

R_open: Rift Stage-3 Hex Encoder & Resolution Trident

/// SemVerX PolyGatic Registry & Runtime /// Implements: Extended semantic versioning (major.minor.patch(channel)) /// Resolution: Tri-node BiDAG (X:Upload, Y:Runtime, Z:Backup)

1. Overview

R_open is a multi-language implementation of the **Rift Stage-3 Hex Encoder**. It facilitates the translation of 1-D binary signals into 3-D duplex streams using a **2→1 sparse duplex** strategy.

The Resolution Trident

The system operates on three primary modules of resolution:

- 1. **Tri-node BiDAG**: Manages state across Upload (X), Runtime (Y), and Backup (Z) nodes using Eulerian and Hamiltonian strategies.
- 2. **FilterFlash Coherence Gating**: Ensures signal integrity during the duplex transformation.
- 3. **Observer-Mediated Recovery**: A rate-limited pattern (5-10 updates/sec) that monitors the Red-Black AVL tree for fault recovery.

2. Technical Specs

Feature	Implementation
Encoding	2→1 Sparse Duplex (A/B Polarity)
Pruning	Red-Black AVL ($\frac{1}{2} \log n$ auxiliary space)
Coherence	FilterFlash Functor Gating
Versioning	SemVerX (Major.Minor.Patch.Channel)

3. Build & Integration

C (MinGW/GCC)

```
gcc -DRIFT_OPEN MAIN -O2 main.c -o ropen_c.exe
./ropen_c.exe input.bin A
```

C++ (Modern C++17)

```
g++ -std=c++17 main.cpp -o ropen_cpp.exe  
./ropen_cpp.exe input.bin B
```

C# (.NET SDK)

```
dotnet run -- input.bin A
```

4. SemVerX Logic

Versions are categorized by channels:

- **Legacy:** Backward compatibility maintenance.
- **Experimental:** Fast-tracking FilterFlash functors.
- **Stable:** Production-ready BiDAG nodes.
- **LTS:** Long-term support for industrial RIFT applications.

“Structure is a signal. Polarity is a strategy. ROPEN is the experiment.”