



Decentralized AI-Controlled Retail Infrastructure with Integrated Tokenized Payment System and Biometric Settlement

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Defensive Publication Title:

Decentralized AI-Controlled Retail Infrastructure with Integrated Tokenized Payment System and Biometric Settlement

Section 1: Technical Field

This invention relates to decentralized computing infrastructure, identity management, financial technology (fintech), and point-of-sale (POS) systems. It defines a system that combines enterprise-grade, AI-managed infrastructure with a cryptographically secure payment framework, enabling irreversible, privacy-respecting, and legally verifiable transactions for retail environments.

Section 2: Background of the Invention

Traditional retail IT systems are often fragmented, insecure, and inefficient:

- Payments involve third-party processors with 2.5–3.5% fees, high fraud rates, and delayed settlement.
- Identity and compliance layers are bolted on rather than integrated.
- Chargebacks and payment reversals increase liability.
- POS and IT infrastructure are siloed, difficult to manage, and vulnerable to data breaches.

This invention introduces a **single, unified appliance** that provides:

- AI-controlled IT infrastructure (networking, RMM, security)
- Integrated payment system (tokenized USD certs + biometric settlement)
- Identity and compliance enforcement
- Optional traditional card fallback
- Incentivized decentralized participation by verified merchants

Section 3: Summary of the Invention

The system includes:

1. CyberNest Appliance

- Edge device or clustered unit with:
 - SD-WAN
 - Firewall and eBPF security
 - AI-managed RMM (Remote Monitoring and Management)
 - Mixtral + Weaviate-based log analysis
 - Local MinIO instance for identity chain storage
 - WireGuard mesh routing

2. Tokenized USD Payment System

- Users hold fiat-pegged, cryptographic Kyber certificates (denominated like physical cash).
- Payments are:
 - **Biometrically approved**
 - **Burned on use**
 - **Instantly settled** between FDIC accounts
- All transactions are **anchored to a public log** (amounts only, no PII)

3. Biometric POS Validation

- At time of sale:
 - Buyer confirms with biometric verification (e.g., mobile app)
 - Token is verified for integrity and legitimacy

- Sale is approved; token is burned
- Funds are transferred in real time

4. **Optional Card Processor Integration**

- System can fallback to Visa/Mastercard/AmEx via Soldfi
- Traditional fees apply, passed to user or merchant as configured

5. **Merchant Participation Incentives**

- Verified merchants (via KYB) who run a CyberNest Trio publicly:
 - Become node validators in the infrastructure
 - Receive **0.5% discount** on transaction fees
 - Help improve uptime, routing, and anchor stability

6. **Zero PCI/PII Exposure**

- No credit card or personal data is stored on the merchant's system
- Cert hashes and biometric approvals are the only transaction records
- Dramatically reduces breach liability and compliance scope

Section 4: System Architecture Overview

4.1 Unified Appliance Stack

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| CyberNest Retail Device |
|-----|
| - RMM Agent             |
| - eBPF Network Firewall |
| - SD-WAN (AI Routed)    |
| - Biometric POS Module  |
| - Token Engine (Kyber)  |
| - MinIO (identity ledger)|
| - WireGuard Mesh Adapter|
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4.2 Transaction Flow (Kyber Token)

1. Customer selects to pay with Avaron cash tokens
2. POS terminal requests biometric confirmation
3. Customer signs token cert (burns it)
4. Local device confirms token is unspent (ObjectBox)
5. Public log is updated (amount, hash only)
6. API triggers real-time cash movement (FDIC → FDIC)
7. Merchant receives funds **instantly**, with no chargeback risk

4.3 Optional Fallback (Solidfi Integration (or other BaaS))

- System routes payments to Solidfi APIs for traditional cards
- Fees passed through or absorbed by merchant
- Token system remains default

Section 5: Incentivized Node Participation

- Merchants who:
 - Complete KYB
 - Deploy CyberNest Trio
 - Opt into public anchoring + routing

→ Become **trusted public nodes** and receive **0.5% fee reduction**

→ Improves:

- Global uptime
- Anchor response time
- Distributed trust of token logs

Section 6: Security and Compliance Benefits

- Biometric approval means **non-repudiation**
- No chargebacks possible due to cryptographic finality
- Identity logs are anchored but private
- No PCI compliance required
- Offline validation possible using on-device ObjectBox

Section 7: Use Case Scenarios

- **SMBs:** Simplified infrastructure and payment stack
- **Enterprises:** Scalable deployment with node-based cost reduction
- **Retail Chains:** Unification of IT + POS + security

- **Government Kiosks:** Audit-ready, fraud-resistant cash handling
 - **International or Rural Businesses:** Offline-first, instant payment acceptance
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End of Defensive Publication

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System Name: Avaron Retail Infrastructure & Payment Platform

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