



# **RFC's und Internet-Drafts mit URN-Bezug**

in Zusammenhang mit der  
Definition von Namen

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# RFC's und Internet-Drafts mit URN-Bezug

- Namensräume
- Namensbezeichnungen
- Auflösung von Namen



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# Namespaces in XML V1.0

## W3C Recommendation - seit Januar 1999

- *documents, containing multiple markup vocabularies, pose problems of recognition and collision.*
- *Software modules need to be able to recognize the tags and attributes ... even in the face of "collisions"*

Produktion:

[1] NSAttName ::= PrefixedAttName | DefaultAttName

[2] PrefixedAttName ::= 'xmlns:' NCName [ NSC: Leading "XML" ]

[3] DefaultAttName ::= 'xmlns'

[4] NCName ::= (Letter | '\_' ) (NCNameChar)\*

*/\* An XML Name, minus the ":" \*/*

[5] NCNameChar ::= Letter | Digit | '.' | '-' | '\_' | CombiningChar | Extender



# Namespaces in XML V1.1

## W3C Recommendation - seit Februar 2004

- Unterschiede zu Namespaces in XML V 1.0
  - you can undeclare a namespace: that is, you can remove the associating between a namespace prefix and a URI;
  - allows **IRIs** as well as **URIs**.



# tag Draft

## The 'tag' URI scheme and URN namespace

- Draft 4. Version - endete 1.3.2003
- *Tag URIs (also known as "tags") are distinct from most other URIs in that they are intended for uses that are independent of any particular method for resource location or name resolution.*
- *A tag URI may be used purely as an entity identifier.*



# tag Draft

## Aufbau

```
tagURI = "tag:" tagAuthority ":" [specific]
tagAuthority = authorityName "," date
authorityName = DNSname / emailAddress
date = 4*dig ["-" 2*dig ["-" 2*dig ]] ; [ISO8601]
DNScomp = lowAlphaNum [*(lowAlphaNum /"-") lowAlphaNum]
DNSname = DNScomp / DNSname "." DNScomp ; [RFC1035]
emailAddress = 1*(lowAlphaNum /"-"/"."/"_") "@" DNSname
```

## Beispiel

```
tag:hpl.hp.com,2001:tst.1234567890
tag:hp.com,2000-12-30:tst.1234567890
tag:exploratorium.edu,2001-06:pi.99
tag:fred@flintstone.biz,2001-07-02:rock.123
tag:sandro@w3.org,2001:Sandro
tag:myIDs.com,2001-09-01:TimKindberg/doc.101
```



# Persistent Identifier

## Persistent Identifier vs. XML Namespace

- Persistent Identifier
  - Wunsch nach eindeutigen Namen (Identifiern) von Ressourcen, die unabhängig vom physikalischen Ort (i.a. der URL) sind
- XML Namespace
  - Wunsch nach eindeutigen Namen von Namensräumen





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# Uniform Resource Locators

## RFC 1738 – seit Dez. 1994

- "URL Syntax"
  - *describes the syntax and semantics for a compact string representation for a resource available via the Internet.*
  - **<scheme>:<scheme-specific-part>**
  - Schemes (kleine Auswahl):
    - ftp File Transfer protocol
    - http Hypertext Transfer Protocol
    - mailto Electronic mail address
    - news USENET news
- Beispiel:

`http://www.w3c.org/XML/`



# URN Uniform Resource Names

RFC 2141 – seit Mai 1997

- "URN Syntax"
  - *Uniform Resource Names (URNs) are intended to serve as persistent, location-independent, resource identifiers.*
  - $\langle URN \rangle ::= \text{"urn:"} \langle NID \rangle \text{"::"} \langle NSS \rangle$
- Beispiel:

urn:nbn:de:gbv:089-3321752945



# diverse urn subschemes

- RFC 2648: A URN Namespace for IETF Documents  
**urn:ietf:rfc:2141**
- RFC 3043: The Network Solutions Personal Internet Name (PIN): A URN Namespace for People and Organizations  
**urn:pin:bs4321234**
- RFC 3044: Using The ISSN (International Serial Standard Number) as URN (Uniform Resource Names) within an ISSN-URN Namespace  
**urn:ISSN:0259-000X**
- RFC 3061: A URN Namespace of Object Identifiers  
**urn:oid:1.3.6.1.2.1.27**
- RFC 3151: A URN Namespace for Public Identifiers  
**urn:publicid:-:OASIS:DTD+DocBook+XML+V4.1.2:EN**
- RFC 3188:  
Using National Bibliography Numbers as Uniform Resource Names  
**urn:nbn:fi-fe19981001**



# RFC 3305

Report from the **Joint W3C/IETF URI Planning Interest Group**: Uniform Resource Identifiers (URIs), URLs, and Uniform Resource Names (URNs): **Clarifications and Recommendations**

- RFC vom August 2002
- W3C URI Interest Group - seit Oktober 2000
- *Warum: confusion in the web community over the partitioning of URI space, specifically, the relationship among the concepts of URL, URN, and URI.*



# RFC 3305 - Views

## Classical View

- URI als Oberbegriff von URL, URN, etc.
  - *http* als URL schema
  - *isbn* als URN schema

## Contemporary View

- die zweite Hierarchiestufe ist weniger von Bedeutung
  - *http* ist ein URI scheme
  - *urn* ist ein URI scheme
  - *isbn* ist weder ein URI scheme noch ein URN scheme
- URL scheme ist eine Unterklasse von URI scheme, die URN schemes ausschliesst



# RFC 3305 - Confusion

## Confusion

- *People are not convinced that URI and URL mean the same thing, in documents where they (apparently) do.*
- "Uniform Resource Identifiers (URI): Generic Syntax" (RFC 2396): URI schemes und ein Versuch, zwischen URIs, URLs and URNs zu unterscheiden
- "Registration Procedures for URL Schemes" (RFC 2717): URL schemes
- "Architectural Principles of URN Resolution" (RFC 2276): URN schemes



# RFC 3305 - Registering

## Registering

- Registering URI
  - "Registration Procedures for URL Scheme Names" (RFC 2717)
  - "Guidelines for new URL Schemes" (RFC 2718)
  - müssten auf URIs generalisiert werden
- Registering URN
  - "URN Namespace Definition Mechanisms" (RFC 3406)





# RFC 2396bis-05

## Uniform Resource Identifier (URI): Generic Syntax

- draft-fielding-uri-rfc2396bis-05  
vom 16. April 2004
- obsoletes RFCs 2732, 2396, 1808
- *An URI is a compact sequence of characters for identifying an abstract or physical resource*
- *defines the generic URI syntax and a process for resolving URI references that might be in relative form, along with guidelines and security considerations for the use of URIs on the Internet.*



# RFC 2396bis-05

## URI, URL, and URN (1.1.3) - present

- A URI can be further classified as **a locator, a name, or both**.
- The term "Uniform Resource Locator" (URL) refers to the subset of URIs that, in addition to identifying a resource, provide a means of locating the resource by describing its primary access mechanism (e.g., its network "location").
- The term "Uniform Resource Name" (URN) has been used historically to refer to both **URIs under the "urn" scheme** [RFC2141], which are required to remain globally unique and persistent even when the resource ceases to exist or becomes unavailable, **and to any other URI with the properties of a name**.



# RFC 2396bis-05

## URI, URL, and URN (1.1.3) - future

- An individual scheme does not need to be classified as being just one of "name" or "locator". **Instances of URIs from any given scheme may have the characteristics of names or locators or both**, often depending on the persistence and care in the assignment of identifiers by the naming authority, rather than any quality of the scheme.
- Future specifications and related documentation should use the general term "**URI**", rather than the more restrictive terms URL and URN [RFC3305].



# Internationalized Resource Identifiers (IRIs)

draft-duerst-iri-07 – vom 9. Mai 2004

- *complement to the Uniform Resource Identifier (URI)*
- *An IRI is a sequence of characters from the Universal Character Set (Unicode/ISO 10646)*
- *A mapping from IRIs to URIs is defined, which means that IRIs can be used instead of URIs where appropriate to identify resources.*
- **Beispiel:**

`http://www.münchen.de`



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# RFC 3401-3404

## Dynamic Delegation Discovery System (DDDS)

- RFC seit Oktober 2002
- *DDDS is an abstract algorithm for applying dynamically retrieved string transformation rules to an application-unique string*
- *Warum: used to implement lazy binding of strings to data, in order to support dynamically configured delegation systems.*
- Beispiele:
  - URI Resolution
  - ENUM telephone number to URI resolution
  - NAPTR DNS resource record
- verschiedene Datenbasen verwendbar



# RFC 3403

## DDDS - Part 3: The Domain Name System (DNS) Database

- RFC seit Oktober 2002
- Warum: *describes a Dynamic Delegation Discovery System (DDDS) Database using the Domain Name System (DNS) as a distributed database of Rules.*
- Wie: *The Keys are domain-names and the Rules are encoded using the Naming Authority Pointer (NAPTR) Resource Record (RR).*



# RFC 3403

## NAPTR – Naming Authority Pointer

- „The Naming Authority Pointer (NAPTR) DNS Resource Record“ (RFC 2915) - seit September 2000
- durch RFC 3403 ersetzt
- Aufbau:

ORDER PREFERENCE FLAGS SERVICES REGEXP REPLACEMENT

- Beispiel:

```
cid.urn.arpa.  
;;          order pref flags  svc  regexp  
IN NAPTR 100  10  ""      ""   "!.^urn:cid:..+@([^\.] + \.) (.*)$!\2!i"
```





# RFC 3761

## The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)

- E.164 Nummer +49-30-884299-25 wird umgesetzt in eine DNS Struktur 2.5.9.9.2.4.8.8.0.3.9.4.e164.arpa

```
> dig 2.5.9.9.2.4.8.8.0.3.9.4.e164.arpa -t NAPTR
```

```
...
```

```
;; QUERY SECTION:
```

```
;;      2.5.9.9.2.4.8.8.0.3.9.4.e164.arpa,  
        type = NAPTR, class = IN
```

```
;; ANSWER SECTION:
```

```
2.5.9.9.2.4.8.8.0.3.9.4.e164.arpa. 12H  
    IN NAPTR 100 100 "u" "E2U+h323:voice"  
    "!^\\+49884299(.*)$!h323:\\1@halley.dfn.de!" .
```



# dn Draft

## A URN Namespace for Domain Names

- Noch nicht eingereicht, da erst eine praktische Umsetzung die Handhabbarkeit zeigen sollte
- vergleichbar mit 'tag' scheme, aber benutzt DNS
- Warum: *tries to combine*
  - *the advantages of the "tag" scheme as purely naming scheme and*
  - *the advantages of the "http" scheme as a location scheme.*
- Wie: *The combining algorithm is the Dynamic Delegation Discovery System which could be used to simplify assigning and resolving URN namespaces*



# dn Draft

## Aufbau: Gruppierung mit zwei Methoden

- Mapping via DNS NAPTR Records
- Path analog http

```
dnScheme = "urn:dn:"t1":"dl":"cd":"gl(ol)?  
t1 = text* // Top Level Domain Name  
dl = text* // Domain Name  
cd = digit{4,}("-"digit{2,}("-"(digit{2,})?)?)?  
        //yyyy[-mm[-dd]] // Creation Date  
gl = (text":"(text":")* | path) // Grouping  
path = "/"alphanum"/"(alphanum"/")*  
ol = text* // Object
```

### • Namespace Beispiele

```
urn:dn:org:w3c:1994-11:/TR/REC-xml-19980210/  
urn:dn:de:nklever:2000-11-01:name:nik:  
urn:dn:edu:fhm:1999:fb05:prof:bohnefeld:
```

### • Dokument oder Objekt Beispiele:

```
urn:dn:org:w3c:1994-11:/TR/REC-xml-19980210/index.html  
urn:dn:de:nklever:2000-11-01:name:nik:vita  
urn:dn:edu:fhm:1999:fb05:prof:bohnefeld:url
```



# dn Draft

## NAPTR Record

- als Namespace erkennbar, wenn ol weggelassen wird  
dnScheme = "urn:dn:"t1": "d1": "cd": "gl(ol) ?  
gl = (text": "(text":")\* | path)
- dennoch lokalisierbar via NAPTR records

## Aufbau

```
dn IN NAPTR 0 0 "" ""
```

```
"/^urn:dn: ([^:]+): ([^:]+): ([\\d\\-]+): ([^:\\/]+) /urn\\.\\.\\2\\.\\.\\1/"
```

```
IN NAPTR 0 10 "" ""
```

```
"/^urn:dn: ([^:]+): ([^:]+): ([\\d\\-]+): \\/(.+)/http:\\/\\/www\\.\\.\\2\\.\\.\\1\\/\\/\\3/"
```

```
IN NAPTR 10 10 "" ""
```

```
"/^urn:dn: ([^:]+): ([^:]+): ([\\d\\-]+): (.+) /dn\\.\\.uasa\\.\\.org/"
```



# Persistent Identifier

## HTTP Redirect

- JS Implementationen von HTTP Redirects
- derzeit für
  - **urn:nbn** ->  
<http://nbn-resolving.de/urn/resolver.pl?urn=...>
  - **urn:issn** ->  
<http://urn.issn.org/urn/?issn=...>
  - **urn:isbn** ->  
<http://www.amazon.com/exec/obidos/ASIN/...>
  - **urn:ietf** ->  
<http://www.ietf.org/rfc/rfc...>
  - **urn:publicid** ->  
redirect aus RE Ersetzung



# RDDL

## Resource Directory Description Language

- A RDDL document, called a *Resource Directory*, provides a package of information about some target, including:
  - *Human-readable descriptive material* about the target.
  - A directory of individual resources related to the target, each directory entry containing descriptive material and linked to the resource in question.



# RDDL

- *The targets which RDDL was designed to describe are **XML Namespaces**. Examples of "individual related resources" include schemas, stylesheets, and executable code designed to process markup from some namespace. A Resource Directory is designed to be suitable for service as the body of an entity returned by **dereferencing a URI serving as an XML Namespace name**.*



# RDDL 1 vs. RDDL 2

- *RDDL 1 (Jun. 2002)*
  - *XHTML-Seite mit einem **Element resource***  
`<rddl:resource>`
- *RDDL 2 (Jan. 2004)*
  - *XHTML-Seite mit den **Attributen nature und purpose zum Anchor-Tag***  
`<a rddl:nature=„“ rddl:purpose=„“>`





# RFC 3650-3652

## Handle System Overview

- RFC seit Nov. 2003
- *provides an overview of the Handle System in terms of its namespace and service architecture, as well as its relationship to other Internet services such as DNS, LDAP/X.500, and URNs.*
- *general-purpose global name service that allows secured name resolution and administration over networks such as the Internet.*
- *manages handles, which are unique names for digital objects and other Internet resources.*



# RFC 3652

## Handle System Protocol (ver 2.1) Specification

- RFC seit Nov. 2003
- *general-purpose global name service that allows secured name resolution and administration over the public Internet.*
- *describes the protocol used for client software to access the Handle System for both handle resolution and administration.*
- *specifies the procedure for a client software to locate the responsible handle server of any given handle.*
- *defines the messages exchanged between the client and server for any handle operation.*



# RFC 3730-3734

## Extensible Provisioning Protocol (EPP)

- RFC seit März 2004
- RFC 3731: EPP Domain Name Mapping
- RFC 3732: EPP Host Mapping
- RFC 3733: EPP Contact Mapping
- RFC 3734: EPP Transport Over TCP
  - Port 700
- *describes an application layer client-server protocol for the provisioning and management of objects stored in a shared central repository.*
- *Specified in XML, the protocol defines generic object management operations and an extensible framework that maps protocol operations to objects.*



# RFC 3730

## Extensible Provisioning Protocol (EPP)

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:ietf:params:xml:ns:epp-1.0
  epp-1.0.xsd">
  <command>
    <info>
      <obj:info xmlns:obj="urn:ietf:params:xml:ns:obj"
        xsi:schemaLocation="urn:ietf:params:xml:ns:obj obj.xsd">
        <obj:name>example</obj:name>
      </obj:info>
    </info>
    <cITRID>ABC-12345</cITRID>
  </command>
</epp>
```



# Zusammenfassung

- Namen
  - XML Namensraum
  - Persistent Identifier
  - URI, URL, URN
- Auflösungsmechanismen
  - Persistent Identifier (HTTP Redirect)
  - DDDS/DNS
  - RDDDL
  - Handle System
  - EPP
  - andere ?



# Zukunft ?

- **Netz** von Namensresolutionen über das Internet
- jeder Mechanismus enthält eine Abstraktionsebene  
**Name – Mapping – Destination**
- jeder Mechanismus verweist auf alle anderen
  - evtl. sind zusätzliche Schnittstellen notwendig
- damit kann jederzeit ein neuer Mechanismus eingebunden werden
- derzeitig denkbar:
  - Persistent Identifier (HTTP Redirect)
  - DNS NAPTR
  - Handle System
  - RDDL/RDF
  - EPP
  - LDAP



**Vielen Dank für die  
Aufmerksamkeit !**



# Literatur

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- dn Draft  
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- RDDDL 2 <http://www.rddl.org/rddl2>
- Namespaces in XML 1.0  
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<http://www.persistent-identifier.de>  
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