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SERIES J: CABLE NETWORKS AND TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

Application for Interactive Digital Television

Harmonization of procedural content formats for interactive TV applications

Recommendation ITU-T J.202

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Harmonization of procedural content formats for interactive TV applications

Summary

Recommendation ITU-T J.202 defines APIs, semantic guarantees and system aspects of platform behaviour for harmonized procedural content formats for interactive TV applications.

Since this Recommendation was approved in 2003, several procedural content formats for interactive TV applications developed by other standardization bodies have been updated or newly developed. Updated specifications include: DVB-GEM, DVB-MHP 1.0, DVB-MHP 1.1, DVB-MHP 1.2, OCAP-1.0, OCAP-1.1 and ARIB STD-B23. Also, ATSC developed ACAP and ABNT has now developed GINGA-J.

The purpose of the third revision of this Recommendation is to harmonize the specifications with a wider variety of standards including GEM 1.2, ARIB-J, GINGA-J, DVB-MHP, ACAP and OCAP. To achieve this, the common core defined in this Recommendation consists of two sets of APIs; one related to core Java technology and another for broadcast extensions, to conform to either DVB-GEM, from which several specifications are derived, or JavaDTV specification, which is the core of GINGA-J and functionally equivalent to DVB-GEM. Additional APIs specific to the standards listed above are included for information in the appendices, which are not included in the harmonized common core.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T J.202	2003-05-14	9
2.0	ITU-T J.202	2005-11-29	9
3.0	ITU-T J.202	2008-04-13	9
4.0	ITU-T J.202	2010-08-13	9

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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Harmonization of procedural content formats for interactive TV applications

1 Scope

This Recommendation is intended to harmonize the application environment for interactive TV applications. The potential for commonality in the procedural application environment is based on the analysis of the common core identified in the work leading to this Recommendation. Such commonality would benefit content providers through knowledge of commonly adopted procedural functionality and economies of scale.

NOTE – The structure and content of this Recommendation have been organized for ease of use by those familiar with the original source material; as such, the usual style of ITU-T Recommendations has not been applied.

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.200] Recommendation ITU-T J.200 (2010), *Worldwide common core – Application environment for digital interactive television services*.

[ETSI TS 102 728] ETSI TS 102 728 V1.1.1 (2010-01), *Digital Video Broadcasting (DVB); Globally Executable MHP (GEM) Specification 1.2.2*. <http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=31422>.

[ABNT 15606-6] ABNT NBR 15606-6, *Digital terrestrial television – Data coding and transmission specification for digital broadcasting – Part 6: JavaDTV 1.3.*

3 Definitions

This clause is intentionally left blank.

4 Abbreviations and acronyms

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5 Conventions

This clause is intentionally left blank.

6 Common platform definitions for interactive TV using procedural applications

The recommended platform definitions for interactive TV consist of:

1) the common core in Annex A which is derived from the commonality in [ETSI TS 102 728], [ABNT 15606-6], [b-ABNT 15606-4], [b-ARIB B23], [b-ETSI ES 201 812], [b-OCAP 1.0], [b-OCAP 1.1], [b-ATSC ACAP], [b-ETSI TS 102 812], [b-ETSI TS 102 727]. The strict adherence to the APIs in Annex A ensures binary interoperability;

2) the additional APIs as defined either:
   - in clause B.1 to conform to the specification given in [ETSI TS 102 728]. These APIs are intended for harmonization among standards derived from [ETSI TS 102 728]; or
   - in clause B.2 to conform to the specification given in [ABNT 15606-6] specification. These APIs are intended as a functional equivalent to [ETSI TS 102 728] and can be used as an alternative to it;

3) the complete specifications that build on the common core defined in Annexes A and B by providing additional guarantees required by individual organizations, where necessary;

4) the system-specific additions such as those given in Appendices I through VII and possible future additions, if necessary.

Further, attention is drawn to the fact that where there are current systems, such as [b-ARIB B24] and [b-ISO/IEC 13522-5], which are in extensive use, the addition of some functionalities may be required to assist migration to the harmonized system in the future. An example is given in Appendix VIII.

Annex A

Common core APIs

(This annex forms an integral part of this Recommendation)

This annex describes APIs for common Java functionalities.

java.awt
java.awt.event
java.awt.image
java.beans
java.io
java.lang
java.lang.reflect
java.math
java.net
java.rmi
java.security
java.security.cert
java.security.spec
java.util
java.util.zip
javax.media
javax.media.protocol
javax.net
javax.net.ssl
javax.security.cert
javax.tv.graphics
javax.tv.locator
javax.tv.media
javax.tv.net
javax.tv.service
javax.tv.service.guide
javax.tv.service.navigation
javax.tv.service.selection
javax.tv.service.transport
javax.tv.util
*java.awt.color
*java.awt.font
*java.awt.im

*java.lang.reflect
*java.math
*java.rmi.registry
*java.security.acl
*java.security.interfaces
*java.text
*java.util.jar
*javax.microedition.io
*javax.microedition.pki
*javax.microedition.xlet
*javax.microedition.xlet.ixc
*javax.security.auth.x500

NOTE – Packages with symbol * require careful consideration of compatibility with systems based on older versions of this Recommendation. See clause 2.

Annex B

Broadcast extension APIs

(This annex forms an integral part of this Recommendation)

This annex describes broadcast extension APIs in addition to those listed in Annex A. APIs which are intended to provide harmonization among standards derived from [ETSI TS 102 728] are described in clause B.1. APIs for those functionalities derived from [ABNT 15606-6] are described in clause B.2.

B.1 Additional APIs to conform to globally executable MHP

In this clause, additional APIs to the common core in Annex A are defined. These are intended to provide harmonization among standards derived from [ETSI TS 102 728]. The standards are [b-ETSI ES 201 812], [b-ETSI TS 102 812], [b-ETSI TS 102 727], [b-OCAP 1.0], [b-OCAP 1.1], [b-ATSC ACAP] and [b-ARIB B23]. These additional APIs should be used in conjunction with common core APIs.

NOTE – [ETSI TS 102 728] covers the broadcast IPTV targets. There are a few APIs that are not required when only the broadcast target is implemented. Similarly, there are a few APIs that are not required when only the IPTV target is implemented. However, when a broadcast target or a hybrid broadcast and IPTV target is implemented, it is mandatory that all the required APIs and other definitions are included as specified in this Recommendation.

org.davic.media
org.davic.resources
org.davic.mpeg
org.davic.mpeg.sections
org.davic.net
org.davic.net.tuning
org.dvb.applications
org.dvb.dsmcc
org.dvb.event
org.dvb.io.ixc
org.dvb.io.persistent
org.dvb.lang
org.dvb.media
org.dvb.net
org.dvb.net.tuning
org.dvb.net.rc
org.dvb.test
org.dvb.ui
org.dvb.user
org.havi.ui
org.havi.ui.event

B.2 Additional APIs to conform to JavaDTV specification

com.sun.dtv.application
com.sun.dtv.broadcast
com.sun.dtv.broadcast.event
com.sun.dtv.filtering
com.sun.dtv.io
com.sun.dtv.locator
com.sun.dtv.lwuit
com.sun.dtv.lwuit.animations
com.sun.dtv.lwuit.events
com.sun.dtv.lwuit.geom
com.sun.dtv.lwuit.layouts
com.sun.dtv.lwuit.list
com.sun.dtv.lwuit.painter
com.sun.dtv.lwuit.plaf
com.sun.dtv.lwuit.util
com.sun.dtv.media
com.sun.dtv.media.audio
com.sun.dtv.media.control
com.sun.dtv.media.dripfeed
com.sun.dtv.media.format
com.sun.dtv.media.language
com.sun.dtv.media.text
com.sun.dtv.media.timeline
com.sun.dtv.net
com.sun.dtv.platform
com.sun.dtv.resources
com.sun.dtv.security
com.sun.dtv.service
com.sun.dtv.smartcard
com.sun.dtv.test
com.sun.dtv.transport
com.sun.dtv.tuner
com.sun.dtv.ui
com.sun.dtv.ui.event

Appendix I

Specific additional APIs common to MHP 1.0.3, MHP 1.1.1 and MHP 1.2

(This appendix does not form an integral part of this Recommendation)

org.davic.mpeg.dvb
org.davic.net.ca
org.dvb.net.ca
org.dvb.si

Appendix II

Specific additional APIs common to OCAP 1.0 and OCAP 1.1

(This appendix does not form an integral part of this Recommendation)

org.ocap
org.ocap.application
org.ocap.event
org.ocap.hardware
org.ocap.hardware.pod
org.ocap.media
org.ocap.mpeg
org.ocap.net
org.ocap.resource
org.ocap.service
org.ocap.si
org.ocap.system
org.ocap.ui.event
org.ocap.storage
org.ocap.system.event
org.ocap.test
org.ocap.ui

Appendix III

OCAP 1.1-specific additional APIs

(This appendix does not form an integral part of this Recommendation)

org.ocap.diagnostics
org.ocap.environment

Appendix IV

ARIB STD-B23-specific additional APIs

(This appendix does not form an integral part of this Recommendation)

jp.or.arib.tv.media
jp.or.arib.tv.net
jp.or.arib.tv.si
jp.or.arib.tv.ui
org.davic.net.ca
jp.or.arib.tv.peripheral
jp.or.arib.tv.peripheral.devices
jp.or.arib.tv.peripheral.protocol
jp.or.arib.tv.peripheral.stream
jp.or.arib.tv.io
jp.or.arib.tv.service.selection
org.ocap.shared.dvr
org.ocap.shared.dvr.navigation
org.ocap.shared.media

Appendix V

MHP 1.2-specific additional APIs

(This appendix does not form an integral part of this Recommendation)

org.dvb.application.inner
org.dvb.application.privileged
org.dvb.application.plugins
org.dvb.application.storage
org.dvb.auth.callback
org.dvb.dom.bootstrap
org.dvb.dom.css
org.dvb.dom.dvbhtml
org.dvb.dom.environment
org.dvb.dom.event
org.dvb.dom.inner
org.dvb.internet
org.dvb.smartcard
org.dvb.spi
org.dvb.tvanytime
org.dvb.xml
org.w3c.dom
org.w3c.dom.events
org.w3c.dom.views

Appendix VI

ACAP-specific additional APIs

(This appendix does not form an integral part of this Recommendation)

org.atsc.dom
org.atsc.dom.environment
org.atsc.dom.events
org.atsc.dom.html
org.atsc.dom.views
org.atsc.si
org.ocap.media
org.ocap.net
org.ocap.si
org.ocap.ui.event
org.ocap.application
org.ocap.event
org.ocap.service
org.ocap.system
org.ocap.hardware.pod
org.w3c.dom
org.w3c.dom.css
org.w3c.dom.events
org.w3c.dom.html2
org.w3c.dom.views

Appendix VII

Ginga-J-specific additional APIs

(This appendix does not form an integral part of this Recommendation)

br.org.sbtvd.net
br.org.sbtvd.net.si
br.org.sbtvd.net.tuning
br.org.sbtvd.bridge
br.org.sbtvd.ui
com.sun.net.ssl
javax.net
javax.net.ssl
javax.security.cert
javax.crypto
javax.crypto.interface
javax.crypto.spec
javax.microedition.apdu

Appendix VIII

Proposed changes to the MHP specification in order to assist migration to MHP from MHEG-5 ([b-ISO/IEC 13522-5])

(This appendix does not form an integral part of this Recommendation)

The process of migration may be assisted by modification and/or addition to a harmonized specification. By way of example, proposals for migration from MHEG-5 to DVB-MHP, as mentioned in clause 6, are given below:

1) Extend the graphics APIs to support drawing lines thicker than 1 pixel for all primitives. This could be implemented by extending the underlying PersonalJava specification or by making DVB-specific extensions.

2) Add 14:9 font support to the DVBTextLayoutManager. If this is not feasible, then it may be possible to use a defensive solution of 16:9 for all display types. This would distort the font (by compressing it horizontally) but would ensure the expected text flow.

   However, the logical widths calculated when using this aspect ratio would be different, resulting in the line breaks being inserted at different points in the body of text. More importantly, anything other than very basic formatted text (relying on tabulation) would have a slim chance of being rendered correctly.

3) Add VK_CANCEL to the set of minimum supported key events.

4) Synchronize the character repertoire to MHEG repertoire specified in [b-ETSI ES 202 184].

5) Provide CI AppMMI extensions; the ability for an interoperable plug-in to register itself as a handler for specific application domains, and the ability to operate a data pipe to the source module.

Bibliography

[b-ABNT 15606-4] ABNT NBR 15606-4, *Digital terrestrial television – Data coding and transmission specification for digital broadcasting – Part 4: Ginga-J Environment for execution of procedural applications.*

[b-ARIB B23] ARIB STD-B23 V1.2 (2009), *Application Execution Engine Platform for Digital Broadcasting.* <http://www.arib.or.jp/english/html/overview/archives/br.html>.

[b-ARIB B24] ARIB STD-B24 V5.4 (2009), *Data Coding and Transmission Specification for Digital Broadcasting*. <http://www.arib.or.jp/english/html/overview/archives/br.html>.

[b-ATSC ACAP] ATSC A/101 (2005), *Advanced Common Application Platform (ACAP).* <http://www.atsc.org/cms/standards/a_101a.pdf>.

[b-ETSI ES 201 812] ETSI ES 201 812 v1.1.2, *Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.0.3*. <http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=25178>.

[b-ETSI ES 202 184] ETSI ES 202 184 V.1.1.1 (2004-11), *MHEG-5 Broadcast Profile*.

[b-ETSI TS 102 727] ETSI TS 102 727 v1.1.1, *Digital Video Broadcasting (DVB); Multimedia Home Platform specification 1.2.2*. <http://webapp.etsi.org/WorkProgram/Report_WorkItem.asp?WKI_ID=31420>.

[b-ETSI TS 102 812] ETSI TS 102 812 v1.2.2, *Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.1.1*. <http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=25177>.

[b-ISO/IEC 13522-5] ISO/IEC 13522-5:1997, *Information technology – Coding of multimedia and hypermedia information – Part 5: Support for base-level interactive applications.*

[b-OCAP 1.0] OCAP 1.0.1 (March 2008), *OCAP 1.0.1 Profile*. <http://www.opencable.com/specifications/ocap.html>.

[b-OCAP 1.1] OC-SP-OCAP 1.1.2-090930, *OCAP 1.1 Profile*. <http://www.cablelabs.com/specifications/OC-SP-OCAP1.1.2-090930.pdf>.

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