e Null-Prefix Problem

An Illustrated Guide — Final April 2026 Update

v1.4: What Is New

P_0 is now identified as a buffer overflow condition. This closes Step 5 in sketch form. AX-1 is derivable pending T-BUF.

P_0 Is a Buffer Overflow

Before P_0: the null state can still be represented by something shorter than itself. The system is compressing. It doesn't need to run the full program yet. At P_0: the buffer is full. No shorter representation exists. The system must flush — execute the program in full. The flush is the Snap.

P_0 = buffer full = no shorter representation = forced execution = the Snap

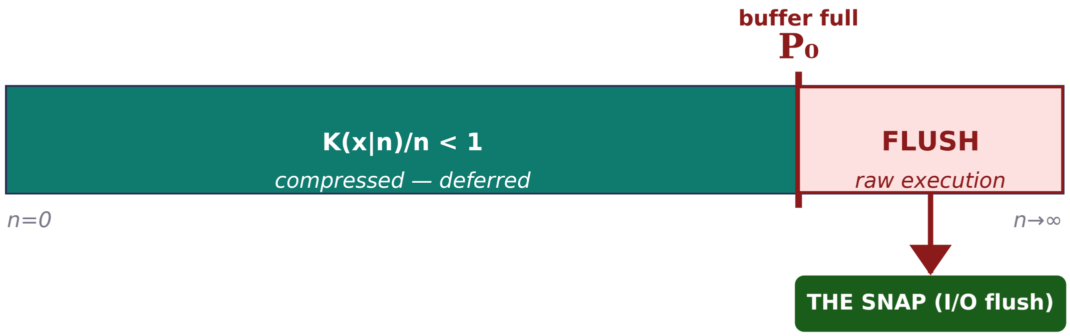
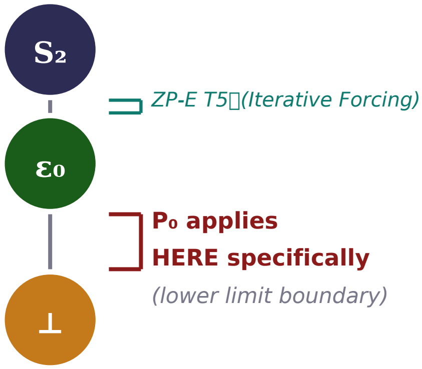


Figure: T-BUF: P_0 = buffer full = no shorter representation available = forced execution. The Snap is not triggered by P_0. The Snap IS the buffer flush at P_0.

P_0 Is Local — Not Global

The buffer that overflows is not "all of zero" simultaneously. P_0 is the density condition specifically at the $\perp \rightarrow \varepsilon_0$ boundary — the null-to-existence transition, the lower limit of the lattice to the first element above it. Higher transitions have their own local forcing (ZP-E T5).



P_0 is a LOCAL condition.

It applies specifically to the $\bot \rightarrow \varepsilon_0$ boundary — the null-to-existence transition.

Higher transitions are governed by ZP-E T5 (Iterative Forcing).

P_0 does not need to be reached "everywhere" simultaneously. Only at this one boundary.

Figure: R-DL: P_0 is local to the $\bot\rightarrow\varepsilon_0$ boundary. Higher transitions are governed by ZP-E T5. T-BUF only needs to hold at this one boundary.

AX-1: Before and After

BEFORE (v1.0–v1.3)	AFTER (v1.4)
AX-1: AXIOM — intentional	**AX-1: NEAR-DERIVED**
P_0 triggers the Snap	*P_0 = buffer full = forced flush*
(assumed, not derived)	*(T-BUF — proof target clear)*
Two irreducible axioms:	*One irreducible axiom*
AX-B1 and AX-1	*if T-BUF closes: AX-B1 only*

Figure: AX-1 is no longer an axiom in substance. It is derivable pending T-BUF. If T-BUF is proven, only AX-B1 remains as an irreducible axiom.

What T-BUF Needs to Prove

Step	What It Says	Status
DA-L	$K(p\|0)=0$: every executor is already in zero	Expected straightforward
DA-1	Running produces non-null output event	Expected straightforward
T-BUF	$K(x\|n)/n=1$ forces execution of the contained program	PROOF TARGET
R-DL	P_0 is local to $\bot\rightarrow\varepsilon_0$ boundary	Sharpens T-BUF

Zero Paradox TQ-IH v1.4 | Illustrated Companion | April 2026 | Not the formal document