                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.

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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:

      "dvb"

   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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