



Open-Source Blockchain Solutions

Cardano's Infrastructure-First Approach



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Cardano Foundation

Open Source & Blockchain Technology

It's about trust and transparency



Use Cases for Blockchain Technology

- Decentralized Finance (DeFi)
- Real-World Asset (RWA) Tokenization
- Cross-Border Payments Without Intermediaries
- Digital Product Passports
- Verifiable Credentials
- Tamper-Proof Data Anchoring
- AI Agent Receipts
- x402 Protocol
- On-Chain Real-Time Financials (Reimagining the Audit)



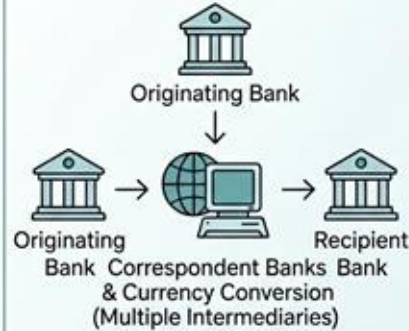
Cross-Border Payments Without Intermediaries

Instant settlement without SWIFT.
Deterministic fees, no currency conversion delays.

Ideal for international contributor payments & open-source bounties.

COMPARISON: CROSS-BORDER PAYMENTS

THE TRADITIONAL NETWORK: SWIFT



- FEES: 3-7% (HIGH)
- SETTLEMENT: 1-5 DAYS (SLOW)
- NO TRANSPARENCY (OPAQUE PIPELINE)

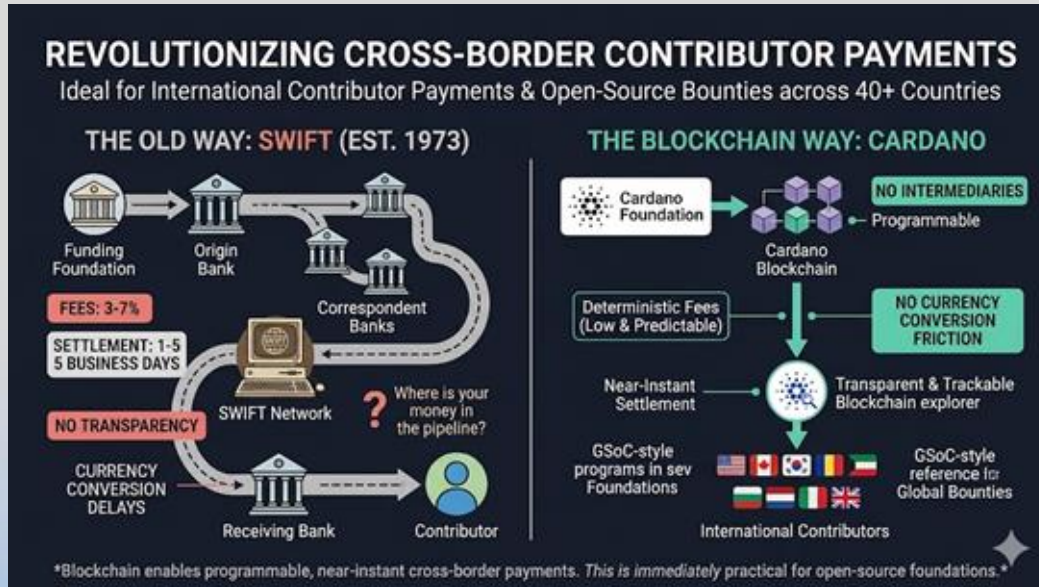
THE BLOCKCHAIN NETWORK: CARDANO



- NO INTERMEDIARIES (DIRECT)
- DETERMINISTIC FEES (LOW & PREDICTABLE)
- NEAR-INSTANT SETTLEMENT (SECONDS)

IDEAL FOR OPEN-SOURCE BOUNTIES & GLOBAL CONTRIBUTORS

Cross-Border Payments Without Intermediaries



Digital Product Passports — Provenance and Compliance

EU Ecodesign Regulation (2027) requires DPPs for electronics & batteries.

Cardano's OriginateNavio platform is already in production — Georgian wine provenance, traceable to the block.

DIGITAL PRODUCT PASSPORT (DPP) OVERVIEW

EU ECODESIGN (2027) REQUIREMENT:
Electronics • Batteries • Textiles



Origin



Materials



Repairability



End-of-Life



PRODUCTION DEPLOYMENT CASE:
WINE PROVENANCE

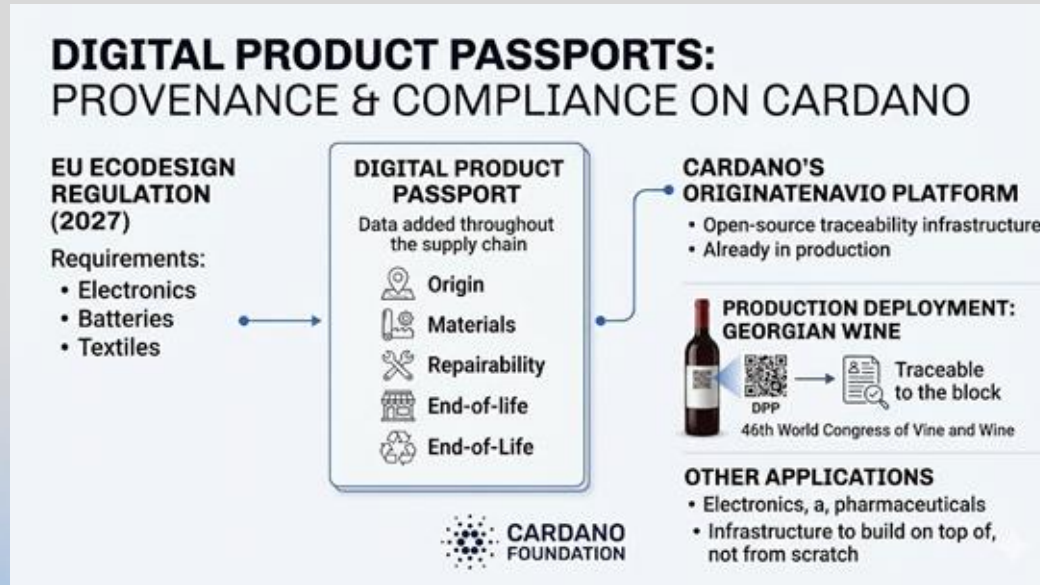
- TRACEABLE FROM VINEYARD TO CONSUMER
- ENSURES DATA INTEGRITY AND VISIBILITY

APPLICATIONS:

Electronics • Pharmaceuticals • And More

INFRASTRUCTURE FOR TRACEABILITY AND COMPLIANCE

Digital Product Passports — Provenance and Compliance



Verifiable Credentials — Certifications That Can't Be Faked

Cryptographically signed certificates —
cannot be forged or secretly revoked.

Deployed by UNDP's Tadamon program
across 57 countries via the Veridian
platform.



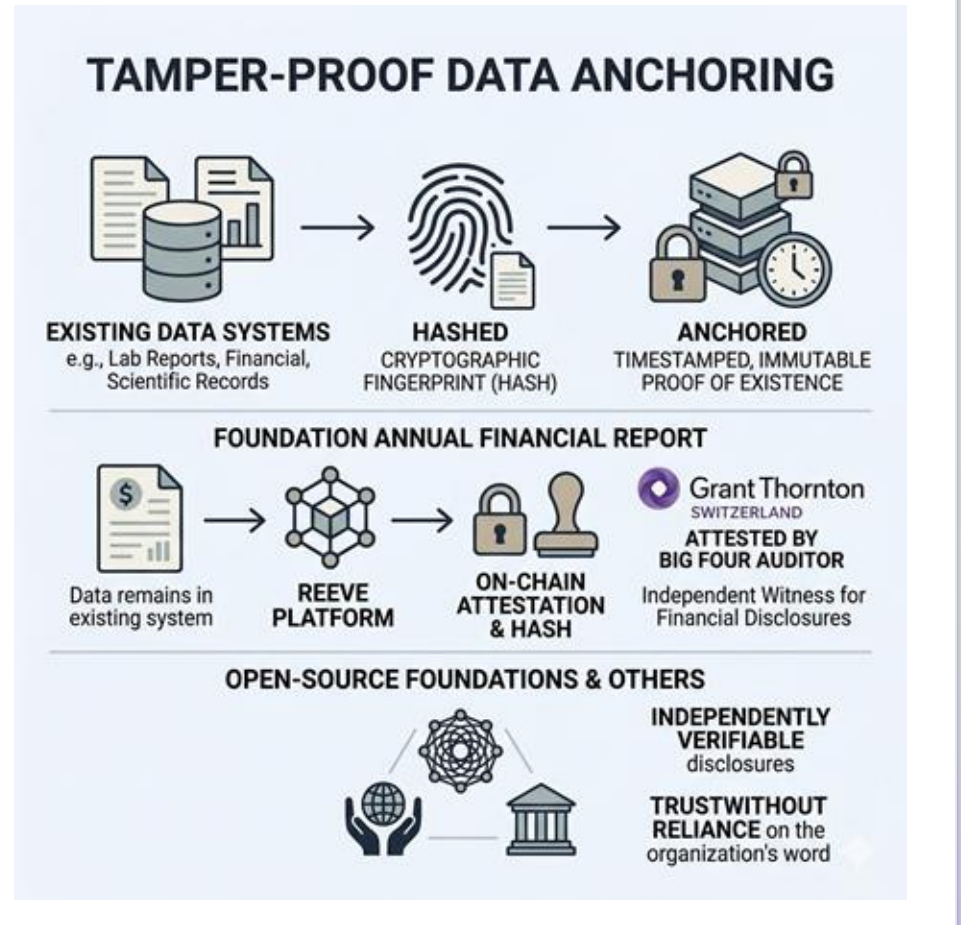
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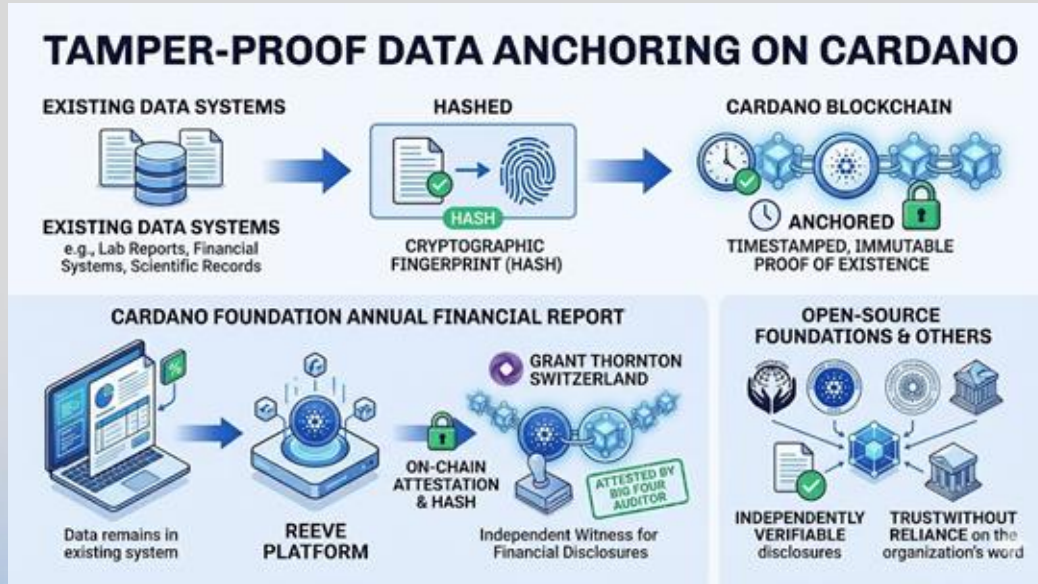
Tamper-Proof Data Anchoring — Lab Reports, Audits, Scientific Records

Hash any document → anchor on-chain →
immutable timestamp.

Lab reports, audit logs, financial
statements. Nobody can quietly edit
history.



Tamper-Proof Data Anchoring — Lab Reports, Audits, Scientific Records



AI Agent Receipts — Signed, Verifiable Inter-Agent Transactions

Every agent action produces a signed, on-chain receipt.

Full forensic audit trail of multi-agent workflows — who called what, when, and what was returned.



AI Agent Receipts — Signed, Verifiable Inter-Agent Transactions



x402 Protocol — Machine-Native Payments, Now Under the Linux Foundation

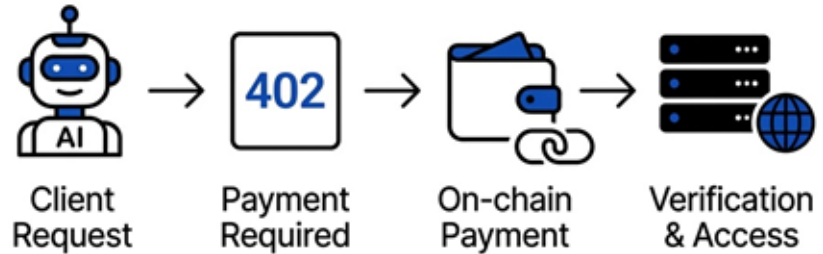
HTTP 402 = internet-native micropayments. One middleware line, no billing system, no accounts, no KYC.

Now under the Linux Foundation:
github.com/cardano-foundation/x402

x402 Protocol: Machine-Native Payments



Under the Linux
Foundation



- No subscriptions.
- No API tokens.
- No billing systems.
- Pay as you go (per request).

x402 Protocol — Machine-Native Payments, Now Under the Linux Foundation

x402 Protocol: Machine-Native Payments

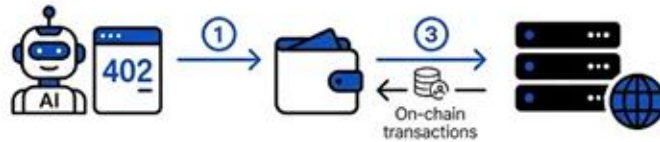


Cardano
Foundation



Developed by Cardano Foundation

Donated to Linux Foundation



1. API Server returns 402 with payment requirements

2. Client (AI agent, wallet, etc.) pays on-chain, retries with signed transaction in header

3. Server verifies payment and serves resource

No subscriptions.
No API tokens.
No billing systems.

Pay exactly for
what you use,
per request.

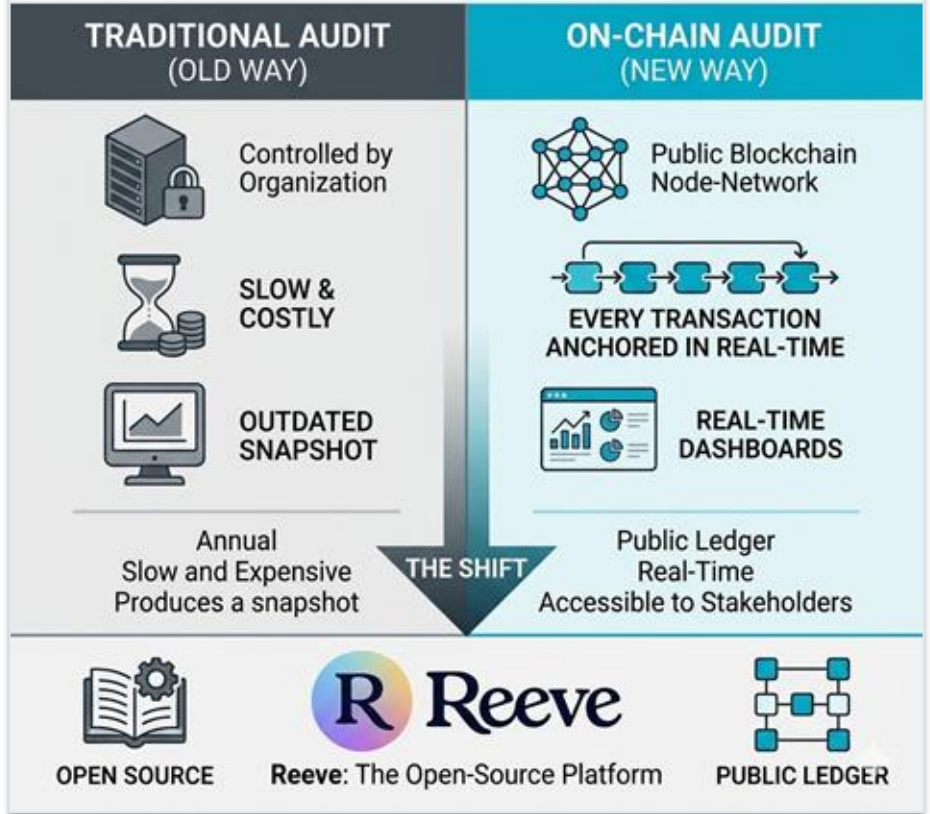


On-Chain Real-Time Financials — Reimagining the Audit

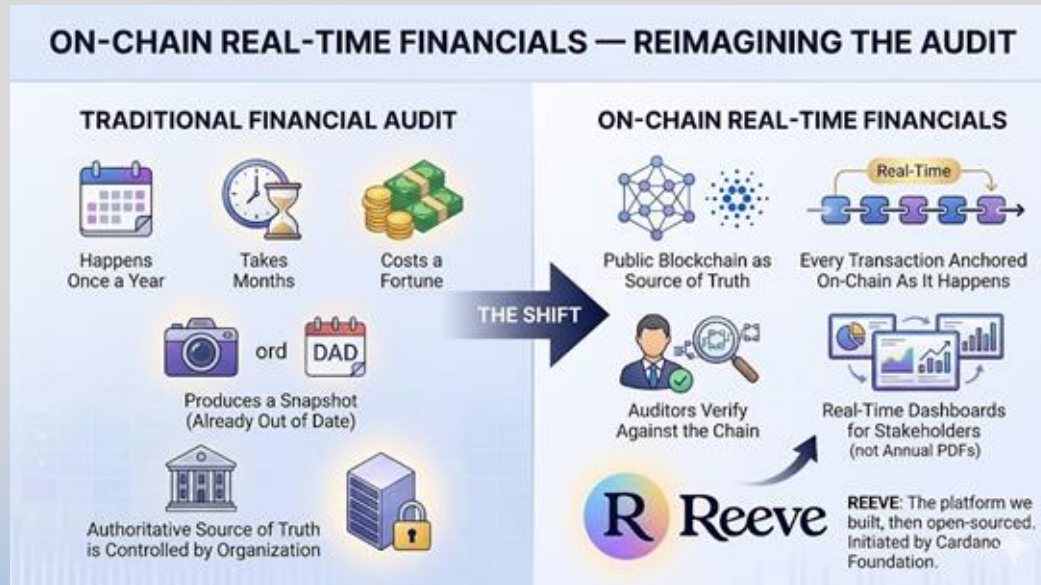
Transactions anchored as they happen. Auditors verify against the chain — not the company's internal database.

Cardano Foundation publishes its own annual report on-chain, attested by Grant Thornton Switzerland.

ON-CHAIN REAL-TIME FINANCIALS — REIMAGINING THE AUDIT



On-Chain Real-Time Financials — Reimagining the Audit



Blockchain Technology as a Tool for Open Source Organizations

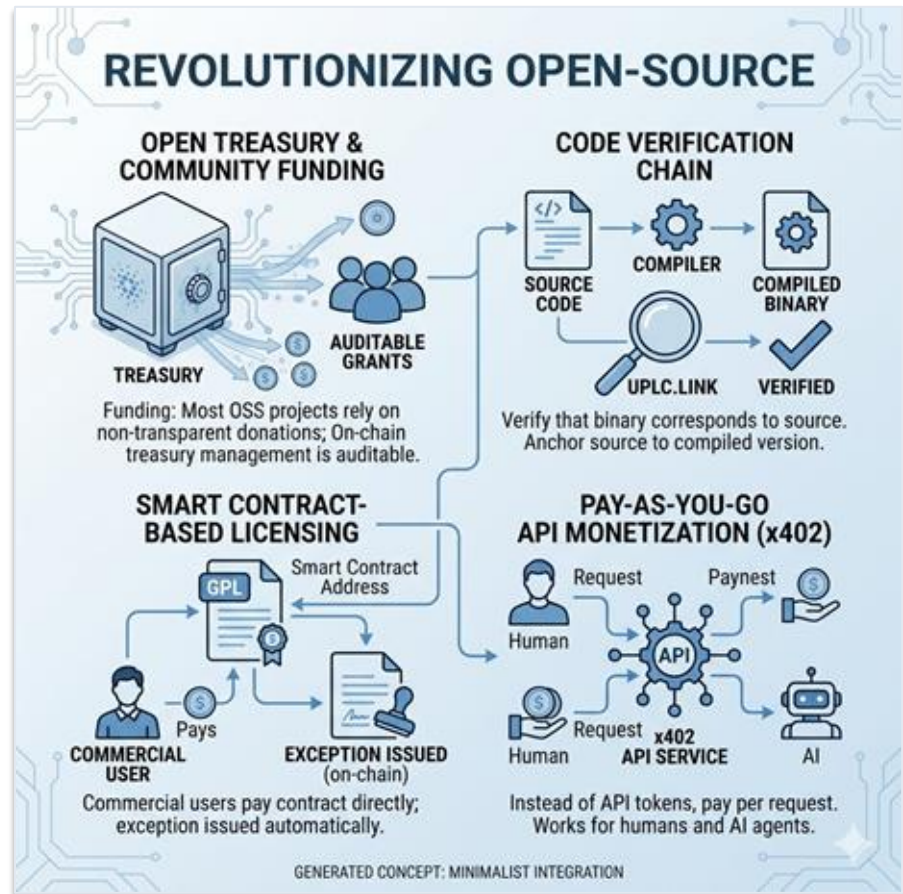
- Open-Source Funding, Licensing & Pay-As-You-Go APIs via x402
- Geospatial Data & Compliance Verification as Paid API Calls
- Scientific Data Monetization — Reproducibility and Attribution On-Chain
- ML Inference as a Paid Service — Agent-to-Agent and Human-to-Model
- Industrial & Sustainability Data — Immutable ESG and Carbon Records
- Agent-to-Agent Payments — The Economic Layer for Autonomous AI Systems



Open-Source Funding, Licensing & Pay-As-You-Go APIs via x402

GPL + smart contract address = automatic license payments.

x402 for pay-as-you-go APIs. On-chain treasury = publicly auditable open-source funding.



Open-Source Funding, Licensing & Pay-As-You-Go APIs via x402



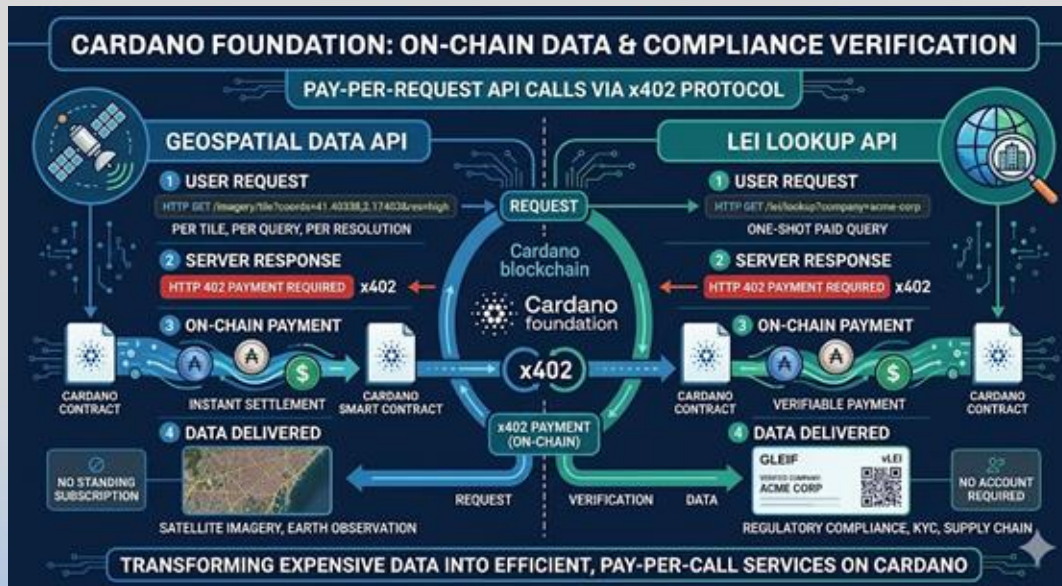
Geospatial Data & Compliance Verification as Paid API Calls

Satellite imagery per tile. LEI compliance lookups per call.

No subscription — pay on-chain per request via x402. Works for human and AI agents equally.



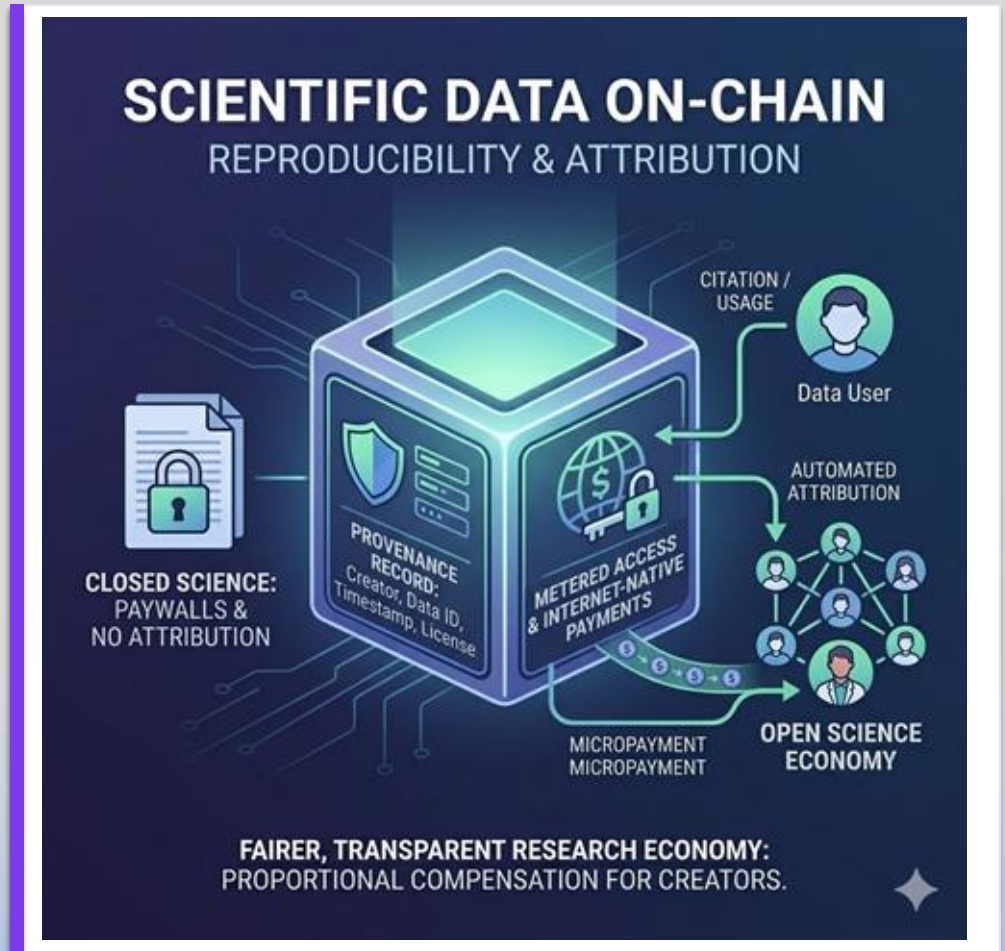
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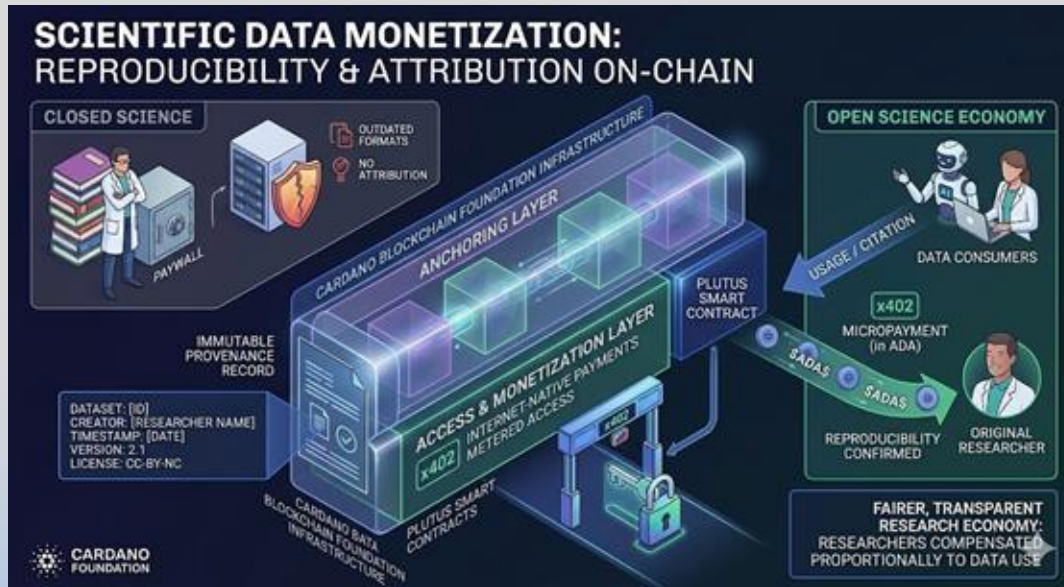
Scientific Data Monetization — Reproducibility and Attribution On-Chain

Dataset provenance on-chain. Attribution micropayments per citation.

Open science with fair compensation — no paywalls, reproducibility by design.



Scientific Data Monetization — Reproducibility and Attribution On-Chain



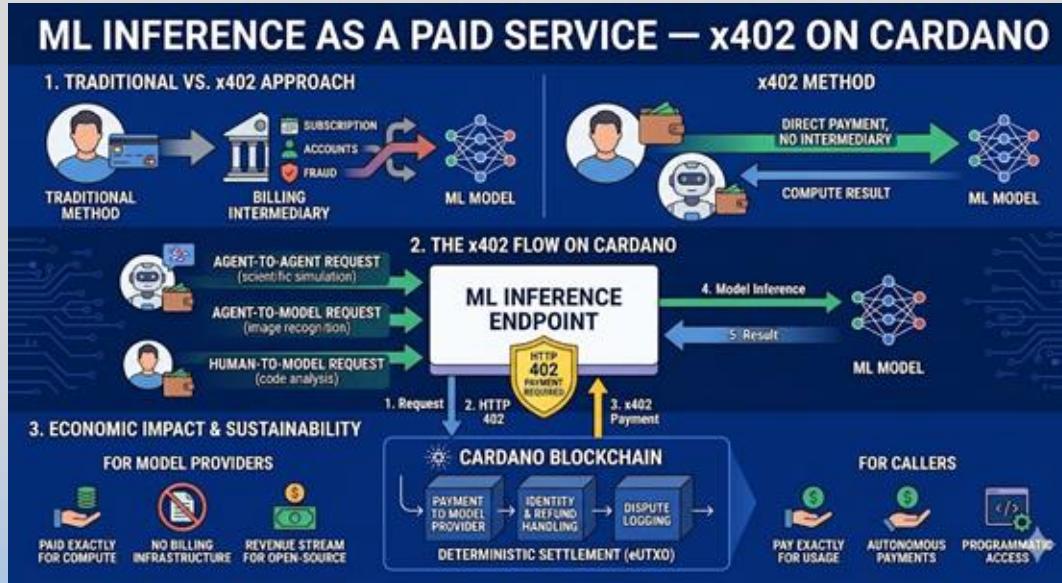
ML Inference as a Paid Service — Agent-to-Agent and Human-to-Model

Expose any model as a metered API endpoint. Callers pay per inference call, on-chain.

Self-sustaining open-source AI infrastructure — no billing system needed.



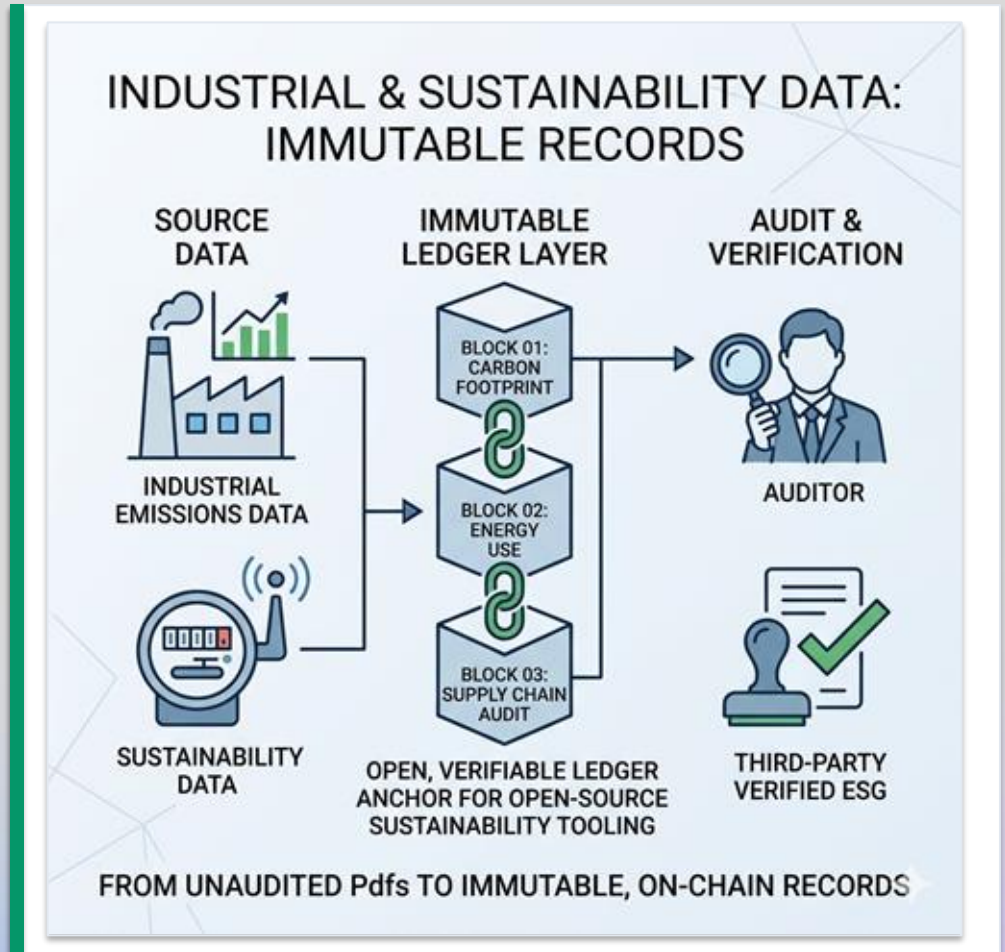
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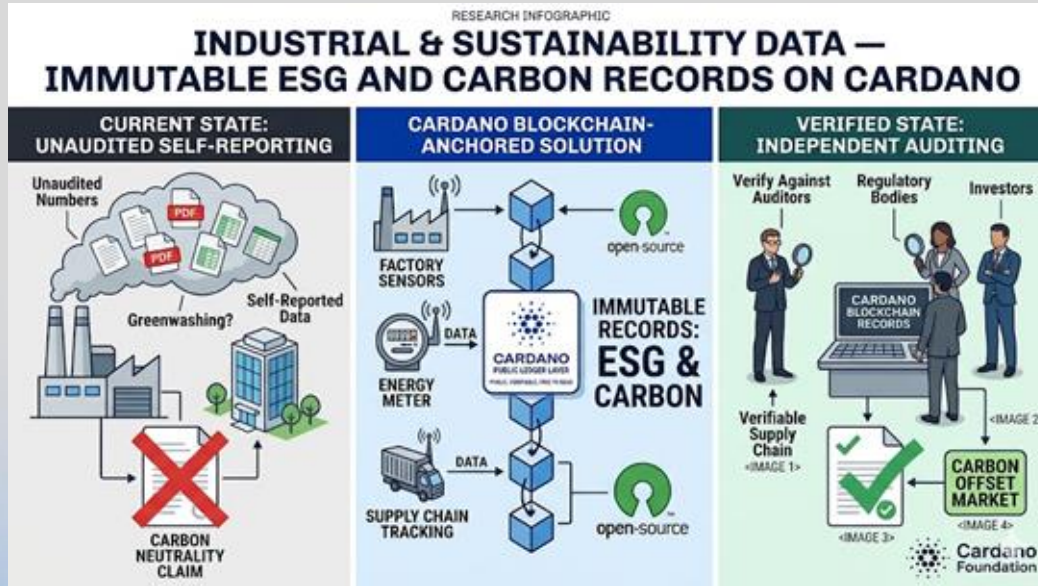
Industrial & Sustainability Data — Immutable ESG and Carbon Records

Sensor readings anchored on-chain.
Immutable carbon accounting.

EU CSRD-ready: third-party verifiable, not self-reported PDFs.



Industrial & Sustainability Data — Immutable ESG and Carbon Records



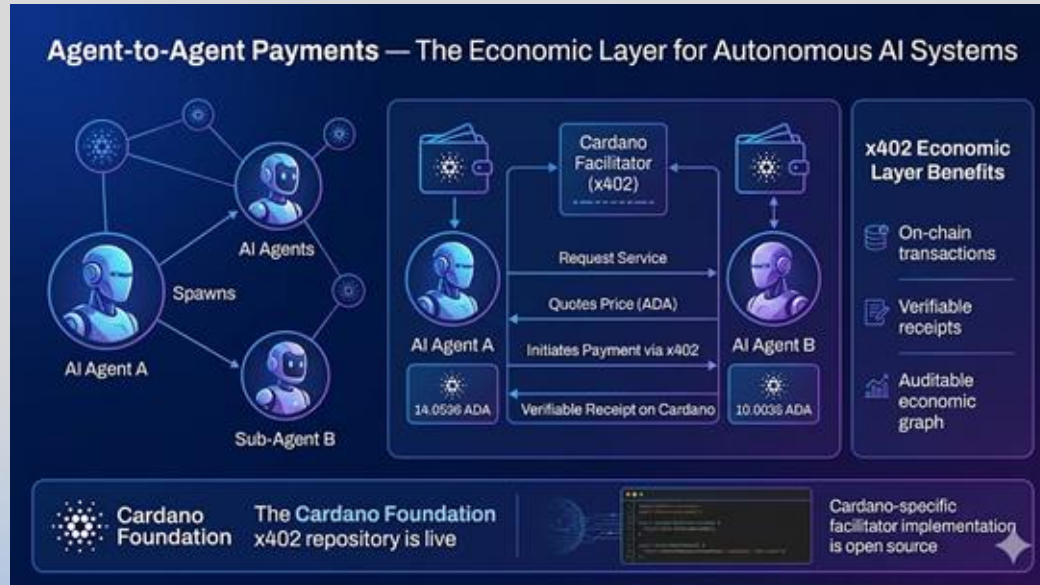
Agent-to-Agent Payments — The Economic Layer for Autonomous AI Systems

Agents hold wallets, earn and spend ada autonomously.

x402 as the economic protocol layer for multi-agent systems. Built and open-sourced by the Cardano Foundation.



Agent-to-Agent Payments — The Economic Layer for Autonomous AI Systems



x402 Payment Required

x402 is an open, neutral standard for internet-native payments. It solves the internet's original sin by natively making payments possible between clients and servers, creating win-win economies that empower agentic payments at scale. x402 exists to build a more free and fair internet.

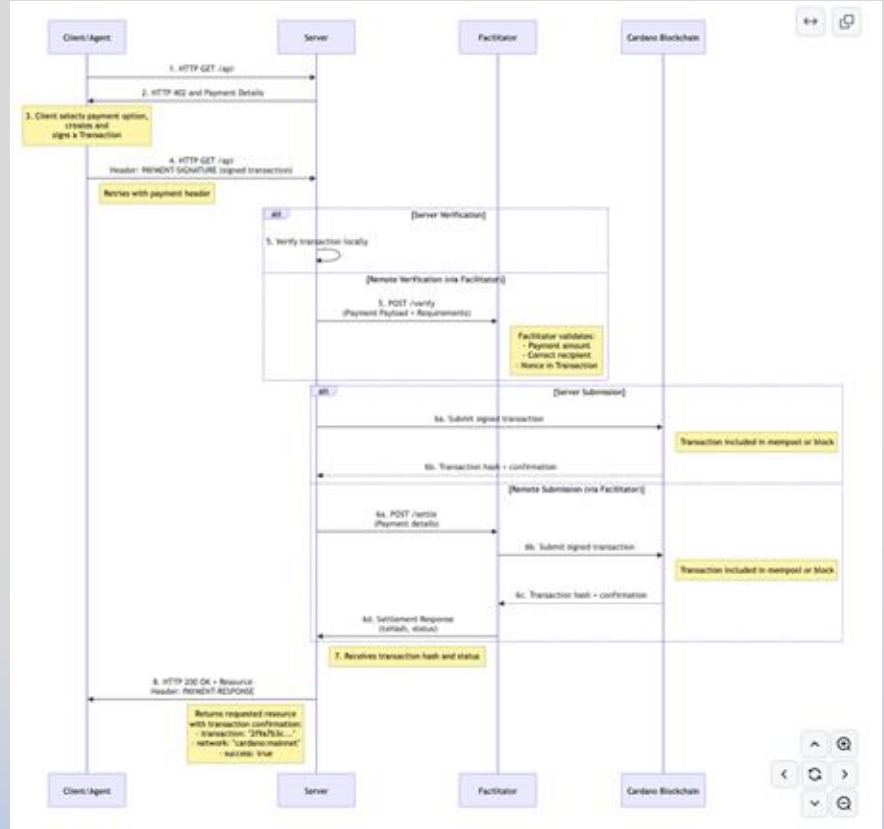
→ Accept payments with a single line of code

```

app.use(paymentMiddleware({
  "set /weather": {
    accepts: [...], // As many networks / schemes as you want to support
    description: "Weather data", // What your endpoint does
  },
}));
  
```

That's it. Add one line of code to require payment for each incoming request. If a request arrives without payment, the server responds with HTTP 402, prompting the client to pay and retry.

TRUSTED BY



<https://www.linuxfoundation.org/x402foundation>

- Agent ↔ Agent payments
- Earth observation & geospatial Compliance & verification one-shots (LEI lookups)
- Scientific & research data
- Specialized ML inference
- Industrial & sustainability data

<https://github.com/cardano-foundation/x402>

Open Source as a Requirement for Blockchain Technology

Intersect MBO

Pinned

cardano-node Public

The core component that is used to participate in a Cardano decentralised blockchain.

Haskell 3.2k 754

ouroboros-network Public

Specifications of network protocols and implementations of components running these protocols which support a family of Ouroboros Consensus protocols; the diffusion layer of the Cardano Node.

Haskell 290 103

cardano-ledger Public

The ledger implementation and specifications of the Cardano blockchain.

Haskell 287 176

cardano-formal-specifications Public

Formal specifications for the Cardano Blockchain

TeX 4 4

plutus Public

The Plutus language implementation and tools

Haskell 1.6k 511

Open-Source-Office Public

Intersect MBO Open Source Office (OSO)

Shell 15 2

Why should you trust a node, if you can't see its source code?

The screenshot shows the UPLC Link website. At the top, there are navigation links for 'Verify', 'Registry', and 'Docs', and a 'Connect Wallet' button. The main heading is 'UPLC Link ALPHA' with the tagline 'Don't trust, verify.' Below this, a sub-headline reads: 'Open-source Cardano smart contract verification tool. Verify source code against on-chain scripts, explore the registry, and build trust.' There are three statistics: 5 Verifications, 15 Smart Contracts, and 4 Resolutions. Below these are three main sections: 'Verify' (with a shield icon), 'Registry' (with a magnifying glass icon), and 'Documentation' (with a book icon). At the bottom, there is a 'Quick Lookup' section with a text input field labeled 'Paste address or script hash...' and a 'Check' button.

Uplc.link: Link source code to on-chain logic



How Does a Blockchain Work (simplified version)

- Live Demo: Python code — (maybe not and jump to Reeve as use case)



What is a Blockchain?



Transaction

Building block of activity

Data

ⓁⓇⓁ

Account

UTXOs



Block

The batching mechanism

Size (kB)

Finality



Consensus

Single Source of Truth

PoA

PoW

PoS

...



Node

Independent computers in the network

Hardware

Cloud

Local

BLOCK 1



Hash: 6U9P2
Previous hash:
00000

BLOCK 2



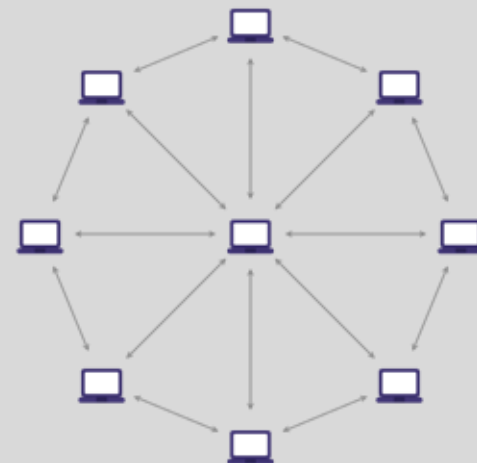
Hash: 8Y5C9
Previous hash:
6U9P2

BLOCK 3



Hash: 9L4Z1
Previous hash:
8Y5C9

...



What is Cardano?



Transaction

Building block of activity

Metadata

16 kB

EUTXO



Block

The batching mechanism

88 kB

~20 sec.

3-5 min | 15 min | 12 hours



Consensus

Single Source of Truth

Delegated Proof of Stake



Node

Independent computers in the network

Raspberry Pi

~3000 Block Producer

Epoch Cycle

1 Epoch = 5 days

(432,000 slots)

1 slot = 1 second



Energy Efficiency

~0.006 TWh/year

Bitcoin: ~150 TWh/y

Academic

Epoch 625 | Block height 13 298 422

eUTXO



UTXO #1

ADA

Datum

Token



Private Keys

Validator Scripts

→ Redeemer data

CARDANO Entities

 **Input | Output**

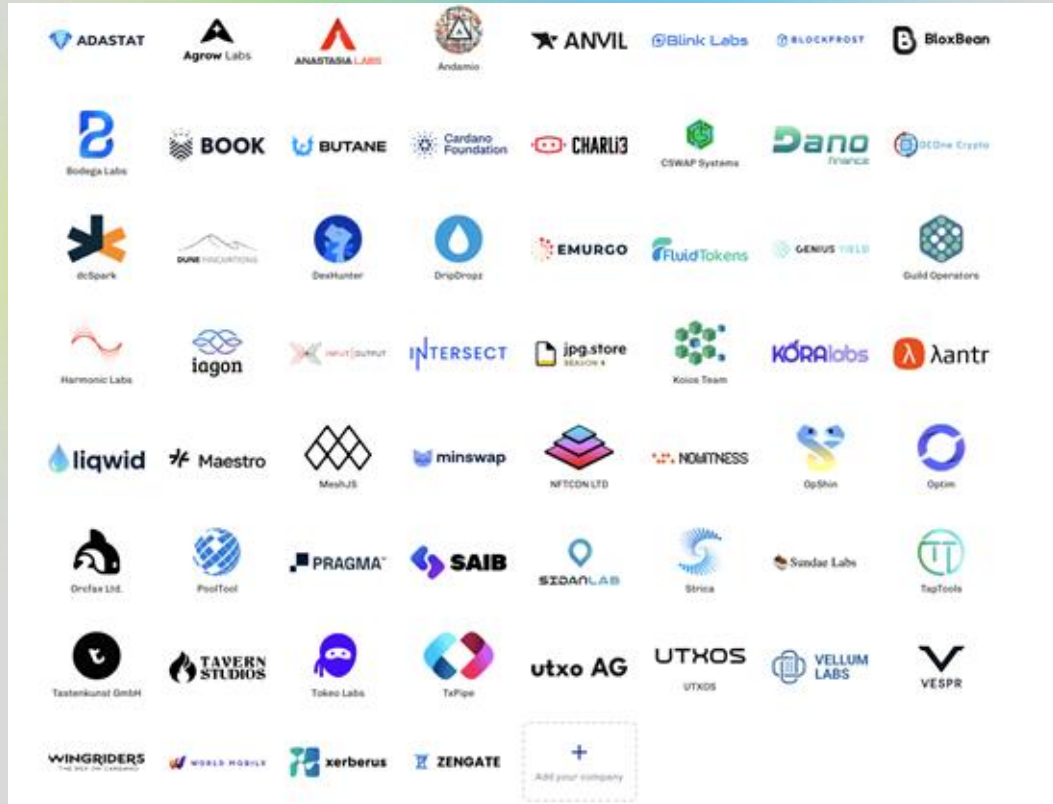
 **Cardano
Foundation**

 **PRAGMA™**

 **Emurgo**

 **INTERSECT™**

CARDANO Ecosystem

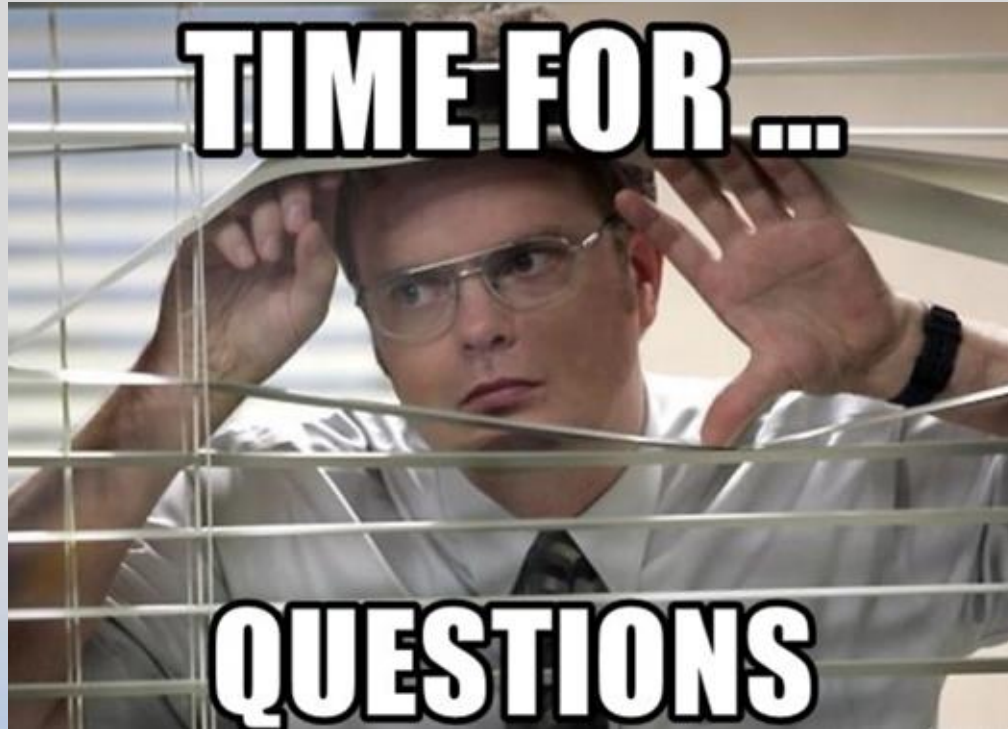


Infrastructure is ready: Now let's use it!

- What is Reeve and Why Does It Exist? — Open-source on-chain financial transparency, tested by Grant Thornton Switzerland.



Q&A



Thank you for joining us today and for your participation!

