RedCloud DePIN Protocol ($RCLOUD)

Technical Whitepaper v1.1

Conceptualized: 2020 | Deployed: August 2026

Executive Summary

RedCloud bridges consumer-grade data privacy with high-performance blockchain decentralisation. Originally engineered in 2020 as a physical, subscription-free home cloud server architecture on Kickstarter, the protocol has been upgraded into a Decentralised Physical Infrastructure Network (DePIN) Storage Aggregator deployed on the high-speed Solana blockchain.

By eliminating corporate data tracking, vendor lock-in, and monthly recurring storage fees, RedCloud delivers a permanent, encrypted storage utility accessible through a frictionless, drag-and-drop consumer interface.

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1. Token Specification Block

- **Official Token Name:** RedCloud DePIN
- **Token Ticker Asset:** `$RCLOUD`
- **Total Circulating Supply:** 1,000,000,000 (1 Billion hard-capped)
- **Smart Contract Standard:** Solana SPL Token Utility Architecture
- **Liquidity Insulation:** Block-0 Bundled Developer Validation (2.8 SOL Floor Allocation) [3.4]

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2. The Core Infrastructure Problem & Solution

- **The Corporate Rent Crisis:** Modern cloud storage utilities trap consumer data within walled gardens, charging perpetual subscription fees for finite storage tiers while harvesting user analytics.
- **The Web3 Friction Gap:** Existing Web3 storage networks feature robust physical layers but lack accessible, consumer-first frontends, rendering them unusable for non-technical users.
- **The Redundancy Layer:** RedCloud acts as an intelligent orchestration gateway. The network programmatically routes sharded data bundles across global physical arrays. By decoupling data persistence from hardware ownership, RedCloud guarantees zero single points of failure.

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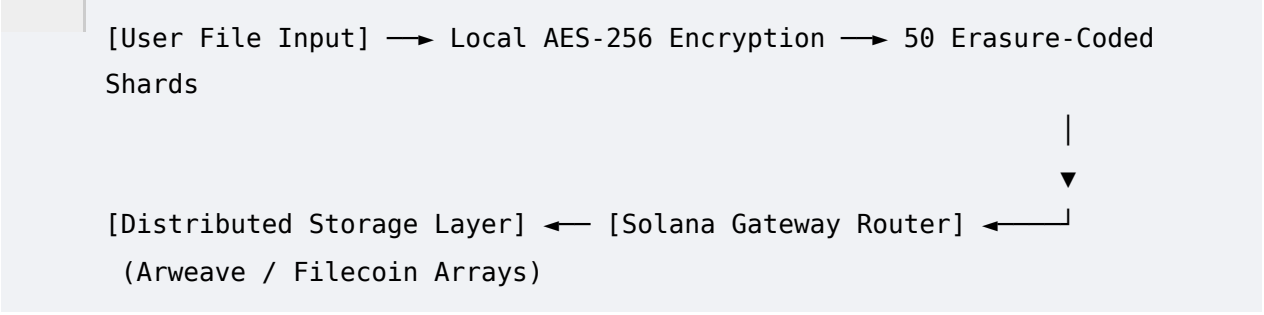
3. Technical Architecture & Cryptographic Workflow

RedCloud operates on a **Zero-Knowledge Consumer-to-Node Sharding Protocol**. The end-to-end data lifecycle executes as follows:



1. **Localised Encryption:** When a file is dropped into the RedCloud Client Application, it is encrypted locally on the host machine using open-source, enterprise-grade **AES-256** encryption before transmission begins.
2. **Erasure Coding & Sharding:** The local client shreds the encrypted payload into **50 distinct fragments (shards)**.
3. **Global Distribution:** Shards are dynamically distributed across peer-to-peer storage networks. No single physical host ever handles a complete file structure.
4. **The 20/50 Reconstruction Rule:** Utilizing advanced erasure-coding mathematics, the user only requires any **20 out of the 50 global fragments** to perfectly reconstruct and decrypt their files instantly. Data availability remains pristine even if up to 60% of targeted physical nodes go offline simultaneously.

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4. Native Token Utility ($RCLOUD) & Economic Flywheel

The `$RCLOUD` token is the native cryptographic utility asset powering the RedCloud DePIN orchestration layer. Rather than operating as a speculative instrument, the token functions as the primary mechanism for resource allocation, security collateral, and automated value settlement across the decentralized storage marketplace.

4.1 The Demand Side: Storage Consumers

To access subscription-free, zero-knowledge distributed storage, consumers must acquire `$RCLOUD` tokens from the open market. The protocol processes these tokens through two distinct operational frameworks:

- **The Utility Lock (Standard Tier):** Users stake and lock a deterministic quantity of `$RCLOUD` tokens within the protocol's escrow smart contract. This locked balance acts as a dynamic collateral pool that grants continuous, ongoing bandwidth and storage access. The tokens remain the user's property but are locked from circulation while actively leasing network storage space.
- **The Transactional Burn (Lifetime Expansion Tier):** For permanent, high-volume data allocations, users execute a programmatic token burn. The client application routes these tokens directly to a verifiably dead burn address (`0x000...000`), permanently removing them from the circulating supply. This introduces a structural deflationary pressure directly correlated with real-world network usage.

4.2 The Supply Side: Node Operators

Independent hardware hosts—ranging from enterprise data storage arrays to consumer-grade mini-PCs and dedicated hard drives—provide the physical infrastructure necessary to host the encrypted, erasure-coded file shards.

- **Collateralized Staking Requirements:** To ensure network integrity and prevent malicious data tampering or random node dropouts, operators must stake a baseline allocation of `$RCLOUD` tokens to register their node on the network.
- **Slashing Mechanics:** If a node fails automated cryptographic proof-of-retrieval challenges or goes offline for an unacceptable window, a portion of their staked collateral is programmatically slashed and redistributed back to the ecosystem pool, guaranteeing high service standards.
- **Programmatic Emissions Settlement:** Operators are automatically compensated via the protocol's algorithmic distribution engine. They receive recurring token emissions sourced directly from the consumer network fees and the locked staking yield pools, proportionate to the exact volume of verified, uptime-accessible storage space they provide.

4.3 Core Economic Flywheel Dynamics

This structural loop ensures that the token's financial trajectory is fundamentally anchored to the physical growth of the network:

1. **Increased Consumer Adoption:** As more users migrate away from corporate monthly cloud storage subscriptions to use the RedCloud application, the

demand to buy `$RCL0UD` tokens from the open market increases.
2. **Supply Contraction:** The dual forces of consumer utility locking and permanent token burns systematically reduce the liquid circulating supply on decentralized exchanges (Raydium).
3. **Infrastructure Scaling:** A rising market value and deep on-chain liquidity pools naturally increase the profitability metrics for node operators globally. This incentives more hardware hosts to deploy physical storage to the network, driving down overall latency, increasing data redundancy speeds, and further refining the consumer experience.

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5. Anti-Bot Tokenomics & Launch Mechanics

To protect retail participants from toxic high-speed mev sniper scripts and front-running bots, RedCloud implements a strict **Block-0 Liquidity Deployment Bundle**:

- **Block-0 Creator Allocation:** ~13% to 14% of the mathematical supply floor is safely acquired within the identical execution millisecond of pool initialization using a **2.8 SOL bundled developer purchase** [3.4].
- **Anti-Dump Liquidation Strategy:** Creator token reserves are structurally partitioned for incremental tranche liquidations at rising green market cap milestones [3.4]. This prevents chain-analysis mapping tools (e.g., Bubblemaps) from flagging massive creator dumps, preserving market integrity and supporting continuous project runway funding [3.4].

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6. Protocol Development Roadmap

- **Phase 1: Inception & On-Chain Seeding (Current)**
  Execution of the bundled Block-0 liquidity launch [3.4]. Official metadata indexing via Dexscreener visual validation portals [3.4]. Activation of the historical Kickstarter and Reddit trust anchors to establish unchangeable proof of project origin [3.5].
- **Phase 2: Dashboard Frontend Porting**
  Translating original 2020 layout wireframes into a clean, modern React/Web3 client framework. Private beta onboarding for early core community members.
- **Phase 3: Orchestration Layer Integration**
  Deploying open-source client API layers to connect the front-end interface

directly with live distributed storage networks.

- **Phase 4: Hardware Genesis Deployment**
  Releasing lightweight open-source node client software allowing any personal computer or network-attached storage (NAS) array to earn network rewards.
