RECOMMENDATION ITU-R BT.1722-1

Harmonization of the instruction set for the execution engine for interactive TV applications

(Question ITU-R 13/6)

(2005-2007)

Scope

This Recommendation is intended to harmonize the application environment for interactive TV applications. The potential for commonality in the executable 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 executable functionality and economies of scale.

The ITU Radiocommunication Assembly,

considering

a) the need to avoid proliferation of protocols for interactive multimedia services;

b) that digital broadcasting services (satellite, terrestrial and cable) are becoming widely available and offer multimedia applications;

c) that multimedia applications comprising video, audio, still-picture, text, graphics, etc. associated with interactive features have been developed;

d) that multimedia applications planned or deployed in some Regions are using the executable application environment;

e) that common instruction sets are desirable for production and international exchange of multimedia content;

f) that continuous work and review of Application Programming Interfaces (APIs) is being carried out in the ITU-R and ITU-T Sectors;

g) that ITU-T Recommendation J.200 defines the high-level architecture for a harmonized set of interactive instruction sets and APIs and identifies the structure of application environment comprising the executable application environment and the declarative application environment for digital television services;

h) that ITU-T Recommendation J.202 defines the executable application environment within ITU-T Recommendation J.200 and is the corresponding Recommendation to Recommendation ITU-R BT.1722,

recommends

1 that the harmonized instruction set for the execution engines specified in Annex 1 should be used for interactive TV applications in the executable application environment.

Annex 1

Harmonization of the instruction set for the execution engine for interactive TV applications

1   Introduction

This Annex specifies the common core APIs consisting of those described in Table 1 and the Globally Executable MHP (GEM) specification published in ETSI TS 102 819 V1.2.1.

2   References

2.1   Normative references

The following texts contain provisions which, through reference in this text, constitute provisions of the present Recommendation.

ITU-T Recommendation J.200 (2001), Worldwide common core – Application environment for digital interactive television services with its Corrigendum 1 (2004-05).

ETSI TS 102 819 V1.2.1 (2004-05), Digital Video Broadcasting (DVB) Globally Executable MHP (GEM) http://www.itu.int/ITU-R/study-groups/docs/rsg6-etsi/index.html.

2.2   Informative references

ETSI TS 101 812 V1.3.1, *Digital Video Broadcasting Multimedia Home Platform (MHP) version 1.0.3*
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=18799.

–   SCTE 90-1 2004, *OCAP 1.0 Profile*
http://www.scte.org/documents/pdf/ANSISCTE9012004.pdf.

–   ARIB STD-B24 V4.0 (5 February 2004), *Data Coding and Transmission Specification for Digital Broadcasting*
http://www.itu.int/md/meetingdoc.asp?type=sitems&lang=e&parent=R03-WP6M-C-0062.

–   ARIB STD-B23 V1.1 (5 February 2004), *Application Execution Engine Platform for Digital Broadcasting (in Japanese)*
http://www.arib.or.jp/english/html/overview/sb_j.html.

–   ATSC A/101 (2 August 2005), *Advanced Common Application Platform (ACAP)*
http://www.atsc.org/standards/a_101.pdf.

–   ISO/IEC 13522-5:1997, *Information technology – Coding of multimedia and hypermedia information – Part 5: Support for base-level interactive applications*.
http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=26876&ICS1=35&ICS2=40&ICS3=.

–   ETSI ES 202 184, *MHEG-5 Broadcast Profile*.
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=16127.

–   ETSI TS 102 812 V1.2.1 Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.1.1
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=18801.

NOTE 1 – References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific:

–   for a specific reference, subsequent revisions do not apply;

–   for a non-specific reference, the latest version applies.

3   Common platform definitions for interactive TV using executable applications

The recommended platform definitions for interactive TV consist of the common core in Table 1 which is derived from the commonality in ARIB STD-B23, MHP 1.0.3, MHP 1.1.1, ACAP and OCAP 1.0 and Globally Executable MHP.

TABLE 1

Common core APIs

java.awt
java.awt.event
java.awt.image
java.awt.peer
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
javax.tv.xlet
org.davic.media
org.davic.resources
org.davic.mpeg
org.davic.mpeg.sections
org.davic.net

TABLE 1 (*end*)

org.davic.net.tuning
org.dvb.application
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

4   Globally Executable MHP

For GEM, ETSI Standard TS 102 819 V1.2.1 applies. This Standard specifies a set of interfaces, and the semantic guarantees underlying those interfaces to enable binary interoperability of applications between different receiver specifications and/or standards.

The full text of TS 102 819 V1.2.1 can be found on the ETSI website at http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=19737.

NOTE – The complete specifications that are built on TS 102 819 V1.2.1, provide additional guarantees required by individual organizations, where necessary.

5   Appendices

In the following appendices, the system-specific APIs are given to supplement the common core where appropriate and for possible future use.

Further, attention is drawn to the fact that where there are current systems, such as BML (see ARIB STD-B24) and MHEG-5, which are in extensive use, the addition of some functionalities may be required to assist migration to the harmonized system in future. An example is given in Appendix VI.

Appendix I

Specific additional APIs common
to MHP 1.0.3 and MHP 1.1

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

Appendix II

OCAP 1.0 specific additional APIs

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

Appendix III

ARIB STD-B23 specific additional APIs

jp.or.arib.tv.media
jp.or.arib.tv.net
jp.or.arib.tv.si
jp.or.arib.tv.ui
org.davic.net.ca

Appendix IV

MHP 1.1 specific additional APIs

java.applet
java.awt.datatransfer
java.text
org.dvb.application.inner
org.dvb.application.plugins
org.dvb.application.storage
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.w3c.dom
org.w3c.dom.events
org.w3c.dom.views

Appendix V

ACAP specific additional APIs

org.atsc.dom
org.atsc.dom.environment
org.atsc.dom.events
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 VI

**Proposed changes to the MHP specification in order
to assist migration to MHP from MHEG-5**

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 5, 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 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.

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