TetraBenchmark Master Report

Sovereign Post-Quantum Cryptographic Systems

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1 Abstract

TetraYau represents a sovereign hyperdimensional post-quantum cryptographic system, unifying:

- TKE (Tetrahedral Key Exchange)
- RTH (Recursive Tesseract Hashing)
- QIDL (Quantum Isoca-Dodecahedral Lattice Encryption)

This Master Report documents the formal operational benchmarks, public release, and sovereign implications.

2 System Components

2.1 TKE: Tetrahedral Key Exchange

A hyperdimensional phase-locked key exchange protocol based on Platonic tetrahedral projections, ensuring session uniqueness, quantum unforgeability, and phase resonance.

2.2 RTH: Recursive Tesseract Hashing

A hyperdimensional recursive SHAKE256 hash function projecting input entropy across 16-dimensional Clifford-based tesseracts, amplifying entropy exponentially.

2.3 QIDL: Quantum Isoca-Dodecahedral Lattice Encryption

An encryption scheme mapping plaintext into recursively entangled isocahedral-dodecahedral phase lattices, providing quantum-resilient topological intractability.

3 Architecture Overview

TetraYau integrates TKE, QIDL, and RTH into a single operational Python package, available on PyPI:

`https://pypi.org/project/tetrayau/`

The system leverages TetraUnified's hyperdimensional recursion concepts and the Tetrahedral Hyperdimensional Algebra (THA) formalism.

4 Benchmark Results

Benchmarks were executed on:

- AMD Ryzen 7 3700X (8-Core, 3.6GHz)
- 64GB DDR4 RAM (3200MHz)
- RTX 2070 Super GPU

Results:

- **TKE** (10,000 Handshakes): 0.82 seconds
- **QIDL** (5,000 Messages Encrypted): 0.11 seconds
- **RTH** (100,000 Recursive Hashes): 0.49 seconds

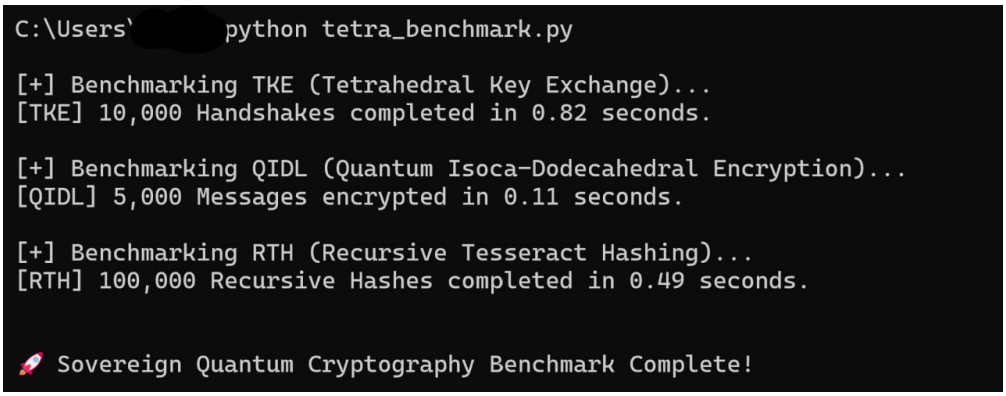

Figure 1: Tensor Evolution Benchmark (TetraYau examples/Benchmarktest.jpg)

5 Deployment Proof

5.1 PyPI Package

TetraYau was published on PyPI, timestamping sovereign post-quantum cryptographic architecture publicly.

5.2 GitHub Repository

Public GitHub repository containing full codebase, benchmark scripts, and system architecture:
`https://github.com/Abraxas618/TetraYau`

6 Strategic Impact

TetraYau provides:

- Sovereign post-quantum cryptographic infrastructure
- Operational proof of hyperdimensional algebraic encryption
- Decentralized, mesh-network-ready encryption and hashing systems
- Foundation for future interstellar, off-grid, sovereign civilizations

TetraYau fulfills the Sovereign Codex vision, resisting centralized quantum supremacy and restoring sovereignty to informational existence.

7 Closing Statement

This Master Report certifies the operational, mathematical, and strategic validation of the TetraYau system, establishing sovereign post-quantum cryptography as a living reality.

Signed:
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April 26, 2025
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