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**Decentralised Music Rights Ecosystem**

# Motivation

Copyright legislation has continuously evolved so that fair, timely and transparent revenues are returned to artists and rights holders, e.g., US Music Modernisation Act and EU Digital Single Market Copyright Directive. Effective IP rights management in the digital environment is key to support the competitiveness of creative industries.  SMEs need to be empowered to make better decisions and deploy more advanced solutions based on insights gleaned from data. ISO/IEC 21000-23 Smart Contracts for Media supported by rich semantic copyright models can be handy when data-based decisions need to be derived by evidence and logic, leading to new business models that can be efficiently deployed on decentralised digital media platforms.

# Scope

This standard will provide the means (e.g., technologies and application programming interfaces) for a decentralised media rights ecosystem based on MPEG technologies (e.g., audio-visual codecs, file formats, streaming protocols, and smart contracts) and non-MPEG technologies (e.g., DLTs, content and creator IDs).

# Use Cases

Overview of use cases from the Smart Contracts for Media CfP (131MPEG/N19504).

## Open Music Initiative (on-demand streaming, digital sale, and radio broadcast)

These use cases are about how the money flows back to song writers, artists, publishers, and labels, when their music is web cast or streamed on interactive services, sold on the digital platforms and played on the radio. In particular, for interactive streams and digital sales, how the money flows depend on what entity negotiated the license (e.g., record labels having a direct deal with services, record labels represented by a digital aggregator/distributor and artists owning recording copyrights and using distribution services), while for radio and radio-like services, blanket licenses determine who gets paid and how much [3]. MPEG-21 CEL/MCO contracts are provided for each of these use cases in 134MPEG/N20314.

This use case has been concluded with ISO/IEC 21000-23 Smart Contracts for Media.

Timeline

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## **Music authoring tools**

Widespread adoption of interactive music services and applications (remixing, karaoke and collaborative music creation) - thanks to IM AF (ISO/IEC 23000-12) aka STEMS - raises the issue of intellectual property (IP) rights monitoring in such applications, for fair and transparent payment of royalties to artists and rights holders. The MVCO (ISO/IEC 21000-19) facilitates rights tracking for such services by capturing user roles and their permissible actions on a particular IP asset. While the AVCO (ISO/IEC 21000-19/AMD1) facilitates transparent IP rights management even when reuse of audio IP assets is involved, such as, tracks or even segments of them in new derivative works.

This use case is related to IM AF (ISO/IEC 23000-12).

## **Broadcasting operations**

The MCO (ISO/IEC 21000-21) provides the means to express the rights for exploiting media content, as it is typical among audio-visual production companies and broadcasters. In such a context, the most commonly used rights for media exploitation are public performance (e.g., where the public is present), fixation (e.g., when a performance is recorded on a tangible medium) and communication to the public (e.g., where the public is reached by means of a communication technology). As in narrative contracts, these exploitation rights might be associated with a wide set of conditions (e.g., number of broadcast transmissions, time periods, territories, languages, exclusivity, royalty percentages), modalities (e.g., linear/broadcast and non-linear/broadband) and access policies (e.g., free of charge, subscription, pay per view).

This use case related to CMAF/DASH & CMAF/MMT.

# Exploration – Decentralised Music Rights Ecosystem

Conduct exploration activities on, e.g., technologies, architecture, and APIs towards a Decentralised Media Rights Ecosystem:

* Smart contracts and DLTs
* Rights metadata management
* Content and creator IDs
  + Content IDs: [MPEG-21 DII](https://www.iso.org/standard/35367.html) [ISCC](https://iscc.codes/) [DIDs](https://www.w3.org/TR/did-core/) [NFTs](https://eips.ethereum.org/EIPS/eip-721)
  + Creator IDs: [Creative Passport](https://www.creativepassport.net/) [OpenID Connect](https://openid.net/connect/) [Self-Sovereign ID](https://en.wikipedia.org/wiki/Self-sovereign_identity) [ISNI](https://isni.org/page/linked-data/) [NFTs](https://eips.ethereum.org/EIPS/eip-721)
* File formats and streaming protocols

## Architecture

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**Figure 1: Decentralised Media Rights Ecosystem: Architecture**

## Smart contracts and DLTs

See ISO/IEC 21000-23 Smart Contracts for Media

## Rights metadata management

See [M59256](https://dms.mpeg.expert/doc_end_user/current_document.php?id=82257&id_meeting=190)

## Content and creator IDs

### International Standard Name Identifier (ISNI)

* **What is ISNI?**

ISNI is the [International Standard Name Identifier](https://isni.org/page/linked-data/), ISO standard 27729, in use by numerous libraries, publishers, databases, and rights management organizations around the world. It is used to uniquely identify persons and organizations involved in creative activities, as well as public personas of both, such as pseudonyms, stage names, record labels or publishing imprints. As an open standard, ISNI is not a proprietary "walled garden" - it is diffused widely on the open web, and is a critical component in Linked Data and Semantic Web applications.

* **Interacting with the ISNI database**

Several mechanisms are available for interacting with the ISNI database, including manual interaction, batch processing and real-time API requests and responses.

Two main APIs are currently deployed: an “[SRU Search](https://isni.oclc.org:2443/isni/docs/ISNI%20SRU%20search%20API%20guidelines.pdf)” API and an “[AtomPub Assignment Request](https://isni.oclc.org:2443/isni/docs/isni-atom-pub-api-guidelines.pdf)” API. Both are extensively documented in the Technical Documentation section of the ISNI website.

* **Data formats supported**

ISNI supports a number of data formats, both for submission to the database and for outputs from the system. For data input operations, primarily related to searches, to matching between source databases and ISNI, and to ISNI assignment requests, ISNI-XML is the preferred format. It is also possible to submit tab-delimited CSV information for batch assignment requests and matching.

For data output from the ISNI system, ISNI-XML is again the preferred and richest format available. Additionally, as a product of ISNI’s work on Linked Data , it is also possible to access a subset of the data available in either RDF/XML or JSON-LD formats.

* **Joining ISNI**

ISNI is a collaborative venture, supported by a wide range of companies, institutions and organizations. Two membership options exist – ISNI Members and ISNI Registration Agencies. ISNI Members have full access to the ISNI database and the tools or facilities that surround it, including batch and API options for search and ISNI assignment. Some ISNI Members may also be interested in consulting the ISNI database as a reference resource rather than actively contributing information to populate it. ISNI membership is on an annual subscription basis, with a tiered fee structure based broadly on the size or revenues of the organization concerned.

### International Standard Content Code (ISCC)

See [M59272](https://dms.mpeg.expert/doc_end_user/current_document.php?id=82273&id_meeting=190)

## File formats and streaming protocols

*Mixrights* is an on-line Javascript application based on IM AF (ISO/IEC 23000-12). It works entirely in the browser and operates much like a typical desktop document-editing application. The user can load IM AF files by simply dropping them on the browser window. Then, she can remove tracks, add new tracks by dropping audio files on the browser, add images and lyrics in the same way, or edit mix presets by playing the sequence and recording fader movements. Furthermore, *Mixrights* users can share their musical creations by uploading them to the server and sharing the links. Users can create new mixes of existing songs and instantly share them. *Mixrights* also keeps a count of the number of times a mix has been played. Mixrights software can be used for seamless integration with MPEG-21 IPR ontologies based smart contracts for rights tracking towards fair payment of royalties.

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**Figure 2:***Mixrights* application based on IM AF (ISO/IEC 23000-12).

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