Recent Achievement of

Hybridcast

W3C TPAC2019
Media & Entertainment Interest Group

NHK (Japan Broadcasting Corp.)

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Today's outline

Broadcast × **Web**

Hybridcast
A new integrated broadcast-broadband platform

> ◆ **Recent Achievement of Hybridcast**
>
>   ● Deployment status
>
>   ● Hybridcast Connect & demo
>
>   ● Hybridcast Connect Test and verification

Past Presentation on;
W3C 2012 4th Web and TV Workshop: https://www.w3.org/2013/10/tv-workshop/agenda.html
W3C TPAC2014： https://www.w3.org/2014/10/tv-ig-meeting/20141027_W3C_Hybridcast20.pdf
W3C TPAC2015： https://www.w3.org/2011/webtv/wiki/images/f/f2/Tpac2015_hybridcast_update.pptx.pdf
W3C TPAC2017：https://lists.w3.org/Archives/Public/www-archive/2017Nov/att-0004/RecentAchievementHybridcast_TPAC20171106.pdf
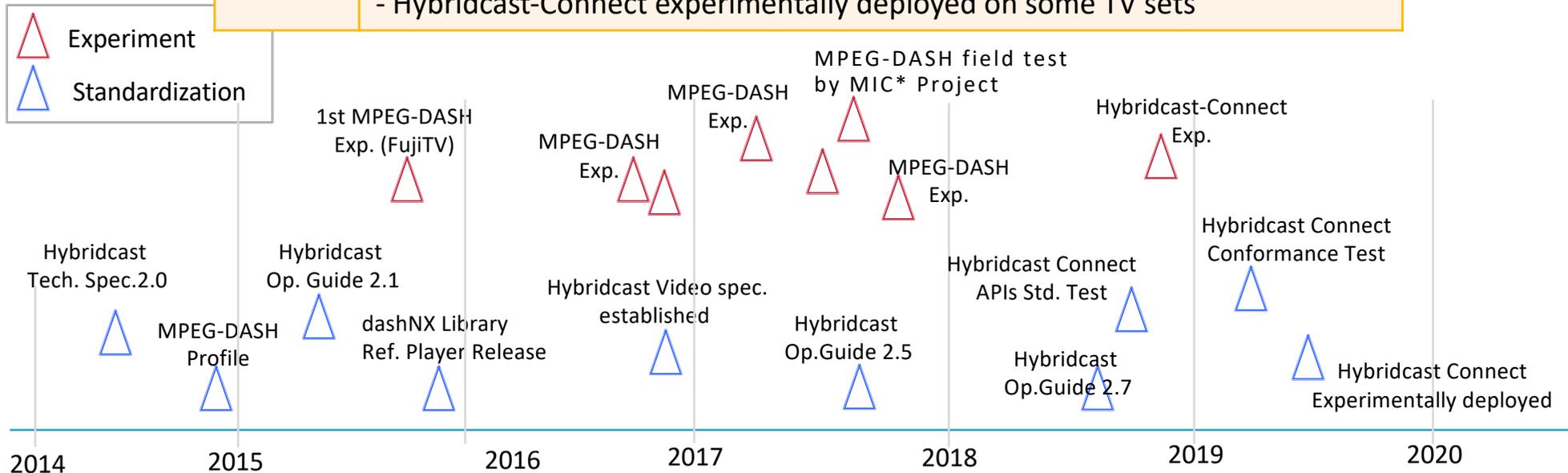W3C TPAC2018：https://www.w3.org/2011/webtv/wiki/images/4/45/RecentAchievementHybridcast_TPAC20181022.pdf
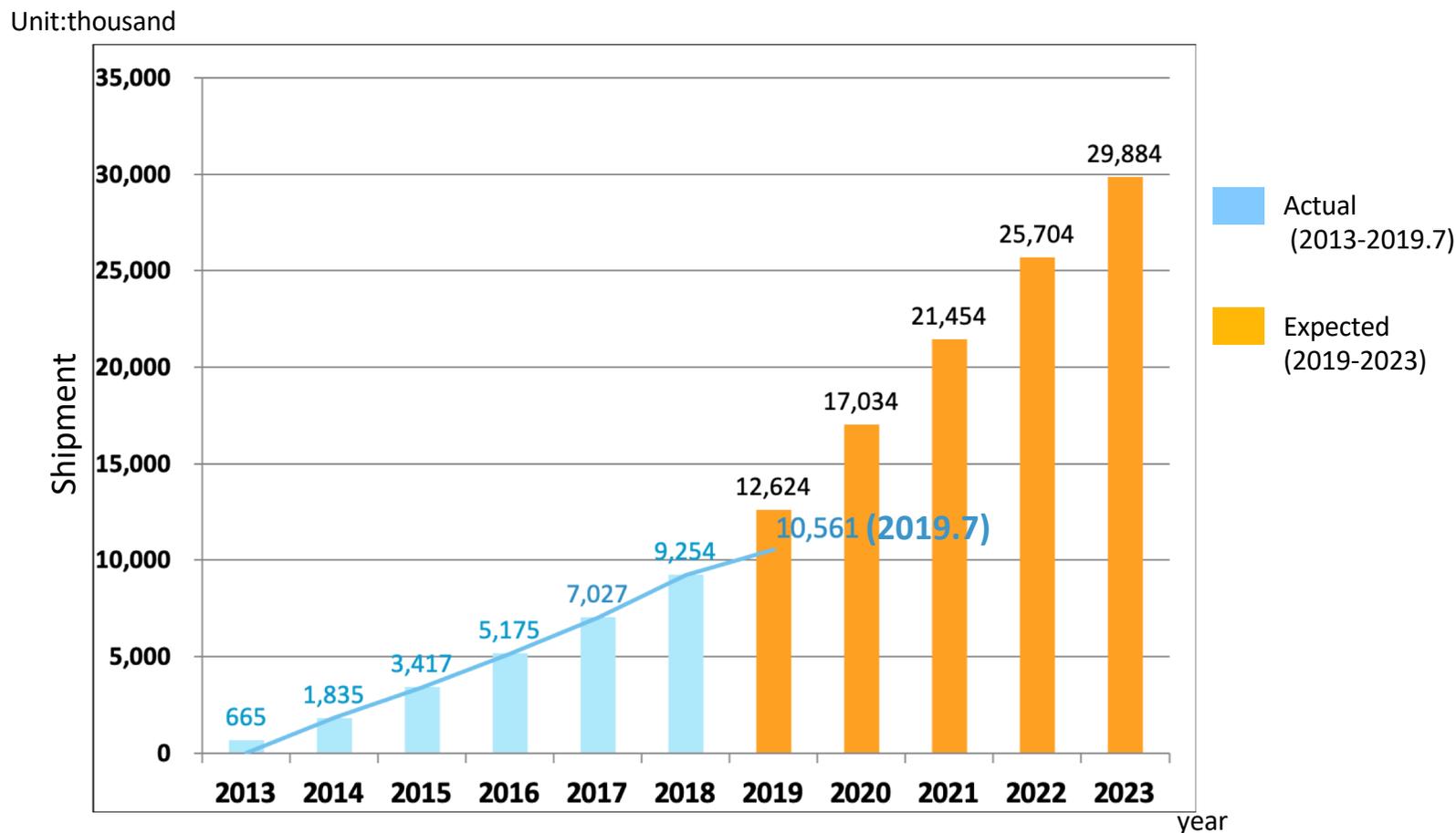
Deployment Status

History of standardization and experiments

year	events
2014	- Hybridcast Technical Spec. 2.0 Released - MPEG-DASH profile standardized
2015	- Hybridcast Operational Guideline 2.1 Released - 1st MPEG-DASH experiment (FujiTV)
2016	- Hybridcast Video spec. established
2017	- MPEG-DASH field test by the national project - Hybridcast Operational Guideline 2.5 published (Hybridcast Video)
2018	- Hybridcast Technical Spec. 2.2 published - Hybridcast Operational Guideline 2.7 published
2019	- Hybridcast-Connect Conformance Test - Hybridcast-Connect experimentally deployed on some TV sets

△ Experiment
△ Standardization

Hybridcast Tech. Spec.2.0
MPEG-DASH Profile
Hybridcast Op. Guide 2.1
dashNX Library Ref. Player Release
1st MPEG-DASH Exp. (FujiTV)
Hybridcast Video spec. established
MPEG-DASH Exp.
MPEG-DASH Exp.
MPEG-DASH field test by MIC* Project
MPEG-DASH Exp.
Hybridcast Op.Guide 2.5
Hybridcast Connect APIs Std. Test
Hybridcast Op.Guide 2.7
Hybridcast-Connect Exp.
Hybridcast Connect Conformance Test
Hybridcast Connect Experimentally deployed

2014   2015   2016   2017   2018   2019   2020

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Shipment of Hybridcast receivers

- Number of Hybridcast Receiver has been over 10 mil.

Unit:thousand

[Source] Actual Shipment in 2013 - 2019.6 : JEITA Statistics, http://www.jeita.or.jp/english/stat/shipment/2019/index2.html
Expected Shipment in 2017-2023 : JEITA, "AV&IT device world demands (2019 Feb.)"
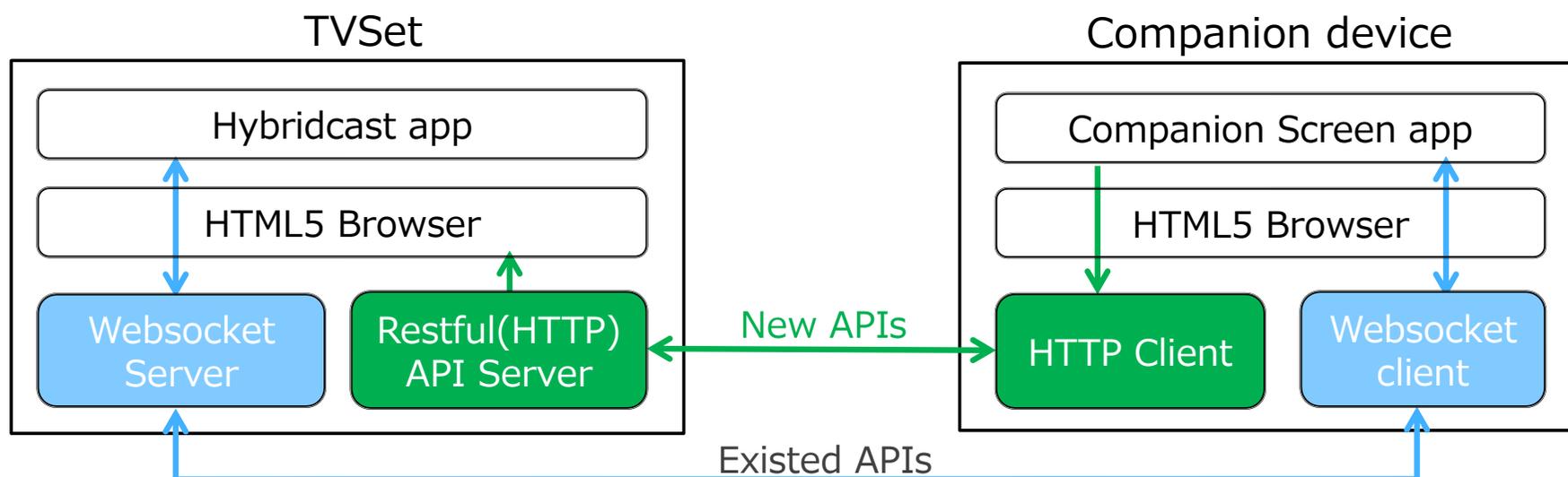
Trial deployment "Hybridcast-Connect"

- ◆ Hybridcast Connect
  - ● New functions or services that uses new APIs standardized in Sep. 2018
  - ● New APIs offers the functions of inter-application com/ctrl
- ◆ New API are experimentally implemented in Some TV sets
  - ● Broadcasters are ready to develop new services with new APIs

TVSet

| Hybridcast app |
| HTML5 Browser |

| Websocket Server | Restful(HTTP) API Server |

Companion device

| Companion Screen app |
| HTML5 Browser |

| HTTP Client | Websocket client |

New APIs

Existed APIs

Typical Sequence by additional APIs

1. MediaAvailabilityAPI

Check availability of
Terrestrial/Satellite tuner
on a TV set

2. ChannelsInfoAPI

Get list of
channel information
and tuning parameters
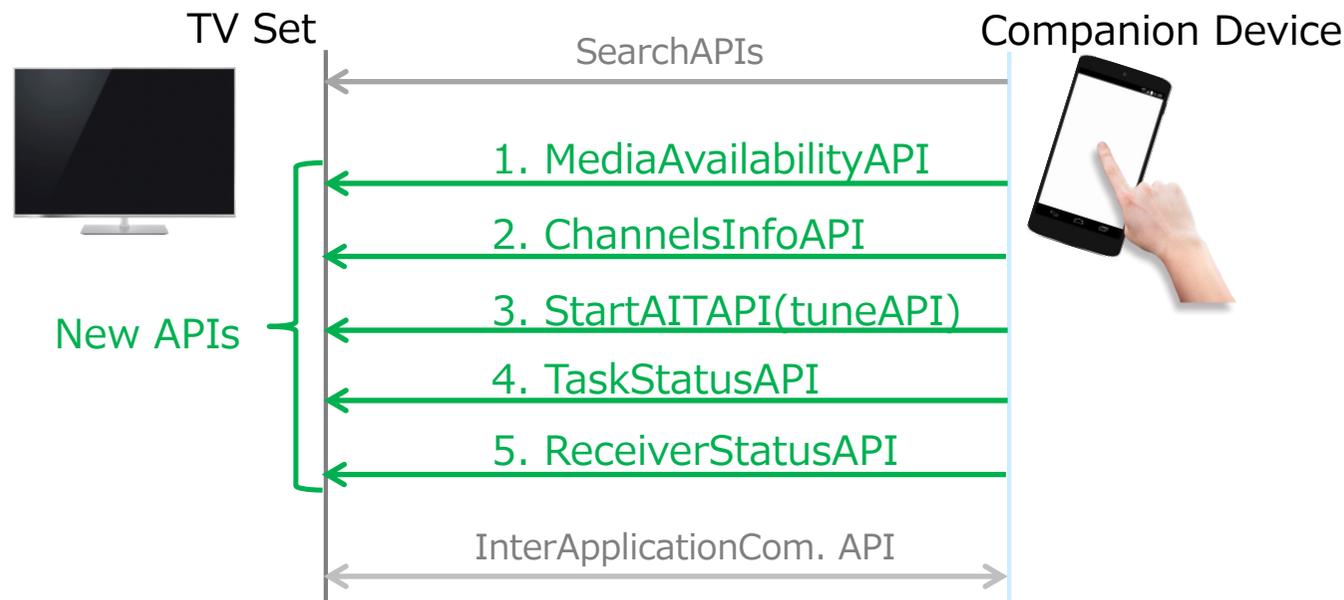
3. StartAITAPI(tuneAPI)

Changes channel of a TV set
and
launches Hybridcast
app(HTML) on the TV set

4. TaskStatusAPI

Get status of startAITAPI
request

5. ReceiverStatusAPI

Get status of HTML5 browser,
the number of communicating
apps on companion devices,
and current channel

TV Set

Companion Device

SearchAPIs

1. MediaAvailabilityAPI

2. ChannelsInfoAPI

New APIs

3. StartAITAPI(tuneAPI)

4. TaskStatusAPI

5. ReceiverStatusAPI

InterApplicationCom. API

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Hybridcast Connect demo

Hybridcast-Connect demos

- Demo implementations
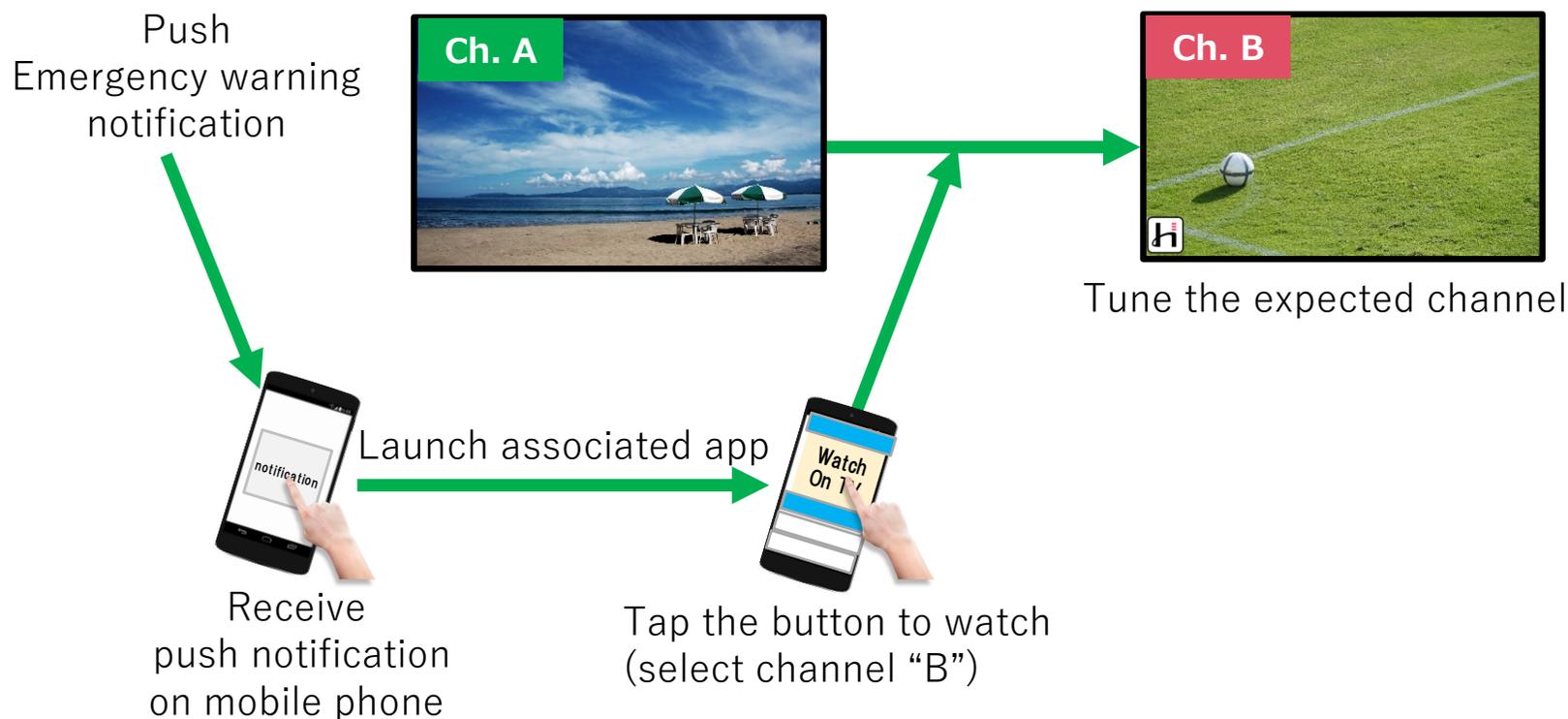
  - Usecase demo(1)

    - In emergency alert, guide to tune news-program on TV set

  - Usecase demo(2)
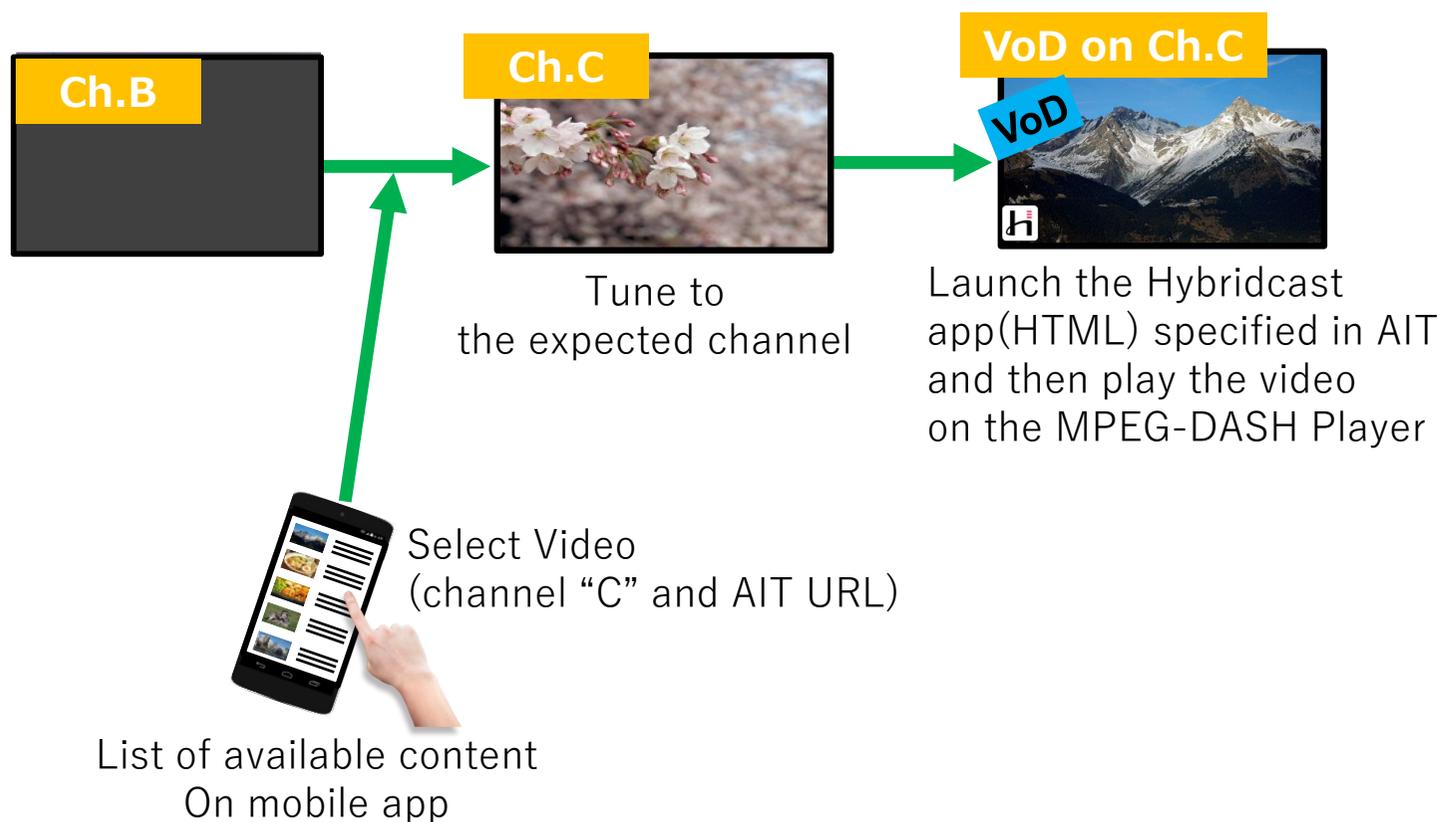
    - Smooth guidunce of catchup video from mobile device

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Supposed use cases demo (1)

> ◆ Guide to the news-program on TV set by push emergency-warning notification on mobile phone

Push Emergency warning notification

Ch. A

Ch. B

Tune the expected channel

Launch associated app

notification

Watch On TV

Receive push notification on mobile phone

Tap the button to watch (select channel "B")

Supposed use cases demo (2)

> ◆ Start watching VOD(catchup) content initiated by mobile App
>
> (MPEG-DASH Video Player is called by Hybridcast app. on a TV Set)

Ch.B

Ch.C
Tune to
the expected channel

VoD on Ch.C
VoD
Launch the Hybridcast
app(HTML) specified in AIT
and then play the video
on the MPEG-DASH Player

Select Video
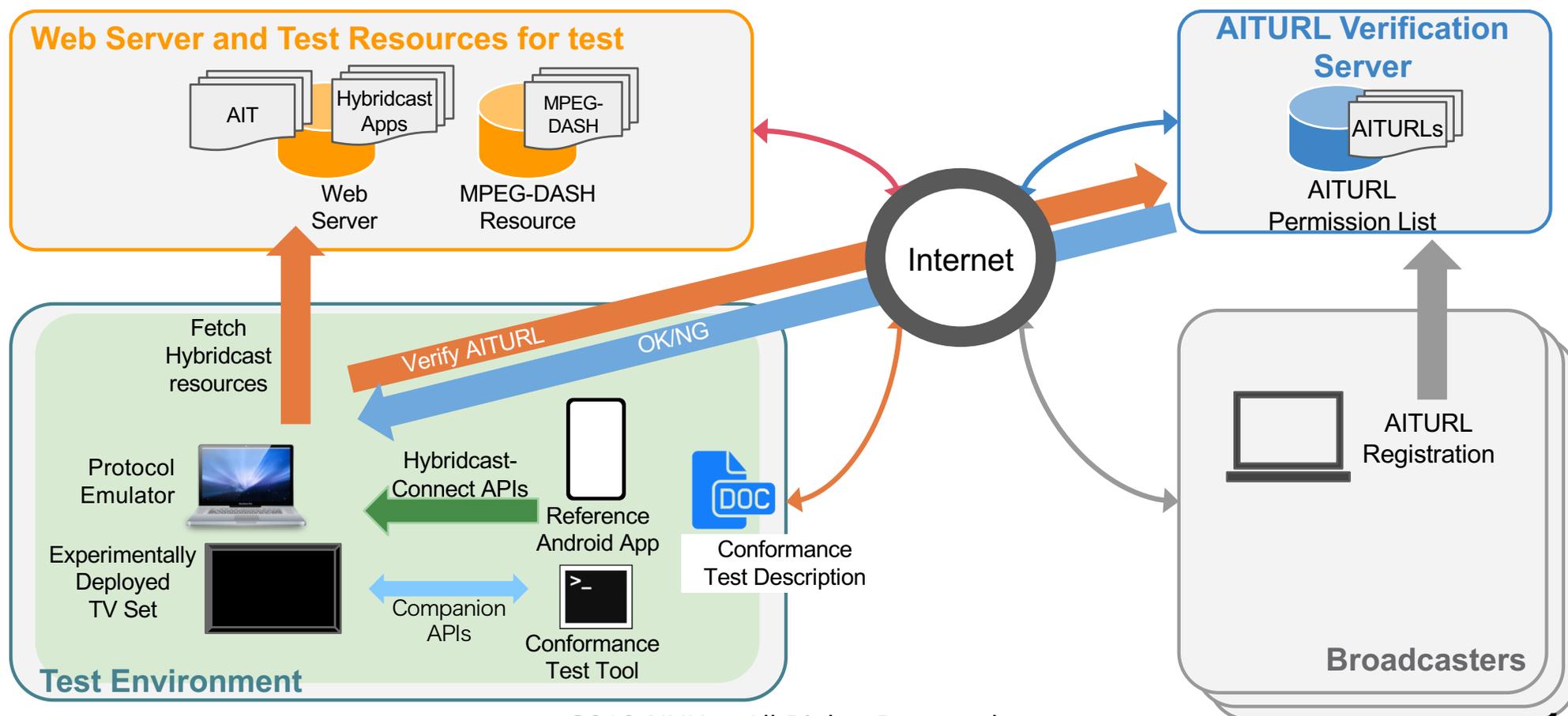(channel "C" and AIT URL)

List of available content
On mobile app

Conformance Test and verification

Conformance Test for Hybridcast-Connect

- Conformance Test for Hybridcast-Connect to ensure inter-operability between TV sets and companion devices
  - IPTVForum Japan makes Test-Kit (Test-Description and reference implementations as mobile-app and Test-Tool)

Web Server and Test Resources for test

AIT
Hybridcast Apps
MPEG-DASH

Web Server
MPEG-DASH Resource

AITURL Verification Server

AITURLs

AITURL Permission List

Internet

Fetch Hybridcast resources

Verify AITURL

OK/NG

Protocol Emulator

Hybridcast-Connect APIs

Reference Android App

Conformance Test Description

Experimentally Deployed TV Set

Companion APIs

Conformance Test Tool

AITURL Registration

Broadcasters

Test Environment

Service Verification by MIC* project and others

◆ **Service Verification with Hybridcast-Connect**

- 2018
  - ◆ 19 Companies and organizations in 5 consortiums participated
- 2019
  - ◆ 23 Companies and organizations in 4 consortiums participated

Reference

- Specs. 2.2 and Operational Guideline 2.7
  - http://www.iptvforum.jp/en/standard/about.html

Thank you very much for your kind attention!

Demos have been

in this room