



NorDig T report to Excom

NorDig Excom meeting 26th May 2015 Stockholm, Sweden

NorDig Excom Agenda 26th May 2015:

Place: Arlanda Hotel, Arlanda in Stockholm, Time: 10:00 to approx. 16:00

1. Agenda and report from previous meeting
2. Organizational matters
 - 2.1. Change of NorDig charter (enclosed)
 - 2.2. Membership situation
 - 2.3. Contract with external consultant
 - 2.4. Finance matters
3. Report from NorDig/T
 - 3.1. Specification and work status
 - 3.2. Special issues
4. Report from Industry
 - 4.1. Report from Nordic Product Manager meeting
 - 4.2. Report from industry members
5. Invited presentation:
 - WRC 15, Amela Hatbovic-Sevic, PTS
 - Presentation about EBU and 700 MHz – Lis Grete Möller, DR
 - Presentation about Nkom Report on 700 MHz– Trude Malterud, NTV
6. Reports from members, DVB and other organizations
7. Any other business
8. Date and place for the meetings in 2016



NorDig T report - Overview specification work

NorDig Excom meeting 26th May 2015

Overview NorDig T specification work :

- Rules of Operation
 - v2.0 target: Q4 2015
- Unified IRD specification
 - v2.5.1 has been published July/Aug 2014 (v2.5 and then correction to v2.5.1)
 - **Proposal v2.6 mid 2016 or end 2015**
- Test Plan
 - v2.4 has been published Feb 2014
 - v2.5 planned Q2 2015 (incl test for PVR crids, HbbTV etc)
- HbbTV
 - Test cases (both NorDig and HbbTV test specs), under progress, NRK supervising, Sofia Digital consulting for writing test cases (partly paid by NorDig and partly by NRK+DR) (target Q1.2015)
 - Logo + marketing: no NorDig specific, no other than HbbTV standard
 - DRM: no NorDig DRMs specified for IRDs (NorDig T still monitor and report DRM to Excom)



NorDig T report - Work and subgroups

NorDig Excom meeting 26th May 2015

Overview

NorDig T – *active*

NorDig T subgroups – status

- Video – *dormant*
- Audio – *active* (audio related for IRD, Test Plan and RoO. Working together w Accessibility group)
- Test – *active* (Test Plan)
- RoO – *active* (RoO spec)
- Accessibility – *active* (accessibility related for IRD, Test Plan and RoO)
- PVR/API – *active* (HbbTV testing (cases+setup), API+PVR related for IRD, Test Plan and RoO)
- CA/CI+/Sec – *dormant* (CI+ v1.4)
- (SSU – *closed* after IRD v2.5 work)



NorDig T report - Work and subgroups

NorDig Excom meeting 26th May 2015

Organisation and status

NorDig T – *Per Tullstedt, Teracom*

NorDig T subgroups – status

- **Video** – *dormant (future maybe HEVC, UHDTV, HDMI 2.x etc)*
- **Audio** – *Johan Lindroos, SVT, preparing proposals related to audio for IRD, RoO and Test specs*
- **Test** – *Pasi Toiva, Labwise, drafting NorDig Test Plan*
- **RoO** – *Des Mac Giolla an Chloig, RTÉNL, drafting RoO spec*
- **Accessibility** – *Kjell Norberg, NRK, preparing proposals related to accessibility (audio, video, subtitling, menus...) for IRD, RoO and Test specs*
- **PVR/API** – *Erik Vold, NRK, preparing proposals related to PVR and API (HbbTV) for IRD, RoO and Test specs. Investigations DRM alt, test model/process. Creating complementing HbbTV Test streams*
- **CA/CI+/Sec** – *dormant (CI+ v1.3, CI+ v1.4)*
- **SSU** – *dormant*



NorDig T report - Meeting calendar 2014

NorDig Excom meeting 26th May 2015

NorDig T meeting calendar 2015:

- 13th Jan 2015, telco/webinar
Informative: NorDig Excom 27 Jan
- 10th March 2015, telco/webinar
- 13th May 2015, physical (Stockholm, Sweden)
Informative: NorDig Excom 26 May
- 16th June 2015, shorter webinar before summer break

Informative: IBC 10-15 Sept
- 22th Sep 2015, physical (London, UK)
Informative: NorDig Excom 29 Sep
- 27th Oct 2015, telco/webinar
- prel 8th Dec 2015, shorter webinar before X-mas



NorDig T report - RoO

NorDig Excom meeting 26th May 2015

Rules of Operation – status report

- v2.x target: Q4 2015 – on schedule
- Progress
 - Des made a number of drafts
 - Now since 1 April support from our technical secretary Peter Molsted drafting
 - Not easy to have same structure as IRD spec



NorDig T report - Test plan

NorDig Excom meeting 26th May 2015

Test Plan

- v2.5.1 target: Q2 2015
- Still under preparation, (waiting inputs for example for Audio parts etc)



NorDig T report - Accessibility

NorDig Excom meeting 26th May 2015

Accessibility status report

- Questionnaire Supplementary audio (*see details at the end of doc*)
 - Questionnaire made for AD audio + Spoken subtitling
 - Replies from NRK, DR, SVT, YLE, RTE/RTENL
 - Both AD + Spoken Subtitling is widely used over broadcast (AD some and Spoken Subt often)
 - AD + Spoken Subtitling is not yet so much used over broadband (except DR)
 - Broadcast mode differs, some separate TV service, others broadcast mix and others receiver mix
 - Spoken subtitles and Audio description can share the same audio channel because they should never occur at the same time.
 - Spoken subtitles are made automatic, and is cheap to generate. It runs on all programs when first installed.
 - Audio description is a manual task. It is 5-10 times the work of subtitles, and therefore only used on high profile programs.
- Remote control
 - Review/update old text (see separate slide)
 - RC for accessibility settings (if possible collect all accessibility settings: HoH subtitling, AD audio etc)



HbbTV and PVR - status report

- HbbTV subgroup very active
- HbbTV test cases maintenance ongoing
- PVR Lite / TV Recorder – will discuss/review proposal TV man
- Organisation ID – 500EUR. (Excom decision needed)
 - “All” HbbTV test cases needs to be reference by an organisation and this refers technical to an (DVB) Organisation_ID value, best would be if this could be a NorDig Org.id. NorDig T+API propose that NorDig apply for an Org.id from DVB (not sure that is possible), one time cost of 500 EUR. Otherwise we have to use NRK’s org.id for NorDig developed HbbTV test cases.
- New item – monitor Must carry of HbbTV signaling in Finland (maybe collect info from NorDig countries?) (Excom view, if any)



NorDig T report - IRD

NorDig Excom meeting 26th May 2015

NorDig Unified IRD spec

- No major updates or new requirement foreseen, **Proposal v2.6 mid 2016 or end 2015**
- Maintain and update current requirements for NorDig (**19 items on bugzilla list**).
- Update guidelines wordings in GUI and translations (mainly related Accessibility and Audio)
- Review and improve IRD's auto update for network changes
- FE (DVB-T/-T2) review if 800MHz scanning can be removed (NRK) and add optional requirements for 700MHz LTE immunity (hopefully via reference to ITU/ETSI) - **started**
- IPTV – ComHem launching IPTV and has some interest to updated current IPTV IRD requirement.
- IRD surveillance (like using TR069), some interest to investigate this more.
- SSU, add alternative for broadcasting SSU notification in accordance with new DVB SSU spec 2015 for IRDs with very large file size – **(DTG D-book v8 has incl this)**
- Recommendation Remote Control related to accessibility settings, check if possible to get a RC key for changing Accessibility setting or modify current requirements and recommendations. (Ensure RC can be via Smartphones etc) - **started**
- HbbTV – investigate and prepare update IRD spec for latest HbbTV v1.5 (i.e. latest errata) - **started**
- TV recorder – closed. No need to define TV Recorder (PVR lite) unless someone volunteer to come with a more concrete text proposal - **started**
- Mix of broadcast and OTT (ideal/intension one common channel list of broadcast and broadband/OTT services for hybrid receivers, viewers should ideal not notice zapping diff between zapping among broadcast or OTT services)

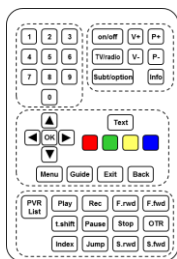


NorDig T report - IRD: Remote Control

NorDig Excom meeting 26th May 2015

Remote Control chapter under review

- Started as action related to Accessibility, to make it easier for these viewer to access these settings. Noted that the complete chapter needs to updated, some text unclear.
- From beginning (1997/1998) requirements for physical keys (arrows, numeric, OK etc...).
- Now 2015 some IRDs uses Remote Control with very few keys together with on-screen virtual keyboard ("magic wands"), smartphones/tablets, gesture, voice control etc.
- Reported that DTG D-book now has only functional requirements and not on physical keys.
- Industry (participating in our work) propose that NorDig changes requirement to functional requirements instead of requirements for physical keys. IRD manufactures asking (NTV/RiksTV, Boxer etc) for approval to minimized RC (functional requirements instead of requirements on certain physical keys), partly due to not fully clear text today in IRD spec.
- NorDig T – “half-OK” to change to functional RC instead of physical keys, technical possible for (basic) IRDs but what about viewers expectations?
- NorDig T/API – OK from HbbTV specifications point of view, but physical Exit button, back button, arrows, OK and colour keys are vital to HbbTV apps. Numeric keys could be OSD.
- **NorDig Excom view?**
 - ~~Prel OK, NorDig T start prepare update of text to be functional requirements instead, or~~
 - Needs more inputs from members and investigation or
 - ~~Keep as today (clarify if not clear today)~~



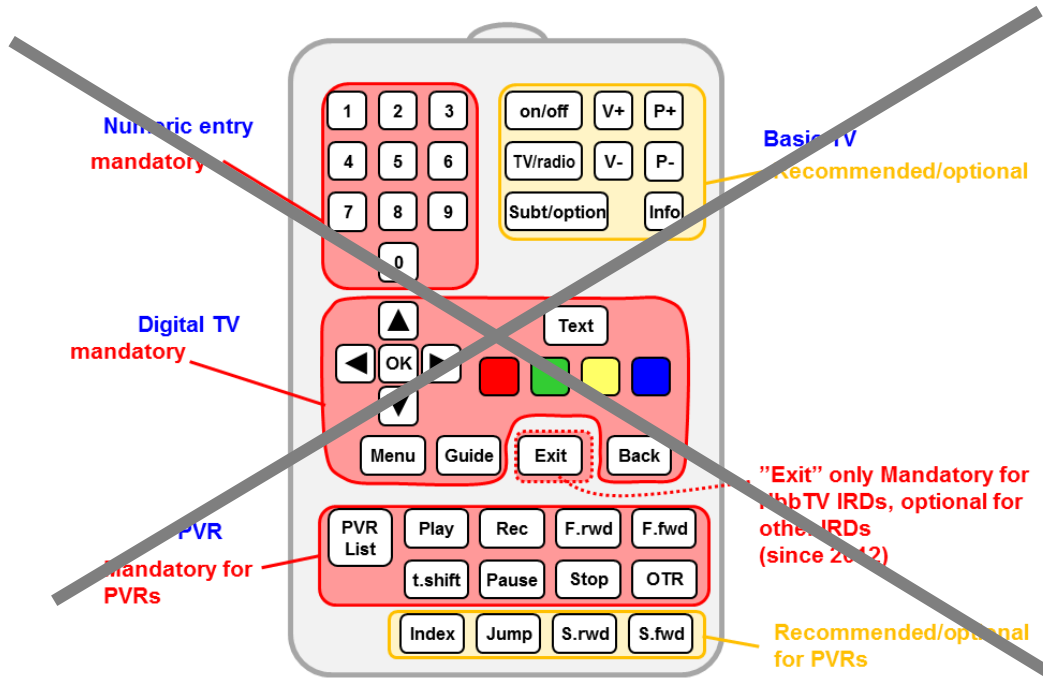


NorDig T report - IRD: Remote Control

NorDig Excom meeting 26th May 2015

Remote Control chapter under review

NorDig v2.4/v2.5/2.5.1 (incl HbbTV)



Extract part of Remote Control chapter NorDig Unified IRD spec v2.5.1:

8.7.2 Functions

The remote control for the NorDig IRD shall include the following functions (the labelling names that are used in Figure 8.1 are shown below within square brackets for each function), associated with input events. An input event may be associated with a physical key or a logical (e.g. on-screen) key, where the “logical key” is associated with the same function as specified for the corresponding physical key.

8.7.2.1 Numeric Entry

The NorDig IRD’s remote control shall include 10 digit keys, labelled 0-9.

8.7.2.3 Digital TV Functions

The NorDig IRD’s remote control shall include the following keys for digital TV functions:...

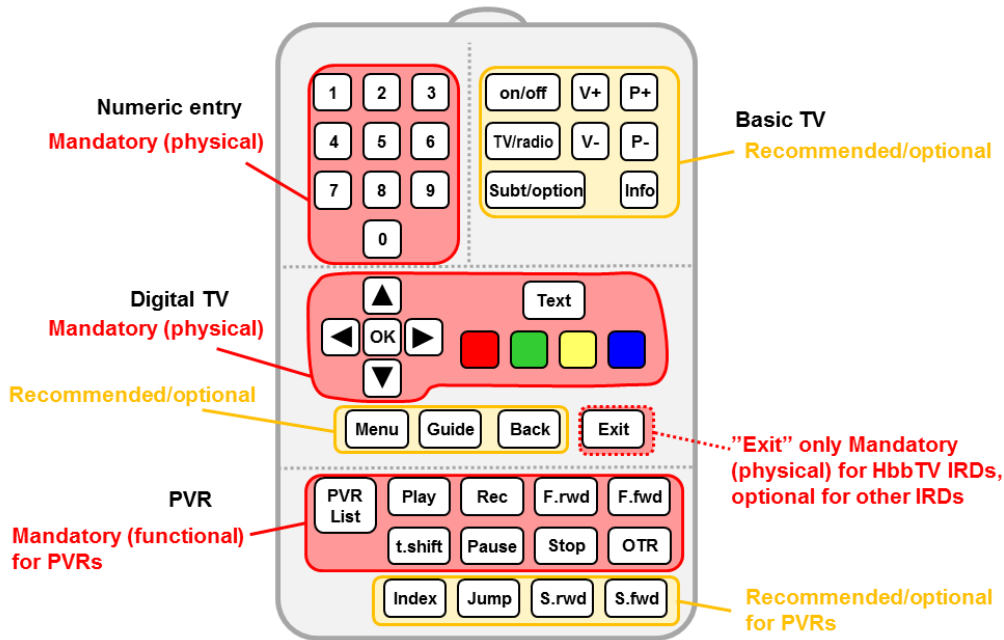


NorDig T report - IRD: Remote Control

NorDig Excom meeting 26th May 2015

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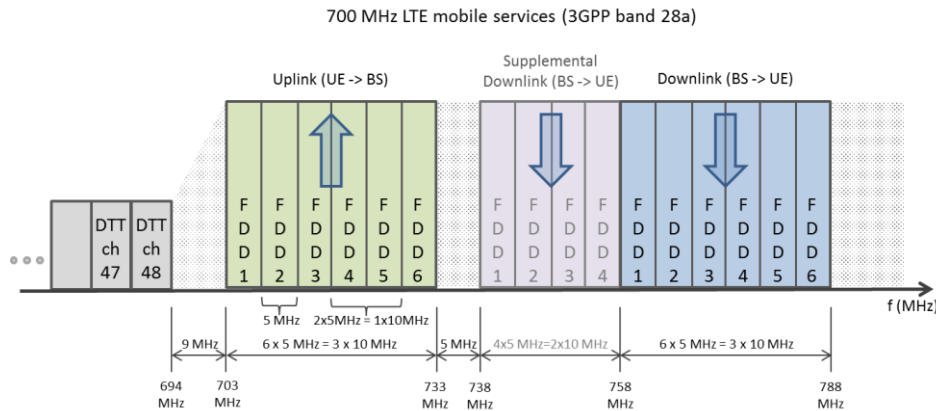
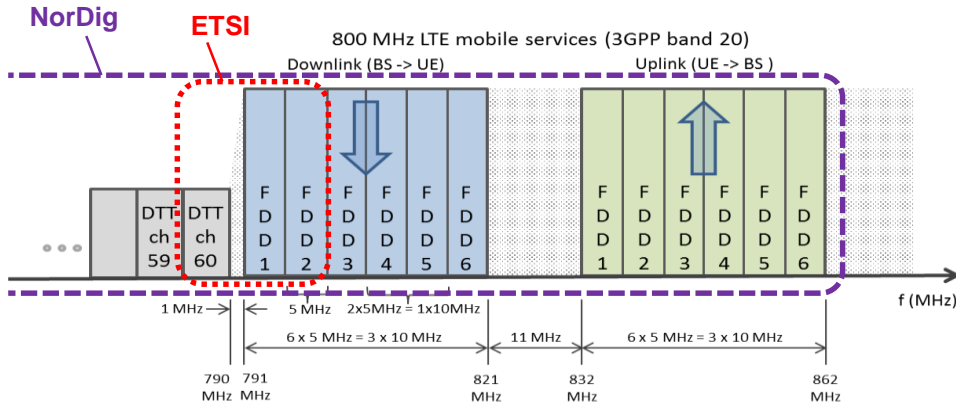


NorDig T report - IRD: 700MHz LTE interference

NorDig Excom meeting 26th May 2015

Info:

Teracom has 13 May presented inside NorDig T first draft proposal for DTT IRD requirements for immunity against 700MHz LTE interference signals, based on extending existing 800MHz LTE immunity requirements.

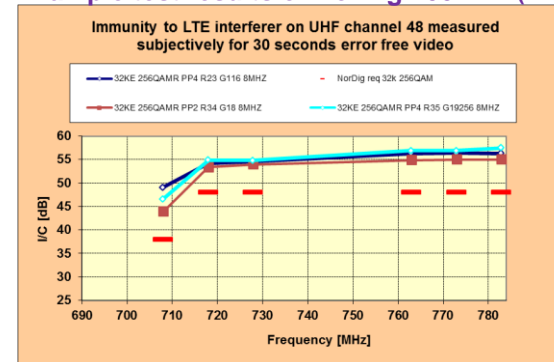


- New EU Radio Equipment Directive 2014/53/EU (RED) states: *“Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference”.*
- ETSI has drafted a harmonised standard that incl IRD requirements, test cases and test signals to be used (partly based on NorDig).
- ETSI requirement only for first adjacent channel interference and closest LTE FDD (2x)block
- ETSI level quite low (but higher than current NorDig)

Teracom proposal:

- Keep NorDig 800MHz LTE requirements + add 700MHz
- Keep requirements for the IRD’s whole freq range and for all LTE blocks (both 700 and 800MHz)
- First align (raise) levels to ETSI now and from 2017/2018 raise again resulting in slightly stricter than ETSI.
- Test cases and test signal still under preparation

Example test results of NorDig 700MHz (DVB-T2)





NorDig T report - TV recorder (PVR Lite) 1/2

NorDig Excom meeting 26th May 2015

Vestel Nordig PVR Lite / TV Recorder Proposal - [check NorDig Excom view before detailed](#)

- Nordig PVR spec is too heavy to implement (for IRD/TVset with simple recording capability).
- Is it possible to prepare a lighter version of PVR spec for IRD's with internal/external storages?
- What are the main expectations of an end user from a tv recorder?
 - **Setting a recording should be easy.**
One Touch Record, Setting timer from EPG(ESG), manual record entering date/time and duration.
 - **It should record required program completely without cutting from start or end of the program.**
Accurate Recording.
 - **Playback should be easy and pause, fast forward/fast rewind should be possible.**
Trick modes should be possible.
 - **Pause of live tv and continue after a short while would be very nice for a short break!**
Timeshift with trick modes should be possible.
- Since spec is light this is not a full PVR, so different naming can be discussed! For example name can be TV Recorder Ready! ([earlier Excom proposed TV Recorder](#))

2013/2014 Previous NorDig discussion TV Recorder / PVR Lite:

- Main reasons: Current CI+ only allows 1 TS in/out, TV set has only 1 tuner, many TV sets has recording capacity, NorDig PVR Lite could be a sanity check level for basic recording.
- TV Recorder / PVR Lite only for single tuner iDTV (ie not for STBs or iDTV with multiple tuners)
- When CI+ (v1.4) allows for multi TS in/out should we keep PVR Lite/TV Recorder profile?



NorDig T report - TV recorder (PVR Lite) 2/2

NorDig Excom meeting 26th May 2015

		Require	All	Reference	TV Recorder			
		crids	IRDs	(full) PVR	Old ideas	2013/2014	Vestel new	
Overview list (main features)					Lite	Super-lite	Lite	Comment
General	EPG/ESG 8day guide			M	M	M	M	
General	Security/anti-piracy (local storage, interfaces...)		M*	M*	M*	M*	M	
General	Recording File System, Deletion of recordings, capacity			M	M	M	M+O	Disk management / de-fragmentation
Recording	Automatic conflict handling			M	M	M	M	
Recording	Basic requirement (30Mbps, SD/HD/radio, min length)			M	M	M	M	
Recording	Programming via ESG/EPG			M	M	M	M	
Recording	Manual recording			M	M	M	M	
Recording	Full service recording			M	M	M	M	
Recording	Accurate Recording			M	M	M	M	
Recording	Back-to-back recording			M	M	M?	O	
Recording	Timeshift recording			M	M	M?	M	
Recording	TVA crids – basic usage (e.g. for re-schedulling)	crids		M	M?	M?	O	here refer to using crids instead of event_id for individual recordings
Recording	Split Recordings	crids		M	M?	M?	O	
Recording	Simulcast (SD<>HD, regional versions)	crids		M	M?	M?	O	
Recording	Series recording (TVA crids)	crids		M	O?	O?	O	
Database	91days of recordings and previous recordings	crids		M	O?	O?	O	
Recording	Simultaneous recording ("two tuners")			M	O	O	O	one tuner and CI+ v1.3 (1in+1out)
Recording	Recommended events	crids		O	O	O	O	
Recording	Alternative instance	crids		O	O	O	O	
Recording	Recently removed recordings	crids		O	O	O	O	
Recording	Late Recording ("continous timeshift buffer")			O	O	O	O	
Recording	Safe margins			O	O	O	O	
Recording	Trailer booking/Promotional Linking	crids		O	O	O	O	
Recording	NorDig Broadcast Record Lists	crids		O	O	O	O	
Playback	Playback – basic requirement (incl sync)			M	M	M	M	
Playback	Playback – trick modes			M	M	M	M	
Playback	Playback – Full service playback			M	M	M	M	
Playback	Simultaneous recording and playback			M	M	M	M	

See more details at the end of the presentation (extra slides)



NorDig T report - HEVC

NorDig Excom meeting 26th May 2015

HEVC and TV format: investigation and commercial requirements

- not yet started (plan to start before summer, still much discussions in EBU+DVB+MPEG)
 - TV format: today's or new higher?
 - Codec: video and how about audio, subtitling?
 - I/O interphases (HDMI incl CP)
 - Signaling: DVB draft but nothing for simulcasting (outside DVB)
 - FE? together with modern/latest modulations?
 - Security requirements – most TV supporting HDMI 2.0 also follows MovieLabs HDCP v2.2
 - CA/DRM – together with CI+ v2? together CSA3 or DRM (128bits AES a la DVB)?
- DVB (and MPEG) still working UHD phase 2 (HDR, higher frame rate, “better pixels”...)
- DVB UHD phase 2 survey



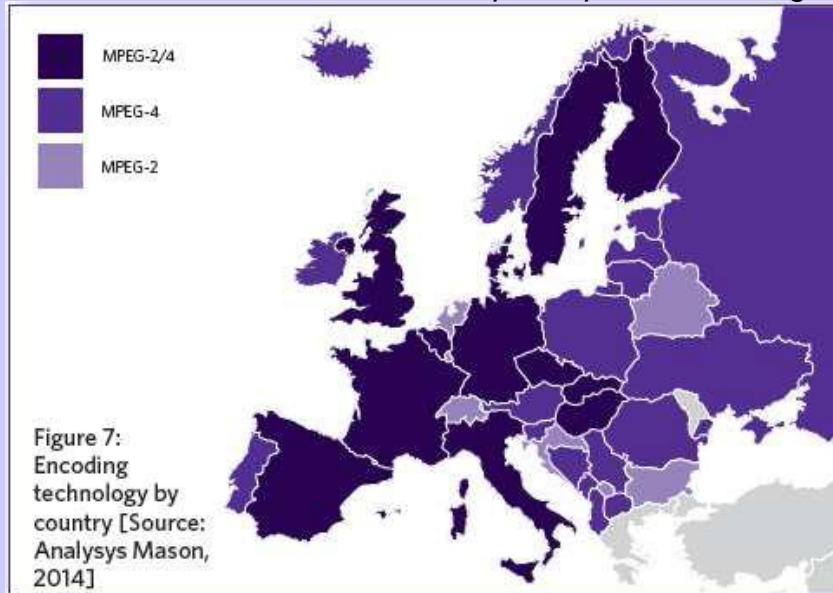
NorDig T report - HEVC

NorDig Excom meeting 26th May 2015

HEVC and TV format: investigation and commercial requirements

- Italy and Germany (DTT) started requiring HEVC, 1080p50Hz 10bits (due to 700MHz spectrum)
- Example of old NorDig Commercial requirements from MPEG4 and HD introduction at the end of the doc.
- IRD Support for MPEG-H HEVC (short indicative check inside NorDig T with TV manufactures):
 - **Samsung:** support HEVC for higher model range, for OTT but also broadcast (future German market etc), uncertain if all UHD or HD.
 - **LG:** support HEVC for broad range models (except entry level models), for OTT and broadcast
 - **Sony:** support HEVC for higher model range, for OTT and broadcast for some markets
 - **Vestel:** developing support for HEVC for higher model range, for OTT maybe broadcast

From ITU workshop on Spectrum Management, Budapest, Hungary, 5-7 May 2015



- *The most recent encoding standard, HEVC, has not been adopted yet. It is likely to be deployed along with DVB-T2, e.g. deployment is expected in Germany in 2017*
- *Broadcasters have already started showcasing HEVC during special events transmitted in UHD*

(ref Bernard Pauchon, Chairman DigiTAG Spectrum and Networks Group)



NorDig T report - EPG interchange format

NorDig Excom meeting 26th May 2015

Common EPG/Event interchange delivery file format

- not yet started (plan to start before summer)
- Intension is to create a new subgroup supported by the API subgroup
- Use our consultant Peter Molsted, has very good experience in this area (lower prio than RoO work and inside budget)
- NorDig T view is that it would be an advantage to invite external (Nordic and Irish) broadcasters and operators into this work to get better acceptance.
- Excom - is it OK to invite external (non-members) broadcasters and operators into this work like Viasat, Telia, SBS, TV4 etc?



NorDig T report - short info standards

NorDig Excom meeting 26th May 2015

Short info about news/progress relevant Standards – NorDig members interest?

General

- DTG D-book v8 released March 2015 (incl Freeview connected, HbbTV and additions for sync 2nd screen)

Front Ends (NorDig IRD v2.5.1: DVB-S/-S2, -C, -T/-T2, some for “-IP”)

- US ATSC 3.0 complete new stack, IP-based (no longer MPEG2 TS based). ARIB Japan new satellite system, instead IP-based and MPEG-H MMT (no longer MPEG2 TS based).

Video & Audio (NorDig IRD v2.5.1: MPEG2 + MPEG4)

- MPEG-H HEVC, UHDTV phase 1 and Dolby AC4 (DVB finalizing subset & additional signaling details)
- UHDTV phase 2, DVB still working with Commercial Requirements

CA, CI+, DRM and security (NorDig IRD v2.5.1: CI+v1.3, scrambling DVB CSA, no CA, no DRM)

- CI+ v2.0 still under development, plan to include new form factor (PCMCIA → USB), waiting low level USB handling
- CI + v1.4, CI+ LLP (Limited Liability Partnership) plan to release license agreement June 2015
- Security – DVB investigate security and tamper proof aspects to ensure credibility with broadcast signals

HbbTV (NorDig IRD v2.5.1: HbbTV v1.5 aka ETSI TS 102796 v1.2.1)

- HbbTV v2.0 (draft ETSI TS 102796 v1.3.1) late 2014 w first impl early 2016, incl HTML5, sync devices etc
- HbbTV Test suits v1.5, 2014/2015 (NorDig contribute/propose)

I/O interfaces etc (NorDig IRD v2.5.1: HDMI v1.4, SCART output optional)

- HDMI v2.0 for UHDTV (4k, 10bit, 50/60Hz, but old colors and dynamics, Sep 2013)



NorDig T report – NorDig countries/networks

NorDig Excom meeting 26th May 2015

List of Countries using NorDig specifications (outside NorDig members), Several IRD manufactures and other mentions that several other territories and DVB networks refers or uses NorDig as basis for their IRD specs (especially “newer” networks). Among reasons seems open spec and content (T2, HbbTV, subtitling etc).

First list:

Country / Network	Status
Turkey DTT	Confirmed via Vestel
Several eastern Europe countries	Indications, not confirmed
Malaysia (<i>blue copy</i>)	Digita
Germany DTT (Media broadcast/TDF)	Based on/reference to NorDig IRD
Georgia DTT	Based on/reference to NorDig IRD (v2.2)



NorDig T report – website update (1/2)

NorDig Excom meeting 26th May 2015

NorDig website update and mail reflectors (inputs from Peter Molsted)

There has long been a desire to modernize the NorDig website to make it more useful for NorDig members and easier to access for other interested

Both the open section of the website and member section should be modernized and updated

Main wishes to better functionality and updates:

1. Editing and updating the permanent texts as NorDig organization, contacts...
2. Meeting schedules for Excom and NorDigT
3. Restructure / redesign document handling for the working groups
4. Mail reflectors which automatically sends mail when updates on the website

Proposal practical matters related to modernization and updating of NorDig website

- The NorDig website will continue be hosted by Labwise on their web platform
- Pasi Toiva (Labwise) will continue to take care of the technical part, publishing documents and specifications
- Peter Molsted (Technical secretary) will be responsible for the content updating, restructuring and administration of mail reflectors



NorDig T report – website update (2/2)

NorDig Excom meeting 26th May 2015

NorDig website update and mail reflectors (inputs from Peter Molsted)

1. Editing and updating the permanent texts as NorDig organization, contacts and Q&A.

- All texts must be reviewed and evaluated where improvements can be made in the structure and wording
- Continuous updating of content and texts, changes and news

2. Meeting schedules for Excom and NorDig-T

- Updated schedules with meetings and other activities in Excom and NorDigT
- The meeting schedules to be placed in the open section such that non Nordig members have the opportunity to see meetings schedules
- Meeting schedules as option for subgroup (in members section)

3. Restructure / redesign document handling for the working groups

- Template document structure for the subgroups
- Easily upload and download of documents

4. Mail reflectors which automatically sends mail when updates on the website

- Mail reflectors for the open section of the website for news and specifications
- Mail reflectors for member part of the website:
- Specific mail reflectors for respectively Excom and NorDigT and subgroups

Excom view?



NorDig T report –

NorDig Excom meeting 26th May 2015

END presentation NorDig-T report

After here some detailed informative slides



NorDig T report - Accessibility AD survey 1/4

NorDig Excom meeting 26th May 2015

Accessibility AD Audio Questionnaire – Audio Description (AD)

Audio Description (AD)	DR	NRK	SVT	YLE	RTÉ	Comments
Is AD provided?						
AD service “on air”	Yes	No	No	Yes*	Yes	*Only pilots
On how many TV channels	1*			4**	2	*In a few months on 3 channels ** all 4 services in both SD and HD.
Programs provided with AD	Few*			Few	daily	*50-60 programs pr. year
If no: plans for this type of service		Yes	Yes*			*Doing trials
Legal or regulatory requirements	Yes	No	No*	No	Yes	* Plans for 2014 on onwards
Distribution of AD audio?						
Broadcast National distribution	Yes		Yes	Yes	Yes	In service’s main broadcast platform (satellite, cable, terrestrial and/or IPTV)
Web Broadband OTT live for PC, tablets, smartphones						via Internet (WiFi etc) and mobile netw.
Web Broadband OTT on demand for PC, tablets, smartphones	Yes		No		No	via Internet (WiFi etc) and mobile netw.
HbbTV broadband OTT live for TV sets						
HbbTV broadband OTT on demand for TV sets						
Is the AD service “must carry”	No*	No*	No	Yes	Yes	* “The Ministry of Culture considers that it is important...
How are the AD audio stream processed and encoded as?						
Broadcast-mix	X	X		X	X	
Receiver-mix			X			Mono audio intended to be receiver mixed with normal audio at IRD
Separate audio stream						But not using receiver mixing
Audio fading of normal audio during AD						Used and if used how? Always same amount of fade applied? Amount?
Fading time before/after						Typical figures?
For receiver mix, is fade and pan metadata broadcasted?						



NorDig T report - Accessibility AD survey 2/4

NorDig Excom meeting 26th May 2015

Accessibility AD Audio Questionnaire – Audio Description (AD)

Audio Description (AD)	DR	NRK	SVT	YLE	RTÉ	Comments
How user discover and access the AD services (signalling)?						
In-band main TV service				X	X	In main TV service as an additional audio stream/track.
As Separate TV service (incl “twin channel”/“virtual ch”)	X	X				As a separate TV service with AD audio instead of normal audio e.g. via main and separate TV service share same video stream but diff audio streams
Is AD audio signaled as accessibility/supplementary?				Yes*	->	According to DVB definition or as a normal audio with an alt audio language * SD:VI, HD:VI+supplementary_audio_descr
Supplementary audio descriptor				Yes*	No	Used or not *Used for HD services
Audio type in ISO639 descriptor			X*	X**	Normal	N: Normal, VI: Visual Impaired, *SD: separate channel, HD: Receiver-mix **SD: VI, HD: VI
Audio language, same or alternative audio language				dut	nar (narrative)	Same: same language as * language_descriptor < dut >, because STB doesn't recognize the "Audio Description" signaling
Are AD signalled in the EPG (EIT)	Yes*	No	No	Yes**	Yes	*Only in program description **EIT component_descriptor (AC3)

On demand refer here to playback of non-live content like catch-up of live broadcast and other clips



NorDig T report - Accessibility AD survey 3/4

NorDig Excom meeting 26th May 2015

Accessibility AD Audio Questionnaire – Spoken Subtitling

Spoken subtitles (audio captioning)	DR	NRK	SVT	YLE	RTÉ	Comments
Is Spoken Subt provided?						
AD service “on air”	Yes	Yes*	Yes	Yes		*Only terrestrial, not published yet
On how many TV channels	1	3	2	4*		*on both SD and HD versions
Programs provided with Spoken subtitles	All	All*	All	All		*with open subtitles
If no: plans for this type of service						
Legal or regulatory requirements	Yes	No	No*	Yes		* Plans for 2014 and onwards
Distribution of Spoken subt?						
Broadcast National distribution	Yes	Yes	Yes	Yes		In service’s main broadcast platform (satellite, cable, terrestrial and/or IPTV)
Web Broadband OTT live for PC, tablets, smartphones		Yes*				via Internet (WiFi etc) and mobile netw. *not published yet
Web Broadband OTT on demand for PC, tablets, smartphones	Yes	No*	No			via Internet (WiFi etc) and mobile netw. *planned
HbbTV broadband OTT live for TV sets		No*				*planned
HbbTV broadband OTT on demand for TV sets		No*				*planned
Is the service “must carry”	Yes	No*	No	Yes		* “The Ministry of Culture considers that it is important...
How are the spoken subt stream processed and encoded as?						
Broadcast-mix	X	X		X		
Receiver-mix			X			Mono audio intended to be receiver mixed with normal audio at IRD
Separate audio stream						But not using receiver mixing
Audio fading of normal audio during AD		6 dB				Used and if used how? Always same amount of fade applied? Amount?
Fading time before/after		0,3 s				Typical figures?
For receiver mix, is fade and pan metadata broadcasted?						



Accessibility AD Audio Questionnaire – Spoken Subtitling

Spoken subtitles (audio captioning)	DR	NRK	SVT	YLE	RTÉ	Comments
How user discover and access the spoken subt (signalling)						
In-band main TV service				X		In main TV service as an additional audio stream/track.
As Separate TV service (incl “twin channel”/“virtual ch”)	X	X				As a separate TV service with AD audio instead of normal audio e.g. via main and separate TV service share same video stream but diff audio streams
Is AD audio signalized as accessibility/supplementary?				X*		According to DVB definition or as a normal audio with an alt audio language *SD: VI, HD: VI+supplementary_audio_descr
Supplementary audio descriptor				Yes*		Used or not *On HD only
Audio type in ISO639 descriptor			X*	VI		N: Normal, VI: Visual Impaired, *SD: separate channel, HD: Receiver-mix
Audio language, same or alternative audio language				dut*		Same: same language as * language_descriptor < dut >, because STB doesn't recognize the " Audio Description" signaling
Are AD signalised in the EPG (EIT)	Yes*	No	No	Yes**		*Only in program description **EIT component_descriptor (AC3)

On demand refer here to playback of non-live content like catch-up of live broadcast and other clips



NorDig T report - TV recorder/PVR Lite details 1/5

NorDig Excom meeting 26th May 2015

Vestel detailed PVR Lite proposal		Require	All	Reference	old discussions		Vestel new proposal
					2013/2014		
Detailed list		crids	IRDs	(full) PVR	Lite	Super-lite	
14	NorDig PVR feature requirements						
14.1	Introduction - PVR			n/a	n/a	n/a	n/a
14.2	General - PVR			M	M	M	M
14.2.1	Recording File System			M	M	M	M
14.2.2	Recording capacity			M	M	M	M
14.2.3	Deletion of recordings			M	M	M	M
14.2.4	Failed and incomplete recordings			M	M	M	M
14.2.5	Save only the last number of episodes			O	O	O	O
14.2.6	File system intact after update			M	M	M	M
14.2.7	Limitations in local storage, interfaces, extraction and removable media for recordings (security)		M*	M*	M*	M*	M*
14.2.8	Disk management / de-fragmentation			M	M	M	O
14.2.9	Safe margins			O	O	O	O
14.2.10	NorDig Record Lists functionality			O	O	O	O
14.2.10.1	Recording capacity and disk management for Record Lists			O	O	O	O
14.2.10.2	Broadcast Record List Entry Point			O	O	O	O
14.2.10.3	Presentation of Broadcast Record Lists			O	O	O	O
14.2.10.4	Broadcast Record List Subscription and Un-subscription			O	O	O	O
14.2.10.5	Presentation of Future scheduled BRL Recordings			O	O	O	O
14.2.10.6	Presentation of Acquired BRL Recordings			O	O	O	O
14.2.10.7	Limitations for External Media			O	O	O	O



NorDig T report - TV recorder/PVR Lite details 2/5

NorDig Excom meeting 26th May 2015

Detailed list		Require crids	All IRDs	Reference (full) PVR	old discussions 2013/2014		Vestel new proposal
					Lite	Super-lite	
					14.2.10.8	Management of Embargoed Content	
14.2.10.9	Management of Content Expiry			O	O	O	O
14.3	PVR Recording						
14.3.1	General PVR recording			M	M	M	M
14.3.2	ESG/EPG recording programming			M	M	M	M
14.3.3	Series recording	crids		M	O	O	O
14.3.3.1	Series, record all episodes	crids		M	O	O	O
14.3.3.2	Series, record limited number of episodes for a serie	crids		O	O	O	O
14.3.3.3	Series, only one instance/copy of each episode	crids		O	O	O	O
14.3.4	Split recordings	crids		M	M	M?	O
14.3.5	Recommended events	crids		O	O	O	O
14.3.6	Alternative instance	crids		O	O	O	O
14.3.7	Accurate Recording			M	M	M	M
14.3.8	Simultaneous recording ("view one + rec another", "two tuners")			M	O	O	O
14.3.9	Full service recording			M	M	M	M
14.3.10	Trailer booking/Promotional Linking (optional)	crids		O	O	O	O
14.3.10.1	General			O	O	O	O
14.3.10.2	Icon activation and deactivation			O	O	O	O
14.3.10.3	Default Icon			O	O	O	O
14.3.10.4	Image icon position			O	O	O	O
14.3.10.5	Subtitling and display of image icon			O	O	O	O
14.3.11	Back-to-back recording			M	M	M?	O
14.3.12	Timeshift recording			M	M	M?	M
14.3.13	Late Recording ("continous timeshift buffer")			O	O	O	O



NorDig T report - TV recorder/PVR Lite details 3/5

NorDig Excom meeting 26th May 2015

					old discussions		Vestel new proposal
		Require	All	Reference	2013/2014		
Detailed list		crids	IRDs	(full) PVR	Lite	Super-lite	
14.3.14	Manual recording			M	M	M	M
14.3.15	One touch recording (OTR)			M	M	M?	M
14.3.16	Automatic conflict handling			M	M	M	M
14.3.16.1	Conflict during the time of programming a (individual, series or manual) recording			M	M	M	M
14.3.16.2	Conflict occurring after the time of programming recording(s)			M	M	M	M
14.3.17	Maximum length of recordings			M	M	M	M
14.3.18	Recording of recently removed recordings	crids		O	O	O	O
14.3.19	Recording of parallel broadcast and simulcast (SD/HD, reg)			M	M	M?	O
14.3.20	NorDig Record Lists recording functionality	crids		O	O	O	O
14.3.20.1	Management of Content Grouping			O	O	O	O
14.3.20.2	Content Acquisition			O	O	O	O
14.3.20.3	Recording List Hierarchies			O	O	O	O
14.3.20.4	Management of Content Versioning			O	O	O	O
14.3.20.5	Metadata Changes Post Broadcast			O	O	O	O
14.3.20.6	Unresolvable PushDownloadPrograms			O	O	O	O
14.3.20.7	Use of Program Information			O	O	O	O
14.3.20.8	Recording Conflicts			O	O	O	O
14.3.20.9	Broadcast Record List Removal			O	O	O	O
14.3.20.10	Broadcast Record List Updates			O	O	O	O



NorDig T report - TV recorder/PVR Lite details 4/5

NorDig Excom meeting 26th May 2015

		Require	All	Reference	old discussions		Vestel new proposal
					2013/2014		
Detailed list		crids	IRDs	(full) PVR	Lite	Super-lite	
14.4	Playback						
14.4.1	General			M	M	M	M
14.4.2	Replay/Playback – trick modes			M	M	M	M
14.4.3	Relative Synchronisation			M	M	M	M
14.4.4	Simultaneous recording and playback			M	M	M	M
14.4.5	Full service playback			M	M	M	M
14.4.6	Resume Playback			O	O	O	O
14.4.7	NorDig Record Lists management and playback functionality			M*	M*	M*	O
16.3	User Preferences, Reset to factory mode, PVR recording priority, SD vs HD: HD			O	O	O	O
12 SI	TVA crids incl default authority (used for: unique id, alt instance, series, recommended, split rec, trailer...)			M	M or O?	M or O?	O
12 SI	Trailer booking (related content descr, related content table)			O	O	O	O
12 SI	Broadcast Record List (metadata descr, metadata pointer descr, TVA XML model/stream for broadcast record list)			O	O	O	O
13 EPG	PVR: 8day ESG/EPG (basic IRD min present/following)			M	M	M	M

*) 14.4.7 NorDig Record Lists management and playback functionality, mandatory refers to that this is only mandatory if the optional Record List function is supported by the PVR.



Extract text from NorDig IRD spec (v2.5.1), PVR requirements that are mandatory for PVRs, but proposed to be optional for TV Recorder (PVR Lite):

14.2.7 Disk management / de-fragmentation

The NorDig PVR shall have appropriate disk management (including de-fragmentation handling for Hard Disk Drive based PVRs) to minimise need for re-formatting disk during its lifetime.

14.3.3 Series recording

The NorDig PVR shall be able to record a complete Series via the CRID.

The NorDig PVR shall store and track series CRIDs that are programmed for recording for up to 91 days between occurrences in EIT schedule. To allow broadcasters to reuse a series CRID for a different editorial concept, the NorDig PVR shall discard any series CRIDs not seen in EIT for 91 days....

14.3.3.1 Series, recording all episodes

The NorDig PVR shall support recording of all episodes of a specific series via series CRID's in the broadcast... The NorDig PVR shall, if the user selects to record the event that belongs to a series, request the user what to record: Only the single event selected OR Several or All events (episodes) of the series

14.3.8 Simultaneous recording (this require 2 tuners normally for DVB-T/S/C IRDs)

The NorDig PVRs shall be able to record one service while viewing another, independently even if the services are on different transport streams....

14.3.11 Back-to-back recording

The NorDig PVR shall be able to record back-to-back events both on same and on different services. For overlapping events...if the NorDig PVR has limitation in recording capacity, it shall first finalise recording of the first event ... before starting recording the next event. If the NorDig PVR has been set to add additional recording time ("safe margins") before and after recorded events' start and stop time, any overlapping "safe margins" between the back-to-back events shall be removed ...

14.3.19 Recording of parallel broadcast and simulcast (same content in SD and HD and/or reg version of service, for recorder that do not support crids this becomes irrelevant)

...The NorDig IRD that has been programmed to record an event with a specific programme_crid or series_crid which a programme_crid is part of, shall only record one instance of the event from one of the services when the event is parallel broadcasted over several services at the same time. The NorDig PVR should, by factory default, prioritise recording of the event from HD service over the SD service during SD and HD simulcast broadcast of the same programme event. (See SI chapter 12 for more details of the service types for SD and HD services).

12 (12.2.8 + 12.3.5 + 12.4.5 + 12.4.6) SI related to support of crids



NorDig T report – HEVC (1/7)

NorDig Excom meeting 26th May 2015

NorDig Video - Informative:

- **Multiplex layer**
 - Broadcast: MPEG2 Transport stream used for all types (SD, HD, UHD) and codecs (MPEG2, MPEG4 AVC and MPEG-H HEVC), however ATSC and ARIB replace MPEG2 TS with UDP/IP layer and ISO/BMFF/MMT and DVB not decided.
- **TV Format:**
 - Interlaced SDTV, up to 720x576i25fps, MPEG2 and subset of MPEG4 AVC HD – NorDig requirement
 - Progressive SDTV
 - Interlaced HDTV, up to 1920x1080i25fps, MPEG4 AVC and subset of MPEG-H HEVC HD “phase 1” – *NorDig requirement*
 - Progressive HDTV, up to 1280x720p50fps, MPEG4 AVC and subset of MPEG-H HEVC HD “phase 1” – *NorDig requirement*
 - Progressive “Full HDTV”, up to 1920x1080p50fps, MPEG4 AVC and MPEG-H HEVC HD “phase 1” (*not specified in NorDig*)
 - Progressive UHDTV phase 1, up to 3840x2160p50fps, MPEG-H HEVC UHD phase 1 (*not specified in NorDig*)
 - Under development: Progressive UHDTV phase 2, TBD (new TV format from SMPTE/ITU), MPEG-H HEVC (“phase 2”)
- **DVB’s Codec** (with relevance for us in NorDig using 25/50Hz systems):
 - MPEG-2, SD profile – *NorDig requirement*
 - MPEG-4 AVC, HD profile (for us HDTV which includes SDTV, but DVB has also defined an MPEG-4 SDTV) – *NorDig requirement*
 - MPEG-4 AVC, “full HD” profile (1080p50fps, only 8-bits) (*not specified in NorDig*)
 - MPEG-H HEVC “full HD” profile “phase 1”, (1080p50fps, 8 and 10-bits) (*not specified in NorDig*)
 - MPEG-H HEVC UHD profile phase 1, (2160p50fps, 8 and 10-bits) (*not specified in NorDig*)
 - Under development: MPEG-H HEVC “phase 2”, UHD phase 2, TBD (discussed features are more bits, HDR, HFR, more colours...)
- **Interfaces:**
 - SCART (SDTV, NorDig optional), Analogue component (NorDig optional, max SDTV resolution)
 - HDMI v1 (HDTV, NorDig requirement: HDMI v1.4b incl ARC)
 - HDMI v2 (UHDTV phase 1) (*not specified in NorDig*)
 - Future: “HDMI vX” for UHDTV phase 2
- **IRD Support for MPEG-H HEVC** (short indicative check inside NorDig T with TV manufactures):
 - **Samsung:** support HEVC for higher model range, for OTT but also broadcast (future German market etc), uncertain if all UHD or HD
 - **LG:** support HEVC for broad range models (except entry level models), for OTT and broadcast
 - **Sony:** support HEVC for higher model range, for OTT and broadcast for some markets
 - **Vestel:** developing support for HEVC for higher model range, for OTT maybe broadcast



NorDig T report – HEVC (2/7)

NorDig Excom meeting 26th May 2015

NorDig Video - Informative:

Short overview summary Video Formats and Video Codecs in DVB specs (as per Jan 2015):

	MPEG-2	MPEG-4	MPEG-H	MPEG-H	H x V t fps	SD	SD+	HD--	HD-	HD	HD	Full HD	UHD--	UHD-	UHD	UHDp2
	AVC	HD	HEVC	HD												
	H.262	H.264	H.265	H.265												
SD-			n/a	n/a	352x288i25	0,24	0,1	0,1	0,07	0,06	0,049	0,024	0,014	0,009	0,006	0,003
SD			n/a	n/a	720x576i25	1	0,4	0,4	0,27	0,23	0,2	0,10	0,06	0,04	0,02	0,01
SD+	n/a	n/a			960x540p50	2,5	1	1,0	0,67	0,56	0,5	0,25	0,14	0,09	0,06	0,03
HD--			n/a	n/a	960x1080i25	2,5	1	1	0,67	0,56	0,5	0,25	0,14	0,09	0,06	0,03
HD-					1440x1080i25	3,8	1,5	1,5	1	0,84	0,75	0,38	0,21	0,14	0,09	0,05
HD					1280x720p50	4,4	1,8	1,8	1,2	1	0,89	0,44	0,25	0,16	0,11	0,06
HD					1920x1080i25	5	2	2	1,3	1,1	1	0,5	0,28	0,18	0,12	0,06
Full HD					1920x1080p50	10	4	4	2,7	2,3	2	1	0,56	0,36	0,25	0,12
UHD--					2560x1440p50	18	7,1	7,1	4,7	4	3,6	1,8	1	0,64	0,44	0,22
UHD-					3200x1800p50	28	11	11	7,4	6,3	5,6	2,8	1,6	1	0,69	0,35
UHD					3860x2160p50	40	16	16	11	9	8	4	2,3	1,4	1	0,50
UHDp2					3860x2160p100	80	32	32	21	18	16	8	4,5	2,9	2	1

(MPEG-2 refers to DVB's MPEG-2 SD profile, MPEG4 AVC refers to DVB's MPEG4 720p/1080i HD profile, HEVC UHD refers to DVB's HEVC UHDTV phase 1 profile)

(UHDp2 refers to UHDTV phase 2 which is still very much under discussion in DVB, ie not defined by DVB CM and is here just an example of how it could become. For UHD Phase2 it is discussed to be based on a new TV format with more colors, higher dynamic range, higher frame rates etc.)



NorDig T report - HEVC (3/7)

NorDig Excom meeting 26th May 2015

Examples of old NorDig Commercial requirements from MPEG4 and HD introduction 2007

Req No:	Transmit side	Receive side	Overall & Comments
HDTV-0	Backward compatible with SDTV, the HDTV requirements shall be in additions to the SDTV's.		Both STB and iDTV HD-implementation alternatives shall be specified. Other implementations, like PC-based (USB-IRD etc), should if possible be investigated if extra requirements is necessary for them
HDTV-1	New service, independent of SDTV-legacy		The HDTV service will be sent in parallel with existing SDTV-services.
HDTV-2 (video)	Use of both progressive and interlaced video formats to be expected Support of still picture should be considered as minimum for all profiles		Video: To be based on efficient video compression; MPEG 4 AVC Still picture (very low bandwidth stream) could typically be used for services that are not on-air at all time (like time shared services) and radio services.
HDTV-3 (main sound)	New sound coding to be selected Simulcasting (of mono/stereo and surround) should not required. It shall not be required to use external audio (decoder) equipment, like audio home receiver, for the HD-services. Down-mix for HDMI and SCART The audio should not be silence in main V/A interface (HDMI/SCART...) when outputting digital (surround) on digital audio interface (SPDIF) interfaces.		Sound: to be based on efficient sound compression and provision of surround sound MPEG4 HE.AAC and/or DolbyDigital AC3 Plus should be considered as the main alternative (in addition to MPEG-1 L.II).



NorDig T report - HEVC (4/7)

NorDig Excom meeting 26th May 2015

Examples of old NorDig Commercial requirements from MPEG4 and HD introduction 2007

Req No:	Transmit side	Receive side	Overall & Comments
HDTV-4 (subtitling)	<p>It shall be possible to use a separate stream(s) (separate from the video) for (HD)-subtitling, which the IRD shall be able to insert (i.e. similar to SD-IRD).</p> <p>It shall support multi-lingual use and use of simultaneous normal and hard of hearing (impaired) subtitles.</p> <p>The presentation/insertion shall ensure reasonable relative timing (“lipsync”) with video and audio</p>		<p>A sub-titling service shall be available, covering fonts for all Nordic languages and with possibilities for a modern layout Downscaling of subtitles into SDTV output of HDTV service.</p> <p>The updated DVB subtitling specification that includes HD should be consider as the main alternative. (EBU Teletext subtitling, probably not any alternative, but should be investigated by NorDig/T)</p>
HDTV-5 (text services)	<p>A modern text service (“superteletext”) is required, as an advanced successor to the present EBU teletext service</p>		<p>This service may be part of the API-requirements, see HDTV-7 below.</p> <p>The group shall study the possibility to avoid (“not allow”) the use of the old classical EBU teletext for transmission of HDTV services. This to push forward a migration to a more modern superteletext</p>
HDTV-6 (special sound & text tracks)	<p>Special sound tracks for impaired users (reduced seeing or hearing) shall be specified, but not as mandatory requirements</p>		<p>Specification shall allow broadcasters to establish such sound tracks to receivers that are equipped as specified.</p>



NorDig T report - HEVC (5/7)

NorDig Excom meeting 26th May 2015

Examples of old NorDig Commercial requirements from MPEG4 and HD introduction 2007

<p>HDTV-7 (API)</p>	<p>An API shall be available, to provide this minimum functionality:</p> <ul style="list-style-type: none">- modern superteletext (see HDTV-5) with some associated graphics- subtitling in Nordic languages (see HDTV-4&6)- the new functions shall be bandwidth efficient	<p>No API is specified for NorDig basic IRDS for SDTV. MHP is mandatory for NorDig's higher profiles for SDTV.</p> <p>A minimum API is required for NorDig basic IRD for HDTV Open-minded investigation of possible API alternatives (MHP, MHEG-5...)</p>
<p>HDTV-8 (copyright protection)</p>	<p>Protection mechanisms of the video to and including the display unit shall be available, in order to protect copyright of some or all content in a broadcast channel.</p>	<p>Access control of the link to the IRD and copy protection from the IRD to the video chip is currently required by copyright organisations. The availability of unprotected (analogue) output signals from the IRD may be required to be downgraded in resolution. Protection levels shall be proposed to ExCom.</p>
<p>HDTV-9 (other functions)</p>	<p>Need for additional functions: To be evaluated by NorDig/T on a case by case basis??</p>	<p>NorDig IRDs include a number of functions/requirements for ease of retransmissions from one media to another, as well as front-end for all media; cable (QAM), satellite (QPSK), terrestrial (COFDM) and IP-/Ethernet based networks. Such functions should also be available for HDTV-based transmissions.</p>



NorDig T report - HEVC (6/7)

NorDig Excom meeting 26th May 2015

Examples of old NorDig Commercial requirements from MPEG4 and HD introduction 2007

<p>HDTV-10 (improved modulation)</p>	<p>The HDTV-multiplexes shall use efficient modulation methods, as available in existing standards.</p>		<p>Use of DVB-S2 is foreseen for satellite. Cable channels should have corresponding capacity per mux. Inclusion of enhanced modulation schemes for DVB-T (ref DVB-T2) shall be proposed when standard is settled.</p>
<p>HDTV-11 (compatibility with SDTV/ MPEG4-signals)</p>	<p>It shall be possible to transmit both HDTV and SDTV signals in the same multiplex</p>	<p>The HDTV-IRD shall be able to receive both HDTV and SDTV signals, also when they are in the same multiplex</p>	<p>This compatibility applies to HDTV and SDTV, all coded in [MPEG4]. (Ref to MPEG2 transmissions is made in HDTV-13)</p>
<p>SDTV/HDTV-12</p>	<p>It shall be possible to compress SDTV video by the same efficient method as used for HDTV</p>		<p>MPEG4 AVC is specified for both HDTV and SDTV. SDTV based on MPEG 4 should follow the performance of HDTV-receivers, unless this leads to excessive bandwidth requirements.</p>
<p>HDTV-13 (backward compatibility to MPEG 2 IRDs)</p>	<p>HDTV-and SDTV/HDTV transmissions shall not interfere with existing SDTV-transmissions based on MPEG2</p>	<p>Receiver shall be backward compatible for NorDig SDTV-signals based on MPEG 2 video compression</p>	<p>The HDTV and SDTV transmissions based on MPEG 4 AVC shall not interfere with existing MPEG 2 transmissions, nor confuse the IRDs, which shall be able to receive a SDTV/MPEG2 as well as HDTV and SDTV based on [MPEG4 AVC] also when transmitted within same multiplex.</p>



NorDig T report - HEVC (7/7)

NorDig Excom meeting 26th May 2015

Examples of old NorDig Commercial requirements from MPEG4 and HD introduction 2007

<p>HDTV-14 installation and simulcasting</p>	<p>It should be possible to control that MPEG2 SD-IRD do not install/display services encoded only with new encoding scheme (SD/HD MPEG4 AVC).</p> <p>HD services shall have prio when simulcasting within HD-IRD</p>		<p>HD-IRD <u>should</u> be able to handle simulcasting of one service (SD+HD), both when transmitted;</p> <ol style="list-style-type: none"> 1. within same service and multiplex (i.e. two video streams attached to the service) 2. on different services and multiplexes.
<p>HDTV-15 EBU Teletext</p>		<p>Review teletext requirements for HD-IRD (since the HD-IRD shall be able to handle SD service)</p>	<p>The minimum requirements for the HD-IRD regarding EBU teletext decoding need investigation (might min. need a full teletext decoder espec work properly w HDMI)</p>
<p>HDTV-16 Interfaces</p>		<p>Digital interfaces shall be possible</p> <p>Analogue (SCART) should be considered as mandatory for STBs</p>	<p>Digital user interfaces for video and audio shall be specified, for example HDMI/DVI etc</p> <p>NorDig/T shall investigate min interfaces for STB as well for iDTV.</p>
<p>HDTV- implementatio n</p>	<p>Spec ready by xxxx</p>	<p>Spec ready by xxxx</p>	<p>Priority should be stated by ExCom</p>



NorDig T report –

NorDig Excom meeting 26th May 2015

Extra slides

NorDig-T 2015-2016 mandates and activity list

(from Excom Jan 2015)



NorDig T report - mandates and activities (1/4)

NorDig Excom meeting 26th May 2015

NorDig T - mandates & activities for period 2015-2016 - **approved by Excom Jan 2015:**

- RoO
 - Continue major update of RoO spec and exchange experience (focus area within NorDig T)
 - Plan in basic have same structure to be same as IRD spec
 - Guidelines and recommend broadcast settings and levels (to reduce differences between NorDig networks)
 - examples
 - Include specific info related to different NorDig members networks/platforms
 - (after major update above) Maintain and update NorDig RoO.
- Test and Test plan
 - Test plan v2.5
 - Match IRD spec v2.5.1 (incl PVR crids, HbbTV and other today missing test cases)
 - Review and where possible combine similar test cases to make it easier and faster to test
 - “minimize” all redundant redundant test cases/combine test cases to speed up testing (without affecting test quality)
 - Missing audio/video test cases (e.g. metadata, video crop etc.)
 - Update and improve test cases
 - HbbTV test and test cases:
 - finalise development of already defined NorDig specific HbbTV test cases and maintain them (minimise NorDig unique specific test cases, based on open test cases). Propose new test cases to be developed if needed (keep to minimum).
 - add HbbTV test requirements into NorDig Test Plan (based on ref as much as possible to HbbTV test suit, clarify if HbbTV optional test is mandatory for NorDig Hybrids)
 - contribute to HbbTV org the NorDig developed HbbTV test cases for inclusion in HbbTV standard Test suits (include as much as possible in HbbTV standard test suits).
 - Propose budget for NorDig’s HbbTV activities (costs , descriptions, alternatives)
 - Supervise and manage any NorDig HbbTV consultancy work (currently Sofia Digital)



NorDig T report - mandates and activities (2/4)

NorDig Excom meeting 26th May 2015

continue - NorDig T mandate and activities for coming period 2015-2016:

- HbbTV IRD requirements
 - Monitor and report HbbTV spec development and usage, (HbbTV now close to release v2.0 spec w HTML5 etc).
 - Investigate additional HbbTV feature and requirements that are of interest for NorDig members (to be confirmed by –T and Excom before detailed proposal and any incl into IRD spec) like:
 - HbbTV 2.0 (functionalities, IRD manufactures implementation, when and how this could be incl into IRD spec, potential possibilities with v2.0 like HTML5, HEVC. Members interest for new feature/functionality with v2.0)
 - Portable devices, Second screen, synchronisation etc (part of HbbTV 2.0)
- HbbTV implementation:
 - Monitor and report HbbTV implementation in NorDig networks and other networks,
 - Monitor and report implementation status on IRD side
 - Monitor and discuss experience and issues/problems with launching HbbTV services
 - Write Guidelines on Operators and broadcasters use of HbbTV, possible cooperation
- HbbTV DRM
 - Monitor HbbTV DRM implementation, interest for common DRM requirements
 - Monitor technologies and functionality (common encryption, CAM/CI+ etc)
 - Review security requirements espec for 4k premium OTT content that has higher security requirements from content owners (interest from Telenor/CanalDigital and TV2 NO)



NorDig T report - mandates and activities (3/4)

NorDig Excom meeting 26th May 2015

continue - NorDig T mandate and activities for coming period 2015-2016:

- Video, audio, subtitling
 - Surround sound, is it possible to reduce the problems with down-mixing, especially investigate broadcast side.
 - Dolby AC4, monitor and get more info about its efficiency and functionality (not yet proposed to specify).
 - Monitor and report NorDig members interest for new audio and video codecs (HEVC, 3D Audio etc) and formats. Investigate how new codec can be introduced in NorDig specs. Check with industry support for new codecs (New codec like HEVC would probably also need review of HDMI, SI and maybe audio requirements etc).
 - Propose “commercial requirements” for HEVC and description of impact on IRDs other parts due to this
- Accessibility
 - Work with harmonization of broadcast and better describe current broadcast for IRD manufactures
 - Advanced Clean Audio / Dialogue Enhancement - investigate members interest for this and if they are able to broadcast this
 - Spoken subtitling, investigate how NorDig broadcasters today broadcast this and how much difference there is around this in NorDig broadcast.
 - HbbTV for Accessibility services – investigate how HbbTV can be used for Accessibility and if needed propose changes to IRD and RoO requirements
 - Investing new technology and equipment for accessibility services.
 - (SVT) Investigate more in to adjusting volume for receiver mixing (~~if needed~~)
- CA and CI
 - monitor and report Cplus LLP (CI+ v1.4 and v2.0) and DVB work (CI+ v2.0 etc) within these topics to NorDig Excom and Technical group.
 - Review security requirements espec for 4k premium OTT content that has higher security requirements from content owners (interest from Telenor/CanalDigital and TV2 NO)



NorDig T report - mandates and activities (4/4)

NorDig Excom meeting 26th May 2015

continue - NorDig T mandate and activities for coming period 2015-2016:

- NorDig Unified IRD spec
 - No major updates or new requirement foreseen for 2015
 - Maintain and update current requirements for NorDig IRDs (minor, all sections, references to other spec are up to date, requirements are up to date, clarification is added for FAQ etc, e.g. HbbTV errata).
 - Update guidelines wordings in GUI and translations (mainly related Accessibility and Audio)
 - Review and improve IRD's auto update for network changes
 - FE (DVB-T/-T2) review if 800MHz scanning can be removed (NRK) and add optional requirements for 700MHz LTE immunity (hopefully via reference to ITU/ETSI)
 - IPTV – ComHem launching IPTV and has some interest to updated current IPTV IRD requirement.
 - IRD surveillance (like using TR069), some interest to investigate this more.
 - SSU, add alternative for broadcasting SSU notification in accordance with new DVB SSU spec 2015 for IRDs with very large file size
 - Recommendation Remote Control related to accessibility settings, check if possible to get a RC key for changing Accessibility setting or modify current requirements and recommendations. (Ensure RC can be via Smartphones etc)
 - HbbTV – investigate and prepare update IRD spec for latest HbbTV v1.5 (i.e. latest errata)
 - (TV recorder – closed. No need to define TV Recorder (PVR lite) unless someone volunteer to come with a more concrete text proposal)
 - Mix of broadcast and OTT (ideal/intension one common channel list of broadcast and broadband/OTT services for hybrid receivers, viewers should ideal not notice zapping diff between zapping among broadcast or OTT services)
- Others
 - Common Event Info file format (Broadcast + OTT), interchange Content Providers to Distributers (e.g. based on “Public schedule”). Shall support event info and metadata for both broadcast (linear TV) and OTT (linear and on-demand/catch-up)



NorDig T report - subgroup planning and mandates

NorDig Excom meeting 26th May 2015

HbbTV API + PVR

Informative: Detailed proposed activities and mandates **from NorDig T to API&PVR** subgroup (based on mandates from Excom):

- NorDig Unified IRD (future versions):
 - Maintain and update current HbbTV requirements for NorDig hybrid IRDs.
 - Investigate additional HbbTV feature and requirements that are of interest for NorDig members (to be confirmed by –T and Excom before detailed proposal and any incl into IRD spec) like:
 - HbbTV 2.0 (functionalities, IRD manufactures implementation, when and how this could be incl into IRD spec, potential possibilities with v2.0 like HTML5, HEVC. Members interest for new feature/functionality with v2.0)
 - Portable devices, Second screen, synchronisation etc (part of HbbTV 2.0)
 - HbbTV for Accessibility services
- NorDig Test Plan related to HbbTV and HbbTV test cases:
 - Maintain and create necessary HbbTV test cases for NorDig (minimise NorDig unique specific test cases, include as much as possible in HbbTV standard test suits, based on open test cases)
 - Propose budget for NorDig's HbbTV activities (costs , descriptions, alternatives)
 - Supervise and manage any NorDig HbbTV consultancy work (currently SofiaDigital)
- HbbTV organisation and specifications – monitor and report development and features
- HbbTV implementation:
 - Monitor and report HbbTV implementation in NorDig networks and other networks,
 - Monitor and report implementation status on IRD side
 - Monitor and discuss experience and issues/problems with launching HbbTV services
 - Write Guidelines on Operators and broadcasters use of HbbTV, possible cooperation
- DRM for HbbTV
 - Monitor HbbTV DRM implementation, interest for common DRM requirements
 - Monitor technologies and functionality (common encryption, CAM/CI+ etc)
- *RoO – support and propose text for HbbTV to RoO group (API+PVR subgroup task)*



NorDig T report - subgroup planning and mandates

NorDig Excom meeting 26th May 2015

NorDig Accessibility

Informative: Detailed proposed activities and mandates **from NorDig T to Accessibility** subgroup (based on mandates from Excom):

- IRD:
 - Maintain and update current Accessibility requirements for NorDig IRDs. (all minor)
 - Update guidelines wordings in GUI and translations
 - Recommendation Remote Control related to accessibility settings, check if possible to get a RC key for changing Accessibility setting or modify current requirements and recommendations. (Ensure RC can be via Smartphones etc)
- Test Plan
 - Support Test group to review test cases related to Accessibility
- RoO
 - Support RoO and come with proposals related to Accessibility
- Others and info
 - Work with harmonization of broadcast and better describe current broadcast for IRD manufactures
 - Advanced Clean Audio / Dialogue Enhancement - investigate members interest for this and if they are able to broadcast this
 - Spoken subtitling, investigate how NorDig broadcasters today broadcast this and how much difference there is around this in NorDig broadcast.
 - HbbTV for Accessibility services – investigate how HbbTV can be used for Accessibility and if needed propose changes to IRD and RoO requirements
 - Investing new technology and equipment for accessibility services.
 - (SVT) Investigate more in to adjusting volume for receiver mixing (if needed)



NorDig T report - subgroup planning and mandates

NorDig Excom meeting 26th May 2015

NorDig Audio

Informative: Detailed proposed activities and mandates **from NorDig T to Audio** subgroup (based on mandates from Excom):

- **IRD:**
 - Maintain and update current Audio requirements for NorDig IRDs. (all minor)
 - Participate in Accessibility sub group
- **Test Plan**
 - Support Test group to review test cases related to Audio
- **RoO**
 - Support RoO and come with proposals related to Audio (main focus)
- **Others and info**
 - Dolby AC-4, monitor and get more info about its efficiency and functionality (not yet proposed to specify).
 - Monitor and report NorDig members interest for new audio and video codecs (HEVC, 3D Audio etc) and formats. (New codec like HEVC would probably also need review of HDMI, SI and maybe audio requirements etc).
 - Surround sound, is it possible to reduce the problems with down-mixing, especially investigate broadcast side.
 - Advanced Clean Audio / Dialogue Enhancement - investigate the algorithms