Craft editing between "Cuts only" and "Grading"

There are basically 3 kinds of editing systems for professional production.

Newsroom editing systems allow journalists to rough cut their item and send the script, cut list and notes to a craft editor for final conforming when required. These systems typically require minimum computer resources so that they may be deployed at all journalists desktops. In many cases they are tightly coupled with a particular manufacturers storage system and have direct interfaces to the other newsroom systems Examples are Newsforce from Harris or the GV Aurora.

Finishing systems are used in high end post for such tasks as color correction, motion graphics and compositing. Typical systems are Smoke from Autodesk or DS from Avid.

In between these two extremes are craft editing systems, which are probably what most people think of as NLE's. We will attempt to define the requirements for a craft editor and look at how various manufactures address these requirements. This will not be a list of features, but rather a guide which will help you to evaluate the various offerings in light of your special requirements.

What makes a craft editor? There is a talent involved in getting the audience to "buy in" to the story you are telling. Give the same project with the same footage, script, etc. to ten different editors and each of the resulting videos will have a different feel. Craft editing systems are designed to allow the editor to tell the story the way she "feels" it.

One of the most important features is the GUI. There are two paradigms currently in use, although others have come and gone, - the timeline and the storyboard.
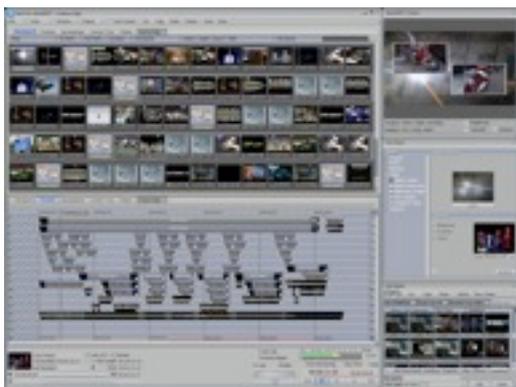
STORYBOARD	TIMELINE

Although some manufacturers attempt to do both you will usually find that they excel at one or the other.

The GUI provides the interface to all the sophisticated processing that is going on in the background. How responsive the GUI is given certain tasks, ie trim to fit, link/unlink sync, multicamera cutting, change fade duration, type and timing, etc., is not only dependent upon the hardware, but also results from good design. Despite the reluctance of editing

professionals to switch GUI's, they will have to do this a number of times during their careers. Thus another criteria for the GUI is learnability. Whether the storyboard or timeline GUI lend themselves to specific types of material is a topic of much discussion. Storyboarding may or may not work best for the type of material you are producing. Some sources say that it is better for long form editing or it may be something that is required to enable import from journalist stations.

In today's connected production environment the handling of metadata is often the key to functionality. Whether it is xml or edl, mxf or aaf, even how the system handles the data in the containers header can be critical to a "stressless" experience.

Audio, "Close your eyes and watch television, now plug your ears. In which case was it easier to follow the plot?" this, or something like it, is asked of every student of media production. How does the NLE handle panning, multichannel sound, EQ and various bit rates. Does it have the ability to record voice over, can it cut on the beat etc.

Multiple format editing was the "holy grail" 10 years ago, now the question is, how seamless is this implemented?

Every home editing system tries to sell itself on the number of effects available. It is not the number that is important. Flexibility and ease of use, ie can template effects be created and recalled, how are opacity and alpha channels handled, what are the tradeoffs between complexity and render time, how is the preview of effects which must be rendered implemented, are what we will be looking for.

Learnability, according to Wikipedia, "In software testing learnability, according to ISO/IEC 9126, is the capability of a software product to enable the user to learn how to use it. Learnability may be considered as an aspect of usability, and is of major concern in the design of complex software applications."

The question of standards. Somewhere between, proprietary systems which are designed to function flawlessly only when all components come from the same manufacturer and open source software conforming to all relevant standards running on off the shelf hardware, lies the reality of all television technology.

Multicamera editing of full resolution sources is probably one of the most difficult tasks an NLE has to master. Not only is the GUI designed to do this of major importance but the computing resources required can bring the most powerful system to its knees.

This is not a comparison!
There may be other criteria that are important for your facility, but as we have limited ourselves to "only" eight editing systems we will use these criteria. We have arbitrarily assigned each of the criteria to one editing system. The results should by no means be construed to indicate that a particlar editing system is "best" in the category assigned.

AVID Media Composer – Ease of editing
What a storyteller needs is the ability to easily and quickly move the clips around and trim the start and end points to create the tension and release required to hold the viewers attention. Sequencing forms the basis of all storytelling. The ability to arrange clips to control time, not in the technical sense of time remapping, but rather to move back and

forth in time and stretch or shrink time by using the arrangement and length of the available video material is at the heart of editing.

Avid is the father of non-linear editing. It started in 1989, as the technology at this time was not capable of playing back high resolution 640x480 30i video in real time, the first AVID was strictly off-line. The unbroken development path of over 20 years is reflected in the deep and intuitive tool set. Trimming in Avid is probably easier than in any other system. There are 3 different types of keyboard shortcuts plus mouse pointers for both rolling edits and head and tail trimmers. A 4 up view shows incoming and outgoing frames of all clips involved when slipping or sliding the edit. Simple toggles allow selection of which audio is to be monitored during the trimming.

GV Edius – Metadata

The Edius software package grew out of the Canopus Storm first introduced in 2000. With the purchase of Canopus by Thomson in 2005 and the subsequent rebirth of Grass Valley with Edius as part of the product line, this has become a viable professional option. Recently GV has upgraded Edius to Ver. 6 and integrated this with their workflow platform STRATUS. An integrated workflow solution is entirely dependent on accurate and inclusive metadata. The first place to look for metadata handling within an NLE is in the bins. What data fields can be selected for display? Is it possible to automatically fill your bins (or storyboard) with data from the asset management system?

From GV's brochure "Once the high-resolution material is transferred to the server, EDIUS automatically substitutes it for the proxies". This implies that the metadata connection between the proxies and the hi res is supported, but does this work when the material comes in as mxf files over FTP with an excel sheet as a clip list? One way Edius can solve this problem is by using a watch folder.

AAF files imported into EDIUS have the following limitations:
- The output in the AAF file must be frame based.
- Embedded AAF files are not supported - the AAF file must reference the source files directly.

Edius provides XML import from the GV Aurora Newsroom systems. Where the crossover is between Edius and Aurora is unclear, but has large implications as Aurora does provide comprehensive metadata facilities including MOS.

XML import from FCP does not provide support for the following item types:
- Clips which cannot be handled as offline clips, Title (text) clips, Key frames, Video filters.

P2 playlists and EDLs from the usual candidates are also supported.

Of course GXF can also be used for import and export.

Most of the above methods can be used in conjunction with an internally managed FTP server list.

Sony Vegas – Audio

Just as finishing systems are used in high end Post there are similar systems such as ProTools or Sadie for audio editing. The genealogy of most NLEs is based upon film cutting, where the term "bin" comes from. Vegas was originally developed by the folks at Sonic Foundry which sold the rights to Sony in 2003. Sonic Foundry were the originators of the loop based music sequencer which is found in all music production software today. Vegas has been around since the late 90's and was always developed with an accent on audio features. All the track controls such as record arm, phase, FX, automation mode, mute and solo, plus horizontal faders for volume and pan are what you would expect in a DAW. Pan faders can also be assigned other functions such as controlling auxiliary send

levels. When a track is armed for recording, a level meter and input channel appear. Direct native mixing to Dolby AC3 in either stereo or 5.1 is available. The list of audio formats is formidable ranging from BWF to Ogg Vorbis, and all this at 24bits and 192 khz. On the fly punch in recording is provided for voice over. Audio can be edited on the sample and is not confined to video frame boundaries.

Quantel eQ – Mixed Timeline
If you have been around for a while you will remember Quantel as the inventor of the "Paintbox". In 1985 they introduced "Harry", beating AVID by almost a decade to deliver the first uncompressed NLE although with only 80 sec. of storage. The modern Q series editing systems were developed out of this experience and have a loyal following worldwide. What do we mean by a "Mixed Timeline"? Simply stated, drag and drop a file, regardless of source, into the timeline and simply edit. We all know that file formats are being invented faster than any NLE can keep up. What is important is how long it has taken a manufacturer historically to implement new formats, and how flexible is the frame server running in the background. Obviously there are certain minimum requirements such as D10, Prorez, AVC intra, DNXHD, etc. but do you (or the system with a delay) have to convert before being able to use. What is the intermediate codec used when rendering effects? Does the use of mixed codecs increase render time?
eQ handles Varicam, HDCAM-SR, Viper, Arri Tornado super slo-mo, P2, XDCAM, XDCAM HD, 720p 50/60. HDCAM records in YUV and HDCAM SR in RGB, eQ handles both in their native color space. Quantel is the first firm to officially announce support for the newest file format, HDCAM SR at 1920 60P. Clips of different resolutions can be edited on the same or different layers without restriction and without rendering.

Apple FCP – Effects
The development of FCP was originally financed by Macromedia. The unstated goal was to combine the capabilities of Premiere and After Effects. After a couple of years of intensive coding the source and the development team moved to Apple in 1998.
FCP makes an arbitrary distinction between an effect and a transition, if an effect takes place at a cut it is a transition. I guess lots of NLE's think like this as this is the way a hardware vision mixer works. It's like Clinton saying "I did not have sex with that women", if the background video pops up in the middle of the screen and disappears before the clip ends it is an "effect". That said, the system is smart enough to know that when you drop a transition on the timeline it is limited to the length of the handles on either side. If an effect has been added to the timeline moving the cursor to that point will preview the effect in the canvas window. Audio/Video transitions and effects can be saved as favourites. All effects can be keyframed and adjusted using Bezier curves. No editing system can compete with the effects available through special plug-ins. Developing plug-ins for FCP is probably easier than for any other NLE, and this is reflected by the number of companies developing for this platform.

Adobe Premiere – Learnability
Despite the fact that hundreds of programs cut with Premiere are aired every day, Adobe has had an uphill climb convincing broadcasters that it is a professional NLE. Premiere ships with keyboard shortcuts for FCP and Media Composer as well as allowing for custom definitions. Customizable workspaces can be shared across the whole facility. Adobe uses the same paradigm across all of its products so that familiarity with Photoshop or Illustrator eases learning Premiere. A special shortcut key (tilde) immediately takes the selected panel to full screen for fine adjustments.

~~NewTek SpeedEdit~~ Media 100 - Standards

It was planned to check out how Newtek was adhering to standards, but then they stopped delivering the Speed Edit product. Fortunately an old friend suddenly reappeared thanks to Boris FX so we have a new candidate. The current Media 100 software is Intel Mac only. 4K, 2K, SD and HD all work in realtime. Standard XML import and export to FCP is provided. Media 100 Suite supports optional video I/O interfaces from AJA, Blackmagic Design, Matrox, and RED and provides AVCHD, AVC-Intra, FireWire, Panasonic P2, and Sony XDCAM acquisition interfaces.

LightWorks - Multicamera

Is open source software ready for Prime time? LightWorks has an excellent pedigree being used off-line for many feature films. The Lightworks system includes advanced multi-cam editing with unlimited sources and dual-SDI outputs. Editors can simultaneously view source angles in sync with the edit. There is no limit to the number of cameras, but at some point the system will slow down.

Horses for Courses

Obviously there is no best editing system. If you make a management decision regarding which systems to purchase then be certain that you can justify that decision based upon the organizational goals. It should be clear by now that no system is the best at everything. Make a prioritized list of what is important in your organization then match this up with the systems in your price class. If you already have editing personnel on-board, they will have to be convinced that this is the best decision or let go.

TCO

Over the past 20 years we have had to add business skills to our engineering talent. Total cost of ownership (TCO) and return on investment (ROI) are now asked for instead of "Whats it cost?". Determining TCO for an editing system is difficult because they are configured and supported differently. Some suppliers offer support contracts including software upgrades and loaner hardware. In other cases the software package is a download and support is through user groups. Available engineering resources within your facility may allow you to reduce the initial investment, but the TCO will probably be the same.