Pay402

First x402 Facilitator on SUI

🔗 LIVE DEMO

merchant-production-0255.up.railway.app

ETH Global HackMoney 2026

x402: Micropayments Are Here

Pay402

Chain	Facilitator	Status
Base	Coinbase x402 SDK	✅ Live, mainnet
Solana	PayAI	✅ Live, mainnet
SUI	❌ None	← We're first

Market Traction

(December 2025)

$600M
annualized volume

63M+
monthly transactions

$7.5M
monthly USDC

1,100+
projects using x402

x402 is proven, production-scale technology.

Micropayments with Zero Friction

Pay402

SUI Unlocks Novel Features

Feature	Enabling Technology
Onboarding Non-Crypto Users	zkLogin + Enoki --> OAuth Wallet
No Browser Wallet	Gas Sponsorship (native)
Low Latency	Sub-Second Finality
Audit & Conflict Resolution	Cheap On-Chain Events
Flexible Extensions	Programmable Transaction Blocks
Massive Scaling	Object Model (Owned Objects)

Difficult or impossible on EVM/Solana

Live Demo - See It Work

Pay402

🔗 **https://merchant-production-0255.up.railway.app**

1. Visit Merchant

Click 'Get Premium Data ($0.10)' → HTTP 402

2. Payment Widget Opens

Stripe-like checkout shows details

3. Sign in with Google

zkLogin derives SUI address - No wallet!

4. [First Time] Fund USDC

Get test USDC for demo

5. PTB Verification

Widget verifies transaction before signing

6. Confirm & Pay

1-click sign, gas sponsored by facilitator

7. Content Delivered

Payment confirmed, receipt on blockchain

How We Built It - Technology Stack

On-Chain Components

- Smart Contract (SUI Move)
- Generic Coin<T> settlement
- Atomic PTB execution
- On-chain receipt events
- Circle USDC (native)
- Gas sponsorship

Off-Chain Components

Facilitator API
(Node.js + TypeScript)

- PTB construction
- Balance checking
- Settlement modes

Payment Widget
(React + Vite)

- zkLogin integration
- PTB verification
- Payment UI

Merchant
(Node.js + Express)

- Invoice generation
- HTTP 402 pattern
- Content delivery

Implementation Status & Roadmap

Pay402

Hackathon Achievements

- ✅ OAuth Login
- ✅ Gas Sponsorship
- ✅ PTB Validation
- ✅ zkLogin Signing
- ✅ Optimistic Settlement
- ✅ Pessimistic Settlement
- ✅ USDC Persistence
- ✅ Merchant Onboarding
- ✅ On-Chain Receipts

Roadmap

- 🔄 Mainnet Deployment
- 🔄 Browser Extension
- 🔄 Production Monitoring
- 🔄 Multi-Region Nodes
- 🔄 Embeddable Widget
- 🔄 Merchant SDK (NPM)
- 🔄 CCTP Integration for multi-chain settlement
- 🔄 Merchant Dashboard

First x402 on SUI - Best x402, Period

🔗 merchant-production-0255.up.railway.app
💻 github.com/hamiha70/Pay402

Solo Hacker Submission

Trust Model & PTB Verification

Pay402

Buyer DOES NOT trust facilitator for:

- Spending funds without signature
- Altering payment amount
- Redirecting to wrong merchant

Buyer TRUSTS:

- Own signature (zkLogin)
- PTB verification in widget
- SUI blockchain execution

PTB Verification Checks:

- Only allowed commands
- Amount matches invoice
- Recipient is merchant
- No unauthorized transfers

Why SUI? - Detailed Comparison

Pay402

Feature	SUI	Solana	EVM (Base)
zkLogin	Native	❌	⚠️ Complex
PTBs	Native	⚠️ Versioned tx	❌ Single-call
Object Model	Owned objects	Account-based	Account-based
Finality	600-700ms	~400ms	~12 min (L1)
Gas Sponsor	Built-in	Supported	⚠️ EIP-4337
Receipt Cost	~$0.0003	~$0.00025	~$0.50-$5

Key Insight: Not 'only possible on SUI' - but dramatically simpler and better

zkLogin Deep Dive

Traditional Crypto Payment

Install wallet extension (2 min)

Save seed phrase (3 min)

Buy crypto on exchange (1-3 days)

Transfer to wallet (10 min)

Connect to site (1 min)

Sign transaction (30 sec)

Total: Days of setup

Pay402 with zkLogin

Click payment link (1 sec)

Sign in with Google (3 sec)

First time: get address (instant)

Confirm payment (1 sec)

Total: ~5 seconds

How zkLogin Works

1. User authenticates with Google (OAuth 2.0)
2. zkLogin derives: Address = Hash(Provider + User_ID + Salt)
3. User signs with ephemeral key + ZK proof
4. SUI validators verify proof and execute

Gas Sponsorship Mechanics

How It Works on SUI

PTB has two 'actors':

```
ptb.setSender(buyerAddress) // Who initiates (owns USDC)
ptb.setGasOwner(facilitatorAddress) // Who pays gas (owns SUI)
```

Why This Is Safe

✓ Buyer signature = USDC spend

✓ Facilitator signature = SUI gas

✓ Neither can spend other's funds

✓ Object model enforces ownership

Economic Attack Mitigation

Gas budget capped per tx (~$0.01 max)

Facilitator rate-limits by address

PTB verifier prevents complex calls

Cost per tx: ~$0.0002 gas

Facilitator fee: $0.001