

# Digital Media Device Association

## Call for Proposals for an Interoperability Solution for Digital Media Devices

IWG	<b>DMDA</b>	FINAL
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### **1 The Digital Media Device Association (DMDA)**

The Digital Media Device Association was organized to promote the acceptance and implementation of technology and applications for portable and 'connected' digital devices, and to foster the development of a technology base that promotes a competitive marketplace for such devices.

The DMDA Interoperability Working Group (DMDA-IWG) is an effort to develop or adopt one or more specifications for the lawful consumption and exchange of music in digital form on portable and networked audio devices, to encourage competition and allow customers freedom of choice. To facilitate rapid development of specifications and their adoption by industry, the DMDA-IWG encourages that DMDA specifications be based on open standards.

#### **1.1 Antitrust Statement on the Digital Media Device Association**

Two points of antitrust law govern the DMDA process:

First, many of the companies participating in this process are competitors of other participants. DMDA is not intended to be, and cannot take the form of, an agreement that limits competition.

Second, the antitrust laws permit, indeed under appropriate circumstances encourage, the creation of neutral standards that benefit the affected industry and consumers.

The end result of the process will be a standard, not an agreement. Each participating company will decide whether and the extent to which it incorporates the DMDA standard in its designs.

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## 2 Definitions

### 2.1 Content

Content is defined as digital audio music and sound.

### 2.2 Open Content

Content without rules regarding usage.

### 2.3 Rights-managed Content

Content with rules regarding the usage of the content (“Content Usage Rules”), such as “play only once”, “do not play after 30 days”, or “no copies”.

### 2.4 Content Information

Content information is defined as any and all of the following kinds of information related to Content:

1. Meta-data such as ID3 tags in an MP3 file.
2. File data, such as headers.
3. CODEC data, such as bitrate, sample depth, etc.
4. License data that may accompany the Content.

### 2.5 Collection

A Collection is some definition that specifies a group of Content including pointers to where the Content is located. Collections may contain other collections.

### 2.6 DMDA Device

A DMDA Device (“device”) is any product or combination of products (system) that can access, store and/or render Content according to the Specification. (e.g.: PC with DMDA software, a 1394 hard drive with DMDA firmware, a portable player attached via USB to a PC running DMDA software, a portable player with a DMDA metadata file, an Internet radio connected via 100bT discovering stations and songs via DMDA requests.)

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### 3 Rationale and Scope

#### 3.1 Motivation

Interoperability of devices means more choices for consumers and increased competition in the marketplace. Interoperability is also necessary to fulfill consumers' expectation of being able to play their music "anywhere and anytime". An interoperability standard is also a prerequisite for other standards, such as content management and delivery services, if such standards are ever going to gain mass acceptance.

#### 3.2 What is covered in the call

This document is a call for proposals (CfP) for a technology solution that will enable digital media devices to interoperate (herein referred to as "Solution").

This CfP provides those functional requirements for interoperable devices that the Solution will enable. The manufacturer will generally decide which features a device actually supports.

Interoperability includes:

- remote discovery and control of devices
- search, locate, and manage content on remote devices
- exchanging files and content meta-data

The scope of this CfP is audio Content and associated Content Information. Solutions that also handle or can be extended to handle other content (video, still pictures, etc.) will be addressed in future calls, but will be considered by this call. See Section 4.5 "Evaluation Criteria".

DMDA will create one or more specifications ("Specification") based on one or more technologies selected as a result of this CfP.

#### 3.3 General Terms and Rules

Intellectual Property Rights: IPR in the responses to this CfP shall be governed as defined in Section 8 "Intellectual Property" in the most current Terms of Participation of the DMDA Interoperability Working Group.

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Terms of Participation: All participants in the DMDA Interoperability Working Group (DMDA-IWG) and each proponent are expected to sign the DMDA-IWG Terms of Participation (available for review on the DMDA web site). Proponents do not need to be DMDA-IWG members to respond to this Call, but if their technology is selected, they will be required to join the DMDA-IWG to complete the Specification and associated compliance software and documents.

Royalties and Fees: All Solutions must be licensable on a fair and non-discriminatory basis.

Copyright: Publication of any Specification resulting from selection of a Solution shall be the responsibility of DMDA. Proponent will provide any license to DMDA necessary for publishing the Specification(s).

Maintenance: Maintenance of the Specification and associated software shall be the responsibility of DMDA.

Trademark: If a Trademark is associated with proponent's technology, the owner will license its use by DMDA and allow DMDA to sublicense the trademark. If DMDA creates a Trademark that is associated with the Specification, said Trademark will be owned and administered by DMDA.

Compliance: After the Specification is final there will be a follow-up specification for determining compliance of products to this specification. Proponents whose technology is selected for the interoperability Specification must agree to provide tools (software test beds, simulators, and associated documentation, etc.) for verifying compliance.

Severability: Proponents can respond to one or any number of requirements defined by the numbered items in section 5.2. If a proponent does not provide a complete Solution, said proponent may be asked to work with other proponents to create a complete Solution. If DMDA decides to accept only part of a proponent's technology, the proponent may be asked to submit only that part in order to be selected.

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### 4 Process for the Call

The goal of DMDA-IWG is to produce the Specification based on existing technology (or technologies), or new technologies that can be quickly deployed. To meet this goal, the Specification is to be completed and available by April 30, 2003.

#### 4.1 Timeline

Proponent Registration: no later than December 9, 2002

Submissions: no later than 23:59 hrs Pacific Standard Time January 27, 2003

Presentations: Feb 6 and 7 IWG meeting

Initial evaluations and eliminations: Feb 20 and 21 meeting

Follow-up presentations: March 6 and 7 IWG meeting

Second round of evaluations: March 20 and 21 IWG meeting

Selection: April 10 and 11 IWG meeting

Specification released: April 30, 2003

Compliance materials: October 31, 2003

*[Note: If integration or refinement is needed, it will occur in April and May, the Final Selection will occur in June, the Specification will be released June 30, 2003, and the Compliance materials will be due December 31, 2003.]*

#### 4.2 Registration

Proponents must register their intentions via email to [CfP@dmda.org](mailto:CfP@dmda.org), stating

1. Proponent Name and Contact Info
2. Overview of the proposed Solution stating:
  - a. Goals of the CfP met by Solution
  - b. Checklist of features supported
  - c. State of proposal (e.g. theoretical study or working implementation)
  - d. Ownership (e.g. proprietary or organization standard)

Industry Associations can submit Liaison statements.

Based on the number of registrations received, DMDA-IWG may modify the schedule described above.

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### 4.3 Submissions

Proponents will submit:

1. A document with sufficient technical detail to permit experts in the DMDA-IWG to evaluate the proposed Solution
2. Specific resource requirements (applicable to specific products)
3. Proposed licensing terms
  - a. Pricing
  - b. Licensing Authority
  - c. Usage restrictions
  - d. Representations and warranties

All submissions will be posted on the restricted DMDA website for review by DMDA-IWG.

### 4.4 Presentations and Demonstrations

Each proponent will be given one hour at the DMDA-IWG meeting of Feb 6-7 (location to be determined) to walk through their proposal and, if possible, present a working demonstration. Proponent must be prepared to answer detailed technical questions.

### 4.5 Evaluation Criteria

Participants in the DMDA Interoperability Working Group are experts and will set their own priorities when it comes to evaluating technologies. However, Solutions that will be given preference (not in any specific order) include:

- Solutions supporting audio and visual (image or video) rather than audio only.
- Solutions that are based on, or built upon, open standards.
- Solutions free of royalties and licensing fees (other than optional maintenance fees).
- Solutions that meet the full requirements of the CfP vs. those that offer only partial solutions.
- Solutions that are demonstrable (e.g. working products), especially on multiple platforms.
- Solutions supporting Content Usage Rules interoperability for a baseline set of usage rules.
- Solutions with lower resource requirements.
- Solutions that are scalable in resource requirements and functionality.
- Solutions that are easily expandable for future functionality.

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### **4.6 Verification**

After initial eliminations and prior to final selection, remaining proponents may be required to (1) provide independent verification of the functionality and performance of the proponent's Solution, and/or (2) submit the Solution to DMDA-IWG for verification, and/or (3) provide evidence of self-verification.

### **4.7 Refinement/Integration**

DMDA-IWG may condition the selection of a proponent's Solution on the ability for said Solution (or parts thereof) to be merged with others. Proponents whose technology is selected as a part of the whole Solution must assist in the integration of their technology with other selected technologies.

If refinement/integration is required, the April date for Selection becomes the date for Initial Selection, refinement and integration will occur in April and May, and the Final Selection will occur in June.

### **4.8 Selection**

Selection will be made by simple majority of the Interoperability Working Group voting members eligible to vote at the selection meeting, for subsequent approval and adoption by the DMDA.

### **4.9 Compliance**

Proponents whose technology is selected will be required to attend DMDA-IWG meetings and collaborate with other DMDA-IWG members in the development and completion of a compliance specification and reference software that will allow implementers to verify that their implementations conform to the Specification. The compliance specification and reference software must be completed by October 31, 2003.

#### **4.9.1 Reference Software**

Proponents must make available fully functional reference software. Such software may be dependent on software implementations of other standards, in which case Proponents need only provide the components unique to the DMDA Solution. Reference software must be ANSI C++, but need not be optimized, and need not be for any specific platform.

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### 5 Requirements

#### 5.1 Types of Devices

Interoperability is desired among a wide variety of devices, from portable players to home gateways, which differ greatly in available memory and power requirements.

Requirement: Solutions must have resource usage appropriate to the devices for which they are intended. In particular, Solutions must be capable of operating on devices similar to today's low-cost, battery-powered portable devices with limited memory and bandwidth.

#### 5.2 Physical Interface

In order to allow for product differentiation and other design considerations, the Solution must work with a variety of devices that may have different physical interfaces.

Requirement: Solution must not be dependent on any particular physical interface. Devices connected via the same physical interface or through a bridge or similar interface adapter must be able to communicate as per Section 5.1.

#### 5.3 Content Coding Algorithms (CODECs)

In order to allow for product differentiation and other design considerations, specification or interoperability of CODECs is not addressed by this specification.

Requirement: The Solution must be CODEC agnostic. Devices must report supported Content coding algorithms as defined in Section 5.5.1.

#### 5.4 Communications Protocol

There must be a standard method for devices to discover and communicate with each other.

Requirement: Solution must include a protocol that includes an extensible command set enabling enumeration, configuration, and remote operation. At minimum the command set must enable the operations listed below, as well as other operations necessary to fulfill various requirements in this Section 5.0:



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1. Get {Device Capabilities, Bookmark, ... }
2. Set {Bookmark, Volume, Mute, EQ { }, ... }
3. Play Control {Start, Stop, Play, Record, Pause, Fwd, Rew, Next { }, Previous { }, ... }
4. Copy {file, folder, playlist, ... }
5. Move {file, folder, playlist, ... }
6. Erase {file, folder, playlist, ... }
7. Create {file, folder, playlist, ... }
8. Rename {file, folder, playlist, ... }
9. Edit Alphanumeric Data
10. Random Play
11. Power on/off
12. Source select { }
13. Find { }
14. Other commands needed to meet other requirements in this Section 5.0

### 5.5 Communicated Information

#### 5.5.1 Device Capabilities

Requirement: The Solution must enable devices to report the following capabilities:

- 1) Content coding algorithms, number of channels and sampling rates supported
- 2) Content file formats supported
- 3) Streaming and downloading support
- 4) Available and maximum storage capacity
- 5) Storage removability
- 6) Content Usage Rules that are supported (if any)
- 7) Device Identifier (if any)
- 8) Other necessary information required for inter-device communication

#### 5.5.2 Content Sharing

Users must be able to designate certain Content and Collections (which may be less than the entire set stored or accessible to a particular device) as available for sharing.

Requirement: The Solution shall enable a device to enumerate that Content which has been made sharable, along with the associated Content Information defined in Section 5.5.3.

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Requirement: The Solution shall enable a device to provide access to user-specified shared Content and/or Collection(s), except where such sharing may not be allowed (as in some Rights-managed Content).

Requirement: The Solution must support a means for establishing user-specified access limitations on shareable Content.

### 5.5.3 Content Information

Requirement: The Solution shall enable the communication of sufficient information about available Content for a device to determine whether it is able to render the Content, and enable users to identify and manage the Content. The Solution must support at least the following data for each piece of Content:

- 1) song title
- 2) album title
- 3) track number from the album
- 4) artist name(s)
- 5) genre
- 6) year
- 7) file type, codec type, sample rate, sample word length, channels per sample
- 8) file size / duration
- 9) license info

Requirement: The Solution must allow for full and selective sharing of Content Information.

## 5.6 Content Organization and Management

### 5.6.1 Collections

Content delivered on physical media today is often identified by users as being associated with the media, such as songs from a particular album that are in a specific sequence. Users have come to identify and associate such Content as being part of a Collection, and this identification will continue to be important for locating Content that is no longer physically in the original Collection form. The persistence of original Collection information is valuable.

A playlist is a Collection that has been assembled for playback in a specific sequence. Collections can also be assembled for other reasons, such as all songs from artist XYZ (possibly in alphabetical or some other order) or all songs residing in a specific location.

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Collection information is a fundamental and valuable part of the consumer music experience. One objective of the Solution is to enable users to exchange unique and personalized Collection information -- especially playlists -- even if the content is not available.

Requirement: The Solution must enable Content to be persistently associated with at least one user-designated collection.

Requirement: The Solution must enable Content to be grouped into Collections by the user.

Requirement: The Solution must enable the exchange of sequenced and non-sequenced Collection Information with or without exchanging the Content.

### **5.6.2 Search, Navigation, and Selection**

Requirement: The Solution must define a format for Content indexing and custom Content navigation data (e.g. last song played).

### **5.6.3 Remote Content Management**

Requirement: The Solution must include functionality that enables remote management (e.g. creation and deletion) of Content and Content Information.

### **5.6.4 Audio books and other non-music content**

Devices that are designed to store and/or playback non-musical audio Content, such as audio books, must be accommodated. For example, with audio books it is desirable to begin listening at the last listening point. There are also unique attributes about content indexing and location that must be considered.

Requirement: The Solution must at minimum support sharing of the following navigation information: (1) last play point, and (2) bookmarks.

## **5.7 Content Usage Rules**

### **5.7.1 Open vs. Rights Managed Content**

Acknowledging the need for interoperability in the existing marketplace of Open Content, we envision a future where devices can interoperate and can store and play both open and Rights-managed Content. Interoperability of Open Content is a logical preliminary step to solving the more complex issue of Content Usage Rules interoperability. DMDA proposes to adopt a baseline set of Content Usage Rules that would be expressed in a future specification

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Requirement: The Solution does not need to solve the problem of Content Usage Rules interoperability now, but must be capable of this functionality, operating in a manner to be defined in a future specification.

### **5.7.2 Default Rules**

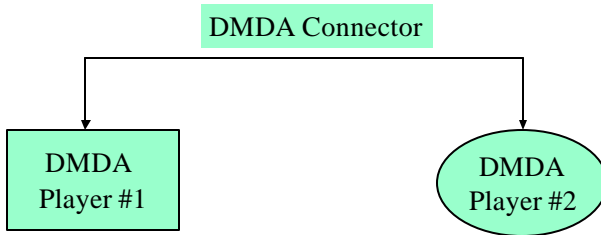
Requirement: In the absence of Content Usage Rules associated with content, the Solution must enable devices to implement default Content Usage Rules to be defined in a future DMDA specification.

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### 6 Use Case Examples & Diagrams

#### Example 1



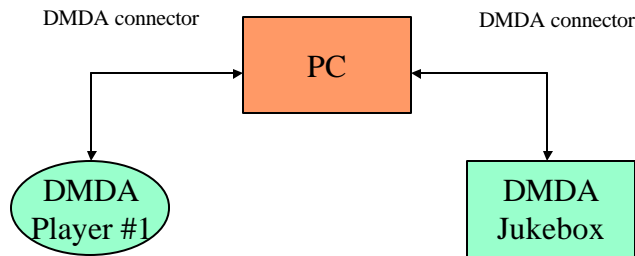
#### Example 2



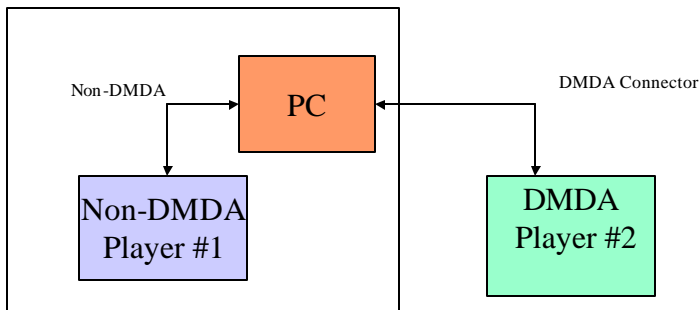
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### Example 3

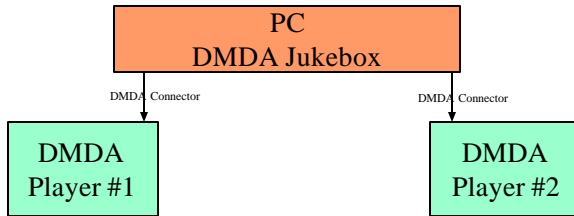


### Example 4

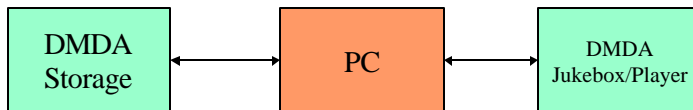


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Example 5

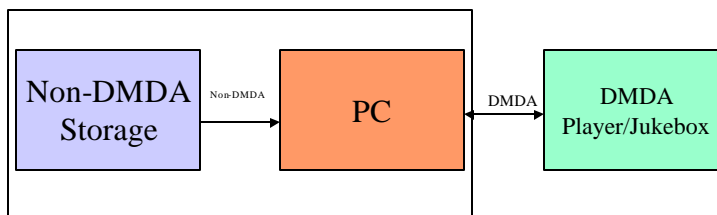


Example 6



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Example 7



Example 8

