

# APPLICATION NOTE

## Softel Swift™ vTX & Grass Valley K2 Summit/Solo

Supporting Subtitling and Closed-captioning in  
File-based Workflows

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September 2011



The proliferation of media formats is a continuing theme in the broadcast industry. Broadcasters need solutions that offer flexibility and simplify integration into their ever more complex workflows.

When it comes to inserting subtitles and closed captions, the ideal solution should efficiently allow subtitle data to be authored once and be available, with minimum human interaction, for inclusion within all current and potential output formats.

This application note outlines how Grass Valley K2 storage and playout technology can be combined with Softel subtitling and closed-captioning software products to simplify complex workflows.

**Note:** In this Application Note, the term “subtitles” means both closed captions and subtitles.

# Introduction

The K2 Summit™ and K2 Solo™ family of media servers from Grass Valley™ provides a high-performance, reliable platform for file-based video playout. They can help dramatically increase productivity and reduce costs in a variety of ways, including repurposing content for multiple mediums.

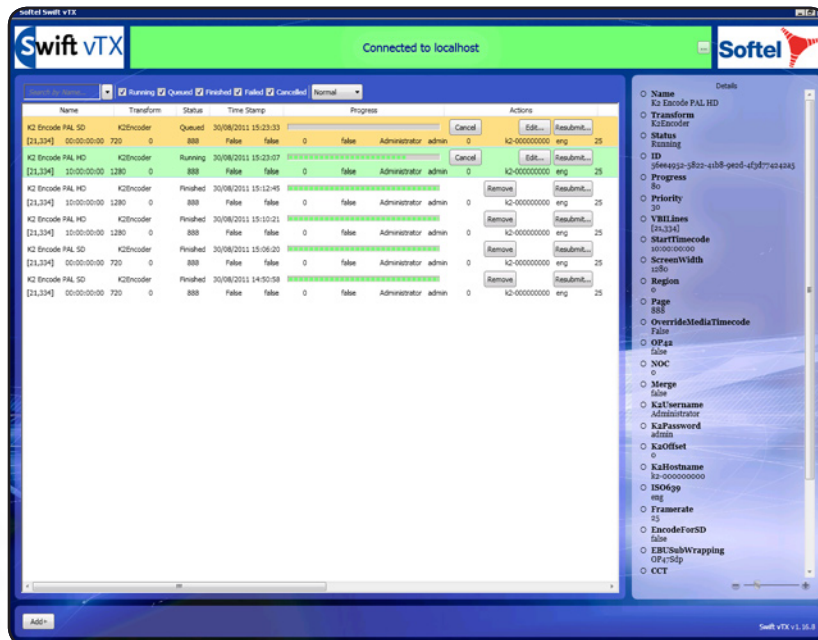
A challenge faced by broadcasters and content providers in reusing or repurposing content is the ability to easily edit assets, without having to re-author the associated subtitles.

Softel's range of software products enables users to extract, edit, and encode subtitles with minimal effort. Integrating Softel's Swift subtitling software with the Grass Valley K2 platform creates a powerful, efficient tool to manage subtitles in complex workflows. Softel's range of subtitle software products supports all global subtitling formats including teletext, closed caption, HD, SD, DVB, 3D, and web-specific formats.

# Subtitle Insertion and Extraction

Softel Swift vTX integrates with the Grass Valley K2 Summit/Solo to deliver seamless insertion and extraction of subtitles.

Swift vTX can be controlled either manually or automatically. The screen shot below shows the vTX manual operation user interface.



Swift vTX manages tasks using an input job queue. Insertion or extraction tasks can be triggered using watch folders or integrated more closely with workflow systems using the API/SDK. Tasks can also be triggered directly from the Softel subtitle workstation – Swift Create.

# Handling Content Edits

When repurposing existing content, typically subtitles will have previously been created and encoded into the video. However, there may be a need to either edit the content, for example to allow a two hour film to fit into a shorter time slot, or to censor unsuitable content.

## The problem:

Most video editors used by broadcasters and post production facilities will delete the subtitles during the editing process. Video editing using NLEs can create invalid subtitle data within the video assets. Normal NLE processing such as color correction and the creation of transitions, or scene editing, can result in on-air subtitle errors. Such errors include subtitles which remain after a video event has stopped, missing subtitles, and downstream subtitle compliance alarms.

## The solution:

Prior to editing, Softtel's Swift vTX extracts the subtitles from the assets on the K2 Summit/Solo server and saves them to a file, which can then be edited as appropriate using Swift Create, Softtel's subtitle creation and repurposing software. Once the video and subtitle edits match, Swift vTX is used to re-encode the edited subtitles into the edited media asset.

Softtel's subtitle workstation, Swift Create, allows caption files to be corrected for content editing; it will open the subtitle file and provide a rich environment to edit the subtitles. Swift Create offers a wide range of functions to make creating or editing subtitles as easy and efficient as possible, including features to quickly reformat subtitles or change in and out times. There are also many preference settings in Swift Create that tailor system operation to your workflow and handle control measures such as reading speed, synchronization with shot changes, and spell check. During the editing process, users may review subtitles at any stage, via a browse-quality clip with subtitles displayed over the video. In addition to video content editing, it is also common for audio content to be changed. This can be due to profanity, for example, and Swift Create and Swift vTX can be used to adjust the subtitles to match.

After the required edits have been made to the video and subtitles, the subtitle data can be re-encoded by Swift vTX to the edited video asset.

## Extracting subtitles with Swift vTX, editing, and reinserting

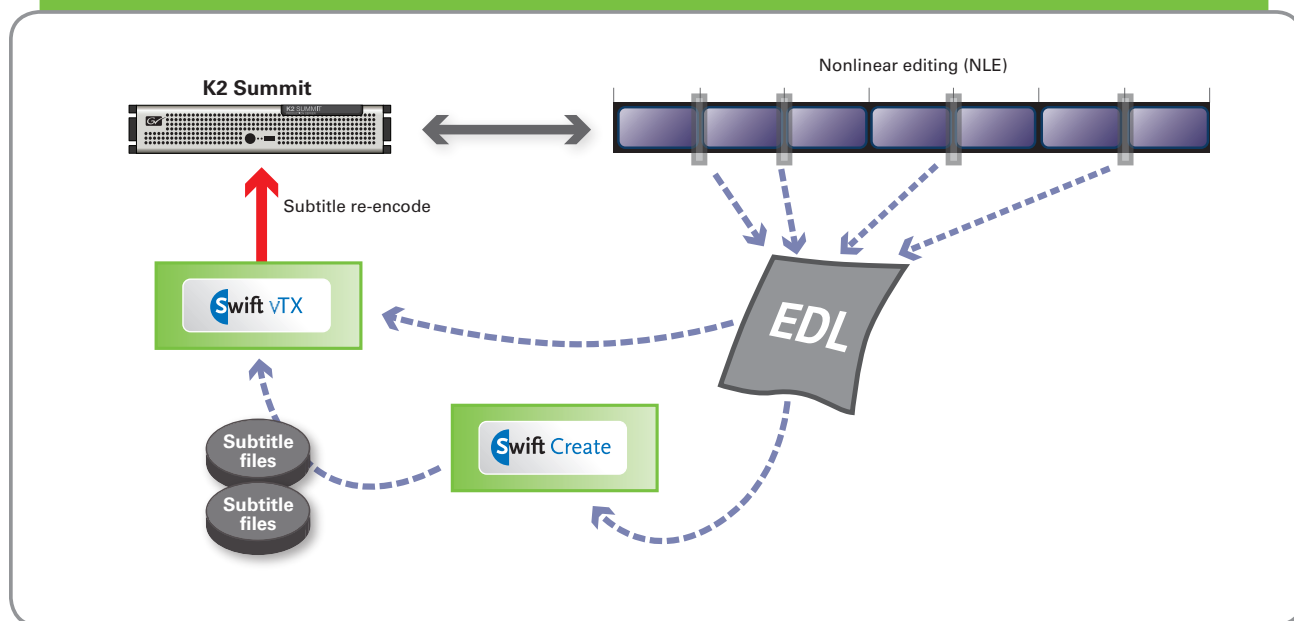


Figure 1 – Edited subtitles from Swift Create are re-encoded into the video asset by Swift vTX.

## Multi-language Support

Various transmission formats support the embedding of multiple subtitle languages. Swift vTX has the ability to encode them in a single processing job. Swift vTX can also add or remove individual subtitle languages.

## MultiText Support

In addition to the omission (transmission) formats described above, Swift vTX can also support insertion of other forms of subtitle data such as MultiText™.

MultiText is an encapsulation format for subtitle data. Using MultiText with Swift vTX allows a wide variety of subtitle data to be embedded into a single media asset. This format of the ancillary data space has been designed so that it is compatible with broadcast equipment.

A broadcaster may wish to transmit channel X to multiple homes across Europe, using a single satellite link to multiple smaller distribution points. At each distribution point, a MultiText decoder converts the stream into a number of localized formats, including the proper subtitle language and format combinations (such as open subtitles and DVB bitmap subtitles).

When MultiText subtitle streams are encoded from 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 processor to render each subtitle as the author intended.

To ensure automated or manual quality control processes have been efficiently and reliably carried out, MultiText can perform early binding of multilingual subtitles to video assets, well in advance of transmission.

Using Swift vTX with MultiText greatly simplifies the playout of complex multi-language broadcast subtitles and reduces operational costs. Quality and productivity are improved through built-in automated quality control procedures.

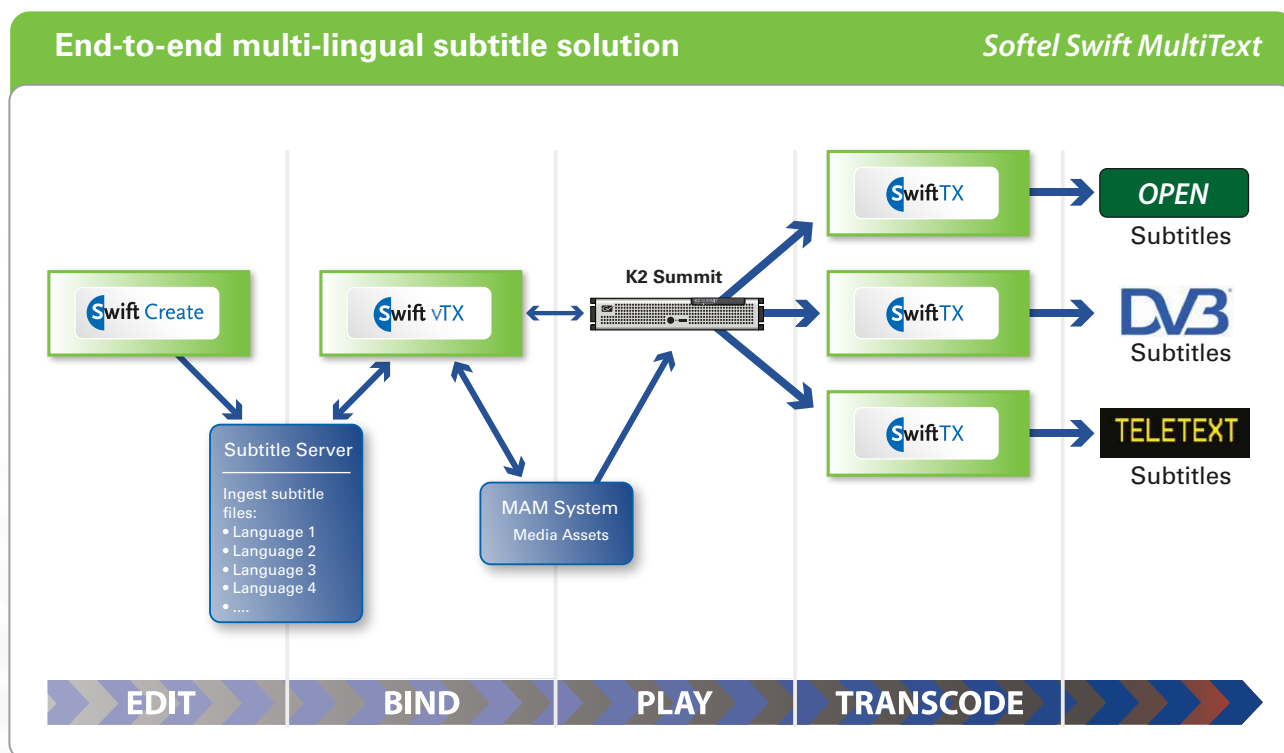


Figure 2 – Use MultiText to play out multiple languages of subtitles in a variety of formats from a single media asset.

# Broadcast and Subtitle File Formats

The Softel Swift family of subtitling products supports the widest range of global subtitle formats. This enables the repurposing of content regardless of file format. It allows effortless switch between SD and HD formats to facilitate multiplatform and worldwide distribution.

In most cases the storage format will be dictated, so there is no need to store subtitles in multiple formats. Softel's Swift TX can transcode subtitles to other formats on-the-fly at time-of-air under the control of a workflow or video transcode system.

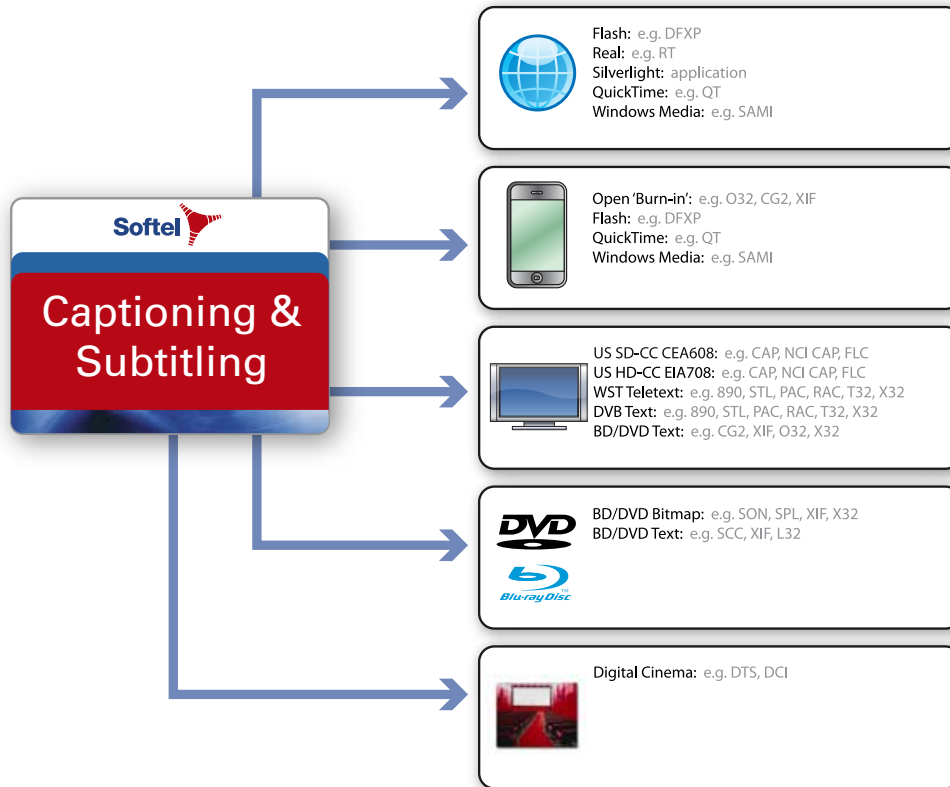


Figure 3 – The range of closed caption and subtitle formats used in various presentation technologies supported by Softel products.

# Frequently Asked Questions

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## How does Swift vTX handle open and closed subtitle formats?

Open subtitles are keyed over the video for all viewers to see, whereas closed subtitles are transmitted alongside the video so the viewer chooses to display them. Swift vTX can process both open or closed subtitles on K2 video files.

## Which are the most often deployed closed subtitle formats?

There is no fixed rule, but in general terms, closed captions are used in the Americas, teletext or DVB subtitles in Europe, and DVB subtitles are most commonly used in Asia and the Middle East.

## Can DVB subtitles be encoded onto K2 video files?

DVB subtitles are transmitted in compressed transport stream format which cannot directly be encoded into K2 video files, so Swift vTX encodes DVB-ready subtitles in MultiText format, which can then be transcoded into DVB streams downstream in the video transmission path, at the point where the video is MPEG encoded for over-the-air distribution.

## How does Swift vTX handle multiple language subtitle streams?

All the common closed subtitle formats support the carriage of multiple subtitle language streams and Swift vTX is designed to process each subtitle language stream to video frame accuracy within the K2 video file.

## How can subtitle re-purposing be streamlined after editing?

Increasingly, Softel is able to offer automated re-purposing of subtitle content where, for example, timecode offsets are applied or where the video frames have been cut for censoring, profanity, or duration.

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