NorDig T report to Excom

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

NorDig ExCom agenda 5th March 2020:

Place: Clarion hotel, Arlanda in Stockholm

1. Agenda and report from previous meeting
2. Organizational matters
   - 2.1. Membership situation
   - 2.2. Finance matters, budget
   - 2.3. Organizational matters

3. Report from NorDig/T (Per T/NorDig T)
- Status and Planning - standard report
- New version of Rules of Operation (v3.1.0), *slide 3 and DRAFT proposal*
- Text proposal for dHDR, *slide 4 and AnnexE*
- Updates of TV Anytime, *slide 5 informative*

4. Report from Industry
5. Reports from members, DVB and other
   - Updates of 5G (NRK LTE test, 5G MAG, 5G Media Group)

6. Any other business
7. Date and place for the meetings in 2020/21

Green Text: text highlighted for Excom (waiting Excom decision/approval)

NorDig T report - Overview specification work

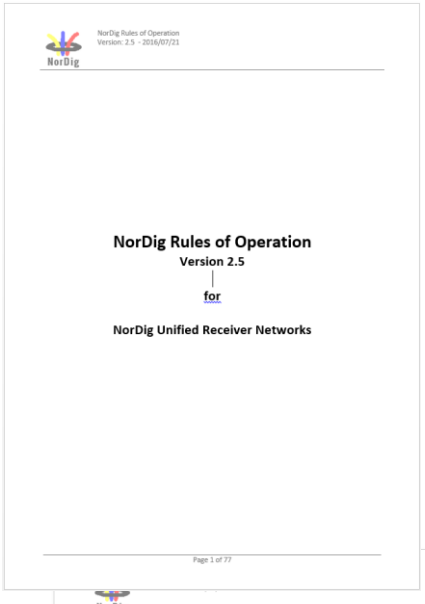
NorDig Excom meeting 5th March 2020 Stockholm, Sweden

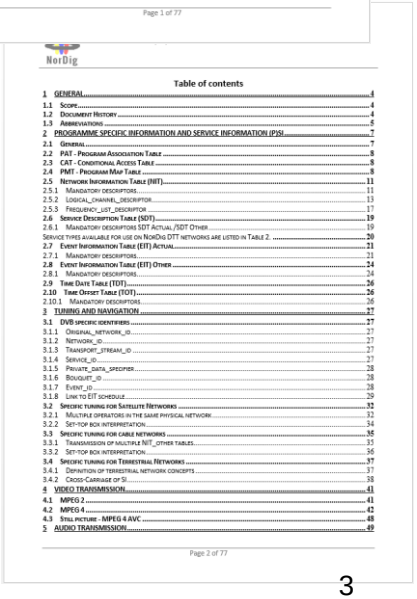
- Rules of Operation
  - Latest published: RoO v2.5 (published October 2016)
  - Update of RoO to v3.1.1, target Oct 2020
    - Excom: change layout to same as IRD spec, most important content for RoO shall be items necessary to avoid misbehavior in IRDs.
    - Status March 2020 - drafting ongoing, some parts/sections ready today, other parts just started/not ready
    - Proposal – two alternatives, **Excom to decide** (see next slide)
      - Alt1 – publish update in two steps, March2020 + Oct2020.
      - Alt2 – one step, wait until all parts are ready, Oct2020.
- Unified IRD specification – *up to date*
  - Latest published: IRD spec v3.1.1 (published September 2019)
  - Next version – not yet started (no/too few new items),
    - Maintenance – buglist
    - dHDR (dynamic metadata HDR) – drafting text proposal, prepared for whenever next IRD spec version is issued *(Excom decided Oct2029 to not mandate dHDR, instead just add IRD not to be disturbed and if used then as DVB)*
- Test Plan – *up to date*
  - Latest: Test Plan v3.1.1 (published September 2019)
  - NorDig Test streams, 12 streams for testing NGA/AC-4 + old LTE interference stream
  - Next version – not yet started (no items)
  - Industry kindly asks for TTML reference test streams
- EPG/EIT exchange file format *- no new documents/specifications (minor updates has done last period to documents)*
- Website and admin *- no changes*

NorDig T report - Rules of Operation, update work

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

Members of RoO Group: Nicholas Frame TP Vision, Kari Eriksson Sony, Richard Moreton Samsung, Richard Moreton Samsung, Andrex Lipscombe Samsung, Johan Lindroos SVT, Jonas Rödén Dolby, Schreiner, Stephan Dolby, Per Tullstedt Teracom, Kjell Norberg NRK, Juha Joki SofiaDigital and Peter Mølsted Chairman (deputy for Des Mac Giolla an Chloig). *(Des Mac Giolla an Chloig, chair, fully occupied with regular work 2019, update of DTT during clearance 700MHz band)*


NorDig Rules of Operation
Version 2.5
for
NorDig Unified Receiver Networks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NorDig RoO spec update to v3.1.1 (to same version as IRD and Test Plan)

The new RoO specification from ver. 2.5 to ver. 3.1.1 will be a **major** update to be in line with IRD spec. v. 3.1.1. (4x IRD spec. versions)

- Work on simplify the specification format and make it more in line with the IRD spec. design
- Status now March 2020
  - some parts/sections ready today (audio, txt, subtitling)
  - other parts just started/not ready (video, SI, CA, "transmission"/FE)
  - Some parts proposed to be omitted/moved to Annex (PVR)
- NorDig RoO spec v3.1.**0** DRAFT005 now ready to with the mature parts

Question to Excom, how to publish RoO, two alternatives, **Excom to decide**

- Alt1 – publish update in two steps, March2020 + Oct2020. Now by March2020 publish a first v3.1.0 with parts are now ready and by Oct2020 publish a complete update to final v3.1.1 with all remaining parts (recommended by NorDig T and RoO subgroup), this require Excom to approve v3.1.0 (DRAFT005) now (via typically 2weeks silent approval procedure)
- Alt2 – wait to Oct2020, publish update in one step, then todays presented draft proposal v3.1.0 is just informative, Excom wait with approving until Oct2020.

NorDig T report - Video dynamic HDR

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

Dynamic metadata HighDynamicRange (dHDR) – status report

- *NorDig Excom decided Oct 2019*
  - *at present time Public Service Broadcasters has no concrete plans and low interest for dHDR*
  - *decision to not mandate dHDR (and then no need to make a selection of one of the 3 DVB's dHDR technologies)*
  - *decide to add into next NorDig IRD spec if dHDR is used then signaling shall be as DVB specified and IRDs shall not be disturbed by formats not supported. AP for NorDig T to prepare proposal,*
  - *however this item is not seen as important to trigger any immediate release of new spec, instead item to be incl whenever next release is released*
- NorDig T/video – status dHDR
  - Drafting almost ready with stable text proposal for NorDig IRD spec and for NorDig RoO
  - NorDig T/API plans to send Liaison letter HbbTV asking guidelines if and when DVB's dHDR supported
    - If a NorDig platform would use dHDR for some broadcasted services (e.g. some premium service), then dHDR might also be used for that service(s) in the platform's/broadcaster' broadband HbbTV Play services (e.g. catch-up/play services). HbbTV not yet dHDR in their spec.
  - Industry/TV set manufactures has commented to earlier drafting not in line with Excom decision and that drafts implies too much, draft has after this been changed and so far no comments to latest draft.
    - LG and Sony has sent comments 3rd March, they prefer that dHDR should not be mentioned at all
  - See Annex E for details of latest draft proposal for dHDR into NorDig IRD + RoO specs (or download complete draft proposal NorDig website, member section, NorDig T group)

SDR

Static HDR

Dynamic HDR

NorDig T report - NorDig EPG/Event info

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

NorDig EPG group and Event exchange file format:

- *Keep TV Anytime spec up to date*
- *Updated of guidelines*
- *Work to promote / help impl and use of NorDig EPG/event file format*
- Open workshop Dec 2019 at TDC Denmark
- Next open workshop May 2019 at SVT Stockholm
- Last period, working on Genre list, some discussion of using EPG data to help with audience measurement and how to generate ids.
- Status of implementation and use of NorDig common EPG/Event metadata exchange format, done or in process: NRK, TV2DK, TV2NO, DR, TDC, Red Bee Media, SimpleTV, SVT and Teracom.

Informative

- NorDig EPG exchange file is based upon international standard TV Anytime and NorDig relies upon that TV Anytime specs is maintained.

- TV Anytime chairman Jean-Pierre Evain will retire summer 2020, it has been a challenge to find somebody that replace Jean-Peirre (EBU struggling w founding). Preferred for NorDig would be if someone from EBU or DVB (office) could replace him.

- No good scenario for NorDig would be if this TV Anytime group get no new chairman, then all updates (even small) would have to be take directly up ETSI in a quite complex procedure.

- We have now received information that discussions is ongoing right now and hopefully DVB will continue chairing TV Anytime.

NorDig T report - Unified IRD spec, after v3.1

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

NorDig Unified IRD spec future – "v3.2" proposals:

- General
  - Bug list - a few number of listed items,
- Video:
  - Dynamic HDR, text draft (optional, IRD shall not be disturbed, if used then according w DVB)
- CA/CP/Security
  - CommonInterface v2 (USB), still monitoring status, members interest?
- Audio – none
- Subtitling – none
- HbbTV - none
- FrontEnd – none
- SSU - none
- PSI/SI, menus etc…
- Others?

Excom view?

NorDig T report – report DVB status

- DVB CI v2 (USB)
- DVB-I
- DVB TA (Target Advertising) – *see also attachment HbbTV Liaison letter*
  - NorDig T has received a Liaison letter 19th Feb 2020 from HbbTV informing NorDig about the completion of HbbTV specification for targeted advertising (TA), in co-operation with DVB (HbbTV defines API in IRD, DVB defines broadcast signalling and returning advert from broadband (Ads) server).
    - TA an optional extension to HbbTV that enables replacing of broadcast content (e.g. adverts) with broadband-delivered content (e.g. ads that are targeted to a particular consumer or group of consumers).
    - BUT this DVB+HbbTV TA tool could also be used for a more non-commercial uses such as switching from national to regional/local content and back again.
  - Some IRD/TV manufacturers says they require (commercial) agreement between a broadcaster and a manufacturer when used for commercial purposes (i.e. TA for commercial TV services).
  - IRD/TV Manufactures reports that it is another thing for non-commercial purposes like public service using this for regional/local insertion.
  - However DVB+HbbTV TA technology has implementation cost for IRD
  - Together with HbbTV watermark could potentially make it work also for STB solution (i.e. for cases w non-HbbTV STBs connected via HDMI to a HbbTV TV set)
  - Excom: could TA be of interest for NorDig members? Should NorDig T/API monitor &/or investigate TA technology more?

NorDig T report – NorDig countries/networks

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

List of Countries using NorDig specifications (outside NorDig members),
Nothing new to report, same as last meeting (same as previous report).

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).

Country / Network	Status
Turkey DTT	Confirmed via Vestel
Several eastern Europe countries	Indications, not confirmed
Malaysia *(blue copy)*	Digita
German DTT (Media broadcast/TDF)	Based on/reference to NorDig IRD
Georgia DTT	Based on/reference to NorDig IRD (v2.2)
French DTT/FAVN ??	Based on/reference to NorDig IRD v??
Italien DTT + Satellite	Partly based on/reference to NorDig IRD (v2.5, RF), partly own requirements (e.g. SI)
Poland DTT	Might be based on/reference to NorDig IRD

END presentation

NorDig-T report

After here some detailed informative slides

ANNEX

- Annex A: NorDig T mandates 2019-2020 - informative
- Annex B: NorDig T meeting calendar 2020 - informative
- Annex C: NorDig T subgroups – informative
- Annex D: dynamic HDR (presentation from Excom Oct2019 meeting) – informative
- Annex E: dynamic HDR, latest text proposals for IRD + RoO spec (main parts)

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

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

NorDig T – mandates & items for period 2019-2020 - *Excom approved March 2019*

- General: Keep IRD, RoO and Test Plan in line with each other
- RoO
  - Maintain and update NorDig RoO - focus for 2019 RoO v3.1.x
  - (Excom Oct 2018) changing layout to same as IRD spec, focus for RoO on items necessary to avoid misbehavior in IRDs.
- Test and Test plan
  - Maintain and update NorDig Test plan to match IRD spec
    - Review and where possible combine similar test cases to make it easier and faster to test
    - "minimize" redundant test cases if possible without compromising with test quality, to speed up time for verification testing.
    - Update and improve test cases
- NorDig Unified IRD spec
  - Maintain and update NorDig IRD specification
    - debugging, references to international standards and specifications are up to date)
  - NorDig IRD spec update - investigate HEVC dynamic HDR
  - Other items (listed since earlier):
    - Review and improve IRD's auto update for network changes?
    - Handle mix of broadcast and OTT in same channel list? (similar to or based upon DVB-I)

continue NorDig mandates & items for period 2019-2020

- Video, audio, subtitling
  - **Video** codec: NorDig's first subset of HEVC (DVB's UHD, HDR&WCG, SFR), incl video processing and I/O (HDMI).
  - **New Video** codec: monitor/investigate issues with adding HEVC dHDR support, check with Industry, make proposal
  - **New Video** codec: If Excom decide, propose tech requirements for dynamic HDR
  - **Video**: Secure good IRD implementation for mixing/blending of SDR content (HbbTV, menus, subtitling) on top of HDR video.
  - **Audio** NGA (Dolby AC-4), monitor DVB and Dolby specifications and recommendations
  - **Audio:** monitor evolution immersive audio and object based audio.
  - **Audio:** if it is possible supports with tests and trials of NGA audio (both basic NGA and more advanced NGA).
  - **Subtitling**: monitor DVB specifications (TXT subt, DVB Subt, TTML).
  - **HbbTV**: Investigate use and mandate of new codes (HEVC and NGA) for (HEVC) HbbTV/Hybrid IRDs.

continue NorDig mandates & items for period 2019-2020

- HbbTV
  - NorDig HbbTV test and test cases:
    - Maintain NorDig developed test cases. Propose new test cases to be developed if needed.
  - NorDig HbbTV IRD requirements:
    - Maintain and update HbbTV requirements
    - Monitor and report HbbTV spec development and usage.
  - 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).
    - Investigate DVB-TA watermarking, impact V/A and possibility to use for STB solutions where STB do not support HbbTV (STB bypass)
  - 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
  - HbbTV DRM
    - Monitor HbbTV DRM
    - Review security requirements

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

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

continue NorDig mandates & items for period 2019-2020

- Accessibility
  - Work with harmonization of broadcast and better describe current broadcast for IRD manufactures
  - Subtitling, propose updates and new IRD requirements both for normal and hard-of-hearing subtitling.
  - Create document explaining the work of the group, (which ExCom members to pass this to their internal accessibility teams). Gather information from accessibility groups and broadcasters to understand what their pain points are.
  - Set up a best practice workshop with broadcasters, manufacturers and distributors
  - Investigate the implications for streaming services on accessibility
  - HbbTV for Accessibility services – investigate how HbbTV can be used for Accessibility and if needed propose changes to IRD and RoO requirements
  - Investigate benefits with NGA for accessibility.
- CA and CI
  - monitor and report CIplus 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
- EPG/Event exchange file format:
  - Promote use for NorDig members for example via open workshops to support promoting and implementation of NorDig TVA format.
  - Maintain NorDig specification of common EPG/Event exchange file format and Guidelines, to be inline with TA Anytime specs
  - Common solution and recommendations about unique program ID's.
  - Translation of genres between Nordic and Irich language and English.
  - Transform NorDig TVA XML schemas to JSON and developing guidelines for using TVA with JSON (on request from developers)

NorDig T report - Annex B - Meeting calendar 2020

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

NorDig T (main group) meeting calendar 2020:

- NorDig T, #1, Thu 28th January 2020, webinar, 10:00-12:00 CET
- NorDig T , #2, Tue 25th February 2020, webinar, 10:00-12:00 C

  Informative: Excom 5th March 2020
- NorDig T , #3, Tue 31st March 2020, webinar, 10:00-12:00 CET
- NorDig T , #4, Tue 26th May 2020, webinar, 10:00-12:00 CET,
- NorDig T , #5, Tue 1st Sep 2020, webinar, 10:00-12:00 CET
- NorDig T , #6, Tue 29th Sep 2020, webinar, 10:00-12:00 CET.

  Informative: Excom 8th October 2020
- NorDig T , #7, Thu 27th October 2020, webinar, 10:00-12:00 CET
- NorDig T , #8, Tue 1st December 2020, webinar, 10:00-12:00 CET.

NorDig T report - Annex C - Work and subgroups

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

Overview - informative

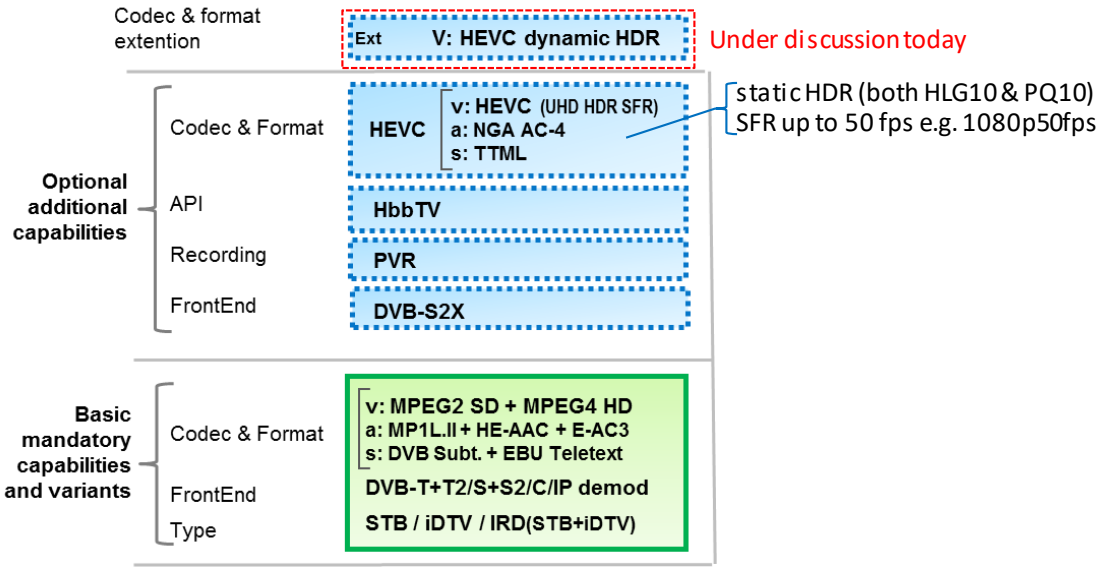
group – status - chairman

NorDig T – *active* – *Per Tullstedt, Teracom*

NorDig T subgroups – status

- Audio – *active* – *Johan Lindroos, SVT*
- Test – *active* – (*Pasi Toiva, Labwise)*
- RoO – *Des Mac Giolla an Chloig, RTÉNL and Peter Mølsted consultant (NorDig tech secretary)*
- Accessibility – *active* – *Kjell Norberg, NRK*
- API/PVR – *active* – *Erik Vold, NRK*
- EPG/Event exchange metadata – *active* - *Peter Mølsted, consultant (NorDig tech secretary)*
- *SSU – within NorDig T*
- *CA/CI+/Sec – within NorDig T*
- *Video – within NorDig T (been active for v3.1.1 now dormant)*

- Background: Dynamic metadata HighDynamicRange (dHDR) and HighFrameRate (HFR):
  - As earlier NorDig based upon DVB spec, only variants inside coming DVB specs is relevant here.
  - *Excom meeting March2019:*
    - *HFR: low interest right now to introduce -> postponed*
    - *dHDR: interest but Excom to investigate members concrete interest and demands,*
    - *dHDR: technical group* study more, too early to start drafting, commercial requirement should be updated (old commercial requirements used for HEVC&NGA)



Dynamic metadata HDR (dHDR)

- DVB dHDR status: spec finalized, DVB/ETSI spec published, DVB prepare reference streams f dHDR
- (OTT) DASH dHDR status: under publication prel w 3 month ETSI spec
- DVB has included 3 dHDR technologies/formats, all HDR **PQ10** based:
  - Technicolor/Philips SL-HDR2 (ETSI TS 103 433-2, SMPTE ST 2094-20 Philips & 2094-30 Technicolor formats)
  - Samsung HDR10+ (SMPTE ST 2094-40)
  - Dolby Vision (ETSI TS 103 572, SMPTE ST 2094-10)

  (Note: all three dHDR candidates been present in NorDig-T/video subgroup meetings)
- All 3 dHDR formats are backward compatible for static HDR/PQ10 IRDs to receive and display (up to broadcaster/colourist to ensure performance for static HDR HEVC IRDs).
- Work ongoing in ETSI (JTC broadcast group) led by Technicolor/Philips to add dynamic metadata with HLG (SL-HDR3). Dolby mention already support but not promoted (since DVB so far been for PQ).
- dHDR bandwidth
  - All formats has low extra capacity (in magnitude of 100kbps or less, could be as low as 10-15kbps per format)
  - supports of "simulcast" several dHDR metadata formats for one and the same video stream in (DVB requirement, so far not yet tested)
- Conversion possible from HLG to PQ dHDR within same format
- Conversion from one dHDR format to another, could harm "artistic intension" from colourist, content owner/broadcasters may not allow this, no "approved" method today -> "risk" that Broadcasters (often part of its content is external from different content owners) will broadcast different formats depending on content origin

Dynamic metadata HDR (dHDR)

- NorDig-T/video group has not (yet) compared the 3 formats (pros&cons, relative efficiency, IPR costs…).

- Service plans in Europe dHDR
  - already used in some OTT/Online streaming services and available in some TV sets, even if it might not yet implemented as DVB signalling for dHDRs.

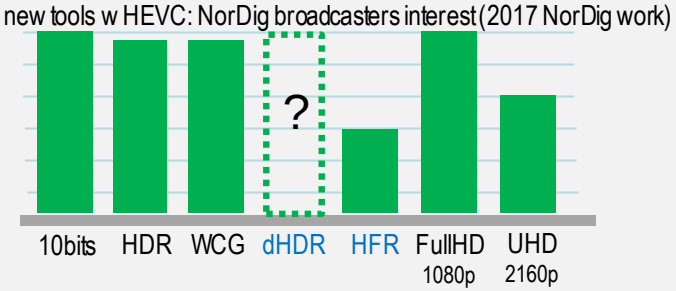
  - OTT: already on-air (including Netflix, Amazon, AppleTV+, Disney+)
  - Broadcast: no info, several considering, live broadcast trials been made in France, Spain, FIFA World Cup
  - PayTV: several operators (e.g. Orange, Canal+, SFR) for VOD/OTT
  - French DTT discuss to draft optional dHDR (all 3 formats) and IRD shall not be disturb by format not supported
  - (DTG no discussion/action/planning yet around broadcast HEVC nor dHDR)
  - (SVT tests HDR for OTT/SVT Play: "SVT Testbild" at SVT Play)

Note, we can not expect that current dHDR impl on TV sets will work for broadcast usage or DVB DASH streaming.

From NorDig 2017 work, HEVC

Figure: data from NorDig T/video HEVC study 2017 and questionnaire.

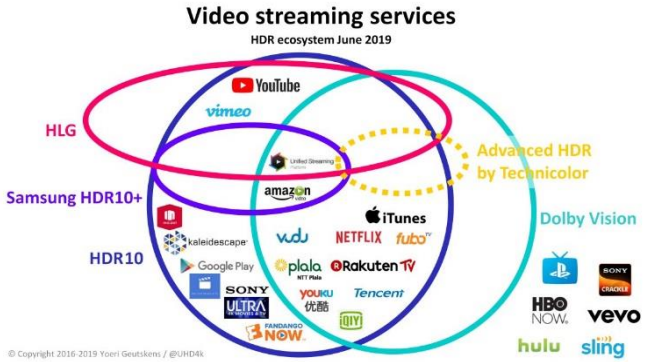
Note about FullHD, refers to as sub-resolution UHD BT2020

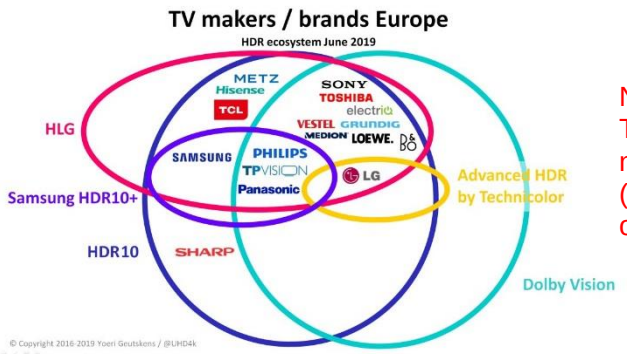


- Members view (broadcasters and operators)
  - SVT, DR & NRK:
    - dHDR, right now more interest than HFR and UHD,
    - dHDR could make big difference espec for drama production,
    - dHDR roll-out could for example be first via OTT streaming and later within broadcast,
    - dHDR too early today to select one of the formats,
    - dHDR could accept that this would be optional tool for IRD (initially), (but big interest among broadcasters for dHDR than NorDig should mandate dHDR w grace period)
    - HFR_{100fps} could accept wait and revisit topic later, a bit challenging to produce right now
    - backward compatibility is of interest.
    - interesting TV format: 1080p50fps dHDR
    - SVT/Lars typical future production could be: drama 2160p25fps dHDR and sports/general 1080p100fps SDR/HDR.
  - DR:
    - Difficult for PSB to choose exclude viewers due to only select one dHDR tech
    - As DR understand it today: Static HDR not as big step for viewers to SDR compared to dHDR, (main interest is for 1080p50, than UHD and HFR/100fps)
  - Test streams: some interest to collect test streams
  - TDC: follow broadcasters, CD: some interest depends upon broadcasters
  - Preferebly if Nordic & Irish broadcasters could agree upon a common dHDR format (for production). Propose to make a study around dHDR to find a common dHDR among broadcasters.
  - If dHDR format, then the decision of which dHDR format should be done productions side and not on the IRD side

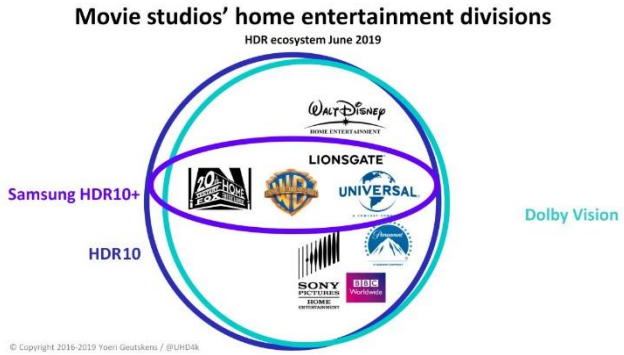
- Industry view
  - dHDR, most TV manufacture prefer dHDR is optional feature in NorDig.
  - dHDR, if NorDig would add dHDR (as mandatory), than most manufactures request only one dHDR format and not require all 3 formats, similar NGA
  - Samsung, TP Vision prefer markets decide themselves (i.e. not specified a single dHDR technology in NorDig, e.g. that NorDig add IRD not to be disturb by dHDR not supported)
  - dHDR already in some TV sets, already used for some services, smaller step than HFR
  - dHDR, manufactures asks for service plans/roll-out plans from broadcaster to consider this.
  - NorDig should collect from members/broadcasters and regular present/provide service plans and intensions to the Industry.
  - (Sony) With all improvement in video processing and display in new modern TV sets, reduces the diff betw sHDR and dHDR
  - DVB during IBC https://www.ibc.org/tech-advances/dvb-unveils-new-specification-for-hdr-dynamic-mapping/4092.article

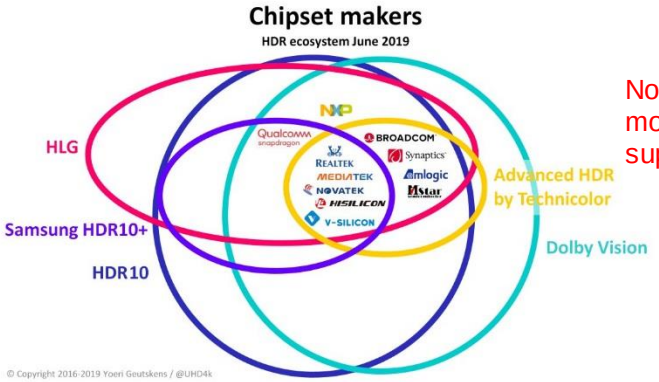
- dHDR formats taken from https://www.flatpanelshd.com/focus.php?subaction=showfull&id=1559638820



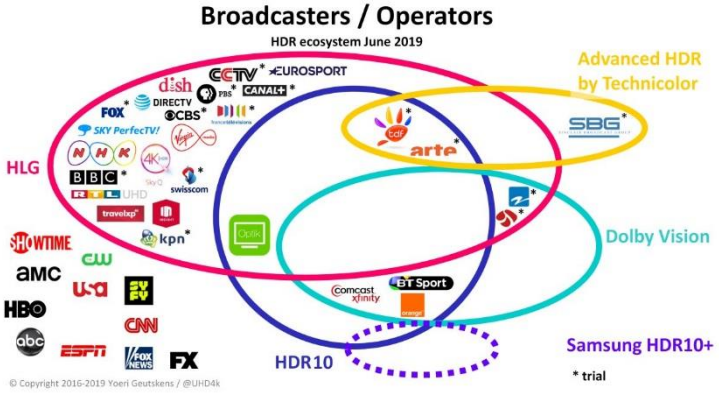


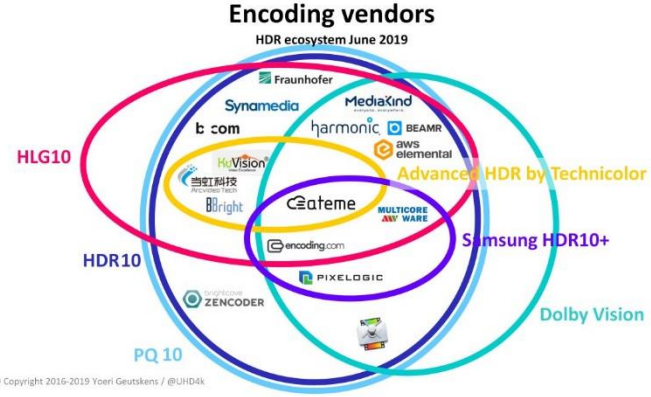
NorDig/Per T note:
TV sets today in general do not impl all 3 formats (some impl two, some other one format)





NorDig/Per T note:
most chipset seems to support all flavours





Source: https://www.flatpanelshd.com/focus.php?subaction=showfull&id=1559638820

Summary mini-study and proposal NorDig HEVC extensions dynamic HDR:

- dHDR
  - DVB has specified three formats [Technicolor/Philips SL-HDR2, Samsung HDR10+, Dolby Vision]
  - no result f comparing, coming/already in several TV sets to some degree (not as DVB specified),
  - Service plans in Europe: OTT several, broadcast: some considering and trails
  - NorDig Broadcasters: high interest from broadcasters (for usage in some program events, like drama productions)
  - Broadcasters might need to deliver (broadcast and OTT) different dHDR for different content (due to restriction from content owners etc), therefore complex for NorDig to select only one format
  - NorDig specification today includes sHDR (HLG + PQ)
  - NorDig work around dHDR:
    - NorDig Excom will collect from members/broadcasters service plans and intensions and (regularly) present it the Industry /NorDig T (planned to be presented at Excom meeting 10th Oct 2019)
    - NorDig T/video group study more, report back in Oct 2019 (waiting Excom decision before start drafting)
    - If NorDig is interested in adding dHDR:
      - Technical evaluation among 3 candidates is expected to be TOO difficult to achieve with "correct" conclusions within NorDig (too many dependencies) in order to select ONE.
      - IF one format is to be selected, NorDig T would only be able to make a technical info gathering similar as NGA work (e.g. collect tech info, licenses etc) AND would be very difficult to come with a recommendation for a single dHDR AND would need to establish well defined criteria before
      - Alternative for selecting ONE system could be to:
        - dHDR optional, where used dHDR signaling shall be as DVB specified and that IRD shall not be disturbed by formats not supported or
        - Not mention/recommend dHDR, BUT incl that IRD shall not be disturb by formats not supported

Summary mini-study and proposal NorDig HEVC extensions dynamic HDR:

- dHDR
  - DVB has specified three formats [Technicolor/Philips SL-HDR2, Samsung HDR10+, Dolby Vision]
  - no result f comparing, coming/already in several TV sets to some degree (not as DVB specified),
  - Service plans in Europe: OTT several, broadcast: some considering and trails
  - NorDig Broadcasters: high interest from broadcasters (for usage in some program events, like drama productions)
  - Broadcasters might need to deliver (broadcast and OTT) different dHDR for different content (due to restriction from content owners etc), therefore complex for NorDig to select only one format
  - NorDig specification today includes sHDR (HLG + PQ)
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      - **Technical evaluation among 3 candidates is expected to be TOO difficult to achieve with "correct" conclusions within NorDig (too many dependencies) in order to select ONE.**
      - **IF one format is to be selected, NorDig T would only be able to make a technical info gathering similar as NGA work (e.g. collect tech info, licenses etc) AND would be very difficult to come with a recommendation for a single dHDR AND would need to establish well defined criteria before**
      - **Alternative for selecting ONE system could be to:**
        - **dHDR optional, where used dHDR signaling shall be as DVB specified and that IRD shall not be disturbed by formats not supported or**
        - **Not mention/recommend dHDR, BUT incl that IRD shall not be disturb by formats not supported**

Excom Oct2019 decision:

- At present time Public Service Broadcasters has no concrete plans and low interest for dHDR
- Excom decision to not mandate dHDR
- Excom decide to add into next NorDig IRD spec if dHDR is used then signaling shall be as DVB specified and IRDs shall not be disturbed by formats not supported. AP for NorDig T to prepare proposal, (however this item is not seen as important to trigger any immediate release of new spec, instead item to be incl whenever next release is released)

NorDig T report - Annex E Video dynamic HDR latest proposal drafted text

NorDig Excom meeting 5th March 2020 Stockholm, Sweden

Extract of NorDig T latest draft text for dynamic HDR for IRD + RoO spec, intention to add dynamic metadata HDR as:

- Not mandating dHDR
- IRD not to be disturbed by dHDR not supported
- Where used then it shall be according to DVB specs

- **NorDig IRD spec** proposed text for dHDR (Blue color is proposed changed/add text)
  - Ch5.1 video, General requirements,
    The following clauses of ETSI TS 101 154 [26] are relevant to this specification:
    5.14.4 "HEVC HDR UHDTV IRDs and Bitstreams" (1). Support for both PQ10 and HLG10 is required for the NorDig HEVC IRD. Only support of 50 Hz and 25 Hz frame rates are required for the NorDig HEVC IRD. Support for Supplemental Enhancement Information messages carrying one or more DMI formats conforming to sub-section 5.14.4.4.3.3.4 "Optional Supplemental Enhancement Information messages carrying DMI" is optional. Any non DMI cognisant HEVC HDR UHDTV IRD shall be able to decode and present the service, even if DMI is in the bitstream.
  - Ch5.5 colorimetry, add at the end a note:
    Note: In the case that DMI messages are included in the bitstream, the NorDig Rules of Operation [61] require broadcasters to provide video quality from that bitstream to NorDig HEVC IRDs that do not support DMI at the level that can be expected from a bitstream that does not include DMI messages. DMI enables further enhancement of the video quality.
  - Ch5.5.1 NorDig HEVC STB colorimetry, following changes (only extracted sentenses with changes):
    The EDID-information shall be used by the Decoder Format Converter of the NorDig HEVC STB to determine any applicable ~~convert~~ colorimetry conversion, display mapping (if supported) or DMI message pass-through (if supported).

    Hence, the Decoder Format Converter of the NorDig HEVC STB shall output SDR video formats based on the HDR to SDR conversion methods described by the ITU (e.g. ITU-R BT.2390 [90] and operational practises in HDR television production ITU-R BT.2408 [95]) or based on DMI (if supported).

    In Note: The latter for example via user control of overall brightness and contrast. ~~Leads on how to best perform the initial display adaption is~~ The initial display adaptation can be done by using DMI (if supported) or by applying processing derived from the conversion methods described by the ITU,
  - Ch5.6 Dynamic changes in the video stream, add at the end of section:
    For NorDig HEVC IRD supporting one or more of the optional DMI formats, dynamic switching should be handled as described in ETSI TS 101 154 [26] sub-section 5.14.4.4.3.3.4.2 "Dynamic switching between bitstreams with and without DMI".
  - Ch12.3.6 Component descriptor – add into table stream and component type values for all three dHDR as Optional

- **NorDig RoO** spec proposed text for dHDR
  - Video section add following text (chapter not defined yet since major update is ongoing)
    It is highly recommended that bitstreams that include DMI provide video quality at the level that can be expected from a NorDig HEVC IRD that does not support DMI, and that the DMI enables further enhancement of the video