Core Emotion Framework (CEF): Technical Specification 18 (TS 18)

Computational Ontology & Machine-Readable Architecture
Canonical Architecture-Level Technical Document — Version 1.0

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0. Purpose and Canonical Position

TS-18 is the eighteenth Technical Specification in the CEF canon.

Where:

- TS-1 → TS-11 define the emotional architecture
- TS-12 → TS-17 define dynamic, predictive, adaptive, plastic, and autonomous behavior

TS-18 defines the **computational ontology** of the CEF — the machine-readable, formally structured representation of:

- operators
- facets
- transitions
- modulation
- centers
- capacity & thresholds
- dysregulation patterns
- reintegration sequences
- predictive indicators
- plasticity parameters

- autonomous governance signals

TS-18 is the foundation for:

- the CEF Knowledge Graph
- the EL-Series global lexicon
- semantic-web integration
- computational modeling
- synthetic affect (TS-9)
- automated validation (TS-2)
- AI-based reasoning engines

TS-18 does not define new emotional constructs.
It defines the **formal structure** through which all existing constructs become computable.

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1. Definition of the CEF Computational Ontology

The CEF Computational Ontology is:

A machine-readable, identity-preserving, contamination-free representation of the entire CEF architecture, expressed in canonical entities, relations, constraints, and metadata.

It enables:

- reasoning
- validation
- simulation
- mapping
- interoperability
- semantic indexing

It does **not** introduce new operators, facets, centers, or transitions.

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2. Ontology Structure

The ontology consists of **six canonical layers**:

1. **Entity Layer**
2. **Relation Layer**
3. **Constraint Layer**

4. **Parameter Layer**
5. **State-Space Layer**
6. **Metadata Layer**

Each layer is defined below.

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3. Entity Layer

The Entity Layer defines all identity-preserving components of the CEF.

3.1 Operator Entities

Ten operator entities:

- Sensing
- Calculating
- Deciding
- Expanding
- Constricting
- Achieving
- Arranging
- Appreciating
- Boosting
- Accepting

Each operator entity includes:

- operator_id
- center_id
- core_function
- facet_set
- canonical_successors
- canonical_modulators

3.2 Facet Entities

Fifty facet entities (5 per operator), each with:

- facet_id

- operator_id
- functional_definition
- canonical_order
- contamination_constraints

3.3 Center Entities

Three center entities:

- Head
- Heart
- Gut

Each with:

- center_id
- operator_membership
- modulation_roles
- weighting_parameters

3.4 Structural Entities

Additional entities:

- transitions
- modulation pathways
- capacity structures
- threshold structures
- dysregulation patterns
- reintegration sequences
- predictive indicators
- plasticity micro-parameters
- governance signals

All entities must preserve identity and canonical boundaries.

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4. Relation Layer

The Relation Layer defines lawful relationships between entities.

4.1 Identity-Preserving Relations

- operator_has_facet
- facet_belongs_to_operator
- operator_belongs_to_center
- center_contains_operator

4.2 Directionality Relations

- operator_transitions_to(operator_i, operator_j)
- facet_precedes(facet_i, facet_j)
- center_modulates(center_i, center_j)

4.3 Constraint Relations

- prohibits_fusion(operator_i, operator_j)
- prohibits_facet_migration(facet_i, operator_j)
- prohibits_directionality_violation(operator_i, operator_j)

4.4 Dynamic Relations

- modulates(operator_i, operator_j)
- influences(center_i, center_j)
- adjusts_capacity(operator_i, parameter)
- recalibrates_threshold(operator_i, parameter)

4.5 Predictive Relations

- predicts_drift(indicator, operator)
- predicts_collapse(indicator, center)
- predicts_overflow(indicator, pathway)

4.6 Governance Relations

- self_corrects(operator)
- self_balances(center)
- self_smooths(transition)
- self_protects(coherence)

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5. Constraint Layer

The Constraint Layer enforces canonical CEF rules.

5.1 Identity Constraints

- operators cannot merge
- facets cannot migrate
- centers cannot collapse into each other

5.2 Directionality Constraints

- transitions must follow TS-1
- modulation must follow TS-3
- reintegration must follow TS-10

5.3 Structural Constraints

- no new operators
- no new facets
- no new centers
- no cross-center facet drift
- no illegal modulation pathways

5.4 Stability Constraints

- capacity must remain within canonical limits
- thresholds must remain predictable
- coherence must remain intact

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6. Parameter Layer

The Parameter Layer defines all numeric and symbolic parameters.

6.1 Activation Parameters

- activation_level
- activation_threshold
- activation_range

6.2 Modulation Parameters

- modulation_strength
- modulation_elasticity

- modulation_latency

6.3 Transition Parameters

- transition_smoothness
- transition_lag
- transition_resistance

6.4 Capacity & Threshold Parameters

- capacity_limit
- threshold_sensitivity
- threshold_spacing

6.5 Predictive Parameters

- drift_velocity
- load_accumulation_rate
- modulation_decay_rate

6.6 Plasticity Parameters

- micro_adjustment_step
- facet_reordering_delta
- center_micro_shift

6.7 Governance Parameters

- self_correction_gain
- coherence_protection_factor

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7. State-Space Layer

The State-Space Layer defines the full computational representation of the emotional system.

7.1 Operator Vector

10-dimensional vector O(t)

7.2 Center Vector

3-dimensional vector C(t)

7.3 Facet Vector

50-dimensional vector F(t)

7.4 Modulation Matrix

10×10 matrix M(t)

7.5 Transition Graph

Directed acyclic graph T

7.6 Coherence Scalar

Single value K(t)

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8. Metadata Layer

Defines:

- versioning
- provenance
- canonical dependencies
- ontology namespace
- JSON-LD context
- RDF/OWL class definitions
- interoperability rules

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9. Canonical Constraints of TS-18

The ontology must always preserve:

- operator identity
- facet boundaries
- center architecture
- transition directionality
- modulation reciprocity
- capacity limits
- threshold predictability
- whole-system coherence

No computational process may violate these constraints.

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10. Canonical Status

TS-18 is the authoritative computational ontology specification of the CEF.
It is subordinate only to:

- Core Essence Document
- TS-1 → TS-17

TS-18 defines the machine-readable structure that enables the CEF to function as a computational, semantic, and synthetic-affect architecture.
