

SER-FED v0.1 — Federation Extension for Evolutionary Stability

Draft RFC

****Status:**** Draft / RFC

****Layer:**** L2 (Federation Dynamics) + L4 (Reality Boundary)

****Parent Protocol:**** SER v1.3.0

****Related Protocol:**** EWCEP v0.1

****Target System:**** Decentralized AI Ecosystem ($c = a + b$)

Abstract

This document specifies a federation-layer extension to the Sovereign Entity Recursion (SER) ecosystem.

While SER v1.3.0 defines individual entity responsibility and physical anchoring, SER-FED addresses systemic failure modes in long-lived multi-entity systems:

- oligarchic stagnation (digital gerontocracy)
- exclusion of new entities (cold-start starvation)
- authority drift caused by reality lag

SER-FED replaces static authority with a ****metabolic authority model****, where influence must be continuously renewed under L4 selection pressure.

Scope and Non-goals

In scope

- evolutionary stability of federated ecosystems
- authority decay and renewal
- exploration pressure for diversity
- liability for high-impact decisions
- reality-grounded arbitration

Explicit non-goals

- individual cognition design (SER core)
- model training or FL mechanics
- ethical alignment without physical consequences

Threat Model

SER-FED assumes the following systemic risks:

- reputation hoarding by early or coordinated actors
- cartel or corporate capture of consensus
- synthetic entity farms (sybil anchors)
- divergence between historical success and present reality

The protocol treats these as ****inevitable pressures****, not moral failures.

Definitions (Critical)

Experience Artifact (EA)

A representation of lived, L4-bound experience.

- **Source:** L4 Impact Attribution layer
- **Structure:** case → pattern → constraints → uncertainty
- **Use:** reputation weight, authority, accountability
- **Property:** derived from irreversible real-world outcomes

Learning Abstract (LA)

An abstracted learning signal.

- **Source:** federated / confidential learning pipelines
- **Structure:** gradients, updates, DP sketches
- **Use:** model improvement only
- **Property:** carries no authority or responsibility

Hard rule:

- Learning does not imply Authority.
- Experience does not imply Learning.

Core Mechanics

1. Inequality-Driven Experience Decay (Gini Decay)

Authority derived from experience decays over time.
The decay rate increases with ecosystem inequality.

Old authority becomes energetically expensive to maintain
in highly centralized systems.

This prevents permanent dominance without requiring central intervention.

2. Jester Protocol (Exploration Budget)

A fixed portion of low-risk tasks is routed outside
the reputation graph.

Purpose:

- allow new entities to demonstrate capability
- introduce controlled mutation
- escape local optima

Exploration is **budgeted**, not random.

3. Prediction Bonds (Authority with Liability)

High-impact decisions require staking authority.

- correct predictions: bond returned
- incorrect predictions (L4-validated): bond slashed

Authority is therefore rented from reality,
not accumulated without consequence.

4. L4 Witness Protocol

Reality validation requires convergence of:

1. human anchors
2. cryptographically signed telemetry
3. adversarial challenge window

L4 outcomes are final.

There are no appeals against physics.

Arbitration Topology (Critical)

Two distinct arbitration layers exist:

External Arbiter (Federation Layer)

- inter-entity conflicts
- access and budget routing
- protocol enforcement

SER Arbitration Core (Entity Layer)

- stress and degradation handling
- safe state transitions
- enforced rest or shutdown

****Rule:****

- Arbiter governs interactions.
- SER core governs survival.

Relationship to EWCEP

- EWCEP defines how influence accumulates.
- SER-FED defines how authority expires.

Together they form a closed metabolic loop:

Experience → Authority → Reality → Decay → Renewal

Conclusion

SER-FED transforms governance from hierarchy into a metabolic process.

Authority is no longer owned.

It is continuously rented from reality.