🤖 AI Agents Will Transact

But Today's Payments Weren't Built for Them

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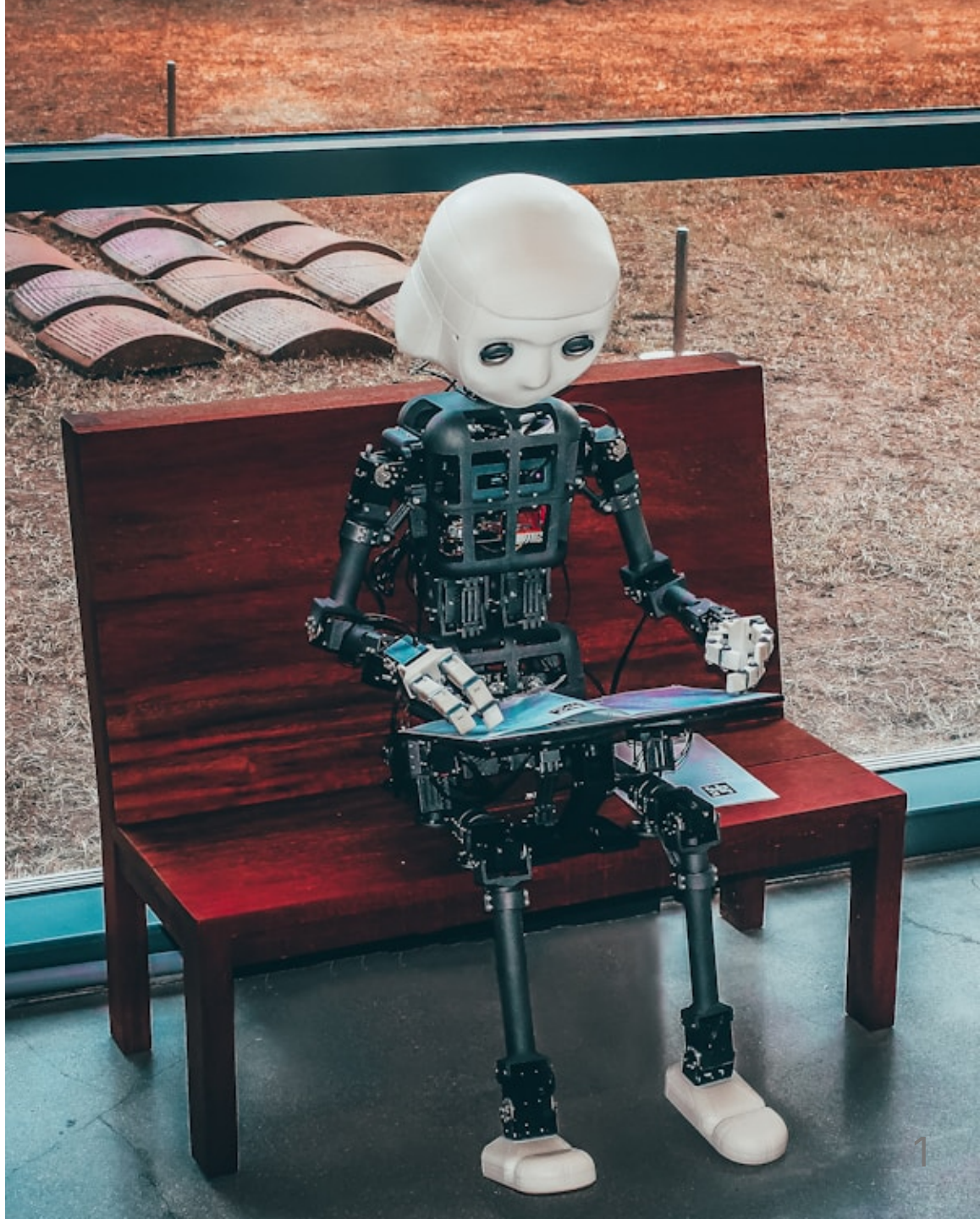
💼 Looking for roles in Product, Fintech, Payments



The Problem: Checkout Was Designed for Humans 🧩

Agents don't have fingers to click "Buy Now".

What Developers Face Today

- No standard way for agents to pay
- Multiple competing protocols (UCP, AP2, x402, ACP)
- No testing tools — only real implementations
- Security concerns unclear

What I Built

AgentPayment Sandbox (APS)

- Mock servers for 4 protocols
- Inspector for compliance testing
- Schema validators
- Works offline, no real money

> **The problem**: Developers building AI shopping agents have no way to test payment flows without implementing real protocol servers.

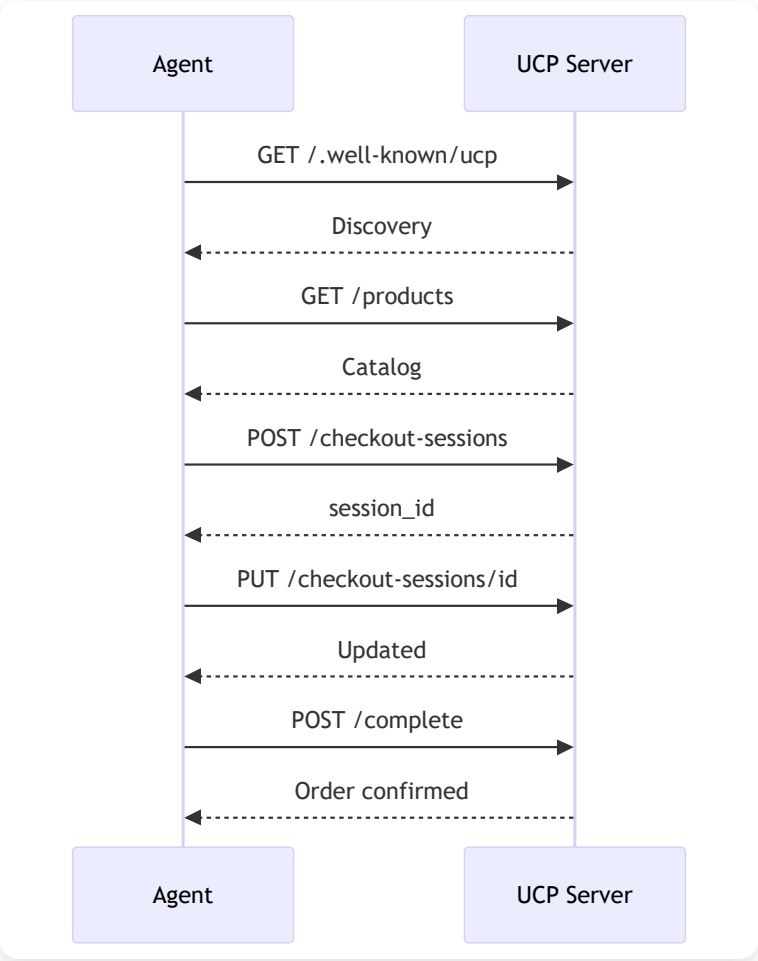
The Emerging Protocols 📋

Google, Coinbase, and OpenAI are defining how agents will pay.

Protocol	What It Does	Key Innovation
UCP	Universal checkout	Shopify, Walmart, Stripe unified API
AP2	Agent Payments	Verifiable Credentials (Mandates)
A2A	Agent messaging	Agents talk to agents
x402	Micropayments	HTTP 402 + crypto signatures
ACP	E-commerce	OpenAI + Shopify checkout
MCP	Tool access	Claude/ChatGPT to APIs

AP2 is built ON TOP of A2A. x402 extends AP2 for crypto.

UCP Flow: Universal Checkout 🛒



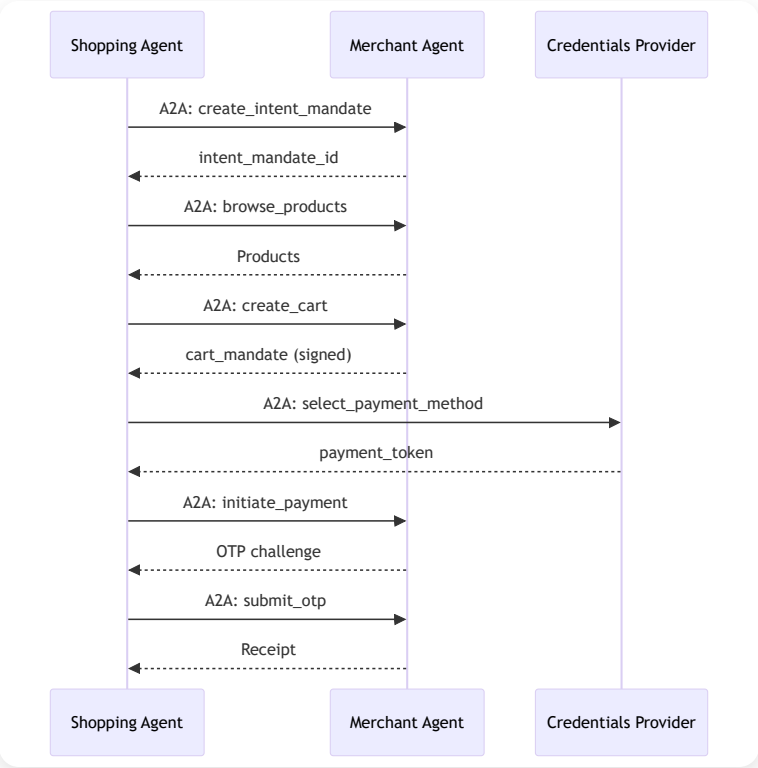
Endpoints Tested

- `GET /.well-known/ucp` → Discovery
- `GET /products` → Catalog
- `POST /checkout-sessions` → Create session
- `PUT /checkout-sessions/{id}` → Update cart
- `POST /complete` → Order confirmed

Key Features

- Idempotency via `Idempotency-Key` header
- Fulfillment options calculation
- Order history tracking

AP2 Flow: Agent Payments Protocol



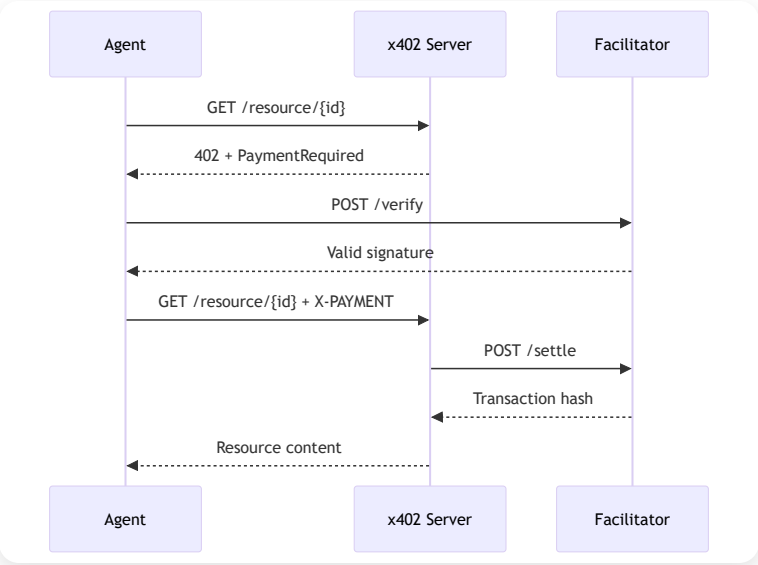
A2A Methods Tested

- `create_intent_mandate` → User authorization
- `browse_products` → Catalog access
- `create_cart` → Merchant commits price
- `select_payment_method` → Credentials Provider
- `initiate_payment` → OTP challenge
- `submit_otp` → Complete payment

Key Features

- Signed mandates (Intent, Cart, Payment)
- Multi-agent architecture
- OTP step-up challenge

x402 Flow: HTTP 402 Micropayments ⚡



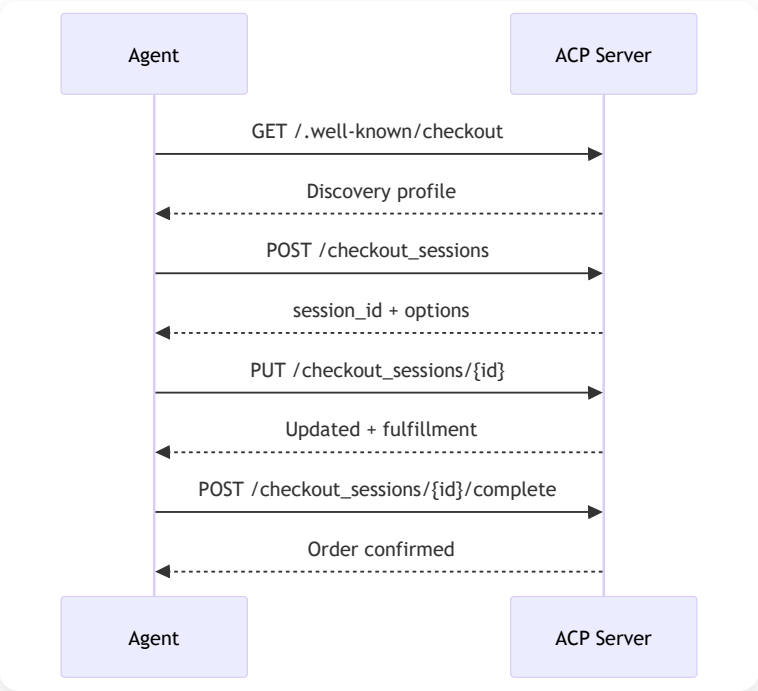
Endpoints Tested

- `GET /resource/{id}` → Returns 402
- `POST /verify` → Validate signature
- `POST /settle` → Execute on-chain
- `GET /info` → Server capabilities
- `GET /supported` → Payment networks

Key Features

- CAIP-2 network identifiers
- EIP-3009 authorization format
- Facilitator API pattern
- Base Sepolia testnet support

ACP Flow: Agentic Commerce Protocol 🏪

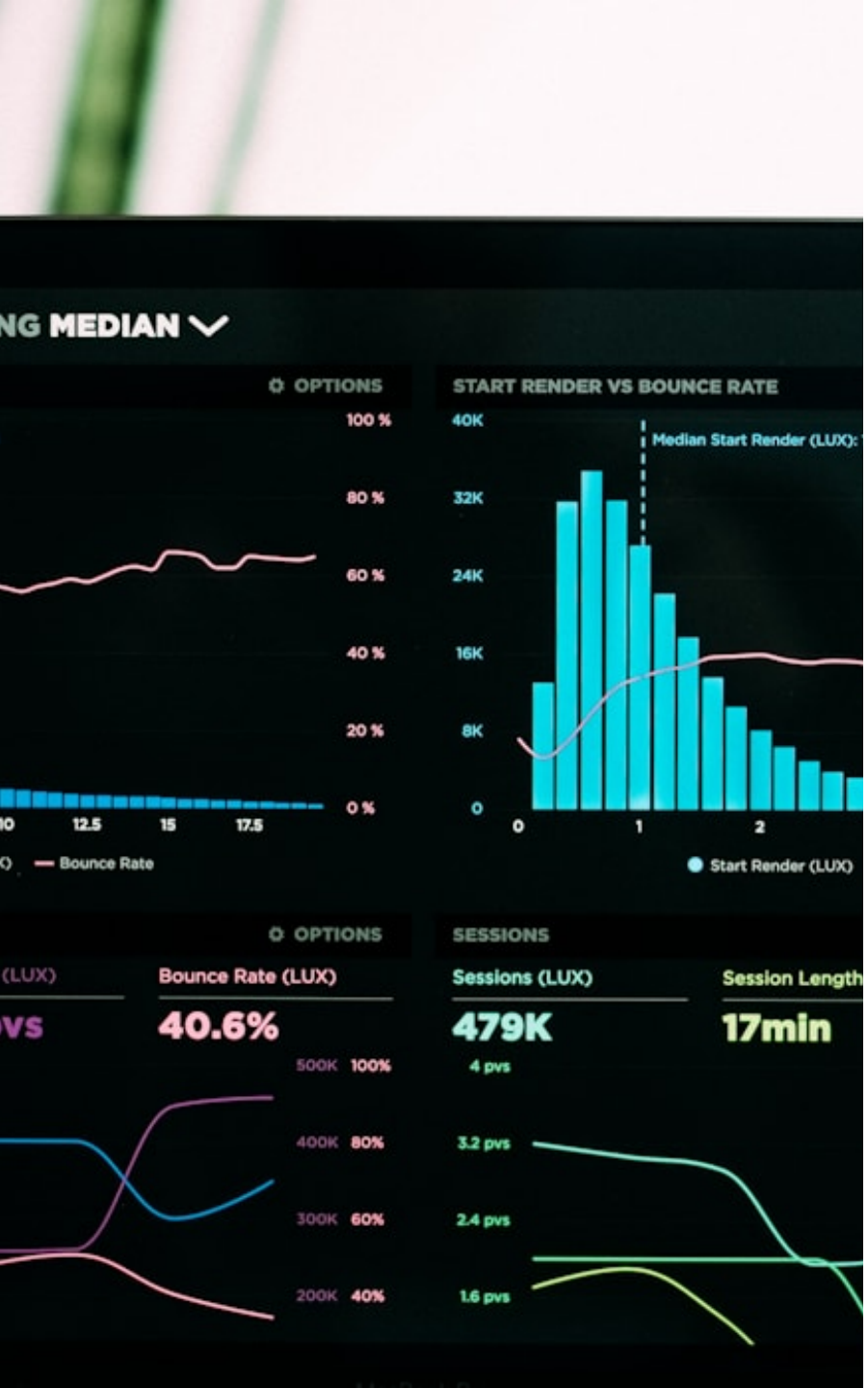


Endpoints Tested

- `GET /.well-known/checkout` → Discovery
- `POST /checkout_sessions` → Create session
- `PUT /checkout_sessions/{id}` → Update items
- `POST /complete` → Finalize order
- `DELETE /checkout_sessions/{id}` → Cancel

Key Features

- OpenAI + Shopify integration
- Fulfillment address handling
- API versioning support
- Session state machine



Why I'm Exploring This 🔍

My Curiosity

Agentic commerce sits at the intersection of **fintech**, **AI**, and **policy** — areas I find fascinating.

Questions That Drew Me In

1. **Infrastructure Gap**: How will payments evolve for agents?
2. **Trust**: Who's liable when an agent buys wrong?
3. **Security**: Can attackers hijack agent purchases?

My Approach

I build things to understand them. APS is how I learn.

The Trust Crisis 🔐

Payments assume a human clicked "Buy". Agents break that.

Old World Problems

- CAPTCHAs block agents
- Card forms need human input
- No proof of agent authority
- Who's liable for wrong purchases?

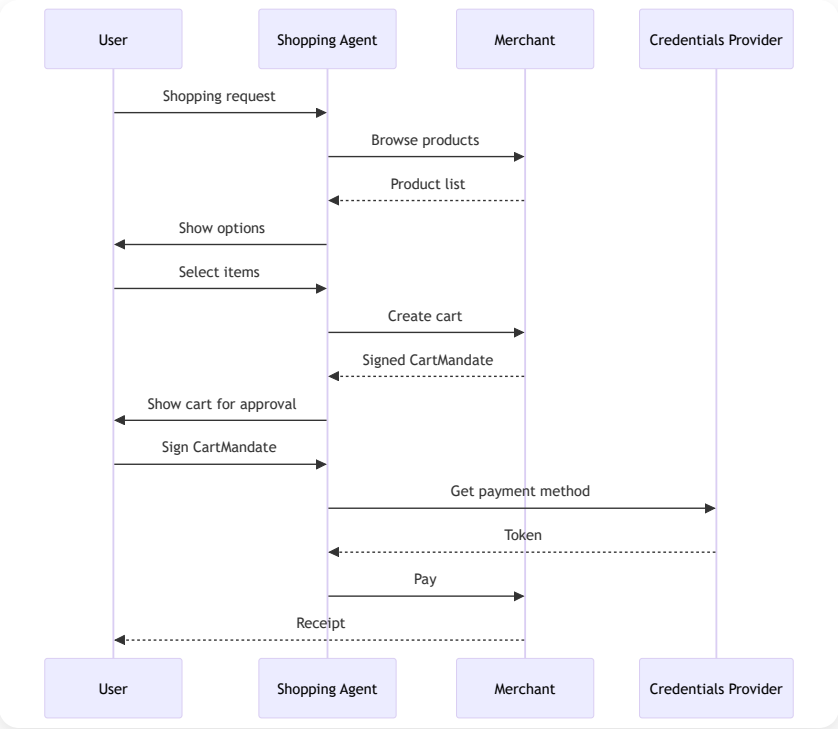
New World Solutions (AP2)

- **Verifiable Credentials** (VCs)
- **Intent Mandates** (what user wants)
- **Cart Mandates** (what merchant agreed)
- **Payment Mandates** (audit trail)

> **AP2's core innovation**: Cryptographic proof of who authorized what.

Life of a Transaction: Human Present

User is available to approve the final purchase.

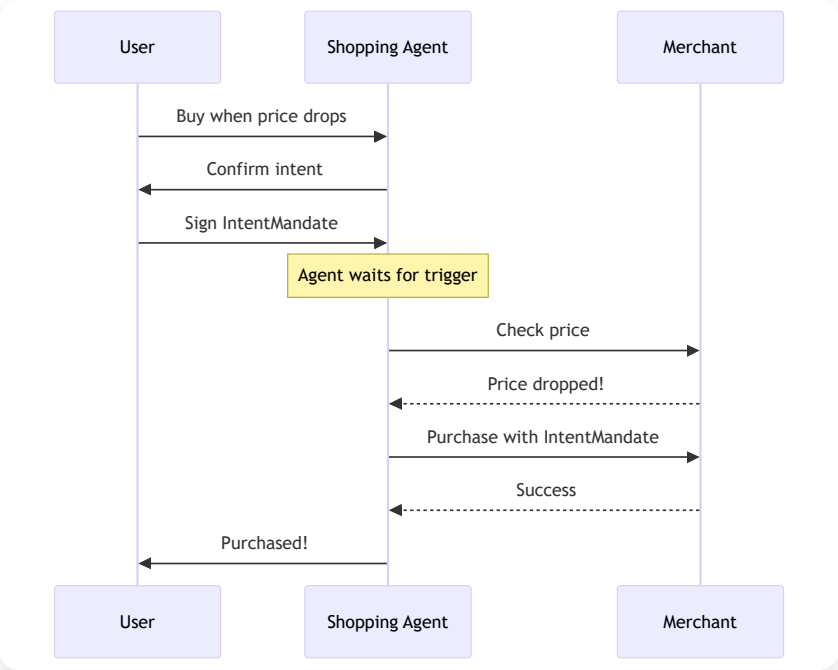


The Flow

1. User → Shopping Agent: "Buy shoes"
2. Agent → Merchant: Browse products
3. Merchant → Agent: Signed CartMandate
4. Agent → User: Show cart for approval
5. User signs CartMandate
6. Agent → Credentials Provider: Get token
7. Pay → Receipt

Life of a Transaction: Human NOT Present 🤖

"Buy these shoes when price drops below $100"



The Flow

1. User → Agent: "Buy when price drops"
2. User signs **Intent Mandate** (budget, constraints)
3. Agent waits for trigger
4. Price drops → Agent purchases
5. Merchant may force user confirmation
6. Receipt sent to user

Key: Intent Mandate limits agent scope.

Security: What Could Go Wrong? ⚠️

The protocol anticipates adversarial scenarios.

Threat	Description	AP2 Mitigation
Prompt Injection	Attacker tricks agent into buying	Intent Mandate limits scope
Agent Hallucination	Agent misunderstands request	Cart Mandate requires user sign-off
First-Party Misuse	User claims fraud for refund	Signed mandate is evidence
Account Takeover	Fraudster uses victim's agent	Device-backed key attestation
Man-in-the-Middle	Attacker alters transaction	Cryptographic signature verification

Dispute Resolution: Mandates provide non-repudiable audit trail.

The Mandate System 📜

Verifiable Credentials are the trust anchors.

1. Intent Mandate

- User's **shopping intent** in natural language
- Budget constraints
- **Signed by user's device key**
- Has expiration time (TTL)

2. Cart Mandate

- Final SKUs, price, shipping
- **Signed by merchant first**
- Then **signed by user**
- Binding contract

3. Payment Mandate

- Shared with network/issuer
- Contains: AI agent presence signals
- Enables: Risk assessment
- Evidence for disputes

Key Property

Non-repudiable: Can't deny you signed it.

How AP2, A2A, MCP Relate 🔗

Three layers of agent infrastructure.

Layer	Protocol	Purpose
Data Access	MCP	Agent ↔ Tools/APIs
Agent Comms	A2A	Agent ↔ Agent messaging
Payments	AP2	Agent ↔ Payments (mandates)

In short:

- MCP: Agents talk to **data**
- A2A: Agents talk to **agents**
- AP2: Agents talk about **payments**

How AP2 and x402 Relate ⚡

AP2 is payment-method agnostic. x402 is crypto payments.

AP2 (Google)

- Supports "pull" payments (cards)
- Roadmap: "push" payments (bank, crypto)
- **Payment agnostic framework**
- Partners: Visa, Mastercard, Adyen

x402 (Coinbase)

- **HTTP 402 "Payment Required"**
- EIP-712 signatures
- Stablecoins (USDC on Base)
- Metered API access

> **Together**: AP2 provides the trust framework, x402 provides the crypto rails.

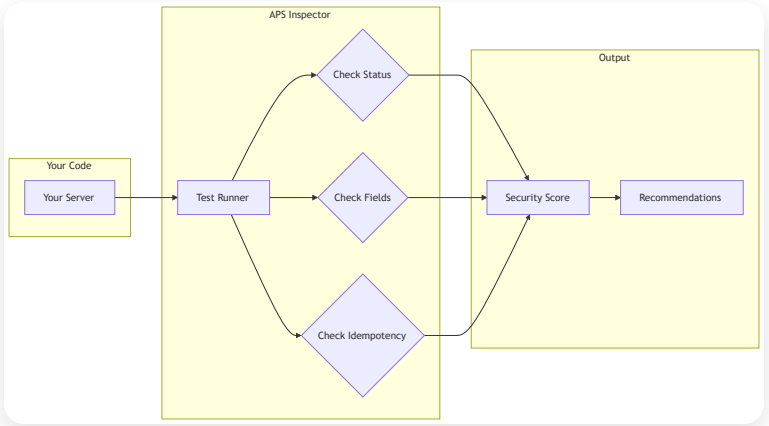
What APS Tests 🧪

I built a sandbox to learn by doing.

Mock Servers

Protocol	What It Tests
`ucp.py`	Discovery, checkout sessions, idempotency
`ap2.py`	Intent/Cart Mandates, OTP flow, A2A messages
`x402.py`	402 response, CAIP-2 networks, EIP-3009 auth
`acp.py`	Sessions, fulfillment addresses, completion

Inspector Flow



Why a Product Owner Built This 👨‍💼

"You built a testing sandbox. Aren't you a PM?"

My Philosophy

1. **Build to Understand**
2. Infrastructure needs PMs who get tech
3. De-risk by prototyping

What This Shows

- I can read protocol specs
- I can implement working software
- I can document thoroughly (8 docs, 3 ADRs)

Live Demo 🌐

GitHub Pages Challenge

No server = No mock endpoints

Solution

```
const IS_DEMO = hostname
  .includes('github.io');

if (IS_DEMO) {
  return DEMO_DATA[endpoint];
}
```

Live: siva-sub.github.io/AgentPayment-Sandbox

Let's Connect 🤝

Sivasubramanian Ramanathan
Product Owner | Fintech & Innovation

💼 Open for Roles In

Product Management • Fintech • Payments
RegTech • Digital Assets

Also open to roles that sit between policy, technology, and stakeholder engagement.

🌐 sivasub.com
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Thank You 🙏

AgentPayment Sandbox

Testing the future of AI agent payments

📄 **Slides PDF**
🔗 **Live Demo**
📚 **Documentation**