

# WoT-enabled TV services with Hybridcast Connect

Presenter

Hiroki Endo (NHK)

2022-09-14

# Outline

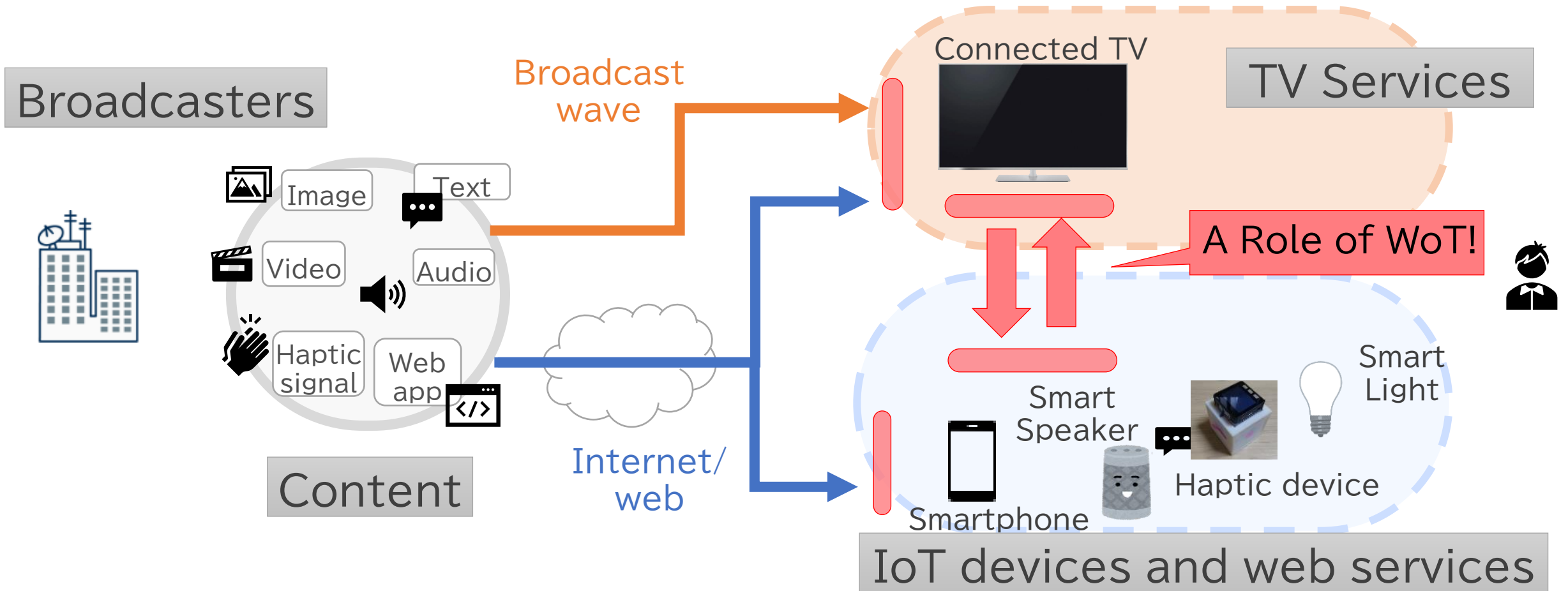
- Objective
- Previous Proposed Media Use Cases
- Demo (Update)
  - WoT-enabled TV services a commercial Hybridcast Connect<sup>\*1</sup> TV
  - IPTV FORUM<sup>\*2</sup> certified Hybridcast Connect TV was Released!
- WoT-enabled Hybridcast Connect

\*1 Hybridcast Connect: device linkage function for Hybridcast-compatible TVs

\*2 IPTV FORUM JAPAN: <https://www.iptvforum.jp/en/>

# Objective

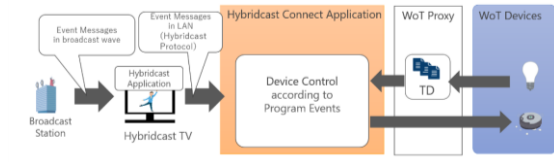
- Broadcasters will deliver content with IoT devices.
- We expect WoT to connect things across **TV and Web worlds**.



# Previous Proposed Media Use Cases from NHK

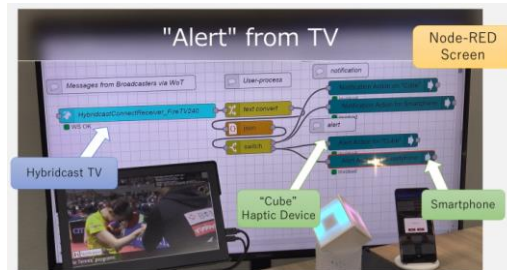
(TPAC 2019)

Home WoT devices work according to TV programs.



(TPAC 2020)

Improving Media Accessibility with WoT devices



Tool) Hybridcast TV Emulator  
OSS) Hybridcast Connect TV Emulator

(TPAC 2021)

Media use case demo in a smart home



Media use case on a virtual Web app



Tool) WoT Device Emulator



These Demos were performed on Prototype TVs or Emulators.

**IPTV FORUM JAPAN certified Hybridcast Connect TV has been Released!**

# Demo: WoT-enabled TV services on a commercial Hybridcast Connect TV

EM is Fired

```
{ "@type": "Message",  
  "example:scene": "start",  
  ... }  
2: Broadcast Event Message is fired.  
{ "@type": "Message",  
  "example:scene": "goal",  
  ... }  
3: Broadcast Event Message is fired.  
{ "@type": "Message",  
  "example:scene": "replay",  
  ... }
```

Event: hybridcastCompanionConnectListener

Subscribed

Broadcast message contains "replay"?

set airFlowLevel value to 1

set airFlowLevel

connected

airFlowLevel

( value: 1 )

airFlowLevel

1



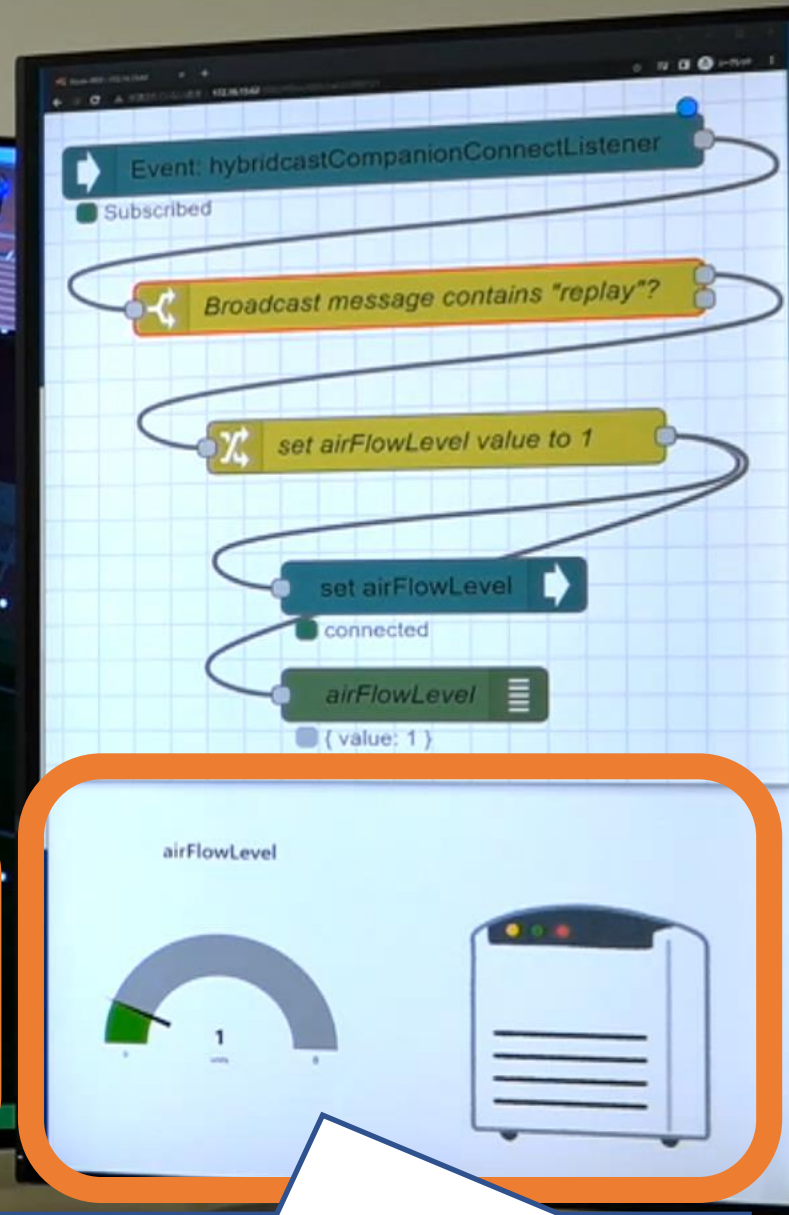
# Demo Situation



- A TV plays a soccer program.
- An air cleaner is noisy in turbo mode.
- Users want quietness in exciting scenes.
- TV can receive Event Messages related to a program via broadcasting wave.



(1) TV receives Event Message telling "replay scene"



(2) Air cleaner reduces air flow level to make it quieter.



# Demo System Configuration

Hybridcast Connect TV  
(LG OLED42C2PJA)

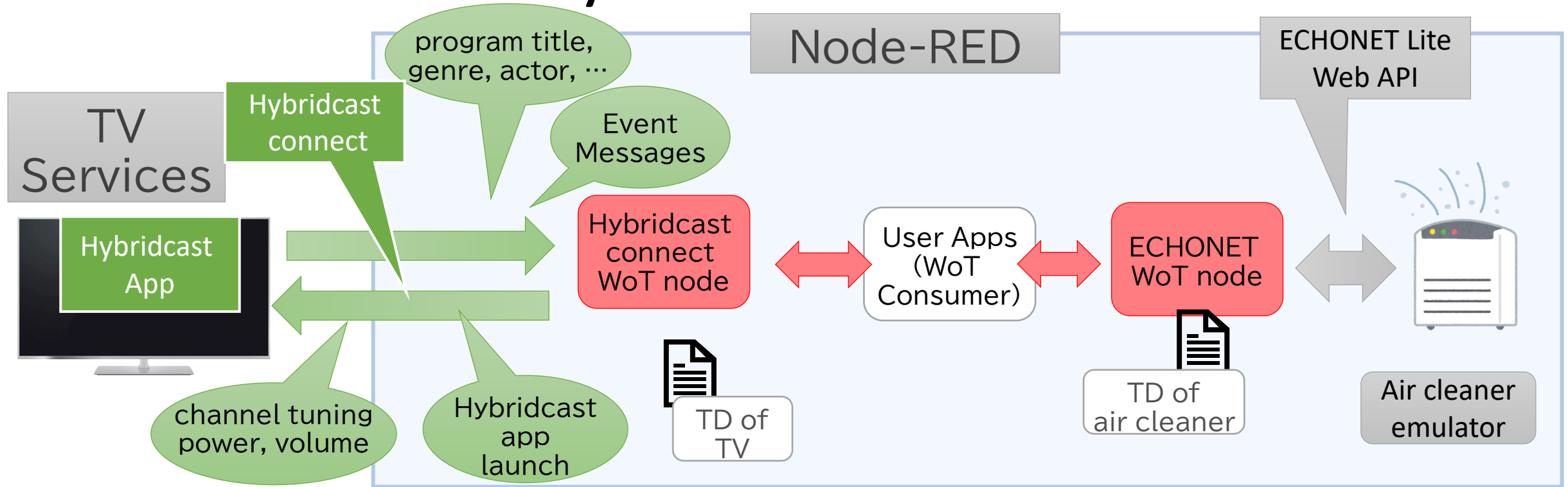
WoT node to listen  
Hybridcast Connect Event

Node-RED  
App





# WoT-enabled Hybridcast Connect



- Actual broadcasting services in Japan can be connected to various devices and services using WoT!
- Hybridcast Connect can provide diverse use cases for WoT.

# Open Source Software Tools

- Hybridcast TV emulator
  - <https://github.com/nhkrd/antwapp4hc>
  - Hybridcast\*-Connect APIs are implemented
- Related Works
  - hyconet.js
    - JavaScript implementation of standardized Hybridcast-Connect API
    - <https://github.com/nhkrd/hyconet.js>
  - node-red-contrib-hyconet
    - Node-RED extra node plugin for hyconet.js (Hybridcast-Connect JavaScript SDK)
    - <https://github.com/nhkrd/node-red-contrib-hyconet>



\*Hybricast is the integrated broadcast and broadband system in Japan