

Cognitive State Append-Only Invariant

In the agent-resident execution substrate, the semantic agent's persistent identity, cognitive state, and lineage are not modified by tool lifecycle operations or subordinate components except by appending to an append-only lineage field under a continuity proof.

Cognitive State Append-Only Invariant

Under the continuity guarantee disclosed for the agent-resident execution substrate, the semantic agent's persistent identity field, cognitive state field, and lineage field are not modified, reset, or interrupted by any lifecycle operation performed on a subordinate component or by a substrate-runtime update operation, except by appending to the lineage field under the continuity proof. The lineage field is an append-only sequence of lineage records structured such that no prior record may be modified or deleted without producing a detectable continuity break.

In the disclosed embodiment, the semantic agent is the sole authority within the substrate over operations affecting its persistent identity, cognitive state, lineage, and governance policy fields. Subordinate components, including the tool registry, dispatcher, lifecycle controller, ingestion module, resource governance subsystem, and substrate runtime, operate under the agent's authority and may modify state within their own domains, but do not modify the agent's persistent fields except by appending

to the lineage field under the continuity proof. In further embodiments, authority over one or more agent fields may be delegated under policy to designated subordinate components or to external authorities, subject to the governance policy field.

Disclosure Scope

This article describes subject matter disclosed in U.S. Provisional Application No. 64/070,239. The provisional discloses embodiments and illustrative arrangements; it does not by itself establish enforceable claim scope.

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 \(/articles/agent-resident-execution-substrate/governed-tool-lifecycle\)](/articles/agent-resident-execution-substrate/governed-tool-lifecycle)
- [Continuity-Proof Lineage \(/articles/agent-resident-execution-substrate/continuity-proof-lineage\)](/articles/agent-resident-execution-substrate/continuity-proof-lineage)
- [Substrate Runtime Continuity \(/articles/agent-resident-execution-substrate/substrate-runtime-continuity\)](/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)
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- [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)