Persistent Identifiers

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- URN: a standard in the world of internet
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- PI in Praxis: the project Epicur in DDB
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### Identification of cars

<table>
<thead>
<tr>
<th><strong>Number plate</strong></th>
<th><strong>Chassis number</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>non stable</td>
<td>reliable</td>
</tr>
<tr>
<td>can be a fake</td>
<td>persistent</td>
</tr>
<tr>
<td>small functionality</td>
<td>appropriate functionality</td>
</tr>
<tr>
<td>non global</td>
<td>(resolution!)</td>
</tr>
<tr>
<td>opaque</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>transparent</td>
</tr>
<tr>
<td></td>
<td>unique</td>
</tr>
</tbody>
</table>
The daily experience

The page you are looking for might have been removed, had its name changed, or is temporarily unavailable.

Please try the following:

- If you typed the page address in the Address bar, make sure that it is spelled correctly.
- Open the www.one-name.org home page, and then look for links to the information you want.
- Click the Back button to try another link.
- Click Search to look for information on the Internet.

HTTP 404 - File not found
Internet Explorer
We have recently re-designed our IBM Global Services site to allow you to gather the information that is important to you based on your interests and needs. Accordingly, you can review information regarding our service offerings in terms of:

- the Industries they support,
- the Business & technology topics they address, or
- the overall IT service categories into which they fall.

With our Services A-Z page, you can also review a comprehensive list of our service offerings if you know the type of offering in which you are interested.

A little help finding the information you're after

If you've come to this page as a result of choosing a bookmarked page from our previous site, we can hopefully help you easily find similar pages in the new site.
Persistence in the WEB

- 16% links after 6 months (T. Dowling)
- 50% after 24 months (British Library)
- 87% since 1998 (OCLC)
- 13% of article publications: after 27 months not available (Science)

So we need: An adequate service to handle the changing locators in the WEB → Persistent Identifiers
Features of the expected service

- unique
- global
- resolvable
- reliable
- And: Governance → policy
- And: Resolution agencies
- And: Registration agencies
History & standardization

- 1994: World Wide Web (WWW)
- 1994: RFC 1738 Uniform Resource Locator (IETF)
- 1998: URI Generic Syntax
- 2004: URI:info (first draft)
Terminology

**URI - Uniform Resource Identifier**
- Identification of an abstract or physical resource

**URN - Uniform Resource Name**
- Persistent naming of resources.

**URL - Uniform Resource Locator**
- Identification of a resource (name)
- Locate a resource by describing its primary access mechanism

**URC - Uniform Resource Characteristic**
- Characteristics of a resource e.g. meta information
### Registered URI-Schemes

<table>
<thead>
<tr>
<th>Scheme Name</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>urn</td>
<td>Uniform Resource Names</td>
<td>[RFC2141]</td>
</tr>
<tr>
<td><a href="http://www.iana.org/assignments/urn-namespaces">http://www.iana.org/assignments/urn-namespaces</a></td>
<td><img src="http://www.iana.org/assignments/urn-namespaces" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>ftp</td>
<td>File Transfer Protocol</td>
<td>[RFC1738]</td>
</tr>
<tr>
<td>http</td>
<td>Hypertext Transfer Protocol</td>
<td>[RFC2616]</td>
</tr>
</tbody>
</table>

[... more than 40 URI SCHEMES]

http://www.iana.org/assignments/uri-schemes
"Uniform Resource Name" (URN)

Syntax: URN:NID:NISS  Example: urn:nbn:de:gbv:089-321752945

NID: name space identifier e.g. ISBN, ISSN und NBN
NISS: name space specific string

Standardization:

- URN Syntax: RFC 2141
- Functional Requirements of URNs: RFC 1737
- Registration of NID’s: RFC 2611, 2288, 3188, 3187
- Resolving: RFC 2915, 2168, 2169, 2276, 2483 [...]
Scope of Persistent Identifiers

- reliable addressing
- unique identification
- resolving

Identifier

Location 1
Location 2

Information object
- object
- parts of documents,
- XML entities e.g. DTD

combination of unique identification and reliable addressing (location independent)
Persistent Identifiers currently in use
(partly propriete)

- **DOI** - Digital Object Identifier (DOI-F)
- **Handle** - Handle System (CNRI)
- **URN** - Uniform Resource Name (IETF)
- **ARK** - Archival Resource Key (CDL)
- **PURL** - Persistent Uniform Resource Locators (OCLC)
The international name space „NBN“

SNID: ISO country code

Designated registration agency: „Library of Congress“ urn:nbn

National Library 1

National Library 2

... DDB urn:nbn:de...

Institution 1 urn:nbn:de:xyz...

Institution 2

SNID-Assignment...
Technical and organisational Infrastructure of URN Management in Germany

- Mirror (BSZ)
- Libray Association / Institution (Publishers etc., NL in Switzerland)
- University Libraries / Ass. Institutions
- aggregators
- University Libraries / Institutions
- External Resolution Service(s)
- DDB
- URN-suppliers
Network of Expertise in Digital Preservation

URN Implementation at Die Deutsche Bibliothek: URN Registration Process

University library

URN, Metadata, Online Theses

Die Deutsche Bibliothek

central interim storage at DDB

catalogue (DDB)

NBN management system

deposit server

URN as a part of the document itself

URN is a component of title record

URN is a part of the document itself
<table>
<thead>
<tr>
<th>Category</th>
<th>URN-IDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online dissertations</td>
<td>urn:nbn:de:gbv:089-3321752945</td>
</tr>
<tr>
<td>Publisher publications</td>
<td>urn:nbn:de:0002-0104</td>
</tr>
<tr>
<td>Reports</td>
<td>urn:nbn:de:0001-00021, urn:nbn:de:kobv:b103-00011</td>
</tr>
<tr>
<td>Conference proceedings</td>
<td>urn:nbn:de:bsz:93-opus-15563</td>
</tr>
<tr>
<td>Journals</td>
<td>urn:nbn:de:1111-2004020921</td>
</tr>
<tr>
<td>Articles</td>
<td>urn:nbn:de:bsz:93-opus-13482</td>
</tr>
<tr>
<td>Videos</td>
<td>urn:nbn:de:0001-00099, urn:nbn:ch:bel-2319</td>
</tr>
<tr>
<td>Annual reports</td>
<td>urn:nbn:de:kobv:b103-030012</td>
</tr>
<tr>
<td>Monographs</td>
<td>urn:nbn:de:bsz:93-opus-13983</td>
</tr>
<tr>
<td>Digitized materials</td>
<td>urn:nbn:de:kobv:b103-030026</td>
</tr>
<tr>
<td>Lectures</td>
<td>urn:nbn:de:1111-200403057</td>
</tr>
<tr>
<td>XML namespace</td>
<td>urn:nbn:de:1111-2004033116</td>
</tr>
</tbody>
</table>
Online Public Access Catalogue

http://nbn-resolving.de/urn/resolver.pl?urn=urn:nbn:de:hebis:26-opus-12272
Credit Risk Modeling with Random Fields

Abstract (english)
In the first part of the work, a survey of the credit risk literature is given, which offers a quick introduction into the area and presents the mathematical methods in a unified way. Second, we propose two new models of credit risk, focusing on different needs. The first model generalizes existing models using random fields in Hilbert spaces. The second model uses Gaussian random fields leading to explicit formulas for a number of derivatives, for which we propose two calibration procedures.

The work is organized as follows. In Chapter 1, a survey of the credit risk literature is given. This includes structural models, hazard rate models, methods incorporating credit ratings, models for baskets of credit risky bonds, hybrid models, market models and commercial models. In the last section we illustrate several credit derivatives. Generally the mathematical
The client (Browser) perspective ...

Plugin

http://www.persistent-identifier.de/?link=550
URN-Strategy of DDB
To what can a URN (nbn:de) be assigned and managed?

- objects **currently** archived by Die Deutsche Bibliothek
- objects to be archived in Die Deutsche Bibliothek **in the future**
- objects which will be administered on **certified document servers**
  - Quality criteria e.g. URL-Updating
  - Endeavors by DINI [http://www.dini.de/dini/zertifikat/dini_certificate.pdf](http://www.dini.de/dini/zertifikat/dini_certificate.pdf)
  - perspective of long term preservation
    *(BMBF project: [http://www.langzeitarchivierung.de](http://www.langzeitarchivierung.de))*
URN-Strategy

Principles

- URNs are valid after their registration at Die Deutsche Bibliothek.
- **URN-Registration** within 24 hours of their publication on a document server.
- **URL-Updating** is mandatory.
- In case of a distributed object storage, URN must be transferred as part of the metadata or as access mechanism.
- [...] 

Recommendations

- URNs should be assigned as closely as possible to the object.
- URNs should be a component of metadata.
- A character set according to RFC 1738 for **URLs** should be used.
URN-Management: Additional Transfer Interfaces

- Manual URN administration
  - Web-Interface
    <http://nbn-resolving.org/login.php>

- Automated URN administration
  - E-Mail-Attachment
  - OAI 2.0

- Integration into administration systems for digital library tools
  - OPUS
  - MyCoRe
Demonstration of the URN (NBN:DE) resolver at Die Deutsche Bibliothek

Please enter the URN: um:nbn:de:bsz:93-opus-59

Resolve URN

Further Examples
um:nbn:de:gbv:089-35217525945
um:nbn:ch:bel-5478
um:nbn:ch:bel-9039
um:nbn:se:uu:dee-3475
um:nbn:hu:3006

Return options for URNs ("nbn:de" and "nbn:ch")
- list of URLs
- document directly

Comments
Please, choose whether you would like to receive a list of URLs or the document directly:
- document
  If you select "document" you will receive the online publication directly.
- list
  All saved URLs belonging to the URN will be returned in a list of URLs
Summary

Persistent identifiers offer a tested possibility to provide reliable access to digital objects. So they will become more and more important in the context of long-term preservation.

Questions? Need for further information?

→ altenhoener@dbf.ddb.de
→ www.persistent-identifier.de