



Nordig EPG/ Event Metadata Exchange format for live and on-demand services

NORDIG WORKSHOP, SVT, STOCKHOLM, 02-03.05.2024

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NorDig EPG/Event documentation

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- ▶ **NorDig Metadata Exchange format specification**
<https://nordig.org/specifications/>
- ▶ There is no need for much documentation for the implementer as the standard is well documented. **NRK EPG-data in TV-Anytime/Nordig format.**
https://www.nrk.no/tvanytime/xml/NRK_EPG-data_TVA_Nordig_format.pdf

Example data for OnDemand

TVA_Nordig_exempladata_OnDemand_...xml

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- ▶ For onDemand service / third party catalog for video and audio content
- ▶ Nordig EPG is for both TV(video) and Radio(audio), therefore we use the term OnDemand and not VOD(Video On Demand).
- ▶ Some example of terms used for OnDemand catalog is:
 - SVOD: Subscription Video on Demand allows users to access an entire library of videos for a small recurring fee or for free. Ex. Netflix, Hulu, and HBO.
 - TVOD: Transactional Video on Demand allows users to buy content on a pay-per-view basis. Ex. Google Play and iTunes. Relevant for TVOD: tva:Free element.
 - AVOD: Ad-based Video on Demand is an ad-based video on demand that is free to its consumers. Ex. YouTube and 4OD. SegmentInformation may be relevant. Relevant for AVOD: SegmentInformation, see Nordig_TVA_examplescenarios [...].pdf, example scenarion 6. Programs with added commercials with ...

... OnDemand ...

- ▶ A complete ondemand catalog may be a lot of data, and it may be relevant to divide the EPG-Data, ex.: ContentCS, Start- or EndOfAvailability, Paging and more.
- ▶ For this we use OnDemandService with the attributeGroup fragmentIdentification, consisting of fragmentId, fragmentVersion and fragmentExpirationDate
- ▶ Scenarios for dividing data:
 - Classification Schema: ex.: fragmentId="urn:tva:metadata:cs:ContentCS:2011:3.4"
 - StartOfAvailability: fragmentId="startOfAvailability"
 - EndOfAvailability: fragmentId="endOfAvailability"
 - Paging: ex.: fragmentId="page 1"
- ▶ It is also relevant to highlight some OnDemand content, ex premiere, modified metadata previously published, last chance(EndOfAvailability)
- ▶ Scenarios for highlighting data:
 - Premiere: fragmentId="premiere"
 - Modified: fragmentId="modified"

Explanations often repeated

► Genre

- Genre is for many the same as a content genre ex News, Sport...
- In TVA genre is an element for multi-dimensional content classification
- See the ETSI spec. annex B

Ex.:

```
<tva:Genre href="urn:tva:metadata:cs:ContentCS:2011:3.4" type="main"/>
```

```
<tva:Genre href="urn:tva:metadata:cs:FormatCS:2011:2.2.1" type="main"/>
```

```
<tva:Genre href="urn:tva:metadata:cs:ContentCommercialCS:2005-03:3.50"/>
```

(IntendedAudienceCS...)

Classification schemas is included in the schema package from ETSI:

https://www.etsi.org/deliver/etsi_ts/102800_102899/1028220301/01.11.02_60/ts_1028220301v011102p0.zip

Questions?

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Thank you for your attention.

EKSTRA

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DVB-I

Linear television over the internet

Source: <https://www.dvb.org/standards/dvb-i> and [DVB BlueBook A177](#)

- ▶ The first DVB-I specification has been published as [DVB BlueBook A177](#)
- ▶ Why DVB-I?
 - Linear television over the internet as user-friendly and robust as traditional broadcast television
 - DVB-I will support any device with a suitable internet connection and media player, including TV sets, smartphones, tablets and media streaming devices.
 - With DVB-I, linear television services on the internet will be signalled and distributed in a standardized manner – individual services will not require specific apps or integration.

- ▶ Where both broadband and broadcast connections are available, devices will be able to present an integrated list of services and content, combining both streamed and broadcast services – users won't have to know or care whether a service arrives via broadband or broadcast.
- ▶ Broadcasters and other content providers will be able to deploy common services across a wide range of devices.
- ▶ Manufacturers will be able make a single consistent user experience for all video services.

DVB-I

Linear television over the internet

Source: [DVB BlueBook A177](#)

- ▶ Service Discovery and Programme Metadata for DVB-I Services
- ▶ The specification defines the mechanisms to be used to find curated sets of linear television services that be delivered through broadband or broadcast mechanisms as well at the methods to retrieve electronic program data for those services.

DVB-I: Service Discovery

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- ▶ may be linear or on-demand
- ▶ DVB-I clients access information about DVB-I services through Service Lists
- ▶ OnDemand service
- ▶ May have deep link to publisher platform

DVB-I: TV-Anytime

The DVB-I metadata profile described is based on the TV-Anytime schema and classification schemes.

- ▶ Example Schedule response:
- ▶ `<?xml version="1.0" encoding="UTF-8"?>`
- ▶ `<TVAMain xmlns="urn:tva:metadata:2019" xmlns:mpeg7="urn:tva:mpeg7:2008" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xml:lang="eng">`
- ▶ `<ProgramDescription>`
- ▶ `<ProgramInformationTable xml:lang="eng">`
- ▶ `<ProgramInformation programId="crid://channel7.co.uk/b01myjsy">`
- ▶ `<BasicDescription>`
- ▶ `<Title type="main">Bargain Hunt</Title>`
- ▶ `<Title type="secondary">01/01/2014</Title>`
- ▶ `<Synopsis length="short">`
- ▶ `The Bargain Hunt teams head to Staffordshire's County Showground.</Synopsis>`
- ▶ `<Synopsis length="medium"> The Bargain Hunt teams head to`
- ▶ `Staffordshire's County Showground, where both experts face double`
- ▶ `trouble.</Synopsis>`
- ▶ `<Genre href="urn:dvb:metadata:cs:ContentSubject:2019:3" type="main"/>`

DVB-I: Low latency DASH multicast

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- ▶ Bluebook A168 was published in October and contains the DVB profile of DASH including low latency (LL) considerations.

Unique identifier - CRID

- ▶ CRID – Content Reference Identifier
- ▶ CRID is an identifier for content that is independent of its location/availability.
- ▶ Syntax: CRID://<registered Internet domain name>/<data>
- ▶ The first part of a CRID is a domain name(ex. nrk.no) and the next part is data. If the data-part is unique within the domain, then the crid is globally unique.
- ▶ The data-part can support global unique program id ex. from www.isan.org, www.eidr.org or other.
- ▶ Until we can get CRIDs from the producer/creator/owner of the content, the publisher has to create unique crid for the content.
- ▶ CRID refers to a piece of content, though in some cases it may refer to one or more other CRIDs, ex. series and season linking.
- ▶ CRID specification: ETSI TS 102 822-4.

CRID – Content Reference Identifier

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- ▶ ProgramInformation:
`<tva:ProgramInformation programId="crid://tv3.dk/A"...`
`<tva:EpisodeOf crid="crid://tv3.dk/AA" index="2"/>`
- ▶ GroupInformation:
`<tva:GroupInformation groupId="crid://tv3.dk/AA" numOfItems="22" ...`
- ▶ ScheduleEvent:
`<tva:Program crid="crid://tv3.dk/A"/>`
- ▶ OnDemandProgram:
`<tva:Program crid="crid://tv3.dk/A"/>`
- ▶ Review: `<tva:Review programId="crid://tv3.dk/A">`
- ▶ SegmentInformation: `<tva:ProgramRef crid="crid://tv3.dk/A"/>`
- ▶ RightsStatement: `<tva:RightsStatement programId="crid://tv3.dk/A"...`

Tv-Anytime in DVB transportstreams

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- ▶ ETSI TS 102 323 Carriage and signalling of Tv-Anytime information in DVB transport streams
- ▶ This is not described in our NorDig work, but I want to mention it because of the possibility it gives to link linear broadcasting with on-demand content and further information.
- ▶ CRID is used for program id and series CRID for series linking

Language

- ▶ Title, Synopsis, and a lot more: A programme can have multiple titles, synopsis and more, in different languages.
- ▶ Language: There may be more than one spoken language specified for a programme
- ▶ CaptionLanguage, SignLanguage
- ▶ AudioLanguage: The spoken language of the audio.
- ▶ xml:lang: The default natural language of the description.
- ▶ ServiceLanguage: The main spoken language in which the service is available.

Are you ready for som pl/sql?

- ▶ TVA is implemented in NRK directly in the Oracle database for program information
- ▶ Pl/sql: Procedural language/ structured query language
- ▶ For implementing code directly in Oracle database

PL/sql code implemented at NRK

demo variant, Main package, implemented in oracle database
contains complete TVA specific functionality

```

create or replace package TvAnytime as
Procedure EksporterPeriode(p_fraDato in date, p_tilDato in date, p_kanal in varchar2,
  p_DirNavn in varchar2 default null, p_jobId in number default to_number(null)) DETERMINISTIC;
End TvAnytime;

create or replace package body TvAnytime as
g_packageName varchar2(20):='TvAnytime';
g_Feilmelding varchar2(255); --global variable for error messages
g_dirnavn constant varchar2(12):='TVANYTIME'; --directory object
Type PIPostType is record (Prog_id varchar2(255), Crid varchar2(255), SCrid varchar2(255), Gruppe_id number(22),
  Tittel varchar2(255), Episodetittel varchar2(255), Serietittel varchar2(255), prodkode varchar2(255),
  Innhold varchar2(255), InnholdKort varchar2(255), Varighet pi_adm.program.varighet%type, Bildeformat varchar2(255),
  Lydstandard varchar2(255), Versjon varchar2(255), Emne varchar2(255), Underkategori varchar2(255),
  Aldersgrense varchar2(255), Proddato pi_adm.program.proddato%type, Produsentland varchar2(255), Episode number(5));

Procedure EksporterPeriode(p_fraDato in date, p_tilDato in date, p_kanal in varchar2,
  p_DirNavn in varchar2 default null, p_jobId in number default to_number(null)) as
ProcNavn varchar2(40):='TvAnytime.EksporterPeriode';
Begin
  ...
  TVAEksport(
  ...
End EksporterPeriode;

...Procedures and Functions

End TvAnytime;

```

PL/sql code implemented at NRK

demo variant, part of the main package,
Main procedure, calling ProgramInformationTab

```
Procedure TVAEksport(p_Sendedato in pi_adm.sending.sendedato%type, p_Kanal_id in pi_adm.sending.kanal%type,
  p_DirNavn in varchar2 default null, p_jobId in number default to_number(null)) is
FilNavn varchar2(100);
xml CLOB;
Begin
--Initiate and verify: p_Sendedato, p_Kanal_id, filnavn ...
if verify_ok then
  TVAMainHeader(xml);
  MetadataOrigInfoTable(xml);
  xml:=xml|| '<tva:ProgramDescription>';
  ProgramInformationTab(xml, p_sendedato, p_kanal_id);
  GroupInformationTab(xml, p_sendedato, p_kanal_id);
  ProgramLocationTab(xml, p_sendedato, p_kanal_id);
  ServiceInformationTab(xml, p_sendedato, p_kanal_id);
  ...
  xml:=xml|| '</tva:ProgramDescription>';
  xml:=xml|| '</tva:TVAMain>';
  --Write xml
  SkrivutClob(xml, p_DirNavn, filnavn);
end if;

Exception
when others then
  ...
End TVAEksport;
```

PL/sql code implemented at NRK

demo variant, part of the main package,

Sub procedure, calling ProgramInformationCur and ProgramInformation

```
PROCEDURE ProgramInformationTab(p_xml in out clob, p_sendedato in pi_adm.sending.sendedato%type,
    p_kanal_id in pi_adm.sending.kanal%Type) is
    ProcNavn varchar2(50):='ProgramInformationTab: ';
    Postcur sys_REFCURSOR;
    Post PIPosttype;
Begin
    p_xml:=p_xml|| '<tva:ProgramInformationTable>';
    Postcur:=ProgramInformationCur(p_sendedato, p_kanal_id);
    FETCH Postcur INTO post;
    WHILE Postcur%FOUND LOOP
        ProgramInformation(p_xml, post, p_UtenFeil);
        FETCH Postcur INTO Post;
    END LOOP;
    CLOSE Postcur;
    p_xml:=p_xml|| '</tva:ProgramInformationTable>';

Exception
when others then
    g_Feilmelding:=substr(g_Feilmelding||ProcNavn||', ', 1,g_maksLengde2);
End ProgramInformationTab;
```

PL/sql code implemented at NRK

demo variant, part of the main package,
Sub function, sql to collect the data

```

Function ProgramInformationCur(p_sendedato in pi_adm.sending.sendedato%type, p_kanal_id in pi_adm.sending.kanal%Type)
  return sys_refcursor as
ProcNavn  varchar2(50):='ProgramInformationCur: ';
Postcur  sys_REFCURSOR;
Begin
  Open Postcur for
    Select distinct ...; --specific for internal metadata structure
  Return Postcur;
Exception
  when others then
    g_Feilmelding:=substr(g_Feilmelding||ProcNavn||', ',1,g_maksLengde2);
End ProgramInformationCur;

PROCEDURE ProgramInformation(p_xml in out clob, post PIPostType) is
ProcNavn  varchar2(50):='ProgramInformation: ';
Begin --TVA structure
  p_xml:=p_xml|| '<tva:ProgramInformation programId="crId://nrk.no"||Post.crid||">';
  p_xml:=p_xml|| '<tva:BasicDescription>';
  p_xml:=p_xml|| '<tva:Title type="main">||Post.tittel||</tva:Title>';
  ...
  p_xml:=p_xml|| '</tva:ProgramInformation>';
Exception
  when others then
    g_Feilmelding:=substr(g_Feilmelding||ProcNavn||', ',1,g_maksLengde2);
End ProgramInformation;

```

Questions?

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