

Overview

The Layered Transformation Foundations (LTF) Sequence establishes the structural basis for how coherent structures move across layers in any layered system. It identifies the minimal set of operators, mechanisms, and relationships required for a structure to transition upward into a more flexible representational space and downward into a more constrained one while preserving identity, coherence, and compatibility with each layer's constraints. LTF is substrate-agnostic: it does not depend on a specific domain, implementation, or representational format. It defines the foundational architecture that any layered system must satisfy to support stable cross-layer transformation.

At the core of LTF are two operators—abstraction and compression—and the mechanisms that perform them. Abstraction lifts a structure into a higher layer by expanding degrees of freedom while preserving invariants and coherence. Compression returns a structure to a lower layer by restoring constraints while preserving the same invariants and coherence. These operators are directionally asymmetric and structurally distinct. Their mechanisms perform different functions and cannot be reduced to one another. Together, they define the bidirectional movement that layered systems require.

The final component of LTF is duality, the structural relationship between abstraction and compression. Duality is not symmetry, inversion, or reversibility. It specifies the conditions under which upward and downward transitions preserve identity, maintain coherence, and remain compatible with the constraint envelopes of each layer. Duality ensures that the operators and mechanisms form a coherent system rather than two isolated processes. With duality in place, the architecture becomes structurally complete: the system can support stable, repeatable, and distortion-free movement across layers.

The LTF Sequence therefore provides a foundational account of cross-layer transformation. It identifies the structural primitives that govern upward and downward transitions, the mechanisms that perform them, and the relationship that binds them into a coherent whole.