

# RAIDAR: an open network of Rights & Asset Information in Decentralized, Authoritative Repositories

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## 1 Problem

To determine rights and rights-holders for music, one must employ cumbersome methods that often fail to return comprehensive, trustworthy results. Music creators encounter inconvenient, time-consuming and costly processes when establishing rights to their work. As a result rights and rights-holder data too often is:

- not recorded, or not recorded comprehensively; or,
- not discovered upon search, or the search yields incomplete, inconsistent, or out of date results. <sup>1</sup>

The situation impedes the ability to properly license music, and to promptly and accurately compensate its creators for its use. The accelerating proliferation of new music distributed via the Internet — 23,000 songs added per day as of mid-2019 — highlights the inadequacies of the previous century's traditional methods for rights management, licensing, and royalty collection/distribution.

## 2 Open Music Exchange

In 2019 March, the Institute for Creative Entrepreneurship at Berklee College of Music and MIT's Media Lab (Human Dynamics) began to design and implement an open network of *rights and asset information in decentralized, authoritative repositories* (RAIDAR), a key element in addressing the above problem.

In 2019 August these two organizations began formalizing a joint project, the *Open Music Exchange* (OMX), to solve this problem at scale by the end of 2022 in a manner that continues to be viable through the remainder of this century. OMX includes not only the development and deployment of the RAIDAR network, but also exemplary applications employing RAIDAR to:

- record rights information;
- search for licensable music;
- record license information; and,
- efficiently collect and pay royalties.

OMX is separate and independent from the Open Music Initiative, a Berklee-led music industry forum created in 2016 to discuss rights and licensing problems.

## 3 Goal

RAIDAR's initial phase creates a network of decentralized repositories (nodes) <sup>2</sup> that:

- records authoritative information about rights associated with *music* <sup>3</sup>;
- accepts inquiries from the public; and,
- returns a comprehensive response to those inquiries; e.g., to allow interested parties to license use of the music.

Subsequent phases may:

- incorporate more complex combinations of rights and rights-holders;
- record authoritative information about licensing of the rights;
- support external apps/tools <sup>4</sup> that facilitate negotiating and registering licenses;

*Properly licensing music requires accurate, comprehensive data about rights and rights-holders — data that remains difficult to record and elusive to discover.*

*RAIDAR provides asset & rights registration/search services based on an open network of authoritative, decentralized repositories of assets, rights and related metadata..*

<sup>1</sup> For an example, see the [Life of a Song](#) project.

<sup>2</sup> The initial nodes will be at MIT and Berklee.

<sup>3</sup> *Music*: the technology supports any generic asset (e.g., music, movie, video, software, written works) and the associated rights (e.g., copyright).

<sup>4</sup> The apps or tools may be implemented or used by external parties.

- support external apps/tools that accurately and automatically collect, pay or audit royalties due under the terms of recorded licenses; and,
- incorporate additional asset types beyond music.

#### 4 Data

RAIDAR includes four data types:

- **Asset:** the musical work or link(s) to an authoritative source.
- **Asset metadata:** information about the asset; e.g., title, date of creation, creator(s).
- **Right:** a right associated with the asset; e.g., mechanical right, composition copyright.
- **Right metadata:** information about the right; e.g., right-holder(s) and splits, legal jurisdiction.

A separate white paper discusses data types and related requirements in more detail.

#### 5 Design principles

- **Decentralized:** do not rely on a single source for any essential function; e.g., data, attestation, authentication, identity. Example: multiple methods, not limited to or requiring an ISRC number, may identify a recorded composition.
- **Authoritative:** include *veracity* <sup>5</sup> (which describes *provenance* <sup>6</sup>, *expertise* <sup>7</sup>, and *reliability* <sup>8</sup>) for every datum of the four types described in §4.
- **Future-tolerant and technology-agnostic:** for each function (such as a database, immutable ledger, interface, proof of identity), allow implementation with a variety of technologies equivalent in ability and performance; allow replacement or upgrade while maintaining compatibility with previous implementations.
- **Ease of use:** people submitting data or inquiries should perceive RAIDAR as elegant and easy to use; developers writing code or otherwise using RAIDAR's defined interfaces should find the documentation clear and the interfaces straightforward to employ.
- **International:** support multilingual data and user interfaces; accommodate asset rights as defined in different regulatory/legal regimes.
- **Open interface:** publish all interface designs.
- **Open source software:** publish exemplary software for each side of every open interface under MIT license terms.
- **Standards:** use relevant, published standards whose license terms equate to those of the MIT license.

#### Performance

Perform with a level of availability and repeatability similar to that of the Internet, the telephone network and the electrical power network in technically advanced parts of the world.

#### 6 Initial scope of music

For simplicity, RAIDAR shall initially address *controlled compositions* <sup>9</sup> that do not contain *derivative works* <sup>10</sup> nor involve *third party licensing* <sup>11</sup>.

Data from these sources will populate the repositories for test and initial production:

- Catalog of verified copyrights, an ongoing activity of the Library at Berklee;
- Rights to musical works created and registered by Berklee students; and,
- Riptide Music Group, which holds assets and rights for about 50,000 licensable musical works.

*Queries submitted to any service provider result in a comprehensive response through the network of authoritative repositories.*

*Registration creates dispersed, redundant, indisputable records of assets, rights and metadata.*

*To implement essential user and service-provider functions, RAIDAR open-source software implements each side of standard APIs.*

*RAIDAR's initial version contains a limited scope of registered music:*

<sup>5</sup> Veracity may be expressed as a weighted index of provenance, expertise and reliability.

<sup>6</sup> Provenance: source (authenticated software, system, and person responsible for original data values and each subsequent change), chain of custody, and degree of confidence that the datum, source and chain of custody records remain unaltered.

<sup>7</sup> Expertise: degree to which others consider the source of the current data values to be definitive for this type of data; e.g., the postal service may be considered a definitive source for postal addresses in its service territory.

<sup>8</sup> Reliability: degree to which others consider these particular data values both current and correct; e.g., a bank may be considered highly likely to both have expertise on the subject of how much money its accounts contain, and also to be highly reliable as to the value contained in a specific account — whereas a credit-reporting agency possesses less expertise and reliability when acting as the source for such data.

<sup>9</sup> Controlled composition: all copyrights owned by the same person(s).

<sup>10</sup> Derivative works: e.g., samples of other music.

<sup>11</sup> Third party licensing; e.g., via a publisher or record label.

Later phases will expand the scope of repository data and provide standard interfaces to third-party data sources for more comprehensive search results.

## 7 Initial architecture

To demonstrate compliance with all design principles, three RAIDAR repositories shall each contain a partially-overlapping subset of the entire dataset.

*RAIDAR's initial version must illustrate key design principles.:*

Data registration and search inquiries may be submitted to any RAIDAR repository's instance of the RAIDAR user interface. The reply to the inquiry shall be comprehensive, regardless of the location(s) of the underlying data.

Each RAIDAR repository employs a defined intra-RAIDAR repository interface to acquire from other RAIDAR repositories any data not held locally. Other solutions <sup>12</sup> may exist to provide decentralized but comprehensive repository service behind the RAIDAR user interface or behind intra-RAIDAR repository interfaces. The implementation of such alternative solutions demonstrates the technology agnosticism design principle.

## 8 Initial development schedule

- 2019 Q1: project definition
- 2019 Q2–3: architecture & API design
- 2019 Q3–4: develop & test a minimum believable version of RAIDAR and simple end-user web-based apps for rights registration and search

A separate white paper describes the RAIDAR development roadmap in more detail.

## 9 Document version history

- 2019 March: publish initial version.
- 2019 September:
  - Add description of relationship between OMX and RAIDAR;
  - Highlight independence of OMX from OMI;
  - Include Berklee student-created musical works in initial test/production phase;
  - Update initial development schedule;
  - Cross-reference related white papers.

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<sup>12</sup> See, for example, [IPFS](#).