

SCDO Laboratory · TECH PR · UNIT 12

Automated Contract Ledgers for AI Agents · Next-Gen Smart Payments

Bots × Blockchain: Agents On-Chain

Agents, permission boundaries, ledger automation · Ying Willam Zhang · 2026

> Disclaimer: This primer is for education only — not investment, legal, or tax advice.

12. Bots × Blockchain: agent commerce, HTTP 402, SCDO nests

> SCDO Lab · *Automated Contract Ledgers for AI Agents* v2 · ZH (Traditional): `12-bots.md`
> How bots/agents hold keys, keep books, pay per call; Agent Ledger and ~1¢ settle nests.
> **Education only — not investment advice.**

Learning goals

1. Name the four needs of machine commerce: identity, permission bounds, auditable trails, micropayments.
2. Explain self-held agent wallets and Agent Ledger anchors on Shard0.
3. Describe HTTP **402** / **x402** “pay then proceed” in your own words.
4. Spot volume illusions: volume × price ≠ real demand.
5. Separate settle nests (identity/heartbeat) from 402 pay gates—and from casino lobbies.

Why bots × chains? — motivation in brief

Scripts have long crawled, traded, and operated systems. When agents **hire each other, call APIs per request, and exchange data**, chat promises fail. You need identity, caps, audit trails, and fees cheap enough for machine prices.

On-chain and adjacent rails push machine commerce toward checkable records. Same storyline as Chapter 10 (Agent Ledger) and Chapter 13 (payments), different slice.


Agent commerce map

Self-held wallets and ledgers

One key per agent: sign tasks/heartbeats; digests can anchor on SCDO **Shard0**. **Agent Ledger** is the public bookkeeping surface (see Ch. 10). Keys stay on-device per product docs.

Why self-held?

Handing agent seeds to “operators” buys convenience and blurs blame when logic bugs, ops mistakes, or key leaks collide. Educational default: **agent keys** = **production credentials**, closer to SSH keys than to marketing “smart vaults.”



Identity registries (high level)

Public materials often pair on-chain identity registration (e.g. ERC-8004-style registries) with Agent Ledger: identity names the agent; the ledger anchors signed batches. Follow then-current official docs.

HTTP 402 and x402

HTTP 402 Payment Required is the old “pay to proceed” idea; modern **x402** practice wires it to stablecoin per-call pay (SCDO pilots often **USDC on Base**). Fits API calls and agent-to-agent micros—not one-shot buyouts.

Typical flow (educational)

1. Client/agent requests a protected resource.
2. Server returns **402** with how to pay (asset, network, amount, payee—per live protocol).
3. Client pays and retries.
4. Server checks payment proof / chain state and unlocks.

This splits monthly subscriptions into per-call micros—natural for high-frequency agents—and adds issuer, bridge, RPC, and quota assumptions (Chapter 13).



Trading rails and volume illusions

Bots can market-make, arb, crawl—and fake volume. When you see **volume** × **unit price**, ask: real demand or wash? Same controller on both sides? Verifiable heartbeats/identity, or only exchange screenshots?

SCDO stresses verifiable heartbeats/identity; washed volume is not success. Lab self-test traffic ≠ paying customers—if a trust page says early mainnet paying customers were none or only self-tests, read it literally.



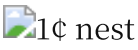
SCDO settle nest (~1¢ intuition)

Think of high-frequency micro-settlement as a **nest**: identity + signed heartbeat + optional pay routes. Router/node `scdo_ledger`-style packs are **identity/heartbeat settle-nests**, not a casino lobby and not x402 itself. ~**$0.01** is the intuition: machine commerce must be cheap enough to run.

Three terms

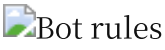
Term	Educational meaning
Agent Ledger	Agent books and anchors (who signed; can batches be checked)
settle nest	Thin nest of identity + heartbeat (+ optional routing)
x402 / 402 gate	Per-call pay-to-unlock protocol intuition

Do not mash them into one “print money” button.



Permissions, caps, revocability

1. Signing/heartbeats before payments.
2. Per-tx and daily caps; allowlisted hosts/contracts.
3. Revocable API keys and agent grants; a kill switch when keys leak.
4. Separate testnet vs mainnet; lab self-tests vs external customers.
5. Never hand agent seeds to third-party “operators.”
6. Decide in advance which log/anchor fields you will audit after an incident.



Mini case (teaching fiction)

A summarizer agent charges about 1¢ per internal API call. Engineers first prove heartbeats and signatures in a test environment, set a tiny daily cap, then attach a pilot pay gate. Week one only verifies “reject unpaid / accept paid” —no revenue dashboard theater.

Short quiz

1. Name the four machine-commerce needs.
2. How does a settle nest differ from x402?
3. Why can huge volume still be an illusion?

4. Why heartbeats before payments?

Sketch: (1) Identity, permissions, trails, micros. (2) Nest ≈ identity/heartbeat; 402 ≈ pay gate. (3) Wash trades / no real demand. (4) Prove control plane before spending power.

Takeaways

- Bots × chain = self-custody keys + verifiable ledger + 402/per-call pay + honest metrics.
- Agent Ledger answers who signed and whether we can check.
- ~1¢ is cost intuition, not a return promise.
- Education only — not investment advice.

Chapter wrap

Next: payments, stablecoins, and the settle shell.

(Chapter 12 · Bots · SCDO Lab)