RC-1 Semantic-Completion Adjudication

Authority Engineering Formal Foundations RC-1

Status: READ-ONLY ADJUDICATION OF THE EXISTING RC-1 CORPUS

Decision rule

This report does not change RC-1. It distinguishes a typed symbol, a model interpretation, a theory constraint, and a complete Authority Engineering definition. A complete definition requires source-supported necessary and sufficient conditions expressed using already admitted symbols. A one-way implication is not treated as a definition.

Result in one sentence

No existing Authority Engineering Registry definition represented in RC-1 can be promoted to an independently semantically complete biconditional definition from the present corpus alone. A, C, and Sigma remain primitives; every other symbol is either a partial encoding, an external background parameter, or an implementation artifact.

1. Semantic Completion Matrix

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
A	State x Transition	B Primitive concept	Primitive constrained by T_RC1	Retain as mathematical primitive	AE-REG-0037 Authority; L-AE0	Intentionally irreducible in the present corpus.	RC-1, BAR-definition, CT-2, AS-1, AT-1, FB-2, CC-2, OT-3, AA-1, CF-1
Accumulated	Transition x Time	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0056 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	ST-2

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

CYBER TERRAIN

Publication Record

RC-1 Semantic-Completion Adjudication

Author: Rob Caswell

Publisher: Cyber Terrain LLC

Published: 2026-01-01

Zenodo version: v1.0

DOI: https://doi.org/10.5281/zenodo.21742372

Website: https://cyberterrain.ai/papers/rc1-semantic-completion-adjudication.pdf

Corpus Context

Corpus: Authority Engineering

Document ID: AE-RC1-SEM-0001

Object family: AE-RC1-SEM-0001

Publisher-imprint edition prepared for versioned republication.
The prior Zenodo record remains the citable record until its new version is published.

© 2026 Cyber Terrain LLC. All rights reserved.

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Assesses	Assessment x Outcome x State x Transition x ExecutionCondition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0042; L-AE9	It organizes the encoding but is not an independently claimed AE concept.	CF-1, CF-2
AuthorityAttack	Attack	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0012; L-AE8	Legitimacy, manipulation, and the classification boundary for system breakage are not defined.	AA-1, AA-2
AuthorizedToInitiate	Role x Decision	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-2
AuthorizedToInterrupt	Role x Decision	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-2
AuthorizedToOwnConsequence	Role x Decision	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-2

Published by Cyber Terrain LLC | cyberterrain.ai DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
BAR	State x Transition	D Partial formalization	Syntactic iff; semantically conditional	Retain as partial extension; exclude from closed AE core	AE-REG-0047; L-AE1	The source terms preservation, realization, Local, and CCR lack closed formal meanings; the biconditional is conditional on those parameters.	BAR-definition, GC-1, GC-2, HC-1, SS-1, CT-2, ST-1
BeforeH	TFH x Guard x Guard	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0045; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	HC-4
BoundedOutcome	Outcome x State x Transition x ExecutionCondition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0042 source phrase; L-AE9	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CF-1
BreaksSystem	Attack	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0012 source phrase; L-AE8	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AA-2
C	Transition	B Primitive concept	Primitive constrained by T_RC1	Retain as mathematical primitive	AE-REG-0038 Consequence; L-AE0	Intentionally irreducible in the present corpus.	RC-1, BAR-definition, CT-2, AS-1, AT-1, FB-2, ST-1, CC-2, OT-3, CF-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
CCR	Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0047 source phrase; L-AE1	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	BAR-definition
CarriedBy	Fabric x Path x State x Transition x System	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0051; L-AE5	No complete carriage relation or medium semantics is supplied.	FB-2, FB-3
Carries	Path x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0043 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CT-2, FB-2, CC-2
Contends	Agent x Agent x Intention x Intention x Future x Future	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0052; L-AE6	Local validity, incompatibility, and shared/intersecting future are not formally defined.	CC-1, CC-2
Continuous	Path	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0043; L-AE4	No criterion determines what preservation, traversal/mutation, or meaningfulness consists in.	CT-1, CT-2, FB-2, CC-2
DecisionRelation	Decision x State x Transition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0002; L-AE7	It organizes the encoding but is not an independently claimed AE concept.	OT-3

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
DegreeOf	Assessment x Degree	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0042 source phrase; L-AE9	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CF-2
Distributed	System	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0051 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	FB-1
DistributedRealization	State x Transition x System	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0051 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	FB-2, FB-3
Dynamic	ExecutionCondition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0042 source phrase; L-AE9	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CF-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Earlier	Time x Time	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0056 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	ST-2
FabricOf	Fabric x System	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0051; L-AE5	No necessary-and-sufficient account identifies an operational substrate or distributed system.	FB-1, FB-2
FidelityAssessment	Assessment	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0042; L-AE9	The source supplies no degree scale, bounding relation, observation rule, or dynamic-condition semantics.	CF-1, CF-2
FlowInTopology	Flow x Topology x State x Transition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0012; L-AE8	It organizes the encoding but is not an independently claimed AE concept.	AA-1
FlowRelation	Flow x State x Transition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0012; L-AE8	It organizes the encoding but is not an independently claimed AE concept.	AA-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
FutureCondition	State x Transition x Time	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0056 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	ST-2
HAt	TFH x State x Transition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0045; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	HC-1, HC-2, HC-3
HMember	TFH x Guard	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0045; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	HC-2, HC-3, HC-4
HOwner	TFH x Guard	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0045; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	HC-3
Holds	Agent x Intention	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Identifiable	Role	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-2
Incompatible	Intention x Intention	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-1
IntendedAuthority	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0042 source phrase; L-AE9	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CF-1
IntendedRelation	Intention x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-2

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Legitimate	Flow	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0012 source phrase; L-AE8	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AA-1
Local	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0047 source phrase; L-AE1	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	BAR-definition
LocallyValid	Agent x Intention	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-1
Manipulates	Attack x Flow	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0012 source phrase; L-AE8	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AA-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Material	Decision	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-1
Meaningful	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0043 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CT-2
Member	Role x Organization	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0002 source phrase; L-AE7	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	OT-2
Modifies	Transition x State x Transition x Time x Time	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0056 source phrase; L-AE5	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	ST-2

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Observable	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0040 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AS-1
OnSurface	Surface x State x Transition	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0040; L-AE4	No rule identifies the complete exposure envelope or defines observability/reachability.	AS-1, AS-2, ST-1
Over	Intention x Future	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-1
OwnershipTest	Decision x Organization	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0002; L-AE7	Materiality, authorization, organization membership, and what authority determines are not closed.	OT-1, OT-2, OT-3

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Owns	Guard x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0054/0045; L-AE2	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	GC-2, HC-3
Participates	Guard x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0045/0046/0054; L-AE2	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	GC-2, HC-2, VC-2
Preq	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0044 source phrase; L-AE3	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	SS-2
Present	Guard x State	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0054; L-AE2	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	GC-1, GC-2, VC-2, SC-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Preserved	Path x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0043 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CT-2
Proceed	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0044 source phrase; L-AE3	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	SS-2
Reachable	State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0040/0041 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AS-1, AT-1
Realized	Outcome	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0042 source phrase; L-AE9	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CF-1

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
SMember	Stack x Guard	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0055; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	SC-1
STOICAnalysis	Analysis	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0056; L-AE5	The source does not define the analysis relation, accumulation, modification, or future-condition metric.	ST-1, ST-2
SharedOrIntersecting	Future x Future	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0052 source phrase; L-AE6	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CC-1
Sigma	State x Transition	B Primitive concept	Primitive constrained by T_RC1	Retain as mathematical primitive	AE-REG-0039 Consequence Seam; L-AE0	Intentionally irreducible in the present corpus.	RC-1, BAR-definition, GC-1, GC-2, HC-1, VC-1, SS-1
StackAt	Stack x State	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0055; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	SC-1
Stop	State x Transition	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0044; L-AE3	No source-complete formal account links a stop to TF-H, convergence, and decision ownership.	SS-1, SS-2

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
Studies	Analysis x Transition x State x Transition x Surface x Topology x Time x Time	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0056; L-AE5	The source says STOIC studies the relation but does not define study as a mathematical relation.	ST-1, ST-2
Supplies	Guard x State x Transition	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0054; L-AE2	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	GC-1
SurfaceOf	Surface x System	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0040; L-AE4	It organizes the encoding but is not an independently claimed AE concept.	AS-2
TopoMember	Topology x State x Transition	D Partial formalization	Necessary-condition constraints	Retain as partial extension; exclude from closed AE core	AE-REG-0041; L-AE4	No structural relation—such as adjacency, path, or membership criterion—defines the arrangement.	AT-1, AT-2, ST-1, CC-2, AA-1
TopologyOf	Topology x System	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0041; L-AE4	It organizes the encoding but is not an independently claimed AE concept.	AT-2

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Type	Current status	Direction supported	Proposed disposition	Source support	Blocking issue	T_RC1 sentence(s)
TraversalOrMutation	Path	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0043 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	CT-1
VAt	TFV x State x Transition	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0046; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	VC-1, VC-2
VMember	TFV x Guard	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	AE-REG-0046; L-AE2	It organizes the encoding but is not an independently claimed AE concept.	VC-2
Within	State x System	C Background parameter	Constrained only where a T_RC1 sentence mentions it	Exclude from closed AE core; retain as typed external parameter	AE-REG-0041 source phrase; L-AE4	Requires contextual, institutional, engineering, temporal, observational, or empirical interpretation not supplied by the corpus.	AS-2, AT-2
src	Transition -> State	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	L-AE0 state-transition scaffold	It organizes the encoding but is not an independently claimed AE concept.	RC-1
tgt	Transition -> State	E Representation artifact	Purely relational / implementation constraint	Retain only in implementation signature	L-AE0 state-transition scaffold	It organizes the encoding but is not an independently claimed AE concept.	None

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

The exact formula for each cited sentence is in 34-l-ae-rc1-formal-theory-presentation.smt2. Source wording and module treatment are in the cited L-AE module and the Registry entry identified in the source-support column.

2. Complete Definitions Register

None.

BAR has a syntactic biconditional, but it is not an independent complete AE definition because its right-hand side contains unresolved Local, CCR, and source terms such as preservation and realization. No other represented Registry definition has source-supported necessary and sufficient conditions in the present language.

3. Primitive and Background Register

Mathematical primitives

A, C, Sigma

These are the existing RC-1 primitive interpretations. They are constrained by theory sentences but not reduced to other current symbols.

Contextual, empirical, or externally interpreted parameters

Accumulated, AuthorizedToInitiate, AuthorizedToInterrupt, AuthorizedToOwnConsequence, BoundedOutcome, BreaksSystem, CCR, Carries, DegreeOf, Distributed, DistributedRealization, Dynamic, Earlier, FutureCondition, Holds, Identifiable, Incompatible, IntendedAuthority, IntendedRelation, Legitimate, Local, LocallyValid, Manipulates, Material, Meaningful, Member, Modifies, Observable, Over, Owns, Participates, Preq, Present, Preserved, Proceed, Reachable, Realized, SharedOrIntersecting, Supplies, TraversalOrMutation, Within

Each requires an external interpretation of the kind recorded in the matrix: for example organizational authorization, observability, physical or digital carriage, temporal accumulation, legitimacy, materiality, or measurement. The corpus does not close those meanings mathematically.

Implementation-only symbols

Assesses, BeforeH, DecisionRelation, FlowInTopology, FlowRelation, HAt, HMember, HOwner, SMember, StackAt, SurfaceOf, TopologyOf, VAt, VMember, src, tgt

These should remain available to compile and validate the existing representation but should not be presented as normative AE concepts.

4. Partial Definitions Register

Symbol	Exact missing condition	Can existing corpus recover it?
AuthorityAttack	Legitimacy, manipulation, and the classification boundary for system breakage are not defined.	Existing corpus does not close the term; completion would require new AE semantic work.

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

Symbol	Exact missing condition	Can existing corpus recover it?
BAR	The source terms preservation, realization, Local, and CCR lack closed formal meanings; the biconditional is conditional on those parameters.	Existing corpus does not close the term; completion would require new AE semantic work.
CarriedBy	No complete carriage relation or medium semantics is supplied.	Existing corpus does not close the term; completion would require new AE semantic work.
Contends	Local validity, incompatibility, and shared/intersecting future are not formally defined.	Existing corpus does not close the term; completion would require new AE semantic work.
Continuous	No criterion determines what preservation, traversal/mutation, or meaningfulness consists in.	Existing corpus does not close the term; completion would require new AE semantic work.
FabricOf	No necessary-and-sufficient account identifies an operational substrate or distributed system.	Existing corpus does not close the term; completion would require new AE semantic work.
FidelityAssessment	The source supplies no degree scale, bounding relation, observation rule, or dynamic-condition semantics.	Existing corpus does not close the term; completion would require new AE semantic work.
OnSurface	No rule identifies the complete exposure envelope or defines observability/reachability.	Existing corpus does not close the term; completion would require new AE semantic work.
OwnershipTest	Materiality, authorization, organization membership, and what authority determines are not closed.	Existing corpus does not close the term; completion would require new AE semantic work.
STOICAnalysis	The source does not define the analysis relation, accumulation, modification, or future-condition metric.	Existing corpus does not close the term; completion would require new AE semantic work.
Stop	No source-complete formal account links a stop to TF-H, convergence, and decision ownership.	Existing corpus does not close the term; completion would require new AE semantic work.
Studies	The source says STOIC studies the relation but does not define study as a mathematical relation.	Existing corpus does not close the term; completion would require new AE semantic work.
TopoMember	No structural relation—such as adjacency, path, or membership criterion—defines the arrangement.	Existing corpus does not close the term; completion would require new AE semantic work.

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

5. Normative Signature Recommendation

Recommended normative AE mathematical core

Sorts and formal scaffolding required to state the core plus the three primitive predicates A, C, and Sigma, with src and tgt retained only as formal state-transition scaffolding. This is the only portion whose AE semantic role is closed enough to be treated as a current mathematical core.

Recommended implementation/validation signature

All 25 sorts, 2 functions, and 71 predicates in 34-l-ae-rc1-formal-theory-presentation.smt2. This signature is needed to replay the present 33 constraints and Z3 model, but most of it is not a closed AE ontology.

Relocation rule

- Keep A, C, and Sigma as primitives.
- Keep partial symbols in extension modules, explicitly labeled partial.
- Keep background parameters typed but outside the closed normative AE core.
- Keep representation artifacts only in the implementation signature.

6. Dependency Impact Analysis

T_RC1 sentence	Status after the recommendation	Non-core dependencies
RC-1	Requires implementation/background signature	src
BAR-definition	Requires implementation/background signature	BAR, CCR, Local
GC-1	Requires implementation/background signature	BAR, Present, Supplies
GC-2	Requires implementation/background signature	BAR, Owns, Participates, Present
HC-1	Requires implementation/background signature	BAR, HAt
HC-2	Requires implementation/background signature	HAt, HMember, Participates
HC-3	Requires implementation/background signature	HAt, HMember, HOwner, Owns
HC-4	Requires implementation/background signature	BeforeH, HMember
VC-1	Requires implementation/background signature	VAt
VC-2	Requires implementation/background signature	Participates, Present, VAt, VMember

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

T_RC1 sentence	Status after the recommendation	Non-core dependencies
SC-1	Requires implementation/background signature	Present, SMember, StackAt
SS-1	Requires implementation/background signature	BAR, Stop
SS-2	Requires implementation/background signature	Preq, Proceed, Stop
CT-1	Requires implementation/background signature	Continuous, TraversalOrMutation
CT-2	Requires implementation/background signature	BAR, Carries, Continuous, Meaningful, Preserved
AS-1	Requires implementation/background signature	Observable, OnSurface, Reachable
AS-2	Requires implementation/background signature	OnSurface, SurfaceOf, Within
AT-1	Requires implementation/background signature	Reachable, TopoMember
AT-2	Requires implementation/background signature	TopoMember, TopologyOf, Within
FB-1	Requires implementation/background signature	Distributed, FabricOf
FB-2	Requires implementation/background signature	CarriedBy, Carries, Continuous, DistributedRealization, FabricOf
FB-3	Requires implementation/background signature	CarriedBy, DistributedRealization
ST-1	Requires implementation/background signature	BAR, OnSurface, STOICAnalysis, Studies, TopoMember
ST-2	Requires implementation/background signature	Accumulated, Earlier, FutureCondition, Modifies, STOICAnalysis, Studies
CC-1	Requires implementation/background signature	Contends, Holds, Incompatible, LocallyValid, Over, SharedOrIntersecting
CC-2	Requires implementation/background signature	Carries, Contends, Continuous, IntendedRelation, TopoMember
OT-1	Requires implementation/background signature	Material, OwnershipTest
OT-2	Requires implementation/background signature	AuthorizedToInitiate, AuthorizedToInterrupt, AuthorizedToOwnConsequence, Identifiable, Member, OwnershipTest
OT-3	Requires implementation/background signature	DecisionRelation, OwnershipTest

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372

T_RC1 sentence	Status after the recommendation	Non-core dependencies
AA-1	Requires implementation/background signature	AuthorityAttack, FlowInTopology, FlowRelation, Legitimate, Manipulates, TopoMember
AA-2	Requires implementation/background signature	AuthorityAttack, BreaksSystem
CF-1	Requires implementation/background signature	Assesses, BoundedOutcome, Dynamic, FidelityAssessment, IntendedAuthority, Realized
CF-2	Requires implementation/background signature	Assesses, DegreeOf, FidelityAssessment

RC-1 remains a well-formed minimal-core sentence using only the three primitives and src. Every other current sentence remains well-formed in the implementation signature, but cannot be claimed as a closed semantic statement of the normative AE core until its non-core symbols are resolved or explicitly parameterized.

7. Final Verdict

Is semantic completion of the current RC-1 mathematical core possible without adding new AE substance?

Only for the minimal primitive core. It is not possible for the represented Registry definitions because the missing semantic conditions are not supplied by the existing corpus.

Which concepts can be completed now?

No Registry definition can be completed as an independent biconditional from current sources. The current formal language, model class, and satisfaction relation can remain complete as mathematical machinery; that is different from semantic completion of an AE concept.

Which must remain primitive?

A, C, and Sigma.

Which must be excluded as background or implementation parameters?

All symbols classified C or E in the matrix. Partial symbols classified D may remain as explicitly partial extension vocabulary, but not as closed core definitions.

After these decisions, would RC-1 qualify as a semantically complete formal theory presentation?

It would qualify as a semantically complete minimal primitive-core presentation only if it explicitly restricts its normative claim to that core. It would not qualify as a semantically complete theory of all currently represented Authority Engineering definitions, because none of those definitions is closed by existing source material.

Published by Cyber Terrain LLC | cyberterrain.ai

DOI: https://doi.org/10.5281/zenodo.21742372