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## A Uniform Resource Name (URN) Namespace for the Digital Video Broadcasting Project (DVB)

### Status of This Memo

This memo provides information for the Internet community. It does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

### Abstract

This document describes a Uniform Resource Name (URN) namespace for the Digital Video Broadcasting Project (DVB) for naming persistent resources defined within DVB standards. Example resources include technical documents and specifications, eXtensible Markup Language (XML) Schemas, classification schemes, XML Document Type Definitions (DTDs), namespaces, style sheets, media assets, and other types of resources produced or managed by DVB.

### Table of Contents

1. Introduction .....	2
2. Specification Template .....	2
3. Examples .....	4
4. Namespace Considerations .....	4
5. Community Considerations .....	7
6. Security Considerations .....	9
7. IANA Considerations .....	9
8. References .....	10
8.1. Normative References .....	10
8.2. Informative References .....	11

## 1. Introduction

The Digital Video Broadcasting Project (DVB) is an industry-led consortium of over 270 broadcasters, manufacturers, network operators, software developers, regulatory bodies and others in over 35 countries committed to designing global standards for the global delivery of digital television and data services. Services using DVB standards are available on every continent with a total of more than 100 million DVB receivers already deployed.

DVB would like to assign unique, permanent, location-independent names based on URNs for some resources it produces or manages. These URNs will be constructed according to the URN syntax defined in [RFC2141].

This namespace specification is for a formal namespace to be registered according to the procedures set forth in [RFC3406].

## 2. Specification Template

This section provides the information required to register a formal namespace according to the registration procedure defined in [RFC3406]. The URNs conform to the syntax defined in [RFC2141].

Namespace ID:

"dvv"

Registration Information:

Version: 1

Date: 2007-02-28

Declared registrant of the namespace:

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#### Declaration of structure:

URNs assigned by DVB will have the following hierarchical structure based on the organizational structure of the DVB standards:

urn:dvb:<NSS>

where the syntax of "<NSS>" is specified in Section 2.2 of the URN Syntax requirements ([RFC2141]).

The individual URNs will be assigned by DVB through the process of development of DVB standards.

#### Relevant ancillary documentation:

None

#### Identifier uniqueness considerations:

DVB will establish unique identifiers as appropriate.

Uniqueness is guaranteed as DVB ensures through its standardization process that an assigned string is never reassigned.

#### Identifier persistence considerations:

DVB is committed to maintaining the accessibility and persistence of all resources that are officially assigned URNs by the organization.

#### Process of identifier assignment:

Assignment is limited to DVB and those authorities that are specifically designated by DVB. DVB may designate portions of its namespace for assignment by other parties under its regime.

#### Process of identifier resolution:

DVB will develop and maintain "URN catalogues" that map all assigned URNs to Uniform Resource Locators (URLs) specifically to enable Web-based resolution of named resources. In the future, an interactive online resolution system may be developed to automate this process. The latest information about DVB-defined metadata can always be found on the DVB website at:

<http://www.dvb.org/metadata>

DVB will authorize additional resolution services as appropriate and in-line with the DVB standardization process.

Rules for Lexical Equivalence:

The "<NSS>" is case insensitive.

Conformance with URN Syntax:

No special considerations.

Validation mechanism:

None specified. DVB will develop and maintain URN catalogues. The presence of a URN in a catalogue indicates that it is valid.

Scope:

Global

### 3. Examples

The following examples are not guaranteed to be real. They are presented for pedagogical reasons only.

urn:dvb:ipdc:esg:2005  
urn:dvb:cs:ZappingTypeCS:2001

### 4. Namespace Considerations

The urn:dvb namespace is used to identify metadata that is defined by DVB and describes DVB multimedia and interactive services. The registration of urn:dvb as a formal namespace enables the use and referencing of DVB XML fragments in other standards worldwide and enables those standards to leverage and build upon publicly available DVB metadata schemas and fragments.

These URNs are used to refer to, in conjunction with, and as part of commercial or public multimedia broadcast services. In most markets, these are under the control of a national regulator. So if a particular market chooses to use DVB services, in general, the regulator imposes compliance with the relevant DVB specifications to ensure interoperability and open competition in the marketplace.

#### URN assignment procedures:

The individual URNs shall be assigned through the process of development of DVB standards by the Digital Video Broadcasting Project (DVB). The latest information about DVB defined metadata can always be found at the owner's website at:

<http://www.dvb.org/metadata>

#### URN resolution/delegation:

The resolution and delegation shall be determined through the process of development of DVB standards by the Digital Video Broadcasting Project (DVB).

Since the implementations envisaged cover a wide range of devices with quite different access methods and capabilities, no single resolution or delegation mechanism can be referenced in this document.

Currently, 2 client system classes are covered by DVB specifications:

- o A broadcast set-top box that only has a unidirectional, receive-only connection. Hence, all DVB URNs need to be resolvable from the service discovery information received in the broadcast stream.
- o A "home network end device" (HNED) that could be an IPTV set-top box, networked TV, or personal digital recorder with an Ethernet or Wireless Local Area Network (WLAN) connection to a home gateway device.

Further device classes will be addressed as DVB standardization progresses. The urn:dvb URNs must however remain valid. DVB will define appropriate resolution/delegation mechanisms to ensure that DVB URNs remain valid for those new device classes as well.

For the two above example device classes, 3 ways of conveying such resolution information are currently defined by DVB:

- o Repeated, cyclic transmission of Resolution Authority Records (RAR) and Resolution Records (RR) as auxiliary data in digital TV broadcast streams over satellite, cable, or terrestrial transmissions according to [EN300468], [EN301192], and [TS102323].

- o Repeated, cyclic multicast transmission of Resolution Records (RR) via the DVBSTP protocol according to [TS102034].
- o Unicast delivery of Resolution Records (RR) in response to HTTP "GET /dvb/sdns" requests according to [TS102034].

Type of resources to be identified:

Types of resources to be identified include XML schema definition files, classification schemes, and identification systems defined and openly published by DVB. These resources being identified constitute a metadata system to describe digital multimedia broadcast services or content conveyed as part of such services. The latest DVB defined metadata can always be found at:

<http://www.dvb.org/metadata>

These metadata definitions are not entirely usable without knowledge of the DVB specifications listed in the Normative References section. To make them generally useful for client platforms typically found in computer network environments today, XSLT transformations to HTML, or other common formats would be needed to enable rendering in a standard web browser. On the other hand, it is expected that with the increasing overlap between the computer and multimedia worlds - e.g., with the forthcoming DVB file format definition - DVB metadata formats will get adopted in player implementations on PC platforms as well.

Type of services to be supported:

Types of services supported include controlled term lookup in classification schemes and resolution of ids in identification systems.

Concrete examples of these services include digital television services, (near) video on-demand services, and digital radio sound services. Another example is interactive multimedia applications which are tied to audiovisual content.

This might, e.g., be a quiz show where viewers can compete against the contestants on the show by picking multiple-choice answers with their remote control. These end-user services are enabled by the metadata defined under the urn:dvb namespace.

Another example is the web-portal site for the video-on-demand offering of an ISP. The portal pages are likely to describe the content in terms of title, genre, parental guidance, cast, etc. The ISP might either publish the DVB format description on their

web-portal site directly, or develop an XSLT transformation to obtain an HTML incarnation of the data. In either case, a client device (in this example the home gateway or the ISP's web portal) will need to be able to resolve references to the urn:dvb namespace. Describing multimedia content in DVB format is a likely choice since it provides rich information specially tailored to multimedia applications like television, movies, music, etc. Furthermore, the DVB content descriptions for consumer terminals are, of course, compatible with the DVB Portable Content Format (PCF, defined in ETSI TS 102 523), which is used in content production environments so that propagation of content descriptions along the entire production chain is easily achieved.

## 5. Community Considerations

With the digitization of the audiovisual broadcasting technologies, television receiver platforms have become quite similar to personal computer equipment in terms of performance, resources, and interfaces. Hence, cross-use of content from the respective other platform (i.e., TV and PC) becomes interesting to consumers and service providers alike. Web pages can for instance today be viewed on a general purpose computer, a set-top box, and a mobile phone just the same. Audio/video broadcasting services are arriving on mobile phones today ("mobile TV"), and efforts are clearly visible to bring such services to personal computer platforms as well ("IPTV").

Hence, cross-linking between these two domains, the Internet/personal computer domain and the TV/broadcast domain is called for. Linking from broadcast domain metadata to Internet-based services is already enabled through the various URN and URI schemes established in the relevant DVB standards ([EN300468], [TS102323], and [TS102034]). Linking from Internet/web resources to DVB multimedia services is not yet possible in a well-defined way. Thus, a URN scheme is proposed for DVB defined metadata describing DVB services. As DVB issues its publications as international standards and has a well-defined compliance regime, this request is for a formal namespace.

Open assignment and use of identifiers within the namespace:

With on-going development of DVB standards, DVB will establish requirements for assignment and use of identifiers within the DVB namespace. Current identifier assignments can be inferred from the relevant DVB standards and from <http://www.dvb.org/metadata>.

### Considerations for resolution server software:

With on-going development of DVB standards, DVB will establish requirements and seek candidates for operating resolution servers as appropriate.

Sources for resolution information can either be stand-alone resolution services, which are announced as part of the Service Discovery and Selection (SD&S), or data conveyed as part of the SD&S information itself. To boot-strap the resolution process, a DVB client hence needs to discover an entry point (or set of) from which to obtain an initial Service Discovery and Selection XML record.

By default, the actual service discovery information is provided on the IANA registered well-known port dvbservdsc (port number 3937) via tcp and udp (see <http://www.iana.org/assignments/port-numbers>) on the IANA registered well-known multicast addresses 224.0.23.14 (DvbServDisc on IPv4) and FF0X:0:0:0:0:0:0:12D (DvbServDisc on IPv6).

As set forth in [TS102034], a list of non-default Service Discovery and Selection (SD&S) entry points addresses may also be provided via DNS based on the service location resource record (SRV RR) [RFC2782]. The service name for DVB services is "\_dvbservdsc", the protocol may be tcp or udp, while the rest of the name is the domain name maintained by DVB for service discovery. This domain name is set to "services.dvb.org". The DVB organization will maintain the services.dvb.org domain name for service discovery, and new service providers should register with DVB to add them to the DNS SRV list.

### Considerations for resolution client software:

With on-going development of DVB standards, DVB members will develop software implementations of its standards for various platforms. Today, these platforms typically include Open Source-based platforms such as Linux.

To resolve a urn:dvb name, a client needs to retrieve Service Discovery and Selection (SD&S) data since this either directly contains resolution data, or lists stand-alone resolution services from which Resolution Authority Records (RAR) can be retrieved.

To obtain the initial Service Discovery and Selection (SD&S) XML record, a client must by default first join the IANA registered well-known multicast addresses 224.0.23.14 (DvbServDisc on IPv4) and/or FF0X:0:0:0:0:0:0:12D (DvbServDisc on IPv6) and try to



obtain a boot-strap record from the IANA registered well-known port dvbservdsc (port number 3937) via tcp and udp (see <http://www.iana.org/assignments/port-numbers>).

To discover non-default entry points addresses, [TS102034] defines that a list of Service Discovery and Selection (SD&S) entry points addresses may be acquired via DNS according to the service location resource record (SRV RR) [RFC2782]. The service name is "\_dvbservdsc"; the protocol may be tcp or udp, while the rest of the name is the domain name maintained by DVB for service discovery. This domain name is set to "services.dvb.org". So the lookup shall be either "\_dvbservdsc.\_tcp.services.dvb.org" or "\_dvbservdsc.\_udp.services.dvb.org". This requires that the terminal support an SRV cognizant DNS client and in a way according to the specification in [RFC2782]. The DVB organization will maintain the services.dvb.org domain name for service discovery. HTTP servers will be found via the tcp protocol method whilst the multicast addresses will be found via the udp protocol method.

## 6. Security Considerations

There are no additional security considerations other than those normally associated with the use and resolution of URNs in general, which are described in [RFC1737], [RFC2141], and [RFC3406].

This document registers a namespace for URNs. DVB may assign special meaning to certain of the characters of the Namespace Specific String in its specifications. Any security consideration resulting from such assignment is outside the scope of this document.

When URNs are resolved, i.e., translated from names to locations, the way the locations are used or accessed may require the resources to be authenticated. The information about the authentication of either the name or the resource to which it refers should be carried by separate information passed along with the URN rather than in the URN itself. The design of such resolution mechanisms by DVB for DVB URNs is guided by [RFC2276] and such mechanisms will be published as DVB specifications.

## 7. IANA Considerations

This document defines a URN NID registration of "dvb". IANA has registered "dvb" in the URN Namespaces registry.

## 8. References

Note: The ETSI specifications listed below - as all ETSI standards - are available to the general public free of charge. They are accessible by going to <http://www.etsi.org> and visiting the standards download page. Select "Standards" from the navigation bar at the top, then choose "Download ETSI Standards" in the contents box on the left. A "Publications Download Area" link occurs at the top of the body text). The direct link to the downloads page is <http://pda.etsi.org/pda/queryform.asp>. When clicking on the download link on the search results page, an email address is requested for the PDF download. As being free-of-charge is funded by the European Commission, the email addresses are collected for statistical purposes only to demonstrate benefit to the general public.

The ETSI specifications are normative references since the URNs are used to refer to, in conjunction with, and as part of commercial or public multimedia broadcast services. In most markets, these are under the control of a national regulator. So if a particular market chooses to use DVB services, in general, the regulator imposes compliance with the relevant DVB specifications to ensure interoperability and open competition in the marketplace. Some of the specifications also have "EN" status, which means that the European Commission has overridden any national regulations by mandating that if any commercial service is rolled out in Europe in the respective area, it must comply with the relevant DVB EN specification(s). Apart from those legal implications, DVB has become a brand to which consumers link certain expectations with regard to the level of service and interoperability. Of course, DVB wants to help manufacturers meeting those expectations by fostering interoperability.

### 8.1. Normative References

- [RFC2141] Moats, R., "URN Syntax", RFC 2141, May 1997.
- [RFC3406] Daigle, L., van Gulik, D., Iannella, R., and P. Faltstrom, "Uniform Resource Names (URN) Namespace Definition Mechanisms", BCP 66, RFC 3406, October 2002.
- [RFC2782] Gulbrandsen, A., Vixie, P., and L. Esibov, "A DNS RR for specifying the location of services (DNS SRV)", RFC 2782, February 2000.

- [EN300468] European Telecommunications Standards Institute (ETSI),  
"Digital Video Broadcasting (DVB); Specification for  
Service Information (SI) in DVB systems", October 2007.
- [EN301192] European Telecommunications Standards Institute (ETSI),  
"Digital Video Broadcasting (DVB); DVB specification for  
data broadcasting", November 2004.
- [TS102323] European Telecommunications Standards Institute (ETSI),  
"Digital Video Broadcasting (DVB); Carriage and signalling  
of TV-Anytime information in DVB transport streams",  
November 2005.
- [TS102034] European Telecommunications Standards Institute (ETSI),  
"Digital Video Broadcasting (DVB); Transport of MPEG-2 TS  
Based DVB Services over IP Based Networks", October 2007.

## 8.2. Informative References

- [RFC1737] Sollins, K. and L. Masinter, "Functional Requirements for  
Uniform Resource Names", RFC 1737, December 1994.
- [RFC2276] Sollins, K., "Architectural Principles of Uniform Resource  
Name Resolution", RFC 2276, January 1998.

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