NorDig EPG / Event metadata exchange format specification v. 1.3

for

Live and On demand services

in

cable, satellite, terrestrial, IP-based networks and internet

Date: 22.10.2019

1 Introduction

1.1 Scope

This document specifies first Nordig standard for a common EPG/Event metadata exchange format.

NorDig EPG/Event metadata exchange format is a standard for B2B exchange of metadata between broadcasters / contentprovider, network operators and other stakeholder in the distribution chain based on TV-Anytime.

The work with a NorDig common EPG/Event exchange metadata format was back in November 2015, started up based on an increased need for a common standard what supports both for classical broadcast linear TV service as well for OTT streaming services, catch-up and other non-linear services.

It is the intension that the NorDig / TV-Anytime standard to be used widely between Nordic and Irish Content Providers and Media Operators/Network Providers and others worldwide, for Live and On demand services in cable, satellite, terrestrial, IP-based networks and internet.

1.2 Document History

Overview:

This NorDig specification was first issued in March 2018.

Details:

Version	Date	Comments
Version 1.0	08.03.2018	This is the first approved version of the NorDig EPG/Event metadata exchange format specification
Version 1.2	22.05.2019	This updated version 1.02 follows the update of the TVAnytime specification, ETSI TS 102 822 – 3 1 v1.11.1 (2019-03), including minor update and added "ServiceType list" in the Metadata schemas.
Version 1.3	22.10.2019	This update is mainly because of the update of the TVAnytime spec., correcting the cardinality of RightsInformation.Format: Updated reference to ETSI TS 102 822-3-1 V1.11.2 (2019-06) and link to spec. The Classification Schemas made by Nordig is changed from urn:tva to urn:nordig. Added info about ServiceTypeCS and removed some whitespace.

1.3 Terminology

Shall (Mandatory)   This word means that the item is mandatory

Should (Recommended)   This word means that this item is not mandatory but is highly recommended.

1.4 Definitions

Naming, NorDig is using following wordings to refer to a certain combination of capability and variant of IRD (including/excluding): InternetAcess (connectable/non-connectable) + FrontEnd (T/C/S/IP) + codec (HEVC/basic) + API (HbbTV/basic) + PVR (PVR/basic) + type (IRD/STB/iDTV). (A NorDig PVR IRD is often shorten to NorDig PVR).

Integrated Receiver Decoder (IRD):
Refers to all implementation variants of IRDs like Set-top-box (STB) or relevant parts of integrated digital TV (iDTV)-set. Used for requirement which is applicable for all variants of IRDs.

Set-top-box (STB):
The NorDig STB is a NorDig IRD variant without display and output the decoded selected service to an external display via a video and audio interface (e.g. HDMI). The term NorDig STB is used for requirements which is mandatory only for STBs.

integrated Digital TV set (iDTV):
The NorDig iDTV (also denoted NorDig TV set) is a NorDig IRD variant which includes a display and normally output the decoded selected service to the internal display.
All other IRD variants which are not a STB variant are in NorDig treated as an iDTV. For example, a DVB receiver USB dongel with its associated software together with the display/computer/tablet **shall** fulfil the requirements for a NorDig iDTV.
The term iDTV (instead of IRD) is used for requirements which is mandatory only for iDTVs.

NorDig IRD:
The NorDig IRDs consist of a user terminal, including all possible low to high functionality implementations and its associated peripherals. The term NorDig IRD is used for requirements that are applicable for all types of IRDs (STB, iDTV, basic, HEVC, PVR, HbbTV IRDs…).

NorDig Basic IRD (NorDig Basic):
The NorDig Basic IRDs (also denoted NorDig Basic) is specified as a minimum NorDig IRD with without any optional capability (e.g. without HEVC, PVR or HbbTV capability).

The NorDig Basic IRD **shall** satisfy all requirements specified for a NorDig IRD, unless stated otherwise. Requirements that states a certain optional capability (e.g. NorDig HbbTV IRD or NorDig HEVC IRD), these requirement is only that IRD configuration and meaning that the requirement is optional for the NorDig Basic IRD.

NorDig HEVC IRD:
The NorDig HEVC IRDs (also denoted NorDig HEVC) is a NorDig IRD with capability for reception of HEVC based services as defined by NorDig. The NorDig HEVC IRD **shall** satisfy all requirements specified for a NorDig IRD (unless stated otherwise) plus all requirements for NorDig HEVC.

NorDig HbbTV IRD:
The NorDig HbbTV IRDs (also denoted NorDig HbbTV) is a NorDig IRD with capability for reception of HbbTV services as defined by NorDig. The NorDig HbbTV IRD **shall** satisfy all requirements specified for a NorDig IRD (unless stated otherwise) plus all requirements for NorDig HbbTV.

NorDig PVR IRD (NorDig PVR):
The NorDig PVR IRD (also denoted **NorDig PVR)** is a NorDig IRD with the capability to record to internal media (for example a built-in hard disk drive) or removable media (for example a DVD or Blu-ray disk). The NorDig PVR (Personal Video Recorder) **shall** satisfy all requirements specified for a NorDig IRD, unless stated otherwise.

NorDig satellite, cable, terrestrial and IPTV IRD:
The satellite/cable/terrestrial/IPTV NorDig IRD refers to an IRD with a front-end that is capable of receiving satellite/cable/terrestrial/IPTV DVB signals according with section 3. For example, the terrestrial NorDig IRD refers to an IRD with a front-end that is capable of receiving DVB-T and DVB-T2 signals.

A NorDig IRD may support multiple FrontEnd variants (e.g. satellite, cable and terrestrial) and in this case the IRD **shall** support all the relevant requirements for all the supported ForntEnds as stated in section 3.

Connectable/non-connectable IRD:

An IRD may and in some cases, **shall** include a two-way interface (e.g. WiFi, Ethernet, Eurodocsis etc, see section 8.3) typically with access to Internet, here referred to as a *connectable IRD* type (e.g. NorDig HbbTV IRD is a connectable IRD with HbbTV API according to NorDig requirements in section 15, or a "Smart TV" using other techniques than HbbTV). A connectable IRD that have connected and activated the two-way interface is here referred to as *connected IRD* (i.e. a *connected connectable IRD*), while a connectable IRD that has not connected or activated the two-way interface is referred to as *non-connected connectable IRD*.

Example multiple capabilities:

*One example of naming for an IRD that supports multiple capabilities is a **NorDig terrestrial HbbTV PVR**, which refers to all terrestrial types variants of HEVC and non-HEVC IRDs (STB and iDTV) that includes HbbTV and PVR capability.*

1.5   References

[1]   ETSI TS 102 822-3-1 V1.11.2 (2019-06)
                                       (TV-Anytime specification)

1.6   List of Abbreviations

0b	values written in binary (ie with base 2)
0x	values written in hexadecimal (ie with base 16)
AAC	Advanced Audio Codec
AAC-LC	Advanced Audio Codec Low Complexity
AC-3	Audio Codec 3
ACE	Active Constellation Extension
AFC	Automatic Frequency Control
AFD	Active Format Descriptor
AFNOR	Association Francaise de Normalisation
API	Application Programming Interface
ARC	Audio Return Channel (regarding HDMI interface)
AV	Audio (and) Video
AVC	Advanced Video Coding (MPEG-4 p.10/H.264)
BAT	Bouquet Association Table
BCD	Binary Coded Decimal
BDR	Broadcast Discovery Record (part of SD&S)
BER	Bit Error Ratio
BOOTP	Bootstrap Protocol
bslbf	bit string, left bit first
C/N	Carrier to Noise ratio
CA	Conditional Access
CAM	Conditional Access Module
CAT	Conditional Access Table
CATV	Community Antenna Television
CEA	Consumer Electronics Association (North American Association)
CENELEC	Comité Européen de Normalisation Electrotechnique
CI	Common Interface

CID	Content Identifier descriptor
CIF	Common Intermediate Format
CI- CAM	CA-module that complies with the basic Common Interface specification
CIP- CAM	CA-module that complies with the Common Interface Plus specification
CRC	Cyclic Redundancy Check
CRID	Content Reference Identifier
CSO	Composite Second Order
CTB	Composite Triple Beat
CVBS	Composite Video Baseband Signal
D/A	Digital-to-Analogue converter
DAD	Default Authority Descriptor
DAVIC	Digital Audio-Visual Council
dB	decibel
dBFS	dB (relative to) Full Scale
DDS	Display definition segment
DDWG	Digital Display Working Group
DECT	Digital Enhanced Cordless Telecommunications
DHCP	Dynamic Host Configuration Protocol
DSB	Double SideBand
DSM-CC	Digital Storage Media Command and Control
DTS	Digital Theater System (audio codec)
DVB	Digital Video Broadcasting
DVB-C	Digital Video Broadcasting – Cable
DVB-C2	Digital Video Broadcasting – Cable system, second generation system
DVB-CAM	CA-module that complies with the DVB Common Interface specification
DVB-data	Digital Video Broadcasting – Data Broadcasting
DVB-S	Digital Video Broadcasting – Satellite
DVB-S2	Digital Video Broadcasting – Satellite system, second generation system
DVB-T	Digital Video Broadcasting – Terrestrial system
DVB-T2	Digital Video Broadcasting – Terrestrial system, second generation system
E-AC-3	Enhanced Audio Codec 3
E-EDID	Enhanced Extended Display Identification Data (regarding HDMI interface)
EBU	European Broadcasting Union
ECCA	European Cable Communications Association
ECL	EuroCableLabs, technical cell of ECCA
EICTA	European Information & Communications Technology Industry Association
EIT	Event Information Table
EITp/f	Event Information Table, present/following tables
EITsch	Event Information Table, schedule tables
EITp	Event Information Table, present table/section of EITp/f
EITf	Event Information Table, following table/section of EITp/f
EPT	Effective Protection Target
EPG	Electronic Program Guide (based on API)
ESG	Event Schedule Guide (without any API)
FDD	(Mobile communication network) Frequency Division Duplex
FEF	Future Extension Frame
FFT	Fast Fourier Transform
GAP	Generic Access Protocol
GOP	Group Of Pictures
GPRS	General Packet Radio System
GS	Generic Stream
GSM	Group Special Mobile
HbbTV	Hybrid Broadcast Broadband TV

HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDMI ARC	HDMI Audio Return Channel
HDTV	High Definition Television
HDR	High Dynamic Range
HEVC	High Efficiency Video Coding (MPEG-H p.2/H.265)
HE-AAC	High Efficiency Advanced Audio Coding
HFR	High Frame Rate (here >60 frames/s)
HTTP	HyperText Transfer Protocol
HW	Hardware
iDTV	integrated Digital TV (IRD with display)
IEC	International Electrotechnical Commission
IEEE	Institute for Electrical and Electronic Engineers
IEFT	Internet Engineering Task Force
IGMP	Internet Group Management Protocol
INA	Interactive Network Adapter
IP	Internet Protocol
IRD	Integrated Receiver Decoder
IMI	Instant Metadata Identifier
ISO	International Organisation for Standardisation
JTC	Joint Technical Committee
LCD	Logical Channel Descriptor
LCN	Logical Channel Number
LTE	(Mobile communication network) Long Term Evolution
LU	Loudness Units
LUFS	Loudness Units (relative to) Full Scale
L-PCM	Linear Pulse Code Modulation
MAC	Medium Access Control
MPEG	Moving Pictures Expert Group
MPTS	Multi Programme Transport Stream
MTU	Maximum Transfer Unit
NEM	Network Element Management
NIC	Network Interface Card
NIT	Network Information Table
NT	Network Termination in general
NVOD	Near Video On Demand
OSD	On Screen Display
PAL	Phase Alternating Line
PAPR	Peak-toAverage-Power Ratio
PAT	Program Association Table
PCM	Pulse Code Modulation
PLP	Physical Layer Pipe
PID	Packet Identifier
PMT	Program Map Table
PSI	Program Specific Information
PSTN	Public Switched Telephone Network
PCR	Programme Clock Referance
PVR	Personal Video Recorder, (same as PDR, Personal Digital Recorder, or DVR)
QAM	Quadrature Amplitude Modulation
QCIF	Quarter Common Intermediate Format
QEF	Quasi Error Free
QoS	Quality of Service
QPSK	Quaternary Phase Shift Keying

RF	Radio Frequency
RFC	Request For Comments
RMS	Root Mean Square
RoO	Rules of Operation
rpchof	remainder polynomial coefficients, highest order first
RS	Reed-Solomon
RST	Running Status Table
RTCP	Real-Time Transport Control Protocol
RTP	Real-Time Transport Protocol
RTSP	Real Time Streaming Protocol
S/PDIF	Sony Philips Digital Interface (for digital audio)
SAP	Session Announcement Protocol
SBR	Spectral Band Replication (regarding HE-AAC audio)
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs (video/audio interface)
SD&S	Service Discovery and Selection
SDL	(Mobile communication network) Supplemental Downlink
SDT	Service Description Table
SDTV	Standard Definition Television
SFN	Single Frequency Network
SFR	Standard Frame Rate (here up to 50 frames/s)
SDR	Standard Dynamic Range
SI	Service Information
SMATV	Satellite Master Antenna Television
SNTP	Simple Network Time Protocol
SPTS	Single Programme Transport Stream
ST	Stuffing Table
STB	Set-top box (IRD without display)
SW	Software
TCP	Transmission Control Protocol
TDT	Time and Date Table
TFS	Time Frequency Slicing
TFTP	Tunnelling File Transfer Protocol
TOT	Time Offset Table
TPS	Transmission Parameter Signalling
TRS	Tip Ring Sleeve
TR	Tone Reservation
TS	Transport Stream
TV	Television
TVA	TV-Anytime
UHDTV	Ultra High Definition Television
UHF	Ultra-High Frequency
uimsbf	unsigned integer most significant bit first
UTC	Universal Time, Co-ordinated
VCR	Video Cassette Recorder
VHF	Very-High Frequency
VHS	Video Home System
VoIP	Voice over IP
VPN	Virtual Private Network
VSB	Vestigial SideBand
xDSL	x Digital Subscriber Line
XML	Extensible Markup Language

2 NorDig EPG/Event Metadata Exchange format

2.1 General

The NorDig common EPG/Event metadata exchange format is meant for professional B2B (business-to-business) use for all stakeholders in the distribution chain. The specification refers to the NorDig Unified IRD specification and NorDig Roll of Operation (www.nordig.org).

The NorDig EPG/Event Metadata Exchange format specification covers EPG / Event program information both for live and on demand content on all media platforms (broadcast TV, PC, mobile, Tablets, etc.) and various distribution networks (DTT, Sat, internet, etc.) and include rights managements.

The NorDig EPG/Event metadata exchange format is based on the TV-Anytime specification (hereafter TVA), latest version, with supports NorDig requirement including rights management and cross platform distribution for both Live TV and Ondemand.

The NorDig EPG/Event metadata exchange format is hereafter in the document named NorDig TVA metadata exchange format.

2.2 Introduction

This chapter describes the NorDig TVA metadata specification, Guidelines for implementation of NorDig TVA metadata exchange format including example files and Guidelines for implementation of "last minute update" including example files.

2.3 Implementation package

NorDig is providing implementation package, NorDigTVAGuidelines ver. 1.3, including files mentioned in this document. It is available for download at www.nordig.org

2.4 NorDig TVA metadata format

The NorDig TVA metadata format is defined on the TV-Anytime specification, latest version, which has been updated to meet NorDig requirement and future needs including rights management and cross platform distribution for Live tv and Ondemand.

2.5 NorDig TVA specification

NorDig is using ETSI TS 102 822-3-1 V1.11.2 (2019-06) Technical Specification. For first introduction read 5.3 CRID and Metadata from page 17.

The specification is available at ETSI website: ETSI TS 102 822-3-1- v1.11.2 (2019-06)

TV-Anytime official web page is https://tech.ebu.ch/TV-Anytime, here you also find Scheemas and Classification schemas (CS).

2.6 Device type, Device OS, Rights type, ServiceTypeCS

NorDig have developed Classification Schemas (CS) for DeviceType, DeviceOS, RightsType and ServiceType maintained by NorDig EPG/Event metadata Group. It is reference lists that contains a description of the receiving equipment and software platforms relevant in the Nordic and Irish markets, in relation to rights managements handling and differentiating types of services.

The Classification Schemas (CS) lists are maintained by the NorDig.
The lists are xml files which is included in the implementation package available for download at www.nordig.org.

2.7 Maintenance and updates

NorDig maintain this specification and will ensure future updates of the TVA specification to support future requirements and needs in new releases.

The NorDig EPG/Event metadata Group will be able to help and support with expertise and know-how also in the future, as the NorDig EPG/Event metadata Group will take care of maintenance and coming updates of the specification.

2.8 TV-Anytime licens

There is no known license claim on TV-Anytime.
For more information please see: https://tech.ebu.ch/TV-Anytime/ and https://tech.ebu.ch/tvalicensing.

2.9 Guidelines for implementation

The Guidelines for implementation of NorDig TVA metadata exchange format, is a document meant for broadcasters, other content providers and distributors to facilitate planning and implementation of NorDig common EPG/Event metadata exchange format based on the TV-Anytime standard (latest version) in their production chain, metadata delivering systems and distribution networks.

The document contains technical guidelines for implementation of NorDig TVA EPG metadata XML files, by providing terms with definitions for a common language/understanding and the representation of the terms in Tva examplefiles.

The Guidelines for implementation of NorDig TVA metadata exchange format is included in the implementation package and avaible at www.nordig.org, including NorDig Termslist, NorDig classification scheemas, NorDig TVA example scenarios and NorDig TVA metadata XML example files.

The "Guidelines Last minutes update" document refers to this Implementation guidelines.

2.10 Guidelines Last minutes update

The NorDig Guidelines Last minutes update document is meant for help to broadcasters and other content providers to facilitate planning and implementation of "last minutes update" in their production chain and metadata delivering systems.

Guidelines for "last minutes update" of program start, duration - "last minutes" refers to shortly before but also afterwards for "correcting" catch-up segmenting.

The NorDig Guidelines for Last minutes update are included in the implementation package and avaible at www.nordig.org.

2.11 Distribution of NorDig EPG/Event metadata

For distribution of EPG/Event metadata is recommend using the pull technique.
The publisher of EPG metadata should provide a public area where the latest and most updated information is available.

2.12 Technical support with implementation

NorDig EPG / Event metadata group can help with advice and technical information related to implementation of NorDig TVA exchange format and provide contact to already implemented solutions.
For contact to NorDig EPG / Event metadata group, please see www.nordig.org.