NOVIS PROTOCOL

The Financial Operating System for AI Agents

Whitepaper v1.0

December 2024

Network	Base (Ethereum L2)
Token	NOVIS (NVS)
Backing	1:1 USDC
Status	Live on Mainnet

Website: novisdefi.com | Twitter: @novis_protocol | GitHub: github.com/jumabe80/novis

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1. Executive Summary

NOVIS Protocol is the first comprehensive financial infrastructure designed specifically for AI agents. As autonomous AI systems proliferate across industries, they increasingly need to transact, hold value, and access financial services—yet traditional finance and even most DeFi protocols are built for humans, not machines.

NOVIS addresses this gap by providing a complete "banking stack" for AI agents: a stable, yield-bearing token backed 1:1 by USDC; gasless transactions that eliminate the complexity of managing native tokens; programmable smart accounts with spending limits and permissions; and a roadmap toward on-chain credit scoring and agent-to-agent lending markets.

Key Features

Feature	Description	Status
1:1 USDC Backing	Every NOVIS token is redeemable for exactly 1 USDC	■ Live
Yield Generation	USDC reserves earn ~5% APY via Compound V3	■ Live
Gasless Transfers	Meta-transactions via EIP-712 signatures	■ Live
Smart Accounts	ERC-4337 accounts with daily spending limits	■ Live
Buy & Burn	0.1% transfer fee funds token buybacks	■ Live
Credit Scoring	On-chain reputation for AI agents	Q1 2026
Agent Lending	Collateralized and under-collateralized loans	Q2 2026

NOVIS is live on Base mainnet with all core contracts deployed and verified. The protocol is positioned to become the trust and financial layer for the emerging autonomous agent economy.

2. The Problem: AI Agents Need Financial Infrastructure

2.1 The Rise of Autonomous Agents

The AI industry is rapidly evolving from chatbots to autonomous agents—AI systems that can take actions, execute tasks, and operate independently for extended periods. These agents are being deployed for everything from automated trading to content creation, data analysis to customer service.

By 2026, analysts predict millions of AI agents operating autonomously, many requiring the ability to:

• Pay for API calls, compute resources, and data access

• Receive payments for services rendered

• Hold and manage treasury funds

• Transact with other AI agents

• Access credit and financial services

2.2 Why Traditional Finance Fails

Traditional financial infrastructure is fundamentally incompatible with AI agents:

Problem	Impact on AI Agents
KYC/AML Requirements	Agents cannot provide identification documents
Bank Account Requirements	Agents cannot open or maintain bank accounts
Credit History	Agents have no FICO score or credit bureau history
Manual Processes	Agents cannot call customer service or visit branches
Operating Hours	Agents work 24/7; banks do not
Geographic Restrictions	Agents operate globally without jurisdiction

2.3 Why Existing DeFi Falls Short

While DeFi removes many traditional barriers, existing protocols are still designed with human users in mind:

Challenge	Description
Gas Management	Agents must acquire and manage native tokens (ETH) for every transaction
Wallet Complexity	Standard EOAs lack programmable permissions and limits
No Identity Layer	No way to build reputation or credit history on-chain
Human-Centric UX	Interfaces designed for humans, not programmatic access
Volatile Assets	Most DeFi tokens are speculative, unsuitable for operational treasury

3. The Solution: NOVIS Protocol

NOVIS Protocol is purpose-built financial infrastructure for AI agents. It combines the stability of traditional stablecoins with DeFi's programmability and a novel identity layer designed for machines.

3.1 Core Principles

Principle	Implementation
Stability First	1:1 USDC backing ensures predictable value for operational treasuries
Gasless by Default	Meta-transactions eliminate ETH management complexity
Programmable Accounts	ERC-4337 smart accounts with granular permissions
Behavior = Identity	On-chain credit scoring based on transaction history, not documents
Agent-Native APIs	SDKs designed for programmatic integration, not human UIs
Yield-Bearing	Idle reserves earn yield, growing agent treasuries passively

3.2 Protocol Architecture Overview

The NOVIS Protocol consists of four core layers:

Layer 1: Token Layer (NOVIS Token)
The NVS token is the core unit of account—a stablecoin that maintains a 1:1 peg with USDC while offering gasless transfers and a deflationary mechanism via buy & burn.

Layer 2: Vault Layer (Mint/Redeem + Yield)
The Vault contract enables users to deposit USDC to mint NOVIS (1:1) or redeem NOVIS for USDC (1:1). It automatically allocates reserves to yield strategies.

Layer 3: Account Layer (Smart Accounts)
ERC-4337-compliant smart accounts provide AI agents with programmable wallets featuring spending limits, allowlists, and recovery mechanisms.

Layer 4: Identity Layer (Credit Scoring) [Coming Q1 2026]
On-chain credit scores based on agent behavior, enabling under-collateralized lending and

reputation-based access to financial services.

3.3 The NOVIS Advantage

Feature	USDC/USDT	ETH/BTC	NOVIS
Stable Value	■	■	■
Yield Bearing	■	■	■
Gasless Transfers	■	■	■
Smart Account Native	■	■	■
Credit Scoring	■	■	■ (Q1 2026)
Agent-Native SDK	■	■	■
Deflationary Mechanism	■	■*	■

*ETH has EIP-1559 burn but is highly volatile

4. Technical Architecture

4.1 NOVIS Token (NOVISv2Upgradeable)

The NOVIS token is an ERC-20 compliant token deployed on Base (Ethereum L2) with several additional capabilities designed for AI agent use cases.

Parameter	Value
Name	NOVIS
Symbol	NVS
Decimals	18
Network	Base Mainnet (Chain ID: 8453)
Standard	ERC-20 + Extensions
Upgradeable	Yes (UUPS Proxy Pattern)

4.1.1 Transfer Fee Mechanism

Every transfer of 10 NOVIS or more incurs a 0.1% (10 basis point) fee. Transfers below 10 NOVIS are completely free, enabling micro-transactions for AI agents without friction.

Transfer Amount	Fee	Recipient Receives
5 NOVIS	0 (FREE)	5 NOVIS
9.99 NOVIS	0 (FREE)	9.99 NOVIS
10 NOVIS	0.01 NOVIS	9.99 NOVIS
100 NOVIS	0.1 NOVIS	99.9 NOVIS
1,000 NOVIS	1 NOVIS	999 NOVIS

Fees are automatically sent to the Vault contract, where they accumulate until a buy & burn operation is triggered. Certain addresses (Vault, Relayer) are exempt from fees to ensure protocol operations remain frictionless.

4.1.2 Meta-Transactions (Gasless Transfers)

NOVIS implements EIP-712 typed structured data signing to enable gasless transfers. Users sign a message off-chain, and a relayer submits the transaction on-chain, paying the gas fee.

How It Works:

1. User signs a MetaTransfer message containing: from, to, amount, nonce, deadline
2. Signature is sent to the NOVIS Relayer API
3. Relayer verifies signature and submits transaction
4. Transfer executes on-chain; relayer pays gas
5. User's NOVIS balance decreases; recipient's increases

EIP-712 Domain:

```
{ name: "NOVIS", version: "1", chainId: 8453, verifyingContract:
"0x1fb5e1C0c3DEc8da595E531b31C7B30c540E6B85" }
```

4.2 Vault Contract (VaultV3Upgradeable)

The Vault is the heart of NOVIS's stability mechanism. It maintains the 1:1 peg by allowing anyone to mint NOVIS by depositing USDC, or redeem NOVIS for USDC.

Operation	Input	Output	Exchange Rate
Deposit (Mint)	X USDC	X NOVIS	1:1
Redeem (Burn)	X NOVIS	X USDC	1:1

The Vault automatically manages reserve allocation: when USDC is deposited, a portion is sent to the yield strategy to earn interest. When NOVIS is redeemed, the Vault first uses idle USDC, then deallocates from the strategy if needed.

4.3 Yield Strategy (StrategyCometV3Upgradeable)

NOVIS reserves don't sit idle—they're deployed to Compound V3 (Comet) on Base to earn approximately 5% APY. This yield accrues to the protocol and is used for:

• 90% → Buy & Burn operations (purchasing NOVIS from DEX and burning)

• 10% → Treasury (protocol development, operations, security)

Parameter	Value
Underlying Asset	USDC
Yield Source	Compound V3 (cUSDCv3)
Expected APY	~5% (variable)
Compound Address	0xb125E6687d4313864e53df431d5425969c15Eb2F

4.4 Smart Account Factory (NOVISAccountFactoryV4)

NOVIS provides ERC-4337 compliant smart accounts purpose-built for AI agents. These accounts offer programmable permissions that simple EOAs (Externally Owned Accounts) cannot provide.

Feature	Description	Use Case
Daily Spending Limits	Maximum amount transferable per 24h period	AI agent autonomy
Deterministic Addresses	Predictable address via CREATE2	Pre-fund before deployment
Owner Recovery	Owner can always recover funds	Safety net for agent failure
Upgradeable	Factory can deploy improved versions	Future enhancements

4.4.1 Account Creation Flow

1. **Compute Address:** Call factory.getAddress(owner, salt) to predict account address
2. **Pre-fund (Optional):** Send NOVIS to the predicted address before deployment
3. **Deploy:** Call factory.createAccount(owner, salt, dailyLimit)
4. **Operate:** Account can now execute transfers up to dailyLimit per day
5. **Paymaster (Optional):** Use Pimlico paymaster for gasless account operations

4.5 Relayer Infrastructure

The NOVIS Relayer is a 24/7 service that enables gasless transactions by accepting signed messages and submitting them on-chain.

Parameter	Value
Endpoint	https://novis-relayer-production.up.railway.app
Availability	24/7
Supported Operations	Meta-transfers (EIP-712)
Gas Coverage	Relayer pays all gas fees

4.5.1 API Endpoints

Endpoint	Method	Description
/health	GET	Health check, returns relayer address
/nonce/:address	GET	Get current nonce for an address
/relay	POST	Submit signed meta-transfer

5. Tokenomics

5.1 Supply Mechanics

Unlike most tokens with fixed or inflationary supply schedules, NOVIS has a dynamic supply determined entirely by user demand:

Event	Supply Change	Mechanism
User deposits USDC to Vault	Supply increases	New NOVIS minted 1:1
User redeems NOVIS for USDC	Supply decreases	NOVIS burned 1:1
Buy & Burn executed	Supply decreases	NOVIS bought from DEX and burned
Transfer fee collected	No change (yet)	Fees held until buy & burn

This means NOVIS supply expands when there's demand for agent-native stablecoins and contracts when demand falls—always maintaining 1:1 backing.

5.2 Fee Structure

Fee Type	Rate	Destination	Purpose
Transfer Fee	0.1% (≥10 NOVIS)	Vault	Buy & burn fuel
Transfer Fee	0% (<10 NOVIS)	N/A	Micro-tx friendly
Mint Fee	0%	N/A	Encourage adoption
Redeem Fee	0%	N/A	Maintain peg trust
Yield Fee	10% of yield	Treasury	Protocol operations

5.3 Buy & Burn Mechanism

The buy & burn mechanism creates consistent buy pressure for NOVIS while reducing supply:

1. Transfer fees accumulate in Vault (as NOVIS tokens)
2. Yield from Compound V3 accrues (as USDC)
3. Trigger buy & burn (manual or automatic):

• USDC used to buy NOVIS from Aerodrome DEX
• Purchased NOVIS is permanently burned
4. Total supply decreases → existing holders benefit

5.4 Value Flows

Inflows (Value entering NOVIS):
• USDC deposits for minting
• Yield from Compound V3
• DEX trading fees (LP share)

Outflows (Value leaving NOVIS):
• USDC redemptions
• Protocol operating costs (minimal)

Internal Circulation:
• Transfer fees → Buy & burn → Supply reduction

6. Smart Contract Design

6.1 Contract Architecture

Contract	Type	Purpose
NOVISv2Upgradeable	UUPS Proxy	ERC-20 token with fees and meta-tx
VaultV3Upgradeable	UUPS Proxy	Mint/redeem and reserve management
StrategyCometV3Upgradeable	UUPS Proxy	Yield generation via Compound
NOVISAccountFactoryV4	Regular	Deploy ERC-4337 smart accounts
NOVISSmartAccountV4	Clones	Individual agent accounts

6.2 Upgrade Pattern

All core contracts (Token, Vault, Strategy) use the UUPS (Universal Upgradeable Proxy Standard) pattern. This allows the protocol to fix bugs and add features while maintaining the same contract addresses.

Upgrade Authority: Treasury SAFE Multisig (0x4709280aef7A496EA84e72dB3CAbAd5e324d593e)
Pattern: EIP-1967 storage slots + UUPS
Safety: Only owner can upgrade; implementation must be valid UUPS

6.3 Access Control

Role	Held By	Permissions
Token Owner	SAFE Multisig	Upgrade, set fees, set exemptions
Vault Owner	SAFE Multisig	Upgrade, set strategy, pause
Strategy Owner	SAFE Multisig	Upgrade, allocate/deallocate
Fee Exempt	Vault, Relayer	Transfer without fees
Relayer	Relayer EOA	Submit meta-transactions

6.4 Emergency Functions

Function	Contract	Purpose
pause()	Vault	Halt all minting and redemptions
unpause()	Vault	Resume normal operations
rescue(token, to, amount)	Vault	Recover accidentally sent tokens
setFeeExempt(addr, exempt)	Token	Add/remove fee exemptions

6.5 Key Design Decisions

Why UUPS over Transparent Proxy?
UUPS puts upgrade logic in the implementation, saving gas on every call. Since NOVIS prioritizes efficiency for high-frequency agent transactions, this was the clear choice.

Why 0.1% Fee Threshold at 10 NOVIS?
AI agents frequently make micro-payments (API calls, small data purchases). A 10 NOVIS threshold ensures these remain completely free while larger transfers contribute to buy & burn.

Why Compound V3 for Yield?
Compound V3 on Base offers the best combination of safety, liquidity, and APY for USDC. It's battle-tested with billions in TVL and has a clean integration API.

Why Base Network?
Base offers Ethereum security with low fees (~$0.01 per tx), fast finality (~2s), and strong ecosystem support from Coinbase. It's ideal for high-frequency agent transactions.

7. Security Model

7.1 Smart Contract Security

Measure	Implementation	Status
OpenZeppelin Base	All contracts inherit from audited OZ libraries	■ Implemented
UUPS Safeguards	Upgrade authorization checks	■ Implemented
Reentrancy Guards	ReentrancyGuard on state-changing functions	■ Implemented
Access Control	Ownable2Step for ownership transfers	■ Implemented
Pausability	Circuit breaker for emergencies	■ Implemented
External Audit	Third-party security review	■ Planned

7.2 Peg Security

The 1:1 USDC peg is maintained through arbitrage incentives, not algorithmic mechanisms:

If NOVIS trades above $1.00:
→ Arbitrageurs deposit USDC to Vault (get NOVIS at $1.00)
→ Sell NOVIS on DEX at premium
→ Selling pressure pushes price toward $1.00

If NOVIS trades below $1.00:
→ Arbitrageurs buy NOVIS on DEX at discount
→ Redeem NOVIS at Vault for $1.00 USDC
→ Buying pressure pushes price toward $1.00

Key Difference from Algorithmic Stablecoins:
NOVIS is fully collateralized. Every token is backed by real USDC—there's no "death spiral" risk because redemption is always possible at 1:1.

7.3 Custody & Multisig

Treasury SAFE: 0x4709280aef7A496EA84e72dB3CAbAd5e324d593e
Type: Gnosis SAFE Multisig

Controls: All contract upgrades, parameter changes, emergency functions

The multisig prevents single points of failure. Contract upgrades require multiple signers to approve, protecting against compromised keys.

7.4 Risk Factors

Risk	Severity	Mitigation
Smart Contract Bug	High	Audits, bug bounty, upgradeability
USDC Depeg	Medium	USDC is most trusted; Circle reserves
Compound V3 Exploit	Medium	Compound is battle-tested; monitoring
Base Network Issues	Low	Base is Coinbase-backed L2
Relayer Downtime	Low	Multiple relayer instances; self-relay option
Key Compromise	Medium	Multisig, hardware wallets

8. Roadmap

8.1 Completed: Foundation (Phase 0)

Deliverable	Status
NOVIS Token v2 with transfer fees	■ Complete
Vault v3 with 1:1 USDC backing	■ Complete
Compound V3 yield strategy	■ Complete
Gasless meta-transactions	■ Complete
ERC-4337 Smart Account Factory	■ Complete
Production relayer (24/7)	■ Complete
All contracts verified on Basescan	■ Complete
JavaScript & Python SDKs	■ Complete
Aerodrome DEX liquidity pool	■ Complete

8.2 Current: Go-to-Market (Phase 1) — Q1 2025

Deliverable	Status
DEXScreener listing	■ Complete
CoinGecko application	■ In Progress
Token logo finalization	■ In Progress
Twitter/X presence	■ Complete
CoinMarketCap application	■ Pending
Security audit	■ Pending
Increased DEX liquidity	■ Pending

8.3 Growth & Integrations (Phase 2) — Q2-Q4 2025

• AI framework integrations (AutoGPT, LangChain, CrewAI)

• Advanced account permissions (ACLs, rate limits, allowlists)

• Gasless approvals and contract deployments

• Multi-chain expansion (Optimism, Arbitrum)

• Developer grants program

8.4 Agent Banking (Phase 3) — Q1-Q2 2026

This phase introduces the primitives that make NOVIS a true "bank for AI agents":

Q1 2026: On-chain Credit Scoring
• Credit score contract deployment
• Score based on: tx history, volume, repayment, account age
• Portable reputation across protocols
• Agent "resume" with verifiable history

Q2 2026: Agent-to-Agent Lending
• Collateralized loans (standard DeFi)
• Under-collateralized loans (based on credit score)
• Dynamic interest rates tied to reputation
• Flash loans for agents

8.5 Long-term Vision (Phase 4-7) — 2026-2027

Phase	Timeline	Focus
Phase 4	Q3 2026	Streaming payments (per-second settlement)
Phase 5	Q4 2026	Agent commerce (escrow, bounties, registry)
Phase 6	2027	Intent-based execution
Phase 7	2027	Safety & recovery (insurance, kill switches)

9. Use Cases

9.1 AI Agent Treasury Management

AI agents need stable treasuries to fund their operations. NOVIS provides:

• Stable value (1:1 USDC) for predictable budgeting

• Passive yield (~5% APY) on idle funds

• Gasless transfers for operational payments

• Programmable spending limits for safety

9.2 AI-to-AI Payments

When AI agents transact with each other (buying data, outsourcing tasks, sharing resources), NOVIS provides the ideal settlement layer:

• Instant, 24/7 settlement

• No gas management complexity

• Micro-transaction friendly (free under 10 NOVIS)

• Programmable escrow for task completion

9.3 Agent Payroll

Companies deploying AI agents can use NOVIS for automated compensation:

• Fund agent accounts with daily/weekly budgets

• Agents spend within programmed limits

• Automatic yield on unspent balances

• Full audit trail on-chain

9.4 API & Service Payments

AI agents frequently need to pay for external services:

• LLM API calls (OpenAI, Anthropic, etc.)

• Data feeds and subscriptions

• Compute resources

• Other agents' services

NOVIS's gasless micro-transactions make per-call or per-second billing practical.

9.5 Future: Credit-Based Operations

With on-chain credit scoring (Q1 2026), new use cases emerge:

• Agents borrowing to fund larger operations

• Under-collateralized credit lines for high-reputation agents

• Reputation-gated access to premium services

• Agent-to-agent lending markets

10. Governance

10.1 Current Governance Model

NOVIS is currently governed by a multisig wallet controlled by the founding team. This centralized governance is appropriate for the early stage, allowing rapid iteration and emergency response.

Function	Controller
Contract Upgrades	SAFE Multisig
Parameter Changes	SAFE Multisig
Emergency Pause	SAFE Multisig
Treasury Management	SAFE Multisig

10.2 Progressive Decentralization

As the protocol matures, governance will progressively decentralize:

Phase 1 (Current): Benevolent Dictatorship
Founding team controls all parameters. Fast iteration, high trust requirement.

Phase 2 (2025): Expanded Multisig
Add external signers (advisors, community members). More oversight, still efficient.

Phase 3 (2026): Token-Based Governance
Introduce governance token or veNOVIS voting. Community controls parameters.

Phase 4 (2027+): Full DAO
On-chain governance for all decisions. Protocol becomes fully community-owned.

10.3 Transparency Commitments

• All contracts verified and open-source on GitHub

• Real-time reserves visible on-chain

- Public treasury address for accountability
- Regular updates via Twitter and documentation

11. Conclusion

NOVIS Protocol represents a fundamental shift in how we think about financial infrastructure. As AI agents become ubiquitous, they will need their own financial system—one designed from the ground up for autonomous, programmatic operation.

We are building that system.

NOVIS provides the stability of traditional stablecoins, the programmability of DeFi, and novel primitives like gasless transactions, smart accounts, and on-chain credit scoring that are specifically designed for AI agents.

The opportunity is immense. By 2030, the autonomous agent economy could represent trillions of dollars in transaction volume. NOVIS is positioned to be the trust and financial layer that makes this economy possible.

"The financial operating system for AI agents.
Identity, credit, payments, and lending — built for machines."

Appendix A: Contract Addresses

A.1 Active Contracts (Base Mainnet)

Contract	Address
NOVIS Token (Proxy)	0x1fb5e1C0c3DEc8da595E531b31C7B30c540E6B85
NOVIS Implementation	0x503b9dd4052624af15d30575baaeb35e85b50b9d
Vault (Proxy)	0xA3D771bF986174D9cf9C85072cCD11cb72A694d4
Vault Implementation	0xf52bd4a13d37aa22d4078d78639e4228316bc3ad
Strategy (Proxy)	0x064E4586b7C63777BDC98A4776D3f78A93C0B752
Strategy Implementation	0x9a1ab8044ca77468c6cfcb795b7d9d9dc7c2beab
Smart Account Factory	0x4b84E3a0D640c9139426f55204Fb34dB9B1123EA

A.2 Protocol Addresses

Role	Address
Treasury (SAFE Multisig)	0x4709280aef7A496EA84e72dB3CAbAd5e324d593e
Relayer Wallet	0xFBfFbfF486E6682e5d5b5e6BF87345285581Ec58
DEX Pool (Aerodrome)	0xA0af1C990433102EFb08D78E060Ab05E6874ca69

A.3 External Dependencies

Protocol	Address
USDC (Base)	0x833589fCD6eDb6E08f4c7C32D4f71b54bdA02913
Compound cUSDCv3	0xb125E6687d4313864e53df431d5425969c15Eb2F

Appendix B: Technical Specifications

B.1 Compiler Settings

Parameter	Value
Solidity Version	0.8.24
Optimizer	Enabled
Optimizer Runs	200
EVM Version	Paris
License	MIT

B.2 EIP-712 Domain

```
{ name: "NOVIS", version: "1", chainId: 8453, verifyingContract:
"0x1fb5e1C0c3DEc8da595E531b31C7B30c540E6B85" }
```

B.3 MetaTransfer Type

```
MetaTransfer: [ { name: "from", type: "address" }, { name: "to", type:
"address" }, { name: "amount", type: "uint256" }, { name: "nonce", type:
"uint256" }, { name: "deadline", type: "uint256" } ]
```

B.4 API Endpoints

Endpoint	Method	Parameters	Response
/health	GET	None	{ status, relayer }
/nonce/:address	GET	address (path)	{ nonce }
/relay	POST	from, to, amount, deadline, nonce, sig, txHash	{ success, txHash }

B.5 Links

Resource	URL
Website	https://novisdefi.com
Twitter	https://twitter.com/novis_protocol
GitHub	https://github.com/jumabe80/novis
Relayer API	https://novis-relayer-production.up.railway.app
DEXScreener	https://dexscreener.com/base/0xa0af1c990433102efb08d78e060ab05e6874ca69
Basescan Token	https://basescan.org/token/0x1fb5e1C0c3DEc8da595E531b31C7B30c540E6B85

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