

New TV experiences on multi-platform

ITU Workshop “The Future of TV for the Americas”

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NHK (Japan Broadcasting Corporation)



8K/4K Satellite Broadcasting launches

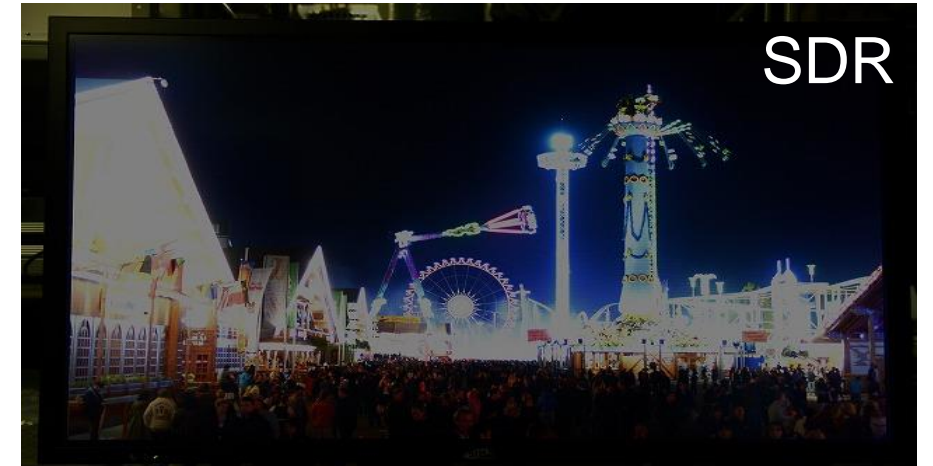
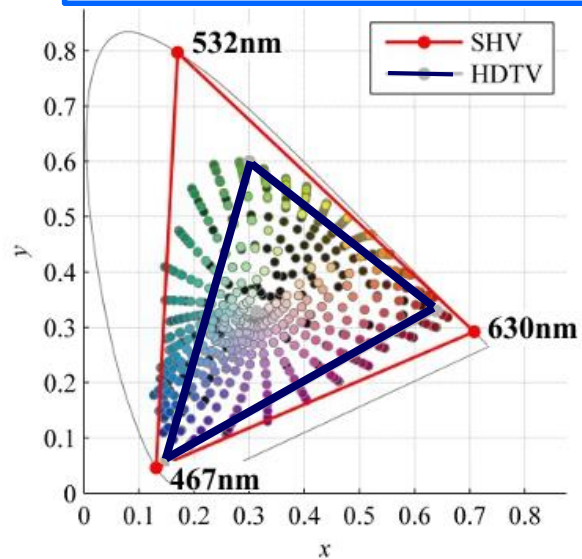
- 8K/4K UHD TV satellite broadcasting starts on 1st December, 2018 in Japan



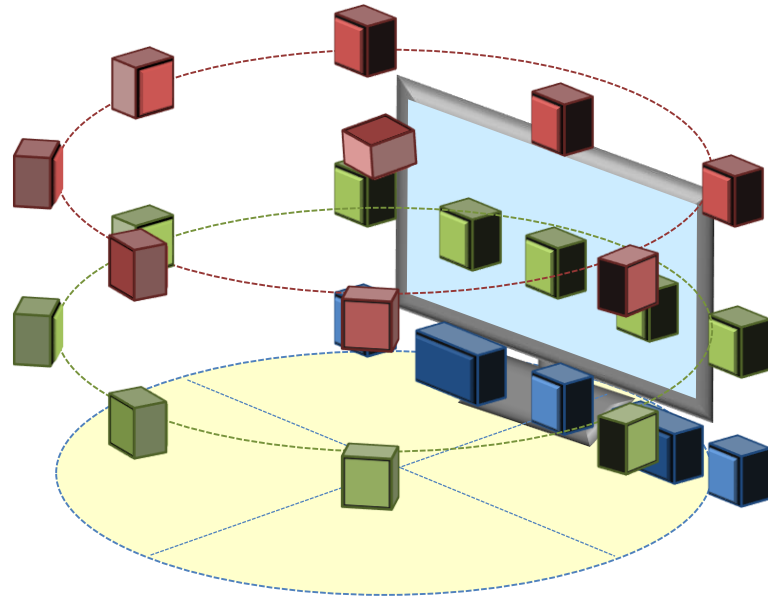
UHDTV Video

	Specification
Aspect Ratio	16:9
Resolution	8K : 7680 × 4320 4K : 3840 × 2160
Frame Rate	60Hz

Wide color spaces



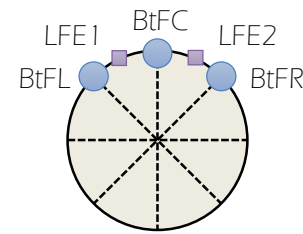
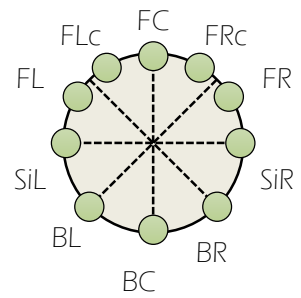
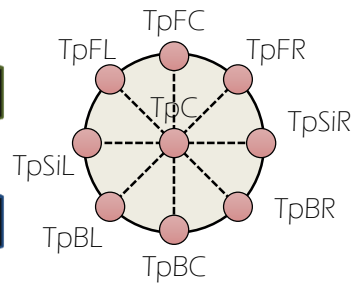
22.2 Surround Multi Channel Sound



Top layer
9 channels

Middle layer
10 channels

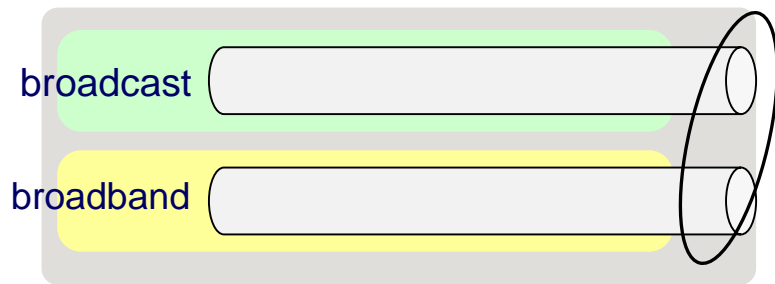
Bottom layer
3 channels
+ 2 LFE



Audio Mode 8K/4K UHD TV satellite broadcasting
Stereo / 5.1 / 5.1+2, 22.2

Multimedia Broadcasting Service

- Flexible delivery through broadcasting and broadband networks
- Closed captions and superimposes
 - Show more closed captions at one time on the screen
 - Rendering Closed captions in different forms by an application



Closed caption with word balloons

Selection from multiple languages

Use Case of Multimedia Broadcasting Service

The interface features several key components:

- Top Left:** "The Latest" news section with a red header.
- Top Center:** Main video player showing a golfer on a green with a "16 Par 4 382y for Birdie" overlay.
- Top Right:** "Closed Captioning" panel with text: "Among the players already finished, Morita's +2 is the lowest score." and "Mik Sakai's long birdie p...".
- Bottom Left:** "Favorite Players" section listing B.M. Lee, R. Morita, and M. Hirose with their scores and hole-in-one status.
- Bottom Center-Left:** "Japan Women's Open Golf Championship 2R" leaderboard table.
- Bottom Center-Right:** "LIVE: B.M. Lee CAM" showing a wide-angle view of a golf course with a large crowd.
- Bottom Right:** "Current Locations" map of a golf course with numbered holes and player icons.
- Right Side:** "Chat" panel with messages: "I want Miko to win..." and "I gonna watch play...".

Broadcasting program

Data Information

Information related to program (Such as SNS)

Live Streaming

Secondary Screen

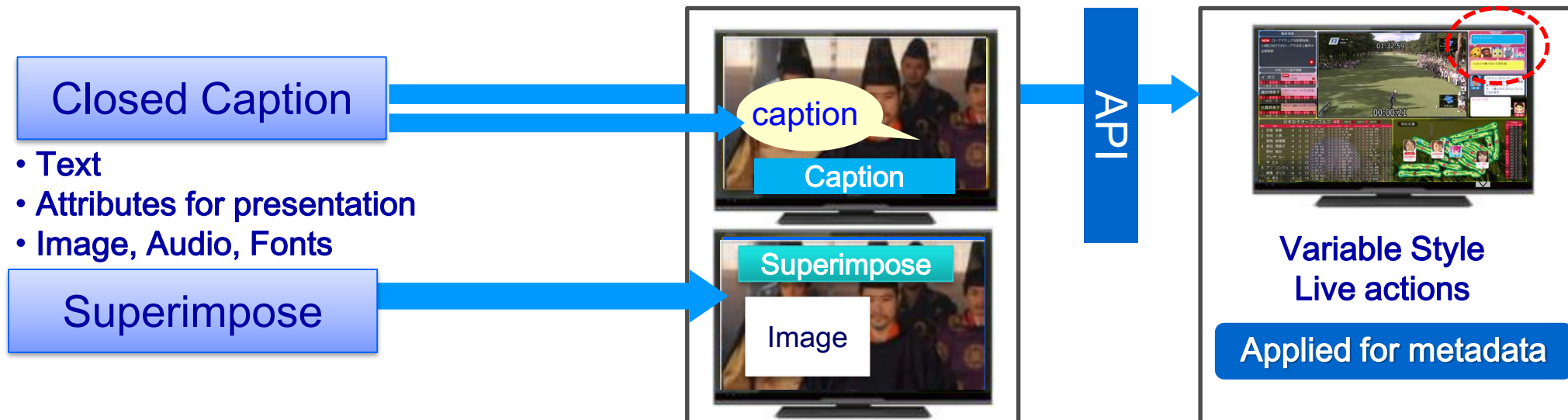


Method of Closed Caption

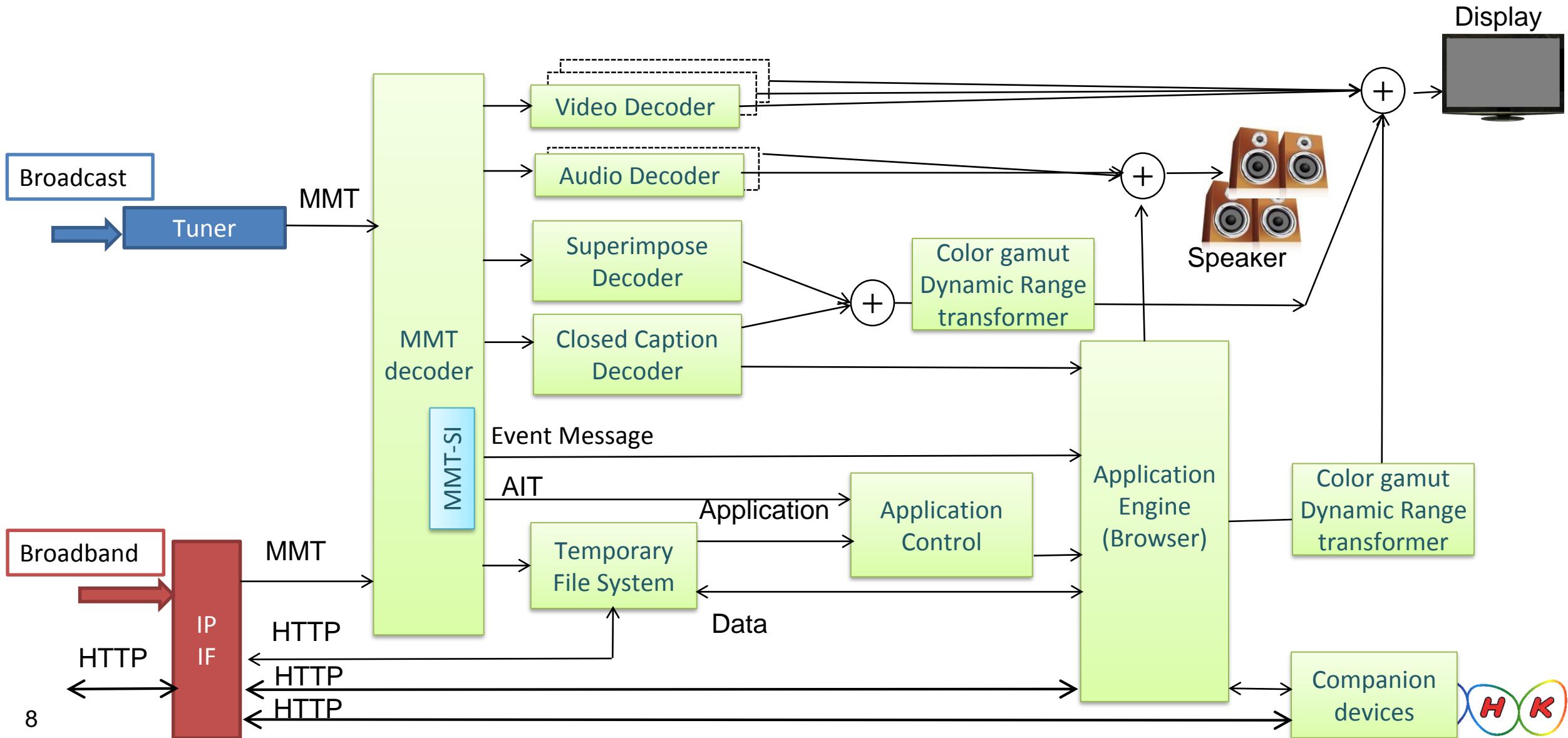
- “ARIB-TTML” based on TTML (Time Text markup language)
 - Image presentation in closed captions
 - Playing audio with closed captions
 - Presentation of external character
 - Presentation with live actions

By receiver

By HTML5 Application

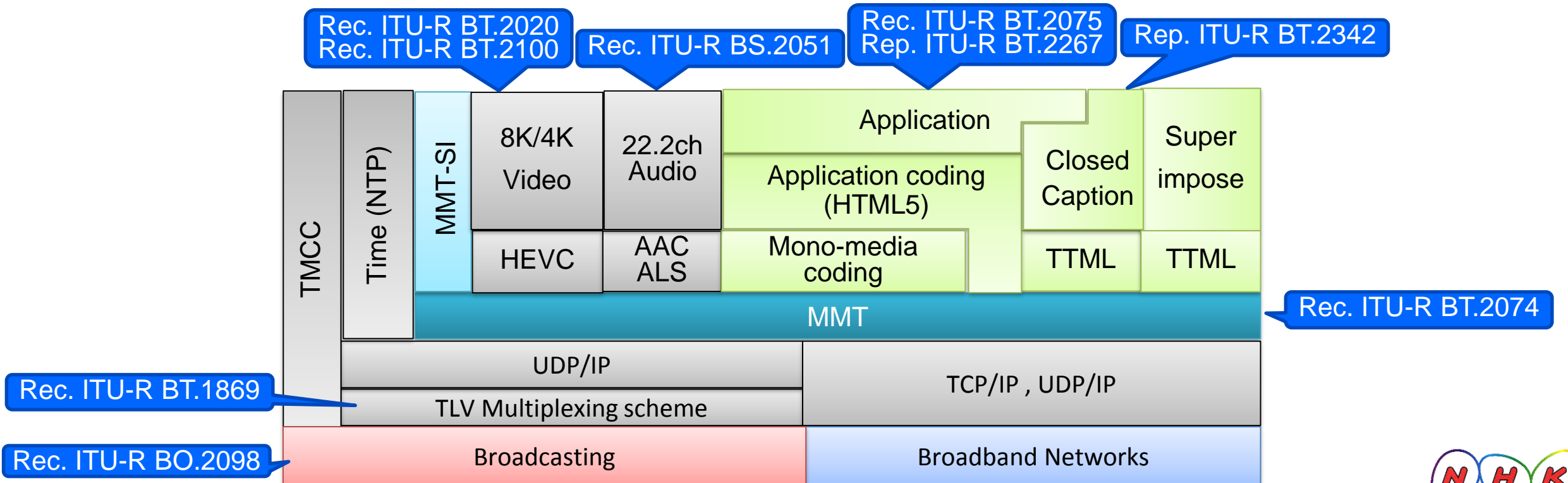


System Model of UHDTV Satellite Broadcasting



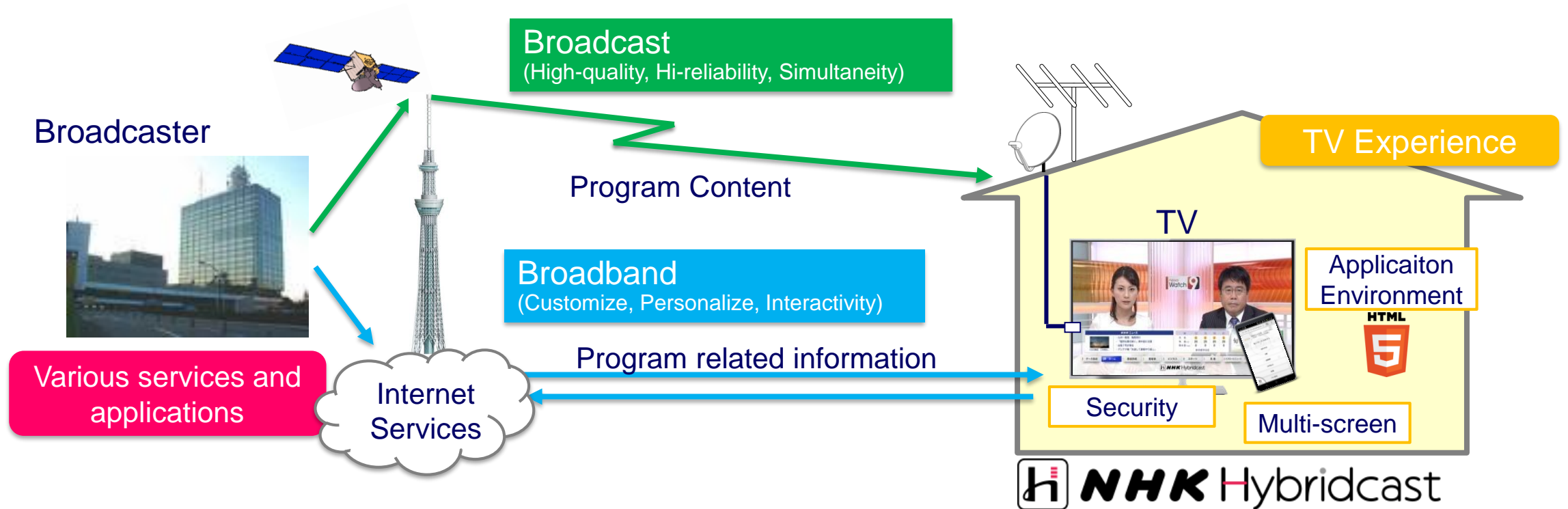
Layer Model

- Enables hybrid services, in which broadband are used together with broadcast to deliver content
- Uses IP-based media transport for hybrid services
- Video, audio, and data encapsulated into MMTP packet



Hybridcast

- Service Launch in 2013 in Japan

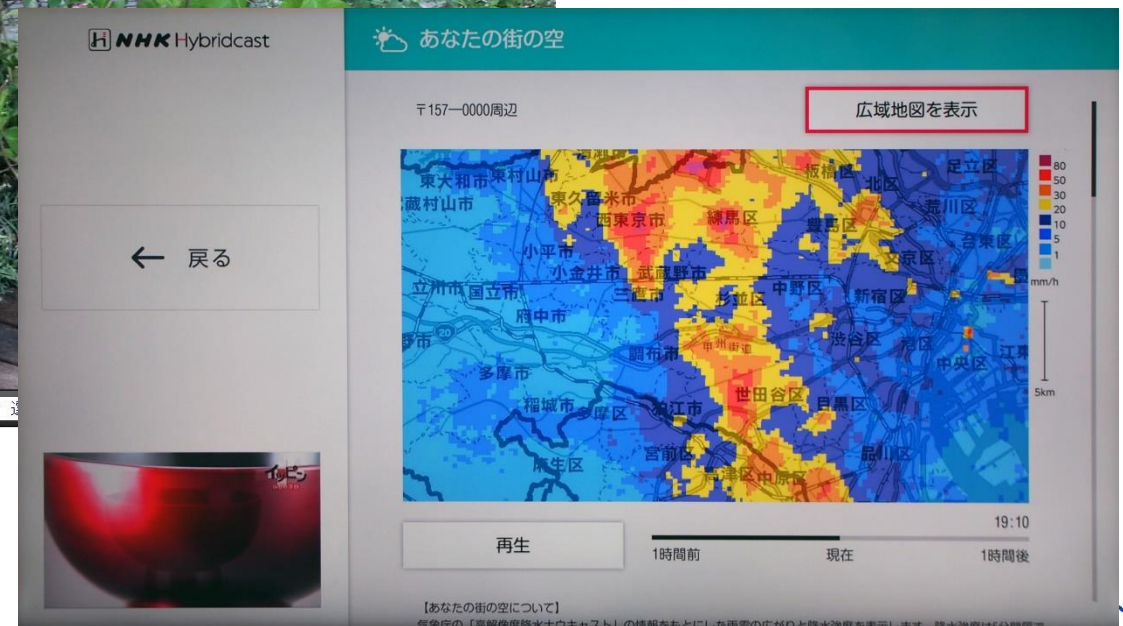
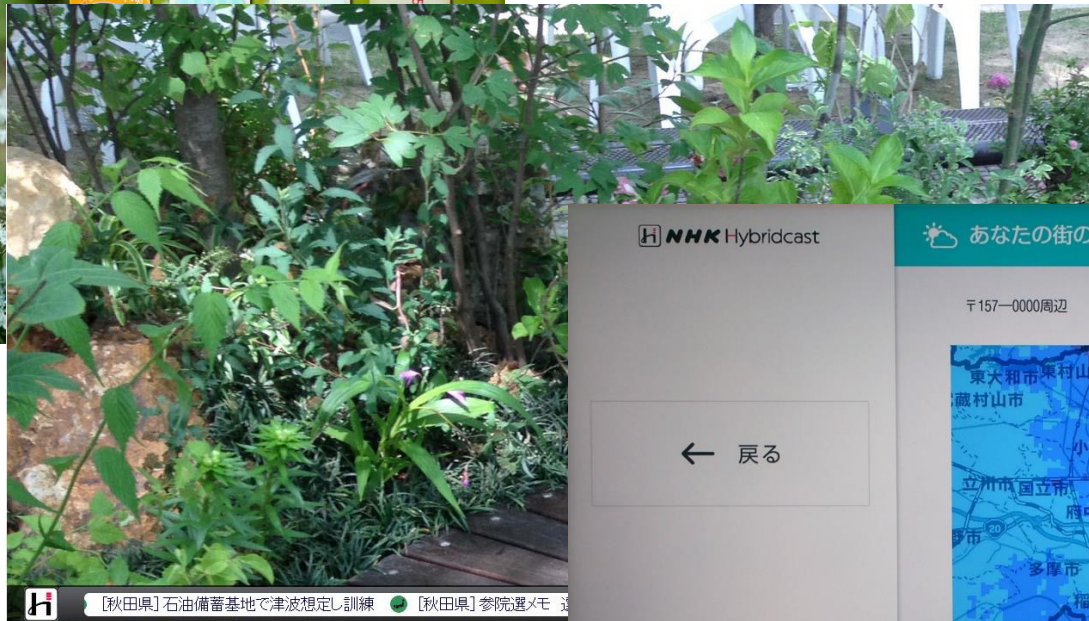


Hybridcast overview

- Hybridcast is a service platform on the digital broadcasting
 - The pioneer of HTML 5 on TV
 - Enables continuous enhancement of the services by its flexibility
- Technical characteristics
 - Web browser based (2K) + proprietary TV functions
 - Layout controls for flexible arrangement of broadcast video and other objects.
 - Alpha blending of broadcast and graphics



Screens of Current services

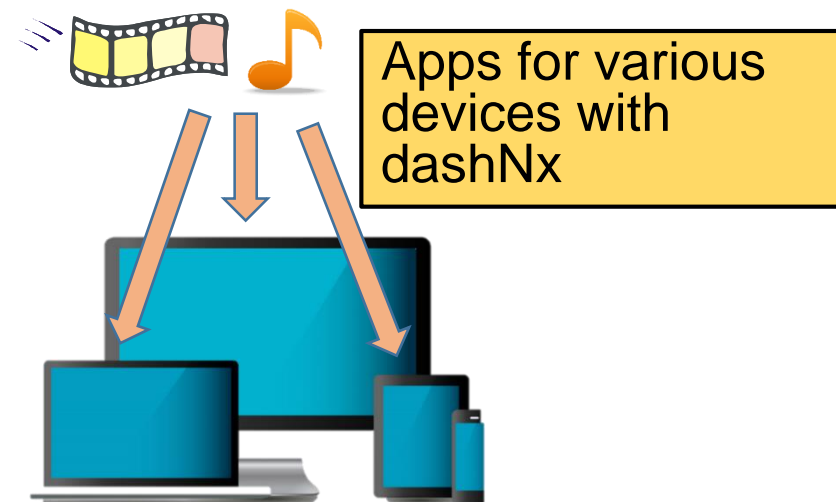
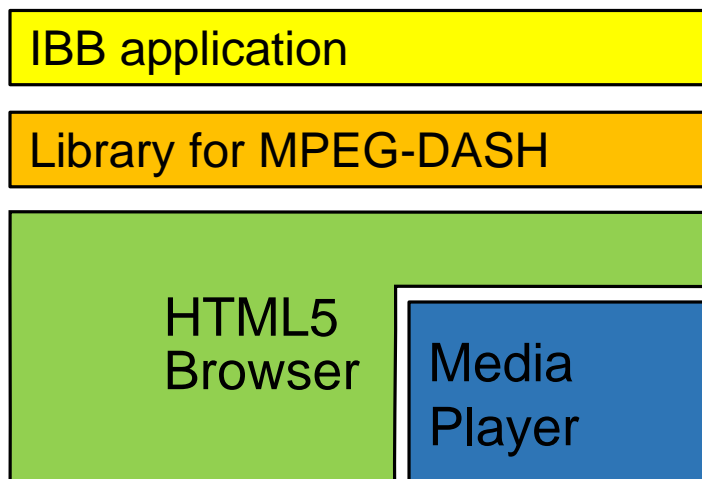




Multi-Resolution Video Services using Hybridcast

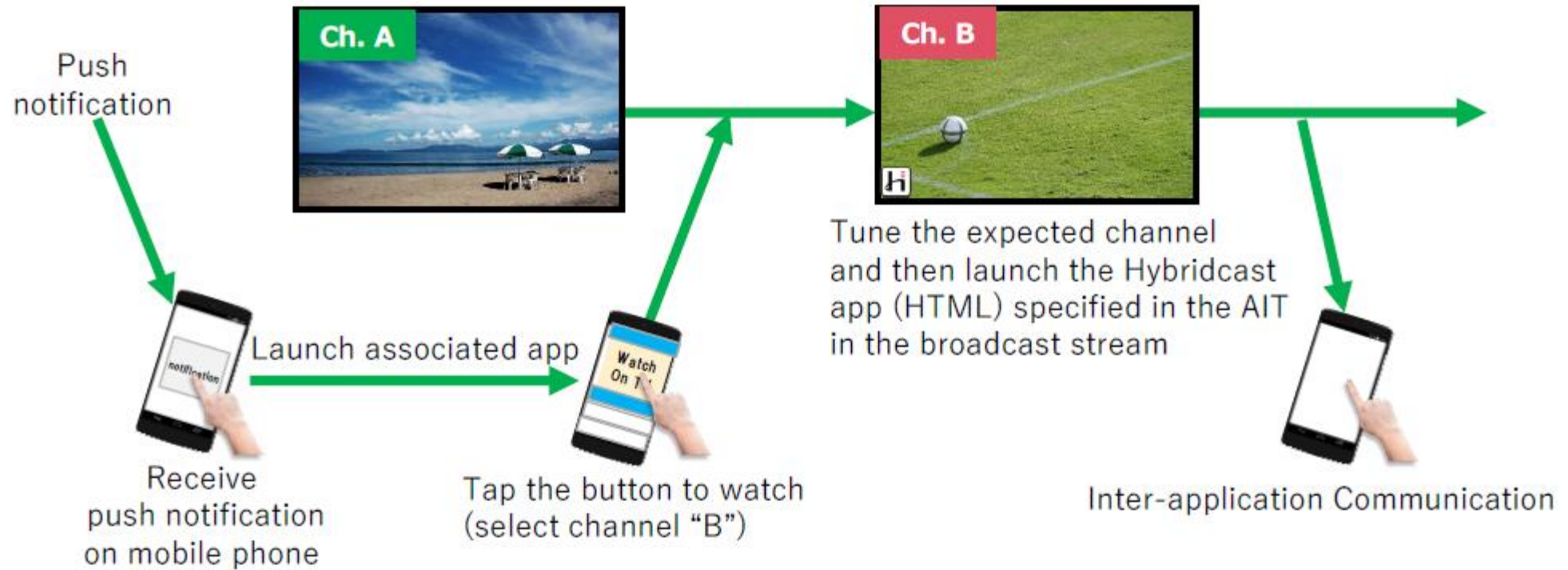
Report ITU-R BT.2267

- MPEG-DASH Handling
 - Use of MSE (Media Source Extensions) and EME (Encrypted Media Extensions)
- MSE Library for TV (called dashNx)
- NHK offered 4K video trial for 2018 Pyonchang Olympic in many games
- Ad insertion
 - Some commercial broadcasters tested this with 4K video for;
 - Seamless playback of ads from different servers
 - Offering of personalized ads



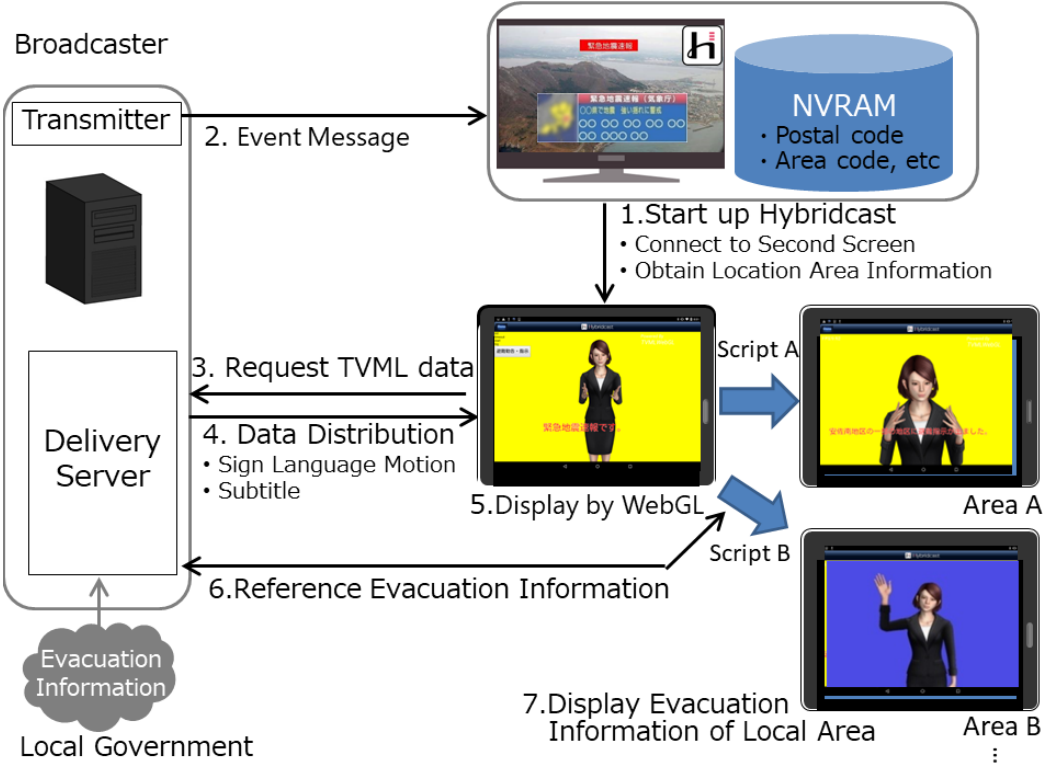
Hybridcast Connect

- To control TV Set by applications on Companion devices



Technical Realisation of Signing in Digital Television

- Sign-language CG system using mobile devices in IBB systems
- Single screen closed signing using IBB



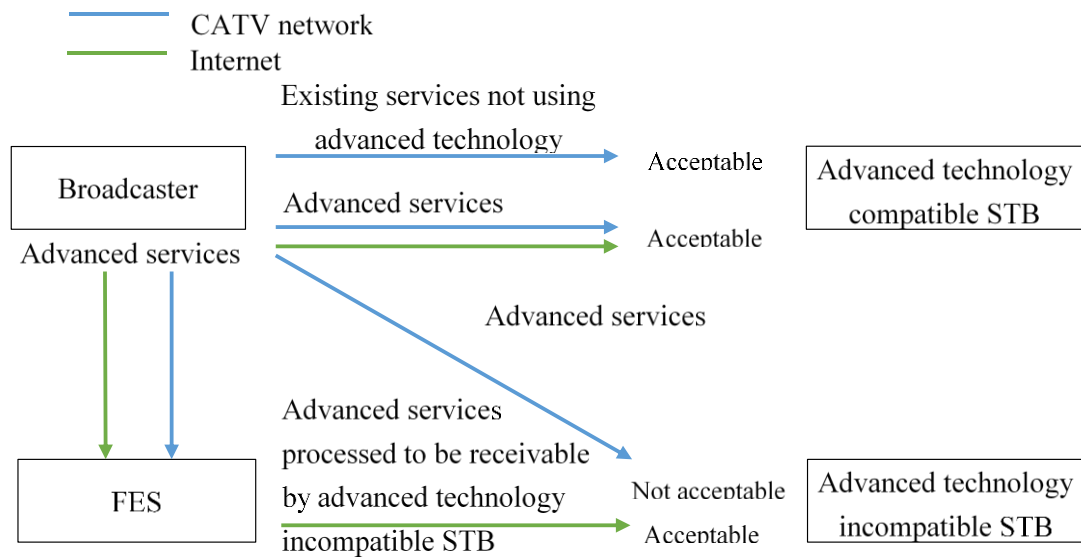
Video of sign language CG animation

Draft New Report ITU-R BT.[SIGNING]



Broadband CATV system using server-side reception and processing

- The introduction of new services that require furthering the capabilities of existing STBs and smoothly transitioning to new STB models
- Based on IBB systems



New Work Item of ITU-T SG9

