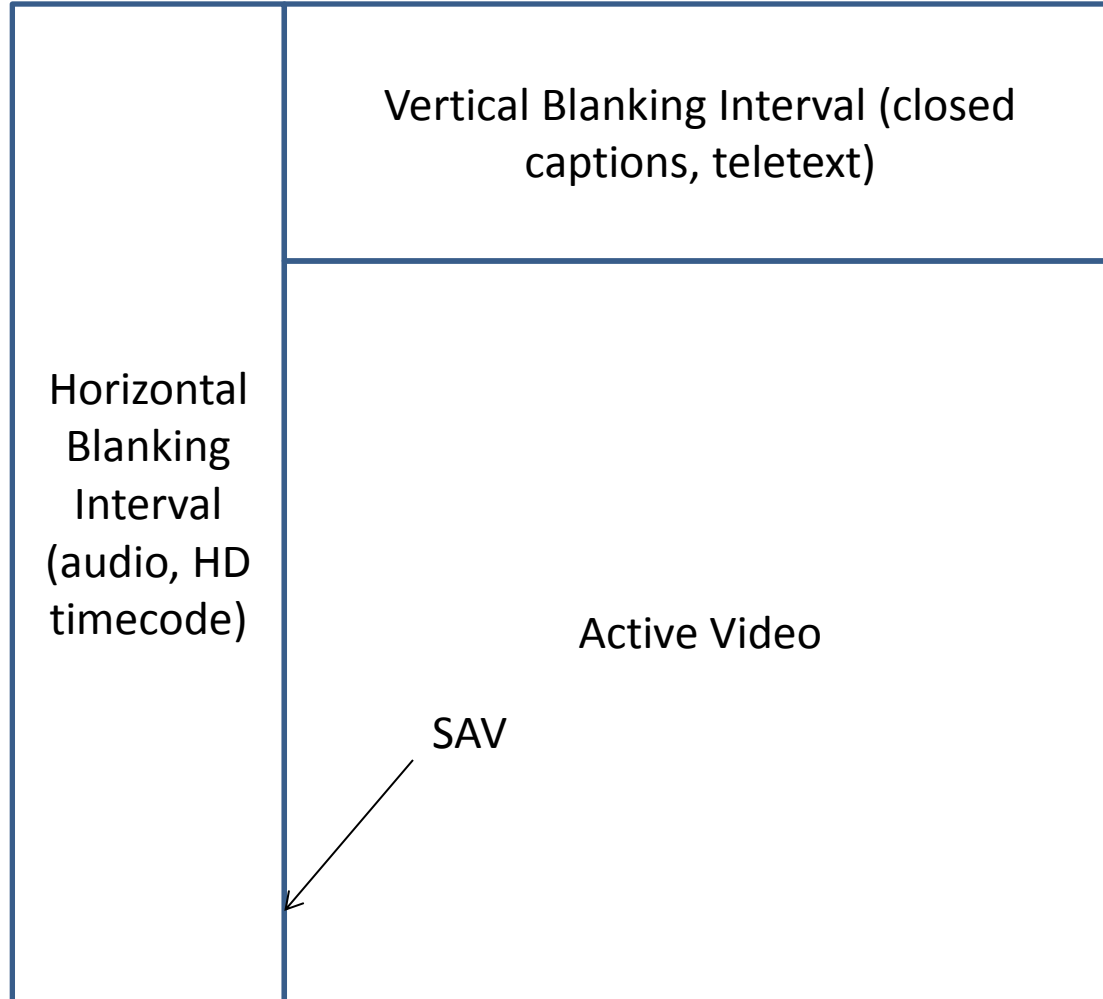# SDI in V4L2 proposal

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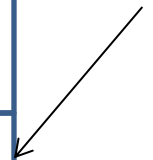
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What is SDI?

- Professional interface for broadcast television
  - SD – 270Mbit/s (PAL/NTSC)
  - HD – 1.5Gbit/s (720p60/1080i30)
  - 3G – 3.0Gbit/s (1080p60 etc)
  - 6G/12G etc (2160p)
- 10-bit 4:2:2 most of the time, some applications do 8-bit capture.
- Many PCI board vendors on Linux, some with binary SDK, some with V4L2/ALSA.
- Slow transition to SDI over IP (10-bit words over RTP)
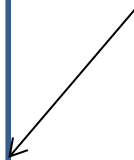
Datastream

1 field or
one frame

Vertical Blanking Interval (closed captions, teletext)

EAV

Horizontal Blanking Interval (audio, HD timecode)

Active Video

SAV

What are the problems (capture only)?

- **Biggest problem –** Separate file descriptors for audio; can never open them at the same time. Always out of sync.
- VBI/HBI access (10-bit)
- Maintain NTSC audio cadence (variable number of audio samples per video frame)
- Signal when frame is dropped to send alternative signal
- Signal when format changes (most applications would want to stop and reopen device to correct buffer sizes)
- Clock timestamps – clock would usually be derived with a PLL from the SDI input

Proposal

- Full line capture from EAV to EAV
  - 10-bit 'v210' pixel format (packed UYVY – 3 samples in LE 32-bits) - V4L2_PIX_FMT_SDI_V210
  - Audio packets have to be captured as 10-bit
  - Userspace library to do v210 unpack – LGPL x86 SIMD available
  - Card would lock to first frame
- Or should we take the raw SDI? (more CPU cost – difficult/impossible to SIMD)
- 8-bit as is currently but with audio pointer attached to frame?

Manufacturers

- One manufacturer understands this problem and looking for V4L2 dev.

- Hopefully others will follow?