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MULTIMEDIA SIGNALS

Application for Interactive Digital Television – Part 1

Harmonization of integrated broadcast- broadband digital television application control framework

Recommendation ITU-T J.208

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Harmonization of integrated broadcast-broadband digital television application control framework

Summary

Recommendation ITU-T J.208 specifies methods for harmonization of integrated broadcast-broadband (IBB) systems or their application environment by identifying commonalities across IBB systems and maximizing portability of IBB applications.

Recommendations ITU-T J.207 and ITU-R BT.2075 provide guidance to IBB service providers on the selection of IBB systems for their use. In general, IBB systems comprise various hardware and software components, and tailoring them for a specific IBB system leads to extensive development by manufacturers. On the other hand, in order to deploy the services in a wider area, IBB service providers need to develop their IBB applications for each IBB system if operators or broadcasters on which service providers intend to deploy their services use a different IBB system to that on which the services are originally deployed.

Thus, it is beneficial for both IBB service providers and manufacturers of IBB capable reception devices such as set-top boxes to harmonize IBB systems. Note that the use of companion devices is already a part of IBB services.

In addition, information about the IBB application environment for the implementation of IBB application software for other IBB systems is useful in the deployment of the same service on different IBB systems.

History

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Introduction

[b-ITU-T J.200], [b-ITU-T J.201] and [b-ITU-T J.202] are Recommendations for the harmonization of interactive television (TV) systems and content. [b-ITU-T J.201] specifies the common core of presentation engines, intermediate language for the conversion of interactive content, and the runtime environment required to provide multiple language options. [b-ITU-T J.202] specifies the common core of the execution engines. [b-ITU-T J.200] specifies the high-level architecture of the common core.

As described in [b-ITU-T J.205], integrated broadcast-broadband (IBB) systems combine both broadcast and broadband. By the use of broadband, IBB systems enable more flexible services than interactive TV systems. Further, the use of broadband allows IBB systems to easily offer international services.

The IBB systems included in [ITU-T J.207], namely HbbTV [b-ETSI TS 102 796] [b-ETSI TS 102 809], Hybridcast [b-IPTVFJ STD-0010] Hybridcast [b-IPTVFJ STD-0010] [b-IPTVFJ STD-0011] [b-IPTVFJ STD-0013] [b-ARIB STD-B24] [b-ARIB STD-B62], HbbTV 2.0 [b-ETSI TS 102 796] [b-ETSI TS 102 809], TOPSmedia [b-TTAK.KO-07.0111] and Ginga [b-ABNT NBR 15606-2] [b-ABNT NBR 15606-11], TOPSmedia [b-TTAK.KO-07.0111], and Ginga-HTML5 [b-ABNT NBR 15606-2] [b-ABNT NBR 15606-11] are all systems based on hypertext markup language (HTML). However, applications in these systems are not compatible, and therefore, construction of individual application(s) for the same services in each system is required. To exchange IBB services offered by the IBB systems considered in [ITU-T J.207] and to deploy these services in an area where other systems are used, it is important to harmonize the IBB systems to ensure compatibility with IBB applications and interoperability across systems.

This Recommendation specifies methods to harmonize the IBB systems in [ITU-T J.207] based on an analysis of these systems from several perspectives.

Recommendation ITU-T J.208

Harmonization of integrated broadcast-broadband digital television application control framework

1 Scope

This Recommendation specifies methods to harmonize IBB systems or their application environment by identifying commonalities across the IBB systems in [ITU-T J.207] and [ITU-R BT.2075] and maximizing portability of IBB applications for those systems.

[ITU-T J.207] and [ITU-R BT.2075] provide guidance on the selection of integrated broadcast-broadband (IBB) systems to those who intend to deploy IBB services. In addition to the selection of an IBB system specification, it is desirable for IBB service providers to maximize commonality or portability of their IBB applications on multiple systems to expand their service availability. It is also desirable for IBB capable receivers and their companion device manufacturers to maximize commonality of IBB systems.

NOTE – The terms "IBB system" and "IBB service" used in [ITU-R BT.2075] should be read as "IBB DTV system" and "IBB DTV service", respectively, to align with [b-ITU-T J.205].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T J.207] Recommendation ITU-T J.207 (2019), *Specification for an integrated broadcast and broadband digital television application control framework*.

[ITU-R BT.2075] Recommendation ITU-R BT.2075-1 (2017), *Integrated broadcast-broadband system*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 service associated IBB application [b-ITU-T J.205]: An application that is part of the integrated broadcast and broadband (IBB) DTV service tuned by the user at a given time.

3.1.2 stand-alone IBB application [b-ITU-T J.205]: Resident or downloaded integrated broadcast and broadband (IBB) installable application that is not part of an IBB DTV service. Such an application can be created by an authorized IBB application provider, and typically delivered through the application repository.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AIT	Application Information Table
Ajax	Asynchronous JavaScript + extensible markup language
API	Application Programming Interface
DTV	Digital Television
DVB	Digital Video Broadcasting
HDTV	High-Definition Television
HTML	Hypertext Markup Language
IBB	Integrated Broadcast-Broadband
JSON	JavaScript Object Notation
REST	Representational State Transfer
TV	Television
UI	User Interface
XML	Extensible Markup Language

5 Conventions

None.

6 Approaches for harmonization

6.1 Possible architecture of harmonized application execution environment

There are several methods to provide an IBB service by using the same application on multiple platforms.

1) Abstraction of execution environment

This approach provides an abstraction layer in the execution environment in a receiver. The abstraction layer unifies the underlying functionalities into a set of application programming interfaces (APIs) so that the upper-layer software can be individually implemented. Further, the multiple upper-layer software can be used for its specific purposes. Figure 1 shows how the abstraction layer works for the harmonization of IBB systems.

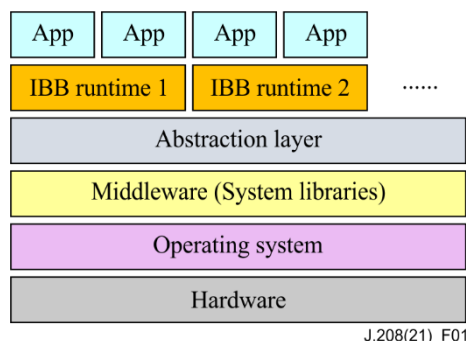


Figure 1 – Basic IBB receiver structure with an abstraction layer

In Figure 1, multiple IBB execution environments (runtime) can be implemented on the same abstraction layer. Compared with the case in [ITU-R BT.2075] and [ITU-T J.207], each IBB runtime in Figure 1 corresponds to each IBB system included in those Recommendations. Since the IBB