

Policy for issuing URNs in the urn:nbn:de namespace

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Contents

About this document	4
Designated community	4
Publication	4
Background.....	4
urn:nbn:de	5
Issuing URNs in the urn:nbn:de namespace.....	5
Conditions for registering a subnamespace in urn:nbn:de.	5
Obligations of URN partners with their own subnamespace	6
Rules regarding the issue of URNs in the urn:nbn:de namespace	6
APPENDIX 1	8
Structure of a urn:nbn:de.....	8
Background.....	8
Hierarchical structure of the URN	8
The structure of URNs in the urn:nbn:de namespace.....	8
Structure of a urn:nbn:de string	9
How is the last part of a urn:nbn:de, the "NISS", formed?	9
Each urn:nbn:de identifier must be formally correct.....	10
How is the check digit of a urn:nbn:de identifier formed?.....	10
APPENDIX 2	11
The issue of URNs in the urn:nbn:de namespace for different types of object.....	11

Policy for issuing URNs in the urn:nbn:de namespace

About this document

Designated community

This document is aimed at institutions that provide persistent identification of their digital publications for the purpose of ensuring reliable citability. These are predominantly institutions which issue URNs from the urn:nbn:de namespace within a separate subnamespace and which aim to assume responsibility for their administration and management in the long term. The present guidelines - hereinafter "policy" - set out the conditions under which an institution or a publisher can become a URN partner¹ and manage its own URN subnamespace, and specify the obligations this entails. It is also specified for which objects URNs from the urn:nbn:de namespace can be issued and what rules apply for issuing URNs.

This document is also aimed at interested end users, as a means of improving transparency in the use of urn:nbn:de URNs.

Publication

This document, including its version information, is to be continually revised and adapted as requirements change; it is published in PDF format on the web pages of the German National Library (DNB).

Before participating in the URN system, new URN partners must accept the conditions and rules set out herein. This greatly increases the binding force of the rules and further enhances the quality of the urn:nbn:de persistent identifier system.

Background

The number of both subnamespaces and registered URNs has increased greatly since the EPICUR² project came to an end in 2005. The number has risen steadily and passed the 10 million mark at the end of 2012. In 2011 alone, almost 3 million new URNs were added to the URN database. The expansion of the collection mandate³ of the German National Library on the one hand and the large number of digitisation projects on the other hand mean that the URN service now has to cope with a wide range of different object types. The changed conditions and the collective experience of the last few years have made it necessary to rethink and optimise the previous URN strategy and to change the rules governing issuing practice. This revision is a prerequisite for the German National Library to continue developing and maintaining this free service. The goal is to increase both the reliability and the transparency of the URN service to ensure that the widespread distribution that URNs already enjoy as persistent identifiers in electronic publishing in Germany can be further consolidated in the future.

¹ URN partners are institutions that have their own subnamespace within the urn:nbn:de namespace.

² <http://www.dnb.de/EN/Wir/Projekte/Abgeschlossen/epicur.html>; date: 14.9.12

³ http://www.dnb.de/EN/Wir/Sammelauftrag/sammelauftrag_node.html; date: 14.9.12

urn:nbn:de

Uniform Resource Names (URNs) are persistent identifiers (as are e.g. DOIs, ARKs or Handles). Their purpose is to identify resources on a permanent and location-independent basis. A resource labelled with a URN can be anything that can be uniquely described. The different URN usage variants are shown in the list of registered namespaces.⁴

This document concerns the namespace urn:nbn:de for which the German National Library is responsible.

urn:nbn:de identifiers are issued for digital objects. These must be discrete content units and be archivable. The function of a urn:nbn:de identifier is to make digital objects permanently citable and accessible. A basic precondition for this is that the objects identified must be preserved in an unchanged state.

Any mention of URNs below refers **exclusively to URNs in the urn:nbn:de namespace**.

Issuing URNs in the urn:nbn:de namespace

When online publications that are subject to the legal deposit regulation are delivered to the German National Library, the library offers issuing urn:nbn:de persistent identifiers as an additional service. All objects submitted are given URNs during the delivery process. The German National Library generally issues URNs from within its own subnamespace (urn:nbn:de:101:1).

If institutions and publishers fulfil the criteria listed below, the German National Library offers them the possibility to manage their own subnamespace within the urn:nbn:de namespace and to register URNs in it. On the one hand this gives them full freedom in creating their own URNs within a set framework, yet on the other hand it also obliges them to assume responsibility for the accuracy of the URNs and to ensure that they remain permanently resolvable. The German National Library is responsible for registering such a URN subnamespace.

The URN service is also available for publications that do not fall within the collection mandate of the German National Library. In this case, however, a separate subnamespace is always required.

Conditions for registering a subnamespace in urn:nbn:de.

- **Long-term preservation**

The applicant's objects must either already be in a trusted repository (that carries the Data Seal of Approval⁵ or equivalent) or it must have concrete, documented prospects of being entered in the future. This includes present or future archiving of the objects by the German National Library as the result of online publication deposits.

- **Suitable URN partners**

are public (or other scientific) institutions or larger publishers based in Germany which regularly issue large numbers of publications (i.e. not self-publishers, individuals, private persons or small publishers).

University institutes or cooperative projects should contact their parent institution.

⁴ <http://www.iana.org/assignments/urn-namespaces/urn-namespaces.xml> ; date: 14.9.12

⁵ <http://assessment.datasealofapproval.org/seals/>, date: 06.11.2012

- **Types of object**

Documents eligible for the issue of URNs in the urn:nbn:de namespace are described in detail in the "Types of object" section (see Appendix 2).

- **Obligations and rules**

All URN partners commit themselves to meet their obligations (see below) and to adhere to the URN issuing rules (see below) for the urn:nbn:de namespace.

Obligations of URN partners with their own subnamespace

- **Frequency of URN issue**

Any organisation which has its own subnamespace is obliged to issue URNs on a regular basis. If no URN is registered in a subnamespace within a period of one year, it will be assumed that the subnamespace has been discontinued and the relevant account of the partner will be closed without further enquiry.

- **Contacts**

The URN partner nominates a contact person both for the end user and the German National Library. Substitutes and successors must be nominated to ensure continuous availability. The URN service of the German National Library must be informed in advance if there are any changes to the contact persons or their addresses.

- **E-mail address for URN-related questions**

The URN partner provides the German National Library with a contact e-mail address that the library can publish together with the result set from the URN resolver. The partner commits to answer and process all queries sent to this e-mail address within a reasonable period of time.

- **URN registration before legal deposit**

The following applies if the URN partner is also a depositor of online publications with the German National Library:

All objects to be deposited must already have been assigned a urn:nbn:de identifier by the URN partner. This URN is registered with the URN service before the deposit and is submitted together with the object when it is deposited with the German National Library.

- **Naming the subnamespace**

Once registered, a subnamespace can no longer be changed or renamed. This must be taken into account when choosing the name. It is not possible to make any adjustments, for example, to bring it in line with changes to the name or structure of the organisation.

Rules regarding the issue of URNs in the urn:nbn:de namespace

In order to safeguard the high quality of the URNs in the urn:nbn:de namespace, they should be issued in compliance with the following rules. Each URN partner is responsible for the URNs in his own URN namespace.

A urn:nbn:de identifier is persistent and citable

This can only be ensured if the formal criteria are observed and if the URNs function correctly and remain up-to-date and known.

- Each URN must be formally correct (see Appendix 1).
- urn:nbn:de identifiers only become valid once they are registered in the German National Library with the corresponding URLs. A URN must be correctly registered within 24 hours of

it being published. The procedures must therefore be designed so that URNs are not publicly accessible before the objects are made available or the URN is registered. Retroactive registration within the deposit process of the online publication to the German National Library is not possible (see <http://www.dnb.de/EN/Netzpublikationen/URNService/urnTransferschnittstellen.html>).

- At least one valid URL is registered for each urn:nbn:de identifier. A valid URL refers directly to the object or a landing page of the object with supplementary metadata. (Note: each URL can only be registered once to a given URN.)
- All special characters in URLs must be percent encoded.
- All URN partners commit to manage their URNs continuously and indefinitely. They must therefore ensure that the URLs connected to the URNs in their subnamespace are permanently valid and up-to-date. The 24 hour rule applies here, too. (Redirects are possible and accepted.) The relevant URN partner is responsible in each case. Exceptions include the link to the archive of the German National Library or other URLs which have been added by third-party institutions.
- It is not allowed to delete a urn:nbn:de. If documents with a URN are withdrawn from publication, the URN must link to a substitute page with relevant information and the URN service of the German National Library should be contacted to set up a redirect if necessary.
- The urn:nbn:de is published in the document itself and/or on the landing page for the object.

Each urn:nbn:de is unique.

- A URN can only be issued once for one object. It is not permitted to re-use that same URN for a different or an altered object.
- Only one URN can be issued for each object. For this reason no URNs may be issued to documents which already have a URN. Therefore:
 - urn:nbn:de identifiers can only be issued within an organisation's own area of digital object responsibility. This applies regardless of the technical means by which the objects are provided, e.g. by an external institution.
 - If a digital object for which a urn:nbn:de has already been issued is managed by a different institution, the URN must be transferred. If no metadata are transferred, the institution in question must be notified of the existence of the URN (e.g. by using the URN as an access mechanism for the object).
- As soon as an object for which a urn:nbn:de was issued is altered, even if only slightly, it is given a new URN. urn:nbn:de identifiers are therefore only issued for static objects.
- Even if another persistent identifier such as a DOI has already been issued for a digital object, it can also be given a urn:nbn:de.

APPENDIX 1

Structure of a urn:nbn:de

Background

The **Uniform Resource Name (URN)** system has been in existence since 1992 and is an addressing standard for objects which carry an institutional obligation to provide persistent, location-independent identification of the resources. URNs were devised with the aim of keeping costs for providing the service and the use of URNs as low as possible - comparable to existing namespaces such as URLs. For this reason standards were created to define how existing or used namespaces or number systems can be easily integrated into the URN schema, the common protocols such as HTTP (Hypertext Transfer Protocol) or schemas such as URLs.

The URN standard was developed by the [URN Working Group](#) of the [Internet Engineering Task Force \(IETF\)](#). The IETF is part of the [Internet Assigned Numbering Authority \(IANA\)](#). It generates and publishes the de facto internet standards in the form of so-called "Requests for Comments" (RFCs). The URN standard includes:

- URN syntax ([RFC 2141](#)),
- Functional requirements for URNs ([RFC 1737](#)),
- Registration of URN namespaces (e.g. RFCs [3406](#), [2288](#), [3187](#), [3188](#)),
- URN delegation procedures (RFCs [3401](#), [3402](#), [3403](#), [3404](#)).

Hierarchical structure of the URN

URNs consist of a number of hierarchically structured components. These include the namespace (NID), which can consist of several subordinate subnamespaces (SNID), and the namespace specific string (NISS).

URN:NID:SNID-NISS

NID Namespace
SNID Subnamespaces (*SNID*)
NISS Namespace specific string, the actual identifying part (*NISS*).

Both existing number systems (e.g. ISBN) and institution-related systems can be integrated at the regional or international level as namespaces within the structure of the URN. This also includes the "National Bibliography Number" (NBN, [RFC 3188](#)), an internationally managed namespace of the European national libraries.

Within this namespace for national libraries, the URNs in the urn:nbn:de namespace come under the area of responsibility of the German National Library.

The structure of URNs in the urn:nbn:de namespace

All URNs, which are issued in Germany and fall within the remit of the URN service of the German National Library and can be resolved by its resolver have the following structure:

URN:NBN:DE:SNID-NISS Check digit

URN is the name of the resolving routine

NID **NBN** **National Bibliography Number**

designates the international "National Bibliography Number" namespace (NBN), which is a namespace managed cooperatively by the national libraries.

DE stands for the namespace that the URN service of the German National Library is responsible for.

SNID Subnamespaces (*SNID*)

NISS *Namespace Specific String*

Check digit The check digit serves to validate the entire URN string.

Structure of a urn:nbn:de string

There are different possibilities for structuring the URNs administrated by the German National Library.

The following structure, for example, is commonly used by libraries:

urn:nbn:de:[library network abbreviation]:[library identifier]-[unique number][check digit]

Example:

urn:nbn:de:gbv:089-3321752945

Libraries / institutions / publishers outside the library networks normally generate URNs with the following structure:

urn:nbn:de:[four-digit numerical code]-[unique number][check digit]

Example:

urn:nbn:de:0292-97839421307388

Only lower case characters may be used to designate a subnamespace.

It should be noted that a subnamespace, once registered, may not be subsequently changed or renamed. It is not possible, for example, to make any adjustments to bring it in line with changes to the name or structure of the organisation. This must be taken into account when choosing the name.

A subnamespace must be applied for at the German National Library, which registers it as an integral part of the URNs.

How is the last part of a urn:nbn:de, the "NISS", formed?

The freely definable part of the URN is introduced by a hyphen. The URN resolver interprets the hyphen as a separator between the fixed subnamespace and the actual identifier, which can be set as desired.

The NISS can be a serial number, a unique production number or a combination of date and serial number. Alphanumerical tokens (strings of numbers and characters) are also possible. There is no necessity for a fixed number of positions, rather the NISS can be gradually expanded as required.

urn:nbn:de:[network initial]:[library identifier]-[unique number][check digit]

urn:nbn:de:[four-digit numerical code]-[unique number][check digit]

Actual examples:

urn:nbn:de:bsz:93-opus-10178

urn:nbn:de:gbv:089-2414302835

urn:nbn:de:0002-0228

urn:nbn:de:0292-97839421307388

urn:nbn:de:tuda-tuprints-3462

Each urn:nbn:de identifier must be formally correct.

1. Resolvers and databases currently distinguish between upper and lower case. To avoid errors and confusion, urn:nbn:de identifiers should be restricted to lower case only.
2. Permitted characters are the numbers 0-9 and the characters a-z (without umlauts). In a departure from previous guidelines, only hyphens (-) and full stops (.) are permitted as special characters.
3. Each urn:nbn:de must contain a check digit. A checking sequence is used to calculate it.

How is the check digit of a urn:nbn:de identifier formed?

The check digit relates to the "urn:nbn:de:[...]" string and is added immediately after the last character. It allows the URN string to be validated.

The check digit for urn:nbn:de strings can be calculated using a [web-form](#). Upon request, a PHP script or a Java program can also be sent for automatic calculation of the check digits.

APPENDIX 2

The issue of URNs in the urn:nbn:de namespace for different types of object

URNs in the urn:nbn:de namespace are issued for digital objects. These must be discrete content units and be archivable. The function of a urn:nbn:de identifier is to make digital objects permanently citable and accessible. A basic precondition for this is that the identified objects are permanently archived in an unchanged state.

A URN in the urn:nbn:de namespace can be issued for a document in different formats. (Examples: an article is published both in html format and as a PDF document; or digitised content is provided in TIFF, jpeg and PDF formats with supplementary XML data; see also "Digitised content" section below). In these cases it is assumed that long-term preservation and therefore persistence is ensured by at least one of the different formats. The other formats can be listed and offered as an extra service under the relevant URN.

There is no one single answer to the question of which objects are suitable for designation with a urn:nbn:de identifier, rather each case must be decided individually. Experience to date has yielded the following indicative collection of examples. This list of object types is continually being updated.

Type of object	Issuing urn:nbn:de identifiers
Monographs (e.g. university dissertations and theses, e-books)	One urn:nbn:de is issued per monographic online publication. The publication is regarded as a single unit even if it is subdivided into chapters. Multiple-part online university publications are regarded as single units and only receive one urn:nbn:de.
Journals	Like all serial publications, journals consist of numerous individual publications. These may consist in turn of articles with discrete content. The question therefore arises of the structural level for which urn:nbn:de identifiers are issued: for the entire journal, for each separate volume or even for individual articles.

Type of object	Issuing urn:nbn:de identifiers
Journal titles	<p>On account of their generally ongoing nature, journal titles are not suitable for being given URNs in the urn:nbn:de namespace. Each new volume adds further content to the journal, meaning that it is constantly changing as a result. A conceivable exception would be the archived version of a complete journal, including all volumes and articles, which has been archived as a single object.</p> <p>Naturally it is beneficial to issue and use URIs for journal titles, too. Here the use of specialised URN namespaces or identifier systems such as an ISSN⁶ or an ID of the German Union Catalogue of Serials (ZDB) is recommended here.⁷</p>
Journal volume (edition, issue, volume etc.)	<p>Whether or not it makes sense to issue a urn:nbn:de identifier at the volume or article level depends on the technical structure of the publication. It is essential that the urn:nbn:de identifies the archival object. If the archival object includes the entire volume with all articles, then the urn:nbn:de should be issued for the volume.</p>
Journal articles	<p>If the article itself is the actual archival object and the volume merely a notional structure containing various individual objects, and if the individual article can be called up via the URL, the urn:nbn:de identifiers should then be issued for the article.</p>

⁶ <http://www.issn.org> , date: 6.11.12

⁷ <http://www.zeitschriftendatenbank.de> , date: 6.11.12

Type of object	Issuing urn:nbn:de identifiers
Digitised content	<p>Digitised content is generally found in archives in the following technical structural variants:</p> <ol style="list-style-type: none"> 1. The individual digitised pages are collected together to form a document (generally as PDF file) 2. The individual pages are held as individual image files in a package structure. The image files are generally individually accessible, yet they have a common base address and are treated by the archive as a single unit. <p>In both cases we recommend issuing the urn:nbn:de identifiers at the work level with the additional possibility of using fragment addresses for part objects.</p> <p>Parallel digitised versions in different formats are often created in digitisation projects and then archived as such. However, only one urn:nbn:de is issued for all the different formats. Long-term preservation must be ensured by at least one of the different formats. The data provider decides which representation is used for displaying.</p>
Websites	<p>Like journal titles, websites also represent constantly changing objects. URNs from the urn:nbn:de namespace can therefore only be issued for archived websites (e.g. snapshots).</p>
Abstracts	<p>Particularly if they are archived together with the related digital object, abstracts are not generally issued their own urn:nbn:de.</p> <p>If an abstract is preserved as a separate citable object, it can be given its own urn:nbn:de.</p>
Metadata	<p>The namespace urn:nbn:de is intended to identify cultural products, but not the descriptive data related to these objects.</p> <p>In the library sector in particular, metadata are continually being corrected, adapted and copied. As a consequence, there are disparate data records for one and the same cultural asset in different reference systems. In such circumstances URLs (permalinks) represent a better means of achieving stable identification. We do, however, recommend including the persistent identifier of the cultural asset in the metadata. This way the metadata record can be uniquely assigned to an object, regardless of the database.</p>

Type of object	Issuing urn:nbn:de identifiers
Supplements	<p>If a urn:nbn:de is issued for both the main part and supplements, all the parts must be clearly linked (by means of a landing page or a container).</p> <p>If a separate urn:nbn:de is to be issued for a supplement, the long-term preservation of this object, too, must be ensured.</p>
Research data (raw data)	<p>URNs in the urn:nbn:de namespace are only partly suitable for research data. This depends on the long-term preservation solution and the stability of the objects. There is currently no instance of this kind of use and each case would need to be assessed on an individual basis.</p>
Database services	<p>The question of long-term preservation has not yet been resolved for database services, and so it is not currently possible to issue a urn:nbn:de here.</p>
AV files	<p>A URN can be issued for these in the urn:nbn:de namespace if the files are directly addressable and are intended for long-term preservation.</p>
Migration (long-term preservation)	<p>If a digital object is migrated for preservation reasons, the same urn:nbn:de applies for the newly created version of the digital object as for the original object.</p>

Contact:

General inquiries to the URN service: urn-support@dnb.de

To apply for subspacenames: urn-unternamensraum@dnb.de