Terrestrial UHD and Interactive Service in Korea

Nov. 14th 2018

JEONG-DEOK, KIM
KBS, KOREA
Contents

- UHD Broadcasting in Korea
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UHD Broadcasting in KOREA

Launching Event of UHD Broadcasting @KINTEX

Regular Broadcasting Started: May 31, 2017

KBS UHDTV Master Control Room
UHD Situation in Korea

2012 ~ 2015
- DVB-T2 Experimental Broadcast

2016
- DVB-T2 Experimental Broadcast
- ATSC3.0 Experimental Broadcast
- Nov. 2016 ATSC3.0 Test Broadcast

2017
- May 31, 2017 ATSC3.0 Regular 4K UHD Broadcast
- Nov. 2017 UHD Interactive Service (IBB Standard) “TIVIVA”

2018
- Feb. 2018 Winter Olympic Games TIVIVA2.0 UHD Mobile Test Service

Spectrum Allocation Sep. 2015
- T-UHD Policy by MSIT, KCC Dec. 2015

- T-UHD Licensed by KCC Nov. 2016

Video
- 4K (3840×2160 60P), Codec : HEVC
- Max 5.1 Ch, Codec : AAC
- MPEG2 TS (Transport Stream)

Audio
- Max 10.2 or 7.1.4 Ch, Codec : MPEG-H 3DA
- MMT (MPEG Media Transfer), ROUTE (Real-time Object delivery over Unidirectional Transport)

※ MSIT : Ministry of Science and ICT
※ KCC : Korea Communications Commission
※ TTA : Telecommunications Technology Association
UHD Spectrum Allocation and Program Regulation

KBS, MBC, SBS, EBS: Around 700MHz

Regulation for 4k UHD Program Schedule Ratio

<table>
<thead>
<tr>
<th>Year</th>
<th>2017~</th>
<th>2020~</th>
<th>2023~</th>
<th>2027~</th>
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<tbody>
<tr>
<td>4k Program Ratio (%)</td>
<td>5%</td>
<td>25%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>UHD Channel Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minutes per Day</td>
<td>63</td>
<td>315</td>
<td>630</td>
<td>1,260</td>
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<tr>
<td>Hours per Year</td>
<td>23,114</td>
<td>115,570</td>
<td>231,140</td>
<td>462,280</td>
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by MSIT Sep. 2015
FBMF Introduction

Future Broadcast and Media Standards Forum

✓ Mission
  ➢ Developing the Future broadcast and Media service specification
  ➢ Research & Propagating the Future broadcast and media service
  ➢ Cooperate with government and International standard organizations

✓ Specifications
  ➢ Transmission and Reception for Terrestrial UHDTV Broadcasting Service
  ➢ Standard for Terrestrial UHD Integrated Broadcast Broadband (IBB)
  ➢ UHDTV/FTV Broadcasting
  ➢ UHDTV/FTV Video/Audio
  ➢ Immersive Media
  ➢ Radio/Mobile Broadcasting Service
FBMF Organization

● Forum Members
  ✓ Total 37 organizations and 46 personal members
  ✓ Broadcasters: KBS, MBC, SBS, EBS
  ✓ Industries: LG, Samsung, Aircode, DigiCAP, Alticast, KaiMedia, etc
  ✓ Institutes and Universities: ETRI, KETI, TTA, SNU, KAIST, etc

● Organization
IBB Service Standard

- **IBB (Integrated Broadcast Broadband) Service**
  - Provides domestic terrestrial UHDTV Viewers with various interactive content service while watching TV
  - Defines method of providing interactive service application based on web through the broadcast and/or broadband network while watching UHD broadcasting and also defines method of providing companion screen service connecting TV and personal smart devices
  - Refers to ATSC3.0 and HbbTV2.0
# IBB Service Standard

- **UHD IBB Service Specification consists of**
  - Part 1. Common Technology
  - Part 2. Application Signaling
  - Part 3. Browser Application Environment
  - Part 4. Companion Screen Service
  - Part 5. Service Guide
  - Part 6. ACR

- **Browser Profile(part3) based on HbbTV2.0 with extensions**

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<tr>
<th>Markup</th>
<th>HTML5, HTML5 2D Canvas</th>
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<td>Text and Fonts</td>
<td>Web Open Font Format, CSS Font</td>
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<td>Graphics</td>
<td>CSS Color Module Level3, CSS Image Values and Replaced Content, CSS Background and Borders, CSS Transforms, CSS Transitions, CSS Animations</td>
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<td>Device Adaptation, Layout</td>
<td>CSS Selectors Level3, CSS Media Queries, CSS Multi-column, CSS Flexible Box, CSS conditional Rules Module Level3</td>
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<td>Scripting</td>
<td>ECMAScript262 5.1</td>
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<td>Events</td>
<td>DOM3 Event</td>
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<td>Applications APIs</td>
<td>XMLHttpRequest, Web Messaging API, Web Socket API, Web Workers API, Server-sent Events, Web Storage API</td>
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<tr>
<td>Extensions</td>
<td>Geolocation, MSE, EME, Network Information API</td>
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</table>
UHD Interactive Service

- Terrestrial UHDTV Hybrid Platform Service: TIVIVA (by KBS, MBC, SBS, Pooq)
  - Service Network Convergence: Broadcast + Broadband
  - Platform Service: Terrestrial Broadcast + OTT (Over The Top)
  - Standard: “UHD IBB Service” (IBB: Integrated Broadcast Broadband)
  - UHD, VOD, Terrestrial PP, 2nd Screen…

LTE 5G Giga Internet
IBB Interactive Service : TIVIVA

* Channel Service : Real-time TV; Broadcast, Broadband
* VOD, CLIP, Searching Service
* Personalization, Recommendation
* 2nd Screen Service
TIVIVA Examples

* PyeongChang Olympic Games 2018
TIVIVA Examples

* Russia Worldcup Games 2018
TIVIVA Examples

* VOD: UHD, HDR contents
TIVIVA Examples

* Categorized and Personalized Contents
UHD Mobile

Fixed Reception for 4K-UHD Channel

Mobile Reception for UHD-MOBILE Channel

Showcase for ATSC3.0 UHD Mobile During PyeongChang 2018 Winter Games

AS-IS

Until now, USB dongle-based EXTERNAL receiver only. Not sold on the market.

TO-BE

ATSC3.0 Chipset EMBEDDED Smartphone
Challenges

Phase 1: ~2017
- Technology: HEVC Encoder, IP Mux, Gateway, SFN, System Interoperability
- Service Model: ESG, Closed Caption, Fixed, Home Portal TiViVa 1.0
- Environment: Frequency, License, Positive Regulation

Phase 2: ~2027
- Technology: IP based Production, HDR, Scalable
- Service Model: TiViVa 2.0, TiViVa 3.0, EAS, Mobile, Monetize
- Environment: Direct Reception Rate, Compete to internet/mobile, Negative Regulation

Launch / Stabilize | Platform / Expand
Service Expansion

Mobile Broadcast
Real-time broadcast
Mobile TIVIVA
Emergency Alarm
Radio

Home-Portal
Interactivity
TIVIVA

Dashboard Infotainment
- Radio
- Audio TV
- Traffic
- Weather
- EAS

Firmware Updates
(Firmware Over the Air FOTA)

4K UHDTV (RF+IP)
UHDTV Direct Reception
TV TIVIVA
A-ESG
Event Real-time broadcast

2ND Screen
Multi-view
Target AD
A Mutual Exchange will be always welcomed for everyone to promote terrestrial interactive service in Europe and Korea in future!

Thank you!

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