Authority Engineering Formal Foundations RC-1: Consolidated Specification

Authority Engineering Formal Foundations RC-1

Status: REVIEW-READY RELEASE CANDIDATE

Scope: L-AE0 0.1 through L-AE9 0.1

Source boundary: ASB-2

Release claim and non-claims

RC-1 is a single controlled, modular specification that consolidates the existing L-AE core and partial necessary-condition encodings for every non-rejected Registry entry categorized as Definition. It specifies a many-sorted first-order representation, not an amendment to Authority Engineering. Every constraint below is a source-bound representation constraint or a definitional convention. None is thereby an AE axiom, Foundational Law, theorem, empirical result, engineering requirement, Registry mutation, or proof of consistency.

The Registry coverage audit records 15/15 eligible definitions with syntactic source-reference and partial necessary-condition coverage; semantic adequacy remains partial. AE-REG-0032 remains excluded because its Registry status is Rejected.

Formal basis

Background logic: many-sorted first-order logic with equality.

Core carrier sorts: State, Transition.

Core functions: src, tgt : Transition -> State.

Core source-bound primitive representations:

- A(s,t): Authority (AE-REG-0037).
- C(t): Consequence (AE-REG-0038).
- Sigma(s,t): Consequence Seam (AE-REG-0039).

Core constraint:

RC-1: Sigma(s,t) -> A(s,t) and C(t) and src(t)=s.

All further symbols are controlled in the accompanying background-parameter glossary. Source-defined representations are not new AE primitives.

Imported modules and compiled constraints

Module	Registry coverage	Constraints / convention

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Module	Registry coverage	Constraints / convention
L-AE1	AE-REG-0047	BAR(s,t) <-> Sigma(s,t) and A(s,t) and C(t) and Local(s,t) and not CCR(t).
L-AE2	AE-REG-0054, 0045, 0046, 0055	Partial carrier-and-necessary-condition encoding: Supplies -> Present and Sigma and BAR; Owns -> Present and Participates and Sigma and BAR; HAt -> Sigma and BAR; HMember and HAt -> Participates; HOwner and HAt -> HMember and Owns; BeforeH -> HMember for both members and distinctness; VAt -> Sigma; VMember and VAt -> Present and not Participates; SMember and StackAt -> Present.
L-AE3	AE-REG-0044	Stop -> Sigma and BAR; Stop -> (Proceed <-> Preq).
L-AE4	AE-REG-0043, 0040, 0041	Continuous -> TraversalOrMutation; Continuous and Carries -> A and C and BAR and Preserved and Meaningful; OnSurface -> A and C and Reachable and Observable; SurfaceOf and OnSurface -> Within; TopoMember -> A and C and Reachable; TopologyOf and TopoMember -> Within.
L-AE5	AE-REG-0051, 0056	FabricOf -> Distributed; CarriedBy -> FabricOf and Carries and Continuous and A and C and DistributedRealization; DistributedRealization -> exists Fabric/path carriage witness; STOICAnalysis and Studies -> C and OnSurface and TopoMember and BAR; STOICAnalysis and Studies -> Accumulated and Earlier and FutureCondition and Modifies.
L-AE6	AE-REG-0052	Contends -> distinct agents/intentions, holds, local validity, incompatibility, futures, and shared-or-intersecting future; Contends -> exists intended authority/consequence relations arranged in one topology with continuous carriage.
L-AE7	AE-REG-0002	OwnershipTest -> Material; OwnershipTest -> identifiable in-organization initiation, interruption, and consequence-ownership roles; OwnershipTest -> exists DecisionRelation with A and C.

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Module	Registry coverage	Constraints / convention
L-AE8	AE-REG-0012	AuthorityAttack -> exists manipulated legitimate authority flow arranged in topology; AuthorityAttack -> not BreaksSystem.
L-AE9	AE-REG-0042	FidelityAssessment and Assesses -> Realized, IntendedAuthority, A, C, Dynamic, and BoundedOutcome; FidelityAssessment and Assesses -> exists DegreeOf.

The compact expressions in this table preserve the exact full signatures, variable binding, and limits in each module. The module documents are normative components of RC-1 and must be read with this document; no compact line expands their scope.

Module import order

```
L-AE0 core
  -> L-AE1 bounded realization
  -> L-AE2 guard/task-force structures
  -> L-AE3 sovereign stop
  -> L-AE4 continuity/surface/topology
  -> L-AE5 fabric/STOIC
  -> L-AE6 contention
  -> L-AE7 ownership test
  -> L-AE8 authority attack distinction
  -> L-AE9 consequence fidelity
```

The order identifies signature dependency, not epistemic priority or proof derivation.

Normative component set

- 03-foundational-specification-skeleton.md and 04-vocabulary-and-syntax-annex-template.md define L-AE0.
- 14-l-ae1-bounded-authority-realization-extension.md through 23-l-ae9-consequence-fidelity-extension.md provide the complete module text.
- 26-l-ae-background-parameter-glossary-rc1.md controls non-AE symbols used in RC-1.
- 08-formal-validation-report.md, the per-module model/non-model witnesses, and 24-definition-coverage-completion-audit.md provide validation evidence.

Release acceptance criteria

RC-1 may be reviewed as a foundational-specification release candidate only if:

1. the package manifest verifies;
2. every module witness and countermodel check passes;
3. the definition coverage audit remains 15/15 syntactic source-reference and partial necessary-condition entries;

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4. reviewers confirm that background parameters have not been treated as new AE theory; and
5. reviewers record any desired changes as source or Registry proposals, rather than silently editing constraints.

Known limits

RC-1 has one checked integrated finite witness satisfying the 33 compiled representation constraints plus JSON type/domain closure. It has not established universal consistency, soundness, completeness, independence, semantic adequacy, empirical applicability, measurement calibration, operational conformance, or satisfiability by an independently checked many-sorted-FOL solver. The witness demonstrates non-vacuity only; those stronger results require separately governed proof and empirical work.

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