

Application Note



Simplifying single and multi-language subtitle and caption encoding to increase QC and reduce operational costs

Synopsis

This application note explores how to gain business and operational advantages when binding subtitle and caption content to video files in complex next-generation workflows encompassing multi-format, multi-language and multi-platform broadcast payout.

Introduction

The proliferation of video file formats, requirements for multi-language channels and the advent of multi-platform support are all adding enormous complexity to broadcast workflows.

As these workflows become cumbersome, operational costs are increasing, along with the risk of potential losses in Quality of Service (QoS). As broadcasters reach out to new geographies and face increasing legal mandates to provide access to hearing impaired viewers, an efficient, cost-effective solution for subtitling and captioning is ever more becoming a necessity.

To remain profitable and deliver multiple channels offering multi-language subtitles over a number of platforms, broadcasters need to find a way to keep the operational costs of these complex workflows as low as possible while retaining the high QoS their viewers expect.

Softel recent innovations in subtitle processing are providing broadcasters with a way to simplify complex subtitle workflows. This application note describes how these new subtitle processing innovations can be used to drive operational costs down while increasing quality control to deliver optimum QoS.

Challenge

- Simplify the payout of single and multi-language broadcast subtitles in complex, next-generation workflows to reduce operational costs and increase productivity while enhancing QoS through innovative, built-in automated quality control procedures.

Solution

- Early binding of subtitles and captions to video content using Softel's MultiText™-powered Swift™ vTX encoder, combined with Swift TX 'time of air' subtitle processors, to deliver an automated process that does not require supervision.

Benefits

- Improved QC for subtitle content
- Reduced operational costs
- Efficient 'video + subtitle' archiving
- Simplified infrastructure

Binding subtitle to content

The recent proliferation of platforms (including cable, IPTV, mobile, satellite, terrestrial, VOD, and the Web) has added enormous complexity to the playout environment. This has led to an adoption of file-based tapeless environments where facilities rely on Digital Asset Management Systems (DAMS) and media servers to manage and organize their assets and target platforms. In file-based workflows, a subtitle ingester can be used to enable the binding of subtitle and ancillary data as digital assets to content in various formats. This 'early' binding takes place ahead of airing, meaning playout is seamless to multiple platforms.

The binding process can take place at any of the following three time periods within the workflow:

- Early binding – The pre-prepared file is matched to the programming well ahead of transmission
- Late binding – Similar to early binding, but occurs near to air time and requires the availability of faster-than-real-time encoding techniques
- Live binding – For either truly live content or for pre-prepared content which only becomes available very close to airing, when the possibility of pre-preparing captions is not available

Next generation ancillary data workflow

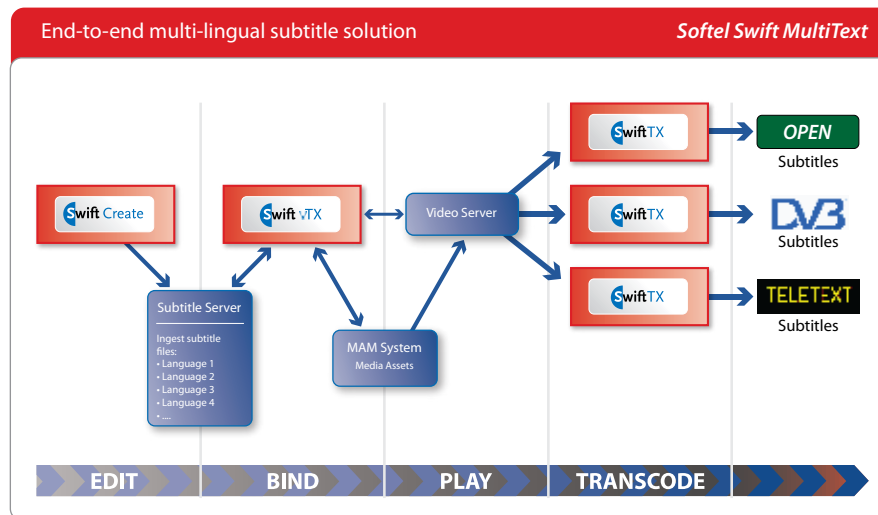


The advent of new video file formats for the exchange and storage of video content has created the possibility to bind subtitles to video content at an earlier point in broadcast operational workflows compared to traditional 'time of air' subtitle processing.

The benefits of early binding and automated transcoding

When the process of binding subtitles to video assets takes place at an early point in the workflow, it becomes much easier to design manual or automated QC processes in the knowledge that there is time to correct errors in advance of transmission. Early binding also makes it possible for broadcast-ready video files to be archived with single or multi-language subtitles attached to the file.

To maximize efficiency, transcoding to the desired subtitle format(s) needs to be a fully automated process that takes place downstream from binding. This allows the process to be unmanned, with no need for supervision, automation triggers, or timecode inputs, simplifying infrastructure requirements and saving operational costs. This is why Softel, an expert in subtitle processing, has enhanced its family of Swift end-to-end subtitling software with a solution that allows broadcasters to streamline the workflow tasks associated with ingesting subtitles, in single or multiple languages, from pre-prepared files, into broadcast-ready video assets.



The Softel solution

Softel has designed Swift vTX MultiText as a solution for binding multi-lingual subtitle streams, in a rich-text format, to programme video files in such a way that the streams may be transcoded from an SDI video signal, at the time of video file transmission, into common transmission formats such as DVB bitmap and Open (burnt-in).

MultiText is a codec designed by Softel to encode multiple language subtitles into a selection of broadcast-ready video file and video server formats - one video frame at a time and in a compressed space-efficient format.

The MultiText codec is also used to decode these multi-language subtitle streams from the MultiText-encoded SD or HD SDI video streams played by a broadcaster's video server platform.

Encoding content to the programme video

For each language stream, every subtitle 'go' and 'clear' is encoded, with associated metadata, into the appropriate video frame of the original programme video file.

The precise MultiText storage location within the original video file will vary depending on the video format. Swift vTX has to use space allocated for VBI or VANC content to ensure that the MultiText content appears in the SDI signal when the video asset is played. In the case of MXF files, for example, MultiText is encoded as Teletext data and stored in the MXF SMPTE 436M track.

MultiText rich text storage format

When MultiText subtitle streams are encoded from Softel generated industry standard XIF format subtitle files, the positional and display metadata for each subtitle row in the subtitle file is encoded along with the subtitle text (which is encoded as Unicode format text). This process allows a downstream Swift TX Open or DVB processor to render each subtitle as the original subtitle the author intended.

On other occasions, such as when third-party files are imported, the MultiText streams may be less 'rich' but are still available.

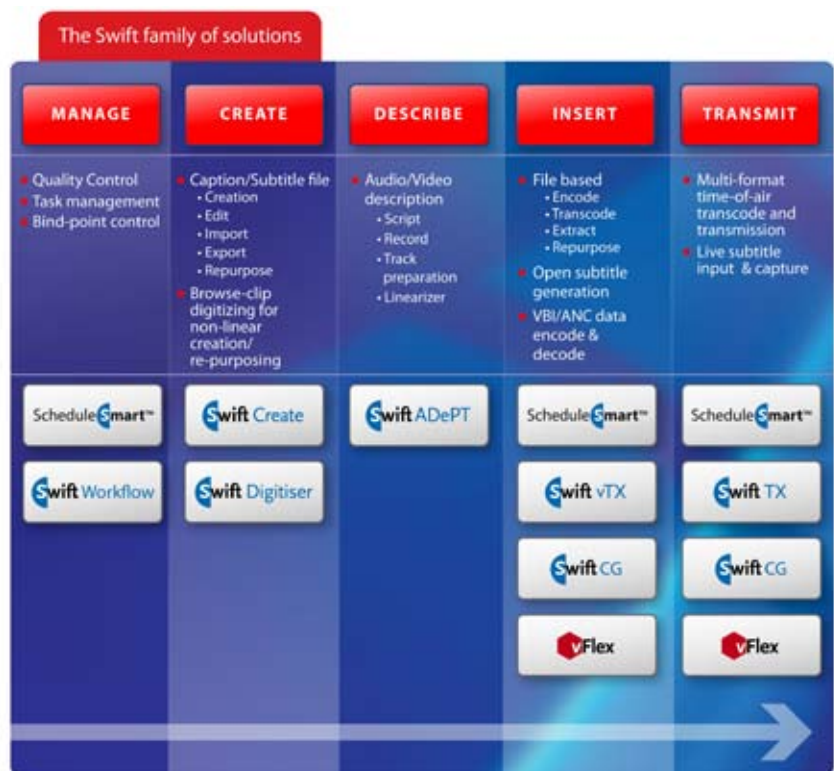
Overall, MultiText greatly simplifies the playout of complex multi-language broadcast subtitles, reducing operational costs and increasing productivity while enhancing quality through built-in automated quality control procedures.

Softel Swift end-to-end subtitle solutions

Swift Create – Subtitle content creation and re-purposing

Softel's **Swift Create** subtitle workstation is the most deployed system worldwide, with thousands of workstations in the field. It is used to create and re-purpose timecoded subtitle files, and to check and QC subtitle content.

Subtitle files created in **Swift Create** contain rich text subtitle metadata such as display font, size, shadowing, boxing and other style information. This metadata 'sticks' to the raw subtitle text and timecode content as it passes through this end-to-end subtitle ingest and broadcast system.



Swift vTX – MultiText-powered encoding of subtitles to video assets

Swift vTX is a powerful software subtitle processor designed to import subtitle files in all common file formats, and to encode the subtitle content into video file assets in any closed or open subtitle standard.

Enhancing **Swift vTX** with the Softel MultiText codec enables the full rich text encoding of multiple language subtitle content into the VBI / VANC space of SD and HD video and server files. **Swift vTX** supports MXF as well as all common video and video server file formats.

Swift vTX subtitle ingest tasks may be triggered automatically when subtitle files appear in a drop folder, or tasks may be added to the **Swift vTX** work queue from third-party DAMS systems using the **Swift vTX** API.

Swift QC

Post ingest, operators need to QC the ingested subtitle content. Softel provide a range of automated and manual subtitle quality control utilities which can be tailored to specific needs.

Swift TX – MultiText-powered subtitle transcoding at time of air

As it is not possible, or desirable, to store either DVB digital subtitle streams or Open (burnt-in) subtitles in the ingested video file assets, it is necessary to transcode the single or multi-language subtitle streams into the final transmission format at time of air.

Softel's **Swift TX** subtitle processor, combined with the MultiText codec, receives the real time SDI video signal from the playout system, and decodes the MultiText subtitle payload from the signal. Some or all of the language streams may be dynamically transcoded into DVB bitmap subtitle transport streams, or a single language stream may be keyed over video as Open subtitles. The subtitle 'style' metadata originally generated by **Swift Create**, and encoded by **Swift vTX**, is also decoded and used by **Swift TX** to ensure that the on-screen appearance of the subtitles is as originally created.

