Recent Achievement of

W3C TPAC2018
Media & Entertainment Interest Group

NHK (Japan Broadcasting Corp.)

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Today's outline

Hybridcast

A new integrated broadcast-broadband platform

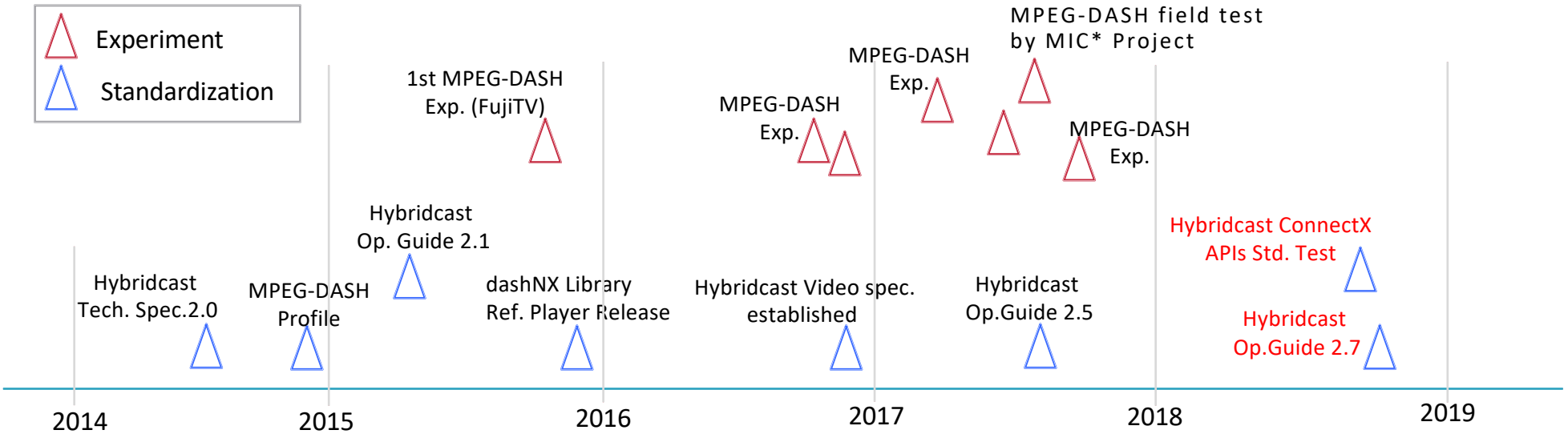
- **Recent Achievement of Hybridcast**
  - Deployment status
  - New APIs for Hybridcast ConnectX
  - Other updates

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

Deployment Status

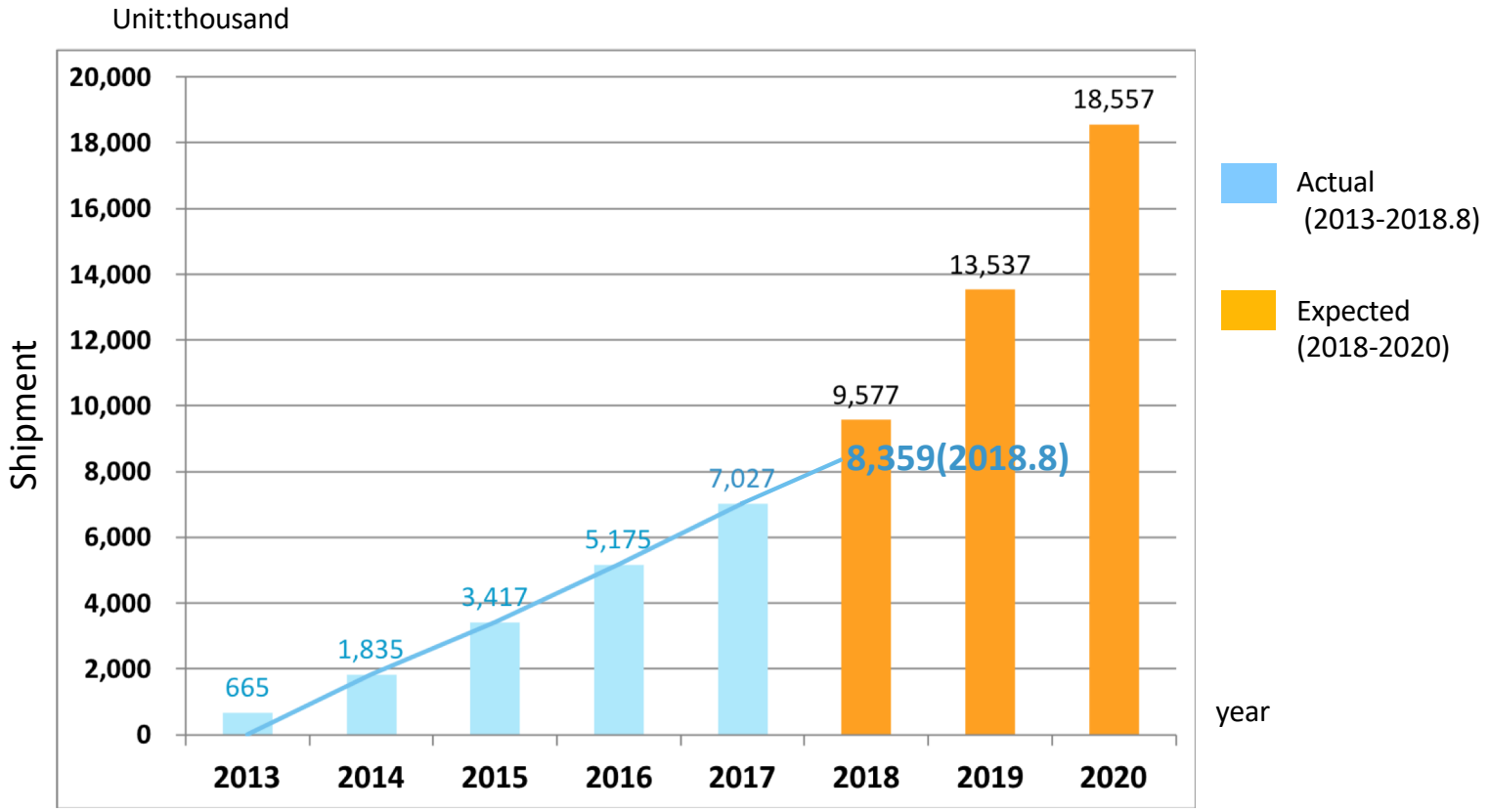
History of standardization and experiments

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



Shipment of Hybridcast receivers

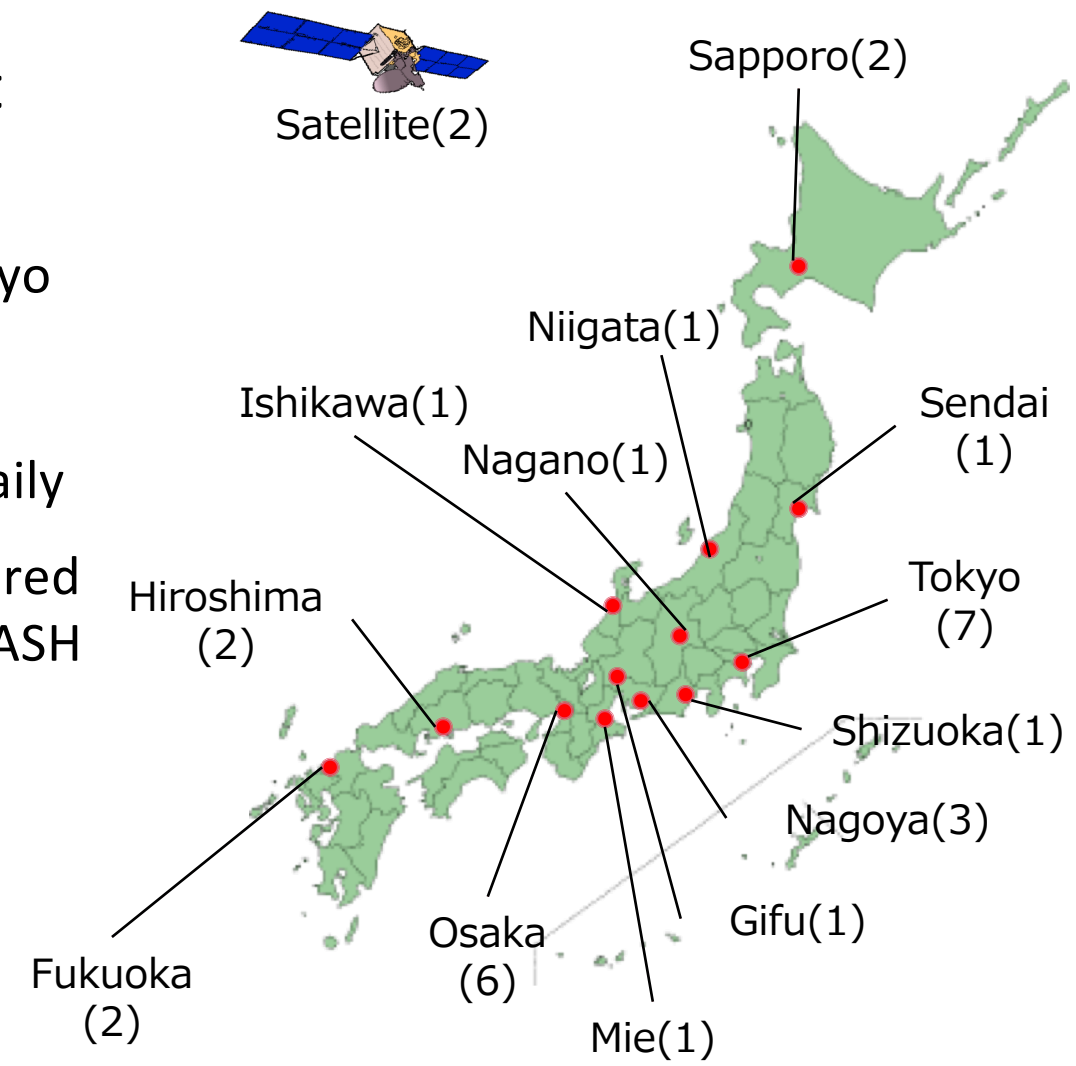
- Number of Hybridcast Receiver is increasing rapidly



[Source] Actual Shipment in 2013 - 2018.8 : JEITA Statistics, http://www.jeita.or.jp/english/stat/shipment/2018/index2.html
Expected Shipment in 2017-2020 : JEITA, "AV&IT device world demands (2017 Feb.)"

Service deployment by broadcasters

- 31 broadcasters in Japan have experience to offer Hybridcast services
  - 6 of 7 major broadcasters in Tokyo and 1 regional broadcaster in Sapporo and 1 of 2 Satellite broadcaster offer the services daily
  - Many regional broadcasters offered trial services (including MPEG-DASH 4K Video experiment)

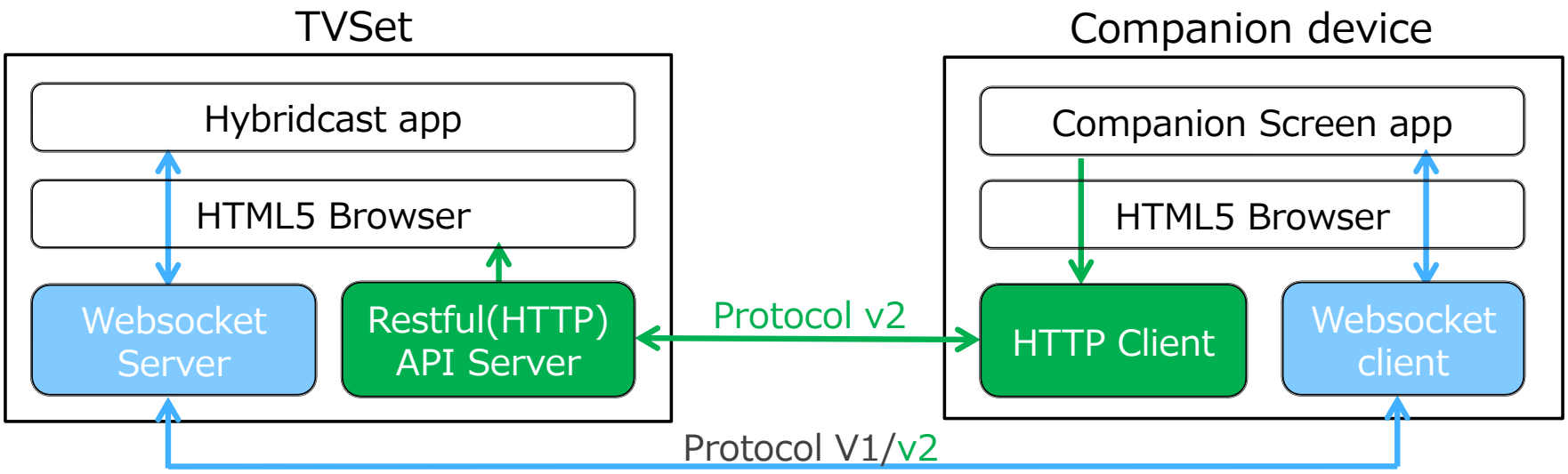


Deployment by commercial broadcasters

New APIs for Hybridcast ConnectX

Additional APIs in protocol Version2

- New APIs for Hybridcast ConnectX defined in protocol version 2.0
  - Specs and Operational Guideline published on Sep. 2018
- Version1.x: standardized inter-device protocol and inter-application com/ctrl APIs
  - Standardized DIAL and Websocket protocol as inter-device protocol
  - Standardized inter-application com/ctrl API assures communication between Hybridcast apps(HTML) and Companion Screen apps(HTML) over inter-device protocol(websocket)
- **Version2.0: APIs to control TV added**
  - To control TV Set by applications on Companion devices
    - Add TVSetInfoAPIs, Tune/StartAITAPIs, TVStatusAPIs



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)

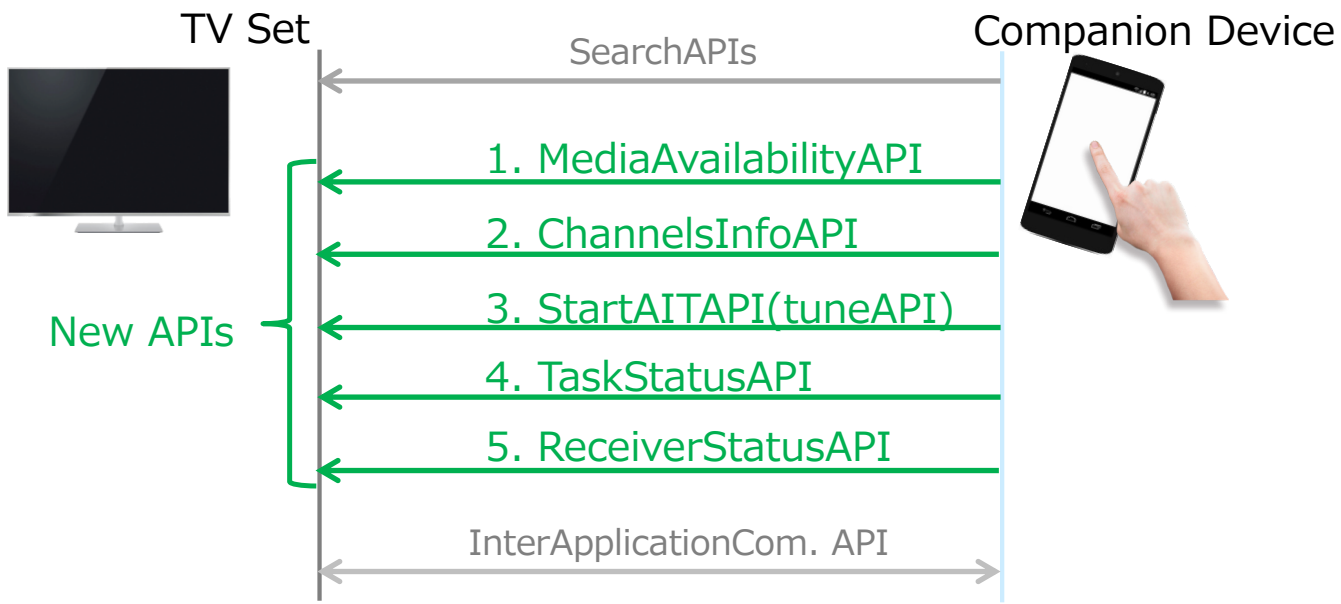
Changes channel of a TV set and launches Hybridcast app(HTML) on the TV set

4. TaskStatusAPI

Get status of startAITAPI request

5. ReceiverStatusAPI

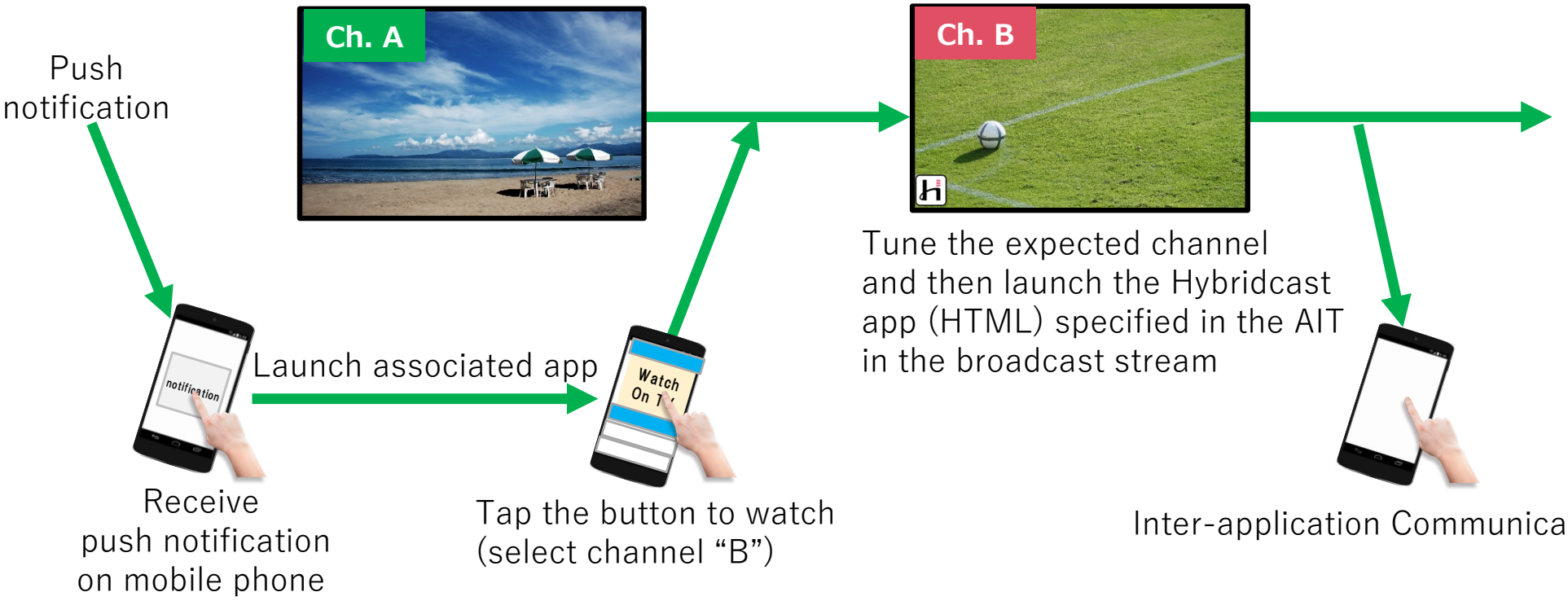
Get status of HTML5 browser, the number of communicating apps on companion devices, and current channel



Supposed use cases in version 2.0 spec. (1)

Smooth guide from a mobile service to the broadcast program for TV by minimal actions

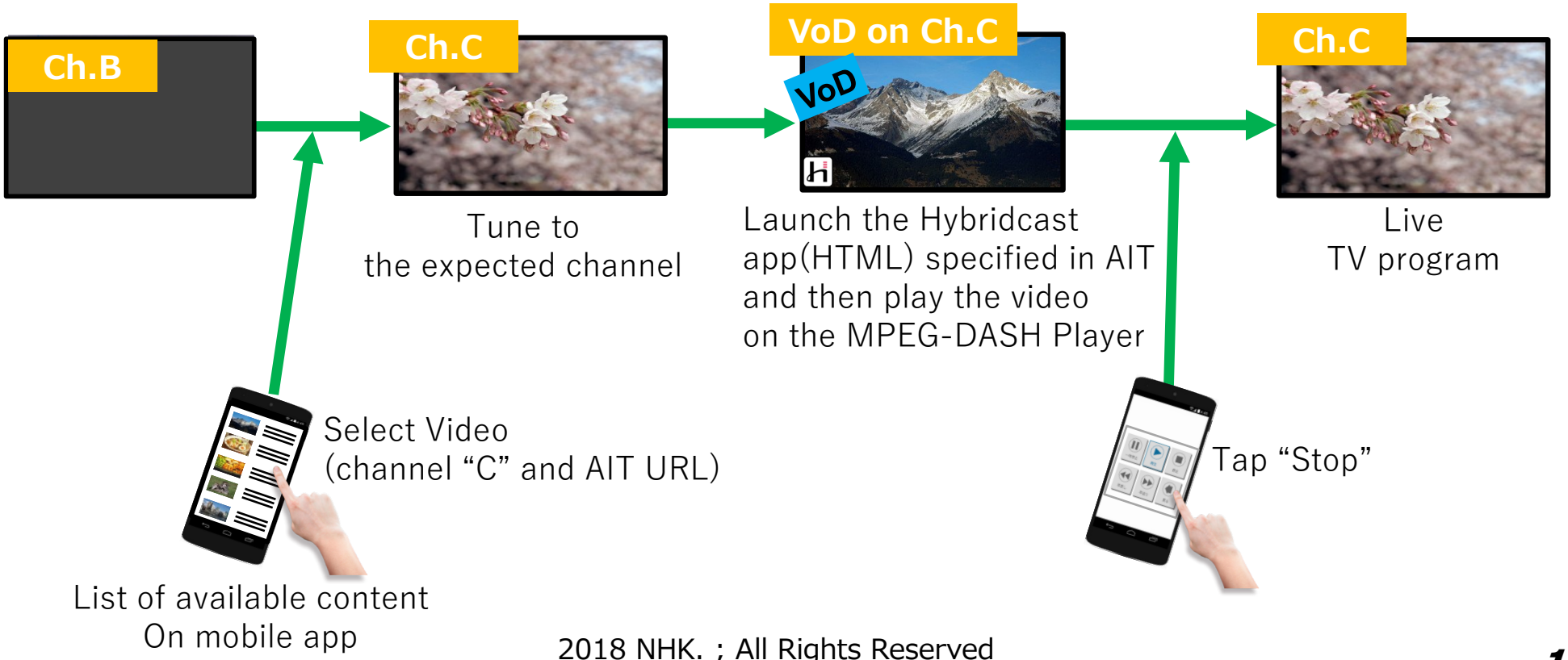
- Guide to the specific TV program by mobile push notification



Supposed use cases in version 2.0 spec (2)

Smooth guide from a mobile service to the broadcast program for TV by minimal actions

- Start watching VOD(catchup) content or Live TV Program initiated by the Companion Screen Apps.(MPEG-DASH Video Player is called by Hybridcast app. on a TV Set)



Ohter Updates

Updates of Hybridcast Video

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- Hybridcast Video
  - standardized in operational guideline 2.5 , 2017
- Compatibility Tests
  - Reference implementation of MSE Library : “dashNX” as a verification tool
  - Conditions to pass the test is defined by IPTVF
  - A TV-set needs to pass the tests to get “Hybridcast Video” Logo
- Daily Hybridcast Video Service
  - A Commercial Satellite Broadcaster launched the service since Dec. 2017

HDR handling

- Update of Operational Guideline
  - Published on Sep. 2018
  - ITU-R BT.2100(HLG/HDR10) and BT.2020(WCG) added for Hybridcast Video (MPEG-DASH)
  - ITU-R BT.709 color space in 4K Video will be deprecated for the future
- Test for HDR handling
  - Performed in Oct. 2017
  - The Hybridcast app used in the test requests HDR(HLG) video delivery for HDR enabled TV sets. SDR video is delivered otherwise.
  - “TV set will have careful consideration” is highlighted in operational guideline against difference of color space between CSS and HDR video.

Reference

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

Thank you very much for your kind attention!