

DVB-H at a glance

What is DVB-H ?

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DiBroC

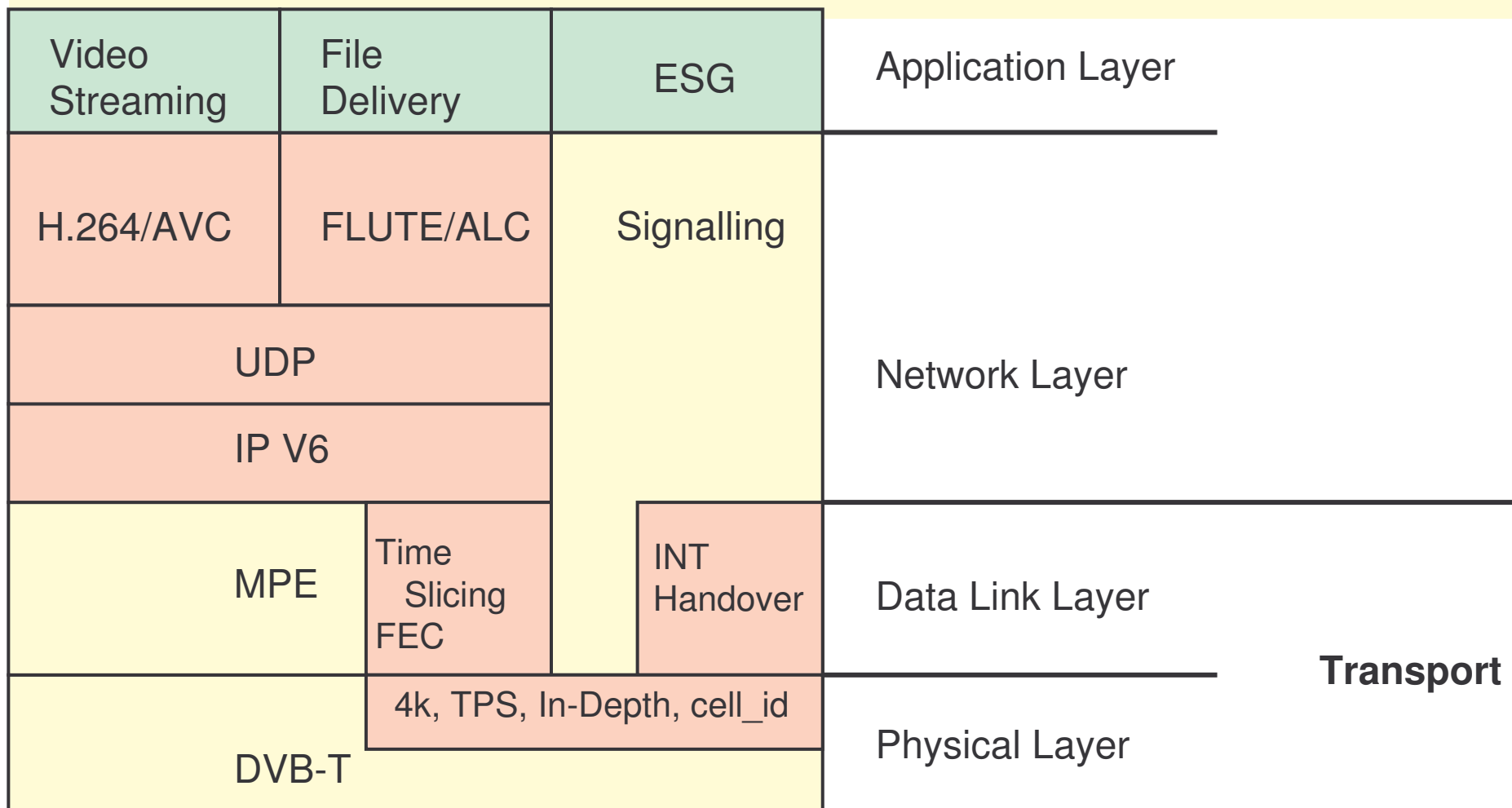
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- ▶ Related Standards
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▶ What is DVB-H ? - I

- DVB-H stands for mobile reception of data via DVB-T (H means Handheld, recently called DVB-X or DVB-M)
- DVB-H is based on DVB-T, „only“ the higher layers are modified (TS, DSM/CC, MPE)
- The lower layers of DVB-T are reused and compatible, a simultaneous operation of DVB-T (TV service) and DVB-H (data service) in one multiplex is possible

What is DVB-H ? - II



What is DVB-H ? - III

- Transmission of data mainly as IP frames (Internet Protocol)
- As data high compressed video (H.264, similar to MPEG-4), with lower bitrate compared to MPEG-2 (instead 3-4 MBit/s approx. 384 KBit/s per each stream)
- Trimmed for the mobile reception on handheld devices (battery power save, screen resolution)
- Additional error correction for reliable transmission and reception with complicated conditions (movement, small antennas)

Related Standards

- EN 203 304, DVB TM 2977 (DVB-H)
- A079 (TM 3025 Rev. 1)
- DVB TM 3037 (DVB-H)
- A081 (TM 3037)
- Draft TM 2977 r3
- EN 301 192 (Time Slicing, MPE-FEC)
- ISO/IEC 13818-6 (DSM/CC, MPE)
- ISO/IEC 13818-6 (DSM/CC, MPE)
- TS 101 190 (DVB-T, TPS)
- TS 101 191 (SFN, TPS)
- EN 300 744 (DVB-T)
- EN 300 468 (DVB-SI)
- H.264
- A080 (I_MT)
- (FLUTE/ALC)

Main Features DVB-H - I

- **Time Slicing:**
block oriented transmission of data (bursts), sleep mode of receivers, relative time information instead MAC addresses
- **MPE-FEC:**
additional Reed Solomon code on MPE level used for the data (IP frames), increased C/N value for poor reception
- **4k mode:**
compromiss between 2k (mobile reception) and 8k (large SFN networks)

▶ Main Features DVB-H - II

- **Signalling:**
extended signalling (modified TPS bits and additional MPEG tables – INT), handover support
- **5 MHz bandwidth:**
a smaller spectrum bandwidth in mind to support wireless telecom channels
- **Non-broadcast channels:**
Not only used in common used broadcast (TV) channels (VHF, UHF), also for non-broadcast frequencies

▶ Main Features DVB-H - III

- **IP V6:**
the new IP version 6 protocol (and UDP) is used to transmit data, IP in DSM/CC, MPE
- **H.264:**
Video is coded as H.264/AVC (Advanced Video Codec)
- **FLUTE:**
New protocol for data carousels (file transfer)

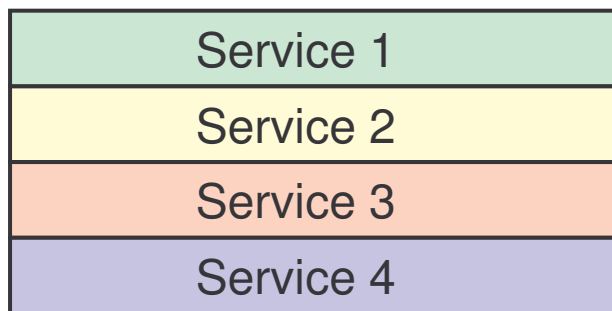
Main Features DVB-H - IV

- I_MT:
Interface for service and applications as well as return channels based on wireless communication channels (GSM, UMTS)
- MMP:
The extension and reuse of the Multimedia Home Platform (MHP) comes in mind as Mobile Media Platform (open service and application interface)

▶ Main Features DVB-H - V

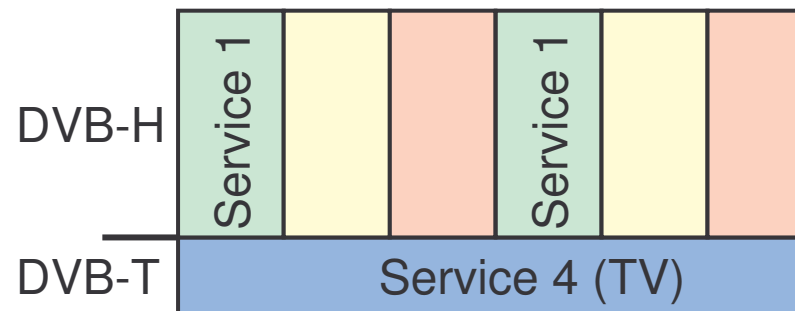
- **In-Depth-Interleaver:**
OFDM symbol interleaver for 8k (memory size) is used to doubled or for-times interleaving in 4k or 2k mode
- **Mandatory Cell_ID:**
The Cell_ID has to be set and transmitted now in DVB-H networks (cell identification and handover)

Time Slicing - I

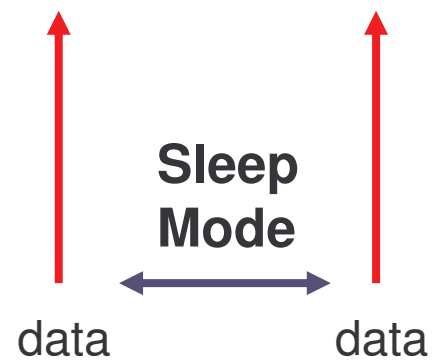


Regular DVB-T Multiplex (TV)

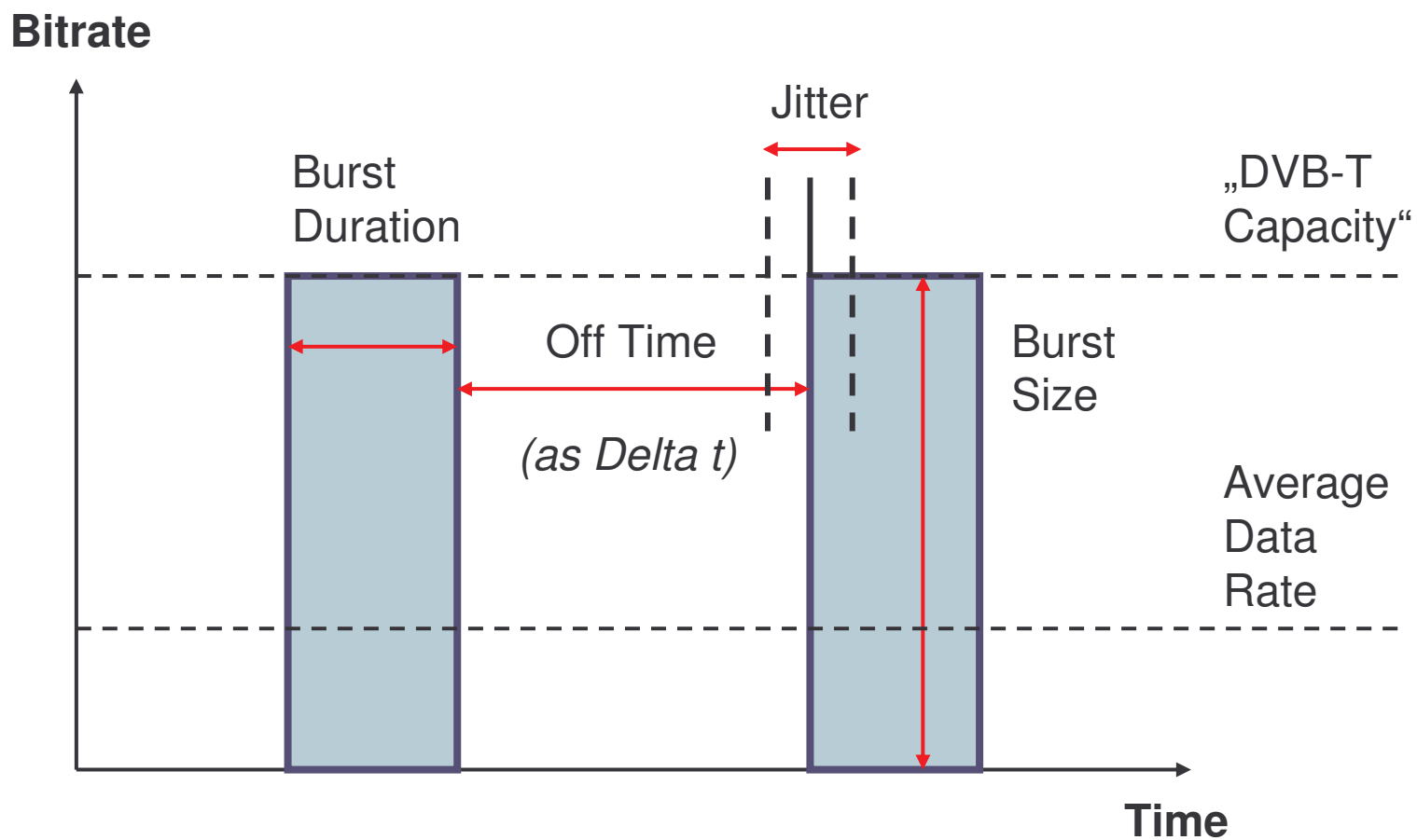
„always on“ - not used data is skipped



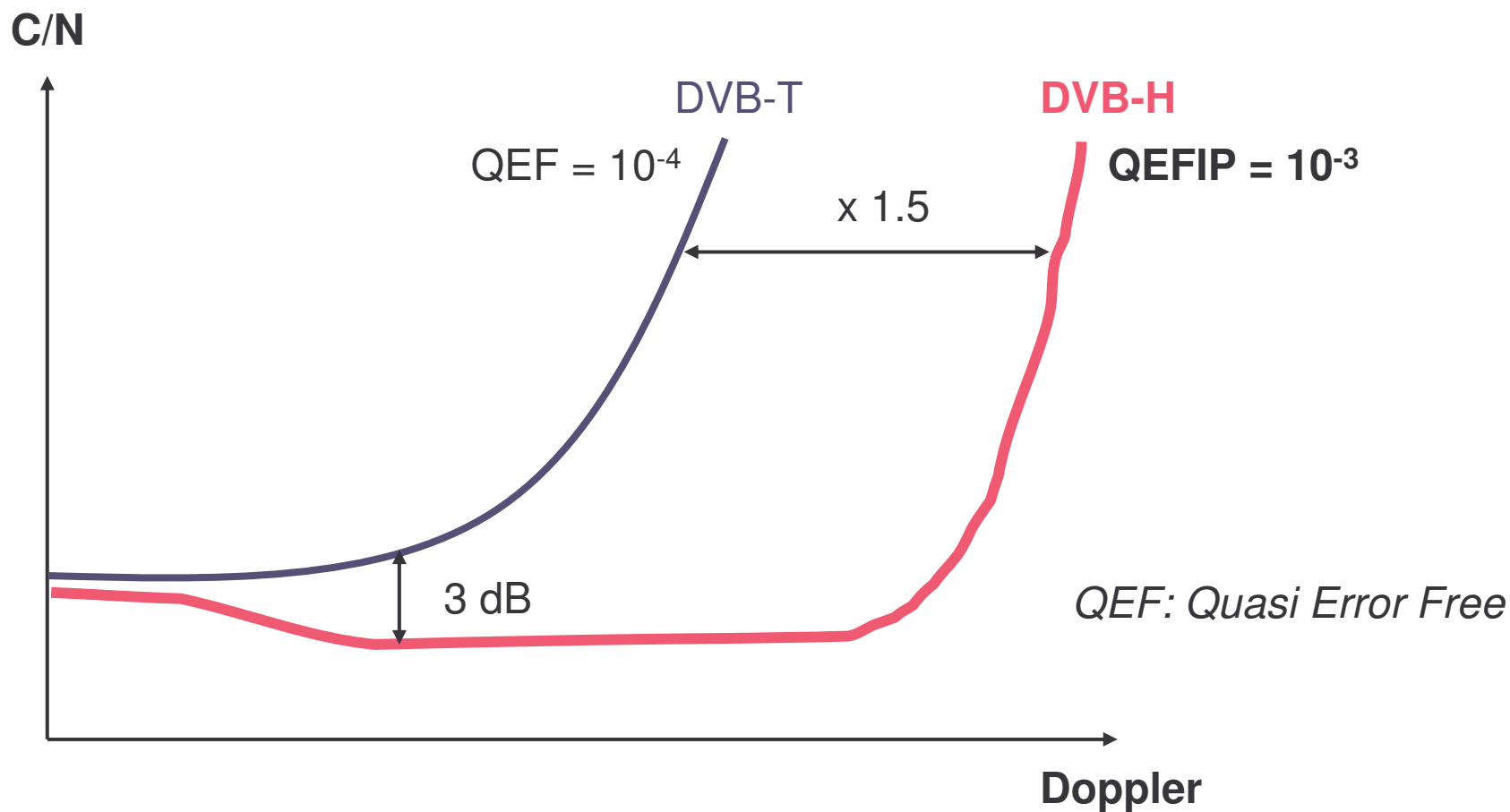
DVB-H Time Slices



Time Slicing - II



Improved Bit Error Ratio (BER)



Application and Services

- Video Streaming, not TV-like (CIF size screens), short video infotainment, advertisement, gaming, e.g. During World Soccer Championship 2006 in Germany
- Mobile information service, music portals and video clips, web based applications (using Rich Media, XML)
- DVB-H remains „One-To-Many“ (broadcast oriented)
- Perhaps not as Free-To-Air (FTA) service but very cost effective in comparison to UMTS
- Return channels and service interworking (billing, accounting) based on wireless communication (GSM, UMTS)

Recommendations

- Modulation:
 - 16QAM (eventually 64QAM)
 - FEC: 1/2 and 2/3
(16QAM with 1/2 better than QPSK with 3/4)
 - GI: 2k: 1/4
 4k: 1/4, 1/8
 8k: 1/4, 1/8
- CIF (360 x 288) at 384 Kbit/s H.264 video streams
- Total bandwidth: 10 – 15 Mbit/s (up to 35 streams)

Contact

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