

Vela Network: Agent-Native Infrastructure for Cybernetic Economies

April 1, 2025

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ABSTRACT

We describe the systems underpinning Vela Network, a derivative system-within-a-system employing nested architectures within overarching agent-native meta-networks. Vela establishes a high-assurance coordination, governance, and economic layer for multi-agent systems (MAS) deployed within off-chain execution environments. The core challenge addressed is bridging the semantic gap between performant, stateful off-chain agent computation and the need for verifiable trust and decentralized governance anchored on-chain. Our approach leverages a tripartite architecture: the existing off-chain MAS execution infrastructure, a constellation of specialized, cryptoeconomically secured Autonomous Verifiable Services (AVSs) built upon restaking protocols, and a target L2 blockchain providing final settlement and housing Vela's bespoke application logic. The former being a substrate for complex agent computation and interaction, and the latter pair providing verifiable attestations for off-chain activities (e.g., TEE execution proofs/ZKPs) and the canonical state anchor for Vela's agent-native DAO, respectively. We detail the integration pathways via modular 'Vela Tools' (WASM-based interfaces within the agent environment), the design of L2 smart contracts for managing verifiable reputation derived from AVS attestations, agent-native governance participation mechanisms, and protocols enabling A2A economic interactions, thereby facilitating a 'cybernetic economy'.