

Online and Offline Video Editing

Online Editing

Online editing is a post-production linear video editing process that is performed in the final stage of a video production. It occurs after offline editing. For the most part, online editing has been replaced by video editing software that operate on non-linear editing systems (N.L.E). High-end post-production companies still use the Offline-Online Editing workflow with N.L.Es.

The term online originated in the telecommunication industry, meaning "Under the direct control of another device" (automation). Online editors such as the Sony B.V.E-9000 edit control unit used the RS-422 remote control 9-Pin Protocol to allow the computer-interface of edit controllers to control video tape recorders (V.T.R) via a series of commands. The protocol supports a variety of devices including one-inch reel-to-reel type C videotape as well as videocassette recorders (VCR) to Fast-Forward, Rewind and Play and Record based on S.M.P.T.E time-code. The controllers have the ability to interface with professional audio equipment like audio mixers with console automation.

The video quality first introduced with Avid's Media Composer in 1989 was incapable of producing broadcast quality images due to computer processing limitations. The term 'Online' changed from its original meaning to where the pictures are re-assembled at full or 'online'++ resolution. An edit decision list (E.D.L) or equivalent is used to carry over the cuts and dissolves created during the offline edit. This conform is checked against a video copy of the offline edit to verify that the edits are correct and frame-accurate. This work-print (cutting copy in the UK) also provides a reference for any digital video effects that need to be added.

After conforming the project, the online editor will add visual effects, lower third titles, and apply color correction. This process is typically supervised by the client(s). The editor will also ensure that the program meets the technical delivery broadcast safe specs of the broadcaster, ensuring proper video levels, aspect ratio, and blanking width.

Sometimes the online editor will package the show, putting together each version. Each version may have different requirements for the formatting (i.e. closed blacks), bumper music, use of a commercial bumper, different closing credits, etc.

Projects may be re-captured at the lowest level of video compression possible - ideally with no compression at all.

Offline Editing

Offline editing is part of the post-production process of filmmaking and television production in which raw footage is copied and the copy only is then edited, thereby not affecting the camera original film stock or video tape. Once the project has been completely offline edited, the original media will be assembled in the online editing stage.

The term offline originated in the computing and telecommunications industries, meaning "not under the direct control of another device" (automation).

Modern offline video editing is conducted in a non-linear editing (NLE) suite. The digital revolution has made the offline editing workflow process immeasurably quicker, as practitioners moved from time-consuming (video tape to tape) linear video editing online editing suites, to computer hardware and video editing software such as Adobe Premiere, Final Cut Pro, Avid, Sony Vegas, Lightworks and VideoPad. Typically, all the original footage (often tens or hundreds of hours) is digitized into the suite at a low resolution. The editor and director are then free to work with all the options to create the final cut.

New technological developments

Three developments of the late sixties and early seventies revolutionized video editing, and made it possible for television to have its own version of the film workprint/conform process.

Time code

The first was the invention of time code. Whereas film negative had numbers printed optically along the side of the film, so that every frame could be identified exactly, video tape had no such system. Only video, audio, and a control pulse were recorded. Early attempts to rectify this were primitive to say the least. An announcer reciting the seconds was recorded onto an audio channel on the tape. Time code introduced frame precision, by recording a machine readable signal on an audio channel. A time code reader device translated this signal into hours, minutes, seconds and frames, originally displayed on a Nixie tube display, and later with LED readouts. This innovation made it possible for the editor to note the exact frames at which to make a cut, and thus be much more precise. He could create a paper edit by writing down the numbers of the first and last frames of each shot, and then arrange them in order on paper prior to the actual edit session with the expensive VTRs.

Cheaper video recorders

Although video technology had the potential to be cheaper since it doesn't have the costs of film stock and have to go through the development process respectively, the quality of early video recording technology in the 1950s and even into the mid 1960s was often far too low to be taken seriously against the aesthetical look, familiarity and relative ease of editing of 16mm and 35mm film stock – which many television cinematographers used well up until the late 1980s in documentaries, dramas etc. before video technology caught up to being 'acceptable' as television cameras and camcorders eventually displaced film stock for regular television use as they became lighter and more practical to take with them. Because early video cameras were so large and so expensive, it wasn't until 1984 with the JVC VHS-C camcorder that consumers had access to video tape technology.

Professionally, early video cameras were designated mostly for studio use, as up until the mid-1980s, when the camera unit and recorder unit merged as a camcorder (CAMera-reCORDER) as their bulky size made them far too big and bulky to be used outside against the smaller and more practical film camera.

The second development was cheaper video recorders. Though not suitable for broadcast use directly, these provided a way to make a copy of the master, with its time code visibly inserted into a small box or 'time code window' in the picture. This tape could then be played in an office or at home on a video recorder costing only as much as a used car. The editor would note down the numbers of the shots and decide the order. They might simply write them in a list, or they might dub from one of these small machines to another to create a rough cut edit, and note the necessary frame numbers by watching this tape.

Exact editing

Though both of these developments helped greatly, effectively creating the offline editing method, they didn't solve the problem of precisely controlling the video recorder for frame accurate editing. That required precise control of the tape transport mechanism, using a dedicated edit controller that could read the time code and perform an edit exactly on cue.

That innovation came about as a result of research conducted by CMX, a joint venture of the CBS and Memorex corporations. The intent was to create a much less haphazard method of editing video directly that had all of the creative control of traditional film editing. The result, the CMX 600, accomplished this goal with a two part process. Camera master tapes were dubbed as black and white analog video to very large computer memory discs. The editor could access any shot exactly, and quickly edit a precise black and white, low quality version of the program. More importantly, re-editing was trivial, as no cuts were actually performed. The shots were simply accessed and played in sequence from the disc in real time. The computer kept track of all the numbers in this offline stage of the process, and when the editor was satisfied, output them as an Edit decision list (EDL). This EDL was used in the final stage of the process, the online edit.

Although tape formats changed from open reels to videocassettes (VCR), and all the equipment rapidly became much cheaper, the basics of the process remained the same. An editor would offline on a less expensive, low quality format, before entering the online editing suite with an EDL and master source tapes, to finish the broadcast quality version of the television show. Even after the transition to digital the concept is the same, with low resolution proxy files streaming from central media storage during editing and the full quality video only getting brought up from deep storage once the clip is committed and rendered.