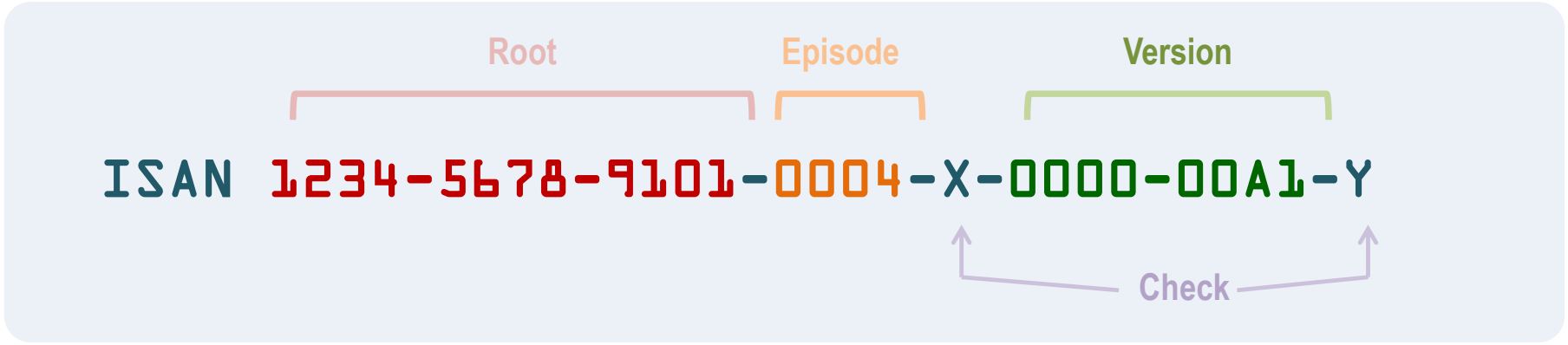
ISAN
INTERNATIONAL STANDARD
AUDIOVISUAL NUMBER

Affixing the ISAN

- Possibilities
- Technical specifications

The ISAN Identifier



Serie	1234-5678-9101-0000-E-0000-0000-A
Episode	1234-5678-9101-0004-X-0000-0000-A
Work	1234-5678-9101-0000-E-0000-0000-A
Version	1234-5678-9101-0004-X-0000-00A1-Y

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Standardized ISAN Representations

ISAN representation in printed form

This representation is used in the 2D barcode

ISAN 0000-0001-DB15-0000-X-0000-000C-N

ISAN 0000-0001-DB15-0000-X-0000-000C-N

ISAN representation in machine readable form and binary form

In this representation the ISAN prefix and hyphens can be omitted. It is also possible (but not recommended) to omit the two check digits.

00000001DB1500000000000C (96-bit binary number)

(000…011101101100010101000000000000000000000000000000000000000000000000)

ISAN representation in XML

<ISAN root=" 0000-0001-DB15" episode="0000" check1=""X version=" 0000-000C" check2="N" />

ISAN representation as a URN

ISAN is a registered Namespace Identifier (NID) with IETF and IANA - RFC4246: http://www.rfc-archive.org/getrfc.php?rfc=4246

***URN:ISAN:* 0000-0001-DB15-0000-X-0000-000C-N**

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Affix ISAN in film credits

ISAN-IA recommends the ISAN insertion with its two dimensional barcode in the film credits

For this purpose EPS image is delivered with each registered ISAN

ISAN bacodes can be downloaded from the ISAN web interface as EPS and JPEG images.

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Use of ISAN in audiovisual standards

SMPTE Metadata Dictionary
Broadcast Exchange Format (BXF)

Content Protection & Copy Management

Prefered content identifier for ATSC transport stream

VOD Content Description
Advertising distribution

ISO 26428 – ISO 26433

ISAN 0000-0002-6523-0000-Q-0000-0000-X

Open EPG

www.tv-anytime.org

ISO/IEC 13818-1 Generic coding of audio & video
ISO/IEC FDIS 21000 Multimedia Framework

Material Exchage Format
Descriptive Metadata Scheme

EN 15744: *Minimum set of metadata for cinematographic works*

EN 15907: *Enhancing interoperability of metadata*

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Use of ISAN in Digital Cinema Packages

- Digital Cinema Package (DCP):collection of digital files used to store and convey Digital DC audio, image, and data streams. DCP is an MXF standard implementation.
- Composition Playlist File (CPL) defines the playback order during the screening.
- The CPL is defined with a UUID, a same CPL can have different UUIDs (e.g. replacement of a DCP).
- The CPL contains a content version ID (version of the content described in the CPL),
- ISO 26429-7 recommends to use ISAN as in the example taken from the std:

```
<cpl:Id>urn:uuid:6922e3fe-98de-4347-b832-92e400509d5b</cpl:Id> => CPL ID is a UUID
<cpl:AnnotationText>First D-Cinema Feature</cpl:AnnotationText>
<cpl:IssueDate>2001-12-17T09:30:47-05:00</cpl:IssueDate>
<cpl:Issuer>Major US domestic distributor</cpl:Issuer>
<cpl:Creator>Reliable Packaging Software v1.4</cpl:Creator>
<cpl:ContentTitleText>The Jazz Singer</cpl:ContentTitleText>
<cpl:ContentKind>Feature</cpl:ContentKind>
<cpl:ContentVersion>
<cpl:Id>urn:isan:0123-1230-3210-2310-1-1234-1234-X</cpl:Id> => ContentVersion ID is an ISAN
<cpl:LabelText>English (Theatrical)</cpl:LabelText>
</cpl:ContentVersion>
```

In the DC standard, the ContentVersion ID is aimed to assist users and softwares in the programing and tracking of the content. (DC logs)

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Use of ISAN in iTunes Packages

When the ISAN is added to the iTunes Film package, it is included in the content usage logs delivered by Apple

- Easy rights management by CMOs
- Easy analytics on sales

iTunes Package Film Specification 5.0

```
<?xml version="1.0" encoding="UTF-8"?>
<package xmlns="http://apple.com/itunes/importer" version="film5.0">
  <provider>Paramount</provider>
  <language>en-US</language>
  <video>
    <type>film</type>
    <subtype>feature</subtype>
    <vendor_offer_code>408CH98720X103</vendor_offer_code>
    <vendor_id>09736156444</vendor_id>
    <isan>0000-0000-03B6-0000-O-0000-0000-2</isan>
    <upc>09736156444</upc>
    <country>US</country>
    …
```

http://www.apple.com/hk/itunes/lp-and-extras/docs/iTunes_Package_Film_Specification5.0.pdf

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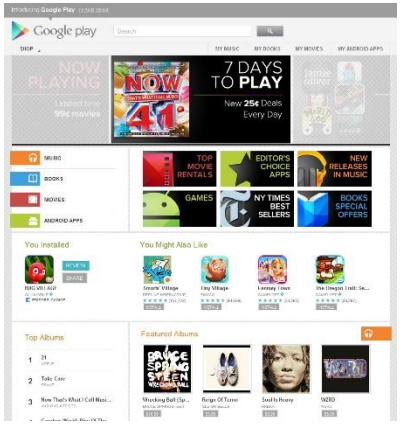
Use of ISAN in YouTube VoD Packages

Google play



Packaging Transactional VOD Content with YouTube

```
<?xml version="1.0" encoding="utf-8"?>
    <package name="lionsgateuk-youtube-UPC12345-GBCA-insert-20111230T113857">
      <feature>
            <filename source="/assets/UPC12345/path-to-feature.mp4">UPC12345-GBCA-feature-
    CougarHunting-8.mp4</filename>
            <audiolanguage>fr</audiolanguage>
            <rating system="BBFC">18</rating>
      </feature>
      ...
      <metadata>
            <isan>0000-0000-D07A-0090-Q-0000-0000-X</isan>
      </metadata>
      ...
    </package>
```

https://code.google.com/archive/p/tvod-integrate/wikis/PackageXML.wiki

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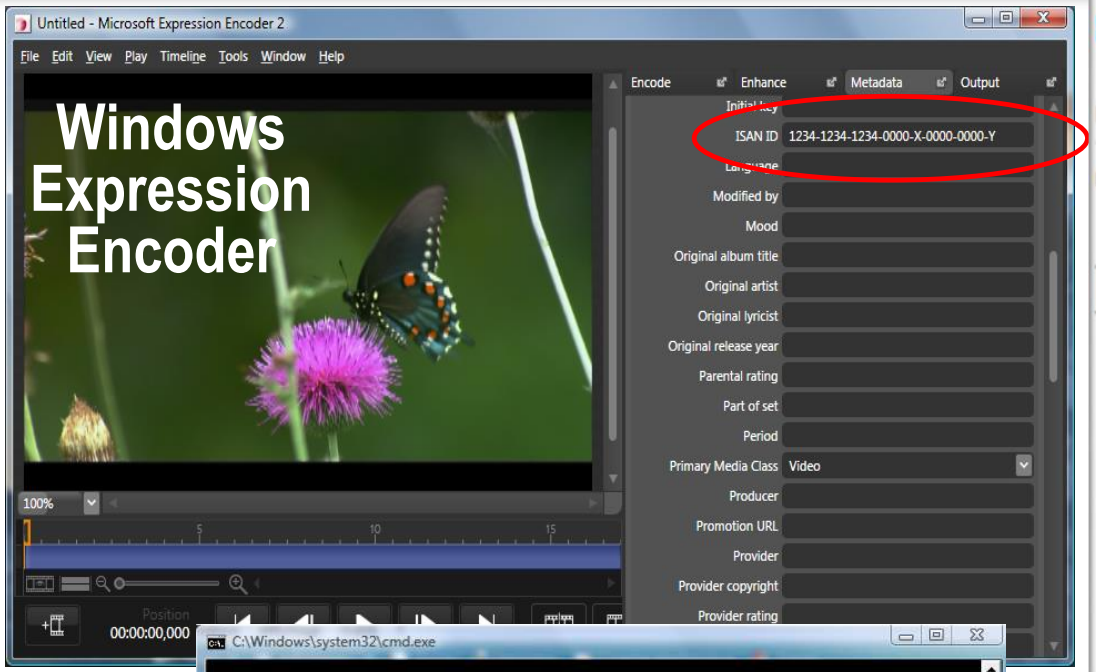
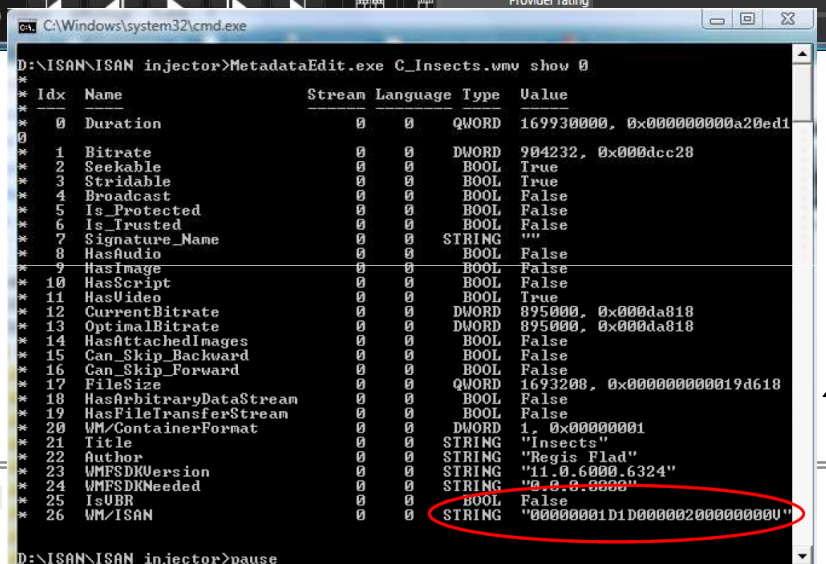
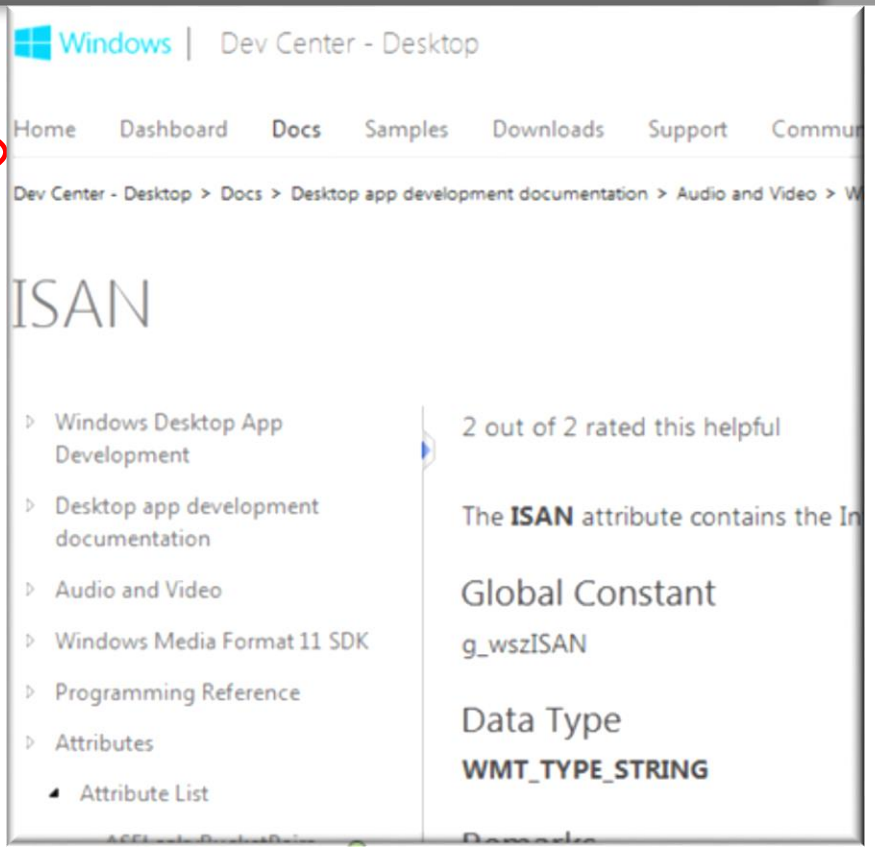
Use of ISAN in Windows Media files







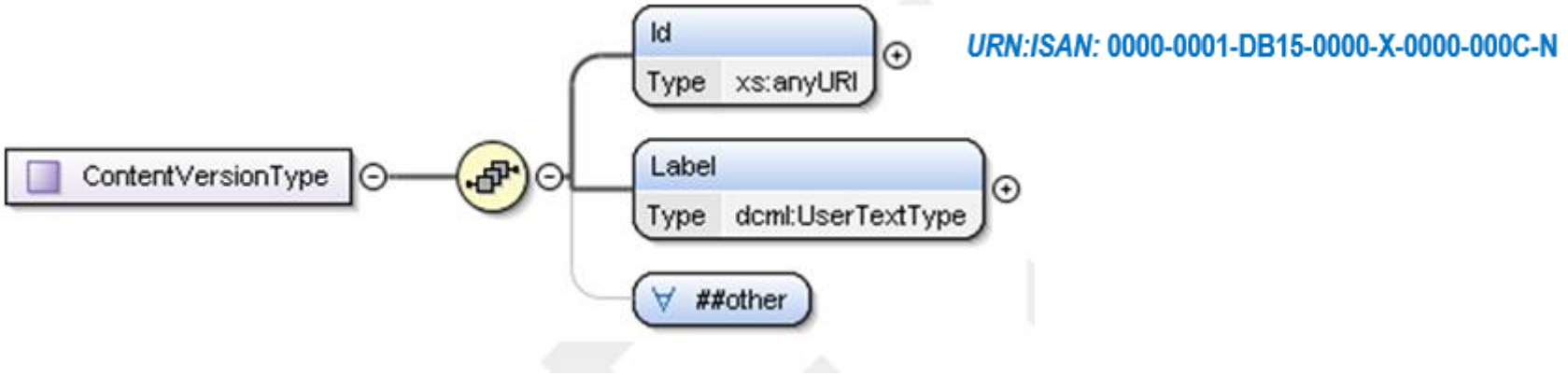
Windows Media SDK (encoder / decoder)

https://msdn.microsoft.com/en-us/library/windows/desktop/dd743275(v=vs.85).aspx

Use of ISAN in IMF - Interoperable Master Format – Standard under developement

- ✓ File-based interchange of multi-version, finished audio-visual works.
- ✓ IMF supports multi-language, multi-reel, subtitles / closed captions, video inserts and after-the-fact delivery of content with “supplemental packages.”

Composition Playlist



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Use of ISAN in MPEG

- ✓ **MPEG-2** Transport Streams (ATSC, DVB and ARIB) can carry an ISAN.

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

- ✓ **MPEG-4** has defined a dedicated placeholder to store the ISAN, enabling the unique identification of the content carried by audiovisual media objects (MPIP: 'Management and Protection of Intellectual Property')
- ✓ **MPEG-21** (Part 3) - Digital Item Identification (DII) allows for uniquely identifying Digital Items and parts thereof by using internationally recognized Identification Schemes such as ISAN for the identification of audiovisual digital content.

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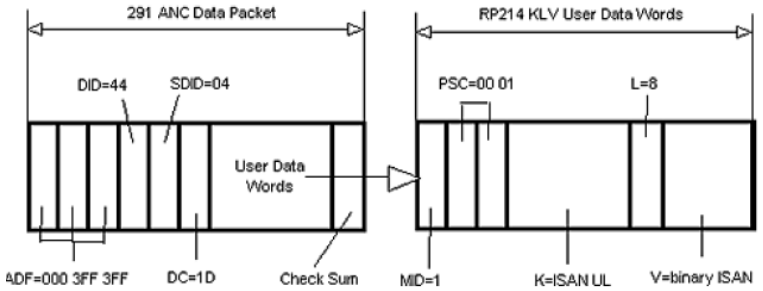
SMPTE Broadcasting Standards

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



Current and future SMPTE standards using the SMPTE metadata dictionary are de facto compliant with ISAN:

- **Television – Material Exchange Format (MXF)** – Descriptive Metadata Scheme-1
- **Broadcast eXchange Format (BXF):** wide-ranging standard that helps in the automation of many media-related workflows

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Use of ISAN with MXF - Material Exchange Format

ISAN URN representation: ***URN:ISAN:*** **0000-0001-DB15-0000-X-0000-000C-N**

- ✓ to link between essence and Metadata stored within MXF files,
- ✓ to link between the material stored in MXF files and external Metadata that could be stored in databases or Metadata files,
- ✓ to link between Metadata stored in MXF files and external Metadata that could be stored in databases or Metadata files.

When using SMPTE 377M: Descriptive Metadata Scheme

"identifier kind" = ISAN

"identifier locator"=urn:smpte:ul:060e2b34.01010101.01011101.00000000

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Use of ISAN with AMWA AS-03 & AS-11

AMWA AS-03 and AS-11 are subset of MXF for the delivery of finished programming from producers & ditributors to broadcast stations

DMS-AS-03 shall include the following mandatory properties:

- AS-03 Identifier Kind – an enumerated string value indicating the kind of program identifier
  e.g. "ISAN"
- AS-03 Identifier – the identifier, as a text string
  e.g. "ISAN 0000-0001-8947-0000-8-0000-0000-D"

AMWA AS-11 is the format used by UK DPP for the delivery of of content to UK broadcasters

Other Identifier type	Description of other identifier, e.g. ISAN.	UKDPP_Other_Identifier_Type

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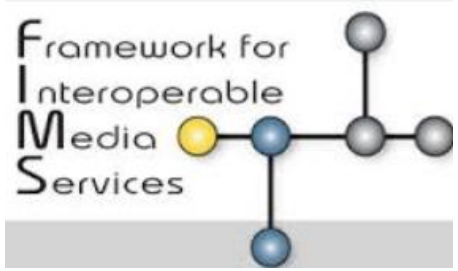
Use of ISAN with EBU Core

```
<ebucore:identifier typeLabel="ISAN"
    typeLink="http://www.ebu.ch/metadata/cs/ebu_IdentifierTypeCodeCS.xml#3.2">
    <dc:identifier>ISAN 0000-0001-DB15-0000-X-0000-000C-N</dc:identifier>
</ebucore:identifier>
```



FIMS enables to associate EBU Core metadata to content

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Use of ISAN Blu-ray discs

- ✓ Blu-ray discs contains a DRM, the Advanced Access Control System (AACS)
- ✓ ISAN is the recommended content ID in AACS Managed Copy system
- ✓ The AACS system relies on a central licence registry to manage the BD copies
- ✓ Authoring companies are responsible to inject the ISAN in the Blu-ray on behalf of distributors.
- ✓ Blu-ray authoring softwares are used to create the master Blu-ray for disk replication.
- ✓ An ISAN version shall be used in a Blu-ray

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Ise of ISAN in Ultra Violet

DECE (ultraviolet standard) specifies several identifiers related to the content

- ✓ **The Asset Logical Identifier (ALID)**
  - ✓ Associated with a specific "right" granted to a user, typically tied to the specific DRM being utilized (DRM Provided ID i.e. guid, etc.)
  - ✓ Syntax: **`"urn:dece:alid:"<scheme>":"<SSID>`** *ISAN is expected for <SSID>*
  - ✓ *Example:* urn:dece:alid:isan:000000018947000000000000
- ✓ **The Asset Physical Identifier (APID)**
  - ✓ Associated to the actual essence file provided by the content owner (SD, HD, PD)
  - ✓ Syntax: **`"urn:dece:apid:"<scheme>":"<SSID>`**
  - ✓ Example: urn:dece:apid:isan:000000018947000000000000:a203
- ✓ **The ContentID** is a string defined in such as way as to be globally unique. It may use a standard identifier, such as ISAN, or it might use an organization-specific identifier. Example: urn:dece:cid:isan:000000018947000000000000
- ✓ **The Bundle Identifiers:**
  - ✓ Associated with any bundle of multiple physical assets, can be used for promotional or logical bundling of content
  - ✓ ISAN (Compilation):contains V-ISANs from all Physical assets that make up the bundle
  - ✓ Example: urn:dece:bid:isan:000000018947000000000000

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Accessing the ISAN Registry

Rest API

registration
search
lookup

Files

Bulk registration
Bulk search / matching

Web interface

registration
search
lookup

registry
snapshots

ISAN

User Copy

Local search
& lookup

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ISAN REST API

- ✓ REST API: read and write data in the ISAN Registry
- ✓ Data encoded in XML (Same schema as for file based data exchange) and JSON
- ✓ Double authentication:
  - ✓ API authentication : HTTP authorization header
  - ✓ ISAN registry authentication: custom X-ISAN authorization header

```
apiSignatureValue  = Base64 (api_username:api_password)

isanSignatureValue = Base64 (isan_username : MD5 (isan_password))
```

- ✓ Swagger active documentation http://web.isan.org/api/
- ✓ List of operations
  - ✓ Register a new work or version of a work
  - ✓ Search in the ISAN Registry (Query)
  - ✓ Update informations for existing works or versions
  - ✓ Resolve ISAN codes or external identifiers (Lookup)
  - ✓ List child versions from an ISAN (hierarchical Registry browsing)

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ISAN Registry API: Search & Lookup functions

- ✓ Lookup Service (ISAN resolutions / external IDs resolutions)
  - ✓Retrieve the metadata associated to an ISAN (all ISAN representations: classic, URI, ..)
  - ✓Validate an ISAN (check digits, existence, active/inactive)
  - ✓Translate ISAN ⇔ External IDs

- ✓ Search Service
  - ✓Perform search in the ISAN registry
  - ✓Filtering, Sorting, Pagination:

`GET /api/works?filter=string&sorting=string&limit=n&page=i`

  - ✓ Search criteria (filter): « AND » combination between : Work Type, Serial Type, Title, Year, Duration, Participants (name / role), root ISAN (episodes of a serial)

To retrieve all feature films released on 2013
filter="setype::SW|wktype::FF|yor::2013"

To retrieve all documentaries or films where Clint Eastwood has participated
filter="any::Clint Eastwood|wktype::DO,FF"

  => supported operators: OR (|), exclusions (_), numeric intervals([xx-yy])

  - ✓ Sorting: ascending (by default), descending (-) order, multiple fields are supported (sorting).
  - ✓ Pagination: define the number of results per pages (limit) and call results page by page (page),

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