



**HIGH QUALITY SUBTITLING – FROM IMAGE TO TEXT**

**TWO ROWS OF TEXT. HOW HARD CAN IT BE?**

**HERE IS THE PROBLEM – AND THE SOLUTION.**

# HIGH QUALITY SUBTITLING – FROM IMAGE TO TEXT

## WHY SUBTITLE?

There are two main reasons for subtitling TV:

1. Translation – when video/audio are in one language and the subtitles in another. This is a very common requirement in Europe, Latin America, Middle East and Asia
2. Assistance for hard of hearing viewers – when video/audio and subtitles are in the same language, usually accompanied by additional information for the viewer such as “thunder outside”

As more and more viewers now watch their TV online, streamed over IP networks, these requirements haven't changed. However, the complexities of delivering high quality subtitles to multiple device types and screen sizes have.



## SUBTITLING TWO ROWS OF TEXT – HOW HARD CAN IT BE?

There are several factors that make this problem harder than it might seem at first:

- ✓ Several alternative subtitling standards have been adopted by the industry
- ✓ Content is often delivered to online TV services with the subtitling already set as images, or bitmaps, because this is a good way to deliver content to a conventional set-top-box
- ✓ IP streaming formats generally don't support bitmap-based subtitles. HLS and Smooth streaming formats don't support it at all and even though DASH has some support for bitmap subtitles, it doesn't behave well with a variety of aspect ratios
- ✓ Most solutions to these problems are proprietary and require the operator to dictate which client is used to view the show, which is not practical
- ✓ Asian and other more complex scripts are not supported by many solutions

## EDGEWARE'S SUBTITLING SOLUTION FOR OTT DELIVERY

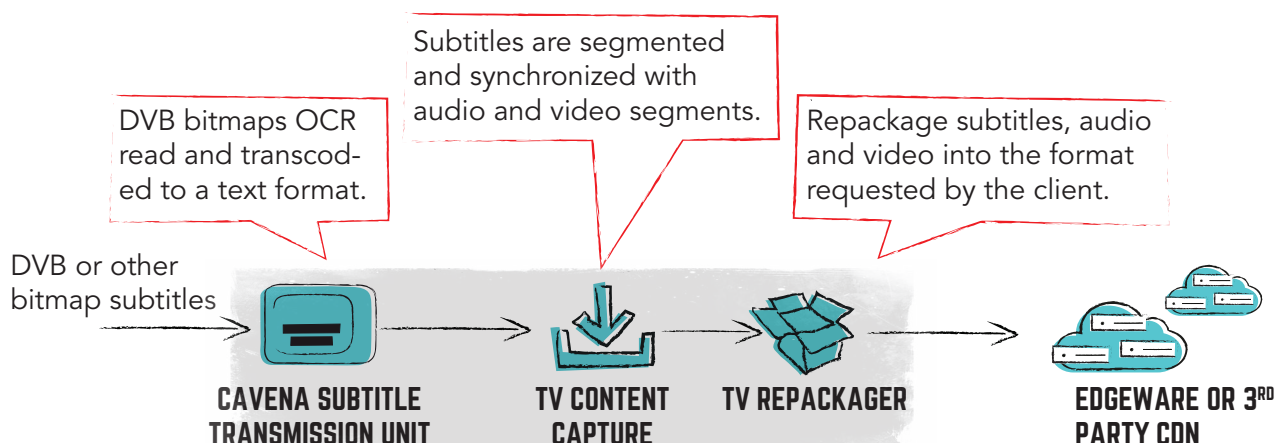
Edgware's solves these challenges with the Cavena Subtitling portfolio, now part of Edgware. The subtitling portfolio, coupled with Edgware's TV Content Capture and TV Repackager products, is ideally suited to deliver high quality subtitles across any screen format, to any client and in any character set.

The Cavena Subtitling technology uses Optical Character Recognition (OCR) to convert subtitles from bitmap to an EBU teletext format. Edgware's TV Content Capture, which can use Cavena's unique P31 propriety format, takes in the EBU teletext, segments it together with the audio and video streams and synchronizes them altogether. The streams — audio, video and subtitles — are then repackaged on-the-fly by the TV Repackager, into the format required by the client, whether that is HLS, Smooth or DASH, for example. Cavena P31 subtitles are Unicode based, and provide better attribute support and timing for improved readability.

The system can also transcode subtitle formats – with one subtitle format in, which is then transcoded within milliseconds, and another format sent out.



Illustration below shows the Edgeware subtitling solution for OTT delivery.



## THE FOUR MAIN TECHNOLOGIES TO BRING SUBTITLES TO THE TV:

1. Burned in – or ‘in vision’ – open subtitles. Using a graphics inserter, subtitles are inserted into the picture. Subtitles are always visible, with no option to turn them off. Each version needs to be distributed by the CDN as a separate piece of content.
2. EBU teletext. Subtitle data is distributed as part of the TV signal, stored as ancillary data, (VBI for SD and VANC for HD). Subtitles can be turned on or off by the viewer. This method is usually used to assist hard of hearing viewers. It is also a good way to transfer subtitle data between different broadcast operators, as part of the uncompressed SDI signal. Note: this method cannot handle Asian scripts.
3. CEA 608/708. Similar approach to EBU teletext used in the US and parts of Latin America. The end viewer has a choice to turn subtitles on or off. The subtitle data is transmitted on VBI line 21 and sometimes simply referred to as “Line 21”. As with EBU teletext the rendering is an old standard and the “look and feel” of subtitles is not ideal. This US standard is also sometimes referred to as Closed Captions, CC, however closed captions actually just means there is a choice of subtitles on or off. Lacks support for non-Latin characters.
4. DVB. Normally means DVB bitmap subtitling, where pictures of the subtitles are generated at the broadcast centre and multiplexed into the transport stream, to be distributed to the end viewer. This supports any character set, and many subtitle tracks, so the end viewer can select what subtitle language to display.

**Note:** EBU teletext and CEA 608/708 are part of the uncompressed SDI signal. EBU teletext can be wrapped in DVB using the DVB teletext specification. 608 can be wrapped into ATSC using the 708 specification.

## UNIQUE BENEFITS OF THE EDGEWARE SUBTITLING SOLUTION

The Edgeware subtitling solution produces high quality, natural looking subtitles for any streaming platform. Benefits include:

- ✓ Automated conversion of bitmap to text-based subtitles using OCR
- ✓ High quality rendering of subtitles
- ✓ Correct adaptation to any screen format
- ✓ Support for standard client protocols, including those used by Apple, Google and Microsoft
- ✓ Support for any language, including Asian character sets
- ✓ Low delays with near real-time performance
- ✓ Scales to hundreds of channels, with as many as 30 simultaneous channels being subtitled by a single server
- ✓ Support for the Cavena subtitling format P31 in Edgeware's origin products TV Content Capture and TV Repackager assuring glitch-free OTT TV with high quality subtitling

### CASE STUDY 1

A telecoms operator in LATAM delivers online TV to its subscribers. It uses Cavena's OCR technology to read incoming DVB bitmaps and send them onto the Edgeware TV Content Capture, as Unicode, EBU teletext and Cavena P31. Because Edgeware receives subtitles with tightly controlled timestamping, it only introduces a minimal delay. The solution subtitles 30 channels per server.

### CASE STUDY 2

A large broadcaster in Asia uses the Cavena/Edgeware solution to offer Chinese character subtitles to its online viewers, using DVB teletext and Cavena P31 format subtitles. Alongside its live HD channels and catch-up library, it also provides 4k content.



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Let's make TV amazing again.

**edgeware**