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**Using National Bibliography Numbers as Uniform Resource Names
draft-ietf-urnbis-rfc3188bis-nbn-urn-04**

Abstract

National Bibliography Numbers, NBNs, are used by the national libraries and other organizations in order to identify various resources such as digitized monographs. Generally, NBNs are applied to resources that do not have an established (standard) identifier system of their own.

A URN (Uniform Resource Names) namespace for NBNs was established in 2001 in [RFC 3188](#). Since then, several European national libraries have implemented URN:NBN-based systems.

This document replaces [RFC 3188](#) and defines how NBNs can be supported within the updated URN framework. A revised namespace registration (version 4) compliant to the RFC 3406bis draft is included.

Discussion

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]]

Status of This Memo

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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 traditional identifier, when used within the URN system, needs to have a namespace of its own. At the time of this writing, there were 46 registered Formal URN namespaces (see [[IANA-URN](#)]), one of which belongs to NBN, National Bibliography Number, as specified 2001 in [RFC 3188](#) [[RFC3188](#)].

URN:NBNs are in production use in several European countries including (in alphabetical order) Austria, Finland, Germany, Italy, the Netherlands, Norway, Sweden, and Switzerland; other countries in Europe and elsewhere are considering usage of them. The URN:NBN namespace is collectively managed by the national libraries. URN:NBNs have been applied to diverse content including Web archives, digitized materials, research data, and doctoral dissertations. They can be used by the national libraries and organizations co-operating with them.

As a part of the initial development of the URN system back in the late 1990s, the IETF URN working group agreed that it was important to demonstrate that the URN syntax can accommodate existing identifier systems. [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 NBN (National Bibliography Number), ISBN (International Standard Book Number), and ISSN (International Serial Standard Number) in RFCs 3188 [[RFC3188](#)], 3187 [[RFC3187](#)], and 3044 [[RFC3044](#)], respectively. The ISBN namespace registration has now been revised so that it covers both ISBN-10 and ISBN-13 [[I-D.ietf-urnbis-rfc3187bis-isbn-urn](#)]. Since the current ISSN registration does not cover ISSN-L, defined in the new version of the ISSN standard, an update of the existing namespace registration is also pursued currently [RFC 3044](#) [[RFC3044](#)],

The term "National Bibliography Number" encompasses persistent local identifier systems that the national libraries and their partner organizations use in addition to the more formally (and internationally) established identifiers. In practice, NBN differs from the standard identifier systems listed above because it is not a

single identifier system with standard-specified scope and syntax. Each NBN implementer is obliged to keep track of how NBNs are being used, but within the generic framework set in this document, local NBN assignment policies may vary a lot.

Historically, NBNs were only applied in the national bibliographies to identify the resources catalogued into it. Prior to the emergence of bibliographic standard identifiers, every publication got an NBN. As of this writing, NBNs are given to, e.g., new books that do not have an ISBN.

During the last 10 years, the NBN scope has been extended to cover a vast range of digitized and born digital resources available in the Internet. Only a small subset of these resources is catalogued in the national bibliographies or other bibliographic databases. Web contents harvested into Web archives are an example of resources that are usually not catalogued but can nevertheless receive an NBN.

It is possible and even likely that the scope of the NBN will be expanded even further. For instance, NBNs can be used to identify metadata elements in order to facilitate creation of linked data. NBNs can also be used for identification of (immaterial) works when there is no standard identifier that could be used for the type of work in question. Still images are an example of this.

Simple guidelines for using NBNs as URNs and the original namespace registration were published in [RFC 3188](#) [[RFC3188](#)]. The RFC at hand replaces [RFC 3188](#); sections discussing the methods in which URN:NBNs should be resolved have been updated, unused features have been eliminated, and the text is compliant with the stipulations of the revised URN specification and URN Namespace definition documents (RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)], 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](#)].

"NBN" refers to any National Bibliography Number identifier system used by the national libraries and other institutions using these identifiers with the national library's support and permission.

In this memo, "URN:NBN" is used as a shorthand for "NBN-based URN".

3. Fundamental Namespace and Community Considerations for NBN

3.1. The URN:NBN Namespace

NBNs are widely used to identify both hand-held and digital resources in the deposit collections of national libraries and similar institutions that are responsible for preserving the cultural heritage of their constituents. All resources in these collections will be preserved for long term. While the preferred methods for digital preservation may vary over time and depending on the content, the favourite one is currently migration. Whenever necessary, a document in outdated file format is migrated into a more modern file format. The old versions of a resource are kept, in order to alleviate the negative effects of failed migrations and gradual loss of original look and feel that often accompany even successful migrations. When there are multiple manifestations of a digital object, each one SHOULD have its own NBN.

NBNs SHOULD only be used for objects when standard identifiers such as ISBN are not applicable. However, NBNs MAY be used for component resources even when the resource as a whole qualifies for a standard identifier. For instance, if a digitized book has an ISBN, a JPEG file containing a single page of the book can get an NBN. Then the URN:NBN can be used as a persistent link to the page.

The scope of standard identifier systems such as ISBN and ISSN is limited; they are applicable only to certain kinds of resources. Generally speaking, the role of the NBN is to fill in the gaps. Collectively, the standard bibliographic identifiers and NBNs cover -- at least in theory -- all resources the national libraries and their partners need to preserve for long term. NBNs can also be applied to immaterial works (which can have 0-n physical manifestations, and each manifestation 0-n items) and, e.g., metadata elements plus terms and concepts in ontologies and thesauri.

[Section 4](#) below, and there in particular [Section 4.1](#), presents a more detailed overview of the structure of the NBN namespace, related institutions, and the identifier assignment principles used.

3.2. Community Considerations for NBNs

National libraries are the key organizations providing persistent URN resolution services for resources identified with NBNs, independent of their form. National libraries MAY allow other organizations such as university libraries or governmental organizations to assign NBNs to the resources they preserve for long term. In such case, the national library MUST co-ordinate the use of NBNs at the national level. National libraries can also provide URN resolution services

and technical services to other NBN users. These organizations MUST either establish their own URN resolution services or use the technical infrastructure provided by the national library. In the URN:NBN namespace, each persistent identifier should be resolvable and provide one or more resolution services.

NBNs MAY be used to identify component resources, but the NBN Namespace does not specify a generic, intrinsic syntax for doing that. However, there are at least three different ways in which component resources can be identified and used within the NBN namespace.

The simplest approach is to assign a separate NBN for each component resource such as a file containing a digitized page of a book, and make no provisions to make such NBNs discernible in a systematical way from others. The URN:NBN assigned to the component resource enables direct and persistent access to the page, which might otherwise be available only via browsing the book from the title page to the page wanted.

Second, a local "fragment" syntax MAY be used to identify component resources in a structured manner within the NSS, independently of the requirements of [RFC 3986](#). Such private fragment identifiers SHOULD be recognized as such by the appropriate URN resolver application. The resolver SHOULD be able to process the fragment part in the URN:NBN correctly; if so, the result is the identified component part of the resource. For instance, if the resource is a database table, the identified component could be a single data element stored in the table.

Finally, if the stipulations of the URI Generic Syntax ([RFC 3986](#) [[RFC3986](#)]) and the Internet media type specification [RFC 2046](#) [[RFC2046](#)] are met, in accordance with the provisions in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)], URI fragment identifiers MAY be attached to URI references to URN:NBNs in order to designate a fragment of the media supplied by URN resolution.

Note that this implies that the fragment identifier is not a part of the NSS, that the resolution process SHALL retrieve the entire document, and that the fragment selection is applied by the resolution client (e.g., browser) to the media returned by the resolution service. In other words, in this latter case the fragments are logical and physical components of the resource whereas in the former cases these "fragments" are actually complete, independently named entities.

Resources identified by NBNs are not always available in the Internet. In that case, a surrogate such as a metadata record

describing the resource SHOULD be supplied. These records often contain information about the physical location(s) of the item(s), or links to related metadata records describing other (possibly digital) manifestations of the work in question.

If an NBN identifies a work, descriptive metadata about the work SHOULD be supplied. The metadata record can contain URI-based links to Internet-accessible digital manifestations of the work. Metadata records describing these manifestations can be interlinked and they can also contain a URI linking them to the work level metadata record.

[Section 4](#) below, and in particular [Section 4.3](#) therein, presents a detailed overview of the application of the URN:NBN Namespace as well as the principles of, and systems used for, the resolution of NBN-based URNs.

[4. National Bibliography Numbers \(NBNs\)](#)

[4.1. Overview](#)

National Bibliography Number (NBN) is a generic term referring to a group of identifier systems administered by the national libraries and institutions authorized by them. The NBN assignment is typically performed by the organization hosting the resource. National libraries are committed to preserving their deposit collections for a long time -- at least decades, but the aim is to provide access to digital resources for centuries.

Each national library uses NBNs independently of other national libraries; apart from this document, there is no global authority that controls NBN usage. For this reason, NBNs as such are unique only on the national level. When used as URNs, base NBN strings MUST be augmented with a controlled prefix, which is the particular nation's ISO 3166-1 alpha-2 two-letter country code. These prefixes guarantee uniqueness of the URN:NBNs at the global scale [[Iso3166MA](#)].

A national library using URN:NBNs SHOULD specify a local assignment policy; such policy SHOULD limit the URN:NBN usage to the digital resources stored permanently in the national library's deposit collection. A more liberal URN:NBN assignment policy MAY be applied, but NBNs assigned to a short-lived resources SHOULD NOT be made URN:NBNs.

URN:NBN assignment policy SHOULD also clarify the local policy concerning component resource identifier assignment and specify with sufficient detail the syntax of local component identifiers (if such exist as a discernible part of the NBNs). This syntax will only be

understood by the appropriate URN resolvers (that is, the resolvers that deal with the namespace in question). The policy SHOULD also cover any employed extensions to the default NBN scope (e.g., to cover works or data elements).

4.2. Encoding Considerations and Lexical Equivalence

Expressing NBNs as URNs is usually straightforward, as traditionally only ASCII characters have been used in NBN strings. If necessary, NBNs must be translated into canonical form as specified in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)].

When an NBN is used as a URN, the namespace-specific string (NSS) MUST consist of three parts:

- o a prefix, structured as a primary prefix, which is a two-letter ISO 3166-1 country code, and zero or more secondary prefixes, each indicated by a delimiting colon character (:) and a sub-namespace identifier,
- o a hyphen (-) as a delimiting character, and
- o the NBN string.

The prefix is case-insensitive. An NBN string can be either case-sensitive or case-insensitive, depending on the NBN syntax applied. Future implementers of NBNs MAY make their NBN strings case-insensitive.

Different delimiting characters are not semantically equivalent.

Use of colon as the delimiting character is allowed if and only if the country code-based NBN namespace (identified by the respective ISO 3166-1 country code used as the primary part of the prefix) is split further into smaller sub-namespaces, in which case the colon separates the ISO 3166-1 country code from the sub-namespace identifier. These sub-divisions (including the colon separator) form an optional part of the prefix. A colon MUST NOT be used for any other purpose in the prefix.

A hyphen MUST be used for separating the prefix and the NBN string, or the part of the NBN string that is assigned to the identified object by a sub-division authority.

If there are several national libraries in one country, these libraries MUST agree on how to divide the national namespace between themselves using this method before the URN:NBN assignment begins in any of these libraries.

A national library MAY also assign to trusted organization(s) such as a university or a government institution its own NBN sub-namespace. The sub-namespace MAY be further divided by the partner organization (or by the national library on request of the partner).

Being part of the prefix, sub-namespace identifier strings are case-insensitive. They MUST NOT contain any hyphens.

The sub-namespace identifiers used beneath a country-code-based namespace MUST be registered on the national level by the national library that assigned the code. The national register of these codes SHOULD be made available online.

Models (indicated linebreak inserted for readability):

```
URN:NBN:<ISO 3166 alpha-2 country code>-<assigned NBN string>
```

```
URN:NBN:<ISO 3166 alpha-2 country code>:<sub-namespace code>-\  
<assigned NBN string>
```

Examples (using actually assigned NBNs):

```
URN:NBN:fi-fe201003181510
```

```
urn:nbn:ch:bel-9039
```

```
urn:nbn:se:uu:diva-3475
```

```
urn:nbn:hu-3006
```

4.3. Resolution and Persistence of NBN-based URNs

Eventually, URNs might be resolved with the help of a resolver discovery service (RDS). Since no such system has been installed yet in the Internet, URN:NBNs are usually embedded in HTTP URIs in order to make them actionable in the present Internet. In these HTTP URIs, the authority part must point to the appropriate URN resolution service. For instance, in Finland, the address of the national URN resolver is <<http://urn.fi>>. Thus the HTTP URI for the Finnish URN in the example above is <<http://urn.fi/URN:NBN:fi-fe201003181510>>. This public persistent identifier will not change. In contrast, since the resource has already moved once from one DSpace system to another, its DSpace-internal Handle has changed (to <https://helda.helsinki.fi/handle/10138/18199>). Since Handles are in this case only internal identifiers, they do not need to persist, and users are asked to rely on the URN-based HTTP URI when they make persistent links to the document.

The country code-based prefix part of the URN namespace-specific string will provide a hint needed to find the correct national resolution service for URN:NBNS from the resolver discovery service when it is established.

There are three inter-related aspects of persistence that need to be discussed: persistence of the objects itself, persistence of the identifier, and persistence of the URN resolvers.

NBNS have traditionally been assigned to printed resources, which tend to be persistent. In contrast, digital resources require frequent migrations to guarantee accessibility. Although it is impossible to estimate how often migrations are needed, hardware and software upgrades take place frequently, and even a life time of 10-20 years can be considered as long.

Migration is often a lossy process, so different manifestations of a resource may have different look and feel, and even different intellectual content. Because of this, digital repositories usually preserve each manifestation. In the URN:NBNS namespace, each manifestation SHOULD have a different identifier.

Different users will prefer different manifestations. A user who requires authenticity probably wants the oldest version of the resource, whereas a user to whom easy access is a priority is likely to be satisfied with the latest manifestation. In order to enable the users to find the best match, it is necessary to interlink URN:NBNS belonging to the different manifestations of a resource to each other (possibly via a work level metadata record) so as to make the users aware of all the existing manifestations of the resource.

Thus, even if manifestations of digital resources are not and will not be persistent per se, persistent identifiers such as URN:NBNS may support construction of an information architecture which enables persistent access to the requested intellectual content.

Persistence of URN resolvers themselves is mainly an organizational issue, related to the persistence of organizations maintaining them. As URN:NBNS resolution services will be supplied (primarily) by the national libraries to enable access to their (legal) deposit collections, these services are likely to be long-lived.

4.4. Additional Considerations

URN:NBNS SHOULD NOT be assigned to resources that are known to not be persistent (that is, resources that will simply disappear). URN:NBNS MAY be applied to resources which have a low-level preservation priority, including resources which are not migrated but only

preserved as bits. URN:NBN or other persistent identifier should be applied to the documents which prioritized in the organisation's preservation plan. If the identified manifestation has disappeared, the resolution process SHOULD supply an alternative if one exists, such as the original printed version which can be used when a digitized surrogate has been lost or rendered unreadable.

5. URN Namespace ID Registration for the National Bibliography Number (NBN)

This URN Namespace registration describes how National Bibliography Numbers (NBNS) can be supported within the URN framework; it uses the template from RFC 3406bis [[I-D.ietf-urnbis-rfc3406bis-urn-ns-reg](#)].

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

Namespace ID: NBN

This Namespace ID was formally assigned to the National Bibliography Number in October 2001 when the namespace was registered officially. Utilization of URN:NBNS had started in demo systems already in 1998. Since 2001, tens of millions of URN:NBNS have been assigned. The number of users of the namespace has grown in two ways: new national libraries have started using NBNS, and some national libraries using the system have formed new liaisons.

Kind of named resources:

Preserved publications at the work, manifestation, or data element level -- or their metadata.

Registration Information:

Version: 4

Date: 2012-10-22

Declared registrant of the namespace:

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The National Library of Finland registered the namespace on behalf of the Conference of the European National Librarians (CENL) and

Conference of Directors of National Libraries (CDNL), which have both made a commitment in 1998 to foster the use of URNs. The NBN namespace is available for free for the national libraries. They MAY allow other organizations to assign URN:NBNs and use the resolution services established by the library for free or for a fee. The fees, if collected, SHOULD be based on, e.g., the maintenance costs of the system.

Declaration of syntactic structure of NSS part:

The namespace-specific string (NSS) will consist of three parts:

- * a prefix, consisting of an ISO 3166-1 alpha-2 country code and optional sub-namespace code(s) separated by colon(s),
- * a hyphen (-) as the delimiting character, and
- * an NBN string assigned by the national library or sub-delegated authority.

Formal declaration of the NSS, using ABNF [[RFC5234](#)]:

```
nbn_nss      = prefix "-" nbn_string

prefix       = iso_cc *( ":" subspc )
               ; the entire prefix is case-insensitive

iso_cc       = 2ALPHA
               ; country code as assigned by ISO 3166, part 1 --
               ; identifies the national library
               ; to which the branch is delegated

subspc       = 1*(ALPHA / DIGIT)
               ; as assigned by the respective national library

nbn_string   = <specific per prefix>
               ; MUST adhere to RFC 3986 <path-rootless> syntax;
               ; parsers must regard nbn_strings as case-sensitive
```

Colon MAY be used as a delimiting character only within the prefix, between ISO 3166-1 country code and sub-namespace code(s), which split the national namespace into smaller parts.

Whereas the prefix is regarded as case-insensitive, NBN-strings MAY be case-sensitive at the preference of the assigning authority; parsers therefore MUST treat these as case-sensitive; any case mapping needed to introduce case-insensitivity MUST be implemented in the responsible resolution system.

Hyphen MUST be used as the delimiting character between the prefix and the NBN string. Within the NBN string, hyphen MAY be used for separating different sections of the identifier from one another.

All two-letter codes are reserved by the ISO 3166 Maintenance Agency for either existing and possible future ISO country codes (or for private use).

Sub-namespace identifiers MUST be registered on the national level by the national library that assigned the code. The list of such identifiers SHOULD be available via the Web.

See [Section 4.2](#) of RFC XXXX for examples.

Relevant ancillary documentation:

National Bibliography Number (NBN) is a generic name referring to a group of identifier systems used by the national libraries and their partner organizations for identification of deposited publications and other resources (and their component parts) that lack a 'canonical' identifier. In the future, the scope of NBN can be extended to include, e.g., intellectual works and metadata elements. Each national library uses NBNs independently of other national libraries; there is neither a general standard defining the NBN syntax nor a global authority to control the use of these identifier systems.

The syntax of NBN strings is specified locally. NBNs used in national bibliographies contain only characters that belong to the US-ASCII character set. Following the expansion of the NBN scope and semi- and fully automated NBN assignment processes, some future NBNs MAY contain characters that MUST be translated into canonical form according to the specifications in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)].

Conformance with URN syntax:

The NSS syntax specified in this registration is in full conformance with RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)] and its predecessor.

Rules for lexical equivalence of NSS part:

The prefix, consisting of an ISO 3166-1 country code and its (optional) sub-divisions, is case-insensitive. The NBN string MAY be case-sensitive or case-insensitive, depending on the rules chosen by the NBN authority designated by the prefix; therefore, general-purpose resolver clients without sub-namespace specific

knowledge) MUST treat NBN strings as case-sensitive. Syntax requirements expressed in RFC 2141bis [[I-D.ietf-urnbis-rfc2141bis-urn](#)] MUST be taken into account.

Formally, two URN:NBNs are lexically equivalent if they are octet-by-octet equal after the following (conceptional) preprocessing:

1. normalize the case of the leading "urn:" token;
2. normalize the case of the prefix (country code and its optional sub-divisions);
3. normalize the case of any percent-encoding;

Note: The case used in the normalization steps is a local matter; implementations can normalize to lower or upper case as they see fit, they only need to do it consistently.

Usage of query instructions:

URN:NBN 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 can consult for instance the national bibliography, digital asset management systems and digital preservation systems to supply these services.

Examples of services that can 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 NBNs should be assigned to one and only one manifestation of a resource.

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

It is also possible to specify a local fragment syntax. By default, such syntax will be understood only by the URN resolvers

dedicated to the relevant URN:NBN sub-namespace. This syntax can be utilized when it is impractical to assign URN:NBNs to all component resources; for instance, a linguistic database can get a single URN:NBN, and each concept in the database can be identified with a fragment.

Identifier uniqueness and persistence considerations:

NBNs as such are not unique; different national libraries can assign the same NBN to different documents. Therefore, something must be done to guarantee the uniqueness of the URN:NBNs. The prefix, based on the ISO country code, serves this purpose. URN:NBNs, once given to the resource, MUST be persistent.

A URN:NBN, once it has been generated from a NBN, MUST NOT be re-used for another resource.

Users of the URN:NBN namespace MUST ensure that they do not assign the same URN:NBN twice. Different policies can be applied to guarantee this. For instance, NBNs and corresponding URN:NBNs MAY be assigned sequentially by programs in order to avoid human mistakes. It is also possible to use printable representations of checksums such as SHA-1 [[RFC6234](#)] or MD5 [[RFC1321](#)] as NBN, as long as the registration process prevents collisions (irrespective of the minuscule probability for these to occur).

Process of identifier assignment:

Assignment of NBN-based URNs MUST be controlled on national level by the national library / national libraries. National guidelines MAY differ, but the common denominator, however, is that the identified resources themselves SHOULD be persistent.

Different URN:NBN assignment policies have resulted in varying levels of control of the assignment process. Manual URN assignment by the library personnel provides the tightest control, especially if the URN:NBNs cover only resources catalogued into the national bibliography. In most libraries, the scope of URN:NBN is much broader than this. Usage rules MAY vary within one country, from one URN:NBN sub-namespace to the next. As of yet, there are no international guidelines for URN:NBN use beyond what has been expressed in this document.

Process for identifier resolution:

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

Validation mechanism:

None specified on the global level (beyond a routine check of those characters that require special encoding when employed in URIs). NBNs may have a well specified and rich syntax (including, e.g., fixed length and checksum). In such case, it is possible to validate the correctness of the NBN programmatically.

Scope:

NBNs are applied to resources held in the collections of national libraries and their partner organizations. NBNs may also be used to identify, e.g., works that these resources manifest, and the individual data elements present in the resource metadata.

6. Security Considerations

This document proposes means of encoding NBNs as URNs. A URN resolution service for NBN-based URNs is depicted, but only at a generic level; thus, questions of secure or authenticated resolution mechanisms and authentication of users are out of scope of this document. It does not deal with means of validating the integrity or authenticating the source or provenance of URN:NBNs. Issues regarding intellectual property rights associated with objects identified by the URN:NBNs are also beyond the scope of this document, as are questions about rights to the databases that might be used to construct resolution services.

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 NBN-based URNs.

7. IANA Considerations

IANA is asked to update the existing registration of the Formal URN Namespace 'NBN' using the template given above in [Section 5](#).

[[Editorial Note: this section to be amended by text on URN Query Parameter registries, once discussion on versions -03 of rfc2141bis and rfc3406bis drafts has settled.]]

8. Acknowledgements

Revision of [RFC 3188](#) started during the project PersID (<<http://www.persid.org>>). Later the revision was included in the charter of the URNbis working group in the Applications Area. The author wishes to thank his colleagues in the PersID project and the URNbis participants for their support and review comments.

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[Appendix A](#). Significant Changes from [RFC 3188](#)

Numerous clarifications based on a decade of experience with [RFC 3188](#).

Non-ISO 3166 (country code) based NBNs have been removed due to lack of usage.

In accordance with established practice, the whole NBN prefix is now declared case-insensitive.

Updated URN:NBN Namespace Registration template for IANA; whole document adapted to new URN Syntax document, RFC 2141bis, and new URN Namespace Registration document, RFC 3406bis.

Use of query directives and fragment parts with this Namespace is now specified, in accordance with the aforementioned RFCs.

Appendix B. Draft Change Log

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

B.1. [draft-hakala-rfc3188bis-nbn-urn-00](#) to [draft-ietf-urnbis-* -00](#)

- formal updates for a WG draft; no more "Updates: 2288";
- introduced references to other URNbis WG documents;
- changes based on review by Tommi Jauhiainen;
- Sect. 3 restructured into namespace and community considerations;
- old Sect. 7 incorporated in new Sect. 3.1;
- Security Considerations: old [Section 4.5](#) merged into [Section 5](#);
- added guidelines for when two manifestations of the same work should get different URN:NBNs;
- clarified role of ISO 3166/MA for ISO 3166-1 country codes;
- clarified role of non-ISO prefix registry maintained by the LoC;
- resolved inconsistency in lexical equivalence rules: as already specified for ISO alpha-2 country-codes, and in accordance with established practice, the whole NBN prefix is now declared case-insensitive;
- registration template adapted to rfc3406bis[-00];
- numerous editorial fixes and enhancements.

B.2. [draft-ietf-urnbis-rfc3188bis-nbn-urn-00](#) to -01

- Numerous changes to accommodate the outcome of the discussions;
- on the urn list;
- three different ways of identifying fragments specified;
- removed some redundant/irrelevant paragraphs/subsections;
- the "one manifestation, one URN" principle strengthened;
- introduced the idea of interlinking manifestations;
- extended the scope of the NBN explicitly to works;
- added reference to S4.2 in namespace registration;
- numerous editorial fixes and enhancements.

B.3. [draft-ietf-urnbis-rfc3188bis-nbn-urn-01](#) to -02

- Removed the possibility of using prefixes not based on country codes;
- replaced all instances of the word object with resources;

- removed some redundant/irrelevant paragraphs/subsections;
- allowed the possibility for identifying data elements with NBNs;
- a few editorial fixes and enhancements.

B.4. draft-ietf-urnbis-rfc3188bis-nbn-urn-02 to -03

- improved text related to "prefix" in NSS;
- addressed issues with text related to case-sensitivity of NSS strings;
- addressed comments and open details on requirements language;
- switched language to talk about "resource" instead of "object";
- several more editorial fixes and enhancements.

B.5. draft-ietf-urnbis-rfc3188bis-nbn-urn-03 to -04

- specification of how to use URN query and fragment part based on the revised versions of rfc2141bis and rfc3406bis;
- various textual improvements and clarifications, including:
- textual alignments with rfc3187bis draft vers. -03;
- multiple editorial fixes and improvements.

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