TECHNICAL WHITEPAPER · V1.0

SpiralCoin (SPLC)

A fixed-supply, transfer-taxed, vote-enabled ERC-20 with cross-chain mobility via LayerZero V2 OFT — deployed as a UUPS proxy on Arbitrum One.

> **Contract:** `0x8e45cc9F480257a1477976848d41A6A9Fb2cf27C` (Arbitrum One, UUPS proxy)
> **Standard:** ERC-20 + ERC-20Permit (EIP-2612) + ERC-20Votes + LayerZero V2 OFT
> **Supply:** Fixed at mint; no inflation function exists in source
> **Decimals:** 18 · **Transfer tax:** 3.14% (immutable; split 50/50 treasury/staking)

1. Abstract

SpiralCoin (ticker **SPLC**) is a self-bootstrapping ERC-20 designed to fund its own ecosystem development through a small, mathematically constrained transfer tax. The contract is upgradeable under the UUPS pattern (for security patches only — supply mechanics are immutable in source), governed by a token-weighted DAO with timelocked execution, and deployable across EVM chains via LayerZero V2 OFT for unified cross-chain liquidity.

SpiralCoin does not claim or guarantee yield, price appreciation, or utility beyond what its on-chain code enforces. This document describes the contract architecture, economic mechanics, and operational commitments — all of which are verifiable on-chain.

2. Contract Architecture

2.1 Proxy pattern (UUPS)

SPLC is deployed via OpenZeppelin's UUPS (Universal Upgradeable Proxy Standard). The proxy contract holds storage; the implementation contract holds logic. Upgrade authority is gated by `onlyOwner` and will transition to the SpiralDAO timelock contract before mainnet liquidity events. UUPS is preferred over Transparent Proxies because it removes the admin-storage collision surface and reduces gas overhead on every call.

2.2 Inherited extensions

- **ERC20Upgradeable** — base token semantics.
- **ERC20PermitUpgradeable (EIP-2612)** — gasless approvals via off-chain signatures.
- **ERC20VotesUpgradeable** — delegation + checkpointing required by SpiralDAO.
- **OFTUpgradeable (LayerZero V2)** — burn-and-mint cross-chain bridging.
- **OwnableUpgradeable** + **UUPSUpgradeable** — controlled upgrade path.

2.3 No mint function

The implementation source contains **no public, external, or owner-callable** `mint()` entrypoint. The initial supply is set inside `initialize()` via `_mint(initialOwner, INITIAL_SUPPLY)`, which runs exactly once. After initialization the only paths that mint tokens are: (a) the OFT bridge's internal credit-on-receive, which is matched by a debit-on-send on the origin chain (net supply = 0), and (b) impossible — there is no other path.

3. The 3.14% Transfer Tax

Every transfer between non-exempt addresses skims **314 basis points (3.14%)** from the gross amount. The skim is split 50/50:

- **1.57%** → `treasury` address (operations, audits, grants, runway).
- **1.57%** → `stakingVault` address (rewards for SPLC stakers).

The rate (`FEE_BPS_TOTAL = 314`) is declared `constant` in source. There is no setter. To change it, the entire implementation contract would have to be upgraded — a change visible on-chain and subject to the timelock once governance is transferred.

3.1 Why 3.14%

π (pi) ≈ 3.14159 was selected as a culturally recognizable constant. The practical rationale: it is low enough to permit normal trading and DeFi composability, but meaningful enough — when multiplied by genuine transfer volume — to fund continued protocol development without requiring inflation, paid sponsorships, or rent-seeking governance proposals.

3.2 Tax exemptions

Specific addresses can be marked `feeExempt` by the owner (later: DAO). Exemptions are needed for: the treasury and staking-vault recipients themselves (preventing recursive skim), bridge/OFT endpoints, the LP-

lock contract (so initial pool seeding is untaxed), and known router contracts where the skim breaks AMM invariants (see §7.2 for the V3 caveat).

3.3 AMM compatibility note

Uniswap V3 pools enforce the K-invariant on every swap: if the actual transferred amount differs from the swap-quoted amount, the transaction reverts. Therefore **V3 pools are kept tax-INACTIVE** — they are added to `feeExempt`. The 3.14% revenue is collected on (a) wallet-to-wallet transfers, (b) V2-style pools (PancakeSwap V2, SushiSwap V2) where the skim is supported, and (c) future curve-shaped or balancer-style venues that tolerate fee-on-transfer tokens.

4. Fixed-Supply Commitment

SPLC ships with a fixed initial supply set in `initialize()`. There is no minting authority, no rebase function, no inflationary issuance, no validator-reward emission. The total supply can only decrease (via voluntary burns sent to `0x000…dead` or via the standard `_burn` path if exposed in a future audit).

This is a deliberate design choice that mirrors Bitcoin's fixed-supply commitment: the protocol cannot fund itself through dilution. All operational funding flows from the 3.14% transfer-tax stream, not from issuance.

5. Governance (SpiralDAO)

SPLC is the voting token for **SpiralDAO**, a Governor-Bravo-style on-chain DAO with timelocked execution. Once governance is migrated:

- Voting power = SPLC balance at proposal-snapshot block (via ERC20Votes checkpointing).
- Proposals execute through a `TimelockController` with a configurable delay (target: 48 hours minimum on mainnet).
- Upgrade authority over the SPLC proxy will be transferred to the timelock — meaning **no single key can ship a malicious upgrade**.
- The treasury wallet and staking-vault wallet will be migrated to multisigs and later to DAO-controlled timelock outputs.

Until those migrations complete, SPLC documents an interim centralization risk in §11.2.

6. Staking Vault

The staking vault receives 1.57% of every taxed transfer. Stakers deposit SPLC into the vault contract and accrue a pro-rata share of incoming tax revenue. There is no fixed APR; yield is purely a function of network transfer volume — when volume is high, yield is high; when volume is zero, yield is zero. No inflation subsidizes staking.

7. Liquidity Strategy

7.1 Initial venue: SPLC / USDC on Uniswap V3

The first AMM venue is a **SPLC / USDC** pair on Uniswap V3 (Arbitrum One), in the **1% fee tier** (10,000 bps; tick spacing 200) — the standard tier for new/volatile tokens. Seeding is done via contracts/scripts/deployLpAndLock.js using a full-range position.

7.2 LP NFT time-lock (12 months minimum)

After the pool is seeded, the LP-position NFT is transferred to **SPLCLPLock** — a custody contract that prevents withdrawal of the underlying position for a minimum of 12 months. Trading fees accrued by the locked position can still be collected by a designated `feeRecipient` (the treasury), but the principal liquidity cannot be removed during the lock window. The lock contract address and unlock timestamp are recorded in contracts/deployments/{network}/LpAndLock.json after seeding.

8. Cross-Chain Mobility (LayerZero V2 OFT)

SPLC inherits **OFTUpgradeable** from LayerZero V2's official package. Cross-chain transfers are burn-and-mint: tokens are burned on the origin chain and an equivalent amount is minted on the destination chain after the LayerZero DVN attestation. Net global supply is preserved across all chains. Initial chains: Arbitrum One (live), Base + Polygon + Ethereum mainnet (configured but not yet liquid).

9. Roadmap

PHASE	MILESTONE	STATUS
0	Token deployed on Arbitrum One (UUPS proxy)	Live
1	Arbiscan token-info verification + listing	Submitted

PHASE	MILESTONE	STATUS
2	SPLC/USDC seed pool on Uniswap V3 (1% fee, full-range)	Funding
3	LP NFT time-lock activation (12 months minimum)	Pending pool
4	GeckoTerminal + DEXScreener listings (auto-indexed)	Pending pool
5	Staking vault mainnet deployment	Audit-pending
6	SpiralDAO governance + timelock takeover of proxy	Drafting
7	LayerZero OFT peer enable to Base / Polygon / Ethereum	Configured
8	ERC-4337 paymaster (pay gas in SPLC) — review pending	Drafted

10. Verifiable References

- Proxy contract on Arbiscan: arbiscan.io/token/0x8e45…f27C
- Source code repository: github.com/SpiralCoinOfficial/ionos-migration
- Token implementation: `contracts/contracts/SpiralCoinUpgradeable.sol`
- LP lock contract: `contracts/contracts/SPLCLPLock.sol`
- Deploy scripts: `contracts/scripts/deployLpAndLock.js`
- Official site: www.spiralcoin.net

11. Risk Disclosures

11.1 General market risk

SPLC is a volatile, speculative digital asset. Token prices can and do go to zero. There is no guaranteed yield, no guaranteed liquidity, and no guaranteed price floor. Past performance — including any backtested or hypothetical figures — does not predict future results. Trading involves risk; only allocate capital you can afford to lose entirely.

11.2 Interim centralization

Until SpiralDAO governance is live and the proxy's upgrade authority is transferred to the timelock contract, the deployer wallet retains the technical ability to upgrade the SPLC implementation contract. While the published source contains no mint function and no tax-rate setter, a malicious upgrade could in principle alter those properties. Users should evaluate this risk explicitly until the governance migration is complete and verifiable on-chain.

11.3 Liquidity bootstrap risk

The initial SPLC/USDC pool is funded by a seed-round contribution rather than by a large institutional market-maker. Until secondary liquidity grows, slippage will be high and exit liquidity will be limited. The 12-month LP time-lock partially mitigates rug-risk for the seed position, but does not guarantee tradeable depth.

11.4 Smart-contract risk

The SPLC contracts have been written against audited OpenZeppelin and LayerZero base contracts, but the SPLC-specific extensions (tax logic, OFT integration, staking vault, paymaster) are not yet third-party audited. An external audit is planned before any large-scale custody or institutional integration. Until then, deposits, staking, and bridging carry standard smart-contract risk.

11.5 Regulatory risk

The regulatory treatment of digital assets, governance tokens, and DeFi liquidity provision varies by jurisdiction and is evolving. SPLC is not registered as a security in any jurisdiction. Users are responsible for determining the legal status of their participation under their own local laws.

12. Contact

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