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ISAN Implementation in Windows Media Technologies

Kevin J. Comerford
Microsoft Corporation

Michael A. Dolan
Chief Executive Officer, Television Broadcast Technology, Inc.

May 2006

Applies to:

Microsoft® Windows Media® Technologies

Microsoft Windows Media Encoder

Microsoft Windows Media Encoder Studio Edition Beta

Summary: Provides an overview of the International Standard Audiovisual Number (ISAN) system, with its use and implementation in Windows Media® technologies.

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Introduction: What Is ISAN?

An International Standard Audiovisual Number (ISAN) is a voluntary numbering system for the identification of audiovisual works. It provides a unique, internationally recognized and permanent reference number for each work and their derivatives. It identifies works throughout their entire life and is independent of any physical form in which the work exists or is distributed.

An ISAN is a 96-bit number comprised of three fields: a root, an episode or part, and an optional version. A root is assigned to a core work. Subsequent film parts or television episodes that relate to the root work can have the same root, but different "episode or part" component. Works (and their episodes or parts) that have different audio or subtitle tracks can have different versions. For example, the printed ISAN for an episode of "I Love Lucy" called "The Girls Want to Go to a Nightclub" is:

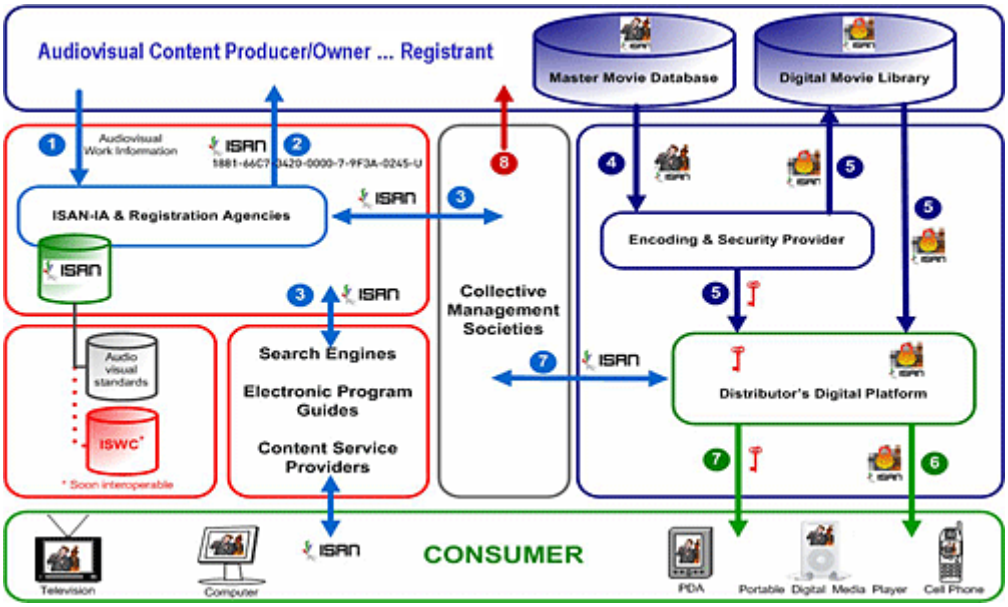
0000-0000-D07A-0090-Q-0000-0000-X

An ISAN is a centrally registered and permanently assigned number. The work it references is identified by a metadata set, which will be addressed later in this article. The central registry ensures that there are not duplicate assignments of ISANs with the same metadata set.

What Can an ISAN Do for the Media Industry?

An ISAN provides the foundation for electronic exchange of information about audiovisual works, such as motion picture films, television productions, Internet media, and games. It is the key identifier for commerce surrounding finished works. Applications include basic archive identification, rights management, royalty management, television program guide linking, and audience measurement. The ISO TC46 SC9 WG1 "V-ISAN FAQ" lists its potential for the following:

- Those interested in the licensing of audiovisual works and in the management of permissions and payments for use of these works such as the stakeholders/rights-holders including (but not limited to) producers, writers, directors, actors, composers;
- Parties involved in the administration of rights for audiovisual works, such as collecting societies to assist in the allocation of royalties;
- Those releasing or exhibiting different versions of works to an audience, such as television broadcasters;
- Those who manage databases about audiovisual works and/or rely on electronic exchange of data, such as television listing services;
- Those who track and report on the use of versions of audiovisual works such as audience measurement and ratings companies;
- Those managing the cataloguing and/or preservation of collections of audiovisual works, such as archivists;
- Organizations involved with engineering and encoding standards for the television, motion picture and broadcasting industries;
- Those who need to exchange accurate data about specific versions of audiovisual works such as parties involved in anti-piracy measures, customs officials and Interpol.



Who Uses ISAN?

An ISAN enables commerce for several industries, including feature films, digital cinema, program guide services, Internet content and gaming. The initial major use and adoption was from the digital cinema work of the major studios in the United States. (*Digital cinema* refers to the digital creation, distribution and projection of feature films in theaters.) To date, the Motion Picture Association (MPA) and its member studios have adopted ISAN and are in various states of deploying ISAN registered works.

Program guide services have been active in the development of ISAN and have expressed interest in being involved with ISAN management. Earlier this year, Secure Path and Microsoft announced plans to use and support ISAN in Windows Media®-encoded works.

What Is the ISAN International Agency?

The key to ISAN working for commerce between parties is a central registration database. The entity authorized by ISO (International Organization for Standardization) to perform this is the ISAN International Agency (ISAN-IA), located in Geneva, Switzerland. More information on ISAN-IA can be found at the ISAN Web site (http://www.isan.org).

ISAN-IA also authorizes a set of geographically distributed Registration Agencies (RAs). These RAs cover selected regions and markets (such as television in Canada). These RAs are the "front office" to the ISAN system and perform registration applications and support queries by users.

The currently approved RAs and their markets are:

- Agence Française ISAN (France)
- Aribsan (Spain & Latin America)
- ISAN Australasia (Australia and New Zealand)
- ISAN Berne (Switzerland and neighboring countries)

- ISAN RA Deutschland (Germany)
- Microsoft Studios (USA)
- Secure Path (USA)

RAs are currently being considered for the following regions:

- Austria
- Belgium
- Brazil
- Canada
- Hong Kong
- Iran
- North America
- Serbia & Montenegro
- Sweden
- The Netherlands
- United Kingdom

How Does ISAN Differ from Other Media Identifiers?

ISAN is for works with moving pictures, or parts directly related to works with moving pictures (such as a full audio track of a feature film). ISAN is for finished works and exchange between potentially unrelated commercial entities. It is not for print media, audio-only works, or unpublished production material. There are other related identifiers in use today in media, such as Advertising Digital Identifier (Ad-ID), International Standard Book Number (ISBN), International Standard Recording Code (ISRC) and Unique Material Identifier (UMID). These other identifiers, while all unique, do not have a public central registry and all the benefits that ISAN provides.

Ad-ID

The Advertising Digital Identifier (Ad-ID) is for all forms of advertising regardless of medium, and is the successor to the Industry Standard Coding Identification (ISCI), which is the broadcast television advertising system. It overlaps ISAN for some audiovisual works, but is constrained in practice to advertising works. An advertising work may have both an Ad-ID and an ISAN. For more information, please see the Ad-ID Web site (http://www.ad-id.org).

ISBN

The International Standard Book Number (ISBN) is used primarily for printed works, but its use has been extended in practice to be used as a universal product code for packaged products for retailers. Therefore, while a work will have an ISAN, its DVD packaging may also have an ISBN.

ISRC

The International Standard Recording Code (ISRC) is used primarily for sound recordings, such as CDs. However, it is also used for music videos, which are audiovisual works and also eligible for an ISAN. Because of this, a music video may have both an ISRC and also an ISAN.

UMID

A Unique Material Identifier (UMID) is primarily for production and post-production work in process and typically used within closely-related community. The final edited work would typically have a UMID assigned by the post-production workstation, so a published work may well have both a UMID and an ISAN, although the UMID would not be well-known.

What Is the ISAN Metadata Set?

A work that is associated with an ISAN is uniquely identified by its metadata set. The ISAN metadata set is registered and stored at an ISAN-IA. It is comprised of the following items, some of which are required.

- **Title:** The form that appears in the work.
- **Original languages:** The categories represented by ISO 639-2 language codes.
- **Alternate titles:** In the original language, if applicable.
- **Year of reference:** The year that appears in the work, where applicable.
- **Year of first publication or communication to the public.**
- **Full names of principal directors:** Includes surname and forename, if known and applicable.
- **Full names of principal cast members or participants:** Includes a minimum of three principal cast members, if applicable and available. Include surname and forename, if known and applicable. If necessary (for example, if the cast members can not be identified), the names of principal characters may be supplied in lieu of the names of principal cast members.
- **Other language versions:** If known, categories represented by ISO 639-2 language codes.
- **Titles of other language versions, if known.**
- **Title and ISAN of all component parts:** Included if it is a composite work.
- **Duration:** In minutes and/or seconds. Not required for non-linear (for example, interactive) audiovisual works.
- **Type:** For example, feature film, series, commercial, or recording of a live event. Uses the categories that are specified by the International ISAN-IA.
- **Live action or animation:** Indicates whether the work is animated or live action, or a combination of both.
- **Producer:** If applicable, the full name of the main producer.
- **Name of the main production company.**
- **Country (or countries) of reference:** The categories represented by ISO 3166 country codes, including whether they are the country of production or the location of shoot.
- **Full names of script writers:** The surname and forename, if known.
- **Supplementary information, as desired.**

For all episodes or parts different than the core (root) work, the following metadata can be included.

- **Title of entire serial audiovisual work:** The form that appears in the work.
- **ISAN root of episode of reference:** Normally, the ISAN root for the first episode registered.
- **Title of episode:** If applicable.
- **Number of episode:** If applicable.
- **Year of reference for episode:** The year which appears in the episode, if applicable.
- **Year of first publication or communication of episode to the public.**
- **Full names of principal directors of episode:** Includes the surname and forename, if known and applicable.
- **Full names of principal cast members or participants in episode:** Includes the surname and forename, if known and applicable.
- **Full names of script writers of episode:** Includes the surname and forename, if known and applicable.
- **Duration of episode:** In minutes and/or seconds.
- **Any supplementary information concerning the episode, as desired including content ratings.**

For all versions other than the initial root/episode version, the following metadata can be included.

- **Version Descriptive Name:** A free-text description of the version of the work, generally the name by which the version is known by the registrant.
- **Title:** Any title by which this version of the work is or has been known.
- **Spoken Language:** The ISO 639-2 language codes for the substantive audible words in the audio tracks.
- **Written Language:** The ISO 639-2 language codes for the written words that are added to a work to translate audible words into another language or the existing written words that appear on screen.
- **Description:** An XML document that contains up to three data elements drawn from a ISAN-registered schema that provide further clarification of the unique characteristics of this particular version.
- **XML Schema:** The name and location of the ISAN-registered XML schema used for the codified version description.

ISAN-IA and their registration agencies are working with industry partners to use the ISAN metadata framework to support dozens of major industrial and national content rating authorities, such as the Motion Picture Association of America (MPAA) Classification and Rating Administration (CARA) rating system for motion pictures and previews, the Entertainment Software Ratings Board (ESRB) rating system for games ratings, and the Recording Industry Association of America (RIAA) rating system for explicit content in music products.

For more information on the metadata in general, please see ISO 15706 and ISO 15706-2.

How Can the ISAN Be Encoded?

There are several standard ways in which an ISAN can be encoded. It can be printed, in binary form, included as XML or Uniform Resource Name (URN), as explained in the following examples. There are also other possible forms that are not covered in this article.

Printed Form

When an ISAN is printed, such as on paper or when being input or output to a computer system by a human, it takes the alphanumeric form as follows:

RRRR-RRRR-RRRR-EEEE-X-VVVV-VVVV-Y

Where:

- **RRRR-RRRR-RRRR** represents a registered root portion of ISAN, or the base ISAN number without episode or version codes.
- **EEEE** represents the episode or part.
- **VVVV-VVVV** represents the version portion.
- **X** and **Y** represent the check character for that ISAN, calculated in accordance with ISO 7064.

For more information on this encoding, see ISO 15706 and ISO 15706-2.

Binary Form

Some uses of ISAN simply encode it as a 96-bit binary number. When this is done, it is encoded left-to-right with respect to the printed form above. For more information, see ISO 15706 and ISO 15706-2.

XML Form

XML has become a common form in which to encode database fields. ISAN has a schema snippet that defines how it should be encoded in XML, as shown in the following example.

<ISAN root=”1881-66C7-3420” episode=”6541” version=”9F3A-0245” />

For more information, see ISO 15706 and 15706-2.

URN Form

The URN form is a special case of the printed form where "URN:ISAN:" is pre-pended, as shown in the following example.

URN:ISAN:0000-0000-D07A-0090-Q-0000-0000-X

ISAN is a registered Namespace Identifier (NID) with Internet Engineering Task Force (IETF) and Internet Assigned Numbers Authority (IANA). For more information, please see IETF RFC 4246.

How Is an ISAN Carried End-to-end in Television Distribution?

Having a number assigned that identifies some work is one thing. Attaching it to some instance of the work and keeping it attached to the work from contribution to the consumer is another. For works that are contributed in MPEG-2 transport streams, there is a way to encode it, defined by the International Organization for Standardization (ISO). There is also encoding defined by Society of Motion Pictures and Television Engineers (SMPTE) for facilities that use SMPTE 292 Serial Digital Interfaces. For communication between television station control devices, there are two related standards, one from Advanced Television Systems Committee (ATSC) and one from SMPTE.

ISO/MPEG

ISO has defined an international mechanism to carry ISAN in the MPEG-2 transport streams (such as ATSC, DVB and ARIB). This mechanism is documented in Amendment 4 to ISO/IEC 13818-1:2000, which also builds on Amendment 1. Amendment 1 defines a generic metadata descriptor, and Amendment 4 defines specific code points for carrying ISAN. The resulting descriptor is shown in the following table.

Syntax	Number of bits	Mnemonic

content_labeling descriptor () {
  descriptor_tag = 36
  descriptor_length = 12
  metadata_application_format = 0x0011
  content_reference_id_record_flag = 1b
  content_time_base_indicator = 0000b
  reserved = 111b
  content_reference_id_record_length = 8
  for(i=0; i<content_reference_id_record_length;i++)
  {
  content_reference_id_byte = (ISAN binary)
  }
}
	
	8
	8
	16
	1
	4
	3
	8
	
	8*8
		
		uimsbf
		uimsbf
		uimsbf
		bslbf
		uimsbf
		bslbf
		uimsbf
		
		bslbf

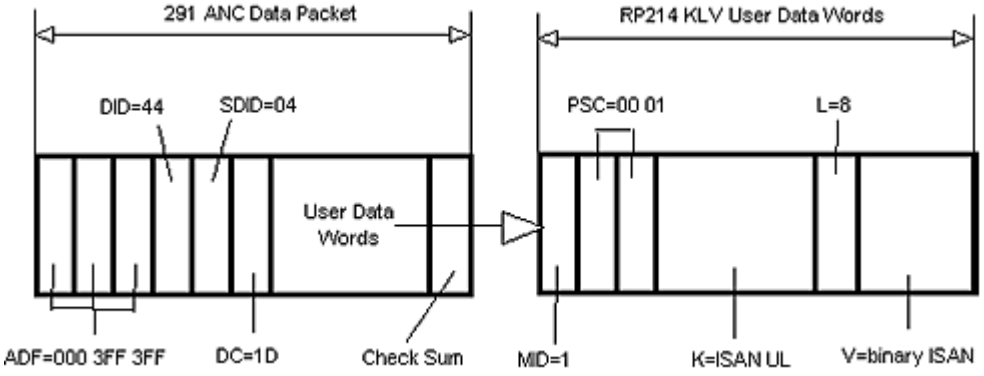
Note There are additional optional fields available. For more information, see ISO/IEC 13818-1:2000, and Amendments 1 and 4.

SMPTE/292/VANC

ISAN is an element in the SMPTE Metadata Dictionary, RP210, with the following assigned Universal Label (UL).

06.0E.2B.34.01.01.01.01.01.01.11.01.00.00.00.00.00

For more information, see SMPTE RP210. General encoding of dictionary items is defined in SMPTE 336, also known as *KLV encoding*. Any metadata dictionary element can be encoded in ancillary data space, according to SMPTE RP214 and S291M. This is encoded as follows:



Any 291 packet can be carried in the ancillary data space of HD SDI (SMPTE S292M).

ATSC/PMCP

For communication of ATSC-specific metadata between facility devices and, in particular to an ATSC PSIP generator, ISAN can be conveyed as a PMCP XML message, according to ATSC A/76. An example of an encoding is as follows:

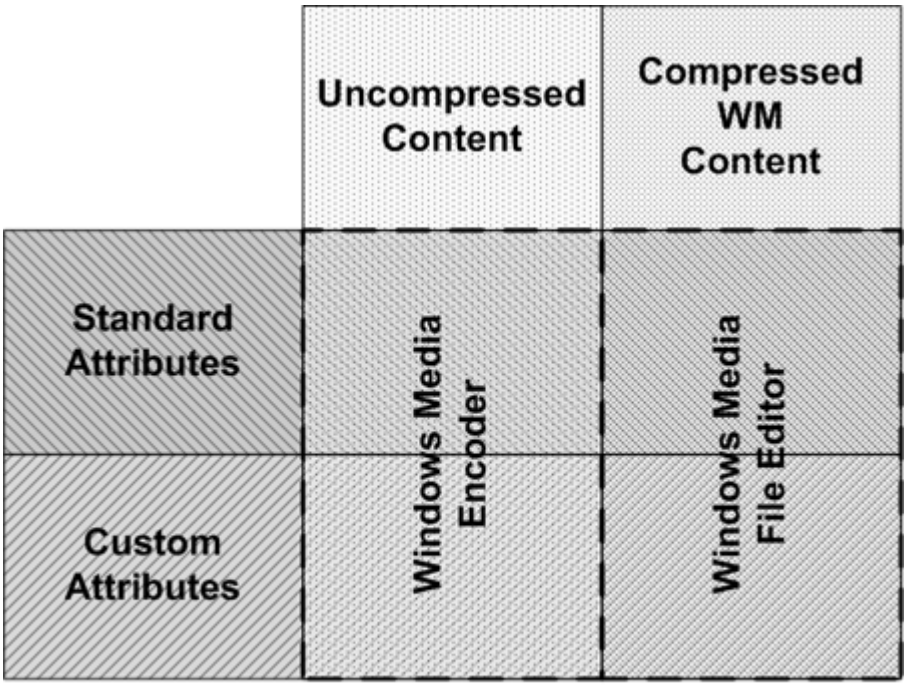
```
<?xml version="1.0" encoding="UTF-8"?>
<PmcpMessage xmlns="http://www.atsc.org/pmcp/2004/2.0" id="4294967295" origin="Traffic"
originType="Traffic" dateTime="2003-12-17T09:30:47-05:00">
   <Show action="update">
      <ContentId>
         <Isan root="2B1A-FF17-3E20" episodeOrPart="6541" check1="7" version="48CD-78B1"
check2="B"/>
      </ContentId>
      <ShowData>
         <Name lang="eng" action="update">I Love Lucy</Name>
      </ShowData>
   </Show>
</PmcpMessage>
```

For more information, see ATSC A/76. Watch for a related command and control message system from the SMPTE Technology Committee on Television Systems Technology, S22.

How Can ISAN Be Used with Windows Media Technologies?

At the 2006 National Association of Broadcasters (NAB) show, Microsoft announced a Beta version of a new tool called Microsoft® Windows Media® Encoder Studio Edition. It is a powerful tool for video professionals, optimized for the creation of high-quality offline encoding using Microsoft's implementation of the VC-1 video standard, called WMV9. It natively supports the inclusion of ISAN and Ad-ID metadata as standard attributes. This metadata can then be exposed throughout the value chain, from encoding, to content management, delivery, and playback (for instance, through Windows Media Player).

The following scenarios address some of the most common workflow and implementation issues encountered by new ISAN adopters. The first scenario is applicable to source content on videotape, live streaming content and digital content that is transcoded (that is, content encoded in formats other than Windows Media). The second scenario addresses adoption issues for existing repositories of Windows Media-based content. Each scenario demonstrates the most straightforward process for embedding ISAN metadata attributes using Windows Media Encoder 9 Series, a general purpose encoder that does not natively support ISAN or Ad-ID. Both can be easily adapted for use in live production and distribution environments. The diagram below shows the relationship between each type of content, metadata and the tools required for ISAN implementation in Windows Media-based content:

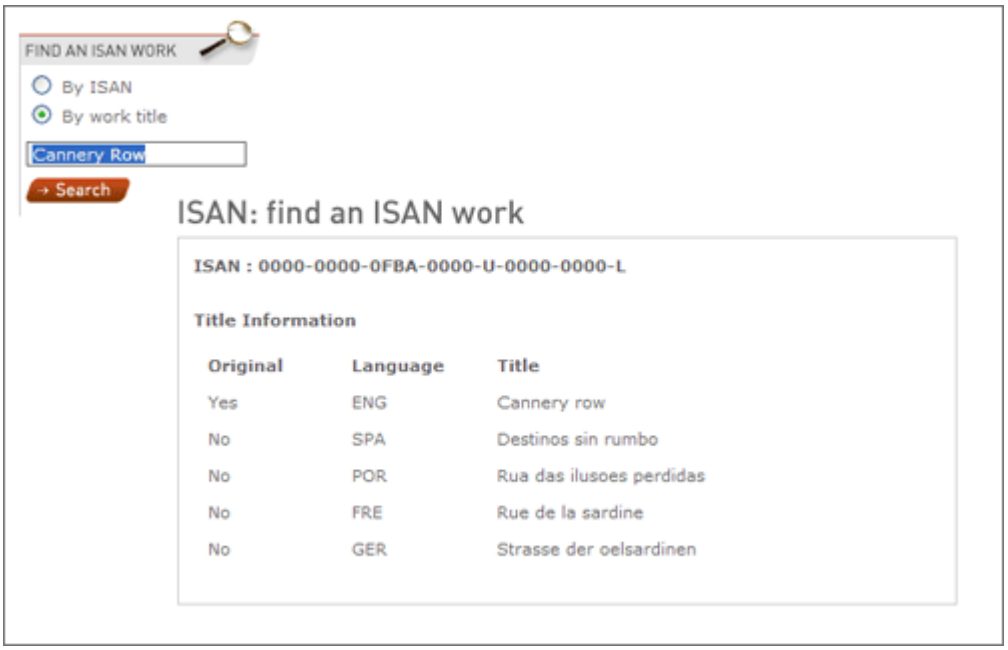


ISAN Implementation Options Matrix For Digital Media

The Windows Media format supports embedded metadata as either standard or customized attributes, both of which can be used for ISAN implementation. Standard attributes (Title, Author, Description, Content Rating, and Copyright Notice) provide descriptive information and are visible to users when the content is played in Windows Media Player. Typically, custom attributes are not displayed, because they are intended to serve data and control information to other applications, such as customized players and search tools. Even though there are presently few applications that can recognize an ISAN number embedded as custom attributes, it is important to use both attribute types in every registered work. This makes the ISAN number visible to users right now through existing versions of Windows Media Player, but also positions the content provider to take advantage of future applications that become available for ISAN-enabled content.

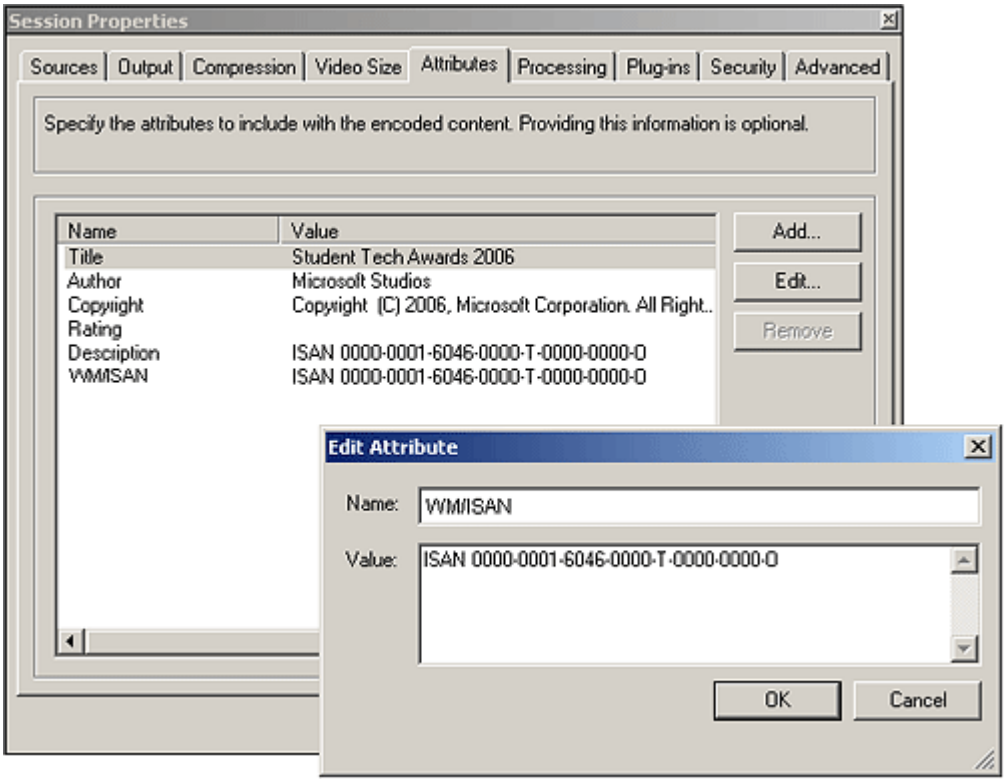
How Do I Implement ISAN When Encoding and Transcoding Video Content?

Many TV shows and commercial films have already been registered with ISAN. When preparing to encode or transcode previously published content, you might only need to register the work as a version or episode. To check the registration status of a work, simply use the search engine at the ISAN International Agency Web site (http://www.isan.org). For example, a title search for "Cannery Row" will show that several language versions of this work have already been registered, as shown in the following screen shot.



By verifying the registration status of a work prior to encoding, both administrative and production problems can be avoided. However, if unregistered source content is identified, it should be registered just prior to encoding, rather than later in the production process. Because registration does require a certain amount of administrative overhead, the temptation to wait can be fairly compelling, especially during peak production times. Nevertheless, a significant time lag between encoding and registration introduces opportunities for number assignment errors and heightens the risk of master files being copied or circulated without the embedded ISAN identifier. If stray copies are all collected and accounted for, the ISAN number will then have to be applied to each. Retrospective number assignment requires additional steps which can be eliminated if the identifiers are applied earlier in production.

In Microsoft® Windows Media® Encoder 9 Series, metadata attributes are easily defined in the encoding profile, which can be created on the fly or saved as a template for later use. The illustration below shows the encoder properties panel during the creation of a new profile. As recommended, the ISAN identifier has been entered twice, once using **Description**, the standard attribute field and a second time using a custom attribute field called **WM/ISAN**.



The value of creating this particular custom attribute is that future versions of Microsoft Windows encoders and players will support it as a standard attribute, beginning with Windows Media Encoder Studio Edition. While not yet finalized, the specifications for Windows Media ISAN (WM/ISAN) as a standard attribute could include information similar to the following.

WM/ISAN

The **WM/ISAN** attribute contains a unique file identifier for the content.

WM/ISAN applies to all types of files.

The following table is an example of the potential support for this attribute in Windows Media technologies. Listed for each technology is an indicator of explicit support and, optionally, any constants, alternate names, or user interface labels that are associated with the attribute. In some technologies, attributes that are not explicitly supported can be included as custom attributes.

Technology	Explicitly supported	Constant or user interface name
Windows Media Format Software Development Kit (SDK)	Yes	G_wszWMISAN
Windows Media Player SDK	Yes	ISAN
Windows Media Player	Yes	ISAN
Windows Media Encoder	Yes	ISAN
Windows Media Encoder Studio Edition	Yes	ISAN
Windows Media Encoder SDK	Yes	
Windows Movie Maker	No	
Microsoft Producer for PowerPoint® 2002	No	

The ISAN identifier is a generic string that can be used by applications and services to uniquely identify the file. You should never clear this attribute. You can append values and remove your own values, but all others should be left unaltered.

In addition to metadata attributes, Windows Media Encoder 9 Series also allows script commands to be inserted in the file header. This feature can be used to perform a number of custom functions when the finished, encoded content is played in Windows Media Player. For example, a TEXT command can be used to make the player display the ISAN number just below the video image at any time during playback.

How Do I Implement ISAN for Existing Windows Media-Based Content?

There are two easy methods for manually inserting ISAN identifiers into existing Microsoft® Windows Media® (.wmv or.wma) files and Advanced System Format (.asf) files. Both methods make use of the Windows Media File Editor, a companion utility that is bundled with Microsoft Windows Media Encoder 9 Series. The first method is to load an existing media file into the editor, then paste the ISAN number into one of the standard attribute fields.

Once the edited file is saved, the ISAN identifier becomes part of its internal metadata. The benefit of this method is ease of implementation, as it does not require extensive familiarity with Windows Media tools for successful implementation.

The second method involves building a new file header for the content. The Windows Media header contains encoding, control and script functions that are necessary for the playback of the file. Once again, by using the Windows Media File Editor, it is a straightforward process to update the header to embed an ISAN identifier in the video content. The following XML sample shows the contents of a Windows Media header where the ISAN number has been embedded multiple times, using the Description standard attribute, the WM/ISAN custom attribute, and as a TEXT script command.

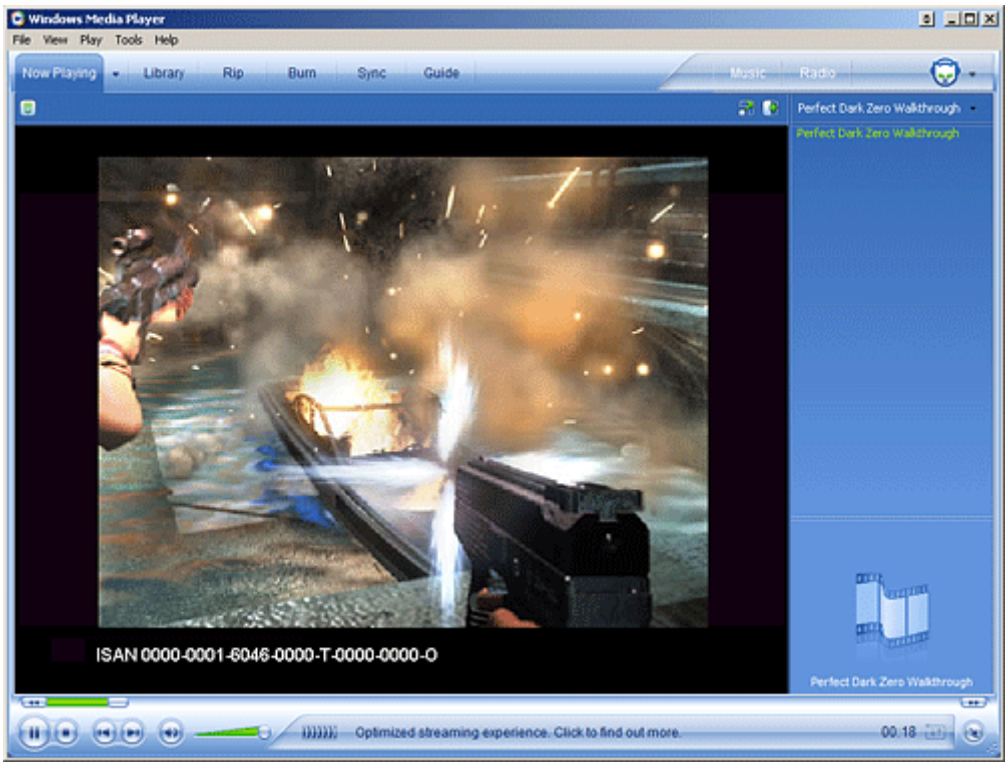
```
<?xml version="1.0"?>
<WMBasicEdit >
   <Attributes >
      <WMENC_STRING Name="Rating" Value="Microsoft Confidential. For Internal Use Only." />
      <WMENC_QWORD Name="WM/ASFPacketCount" Value="1147" />
      <WMENC_QWORD Name="WM/ASFSecurityObjectsSize" Value="0" />
      <WMENC_BLOB Name="WM/StreamTypeInfo" >

<![CDATA[766964730000100080000aa00389b7158000000000000000000000600100002001000000000000
0000000060010000200100046cc090000000000000000000000000028000000600100002001000001001800574d5631000000000000000000000000000000000000000000]]>
      </WMENC_BLOB>

      <WMENC_LONG Name="WM/PeakBitrate" Value="642118" />
      <WMENC_STRING Name="Title" Value="Perfect Dark Zero Trailer" />
      <WMENC_STRING Name="Author" Value="Microsoft Game Studios" />
      <WMENC_STRING Name="Copyright" Value="(C) 2006, Microsoft Corporation. All Rights Reserved." />
      <WMENC_STRING Name="Description" Value="ISAN 0000-0001-6046-0000-T-0000-0000-O" />
      <WMENC_STRING Name="WM/ParentalRating" />
      <WMENC_STRING Name="WM/ISAN" Value="0000-0001-6046-0000-T-0000-0000-O" />
   </Attributes>

   <RemoveAllMarkers />
   <RemoveAllScripts />
   <Scripts >
      <Script Type="TEXT"
         Command="ISAN 0000-0001-6046-0000-T-0000-0000-O" Time="0" />
      </Scripts>
</WMBasicEdit>
```

The following screen shot shows how the TEXT script command displays the ISAN number in Windows Media Player.



Note TEXT commands can be displayed at any point during playback by setting the Time property. Specifying **Time="0"** ensures that the ISAN number will be displayed when playback begins.

This example provides just a hint of how Windows Media-based content can be customized for use with ISAN. For those who wish to explore the options further there are a variety of technical resources available. In particular, two are the Microsoft Windows Media Software Development Kit (SDK), and the Microsoft Press book, *Fundamentals of Programming the Microsoft Windows Media Platform*. The Microsoft Windows Media Web site also provides a wealth of additional information, including links to third party authoring and development tools for the Windows Media Platform. For more information, see the Windows Media Web site (http://www.microsoft.com/windows/windowsmedia).

Examples of ISAN Implementation

As acceptance of the ISAN standard increases, content producers and distributors will have access to a broad spectrum of tools and resources. The following are examples of current activities in this area.

ISAN in the Movies: Secure Path Technology, LLC

Secure Path Technology, LLC is an ISAN Registration Authority located in Los Angeles, CA. The company works closely with the Motion Picture Association (MPA) and its member studios to develop tools and resources for ISAN implementation in the film industry. The following screen shot shows Secure Path's ISAN Injector, a custom utility for inserting ISAN identifiers into existing digital audio and video files.

ISAN at Microsoft

Microsoft Corporation recently adopted ISAN and appointed Microsoft Studios (the company's internal video production facility) to provide registration services for the corporation. Particular attention is being given to using ISAN for the Microsoft® Xbox® and XBox 360™ game titles. Working in partnership with Microsoft Studios and the Xbox team, the ISAN International Agency (ISAN-IA) has just released an extended ISAN metadata schema specification for games content. The following illustration is an excerpt from the new games schema.

ISAN Field Name	Field Values		
	Code	Authorized Values	Scope
User Experience Features		Edit Tools	
		HDTV 480p	
		HDTV 720p	
		HDTV 1080i	
		Rumble Effects (Vibration)	
		Split-Screen Play	
		Storage Device	
Online Experience Features		Downloadable Content	
		Online Safeguards (Friends)	
		Multiplayer Scoreboard	
		Rumble Effects (Vibration)	
		Voice/Chat Enabled	
Supported Players		Single Player	
		1-2 Players	
		1-4 Players	
		2-4 Players (Systems Linked)	
		2-8 Players (Systems Linked)	
		2-4 Players (Online)	
		2-8 Players (Online)	
		2-16 Players (Online)	
		2-24 Players (Online)	
		2-32 Players (Online)	
ESRB Rating	**EC**	Early Childhood	Players 3 years and above
	E	Everyone	Players 6 years and above
	E10+	Everyone over 10 years	Players 10 years and above
	T	Teen	Players 13 years and above
	M	Mature	Players 17 years and above
	AO	Adults Only	Players over 18 years
	RP	Rating Pending	N/A (Default Value)
		Alcohol Reference	
		Animated Blood	
		Blood	

A Final Consideration: ISAN in Media Asset Management

While interest in adopting the ISAN is presently oriented toward exploiting its potential in commercial media content production and distribution, the long-term success of the standard also depends on its application in media archives, libraries, and asset management systems. The following screen shot shows how Microsoft Studios has configured Telescope Digital Asset Management System to support ISAN identifiers, labels and barcodes.

This image represents the metadata record of a video asset (in which the ISAN number was embedded). Two fields have been added to the Telescope system's metadata schema to support ISAN. The first is a general text field in which the ISAN number is recorded. It provides an easy way to read the identifier, but more importantly allows the asset to be indexed, queried, and subsequently retrieved using its ISAN number as an access point. The second is a container field used to store the associated ISAN label for the asset, and a barcode graphic that is generated upon completion of the ISAN registration process. Storing the graphic as part of the metadata for the video ensures that, whenever a copy of the asset is retrieved, the label graphic is readily available to print and adhere to a DVD disc, data cartridge, or other physical media for transport. While this example demonstrates a very basic level of support for management of ISAN registered digital content, it is hopefully sufficient to hint at the many potential implementation scenarios of this important standard.

For More Information

- For general information about Windows Media technologies, see the Windows Media Web page (http://www.microsoft.com/windows/windowsmedia).
- To download Windows Media Encoder 9, Windows Media Player 10, and other Windows Media platform components, go to the Windows Media Download Center (http://www.microsoft.com/windows/windowsmedia/download).
- For more information about the International Standard Audiovisual Number (ISAN), see the ISAN Web site (http://www.isan.org).
- To obtain a copy of the ISAN standard, go to the International Standards Organization (ISO) Web site (http://www.iso.org).
- For more information about the Ad-ID standards, see the Ad-ID Web site (http://www.ad-id.org).
- For more information about ISAN services and resources, see the Secure Path Technologies, LLC Web site (http://www.secpath.com).

Web addresses can change, so you might be unable to connect to the Web site or sites mentioned here.

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- SMPTE RP214, "SMPTE RECOMMENDED PRACTICE—Packing KLV Encoded Metadata and Data Essence into SMPTE 291M Ancillary Data Packets" (http://www.smpte.org).
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