canopus

HDV Education

Canopus HDV Solutions

Why Canopus?

Our hardware solutions and codec technology enable you to edit and preview your HDV project in realtime without compromising quality or resolution. Read more on the following pages about how Canopus can deliver the HDV tools for today and the future.

What Makes HDV Hard to Edit ?

There are several factors that make HDV a difficult format to edit. First of all the native HDV file is an MPEG-2 Transport Stream. MPEG files use an "inter-frame" style encoding. In order to encode an MPEG file data is removed from various frames to reduce the overall file size, but for playback/editing this file data must be recalculated and decoded. During this decoding the removed data can be reconstructed using data found in nearby GOPs (Group of Pictures). This means if you drop an MPEG clip into a timeline with the timeline cursor on a frame and that frame is not entirely complete, it needs to have the missing data filled in with data from the surrounding pictures.

This process requires a lot of extra CPU effort, even for a single frame, and lowers overall realtime performance. This is further complicated when filters, layers, transitions, and titles are added. Imagine processing a color correction and/or a PiP (Picture and Picture) in addition to the overhead added to decode the MPEG. Now you are not only asking your editing software to figure out the color correction and/or PiP at that very frame, but it also may need to decode the frame by retrieving information from the surround pictures as well. This extra decoding and dependency on other frames makes native HDV very difficult to edit.

Compare this method to "intra-frame" style compression used by the DV format. "Intra-frame compression" means that all the data required to decode the frame is located within the same frame. "Intra-frame" style compression makes the file significantly easier to decode for playback and editing because the CPU does not have to look in multiple places for a single frame's data.

The second factor that makes HDV very hard to edit is preview to an external monitor. Many people who edit SD video understand that editing with a broadcast monitor is a necessity to be able to view the true results of what they are editing. Without an external monitor it is impossible to accurately tell how colors and details will appear upon final output. HDV presents a new problem for external output however. In NTSC, for example, an SD monitor uses 720 x 480i and a HD monitor uses 1920 x 1080i of resolution. If HDV is using 1440 x 1080i resolution, how is one supposed to get full-resolution output to an external monitor? Canopus codec technology combined with Canopus hardware answers this key question.

Canopus Codec Technology

It is critical to understand that the most important aspect of the EDIUS Solutions is the Canopus codec technology. Canopus has developed several codec technologies and these have always been the driving force behind most Canopus products. The same is true for our HDV editing technology.

Canopus HQ Codec

EDIUS Pro 3 now comes with our powerful HQ (High Quality) codec. This means if you use any of our EDIUS Solutions you will have access to this high quality codec regardless of whether or not you have Canopus hardware installed. When using EDIUS Pro 3 for editing HDV, the user should select the HQ codec as the codec to be used throughout editing the project. The HQ codec uses the same resolution that you find with an HDV camera (1440 x 1080i for example). During capture, the HQ codec transcodes the native HDV MPEG-2 Transport Stream into a Canopus HQ format AVI using its “intra-frame” style compression. As mentioned earlier, this increases realtime performance by reducing the overhead required to decode the file for playback and editing while still maintaining the true HDV quality.

Another major advantage of the Canopus HQ codec is that it uses a dynamic variable bit rate in order to create a file that still maintains all of the original quality of the MPEG-2 Transport Stream. This bit rate will automatically adjust itself to a higher or lower data rate based on the information that is being processed. For example, video that had less color and motion (a shot of the blue sky) would have a lower bit rate than video that had lots of color and motion (like an amusement park). Even if both of these scenes are in the same video clip, the bit rate will adjust over time thus keeping

quality high without using an excessive data rate for 'simple' video. This is why we say that the HQ codec has a dynamic and variable bit rate. In general this bit rate will float no lower than 100 Mbps and no higher than 170 Mbps, but for most 'normal' video will sit between 130-140 Mbps in default quality setting. As you can see, even at 130 Mbps these HQ AVI files can be 5 times larger than the native HDV MPEG-2 Transport Streams. However the trade off is that we have created a file that maintains all the original quality of the HDV footage but now have the file in a compression format (Canopus HQ) that is easy for editing software to process.

EDIUS Pro 3 can process both native HDV MPEG-2 Transport Streams and Canopus HQ AVI files. Canopus HQ AVI files allow for much more real time performance than the MPEG-2 Transport Streams. Every frame of these AVI files contain the full information necessary to process any effect, title, or transition within EDIUS unlike MPEG-2 files which require extra decoding to get each frame of video. This means that on a system where you could get only one stream of MPEG-2 to play back in real time you could get up to four layers of HQ AVI files to play back in real time with simple PiPs applied.

Mixing Multiple Formats and Frame Rates

Canopus codec technology also allows EDIUS Pro 3 to process multiple formats and frame rates within the same timeline. When starting an EDIUS project the user can choose the codec of their choice as well as the resolution and frame rate (HDV 1080/60i, HDV 720/30p, DV NTSC 4:3, etc). These project settings will determine how all clips added to the timeline are processed. As an example, a project for HDV might be set up as HDV 1080/60i using the Canopus HQ codec. If the user drops 1080i Canopus HQ AVI files into the timeline these clips playback effortlessly as the project settings match the format of the AVI files. The user is still free to add other clips to the timeline that are not the same as the project setting currently used. If a user decides to bring in SD MPEG-2 clips, SD 16 x 9 clips, or even NTSC or PAL DV clips, the EDIUS timeline will accept them and they will remain in their native format on the timeline. During playback EDIUS Pro 3 will pre-process these clips to match the project settings being used in realtime without making any changes to the original clip. So while the SD MPEG-2 clip will remain an SD MPEG-2 clip on the disk, during playback in an HDV project there is processing power being used to convert that to the HDV project setting on-the-fly and this is what we refer to as pre-processing.

This pre-processing also comes into play if there is an effect, title, or transition that needs to be applied. As an example let's take that SD MPEG-2 clip placed on the 1080/60i project timeline. The SD MPEG-2 clip is converted to 1080/60i on-the-fly during playback without changing the original file. Now if a color correction is applied to that clip there will be additional processing we refer to as effect processing. Upon playback of the SD MPEG-2 EDIUS Pro 3 will now be doing pre-processing (to make the clip play back at the project setting) and then effect processing for the color correction. This means the color correction is being processed at 1080i instead of the SD resolution of the original MPEG clip because the pre-processing has already occurred before the effect processing. While this is a lot of information to be processed, the EDIUS Pro 3 software can do this and more in real time because of the high performance and high quality Canopus codecs tied directly into the application to maximize processing performance.

All of the processing described thus far happens solely within the EDIUS Pro 3 software. That means if you use EDIUS Pro 3 with an OHCI card, a supported Canopus realtime DV card (like DVStorm), or even the new Canopus HDV hardware cards, the processing is handled the same. Canopus hardware is most important for capturing footage and output to an external monitor and real-time DV out is needed.

Scalable Technology

Canopus pioneered scalable technology as the best way to prolong the life of technology and this concept remains true for EDIUS Pro 3 as well. With EDIUS Pro 3, CPU power is the primary fuel for real time performance so the more CPU power that is available on the system, the more layers, titles, and effects that can be processed in real time. With the introduction of HDV and the HQ codec, dual processors are currently necessary to edit this format in real time. HQ AVI files can be 5x larger than standard DV clips so editing 2 streams of HQ AVI is comparable to editing 10 DV streams! Editing the native MPEG-2 Transport Stream is even more difficult to process. That is why EDIUS Pro 3 software is specifically designed to take advantage of processing power and give increased performance with more CPU power. Currently, a dual Pentium 4 Xeon 2.8GHz system can edit two to three layers of Canopus HQ (1080i) clips in real time. If using native MPEG-2 Transport Stream clips, typically only one layer can be edited in real time. In addition to CPU speed, real time performance is also dependant on hard disk and memory transfer speed.

EDIUS NX for HDV & EDIUS SP for HDV

Canopus has manufactured two boards that integrate with EDIUS Pro 3 and there are several benefits to using our EDIUS NX for HDV or EDIUS SP for HDV hardware. Some of these key features include a hardware DV codec, real time bi-directional analog/DV conversion and capture, and advanced analog video input enhancement technology. These features can be seen on the product pages for EDIUS NX for HDV and EDIUS SP for HDV on our web site. This page is focused on HDV editing and will cover how the EDIUS hardware solutions help the HDV editing process.

NX vs. SP : Key Differences

In addtion to all of the features of the EDIUS NX for HDV board, EDIUS SP for HDV has:

- Component Video Input
- Balanced Analog Audio I/O
- RS422 Device Control
- Rack Mount Breakout Box Option

Output to an External Monitor

The real challenge to HDV editing is getting the processed HDV-resolution video to an external monitor. In order for EDIUS Pro 3 to do this one of our HDV editing cards such as EDIUS NX for HDV or EDIUS SP for HDV is required. EDIUS Pro 3 already performs the necessary pre-processing and effect processing in software at the project resolution. So, as an example, a project set up with the HQ codec at 1440 x 1080i processes all of its clips at 1440 x 1080i resolution. Now if we have an EDIUS NX for HDV or EDIUS SP for HDV hardware solution (which will be referred to simply as "EDIUS hardware" from

this point) in the machine we get realtime HD video output. This realtime HD output is true uncompressed full resolution, full frame rate output. In the case of a 1440 x 1080i project, the EDIUS hardware is responsible for performing the line scaling from the processed 1440 x 1080i frame to the standard 1920 x 1080i HD frame and sending this video out through the component output of the boards. This feature sets the EDIUS solutions apart from its competitors as most software that claims to perform realtime HDV editing can only provide reduced-resolution and/or reduced frame rate software preview on the computer screen. Professional video editors are well aware that the view display on the computer is very different from the actual video output. With the EDIUS hardware' realtime full resolution full frame rate output allows for the highest quality and most-accurate HDV editing required for title positioning, keying and color correction. In addition to providing input/output for EDIUS Pro 3, the EDIUS hardware is necessary to perform the same kind of high-quality line scaling that a HDV camcorder or deck would perform. Competing software-only solutions simply cannot provide the same quality scaling and audio/video synchronization that the dedicated EDIUS hardware provides.

It must be noted at this point the EDIUS hardware is not capable of outputting progressive formats at this time even though the EDIUS software is capable of editing these formats. This is just the limitation of the hardware driver software. A new version of the driver and EDIUS Pro3 will enable full function for 720P mode including the progressive format output through the EDIUS hardware.

The EDIUS hardware is also capable of outputting SD resolutions for SD editing projects as well.

EDIUS Hardware for Real-time Editing

One advantage of having exclusive hardware when editing video is that it can increase realtime editing features and enables you to check the video and audio in realtime while editing in the exact same environment as the final output.

It is essential in a professional editing environment that the final output result of video and audio is always displayed & checked on a monitor while you are editing in HDV. HD video has various display formats: LCD, plasma, CRT, or rear projection. Each of these types have significant differences in display quality and characteristics, therefore the final master clip cannot be completed unless the editing result is correctly confirmed while editing. Many video camera manufacturers adjust their camera to output the best quality video when monitored on any HDTV. Video display position, the size, title visibility, and colors on HDTV differ greatly from the current SD televisions. Because of these differences, editors often encounter problems during content creation for HDTV display. While editors need to acquire new tips for editing, the important criteria they rely upon will be the image displayed on the HDTV, which is the output from the camera's component output. In another words, the edited video and audio on the monitor should be exactly the same as the video clip which the camera plays back directly from the tape to the HDTV.

This is where monitoring the output makes an important difference. Even if it can play back in realtime, a system that drops frames or lowers the video quality to display on a PC monitor cannot be qualified as a professional's realtime editing system. Specifically, the PC monitor has different display characteristics from HDTV, which means it is impossible to visibly check color correction and gamma adjustment. DV editing compresses images by frames, which enables the DV compression of the video on the timeline in realtime with constant output to a DV camera. The DV camera can provide analog output of the image by receiving only a single frame of data. However, in the case of HDV, because of its long GOP structure, a decoder cannot decode the video image unless at least 1 GOP of data (approx. 0.5 sec) is sent to the HDV camera, even to display a single frame. Generally, it takes a few seconds after starting to send the MPEG stream before video playback begins. Also, MPEG compression takes a huge amount of time when the data is processed in software by the CPU, so it is unrealistic to monitor the video and audio editing result by using a camera as a decoder, because checking a single frame will take more than 5 seconds.

Three methods have been presented to enable video and audio monitoring for HDV editing:

1. Use a dedicated HD / HDV editing board to output HD master quality video and audio
2. Connect the VGA output or component analog signal of the graphics board to HDTV, and connect the sound output of PC to the HDTV.
3. Display the video on the PC monitor, and output audio from the PC's audio circuit.

The only shipping products that utilize the first method currently are EDIUS SP/NX and EDIUS HD/SD (hereinafter referred to as "EDIUS Hardware"). The EDIUS Hardware outputs the analog component video and audio in HD master quality from a dedicated output circuit. It guarantees realtime, full frame output for realtime playback, and does not drop frames or lower the quality. Audio and video synchronization is complete and guaranteed. The same quality as a broadcast quality HD signal is maintained in the signal level, SN ratio, synchronizing signal level and position, and quality deterioration by horizontal interpolation is prevented. The monitored signal during editing will be of equivalent quality to the content that is written back to the tape and played back from the original playback system.

HDV 1080i (Sony HDV camera format) records in MPEG format with 1440x1080 resolution video to the tape. To accurately edit the video shot, it is necessary to edit in 1440x1080 resolution and monitor in 1920x1080, horizontally stretched through the component output since HDTV displays are designed to receive a 1920x1080i signal. HDTV defines its input signal as an analog signal with its horizontal and vertical display position and size in its resolution. To monitor a high-quality video, a multitap digital filter is required for horizontal interpolation processing. Because high-quality monitoring requires a high order digital filter, performing the same quality processing in the CPU and graphic chip is practically impossible. EDIUS Hardware processes it in realtime on the board, matching its display timing with the HDTV requirements. This enables the EDIUS Hardware to produce a video signal that completely meets HD master quality. Furthermore, the high quality audio circuit on the EDIUS Hardware precisely synchronizes the audio with video to provide superior quality audio.

In the second method, one of the RGB outputs of a graphic card with 2 outputs is connected to an HDTV's RGB input. The problems with this method are:

1. The original component output is in YUV format, which has different dynamic range compared to RGB, with different color representation range. Also many HDTV displays have different gamma characteristics for the YUV input, so input from RGB results in a difference in video quality.
2. In many HDTV displays, RGB and YUV signals have different relationships between the synchronization signal and the video monitoring area. Even if an editor has confirmed the safe area on the HDTV display, when the editing result is written back to the tape and monitored from camera's component output, it may be displayed in a shifted position.
3. This method does not guarantee synchronization between the audio output from the audio circuit and the video played back from the graphic circuit because there is no way to check the audio and video together from the editing software.
4. The graphics board's RGB output does not have accurate calibration and is not intended for professional video output. In the professional editing environment, even a 10% difference in analog video signal level cannot be tolerated. It is impossible to perform accurate color correction by relying on the RGB monitor output from the graphics board.
5. This method cannot guarantee that all video frames are fully played back. Many of the systems that incorporate this method will drop frames and/or lower video quality but plays back audio normally to give the appearance of realtime playback. Video may jump to next frame, giving the impression that the clip was interrupted and making verification of the edited master clip impossible.
6. 1080i is an interlaced video signal, however the PC graphics card outputs progressive frames. This causes video clips with dynamic motion to be displayed differently on an RGB monitor from the original HDTV video. Some graphics boards may have a dedicated component output connector; however most of them still have the above issues.

The third method involves checking video quality on a PC monitor. In addition to the issues with the second method, the third method has another critical issue that makes monitoring significantly different from the original HDTV video. In editing software, a video clip is displayed in the view window on the PC monitor, which is smaller than 1920x 1080, and cannot confirm the final status of how small title text and other details will appear on an HDTV. Usually, the PC will display the entire video frame including the safe area and it is difficult to confirm the display area of a true HDTV display. Editors cannot rely on such a monitoring environment to finish their final edit, which forces them to write back to tape and play back with the camera for confirmation. Writing back to the tape requires re-encoding to MPEG, consuming a significant amount of time, which cannot be practical for professional use.

After understanding the available HDV editing methods, it is easy to see that the exact quality of component video and audio signal output from an HDV camera or deck should always be output and monitored on an HDTV in full frame and full resolution, and doing so requires a dedicated hardware solution like our EDIUS Hardware.

The EDIUS HDV Workflow

It is important to cover the workflow of HDV editing within EDIUS Pro 3 for two reasons. First of all it is important because there are some distinctions for editing SD that current editors (EDIUS 2.x or otherwise) may not be aware of. Secondly it will help differentiate why EDIUS Pro 3 is a superior solution to many other editing applications on the market.

Capturing HDV

When capturing HDV with EDIUS Pro 3 you have several options to select from before starting capture. Within EDIUS Pro 3 there is a tool called Mpeg Capture. Since we will be capturing an MPEG-2 Transport Stream from the HDV camera we cannot use the normal DV capture procedures. The Mpeg Capture tool is how we import the MPEG-2 Transport Stream from the HDV camcorder and select whether to store the incoming data as an MPEG-2 program or transport stream, or to transcode the incoming data to the Canopus HQ AVI format on-the-fly. For most editors there will probably be few times an MPEG-2 program stream would be necessary except if there was no editing needed. Capturing as an MPEG-2 Transport Stream captures the native HDV data to the hard drive. Capturing as the Canopus HQ AVI requires sufficient CPU processing power to convert the native MPEG-2 Transport Stream into the Canopus HQ format in real time. This is another reason that the specs for EDIUS Pro 3 recommend a dual 2.8 Xeon machine or faster for HDV editing. With these specs all of the different capture formats are available. If the computer does not meet the requirement given, capture in the Canopus HQ format may not be possible.

Editing HDV Real-time

First off, an HDV project type must be selected in EDIUS Pro 3. Most users will select 1080/60i for NTSC and 1080/50i for PAL, as these are the two settings that support realtime HD video output using EDIUS hardware. During the editing process we will see the difference in performance between using native MPEG-2 streams and Canopus HQ format AVI files. As has been mentioned earlier, Canopus HQ format AVI files provide much more realtime performance than native MPEG-2 streams. Also during the editing process, clips with frame rates or resolutions differing from the project settings may be added and will be automatically pre-processed to conform to the project settings during playback before effects processing is done.

After clips have been assembled on the timeline, effects, titles and transitions may be added. Layers of video of different formats may also be assembled on the timeline at any time. The amount of layers, filters, titles and transitions will also depend on CPU power, memory, and hard drive throughput.

For reference, a dual 3.4 GHz Pentium 4 Xeon with 2 GB of RAM can easily edit 3 layers of Canopus HQ AVI, have two layers with simple filters and titles, or have one layer of video with many effects and many titles. If there are points in the timeline that the machine is not able to process in realtime, they will be marked and can be rendered for smooth playback. Even if not rendered, the user can scrub through these very difficult multi-layered, multi-effect sections with good response.

If editing with just the EDIUS Pro 3 software, all of these layers, effects, titles and transitions will play back on the PC monitor in realtime. If EDIUS hardware is installed, 1080i projects will output in real time at full HD resolution and frame rate as well.

Exporting Video

Now that the video has been edited and is ready to be sent off there are several options for the user. First of all ProCoder Express for EDIUS is what we use to deliver various file formats from the timeline. ProCoder Express for EDIUS is used to export such file formats as MPEG-2 Transport, Program, or elementary stream, Windows Media, Quick Time, Real Media, and an array of other formats.

If you want to write your HDV project back to the HDV camera there is a tool in EDIUS called Mpeg TS Writer to do so. Mpeg TS Writer is specifically designed to write an HDV-compliant MPEG-2 Transport Stream created from ProCoder Express for EDIUS back to an HDV camcorder or deck. It is important to understand this process as many SD editors who have become accustomed to real time editing may not realize that there will be this ‘extra’ step to output back to the HDV camera. Currently no solution provides realtime HDV output from the timeline.

Of course with an EDIUS hardware solution, there is always the HD component video output if writing back to an HDV camcorder or deck is not necessary.

The Canopus Advantage

There are several other solutions on the market that advertise HDV editing. Most of these solutions, like EDIUS, accept that editing the native MPEG-2 Transport Stream is complicated, difficult, and impractical. Competing solutions fall into three different categories defined by the manner in which they handle HDV.

Other Solutions

1. **Wavelet Based Compression:**
   One strategy that some applications use is called Wavelet based compression. This compression provides a way to convert MPEG-2 Transport Stream data into a format that can be processed more easily by the editing software. The data is compressed between capture of the native HDV and the clip being "available" to the system, thus introducing a delay between capture and starting to edit. Wavelet compression has the unique property of allowing "partial decompression" so the system can provide a low-resolution preview without generating a high CPU load by cutting the decoding process in the middle. This partial decoding is usually combined with frame skip when the CPU can't process the timeline in real-time. This means that during editing of these effects, filter, titles, and transitions the editor is incapable of seeing the full resolution of the video. Furthermore, while the editor has "realtime preview," they are unable to accurately check quality-critical items like titling, color correction, and speed control until the project or section is fully rendered. For any quality-critical evaluation, the editor is left to "render, wait and check" and without a way to view the final output on a real HD video monitor, the entire process involves a great deal of guesswork.
2. **HD Resolution with SD Data Rate:**
   Another way some editing software works with HDV is by 'dumbing down' the resolution of the HDV stream to an SD data rate for playback purposes. This means that while editing footage the editor is still looking at a 16:9 frame size, the data that they are looking at does not contain the full resolution of HDV. Instead this data rate is similar to SD video. This again does not allow the editor to see the full quality of the video in its native resolution. This process is similar to traditional proxy editing and still requires a lengthy rendering process before the true output quality can be evaluated.
3. **Turning HDV into HD:**
   Another solution to editing HDV is to simply convert the HDV video into a mainstream HD format. This solution preserves the resolution of HDV by moving it directly to a full HD stream or a native HD compression (DVC Pro HD for example). However these solutions need to support full HD formats and not just HDV. Often this means that there is little to no realtime performance as few full HD editors are designed for a lot of realtime functionality. In other cases this means the editor would be paying a greatly increase price for functions and format support such as DVCPRO HD and HDCAM even though their main focus is HDV.

The Canopus Difference

Dedicated HDV Hardware

Canopus has hardware solutions. Even though modern PCs have incredibly powerful processors, they still have finite capabilities. Working with DV is comfortably within their abilities. Working with HDV is not.

When working 'natively' in HDV, without dedicated HDV hardware, editing can be a slow and unrewarding business. There are questions about quality too. Canopus hardware solutions are able to filter the video material as it is re-sized in real-time. Other, software-only, editing solutions either take much more CPU power, which can make the process non-real-time, or take resources from other components, for example a graphics card. In the latter case it's very likely that the quality will suffer, as graphics cards are optimized for RGB graphics (unsurprisingly), not YUV video.

Canopus HQ Codec Technology
Canopus has the best codec technology for editors available anywhere, and this is the key to the quality and performance of Canopus systems. We've already seen how editing natively in HDV is slow and can lead to poor quality. The Canopus solution to this is elegant and effective. Canopus has its own high definition codec. It uses more gentle compression than HDV, and is very much more suitable for editing. It needs less processing power as well, so you can play more simultaneous video streams and have more real-time effects. Here's how it works.When HDV is brought into a Canopus editing system, it is transcoded into Canopus's HQ format. You work in HQ for the duration of your project. What this means in practice is that you will be able to play more video streams in real time (because it's easier to uncompress and compress in HQ), and you'll be able to work with more layers without significant quality loss. With Canopus's HQ codec, and with hardware resolution conversion, editing is as easy and straightforward as working with DV. You use the same tools, the same software, and the same workflow.

Real-time Editing
Real-time Editing enables you to spend less time waiting for the project to render and more time editing. There are two important pieces of an HDV real-time editing system:

1. The result of editing does not require rendering and can be immediately played back on a monitor.
2. Video and audio playback is in the equivalent quality of the final output result. That means you can check the clip in its final quality while you edit, so that you don't have to wait around for a render and then go back and fix any problems.

With EDIUS NX for HDV and EDIUS SP for HDV, you have real-time editing capabilities. Competitor's systems use software-only solutions that claim to have real-time editing, however these are "pseudo-"real time. Many of these systems skip frames to reduce image processing load when playback cannot catch up. They also reduce video quality in the playback. Most systems will only provide a small preview screen on the computer.

Not Yet Ready for HDV?

Still Editing in DV?... No Problem

With EDIUS NX, you'll be ready for the future while still being able to work in DV. If you are investing in an editing solution today, why limit yourself to DV-only solutions? Why not future-proof your video production? The EDIUS NX gets you into tomorrow's technology today.

Everyone is moving to High Definition. Very soon products that only edit Standard Definition will be a thing of the past. The future of video editing has been laid out. HDV **is** the future. And it's already here.

What DVStorm Did for DV Editing, EDIUS NX for HDV Will Do for HDV and DV.

EDIUS NX for HDV is Truly The Next DVStorm

Your DV Editing Solution

- Works in all the same PCs as DVStorm for Standard Def editing
- Doesn't require an extremely powerful PC for DV editing
- Same realtime functionality and output as DVStorm
- Designed using Canopus' future-proof scalable technology
- Enables you to migrate your DV projects of today into your HDV projects of tomorrow
- Supports most Premiere Pro functions, with realtime input / output
- ADVC mode to capture and output SD video as DV from any DV-enabled application
- Filtering and noise reduction technology for analog input