# Executive Summary

Interchained is a next-generation blockchain combining Bitcoin’s proven security model with innovative features like Yespower CPU-friendly mining, Dark Gravity Wave Nova difficulty adjustment, emission sharding, and an on-chain token subsystem. Designed for speed (~1 minute block time) and community-driven governance, Interchained delivers a sustainable monetary policy of 1,100,000 coins plus tail emission to incentivize node operators, miners, and ecosystem growth.

# Interchained: A Scarce, Sustainable & Community-Governed Digital Currency

Empowering Decentralization. Securing the Future.

## Abstract

Interchained is a decentralized, peer-to-peer digital currency built upon the proven Bitcoin protocol, redesigned for speed, accessibility, and long-term sustainability. It features a fixed main emission of 1,100,000 coins, followed by a perpetual tail emission of 0.10301990 coins per block.  
  
Interchained integrates:  
• Yespower — a CPU-friendly, ASIC-resistant Proof-of-Work algorithm for fair mining.  
• Dark Gravity Wave Nova — a custom difficulty algorithm based on DGW3, optimized for stability under sub-1-minute block targets.  
• Emission Sharding with Governance — a system that allocates portions of new block rewards to miners, node operators, and governance-controlled initiatives.   
• Node Operator Rewards — incentivizing full node participation to strengthen decentralization.   
• Interchained Token Subsystem Layer — native tokenization built-in for ultimate digital asset management with ease-of-use and baked in to the p2p protocol.

These innovations ensure long-term network security, rapid confirmation times, and community participation while preserving scarcity.

## 1. Introduction

Bitcoin demonstrated that a decentralized monetary network could operate without central authority. However, as Bitcoin approaches its fixed supply cap, miners will rely solely on transaction fees, which may challenge security. Additionally, high hashrate centralization due to ASIC dominance and long block times limit accessibility and scalability.  
  
Interchained addresses these concerns by:  
1. Reducing the main emission to 1,100,000 coins with a small tail emission for perpetual security.  
2. Switching to Yespower PoW to democratize mining access.  
3. Adopting Dark Gravity Wave Nova to handle sub-minute block targets with precision.  
4. Implementing emission sharding to reward not just miners, but also node operators and governance-approved projects.

## 2. Monetary Policy

2.1 Main Emission  
• Total capped main emission: 1,100,000 coins  
  
2.2 Tail Emission  
• Begins immediately after main emission ends.  
• Rate: 0.10301990 coins per block (~6 coins/day at a ~1 min block time).  
• Ensures perpetual miner and node operator rewards without runaway inflation.  
  
2.3 Emission Sharding with Governance  
Block rewards are split into multiple streams:  
• Miner Reward: Majority share to incentivize security through Proof-of-Work.  
• Node Operator Reward: A fixed percentage allocated to active full nodes to encourage decentralization and reduce reliance on centralized infrastructure.  
• Governance Pool: A community-managed allocation for ecosystem development, marketing, technical upgrades, and strategic partnerships. Governance decisions are made on-chain through a proposal and voting system.

The Interchained Token Subsystem Layer (ITSL) introduces native, Bitcoin-compatible token functionality directly into the Interchained protocol without requiring sidechains or external smart contract platforms. Tokens are first-class citizens in the network, with operations validated, propagated, and recorded alongside regular Bitcoin-style transactions.

Interchained’s technology stack combines proven Bitcoin architecture with modern innovations:  
• Consensus Algorithm: Yespower – CPU-friendly, ASIC-resistant mining to promote decentralization.  
• Difficulty Adjustment: Dark Gravity Wave Nova – based on DGW3, optimized for rapid retargeting.  
• Block Time: Target under 1 minute for faster confirmations.  
• Emission Sharding: Splits rewards between miners, node operators, and governance participants.  
• Token Subsystem: Native fungible and non-fungible token support compatible with Bitcoin's UTXO model.  
• Governance & Rewards: Incentivizes community participation in decision-making and infrastructure operation.

## 3. Consensus & Block Parameters

• Consensus Algorithm: Proof-of-Work (Yespower)  
• Block Target: ~under 1 minute (fast confirmations)  
• Difficulty Adjustment: Dark Gravity Wave Nova — an advanced retargeting algorithm based on DGW3, modified for faster block intervals and resistance to hashrate spikes or drops.  
• Supply Transparency: All supply rules and reward splits are hard-coded and auditable on-chain.

## 4. Interchained Token Subsystem Layer (ITSL)

**4.1 Overview**ITSL enables users to issue, transfer, and manage fungible and non-fungible tokens directly on the Interchained blockchain. Token operations are signed, verified, and broadcast as dedicated network messages (TOKENTX) and can also be embedded in block data for permanent ledger inclusion. **4.2 Token Operation Security**- Signature Enforcement: Each token operation is signed with the originator’s private key. Thesigning process uses a deterministic string of all operation fields, ensuring that both signers and verifiers operate on identical data.  
- Verification: Upon receipt, every node reconstructs the message and checks the signature using the declared signer’s public key. The signer must match the expected sender for the operation type (e.g., from address for transfers).  
- Replay Protection: Processed operations are tracked via operation hashes (TokenOperationHash). If a duplicate is detected, the node discards it without re-executing or re-broadcasting. **4.3 Network Processing**- Message Propagation: Token operations are broadcast using the TOKENTX message type. Peers relay valid operations to connected nodes, ensuring rapid global propagation.  
- Execution: Nodes apply valid operations via ApplyOperation when received in real-time, or ReplayOperation when loading from historical blocks.  
 - ApplyOperation processes live operations, optionally recording them on-chain and broadcasting to peers.  
 - ReplayOperation re-applies historical operations during sync without creating new transactions or governance fee payments. **4.4 Governance Fees & Node Incentives**- When a wallet generates a token operation, it can include a governance fee paid to the network’s development or ecosystem fund.  
- If a node lacks the originating wallet, it applies the operation locally without attempting fee collection, allowing trustless network-wide processing without halting execution.  
 **4.5 Duplicate Prevention**Strict checks prevent the same operation from being processed more than once, whether seen in the mempool, from peers, or during blockchain replay. This ensures consistent, conflict-free token state across all nodes. **4.6 Use Cases**- Stablecoins & Wrapped Assets: Issue pegged tokens for fiat, commodities, or other crypto assets.  
- NFTs: Create and trade unique, non-fungible assets without leaving the Interchained network.  
- Governance Tokens: Enable decentralized decision-making tied directly into the Interchained governance pool.  
- In-Game Economies & Loyalty Points: Support tokenized ecosystems with transparent, verifiable balances.  
  
Example Use Cases:  
• Stablecoins pegged to fiat or commodities  
• In-game assets tradable on-chain  
• Governance tokens for decentralized decision-making  
• Tokenized physical goods with verifiable provenance  
• Community reward tokens for participation and engagement

## 5. Yespower Proof-of-Work

Yespower is a CPU-optimized PoW algorithm designed to minimize ASIC advantages and promote wide mining participation.  
  
Advantages for Interchained:  
• ASIC Resistance: Keeps mining fair and community-driven.  
• Global Accessibility: Can be mined on everyday computers, lowering entry barriers.  
• Energy Efficiency: Reasonable power requirements make small-scale mining practical.  
• Decentralization: Prevents industrial-scale hardware monopolies.

## 6. Dark Gravity Wave Nova

Dark Gravity Wave Nova builds upon DGW3, enhancing difficulty adjustment for sub-minute block targets and volatile hashrate conditions:  
• Retargets every block using a weighted average of recent block times.  
• Mitigates “time warp” and other manipulation attacks.  
• Smooths difficulty changes to prevent chain instability during rapid hashrate swings.  
• Ensures block production remains consistent and predictable.  
  
DGW3-NOVA is an advanced, height-aware evolution of Dark Gravity Wave v3 (DGW3), designed for faster blockchains like Interchained that require smooth, safe, and reactive difficulty adjustment. It addresses rapid hashrate changes and timestamp manipulation without sacrificing block time stability. This version introduces graceful decay, rolling medians, asymmetric clamps, and emergency controls — all applied conditionally at fork heights.  
  
**6.1 Overview**  
DGW3-NOVA prevents abrupt difficulty drops that could cause a death spiral, smooths upward difficulty to reflect real hashrate increases, and gradually adjusts to slow blocks without overreacting.  
  
**6.2 Core Enhancements**  
• Graceful Decay Logic – Applies an exponential decay factor only when solveTime > targetSpacing to soften difficulty drops without overreacting.  
• Emergency Difficulty Clamp – Triggers if solve time is too fast and cumulative timespan too short, avoiding block floods or timestamp abuse.  
• Rolling Median Solve Time (Fork 8) – Uses a median over the past 9 blocks to reduce noise from outlier blocks.  
• Difficulty Median Smoothing (Fork 8) – Uses a median of the last 5 difficulties instead of raw averages to avoid distortion from recent spikes or drops.  
• Asymmetric Difficulty Clamping (Fork 8+) – Downward adjustments apply decay, while upward jumps remain agile, allowing difficulty to catch up quickly to rising hashrate while being cautious on drops.  
  
**6.3 Expected Behavior**  
• Smooth decay of difficulty after block floods  
• Quick rise in difficulty after sustained fast blocks  
• Stable long-term average near target spacing  
• Protection from timestamp manipulation  
  
**6.4 Simplified Formula**  
Median smoothing: difficultySmoothing = median(past N difficulties)  
Rolling solve time: rollingSolveTime = median(last N solve times)  
Graceful decay: decayFactor = pow(min(actualSolveTime / target, cap), exponent)  
Baseline: baseline = difficultySmoothing \* actualTimespan / target  
Final difficulty: If dropping, newDifficulty = difficultySmoothing - ((difficultySmoothing - baseline) / decayFactor), else newDifficulty = baseline  
  
**6.5 Compatibility**  
• Built on DGW3 (inherits weighted average and timespan clamping)  
• Uses nBits compact target format  
• Plug-and-play in GetNextWorkRequired()-style interfaces  
  
**6.6 Citation**  
DGW3-NOVA: A Fork-Aware, Asymmetric, Graceful Decay Difficulty Algorithm for Fast Blockchains. Interchained Project, 2025. Based on Dark Gravity Wave v3 by Evan Duffield.

## 7. Security, Incentives & Node Rewards

Interchained’s security model extends beyond miners:  
• Miners secure the network through PoW and receive the majority of block rewards.  
• Node Operators earn a direct share of rewards for maintaining full nodes with high uptime, reducing centralization and increasing transaction relay capacity.  
• Governance Pool ensures that ecosystem growth is funded without requiring external control.  
  
This multi-tier reward model aligns the incentives of all participants, not just miners, creating a more resilient network.

## 8. Economic Properties

• Scarcity: Main supply is ~5% of Bitcoin’s, increasing value per coin.  
• Sustainability: Tail emission ensures security without hyperinflation.  
• Community Strength: Rewards for node operators incentivize decentralization.  
• Governance Funding: Built-in development budget avoids reliance on donations or premines.

## 9. Use Cases

• Store of Value: Scarce supply and decentralized governance make Interchained a strong reserve asset.  
• Fast Settlement: Sub-minute confirmations make it ideal for payments and commerce.  
• Community Mining: Anyone with a CPU can participate in securing the chain.  
• Ecosystem Funding: Governance ensures continuous improvement and real-world adoption initiatives.

## 10. Governance and Upgrades

Interchained uses a proposal + voting governance system:  
1. Any community member can submit a proposal for funding or protocol change.  
2. Node operators and governance participants vote on proposals.  
3. Approved proposals are funded directly from the governance pool portion of block rewards.

# 11. Interchained Token Subsystem Layer

The Interchained token subsystem layer extends Bitcoin’s functionality by allowing native token issuance and management directly on-chain. This system supports fungible tokens (similar to ERC-20) and soon semi-fungible and non-fungible tokens (NFTs), enabling use cases such as:  
• Asset-backed tokens  
• Decentralized finance (DeFi) applications  
• Governance and voting rights  
• Digital collectibles   
  
All token transactions are validated by the network consensus and secured using the same cryptographic principles as ITC transactions. This ensures compatibility, security, and long-term interoperability with other Bitcoin-based systems.  
  
Example Use Cases:  
• Stablecoins pegged to fiat or commodities  
• In-game assets tradable on-chain  
• Governance tokens for decentralized decision-making  
• Tokenized physical goods with verifiable provenance  
• Community reward tokens for participation and engagement

# 12. Roadmap

2025 Q3 – Mainnet Launch  
2025 Q3 – Token Subsystem Activation  
2025 Q3 – Partnership with Elara Wallet (Android & iOS BlueWallet fork)   
2025 Q4 – Governance Module Deployment  
2026 Q1 – Ecosystem Grants & Partnerships  
2026 Q2 – Lightning Network Integration  
2026 Q3+ – Ongoing scalability and privacy upgrades (MEWB)

## 13. Conclusion

Interchained is a next-generation Bitcoin derivative built for speed, fairness, and sustainability. With Yespower mining, Dark Gravity Wave Nova difficulty adjustment, emission sharding, and node operator rewards, it creates a truly community-owned and self-sustaining blockchain.  
By limiting supply to 1,100,000 coins with a small tail emission, Interchained achieves both scarcity and perpetual security. Sub-minute block times enable rapid commerce, and governance ensures continuous development driven by the community.  
  
Technical Summary:  
• Total Main Supply: 1,100,000 coins  
• Tail Emission: 0.10301990 coins/block (~6 coins/day)  
• Consensus: Proof-of-Work (Yespower)  
• Difficulty Algorithm: Dark Gravity Wave Nova (DGW3-based)  
• Block Target: ~under 1 minute  
• Reward Split: Miners / Node Operators / Governance Pool