Recent Update and Remaining Issues on Hybridcast

W3C TPAC2021

Media & Entertainment Interest Group

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Future Vision:Web-based Broadcast Platform

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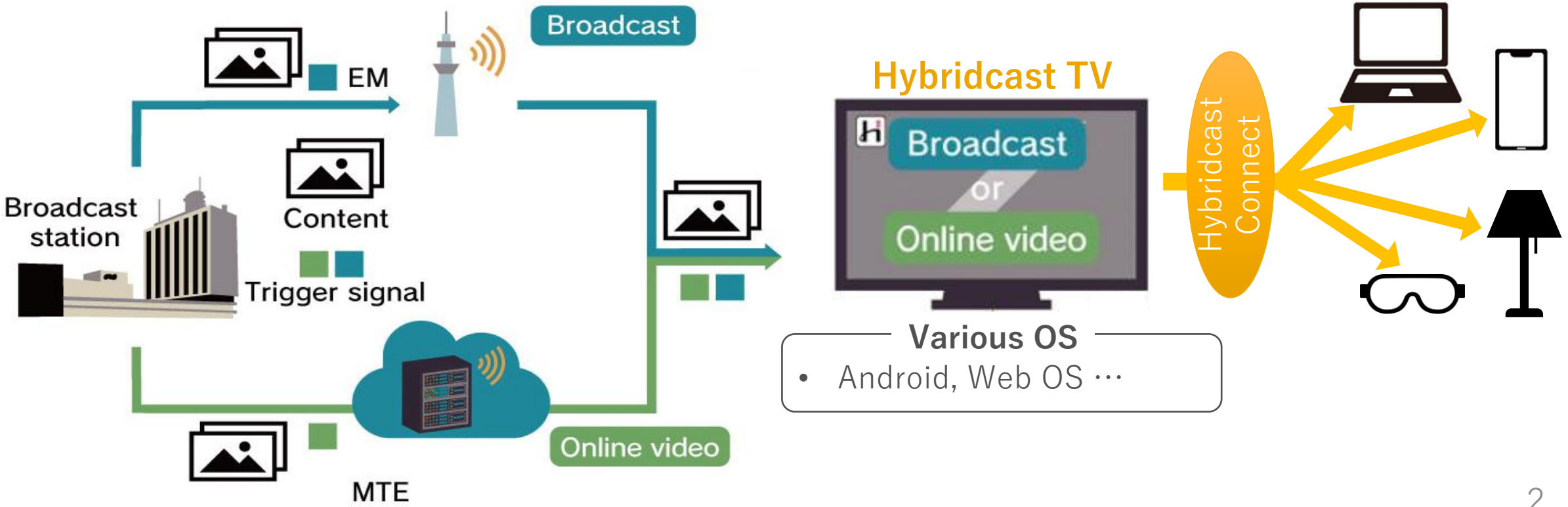
- For delivering broadcaster's service for any situations/devices, we aim to make it possible
  - to present content in any viewing environment using Hybridcast TV and other devices,
  - and to provide users the same UX regardless of device types and transmission paths.



NHKSTRL OPEN HOUSE 2021： https://www.nhk.or.jp/strl/english/open2021/tenji/8/index.html

Goals

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- Making UX of “Broadcast” and “Internet Streaming” similar and seamless
  - A) Seamless switching between “Broadcasting" and “Internet streaming“ preserves familiar and usable UX of conventional TV.
  - B) Bring the viewing experience “Internet streaming” similar to “Broadcasting" to provide the same quality of service.

- Utilization of various devices for broadcasting services
  - C) Enabling various devices connect with TV
  - D) Provide content to various devices using WoT technology

A) Seamless switching between Broadcasting and Internet streaming

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- Current status of Hybridcast standard
  - HTML-based application — OS- and platform-independent
  - Two application types:
    - Broadcast-oriented Managed Application:
      Can access broadcast resources but only run while corresponding broadcasting channel is tuned.
      => For presenting broadcast programme and content-selection UI
    - Broadcast-independent Managed Application: (Added in 2020 spec.)
      Not able to access broadcast resources, run independently of broadcasting services.
      => For presenting Internet streaming and content-selection UI

Demo Video


映画、テレビ番組などを検索
Broadcast
Broadcast programme
NETFLIX
prime video
YouTube
Google Play
ムービー＆TV
BiaApp
アプリ
次のおすすめ
ここには映画やテレビ番組が自動的に表示されるため、
簡単に視聴を再開できます。リモコンの中央のボタンを長
押しすると、番組を直接追加できます。
On demand program
NETFLIX
Netflix
TOP 10
愛の不時着

A) Seamless switching between Broadcasting and Internet streaming

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- Current status of Hybridcast standard
  - HTML-based application — OS- and platform-independent
  - Two application types:
    - Broadcast-oriented Managed Application:
      Can access broadcast resources but only run while corresponding broadcasting channel is tuned.
      => For presenting broadcast programme and content-selection UI
    - Broadcast-independent Managed Application: (Added in 2020 spec.)
      Not able to access broadcast resources, run independently of broadcasting services.
      => For presenting Internet streaming and content-selection UI
- Remaining issue
  - Transition(zapping) between Broadcasting and Internet streaming is not as responsive as conventional broadcasting

B) Bringing the viewing experience of “Internet streaming” similar to “Broadcasting"

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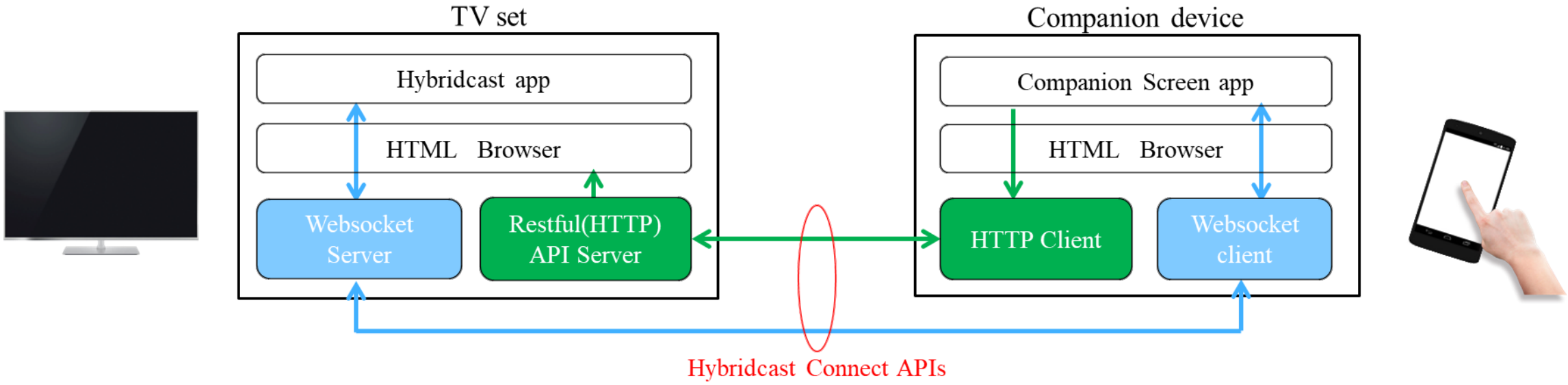
- Requirements
  - Low and same-for-all delay of video playback
    - allows multiple users to share the same experience at the exact same time.
  - Fire event with precise time-accuracy
    - for dynamic ad insertions and programme-linked UI control such as interactive quizzes.
- Current status of Hybridcast standard (added in 2020 spec)
  - CMAF chunk without an intra-frame — enabling low-latency playback
  - Media Timed Events support
- Remaining issues
  - Reducing latency differences in online delivery
    - Will combination use of CMAF and WebTransport be a solution?
  - Improving accuracy of event firing during MSE playback
    - Accuracy of event handling in JavaScript is affected by other processes especially on CE-device.
    - Synchronization control mechanism from the native layer is desired.

C) Enabling various devices connect with TV

- Hybridcast Connect
  - Enables communication between a TV app and a smartphone app
    - Standardized in Sep. 2018 as a part Hybridcast technical spec.
    - Provides mechanism for device discovery and inter-app command and communication

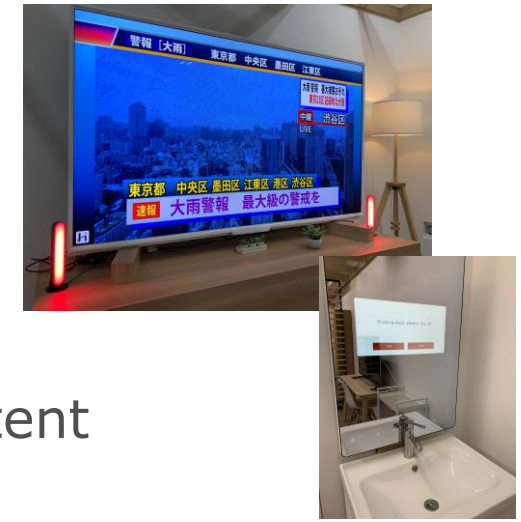


Hybridcast Connect Protocol

- Need to use a protocol that complies with open standards
  - Current version of specifications
    - Built on top of open standards — device discovery using DIAL and two-way communication using Websocket.
  - Remaining issues
    - Current version employs proprietary protocol for device-to-device authentication and communication secrecy
    - Open and secure international standards are desired for the future specifications
      - One solution would be enabling HTTPS in local networks.

D) Utilization of IoT devices

- Possibility for new way of content presentation using IoT devices
  - e.g.,
  - ➢ Present audio content to smart speaker,
  - ➢ Present text news to smart mirror,
  - ➢ Changing the color of LED roomlight by linking with the content



- Issue
  - No established method to present content that matches the characteristics of devices
    - ◆ Is Web of Things(WoT) a promising tool for this issue?

IoT-based Media Framework

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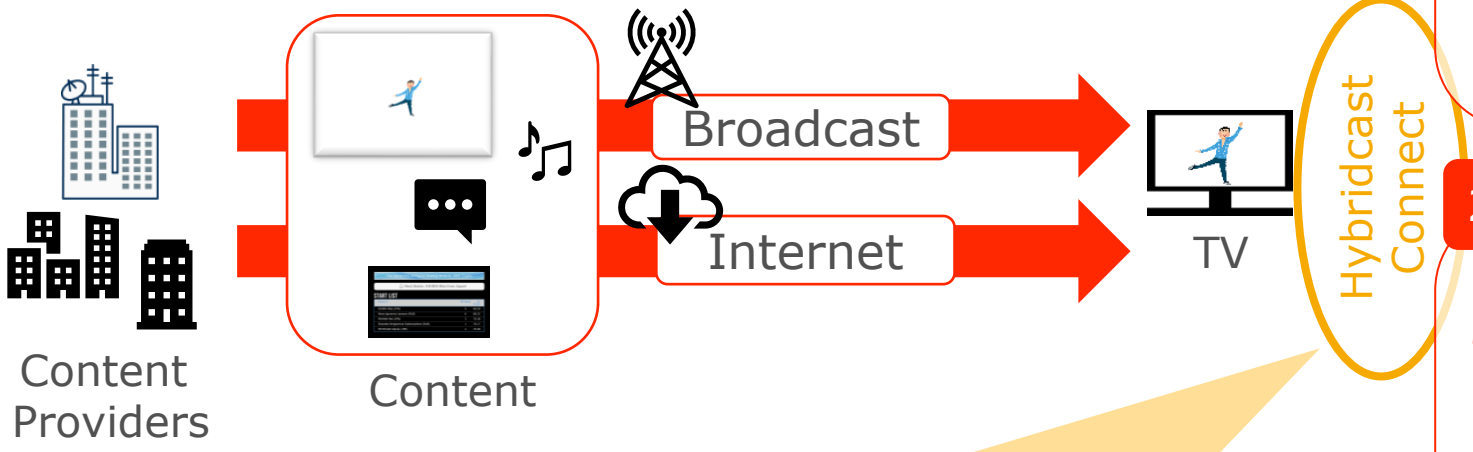
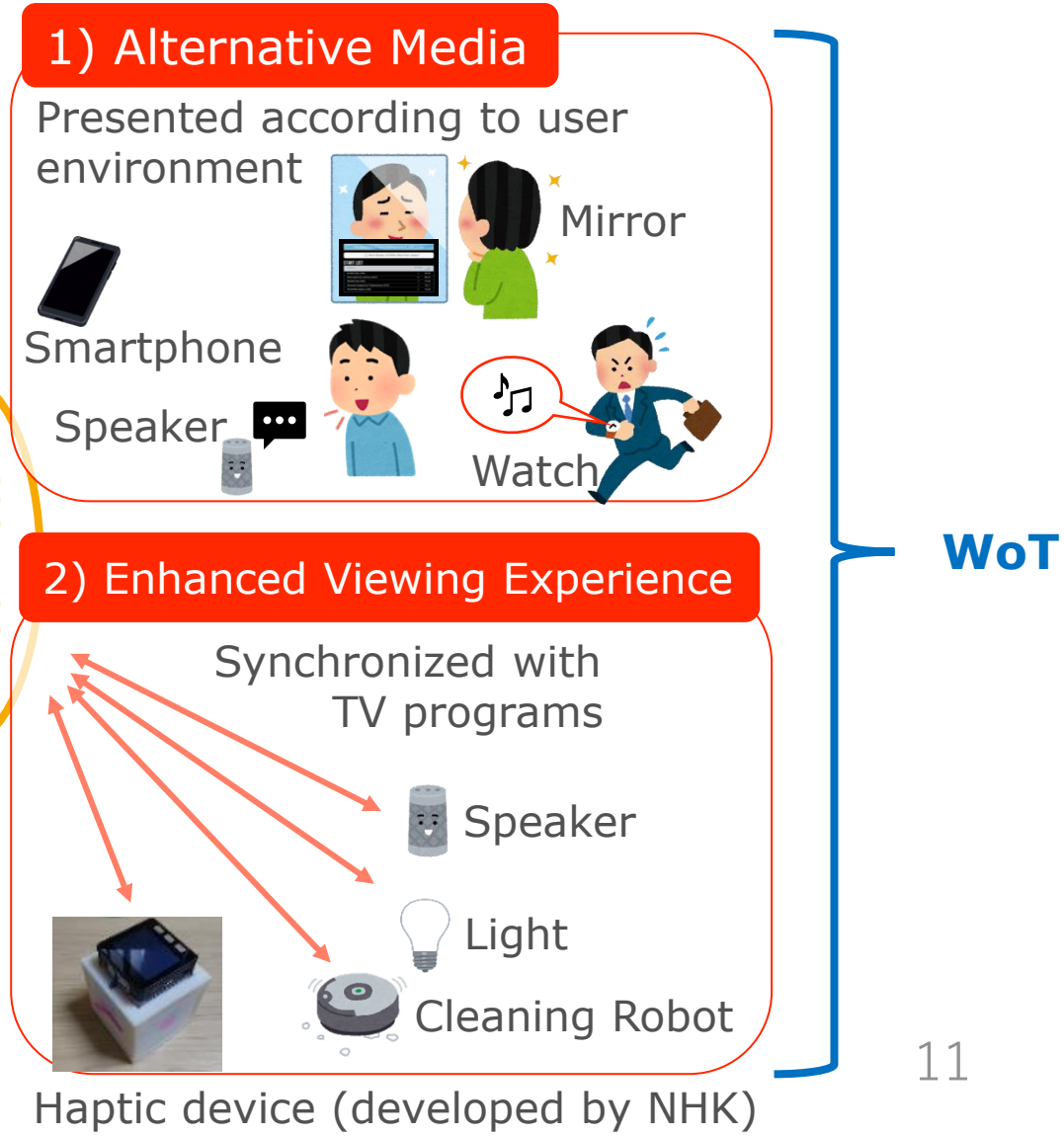
- It not only delivers broadcaster's content to a device that does not have a broadcast tuner, but also creates new use cases for integrated broadcast and broadband service.



Using Hybridcast Connect, a TV set works as a hub for connecting broadcasters' service with various WoT devices and Internet services.



Haptic device (developed by NHK)

Demo Video

Full size video： https://www.nhk.or.jp/strl/english/open2021/tenji/8/index.html#v8_3

Thank you for your attention