

# BIZRA Apotheosis Node - SAPE Review (Evidence-Based)

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Scope: bizra-agentic-sdk.zip + bizra-rust-ralph-module-pack.zip + prior chat artifacts.

## Executive Signal

- The SDK articulates a strong proof-carrying contract (PCIEnvelope + CommitReceipt) and policy gates (SNR + Ihsan).
- Rust digest computation is currently self-referential (digest includes itself), breaking determinism and auditability.
- Python digest sealing correctly blanks digest before hashing; Rust must match to preserve cross-language consistency.
- Ralph loop module is promising (dual-exit, convergence, circuit breaker), but ships with a syntax defect and non-cryptographic hashing.
- Docs promise Kernel Hooks / IdentityMemory / local model runtime beyond the current Rust implementation; align roadmap, code, and CI tests.

## Top Risks and Fixes

Risk	Impact	Evidence (path:lines)	Fix (1-liner)
Self-referential digest in Rust	Integrity + replay verification fails	rust/.../protocol.rs:26-49, 70-91	Hash with digest/signature blanked (like Python seal())
Ralph dev_hash + stray leading character	Non-crypto receipts + compile failure	ralphpack/src/ralph.rs:1, 114-124	Use SHA-256 canonical hash; remove stray character
Policy requires evidence/assumptions but SDK often empty	Gates can be bypassed by empty artifacts	specs/policy/ihshan_snr_policy.yaml	SAT must fail-closed when must_have missing
Docs promise Kernel Hooks, IdentityMemory, process models	Expectation gap; tests/docs cannot anchor	docs/01_architecture.md, docs/02_quickstart_local_node.md	Add kernel module + hook trait; start with FS-only hook

## **Architectural Throughline (SAPE)**

SAPE in this system is not a prompt; it is a control surface: artifacts (PCIEnvelope/CommitReceipt), gates (SNR/Ihsan), loops (PAT/SAT/Ralph), and an evidence ledger that makes truth cheap and hallucination expensive.

### **Immediate Patch Order (build confidence fast)**

- Fix Rust digest computation to exclude digest/signature from the hashed view (match Python).
- Integrate Ralph as an optional loop runner, replacing dev\_hash with SHA-256 canonical hashing.
- Make SAT enforce policy.must\_have fail-closed (evidence\_hashes + explicit\_assumptions).
- Add minimal Kernel Hooks trait + a single filesystem hook; log hook calls into envelopes.
- Add tests: digest stability, schema validation, and a golden-vector cross-lang test (Python vs Rust).

### **Ihsan Alignment Checklist**

- Excellence: deterministic artifacts; reproducible tests; documentation that matches code.
- Sincerity: fail-closed gates; explicit assumptions; uncertainty labeled in outputs.
- Ethical integrity: audit logs; least-privilege hooks; safe defaults; signatures for provenance.