

Substrate Runtime Continuity

The semantic agent maintains continuity of identity, cognitive state, and lineage across device power cycles, application restarts, and governed substrate-runtime update operations.

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The semantic agent maintains continuity of identity, cognitive state, and lineage across device power cycles, application restarts, model artifact loading and unloading events, tool lifecycle operations, substrate-runtime update operations, and substrate-internal mutations. The agent's identity is not dependent on any specific model artifact and is preserved across replacement, retraining, or removal of any subordinate model.

The continuity guarantee is enforced by structural separation between the agent's persistent state and the state of subordinate components, by cryptographic continuity proofs over the append-only lineage field, or by a combination thereof. The lineage field is append-only such that a lifecycle operation may not retroactively alter prior lineage records. Across a substrate-runtime update operation, the persistent identity field, cognitive state field, and lineage field are preserved through a continuity attestation linking the agent's identity across runtime versions, such that the agent's persistent identity is unchanged across substrate-runtime version transitions.

Disclosure Scope

This article describes subject matter disclosed in U.S. Provisional Application No. 64/070,239. The provisional discloses the substrate architecture in illustrative, non-exhaustive embodiments; the architectural primitives described herein may be implemented through a variety of equivalent mechanisms.

Agent-Resident Execution

[All 40 steps → \(/inventive-steps\)](#)

Substrate ([/agent-resident-execution-substrate](#))

Persistent execution environment carried by the agent, not the host — identity, state, and lineage across power cycles, devices, and upgrades.

Provisional application

PRIMARY TECHNICAL DISCLOSURE

- [{step.name}, Articles \(/articles/agent-resident-execution-substrate\)](#).

SECONDARY TECHNICAL

- [Persistent Semantic Agent \(/articles/agent-resident-execution-substrate/persistent-semantic-agent\)](#)
- [Managed Inference Tool Registry \(/articles/agent-resident-execution-substrate/managed-inference-tool-registry\)](#).
- [Agent-to-Tool Dispatcher \(/articles/agent-resident-execution-substrate/agent-to-tool-dispatcher\)](#).
- [Lineage-Derived Training Signal \(/articles/agent-resident-execution-substrate/lineage-derived-training-signal\)](#)
- [Identity Preservation Across Upgrades \(/articles/agent-resident-execution-substrate/identity-preservation-across-upgrades\)](#).
- [Cognitive State-Conditioned Dispatch \(/articles/agent-resident-execution-substrate/cognitive-state-conditioned-dispatch\)](#).
- [Governed Tool Lifecycle \(/articles/agent-resident-execution-substrate/governed-tool-lifecycle\)](#).
- [Continuity-Proof Lineage \(/articles/agent-resident-execution-substrate/continuity-proof-lineage\)](#).
- [Substrate Runtime Continuity \(/articles/agent-resident-execution-substrate/substrate-runtime-continuity\)](#)

- [Personal Corpus Model Training \(/articles/agent-resident-execution-substrate/personal-corpus-model-training\)](/articles/agent-resident-execution-substrate/personal-corpus-model-training).
- [Heterogeneous Inference Endpoints \(/articles/agent-resident-execution-substrate/heterogeneous-inference-endpoints\)](/articles/agent-resident-execution-substrate/heterogeneous-inference-endpoints).
- [Atomic Lifecycle Substitution \(/articles/agent-resident-execution-substrate/atomic-lifecycle-substitution\)](/articles/agent-resident-execution-substrate/atomic-lifecycle-substitution).
- [Integrity Signal Feedback \(/articles/agent-resident-execution-substrate/integrity-signal-feedback\)](/articles/agent-resident-execution-substrate/integrity-signal-feedback).
- [Hardware-Bound Identity \(/articles/agent-resident-execution-substrate/hardware-bound-identity\)](/articles/agent-resident-execution-substrate/hardware-bound-identity).
- [Cognitive State Append-Only Invariant \(/articles/agent-resident-execution-substrate/cognitive-state-append-only-invariant\)](/articles/agent-resident-execution-substrate/cognitive-state-append-only-invariant).
- [Counterparty Identity Records \(/articles/agent-resident-execution-substrate/counterparty-identity-records\)](/articles/agent-resident-execution-substrate/counterparty-identity-records).
- [Privacy Egress-Controlled Disclosure \(/articles/agent-resident-execution-substrate/privacy-egress-controlled-disclosure\)](/articles/agent-resident-execution-substrate/privacy-egress-controlled-disclosure).
- [Federated Cross-Device Agent Identity \(/articles/agent-resident-execution-substrate/federated-cross-device-agent-identity\)](/articles/agent-resident-execution-substrate/federated-cross-device-agent-identity).

[Agent-Resident Execution Substrate overview → \(/agent-resident-execution-substrate\)](/agent-resident-execution-substrate)