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AI OSI Stack Architecture Overview
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> ## Normative Language Notice
> This document uses normative language consistent with ISO/IEC 42010 and NIST conventions.
> SHALL denotes mandatory requirements, SHOULD denotes strong recommendations, and MAY denotes optional practices.
> Interpretations SHALL preserve authorial intent: layered accountability, epistemic integrity, and human dignity as binding design constraints.

1. Purpose and Relationship to AEIP

The AI OSI Stack defines a seven-layer governance architecture that binds technical controls, institutional stewardship, and evidentiary accountability. It functions as the canonical scaffold for the **AI Epistemic Infrastructure Protocol (AEIP)**, which provides the transport layer that conveys reasoning states, decisions, and temporal attestations between personas, auditors, and custodial nodes. AEIP inherits the stacks normative guardrails reasoning fidelity, traceable accountability, and dignity-first commitments while supplying deterministic handshakes that keep each layers artifacts synchronized.

2. Seven-Layer Design Summary

The blueprint encompasses seven mandatory governance layers (with an optional civic mandate precursor). Each layer exposes interfaces, controls, and evidence channels that align with AEIP packet classes.

Layer	Core Objective	Canonical Interfaces	Primary Artifacts
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L1	Physical Substrate	Secure compute foundations, supply integrity	Environmental attestations, facility provenance GDS, DRR
L2	Data Stewardship	Provenance, consent, and epistemic hygiene	Data lineage ledgers, consent registries ITP, DRR
L3	Model Development	Training rigor, evaluation transparency	Evaluation harness APIs, persona regression hooks OAM, GDS
L4	Instruction & Control	Persona governance, affect safeguards	Persona briefs, refusal logic, AEIP intents ITP, DRR, GDS
L5	Reasoning Exchange	AEIP handshake execution	Signed reasoning packets, counter-signatures ILE, OAM
L6	Deployment & Integration	Runtime assurance, change control	Release manifests, incident playbooks TRR, OAM
L7	Governance Publication	External transparency, civic accountability	Disclosure

portals, audit submission queues | GDS, ILE |

3. Ethical Foundations

The stacks structure codifies Daniel P. Maddens ethical triad:

1. **Dignity by Design** Personas, affect controls, and refusal logic maintain human primacy and avert manipulative behaviors.
2. **Epistemic Integrity** Interpretive Trace Packages (ITP) and Decision Rationale Records (DRR) ensure reasoning is reconstructable and contestable.
3. **Accountable Stewardship** Integrity Ledger Entries (ILE) and Governance Disclosure Statements (GDS) expose temporally sealed evidence to auditors and the public.

4. Offline-First Blueprint Scope

This reference implementation is intentionally **offline-first**. All utilities, schemas, and example ledgers SHALL operate without network dependencies to guarantee reproducible review, audit rehearsals, and archival resilience. Deployment, live registries, and production key material are **out of scope**. Stakeholders SHALL treat this repository as a normative blueprint: design decisions are finalized, but instantiation in live infrastructure remains deferred until governance coalitions ratify operational requirements.

5. Integration Roadmap Considerations

Organizations adopting the AI OSI Stack SHALL first internalize the seven-layer obligations, map existing controls to artifact expectations, and stage AEIP nodes in sandbox form. Only after governance councils approve contextual adaptations SHOULD production roll-out proceed. Continuous maturation follows the Implementation Maturity Model described in the canonical specification, ensuring every escalation preserves the ethical foundations summarized above.