

**SET eXPerience 2021**

**Response to TV 3.0 project  
CfP Phase-1 and 2  
Captions**

**DiBEG/Japan**

# Proposal on Captions by DiBEG

## 1. General Description

We, DiBEG, or Digital Broadcasting Experts Group, of Japan, proposed Ph-1 and Ph-2 of Captions in response to the TV 3.0 CfP (Call for Proposal) issued by the SBTVD Forum. We describe the outline of our technical proposal of Ph-1 and Ph-2 for the captions.

## 2. Outline of Captions

Our proposed Captions have already been started in the 4K and 8K services via satellite broadcasting in Japan. These Captions scheme is called “ARIB-TTML”.

We are offering the specifications of this TTML in our proposal. This document describes the outline of ARIB-TTML features.

# Ph-1 Proposal on Captions

We submitted the statement based on the CfP requirements. The following is othe utline of the statement for Captions.

## CC1.1: Video/caption sync

Our proposed ARIB-TTML complies with frame-accurate.

## CC2.1: Support complete character set for closed caption in Brazil

Our proposed ARIB-TTML supports the whole character set.

## CC2.2: Support other languages character set

Our proposed ARIB-TTML supports other languages.

## CC3.1: Live closed captioning

Our proposed ARIB-TTML handles live captioning.

## CC3.2: Offline closed-captioning

Our proposed ARIB-TTML can handle offline captioning of the pre-recorded materials.

# Ph-1 Proposal on Captions

The following is the outline of the statement for Captions.

## **CC4.1: Control text horizontal and vertical position**

Our proposed ARIB-TTML complies with these positions.

## **CC4.2: Control text horizontal and vertical alignment**

Our proposed ARIB-TTML supports these alignment.

## **CC4.3: Select text font**

Our proposed ARIB-TTML supports the selection of text font.

## **CC4.4: Control text size**

Our proposed ARIB-TTML can control text size.

## **CC4.5: Select font style (normal, bold, italic and underline)**

Our proposed ARIB-TTML supports the selection of font style.

# Ph-1 Proposal on Captions

The following is the outline of the statement for Captions.

## **CC4.6: Select text color**

Our proposed ARIB-TTML enables the selection of text color.

## **CC4.7: Select background-color**

Our proposed ARIB-TTML enables the selection of background-color.

## **CC5.1: Support images to enable displaying non-textual information**

Our proposed ARIB-TTML supports these images.

## **CC6.1: Enable sending sign language gloss as a separate caption stream**

Our proposed ARIB-TTML requires to improve for sign language gloss as a separate caption stream.

## **CC7.1: Emergency information media format**

Our proposed ARIB-TTML supports emergency information.

# Ph-1 Proposal on Captions

The following is the outline of the statement for Captions.

## **CC8.1: Interoperability with different distribution platforms**

Our proposed ARIB-TTML can deliver captions over any file transport, and thus it can be applied to various broadcasting systems with signaling capability. And ARIB-TTML-based closed caption is a proven technique for broadband streaming with the reference MPEG-DASH player software for Hybridcast.

## **CC8.2: Convertibility between new caption format and format specification**

Our proposed ARIB-TTML is a generic closed caption format, thus it is convertible to other formats in general. There is a format converter from ARIB STD-B24 Caption to ARIB-TTML.

# Ph-2 Proposal on Captions

## 1. Specifications of the technical proposal

DiBEG submitted the Document of ARIB STD-B62 Version 2.2-E1 (English Translation).

## 2. Comments on the technical proposal

ARIB-TTML in Japan has already been in the actual operation phase for 4K/8K satellite broadcasting; and the independent equipment that existed in the development phase is no longer available.

For the same reason, this response does not include the Files requested by the Section 4.6.

ARIB STD-B62, a standard document used for 4K/8K satellite broadcasting, is attached to this response. ARIB-TTML enables flexible and rich presentation, and can be handled by HTML5 apps. Also, it can be used in both broadcast and streaming.

# Features of ARIB-TTML Captions

## Accessibility in ARIB UHDTV

### (1) Audio Description

- Additional audio stream(s) for both broadcast and streaming
- User selectable by remote
- Manipulation by application coding for streaming

### (2) Closed caption

- ARIB-TTML for both broadcast and streaming

### (3) Additional video

- Handled by application coding (Hybridcast)



# Features of ARIB-TTML Captions

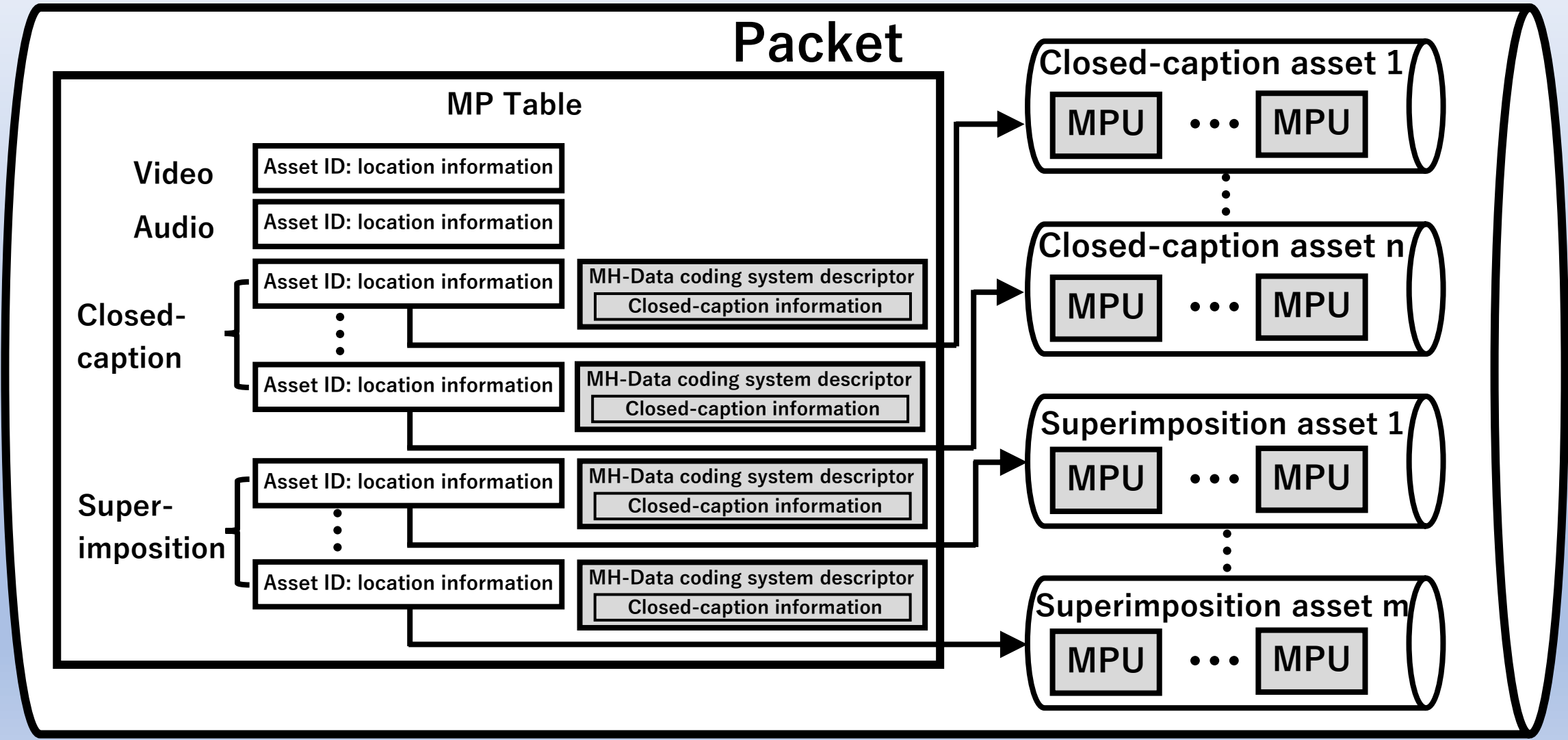
- (1) Developed for UHDTV**
  - Applicable to HDTV or higher resolution
- (2) Concentrates to text captions and super-imposed text**
  - Additional A/V presentations for accessibility are handled by application coding.
  - However, capable for still pictures, animation and simple sound (chime)
- (3) Based on W3C TTML1 (Second Edition)**
- (4) Extension of SMPTE-TT**
  - Based on requirements from Japanese broadcasters
- (5) Modeless**
  - Graphics and Text can be integrated at all time.
  - Significant difference from SMPTE-TT/EBU-TT-D/IMSC 1.x

# Features of ARIB-TTML Captions

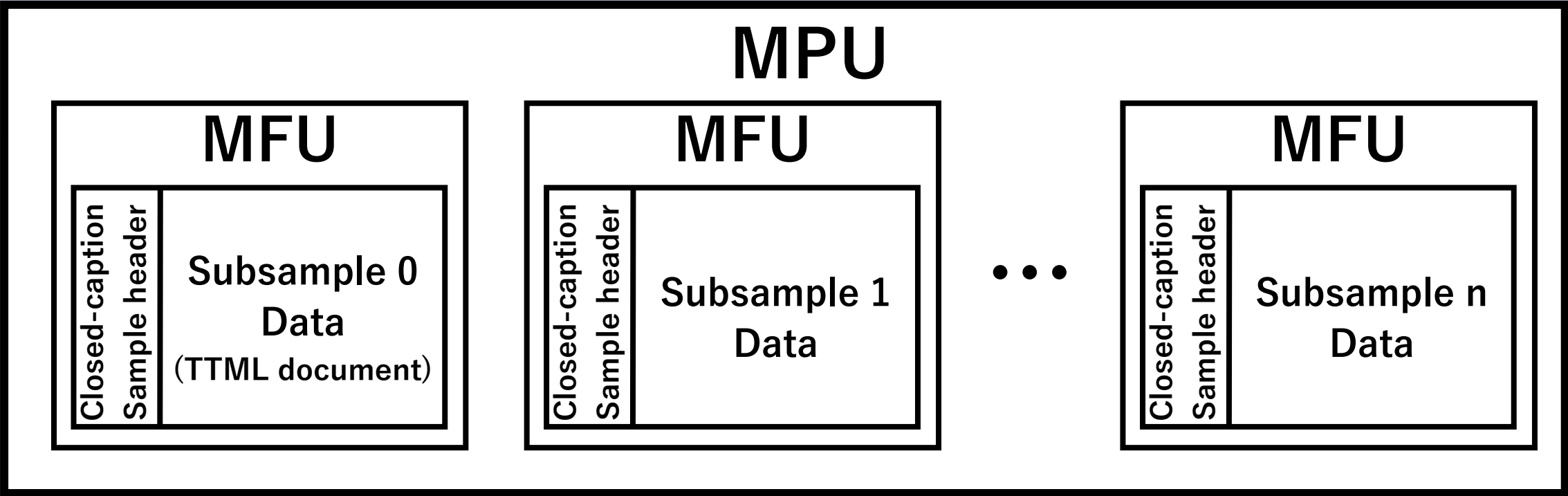
## Enhancements in ARIB-TTML

- (1) Animation
  - Sequence of pictures can be defined
- (2) Supposed to use vector fonts
  - Including “ Gaiji ”
- (3) Dynamic font download
  - SVG and WOFF fonts can be downloaded within ARIB-TTML
- (4) Short sound support
  - Such as chime
- (5) Rich presentation
  - Such as border, marquee
- (6) Ruby support

# Broadcast delivery in ARIB STD-B62 (1)



# Broadcast delivery in ARIB STD-B62 (2)



# Broadcast delivery in ARIB STD-B62 (3)

**Subsample 0**  
(ARIB-TTML document)

```
<tt>  
<body>  
  <div> ..... </div>  
</body>  
</tt>
```

**Subsample 1**  
(Picture data 1)

Picture data referred by a ARIB-TTML document

**Subsample 2**  
(Picture data 2)

Picture data referred by a ARIB-TTML document

**Subsample 3**  
(Font data)

Font data referred by a ARIB-TTML document

# MPEG-DASH delivery

**Can also be handled in MPEG-DASH**

- (1) HTML5 app. requires an MSE-based DASH player.**
- (2) In MPD file acquired by the player, a reference to ARIB-TTML can be included.**
- (3) The DASH player, dashNX, can handle it with additional JavaScript**

# Broadcast delivery example



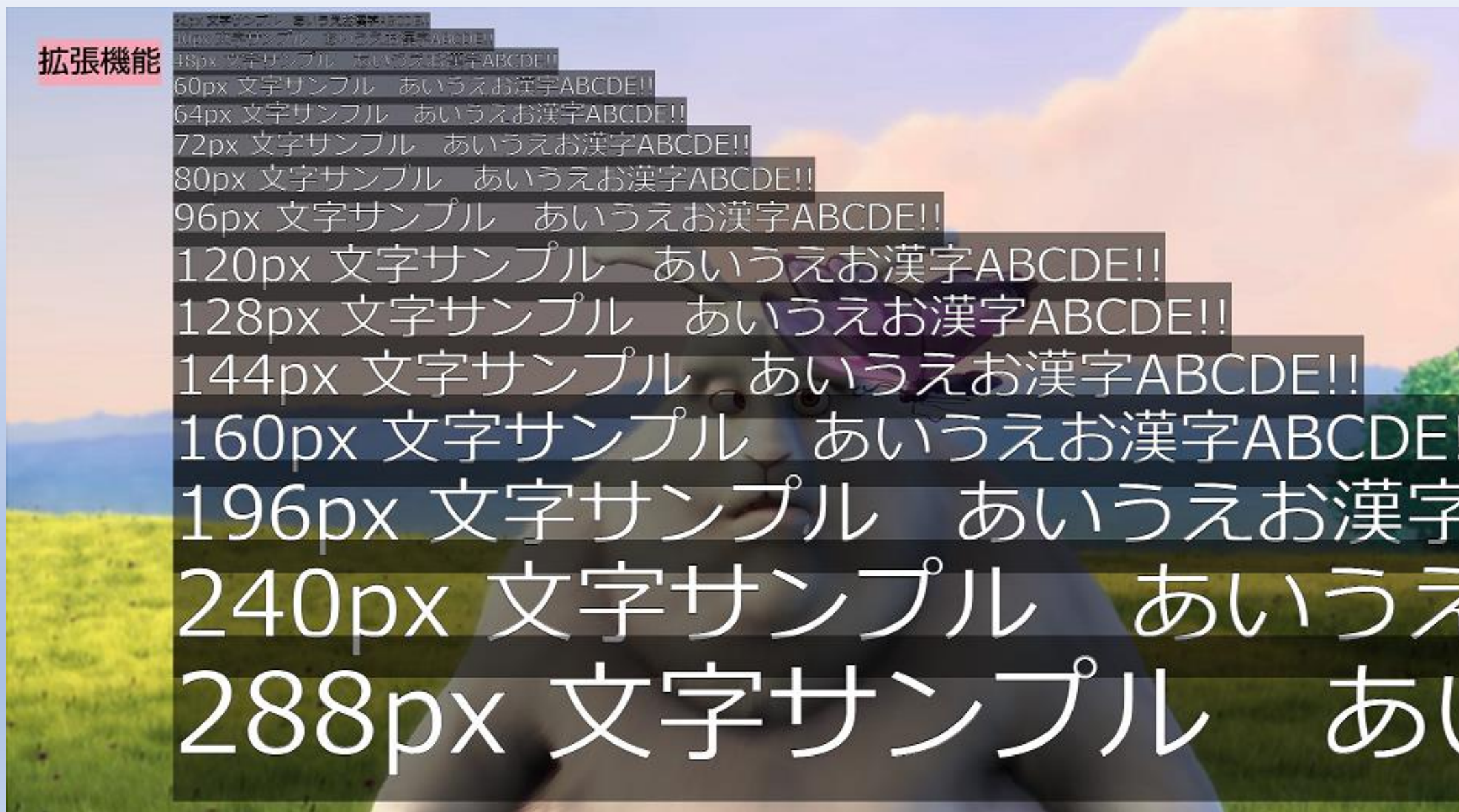
ヒラマサは 夏 対馬海流に乗って➡

# “Ruby” example

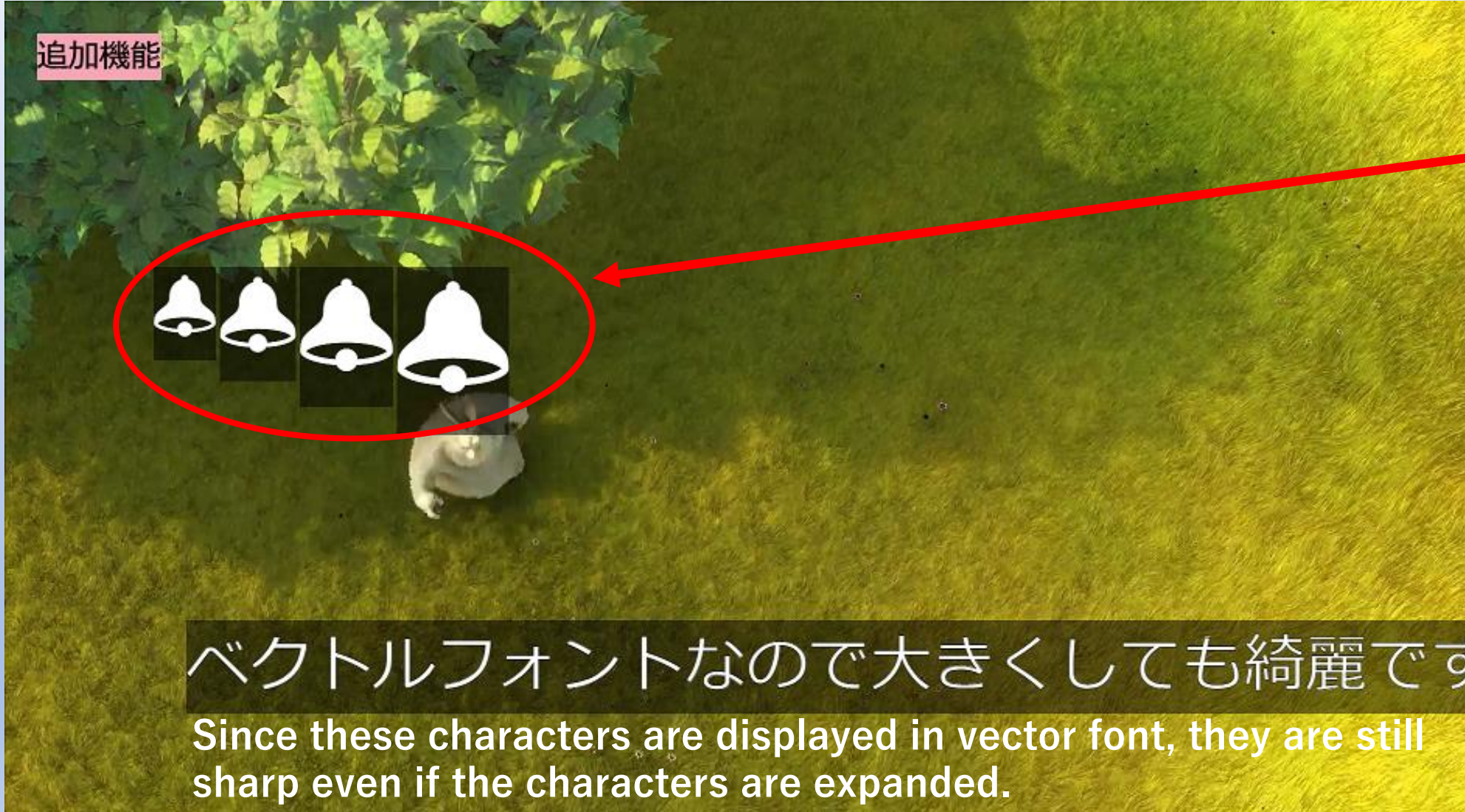




# Vector font example



# Dynamic font download example



# ARIB-TTML summary

- (1) “Text concentrated” caption and super-impose system**
- (2) Flexible and rich presentation**
  - Modeless**
  - Dynamic font download**
  - Animation**
  - SVG and WOFF support**
  - Various attribution**
  - Vector font**
  - Short sound**
- (3) Can also be handled by HTML5 apps.**
- (4) Can be used in both broadcast and streaming**

# Muito obrigado!

**ARIB / DiBEG extend technical cooperation to Brazil  
adopting Next Generation Broadcasting Standard!**

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