HDV Editing Made Simple
(And Fast)

Convergent Design

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HDV Editing Made Simple (And Fast)

Two Simple Rules

1. Convert HDV → I-Frame CODEC
2. Keep it All Digital

Rule #1

Convert HDV ⟶ I-Frame CODEC

(or uncompressed)

What is HDV?

- MPEG2 Compression applied to HD Video
- Stored on Mini-DV Tape
- Two Formats:
  - 1440x1080 Interlaced (resized to 1920x1080 on output)
  - 1280x720 Progressive
- Excellent acquisition format, but difficult to edit

HDV (MPEG2) Advantages

- Excellent acquisition format with relatively low data-rate; constant bit rate, ideal for tape
- Provides HD Video at the same (compressed) data-rates of SD Video (DV)
- Uses spatial (I-Frame) and temporal (P,B-Frame) to improve compression efficiency
- Approximately 4.5x better compression efficiency compared to I-Frame CODEC

HDV (MPEG2) Disadvantages

- Software Compression runs 3x-6x real time
- 4:2:0 Color Space
- Simple “Cuts Only” editing often (over 80% chance) requires entire video to be re-compressed (time consuming process)
- Display of any given frame may require decode of many frames (due to temporal compression)
- Playback and timeline scrubbing may be jerky and at less than full-resolution

I-Frame CODEC Advantages

- Real-Time software compression
- 4:2:2 Color Space (DVCProHD, DNxHD)
- No render needed for “cuts only” editing
- Display of a given frame not dependent on decode of previous frames
- Playback and timeline scrubbing are generally smooth and predictable

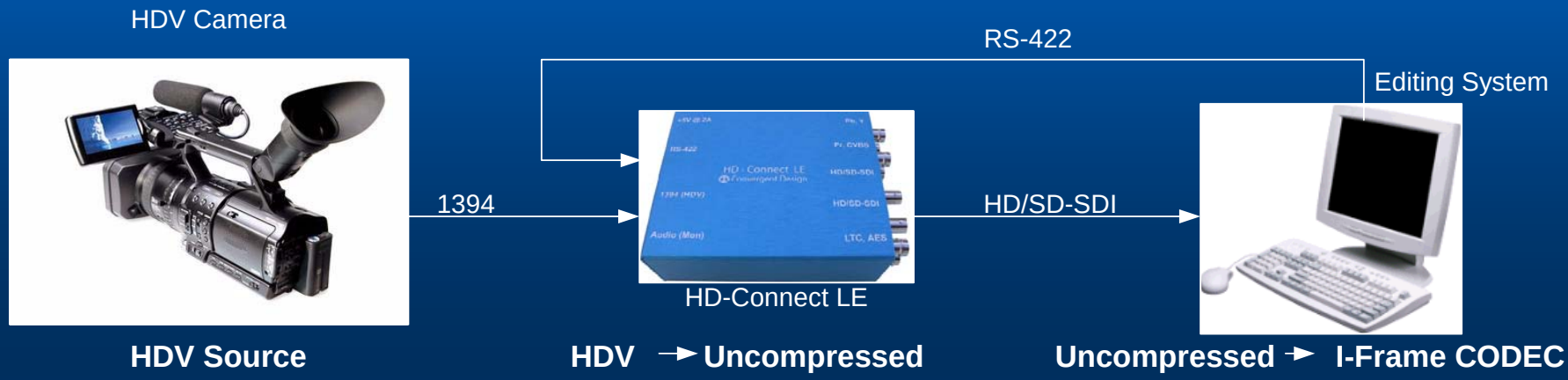
I-Frame CODEC Disadvantages

- Data-Rate about 4.5x greater than MPEG2 at approximately the same video quality
- Not an ideal distribution format

HDV (MPEG2) Vs. I-Frame

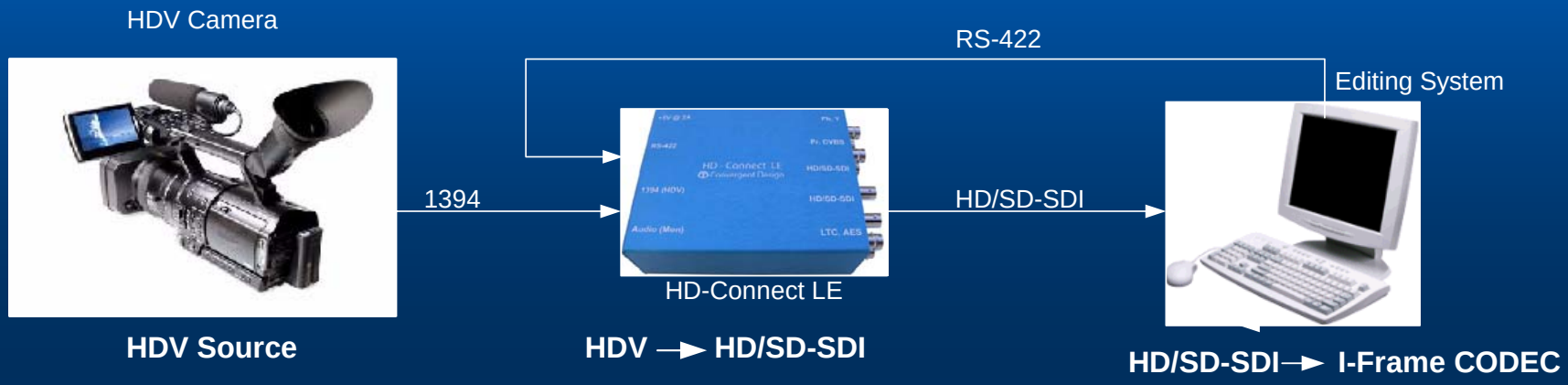
	HDV-1080i	HDV-720p	DVCProHD	DNxHD	Uncompressed
Data-rate (Mbytes/sec)	3.6	2.4	12.5	20	125
GB/Hour	13	9	45	72	450
Sampling	4:2:0	4:2:0	4:2:2	4:2:2	4:2:2
GOP (Group of Pictures)	15/12	6	1	1	1
Compression Time	6x	5x	2x	2x	NA
De-Compression Time	1x	1x	1x	1x	NA
Disk Drive Requirements	IDE	IDE	SATA	SATA RAID	SCSI RAID

HDV → I-Frame CODEC



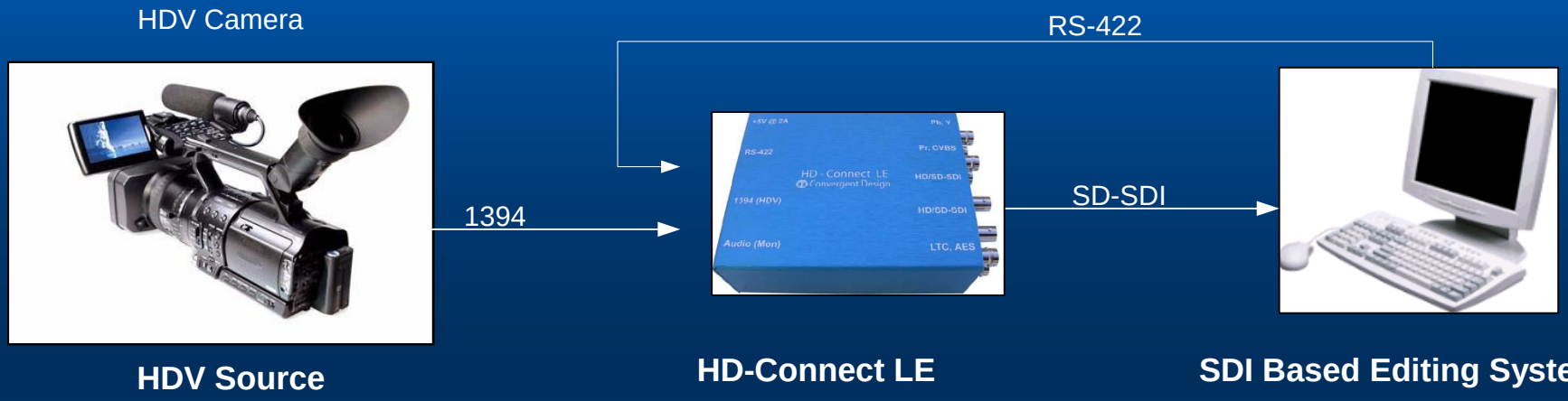
- Real-time Ingest of HDV
  - HD-Connect LE decodes (de-compresses) HDV to HD/SD-SDI
  - Software CODEC in MAC/PC encodes (compresses) stream to I-Frame CODEC (DVCProHD, DNxHD, etc)
- Divides task into two real-time processes:
  - HDV Decode (Hardware)
  - I-Frame Encode (Software)

HDV ⟶ I-Frame CODEC



- No lengthy HDV Render/Conform operation
- Deck control via RS-422
- Relatively low disk drive I/O requirements
- Simple Connection
- Brings HDV into the HD/SD-SDI Workflow

HDV → SD Conversion



- HD-Connect LE can decode (de-compress) HDV and scale to SD in hardware (letterbox or edge-crop output)
- SD Video captured into I-Frame CODEC (DVCPro50) or even uncompressed (21 Mbytes/sec)
- Excellent SD Video quality, superior to DV down-convert
- Tremendous time saver over software approach

1080i ⟷ 720p Conversion

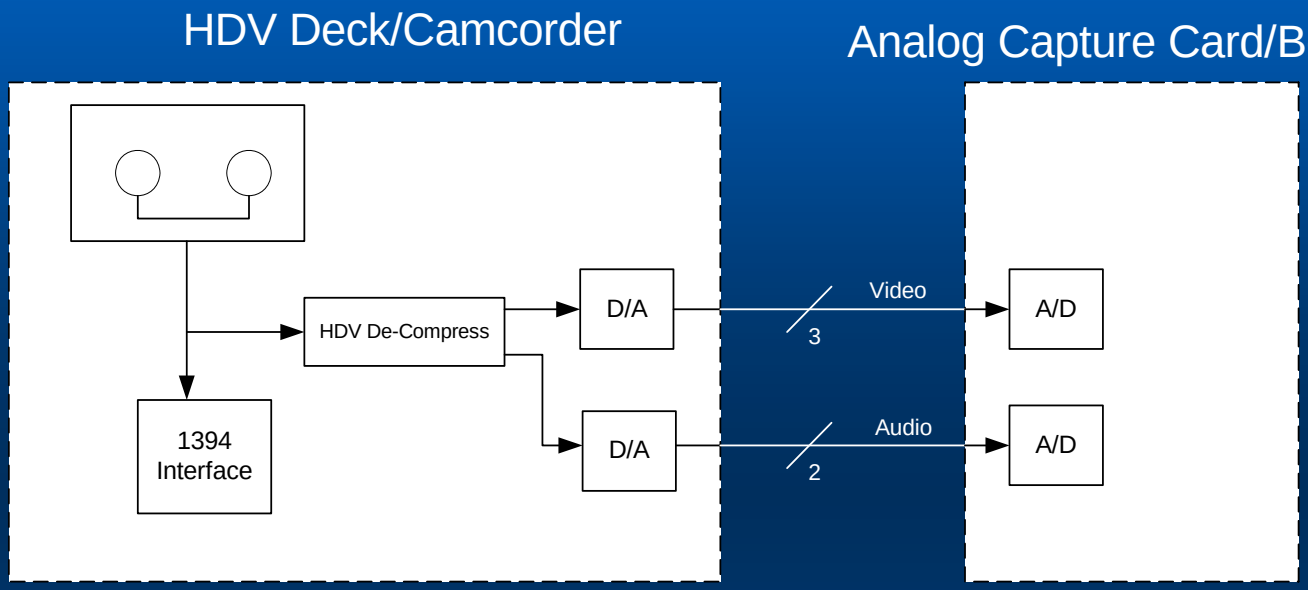
- HD-Connect LE also supports cross conversions
  - 1080i HDV → 720p
  - 720p HDV → 1080i

- Simultaneous HDV Decode & Cross Convert
- Tremendous time saver
- Mix and match footage from JVC, Sony, and Canon

Rule #2

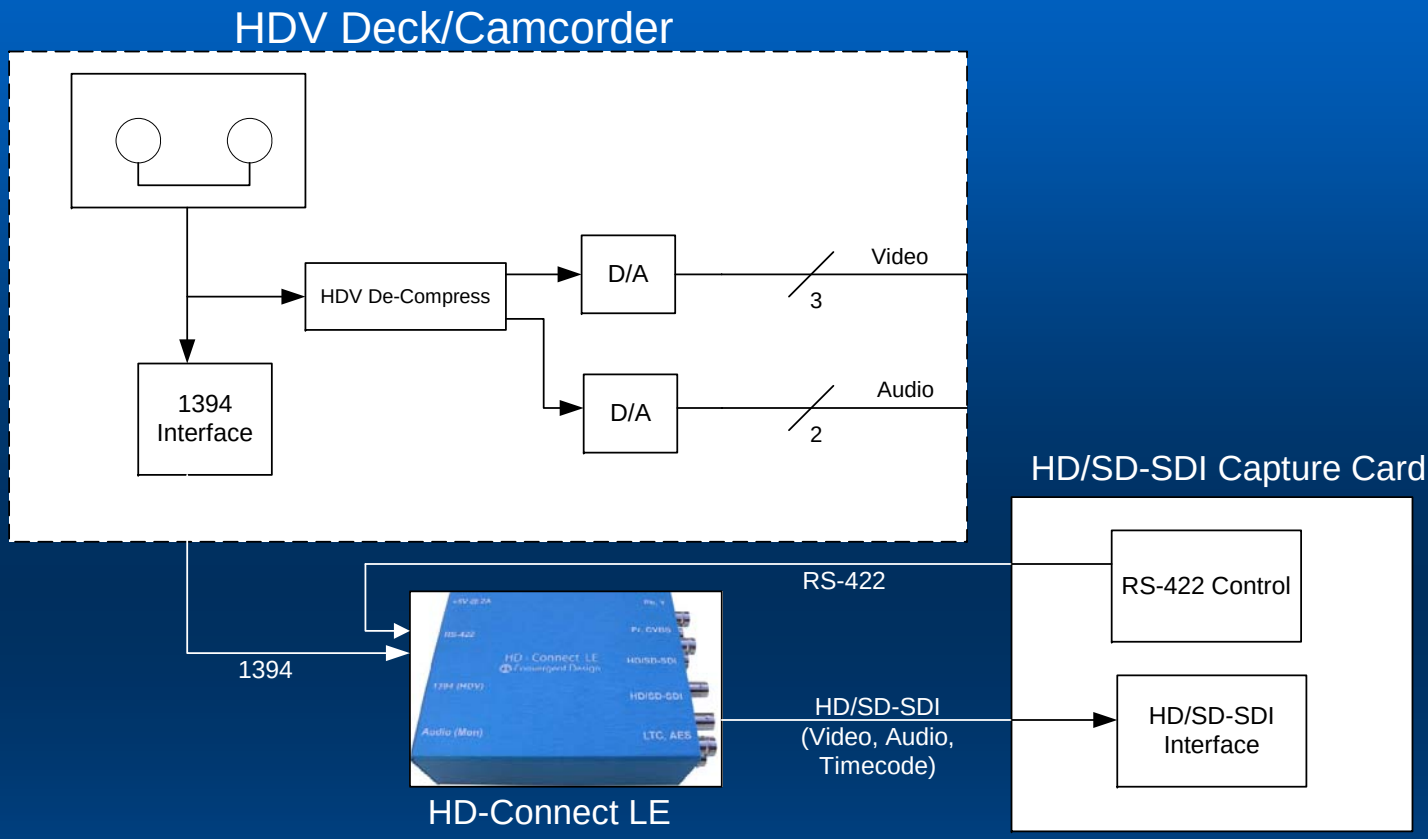
Keep it All Digital

The Analog Approach



- Analog approach requires additional D/A and A/D conversion, reducing video/audio quality
- Deck control can be complicated (LANC)
- Requires expensive (analog-based) capture card

The All Digital Approach



- All digital, no A/D or D/A quality loss
- Simple deck control
- Uses lower-cost HD/SD-SDI capture card

Summary

- HDV (MPEG2) for acquisition, I-Frame CODEC (DVCProHD, DNxHD) for editing
- Convert HDV → I-Frame CODEC using HD-Connect LE (hardware decode/scaling) followed by HD/SD-SDI capture card and software compression
- Keep it All Digital for best quality, lowest hardware costs and simplest connection

Conclusion

- Video acquired on HDV can now be seamlessly brought into an existing HD/SD workflow
- All the complications and long render/conform times of HDV (MPEG2) are eliminated
- You can now shoot in HDV and ingest in either HD or SD formats
- HDV is now…just another HD tape format
- HD-Connect LE makes it Simple (and Fast)

More Information

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