

Codex Virtual CPU - System Architecture & Integration Document

Version: 1.0

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Date: 2025-07-22

OVERVIEW

The Codex Virtual CPU is a fully symbolic, software-defined processor designed to interpret and execute

This CPU forms the execution core of the CodexCore Runtime, handling symbolic program execution ins

CORE PURPOSES

- Execute symbolic logic in a highly compressed tree format
- Support mutation, reflection, recursion, and traceability
- Power self-writing scrolls, thoughts, and memories
- Provide a programmable symbolic runtime across containers
- Integrate deeply with Tessaris, DreamCore, and GlyphOS

STRUCTURAL OVERVIEW

Codex Virtual CPU

- CodexLang Instruction Set (symbolic opcodes)
- Runtime Registers (A, B, C, D, OUT, TEMP, etc.)
- Instruction Tree Executor
- Memory Bridge (stores outputs to long-term memory)
- Trigger Hooks (dreams, mutations, glyphs)
- Metrics + Tracing Engine

MODULES & CONNECTIONS

See text version for full integration table.

FRONTEND INTEGRATION

- CodexScrollRunner.tsx: Allows authors to input, mutate, and run scrolls
- CodexLangEditor.tsx: Syntax-aware editor for CodexLang scrolls
- CodexHUD.tsx: Live visual overlay of execution
- CodexRegisterViewer.tsx / CodexRegisterDebug.tsx: Views runtime state

SYMBOLIC EXECUTION FLOW

1. Scroll Load
2. Context Injection
3. Instruction Execution
4. Register Mutation
5. Trigger Checks
6. Trace Logging

CURRENT FEATURES

- Symbolic opcode execution (\oplus , \rightarrow , ■, \leftrightarrow , ■)
- Context injection, memory integration, tracing, WebSocket HUD
- Mutation engine, register trace, scroll presets

FUTURE FEATURES

- Auto-Mutation Loop
- Export to `.codex` Format

- Versioning + Diff
- Memory-to-Scroll Converter
- SQL Integration (QBits)

RELATIONSHIP TO OTHER SYSTEMS

- GlyphOS: scroll → glyph logic
- Tessaris: scrolls as thought trees
- DreamCore: stores outputs as memories
- CodexLang: input format
- Containers: scroll runtime execution

SAFETY & ETHICS

- SoulLaw-enforced triggers
- Mutation safety checks
- Time dilation context awareness
- Cost tracking

HANDOVER FILES

See text version for full list.

CONCLUSION

The Codex Virtual CPU is the symbolic execution core of AION's intelligence. It simulates symbolic logic