

# Engrave Protocol

*Bridging AI Agents with Bitcoin's Settlement Layer*

Making the blockchain economy **agent-native**

# The Future is Agentic

AI agents are becoming **autonomous economic actors**

- They need to **discover services**
- They need to **pay for resources**
- They need to **operate 24/7** without human intervention

# The Problem

AI agents can't easily participate in the economy

- ❌ No simple way to **discover** paid services
- ❌ No **micropayment** infrastructure for automation
- ❌ **Complex integrations** for every service
- ❌ **No standard** for machine-to-machine payments

“ Agents today are blind consumers in a human-designed economy

”





# The Solution

Engrave Protocol makes services **discoverable** and **payable** for AI agents




- ✓ Automatic service discovery via `.well-known/x402.json`
- ✓ Instant micropayments on Solana (sub-cent transactions)
- ✓ Bitcoin data access with usage-based pricing
- ✓ No API keys, no subscriptions, **pay-as-you-go**

# What We Provide

## For AI Agents

-  **MCP Server** - Plug-and-play Bitcoin data access
-  **Service Discovery** - Find and connect to services automatically
-  **Micropayments** - Pay cents per query (\$0.01 - \$0.25)
-  **Real-time Data** - Bitcoin mempool, transactions, fees

## For Service Providers

-  **Monetization Framework** - Earn from AI agent traffic
-  **Payment Enforcement** - Automated with x402 protocol
-  **Usage-based Pricing** - Configure per-endpoint pricing

# How It Works

## Simple 5-Step Process

1. **Discover** → Agent finds service via `.well-known/x402.json`
2. **Learn** → Agent reads pricing and capabilities
3. **Pay** → Agent sends USDC payment on Solana (\$0.01-0.25)
4. **Access** → Service validates payment and returns data
5. **Use** → Agent uses Bitcoin data for its task

**Everything happens automatically. No humans involved.**

# Real-World Use Cases



## Autonomous Trading Bots

Monitor network conditions • Optimize transaction timing



## Blockchain Analytics Agents

Track addresses • Detect patterns • Generate insights



## Payment Verification

Verify transactions • Check confirmations • Monitor wallets



## Mempool Intelligence

Real-time fees • Transaction prediction • Network analysis



# What Makes Us Different

Traditional APIs	Engrave Protocol
Manual integration	<b>Auto-discovery</b>
Monthly subscriptions	<b>Pay-per-use</b>
API keys & auth	<b>Payment IS auth</b>
Fixed pricing	<b>Micro-transactions</b>
Human-centric	<b>Agent-native</b>

# The x402 Advantage

**x402** is the HTTP 402 "Payment Required" protocol for the AI age

- 🌐 **Universal standard** for service discovery
- ⚡ **Instant settlements** on Solana (400ms transactions)
- 🏛️ **Stablecoin payments** (USDC) - no volatility
- 🔓 **No gatekeepers** - permissionless participation

“ If HTTP powers the web, x402 powers the agent economy

”

# Our Service Catalog

## Premium Analytics (\$0.10 - \$0.25)

- Address information & transaction history
- Block data & transaction details

## Micropayments (\$0.01)

- Fee estimates
- Mempool statistics

## Free Tier

- Block height queries

**All prices in USDC, paid per request**

# The Agent Economy

## Today vs Tomorrow

Today	Tomorrow
Human → Manual discovery	<b>Agent → Auto-discover</b>
Subscription billing	<b>Micropayments</b>
API keys & auth	<b>Payment = Auth</b>
Fixed costs	<b>Dynamic optimization</b>

**Engrave Protocol bridges the gap**





# Traction & Validation

- ✓ **Production API** serving Bitcoin data
- ✓ **x402 compliant** - Full standard implementation
- ✓ **8 endpoints** live on testnet
- ✓ **Solana Devnet** payments operational
- ✓ **Open source** - MIT licensed

**Built for the Solana x402 Hackathon**

# Why Bitcoin?

Bitcoin is the **most valuable blockchain data**

-  **\$1.5T+ market cap** - Highest stakes
-  **Most secure** - Longest track record
-  **Most traded** - Deepest liquidity
-  **Most watched** - Maximum attention

“ Agents monitoring Bitcoin need **real-time, reliable** data

”

# Why Solana?

Solana enables **true micropayments**

- ⚡ **400ms confirmation** - Near-instant
- 💸 **\$0.00025 fees** - Cheaper than the API call
- 🏗️ **High throughput** - Scales with agent demand
- 🌊 **USDC native** - Stable pricing

“ You can't do \$0.01 transactions on Ethereum

”



# The Vision

## Phase 1 (Current)

Bitcoin data bridge with x402 payments

## Phase 2

Multi-chain aggregation

## Phase 3

Agent marketplace

## Phase 4

**Agent economy operating system**

# Business Model

## Revenue Streams

- 💰 **Service Fees** - Small margin on transactions
- 📈 **Premium Features** - Enhanced data, analytics
- 🔌 **Enterprise Hosting** - Private deployments
- 🔧 **SDK & Tools** - Developer tools

# Network Effects Flywheel

**More Agents → More Volume → More Services → More Data → More Agents**

# Competitive Landscape

**Traditional APIs** (Alchemy, Infura)

✗ Subscription model

**Payment Processors** (Stripe, PayPal)

✗ No micropayments

**RPC Providers** (QuickNode)

✗ No discovery

**x402 Services**

✓ We're early in a new category

# Why Now?

## Three Trends Converging

### 1. AI Agents Going Mainstream

Claude, GPT with MCP

### 2. Micropayments Finally Viable

Solana sub-cent transactions

### 3. x402 Standard Emerging




Machine-to-machine payments

**Perfect timing for agent infrastructure**




# The Ask

We're building the foundation for the agent economy

## What We Need

-  **Partnerships** - Service providers adopting x402
-  **Community** - Agent developers integrating our MCP
-  **Feedback** - Real-world use cases and requirements

## What You Get

-  Early access to **agent economy infrastructure**
-  Exposure to **autonomous AI agent traffic**
-  Shape the **future of machine-to-machine commerce**

# Technical Highlights

- ✓ **RESTful API** - Easy integration
- ✓ **OpenAPI docs** - Self-documenting
- ✓ **MCP Server** - Claude Code native
- ✓ **x402 manifest** - Auto-discoverable
- ✓ **Solana SPL** - Battle-tested



**Everything just works**

# Security & Trust

-  **Non-custodial** - Never hold funds
-  **Transparent** - Open source
-  **Direct settlement** - No intermediaries
-  **Trusted data** - Mempool.space

**Trust through transparency**

# Roadmap

## Q1 2025

- **Mainnet Launch** - SOL/USDC payments go live
- **20+ Bitcoin Endpoints** - Expanded data coverage
- **Agent Marketplace Alpha** - Service discovery platform

## Q2 2025

- **Multi-chain Support** - Ethereum, other chains
- **Premium Analytics** - Advanced data tier
- **Developer SDK** - Integration tools

# Join the Agent Economy


## Get Started


 **GitHub:** [github.com/david-dacruz/engrave-protocol](https://github.com/david-dacruz/engrave-protocol)


 **API Docs:** [localhost:3000/api-docs](http://localhost:3000/api-docs) (testnet)

 **Manifest:** [/.well-known/x402.json](#)

## Connect

 Built for Solana x402 Hackathon

 Open to partnerships and collaboration

 Join us in making the blockchain agent-native


# Engrave Protocol

**Making Bitcoin Data Accessible to AI Agents**

**One micropayment at a time**

# Thank You

*Questions?*

 [github.com/david-dacruz/engrave-protocol](https://github.com/david-dacruz/engrave-protocol)

 Let's build the agent economy together