



Request for Information on Audio Fingerprinting Technologies

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Issue Date: 17 July 2001

1 Introduction

The Recording Industry Association of America (RIAA) and the International Federation of the Phonographic Industry (IFPI), the trade associations representing the world's record labels, hereby ask for information about technologies that can identify music based on its content. Commonly known as “audio fingerprinting” these new technologies could play a significant role in the legitimate distribution and protection of audio content in the digital environment.

Fingerprinting, or content-based identification, technologies have been discussed in the technology community for many years. They work by extracting characteristics of a piece of audio content and storing them in a database. When the technology is presented with an unidentified piece of audio content, characteristics of that piece are calculated and matched against those stored in the database.

This Request for Information (RfI) asks for information about such fingerprinting technologies, about their suitability for use in a variety of application scenarios and about the availability of such technologies.

Submissions of information in response to this RfI regarding audio fingerprinting technologies are due by 31 July 2001.

2 Logistics

Responses to this RfI should be sent by 23:59 GMT on 31 July 2001 to Richard Gooch of IFPI and Carlos Garza of RIAA. Responses are preferred electronically in Microsoft Word 2000 (doc), Adobe Portable Document Format (pdf) or HTML formats.

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The recording industry intends this RfI to initiate a technology documentation process that will enable proponents to make known the capabilities for their technologies. Responses to the RfI will form the first stage of the technology documentation process. It is expected that some proponents may, at a later stage, be invited to present their technology for further analysis. Such technology presentations would take place in Europe and North America in late August/early September. Further details of the planned process and guidelines for proponents are presented in section 5.

For press inquiries please use the contacts given in Section 6.4.

3 Reference Architecture

A reference architecture has been developed to illustrate the potential functionality of the core technology of fingerprinting. Two distinct aspects are shown in Figure 1:

- 1 *Populating the database* (top of Figure 1): A series of sound recordings are presented to a fingerprint generator. This generator processes audio signals in order to generate fingerprints derived uniquely from the characteristics of each sound recording. The fingerprint that is derived from each sound recording is then stored in a database and may be associated with an identifier or other metadata for that particular sound recording.
- 2 *Content Identification* (bottom of Figure 1): Audio, in either streaming or file format, is presented to the input of a fingerprint generator. The generator function processes the audio signal to produce a fingerprint. This fingerprint is then used to query the database. If a match is found, the resulting Track ID is retrieved from the database. A confidence level or proximity associated with each match may also be given.

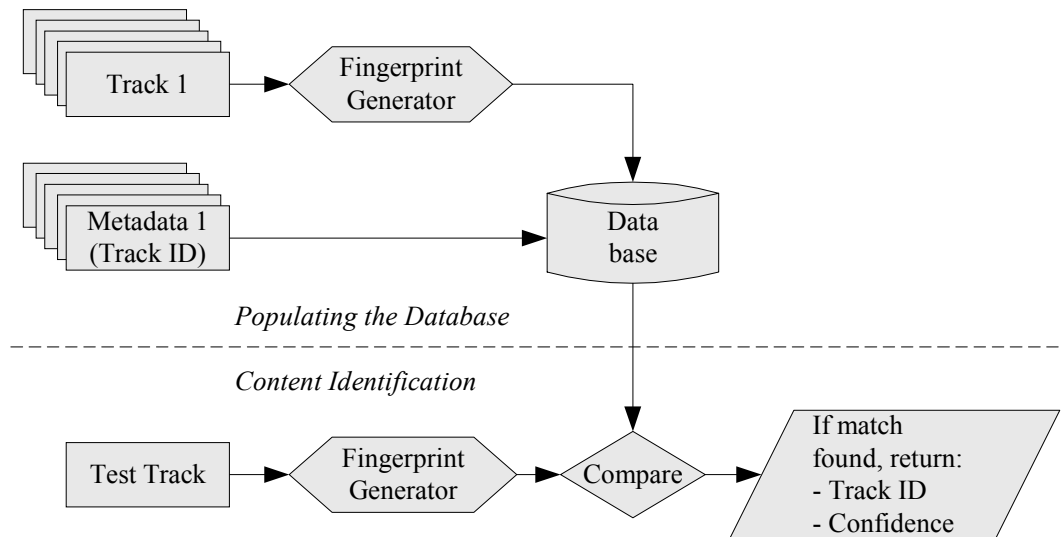


Figure 1 – Reference Architecture

The reference architecture of Figure 1 addresses specifically the *core technologies* of fingerprinting. This aspect is distinct from *applications* of fingerprinting, which are separately addressed in section 4. Please note that proposals that do not to use the reference architecture shown above are also invited by this RfI. However, where a relevant technology is implemented differently, proponents should explain the reasons for any differing approach and provide their architectural model. Proposals offering component parts of the reference architecture are also sought.

4 Application Scenarios

Fingerprinting applications may have many important uses within the recording industry. Some potential applications are described in this section. The list of application scenarios below is not exhaustive and proponents are invited to describe additional potential uses of their technologies.

4.1 Audio Content Tracking and Reporting

Sound recordings are communicated over broadcast channels, cable and other networks such as the Internet. Rights holders, service providers and other stakeholders often seek to monitor the use of such sound recordings. Some of the many examples in this field include:

- 1 Reporting. Fingerprinting applications could track audio content played by broadcasters and webcasters to report usage. Royalties could then, where appropriate, be distributed to the correct rights holders. In such applications it may be advantageous if the technology could distinguish between different versions of a song;
- 2 Compiling Charts. Airplay/netplay monitoring for automated charts compilation in unicast and multicast scenarios.

4.2 Internet Audio Content Services

The Internet has brought new opportunities for distributing audio content to consumers. Distributors may need assistance in ensuring that only audio content authorised for distribution is transmitted. In such an environment, fingerprinting technologies may be usable to identify which tracks are authorised and could be applied in a number of ways.

4.3 Anti-Piracy Investigation and Enforcement

Anti-piracy investigators often need to analyze unlabelled or mislabeled CDs to determine the identity of recordings on the CD, or to identify unlabeled or mislabeled files on the internet. Fingerprinting technologies may help to automatically identify such works. Typical anti-piracy applications would include:

- 1 Verifying that a suspected infringing recording is in fact the same as a recording whose ownership is known;
- 2 Repertoire analysis, e.g., identifying unidentified audio content recovered from CD plants and distributors in anti-piracy investigations;
- 3 Screening of master recordings at CD manufacturing plants; and,
- 4 Identification of sound recordings for Internet anti-piracy applications.

The requirements of such applications, particularly with respect to accuracy and confidence, will vary depending the mode of use (e.g., investigation, forensic evidence, etc.)

4.4 Value Added Services

Content-related services that identify a sound recording can use such identification to offer additional services such as:

- 1 Providing informational metadata about the track, e.g., artist name, track title, lyrics, etc. (e.g., by sending a fingerprint to an on-line audio content metadata resolution service);
- 2 Integration with on-line purchase services (“click-to-buy”); and
- 3 Offering special promotions and other incentives to consumers playing certain recordings.

5 Technology Documentation Process

The primary goal of this RfI is to provide proponents the opportunity to make known the capabilities and applications of their technology. Two phases of the study are envisaged:

- 1 Analysis and documentation of responses to this RfI; and,
- 2 Follow-up discussion and presentation.

5.1 Phase 1 – Analysis of RfI Responses

In direct response to this RfI, technology proponents are requested to provide their initial documentary submission by the deadline specified in Section 2. Proponents are asked to provide information such as:

- 1 A functional description of their technology;
- 2 A description of the capabilities or their technologies;
- 3 An indication of application scenarios which are addressed by proponent’s technology;
- 4 An indication of application scenarios which are not addressed by proponent’s technology;
- 5 An indication of complementary technologies which are needed to build a complete system and the description of such a system (if applicable);
- 6 An indication of how the proponent’s technology can be optimally evaluated and tested;
- 7 A technology roadmap, including planned or potential evolution of the core technology or its capabilities;
- 8 A product roadmap, including:
 - (a) Information on the availability of Software Development Kits;
 - (b) Information about proponents and third parties’ intellectual property on proposed technologies;
 - (c) Outline of general commercial terms and conditions. This would be used to provide a framework for understanding proponent’s commercial considerations including licensing conditions. ***This should not include specific commercial information such as pricing;***
- 9 Information about intellectual property related to the technology. This includes intellectual property held either by proponents or third parties and which is needed to implement the applications and/or services using the proposed technology;

- 10 Information about known or prospective methods of circumventing the technology;
- 11 Information about intellectual property held by proponents and which is needed to implement circumventions and thus may be used to provide a legal defense against third party development of circumvention devices;
- 12 Company information as to size, maturity, management, stability, etc. and
- 13 Any other information that the proponent believes to be important.

This first phase will be conducted by examining and documenting the direct responses to this RfI. Proponents are encouraged to submit a comprehensive description of their technology for this documentation phase.

5.2 Phase 2 – Discussion, Demonstration and Testing

Following the analysis of proponent responses to this RfI, it is anticipated that further information will be sought where necessary. Depending on the nature of information sought this second phase may comprise one or more of:

- 1 Clarification of information in correspondence or face to face discussion;
- 2 Presentation and demonstration of the technology; and
- 3 Invitation to participate in interactive demonstration and testing of the capabilities of the technology.

This phase is intended to substantiate, verify, and further develop the findings of the aforementioned analysis. In cases where proponents are asked to further present or demonstrate their proposal, a request including further guidelines will be issued to them at an appropriate time. This phase is expected to take place between August and October of 2001.

6 Miscellaneous

6.1 No Obligations

RIAA and IFPI reserve the right to cancel this RfI at any time for any reason, to select none, one, many or all responses for further analysis.

6.2 Non-Discrimination Policy

RIAA and IFPI will neither recommend nor approve any specific company's technology to their member companies. RIAA and IFPI do not intend to sanction specific business models or technologies. Analysis conducted in conjunction with this RfI indicates in no way RIAA's or IFPI's preference for any technology or proponent over another competing technology or proponent.

Should either RIAA or IFPI (or both) consider adopting one or more of these technologies for their own purposes, they will conduct separate evaluations which may rely on the information gathered in response to this RfI.

6.3 IP Considerations

This RfI solicits detailed information including information about intellectual property of proponents. RIAA and IFPI will, if requested by a proponent, protect such information by means of a Non-Disclosure Agreement in the terms set out in Annex A.

It is anticipated that RIAA and IFPI's understanding of the capabilities of proponent technologies will be communicated to RIAA's and IFPI's member companies in a report. However, proponents will be given the opportunity to review the documentation of *their individual technologies* so as to obtain comments on whether the proponent believes that no material fact has been overlooked or presented incorrectly prior to the release of the report.

6.4 Press Inquiries

Any press inquiries should be addressed to:

Adrian Strain IFPI Secretariat 54 Regent Street London W1R 5PJ UK Tel. +44 (0)20 7878 7939 Fax. +44 (0)20 7878 7950 Email: adrian.strain@ifpi.org	Jano Cabrera RIAA, Suite 300 1330 Connecticut Avenue, NW Washington, DC 20036 USA Tel. +1 202-857-9650 Fax. +1 202-775-7253 Email: jcabrera@riaa.com
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Appendix A – Non Disclosure Agreement

THIS AGREEMENT is made this _____ day of _____ 2001.

BETWEEN:

- 1 RIAA of 1330 Connecticut Avenue NW, Washington DC (“RIAA”);
- 2 IFPI Secretariat of 54 Regent Street, London W1B 5RE (“IFPI”); and
- 3 _____

A.1 Disclosure

1. Each party finds it beneficial to disclose to the other party certain information for the purpose of the evaluation, possible testing, and reporting to record companies of methods for identifying audio tracks from their content (commonly known as “audio fingerprinting”) (hereinafter “the Purpose”).

2. Such disclosures may include, but are not limited to, business plans and technology, techniques, operations, programs, facilities, computer terminals, systems design, communications networks, finances, product development plans, business directors, marketing plans, input codes, data arrangement, production schedules, and introduction dates, customer names and lists, and other technical or business information (hereinafter “Information”).

3. Such Information may be conveyed orally or in writing, or in an encoded, graphic or other form. Where, either at the time of disclosure or any time subsequent to disclosure, the disclosing party indicates that the Information (or any part thereof) comprises confidential or proprietary information (“Confidential Information”) that Confidential Information together with any notes, records or documentation regarding the Confidential Information shall be:

- a) marked “confidential” or shall bear a similar marking; and
- b) subject to restricted use as provided herein.

In addition, Confidential Information that is disclosed orally will have its status as Confidential Information confirmed in writing by the parties within seven (7) days of such disclosure.

A.2 Restricted Use

With respect to Confidential Information provided under this Agreement, the party to whom Confidential Information is disclosed shall:

1. Hold Confidential Information in confidence and not disclose it to any third party save with the express consent of the disclosing party, and shall use its best efforts to protect Confidential Information in accordance with the same degree of care with which it protects its own Confidential Information;
2. Advise its employees of their obligations of trust and confidence with respect to Confidential Information, and disclose Confidential Information only to its employees who need access to the same for the Purpose;
3. Not use Confidential Information for any purpose whatsoever other than strictly for the Purpose;
4. Not make any copies of any Confidential Information except strictly for the Purpose and to the extent necessary for the Purpose;
5. Not use, reproduce, translate or store any Confidential Information in a computer system that is externally accessible and to store all Confidential Information in separate computer files from its own information;

Such obligations on each party shall continue for a period of three (3) years after completion of the Purpose.

A.3 Exceptions

The party to whom such Information is disclosed shall have no obligation to preserve the confidential/proprietary nature of the Information, if that party can show by documentary evidence that the Information:

1. Is, on or after the date of this Agreement in the public domain otherwise than by reason of any breach of this Agreement by any party; or
2. Was within the recipient's possession before the date of this Agreement and free from any restriction imposed by the party disclosing the Information; or
3. Was disclosed following the date of this Agreement and free from any restrictions on disclosure and use by an independent third party.

A.4 Return of Information

Any party, upon request of another party, shall promptly return all Confidential Information, including all copies made thereof.

A.5 General

The parties acknowledge that:

1. Except where strictly necessary for the Purpose and expressly agreed to by the parties the party to whom such Information is disclosed shall not acquire any right or title in the Confidential Information;
2. Nothing in this Agreement places any obligation on any party to disclose any Information;
3. No delay by any party to exercise any right or remedy available under or in connection with this Agreement shall prevent the later exercise of such right or remedy.
4. This Agreement is not assignable by any party;
5. If a party to whom such Information is disclosed breaches this Agreement it shall forthwith notify the other parties in writing giving all available details and make all steps at its own cost to minimise the loss which the disclosing party may otherwise suffer as a result of such breach;

A.6 Jurisdiction

This Agreement shall be governed and construed in accordance with US law and the parties hereto submit to the exclusive jurisdiction of the US Courts.

EXECUTED by the parties or their duly authorised representatives:

For and on behalf of RIAA

For and on behalf of IFPI

Signature: _____

Signature: _____

Name: _____

Name: _____

Position: _____

Position: _____

Date: _____

Date: _____

For and on behalf of _____

Signature: _____

Name: _____

Position: _____

Date: _____