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**Using International Standard Book Numbers as Uniform Resource Names**  
**draft-ietf-urnbis-rfc3187bis-isbn-urn-03**

Abstract

The International Standard Book Number, ISBN, is a widely used identifier for monographic publications. Since 2001, the URN (Uniform Resource Name) namespace "ISBN" has been reserved for ISBNs. The namespace registration was performed in [RFC 3187](#) and applied only to the ISBN as specified in the ISO Standard 2108-1992, now known as "ISBN-10". To allow for further growth in use, the successor ISO Standard, ISO 2108:2005, has defined an expanded format for the ISBN, known as "ISBN-13". This document defines how both of these ISBN standard versions can be supported within the URN framework. Moreover, additional query and fragment usage related information required by RFC 2141bis has been included. An updated namespace registration conformant to RFC 3406bis is provided. It describes how both the old and the new ISBN format can share the same namespace.

This document replaces [RFC 3187](#); it also obsoletes and moves to Historic status the predecessor thereof, [RFC 2288](#).

Discussion

This draft is based on individual work started in 2008. When the URNBIS working group was launched, revision of the ISBN namespace registration was included in its charter.

Comments are welcome and should be directed to the urn@ietf.org mailing list or the authors.

[[ RFC-Editor: this clause to be deleted before RFC publication ]]

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## Table of Contents

<a href="#">1.</a>	<a href="#">Introduction . . . . .</a>	<a href="#">4</a>
<a href="#">2.</a>	<a href="#">Conventions used in this document . . . . .</a>	<a href="#">5</a>
<a href="#">3.</a>	<a href="#">Fundamental Namespace and Community Considerations . . . . .</a>	<a href="#">5</a>
<a href="#">3.1.</a>	<a href="#">The URN:ISBN Namespace . . . . .</a>	<a href="#">5</a>
<a href="#">3.2.</a>	<a href="#">Community Considerations for ISBNs . . . . .</a>	<a href="#">5</a>
<a href="#">4.</a>	<a href="#">International Standard Book Numbers . . . . .</a>	<a href="#">6</a>
<a href="#">4.1.</a>	<a href="#">Overview / Namespace Considerations . . . . .</a>	<a href="#">6</a>
<a href="#">4.1.1.</a>	<a href="#">ISBN-10 Structure . . . . .</a>	<a href="#">6</a>
<a href="#">4.1.2.</a>	<a href="#">ISBN-13 Structure . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.3.</a>	<a href="#">Relation between ISBN-10 and ISBN-13 . . . . .</a>	<a href="#">7</a>
<a href="#">4.2.</a>	<a href="#">Encoding Considerations . . . . .</a>	<a href="#">8</a>
<a href="#">4.3.</a>	<a href="#">Resolution of ISBN-based URNs . . . . .</a>	<a href="#">8</a>
<a href="#">4.3.1.</a>	<a href="#">General . . . . .</a>	<a href="#">8</a>
<a href="#">4.3.2.</a>	<a href="#">Practical Aspects . . . . .</a>	<a href="#">9</a>
<a href="#">4.4.</a>	<a href="#">Additional Considerations . . . . .</a>	<a href="#">12</a>
<a href="#">5.</a>	<a href="#">URN Namespace Registration and Use . . . . .</a>	<a href="#">13</a>
5.1.	URN Namespace ID Registration for the International Standard Book Number (ISBN) . . . . .	<a href="#">13</a>
<a href="#">6.</a>	<a href="#">Security Considerations . . . . .</a>	<a href="#">18</a>
<a href="#">7.</a>	<a href="#">IANA Considerations . . . . .</a>	<a href="#">18</a>
<a href="#">8.</a>	<a href="#">Acknowledgements . . . . .</a>	<a href="#">19</a>
<a href="#">9.</a>	<a href="#">References . . . . .</a>	<a href="#">19</a>
<a href="#">9.1.</a>	<a href="#">Normative References . . . . .</a>	<a href="#">19</a>
<a href="#">9.2.</a>	<a href="#">Informative References . . . . .</a>	<a href="#">20</a>
<a href="#">Appendix A.</a>	<a href="#">Draft Change Log . . . . .</a>	<a href="#">21</a>
A.1.	<a href="#">draft-hakala-rfc3187bis-isbn-urn-00</a> to <a href="#">draft-ietf-urnbis-* -00</a> . . . . .	<a href="#">21</a>
A.2.	<a href="#">draft-ietf-urnbis-rfc3187bis-isbn-urn-00</a> to -01 . . . . .	<a href="#">21</a>
A.3.	<a href="#">draft-ietf-urnbis-rfc3187bis-isbn-urn-01</a> to -02 . . . . .	<a href="#">21</a>
A.4.	<a href="#">draft-ietf-urnbis-rfc3187bis-isbn-urn-02</a> to -03 . . . . .	<a href="#">21</a>



## 1. Introduction

One of the basic permanent URI schemes (cf. [RFC 3986](#) [[RFC3986](#)], [[IANA-URI](#)]) is 'URN' (Uniform Resource Name) as originally defined in [RFC 2141](#) [[RFC2141](#)] and now being formally specified in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)]. Any identifier, when used within the URN system, needs its own namespace. At the time of this writing, there were over 45 registered URN namespaces (see [[IANA-URN](#)]), one of which belongs to ISBN, International Standard Book Number, as specified 2001 in [RFC 3187](#) [[RFC3187](#)].

Since 2007, there have been two variants of ISBN in use; an outdated one based on ISO 2108-1992 [[ISO1](#)] and a new one defined in ISO 2108-2005 [[ISO2](#)]. These versions shall subsequently be called "ISBN-10" and "ISBN-13", respectively. If what is said in this document applies to both ISBN versions, the generic term "ISBN" is used.

As part of the validation process for the development of URNs, the IETF URN working group agreed that it is important to demonstrate that a URN syntax proposal can accommodate existing identifiers from well established namespaces. One such infrastructure for assigning and managing names comes from the bibliographic community. Bibliographic identifiers function as names for objects that exist both in print and, increasingly, in electronic formats. [RFC 2288](#) [[RFC2288](#)] investigated the feasibility of using three identifiers (ISBN, ISSN, and SICI -- see below) as URNs, with positive results; however, it did not formally register corresponding URN namespaces. This was in part due to the still evolving process to formalize criteria for namespace definition documents and registration, consolidated later in the IETF, first into [RFC 2611](#) [[RFC2611](#)], then into [RFC 3406](#) [[RFC3406](#)], and now given by RFC 3406bis [[I-D.ietf-urnbis-rfc3406bis-urn-ns-reg](#)].

URN Namespaces have subsequently been registered for both ISBN (International Standard Book Number) and ISSN (International Serial Standard Number) in RFCs 3187 [[RFC3187](#)] and 3044 [[RFC3044](#)], respectively, but not for SICI (Serial Item and Contribution Identifier), mainly due to the identifier's limited popularity.

Guidelines for using ISBN-10s (based on ISO 2108:1992) as URNs and the original namespace registration have been published in [RFC 3187](#) [[RFC3187](#)]. The RFC at hand replaces [RFC 3187](#); sections related to ISBN-13 have been added, all ISBN-10 information has been updated, and the namespace registration revised to make it compliant with both ISBN versions and the stipulations of RFC 3406bis [[I-D.ietf-urnbis-rfc3406bis-urn-ns-reg](#)].



## **2. Conventions used in this document**

When spelled in all-capitals as in this paragraph, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)].

"ISBN-10" refers to the original, 10-digit ISBN scheme specified in ISO 2108-1992 [[ISO1](#)].

"ISBN-13" refers to the current, 13-digit ISBN scheme specified in ISO 2108-2005 [[ISO2](#)].

"URN:ISBN" is used as a shorthand for "ISBN-based URN".

## **3. Fundamental Namespace and Community Considerations**

### **3.1. The URN:ISBN Namespace**

ISBN is a well established standard identifier system for monographic publications. Therefore, any useful and deployable method for identifying these entities for Internet-wide reference and making their metadata available on the Internet needs to be based on ISBNs.

### **3.2. Community Considerations for ISBNs**

ISBNs are assigned under the auspices of the International ISBN Agency [[ISBNORG](#)] and national/regional ISBN agencies. ISBN assignment is a well managed and understood process, but as in any process administered by humans, errors do take place. If so, there are procedures in place for fixing the incorrect ISBNs.

Books are finite objects, which may consist of (logical) component resources such as chapters or short stories / novellas. Such component resources can get an ISBN if and only if they are for sale independently. For example, a user could purchase either the entire short story collection, or just one short story. Either way, he gets a file with the relevant content. Logical components can also be represented in the physical structure of the document; for instance, chapters of a digital book may be encoded into its HTML structure. Then and only then an URI fragment can be attached to the URN:ISBN. The entire resource will be retrieved, but the fragment will be applied by the browser to take the user into the desired point within the document. Please note that according to the ISBN standard, ISBN MUST be assigned to a single manifestation of the resource. An ISBN given to the PDF version of the book cannot be reused to the EPUB 3 version.





The ISBN standard does not allow augmentation of the ISBN itself with an identification of a physical component resource of a book. However, if a fragment part is added to a URI reference to an URN:ISBN, the namespace specific string is still the base ISBN only, and lexically, the URN with and without the URI fragment identifier are equivalent.

For the ISBN community, the use of URI fragment identifiers provides additional functionality that would not be easily available in any other way. An ISBN-13 can be assigned to logical component resources, but this feature has not been used extensively. URI fragment offers a light-weight (technically and administratively) solution to the users to pinpoint component resources within electronic manifestations of books, provided that these components have been encoded in an appropriate manner.

The materials identified by an ISBN can exist only in printed or other physical form, not as digital resources accessible in the WEB; and even if an electronic book exists, its access rights may be limited. ISBN-based URN resolution services are expected to support a wide variety of information services related to books. Hence, when the identified manifestation of the book cannot be supplied, the applicable URN:ISBN resolver SHOULD supply descriptive and rights metadata about the relevant manifestation; the resolver MAY also provide links to other manifestations of the same work, or to related works.

The next section presents an overview of the application of the URN:ISBN namespace and the principles, and systems used, for the resolution of ISBN-based URNs.

## **[4.](#) International Standard Book Numbers**

### **[4.1.](#) Overview / Namespace Considerations**

An International Standard Book Number (ISBN) identifies a product form or edition of a monographic publication. ISO 2108 requires that each product form (e.g. hardcover, paperback, PDF) has its own ISBN.

#### **[4.1.1.](#) ISBN-10 Structure**

The ISBN-10 is defined by the ISO Standard 2108-1992 [[ISO1](#)]. It is a ten-digit number (the last "digit" can be the letter "X" as well) that is divided into four variable-length parts usually separated by hyphens when printed. Note that these hyphens can be removed; ISBNs with and without the hyphens are lexically equivalent. The parts are as follows (in this order):



- o a group identifier that specifies a group of publishers, based on national scope, geographic scope, or some other criteria;
- o the publisher identifier;
- o the title identifier; and
- o a modulo 11 check digit, using X instead of 10; the details of the calculation are specified in the ISO Standard [[ISO1](#)].

ISBN-10s were assigned starting from the 1970s until the introduction of ISBN-13 in January 2007.

#### **[4.1.2.](#) ISBN-13 Structure**

ISBN-13 is defined by the ISO Standard 2108-2005 [[ISO2](#)]. The ISBN-13 is a thirteen-digit number that is divided into five parts usually separated by hyphens when printed. The first and the last part have a fixed length, but the other parts have variable length. These parts are as follows (in this order):

- o an ISBN-13 prefix element -- a 3-digit prefix specified by the International ISBN Agency; at the time of this writing, applicable values were 978 and 979; future versions of the standard may define additional values;
- o a registration group element that specifies the registration group; it identifies the national, geographic, language, or other such grouping within which one or more ISBN Agencies operate;
- o the registrant element;
- o the publication element; and
- o a modulo 10 check digit; the details of the calculation are specified in the ISO Standard [[ISO2](#)].

#### **[4.1.3.](#) Relation between ISBN-10 and ISBN-13**

The structural differences between the ISBN-10 and ISBN-13 are the prefix element (which does not exist in the ISBN-10) and the check digit calculation algorithm, which is modulo 11 in ISBN-10 and modulo 10 in ISBN-13.

Further, the terminology in ISBN-10 differs substantially from the terminology applied in ISBN-13. In this document, ISBN-13 terminology shall be used from now on; for a reader used to ISBN-10 terminology, the following mapping may be useful:



- o ISBN-10 group identifier <-> ISBN-13 registration group element under prefix 978;
- o ISBN-10 publisher identifier <-> ISBN-13 registrant element;
- o ISBN-10 title identifier <-> ISBN-13 publication element.

Any ISBN-10 can be converted to ISBN-13 form (and retrospective conversion is the recommended practice in ISO 2108:2005) by mapping it into the ISBN-13 prefix-978 range and recalculating the check digit. Any application that processes ISBN-based URNs MUST be prepared to deal with both kinds of ISBNs, since instances of ISBN-10 numbers will persist that cannot be converted to the new form (e.g., ISBNs imprinted in books). ISBN-13s using prefix element 979 cannot be converted back to ISBN-10, since under this prefix, ISBNs group identifiers will be re-assigned from scratch. New books may still have ISBN-10 alongside ISBN-13 for practical reasons, but only as long as the prefix element in ISBN-13 is 978.

## **4.2. Encoding Considerations**

Embedding ISBNs within the URN framework does not present encoding problems, since all of the characters that can appear in an ISBN are valid in the namespace-specific string (NSS) part of the URN. Percent-encoding, as described in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)], is never needed. In order to improve readability of the NSS, hyphens MAY be used.

Example 1: URN:ISBN:978-0-395-36341-6

Example 2: URN:ISBN:951-0-18435-7

Example 3: URN:ISBN:951-20-6541-X

Example 3: URN:ISBN:951206541X

## **4.3. Resolution of ISBN-based URNs**

### **4.3.1. General**

For URN resolution purposes, all elements except the check digit (0-9 for ISBN-13, and 0-9 or X for legacy ISBN-10) must be taken into account. The registration group and registrant element assignments are managed in such a way that the hyphens are not needed to parse the ISBN unambiguously into its constituent parts. However, the ISBN is normally transmitted and displayed with hyphens to make it easy for humans to recognize these elements without having to make reference to or have knowledge of the number assignments for



registration group and registrant elements. In ISBN-10, registration group element codes such as 91 for Sweden were unique. In ISBN-13, only the combinations of prefix and registration group elements are guaranteed to be unique. 978-951 and 978-952 both mean Finland, but 979-951 and 979-952 almost certainly will not (once they will be assigned in the future); at the time of this writing, registration group element(s) for Finland are not yet known for ISBNs starting with 979.

The Finnish URN registry is maintained by the national library. The service is capable of resolving ISBN-based URNs. URNs starting with URN:ISBN:978-951 or URN:ISBN:978-952 are mapped into appropriate URL addresses in a table maintained within the registry. Applications, such as the national bibliography or the open archive of a university, can use the URN as the persistent address of the resource. There is just one place (the URN registry) where the address is mapped to one or more physical locations.

ISBN-13 prefix / registration group element combinations (and the corresponding ISBN-10 registration group identifiers, if any) usually designate a country, but occasionally a single combination / ISBN-10 group identifier is used to indicate a language area. For instance, "978-3" (or "3" in ISBN-10) is utilised in Germany, Austria, and the German speaking parts of Switzerland. As of this writing, there are two regional registration groups: "978-976" is used in the Caribbean community and "978-982" in the South Pacific (see [[ISBN\\_PREFIX](#)]).

Note that the prefix and registration group element combination "979-3" has not yet been assigned. There is no intention to allocate the registration group elements in the same way as was done with ISBN-10.

The registrant element may or may not be used for resolution purposes, depending on whether individual publishers have set up their resolution services.

The publication element shall enable targeting the individual publication.

#### **4.3.2. Practical Aspects**

Due to the lack of URN support in, e.g., web browsers, the URNs are usually expressed as URLs when embedded in documents. The Finnish URN registry is located at <http://urn.fi/>, and URNs are therefore expressed in the form <http://urn.fi/<URN>>. For example, the URI <http://urn.fi/URN:ISBN:978-952-10-3937-9> identifies Sami Nurmi's doctoral dissertation "Aspects of Inflationary Models at Low Energy Scales".





Any national URN registry can resolve URN:ISBNs with foreign registration group element values if a) there is a URN:ISBN resolution service for that country, b) the national resolution service is aware of the existence of the foreign service and how to find it, and c) the two resolution services can communicate with one another. The PERSID project (<<http://www.persid.org/>>) developed such an infrastructure for the URN:NBN namespace.

Alternatively, instead of linking the national resolvers together, it is also possible to build international resolvers that copy resolution data from several national services, or to create a way station which will enable the resolvers to communicate with one another. We can assume that the network of URN:ISBN resolvers will grow, and at the same time the set of services they support will also grow and become more diverse. Such development might make these union resolvers and way stations more important.

If a registration group element does not identify a single country but a language area, there are at least two means for locating the correct national bibliography. First, it is possible to define a cascade of URN registries -- for instance, the German, Austrian, and Swiss national registries, in this order --, which collectively is aware of resolution services such as national bibliographies for ISBN-13s starting with "978-3". If the German registry is not able to find an authoritative resolution service, the request could be passed on to the Austrian one, and if there are still no hits, finally to the Swiss service.

Second, the registrant element ranges assigned to the publishers in Germany, Austria, and Switzerland by the respective ISBN Agencies could be defined directly into the national registries. This method would be more efficient than cascading, since the correct resolution service would be known immediately. The choice between these two and possible other options should be made when the establishment of the European network of URN registries reaches this level of maturity.

In some exceptional cases -- notably in the US and in the UK, where international companies do a significant portion of publishing -- the information provided by the group identifier may not always be fully reliable. For instance, some monographs published in New York by international publishing companies may get an ISBN with the registration group element "3". This is technically appropriate when the headquarters or one of the offices of the publisher is located in Germany.

Information about such a book may not always be available in the German national bibliography, but via the Library of Congress systems. Unfortunately, the German/Austrian/Swiss URN registries



that should in this case be contacted may not be aware of the appropriate resolution service.

However, the problem posed by the international publishers may be less severe than it looks. Some international publishers (Springer, for example) give the whole production to the national library of their home country as legal deposit, no matter which country the book was published. Thus everything published by Springer in New York with registration group element "3" should be resolvable via the German national bibliography. On the other hand, when these companies give their home base also as a place of publication, the "home" national library requires the legal deposit.

A large union catalogue, such as WorldCat maintained by OCLC [[OCLC-WC](#)] can be used to complement the resolution services provided in the national level, or as the default service, if no national services exist or are known to the registry from which the query originates.

Due to the semantic structure of ISBN-13, the registrant element can be used as a "hint". Technically, it is possible to establish a number of URN resolution services maintained by different kinds of organizations. For instance, "978-951-0" is the unique ISBN registrant element of the largest publisher in Finland, Sanoma-WSOY. Resolution requests for ISBNs starting with "978-951-0" can be passed to and dealt with the publisher's server, if and when it is made URN-aware. In such a case, resolving the same URN in multiple locations MAY provide different services; the national bibliography might be able to provide bibliographic information only, while the publisher can provide the book itself, on its own terms. Users can expect Resolution services to co-exist and complement one another. The same ISBN can be resolved both as URN and as a Digital Object Identifier (DOI) [[DOIHOME](#)]. URN-based services hosted by, e.g., a national library, might provide only bibliographic metadata, whereas a service based on the DOI system provided by the publisher may supply the book, parts of the book or various other services.

Persistence is one of the key features for any persistent identifier system. There are three inter-related aspects of persistence that need to be discussed: persistence of the resource itself, persistence of the identifier, and persistence of the URN-based resolvers.

ISBNs are assigned to manifestations (physical embodiments) of books. Thus each digital version of a book (PDF, XML and so on) MUST receive its own ISBN. This guarantees that if URI fragment is added to the NSS, it remains functional as long as the digital manifestation is available.



Printed books and library catalogues are persistent, so even after 500 years, a URN:ISBN identifying a printed book can resolve to a bibliographic description of the book, which usually tells where the book can be found in, e.g., libraries' collections.

With digital books things get more complicated. According to ISO 2108, each product form must have a separate ISBN. Since digital manifestations are not long-lived, future users who try to find an old version of an electronic book, are not likely to find that version. Instead there will be several modernized versions of the resource, produced via migration. There might also be a printed book with similar intellectual content. These manifestations of a book SHOULD be interlinked (using, for instance, the work level metadata record with URN:ISBN links to all manifestations) so as to make a user aware of the existence of alternative sources. Such interlinking enables the users to retrieve manifestations which match their interests best. Different users are likely to have different preferences. While some users prefer a modern manifestation which no longer has the authentic look and feel, there are users who want the "first edition" even if it requires digital archaeology for access.

Persistence of URN:ISBN resolvers themselves is mainly an organizational issue, related to the persistence of organizations maintaining them. URN:ISBN resolution services are currently supplied by several national libraries to enable access to their legal deposit collections. These URN:ISBN resolution services are likely to be relatively persistent.

#### **4.4. Additional Considerations**

The basic guidelines for assigning ISBNs to electronic resources are the following:

- o Product form and the means of delivery are irrelevant to the decision whether a product needs an ISBN or not. If the content meets the requirements of the standard, it gets an ISBN, no matter what the file format or the delivery system.
- o Each product form (manifestation) of a digital publication should have a separate ISBN. The definition of a new edition is normally based on one of the two criteria:
  - \* A change in the kind of packaging involved: the hard cover edition, the paperback edition and the library-binding edition would each get a separate ISBN. The same applies to different versions of digital books.



- \* A change in the text, excluding packaging or minor changes such as correcting a spelling error. Again, this criterion applies regardless of whether the publication is in printed or in digital form.

Although these rules seem clear, their interpretation may vary. As already [RFC 2288](#) [[RFC2288](#)] pointed out,

The choice of whether to assign a new ISBN or to reuse an existing one when publishing a revised printing of an existing edition of a work or even a revised edition of a work is somewhat subjective. Practice varies from publisher to publisher (indeed, the distinction between a revised printing and a new edition is itself somewhat subjective). The use of ISBNs within the URN framework simply reflects these existing practices.

Since ISBN assignment is a manual process mistakes do happen. For instance, ISBNs are occasionally re-used for another book or another manifestation of the same book. Such human errors are relatively rare and do not threaten or undermine the value of the ISBN system as a whole. They are not a serious risk to the URN resolution service based on ISBNs.

Libraries routinely correct ISBN mistakes. Their catalogs provide cross references ("incorrect ISBN -> correct ISBN"). This MUST be taken into account in the URN resolution process. Further details on the process of assigning ISBNs can be found in [Section 5](#) (Namespace registration) below.

## **5. URN Namespace Registration and Use**

The formal URN Namespace Identifier Registration for the pre-2005 version of the International Standard Book Number (ISBN) was done in [RFC 3187](#) [[RFC3187](#)].

The new ISBN standard does not require a new namespace, but the registration is renewed here. The registrant organization has moved from Staatsbibliothek zu Berlin - Preussischer Kulturbesitz to The International ISBN Agency, London, U.K. Moreover, the description of the NSS and resolution details have been amended.

### **[5.1.](#) URN Namespace ID Registration for the International Standard Book Number (ISBN)**

This registration describes how International Standard Book Numbers (ISBN) can be supported within the URN framework.





[ RFC Editor: please replace "XXXX" in all instances of "RFC XXXX" below by the RFC number assigned to this document. ]

Namespace ID: ISBN

This Namespace ID has already been assigned to the International Standard Book Number in January 2001 when the namespace was initially registered.

Kind of named resources:

Manifestations of monographic publications.

Registration Information:

Version: 2

Date: 2012-10-19

Declared registrant of the namespace:

Registering Organization: The International ISBN Agency

Designated Contact Person:

Name: Ms. Stella Griffiths

Affiliation: Executive Director, The International ISBN Agency

Email: [info@isbn-international.org](mailto:info@isbn-international.org)

Postal: EDItEUR, 39-41 North Road, London, N7 9DP, U.K.

Web URL: <<http://www.isbn-international.org/>>

Declaration of syntactic structure of NSS part:

The namespace-specific string of 'ISBN' URNs is either an ISBN-13 (see [Section 4.1.2](#) of RFC XXXX) or an ISBN-10 (see [Section 4.1.1](#) of RFC XXXX); the former is preferred.

Example 1: URN:ISBN:978-0-395-36341-6

Example 2: URN:ISBN:951-0-18435-7

Example 3: URN:ISBN:951-20-6541-X

Example 4: URN:ISBN:951206541X

Relevant ancillary documentation:

The ISBN (International Standard Book Number) is a unique machine-readable identification number, which marks any edition of a book unambiguously. This number is defined in ISO Standard 2108:2005. ISBNs has been in use for more than 30 years and they have revolutionised the international book-trade. 170 countries and territories are officially ISBN members.



The administration of the ISBN system is carried out on three levels:

- International agency,
- Group agencies,
- Publishers.

The International ISBN agency is located in London. The main functions of the Agency are:

- \* To promote, co-ordinate and supervise the world-wide use of the ISBN system.
- \* To approve the definition and structure of group agencies.
- \* To allocate group identifiers to group agencies.
- \* To advise on the establishment and functioning of group agencies.
- \* To advise group agencies on the allocation of international publisher identifiers.
- \* To publish the assigned group numbers and publisher prefixes in up-to-date form.

Detailed information about ISBN usage can be found from the ISBN Users' Manual [[ISBN\\_UM](#)]. A shorter introduction to ISBN usage can be found from the ISBN FAQ web pages [[ISBN\\_FAQs](#)], which also include guidelines for the assignment of ISBNs to e-books.

#### Conformance with URN Syntax:

Legal ISBN characters are 0-9 and hyphen for ISBN-13 and 0-9, hyphen, and X for ISBN-10. No percent-encoding is needed. Hyphen carries no semantic content and MAY be dropped from the NSS.

#### Rules for Lexical Equivalence of NSS part:

ISBN numbers are usually printed with the letters 'ISBN' and a single blank preceding the ISBN proper (for instance: ISBN 951-746-795-8). The data preceding the ISBN MUST NOT be included in the NSS. No percent-encoding is needed.

Prior to comparing the NSS of two ISBN-based URNs for equivalence, all hyphens, if present, MUST be removed and letter 'X' capitalized. Prior to comparing a URN based on ISBN-10 with a URN based on ISBN-13, the ISBN-10 MUST be converted to the ISBN-13 form. This step is necessary since it is not possible to know if



the ISBN-10s have been converted to the new form; libraries SHOULD keep the old ISBN since it is the one printed in books published prior to 2007, while publishers MAY convert the old identifiers originally assigned in ISBN-10 form and use the equivalent ISBN-13s in unchanged reprints of the books, which according to the ISBN assignment rules should not receive a new ISBN.

Note that the prefix "URN:ISBN:" is case-insensitive; generic URI parsing and comparison software frequently uses lower case as the canonical (normalized) form.

Note that URI fragment and/or query, if present, are not part of the NSS and MUST be removed before the lexical equivalence is determined. Thus urn:isbn:978-951-1-25645-8, urn:isbn:978-951-1-25645-8?s=U2C and urn:isbn:978-951-1-25645-8#chapter2 are lexically equivalent, although the URN resolvers will treat them in a different manner.

The URNs are equivalent if the normalized forms compare equal.

#### Usage of query instructions:

URN:ISBN resolvers MAY support several global services. Some of them have been specified in [RFC 2483](#); some remain unspecified. Examples of existing relevant services are URI to URL or URLs, URI to URN or URNs, URI to resource or resources, and URI to URC or URCs. The component directive is relevant especially to the URI to URC service, where it can be used to, e.g., indicate the preferred metadata format or the completeness of the metadata record or the metadata content requested such as table of contents. A URN resolver maintained by a national library may consult for instance the national bibliography, digital asset management systems and digital preservation systems to supply these services.

Examples of services which may be specified and implemented in the future: request the oldest and most original manifestation of the resource; request the latest version of the resource and request metadata related to the work.

#### Usage of fragment part:

If URI-to-resource service is used and the media type supports the use of URI fragment parts, the users can utilize that to indicate locations within the identified resources since ISBNs are assigned to one and one only manifestation of a resource.



The URN:ISBN Namespace does not impose any restrictions of its own on the fragment identifiers allowed, beyond what the respective media type admits.

#### Identifier uniqueness considerations:

ISBN is a unique identifier. An ISBN, once it has been assigned, MUST NOT be re-used for another book or another product form (manifestation) of the same book.

URN:ISBNs inherit the uniqueness properties from ISBNs. Please note that the same ISBN can be used in another persistent identifier system, such as DOI or Handle. The resulting persistent identifier is likely to provide different resolution services than URN:ISBN.

If there are multiple manifestations of a single literary work such as a novel, each one MUST receive a different ISBN. ISTC (International Standard Text Code, ISO 21047-2009) enables identification of textual works. See <http://www.istc-international.org/> for more information. Annex E of the ISTC standard describes the relations between ISTC and publication identifiers such as ISBN.

#### Identifier persistence considerations:

ISBN is a persistent identifier. Once a book has received an ISBN, it MUST NOT get a new ISBN.

URN:ISBNs inherit the persistence properties from ISBNs.

Since ISBNs are attached to manifestations, a URI fragment, if attached to the URN:ISBN, is as persistent as the ISBN itself. Support for URI query is likely to be less persistent, since it is dependent on applications supporting the functionality requested.

#### Process of identifier assignment:

Assignment of ISBNs is controlled, and URN:ISBNs inherit this property. There are three levels of control: the international agency, group agencies that typically operate in the national level, and finally each publisher is responsible of using the ISBN system correctly. Small publishers may demand ISBN numbers one at a time by contacting the ISBN group agency. Large publishers receive ISBN blocks from which they allocate ISBNs to the books according to the ISBN assignment rules.





Process for identifier resolution:

See [Section 4.3](#) of RFC XXXX.

Validation mechanism:

The check digit helps to assure the correctness of an ISBN number assigned for a book when it has been entered or processed. Applications processing bibliographic data such as integrated library systems MAY check the correctness of both ISBN-10 and ISBN-13 (and make conversions between the two). If the number is wrong due to, e.g., a typing error made by a publisher, a correct ISBN SHOULD be assigned afterwards. Although the book will only contain the wrong number, national bibliography and system used by the book trade often will contain both the wrong and new, correct ISBN number.

Scope:

ISBN is a global identifier system used for identification of monographic publications. It is very widely used and supported by the publishing industry.

## **6. Security Considerations**

This document proposes means of encoding ISBNs within the URN framework. An ISBN-based URN resolution service is depicted here both for ISBN-10 and ISBN-13, but only in a fairly generic level; thus questions of secure or authenticated resolution mechanisms are excluded. It does not deal with means of validating the integrity or authenticating the source or provenance of URNs that contain ISBNs. Issues regarding intellectual property rights associated with objects identified by the ISBNs are also beyond the scope of this document, as are questions about rights to the databases that might be used to construct resolvers.

Beyond the generic security considerations laid out in the underlying documents listed in the Normative References ([Section 9.1](#)), no specific security threats have been identified for ISBN-based URNs.

## **7. IANA Considerations**

IANA is asked to update the existing registration of the Formal URN Namespace 'ISBN' using the template given above in [Section 5.1](#), which follows the outline specified in RFC 3406bis [[I-D.ietf-urnbis-rfc3406bis-urn-ns-reg](#)].



## 8. Acknowledgements

This draft version is the outcome of work started in 2008 and brought to the IETF in 2010 to launch a much larger effort to revise the basic URN RFCs. The aim in the IETF is to bring these RFCs in alignment with the current URI Standard (STD 63, [RFC 3986](#)), ABNF, and IANA guidelines. The participants of project PERSID (<http://www.persid.org/>) contributed significantly to the standards work.

Leslie Daigle has provided valuable guidance in the initial draft stage of this memo.

Stella Griffiths has advised and guided the development of this document, has verified the technical content from the director's view of the International ISBN Agency, and provided valuable comments.

Larry Masinter, Subramanian Moonesamy, Julian Reschke, and other participants of the URNbis working group have provided review comments and text suggestions that have improved this document.

## 9. References

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## 9.2. Informative References

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## **Appendix A. Draft Change Log**

[ [ RFC-Editor: Whole section to be deleted before RFC publication. ] ]

### **A.1. [draft-hakala-rfc3187bis-isbn-urn-00](#) to [draft-ietf-urnbis](#)-\*-00**

- formal updates for a WG draft;
- [RFC 2288](#) now obsoleted and made Historic;
- added references to rfc2141bis and rfc3406bis;
- Sect.3 reorganized and amended: Namespace/Community Considerations;
- registration template adapted to rfc3406bis [-00];
- numerous editorial fixes and improvements.

### **A.2. [draft-ietf-urnbis-rfc3187bis-isbn-urn-00](#) to -01**

- discussion on persistence altered, based on list discussion;
- changes and amendments to discussion of URN resolution services;
- discussion of fragment part usage added;
- broken link to ISBN manual fixed based on feedback from [[ISBNORG](#)];
- various editorial fixes and enhancements.

### **A.3. [draft-ietf-urnbis-rfc3187bis-isbn-urn-01](#) to -02**

- addressed review comments by LM and SM;
- cleanup of requirements language, but
- kept [RFC 2119](#) terms where non-canonical/non-intuitive behavior of resolver systems is specified;
- URLs for ISBN user manual (new public version) etc. updated;
- numerous editorial updates, fixes, and enhancements.

### **A.4. [draft-ietf-urnbis-rfc3187bis-isbn-urn-02](#) to -03**

- use of URI fragment is now allowed since they are not part of the NSS;
- namespace registration template updated to conform with the -03 version of the rfc3406bis draft
- a few editorial updates, fixes, and enhancements.





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