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L. J. Reilly
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REM License Token (RLT) - Genesis Artifact
draft-reilly-rlt-genesis-00

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Abstract

This document defines the REM License Token, referred to as the RLT, as the genesis artifact of the Reilly EternaMark Protocol for digital permanence and verifiable provenance. This specification formally defines the token structure, issuance procedures, cryptographic hash requirements, blockchain anchoring requirements, DOI archival requirements, verification methodology, and security model. The RLT represents an implementation of a dual-layer permanence artifact combining a blockchain timestamp with DOI-based archival to achieve durable, tamper-evident provenance guarantees. This document is published as an Informational Internet-Draft to serve as open, implementable guidance.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on 16 May 2026.

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1. Introduction

The Reilly EternaMark Protocol defines a dual-layer digital permanence model. This model binds cryptographic timestamping on a public blockchain with academic-grade DOI archival. The REM License Token is the first artifact created using this model. This document specifies that artifact in a manner consistent with IETF documentation practices, so that it can be implemented, evaluated, and extended by independent parties.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 (RFC 2119 and RFC 8174).

RLT: REM License Token
REM: Reilly EternaMark Protocol
DOI: Digital Object Identifier
OTS: OpenTimestamps proof file
DAR: Digital Archival Record

3. Background and Rationale

Intellectual property, authorship, and digital provenance frequently require durable, independently verifiable records. Traditional systems rely on centralized registries, contractual agreements, or proprietary evidence that may not be globally accessible or cryptographically strong.

The REM Protocol introduces a method for creating tamper-evident digital records by combining:

1. A SHA-256 hash of the artifact to be protected.
2. A public blockchain timestamp anchoring the hash.
3. A DOI archival record storing the artifact, metadata, and proofs.

4. RLT Genesis Artifact Definition

The REM License Token binds together:

* Author identity information
* SHA-256 hash of the reference document
* Blockchain timestamp proof
* DOI archival reference
* Token issuance metadata

The canonical REM License Token genesis artifact is archived under:

   DOI 10.5281/zenodo.17438760

Metadata Date: November 16, 2025

SHA-256:
   9964A78C6FC33794EF840ED69045C5C2477BC611CBC73EF6EC537FACA4C7BB74

Blockchain Anchor:
   Bitcoin Block Height 914168

5. Token Format and JSON Schema

```
{
  "rltVersion": "1.0",
  "tokenId": "<unique-id>",
  "author": {
    "name": "Lawrence J. Reilly",
    "ORCID": "<optional>",
    "affiliation": "<optional>"
  },
  "license": "CC_BY_4_0",
  "hash": "9964A78C6FC33794EF840ED69045C5C2477BC611CBC73EF6EC537FACA4C7BB74",
  "metadataDate": "2025-11-16",
  "blockchain": {
    "chain": "Bitcoin",
    "blockHeight": 914168,
    "timestamp": "2025-09-10T00:00:00Z",
    "proofFile": "RLT_FIRST_TOKEN_FULL_GUIDE_v2.pdf.ots"
  },
  "doi": "10.5281/zenodo.17438760",
  "issuedDate": "2025-11-16",
  "tokenUrl": "https://zenodo.org/records/17438760"
}
```

6. Issuance and Anchoring Requirements

The issuance process MUST include:
1. Compute SHA-256 hash.
2. Obtain OpenTimestamps proof.
3. Confirm blockchain anchor.
4. Upload artifact + proof to DOI archive.
5. Receive DOI.
6. Create JSON token.
7. Publish token.

7. Verification Requirements

A verifier MUST:
* Retrieve JSON token.
* Retrieve DOI metadata.
* Hash reference document and compare.
* Validate OTS proof.
* Confirm DOI availability.

8. Security Considerations

Security relies on:
* SHA-256 integrity
* Blockchain immutability
* DOI archival persistence
* Author identity correctness

9. IANA Considerations

This document has no IANA actions.

10. References

10.1 Normative References

RFC2119
RFC8174

10.2 Informative References

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DOI 10.5281/zenodo.17438760

Appendix A. Example RLT Token


```
{
  "rltVersion": "1.0",
  "tokenId": "example-uuid-0000",
  "author": { "name": "Lawrence J. Reilly" },
  "license": "CC_BY_4.0",
  "hash": "9964A78C6FC33794EF840ED69045C5C2477BC611CBC73EF6EC537FACA4C7BB74",
  "blockchain": { "chain": "Bitcoin", "blockHeight": 914168 },
  "doi": "10.5281/zenodo.17438760"
}
```


Appendix B. Change Log

draft-reilly-rlt-genesis-00
* Initial version with corrected IETF-compliant document date.

Author’s Address

Lawrence J. Reilly
Email: lawrencejohnreilly@gmail.com