-chain metrics such as validator uptime, transaction volume, and participation in governance voting. In a future release, the network will periodically burn

unclaimed rewards and a share of transaction fees, helping regulate supply and increase token scarcity. With clearly defined incentive rules and governance-driven adjustments, BTTC aims to balance ecosystem growth with long-term token value stability.

8. Application Scenarios & Ecosystem Development

BTTC is more than just foundational cross-chain infrastructure—it is a catalyst for multi-chain connectivity and Web3 application innovation. Built on a high-performance, low-cost, and scalable architecture, BTTC supports diverse application deployment and empowers developers to build cross-chain decentralized services with composability.

8.1 Cross-Chain Bridges and Asset Interoperability

Leveraging the Delivery Chain, BTTC introduces a unified cross-chain data and state relay protocol, resolving key challenges such as security vulnerabilities, limited interoperability, and poor user experience commonly found in traditional multisig bridges. The platform natively supports major token standards such as ERC-20, TRC-20, and BEP-20, enabling seamless cross-chain asset transfers. By employing a checkpoint mechanism, BTTC verifies and broadcasts transaction data and state across chains, effectively eliminating the trust risks associated with centralized custody and multisig solutions.

By tapping into BTTC's relay module, developers can launch bespoke decentralized bridge services more quickly while maintaining robust security. BTTC is already driving key use cases like multi-chain DEXs, cross-chain lending, liquidity aggregation, and stablecoin settlement, firmly establishing itself as core infrastructure for cross-chain asset flow.

8.2 DeFi Protocols and Financial Infrastructure

Powered by an EVM-compatible smart contract environment and a high-throughput execution engine, BTTC provides a flexible and robust foundation for deploying DeFi protocols. It enables developers to build cross-chain financial models such as collateralized lending, yield aggregation, and settlement networks. With the Delivery Chain's checkpoint mechanism, protocols can securely synchronize asset values, update states, and relay

bundled transactions, enabling seamless cross-chain execution of complex financial workflows.

Users can deposit collateral on one network and claim the loan on another; the yields generated across several chains can then be aggregated and reinvested through a shared strategy, effectively boosting asset efficiency and capital utilization. By bridging both the data and state layers, BTTC delivers a reliable relay service for building modular financial protocols, effectively breaking down the silos of single-chain systems.

8.3 NFTs and Blockchain Games

NFTs and blockchain games are among the most vibrant native applications in the Web3 ecosystem. BTTC provides an ideal execution environment for these applications through its low-latency and highly compatible on-chain infrastructure. With efficient block production and minimal gas fees, BTTC enables developers to perform frequent batch tasks involving BRC-721 tokens—from minting to transfers and burns—significantly reducing entry hurdles and development costs.

BTTC natively supports cross-chain mapping of ERC-721, TRC-721, and BEP-721 assets, enabling asset state migration across multiple chains through a layered architecture where assets reside on the main chain and execution takes place on side chains. In blockchain gaming scenarios, BTTC's cross-chain event structure enables trusted synchronization of key state data such as character attributes, in-game items, and achievement progress, ensuring state consistency across chains.

Meanwhile, the platform is compatible with mainstream NFT protocols and supports one-click integration with existing NFT engines and blockchain gaming SDKs, allowing developers to efficiently merge asset logic with interactive gameplay. Through these capabilities, BTTC is emerging as a vital bridge between content creators and users, enabling on-chain interaction and asset state connectivity.

8.4 DAO Governance and Voting System

Decentralized Autonomous Organizations (DAOs) serve as the foundational governance infrastructure of Web3, with a growing trend toward multi-chain deployment and collaborative governance. BTTC's state synchronization and cross-chain verification

mechanisms empower DAOs to conduct distributed voting across multiple main chains and submit governance results to the BTTC platform for unified processing, establishing an end-to-end execution loop.

BTTC enables cross-chain synchronization of proposal outcomes, including automated contract fund releases and protocol parameter modifications, ensuring governance actions are both executable and consistent across networks. The platform natively supports on-chain verification for tools such as Snapshot and zero-knowledge proof (ZKP)-based voting systems, with future plans to enable modular integration of additional governance frameworks.

Leveraging its scalable relay architecture, BTTC serves as a unified coordination hub for multi-chain DAO governance states, enhancing organizational decision-making efficiency and transparency. It also provides standardized operational pathways for cross-chain governance, enabling large-scale DAO collaboration networks to function reliably across complex multi-chain environments.

8.5 Web3 Payment and Microtransaction System

BTTC's high-performance blockchain architecture is purpose-built for high-frequency, low-value, and low-latency microtransactions, making it exceptionally well-suited for Web3 applications such as content platforms, gaming economies, and social networks. Its 2-second block time ensures fast payment confirmation with near-zero on-chain latency.

With ultra-low gas fees, BTTC enables high-throughput execution of small-value on-chain transactions, effectively powering business models such as peer-to-peer tipping, in-game asset settlement, content subscriptions, and rapid NFT circulation. The system enhances scalability through compatibility with Layer 2 solutions such as State Channels and the Lightning Network, offering expanded potential to boost transaction throughput and strengthen privacy protection.

BTTC is integrated with ecosystem products such as BTFS to deliver a frictionless on-chain payment experience, enabling a truly seamless micro-payment infrastructure that bridges off-chain accessibility with on-chain execution.

9. Roadmap and Ecosystem Development Plan

BTTC's vision goes beyond being a technical cross-chain protocol—it aims to become the core infrastructure driving the next-generation multi-chain operating system. To realize this ambition, BTTC has crafted a structured technical evolution roadmap and ecosystem expansion strategy, encompassing protocol upgrades, validator mechanism optimization, native application support, and governance system development.

9.1 Technical Evolution Roadmap

The BTTC technology stack will undergo systematic, in-depth optimization and structural enhancement through carefully planned phases:

Phase 1: Multi-Chain Connectivity Infrastructure (Completed)

- Deployment of cross-chain bridges linking three major blockchain networks: TRON, Ethereum, and BNB Chain.
- Stable operation of the Delivery Chain with checkpoint mechanism fully activated.
- Core contracts opened for deployment with full support for the EVM development environment.

Phase 2: Consensus and Governance Enhancement

- Introduction of a validator slot mechanism to enhance decentralization and market-driven selection.
- Refinement of validator incentives with dynamic scoring and slashing mechanisms.
- Deployment of core on-chain governance modules to support parameter adjustments and proposal voting.

Phase 3: Performance and Composability Upgrades

- Introduction of state snapshot compression modules to reduce signature costs.
- Support for Layer 2 solution integration and experimental zk-rollup state synchronization.
- Release of SDK specifications to facilitate DApp integration across multiple languages and platforms.

Phase 4: Interoperability Standards and Strategic Alliance

- Expansion of cross-chain connectivity to major networks such as Arbitrum, Polygon, zkSync, and Avalanche.
- Joint development of the BTTC relay standards with decentralized bridge protocols.
- Promotion of standardized cross-chain governance through MetaDAO architectural framework and participation in the State Relay Hub alliance.

9.2 Native Ecosystem and Developer Support

BTTC actively cultivates native project development through comprehensive support programs:

- Dedicated funding pools for native DEX platforms, lending protocols, and liquidity infrastructure projects.
- Gas fee discounts and launch incentives for NFT and blockchain gaming startup teams.
- One-click deployment frameworks, Devnet support, and smart contract auditing services.
- Planned formation of the BTTC Builders DAO as the central hub for developer self-governance and project incubation.

9.3 Security Audits and Community Governance Mechanisms

- Regular full-chain security audits in partnership with top security firms, including SlowMist and CertiK.
- All changes to governance parameters, fee structure, and validator slot allocations are subject to proposal-based voting.
- Reserved governance contract interfaces to support future integration of Snapshot voting with Layer 2 governance modules.

10. Conclusion

As a multi-chain ecosystem hub, BTTC is dedicated to addressing structural challenges that hinder the blockchain world today: limited cross-chain interoperability, inadequate secure bridging solutions, and fragmented user experiences. Through its

three-layer architecture, PoS consensus mechanism, secure relay network, and flexible economic incentive model, BTTC facilitates the deployment of key use cases such as decentralized finance, digital assets, on-chain identity, and multi-chain governance.

With expanding blockchain integrations, thriving developer ecosystems, and emerging native protocols, BTTC is poised to become the infrastructure powering liquidity and coordination across Web3's multi-chain ecosystem—seamlessly connecting users, assets, and protocols in a trusted, open, and collaborative network.

We warmly invite validators, development teams, cross-chain protocol builders, and Web3 innovators from around the world to join the BTTC network—together building a more secure, collaborative, and open multi-chain ecosystem.