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OF TELEVISION, SOUND PROGRAMME AND OTHER
MULTIMEDIA SIGNALS

Application for Interactive Digital Television – Part 1

Harmonization of declarative content format for interactive television applications

Recommendation ITU-T J.201

ITU-T

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Recommendation ITU-T J.201

Harmonization of declarative content format for interactive television applications

Summary

Recommendation ITU-T J.201 is intended to harmonize the application environment for declarative content for interactive television. It specifies common elements, media types and APIs at the syntactic level of the declarative application environment.

This edition includes enhancements of broadcast markup language (BML) to provide functionalities for some scenarios of integrated broadcast-broadband (IBB) digital television (DTV) services.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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Table of Contents

		Page
1	Scope.....	1
2	References.....	1
3	Definitions	2
3.1	Terms defined elsewhere	2
3.2	Terms defined in this Recommendation.....	2
4	Abbreviations and acronyms	2
5	Conventions	2
6	Recommendation	2
	Annex A – Common core	3
A.1	Methodology.....	3
A.2	Media type	3
A.3	XML markup	3
A.4	Stylesheet.....	5
A.5	Scripting language	7
A.6	DOM API	8
	Annex B – Additional elements, media types and APIs for BML.....	10
B.1	Additional BML media types	10
B.2	Additional BML XML markup	11
B.3	Additional BML CSS properties	12
B.4	Additional BML DOM APIs	13
B.5	Additional functions for integrated broadcast-broadband services	16
	Annex C – Additional elements, media types and APIs for ACAP-X	19
C.1	Additional ACAP-X media types	19
C.2	Additional ACAP-X XML markup	19
C.3	Additional ACAP-X CSS properties	20
C.4	Additional ACAP-X stylesheet attributes	20
C.5	Additional ACAP-X DOM APIs	20
	Annex D – Additional elements, media types and APIs for DVB-HTML	23
D.1	Additional DVB-HTML media types.....	23
D.2	Additional DVB-HTML XML markups	23
D.3	Additional DVB-HTML CSS properties.....	24
D.4	Additional DVB-HTML DOM APIs.....	24
	Annex E – Presentation interoperability through translation.....	26
	Annex F – Presentation integration of multiple formats for declarative applications	27
	Bibliography.....	31

Recommendation ITU-T J.201

Harmonization of declarative content format for interactive television applications

1 Scope

This Recommendation is intended to harmonize the application environment for declarative content for interactive TV. It specifies common elements, media types and APIs at the syntactic level of the declarative application environment to satisfy regional application requirements for the four standards: ACAP-X [ATSC A/101], BML [ARIB STD-B24], Ginga-NCL [ABNT 15606-2] [ABNT 15606-5] and DVB-HTML[ETSI TS 102 322] [ETSI TS 102 812]. This Recommendation is divided into six annexes. Annex A describes the common core for XHTML-related technologies of the four standards. Annex B describes additional functionality outside the common core for BML. Annex C describes additional functionality outside the common core for ACAP-X. Annex D describes additional functionality outside the common core for DVB-HTML. The format described in Annex E is intended as the intermediate format for translation between formats including the common core and the standards covered in this Recommendation. The format described in Annex F is a framework to bind content authored in multiple formats into single content.

It is noted that there are other formats such as ETSI MHEG-5 [b-ETSI ES 202 184], which contain declarative functions that are not covered in this Recommendation. However, the migration from environments in current use to the harmonized environment is assisted by the identification of a common core and translation using the intermediate format.

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), <i>Worldwide common core – Application environment for digital interactive television services.</i> |
| [ETSI TS 102 322] | ETSI TS 102 322 V1.1.1 (2004), <i>Specification for a Lightweight Microbrowser for interactive TV applications, based on and compatible with WML.</i> |
| [ETSI TS 102 812] | ETSI TS 102 812 V1.2.1 (2003), <i>Digital Video Broadcasting (DVB); Multimedia Home Platform (MHP) Specification 1.1.1.</i> |
| [ABNT 15606-2] | ABNT NBR 15606-2 V2 (2007), <i>Digital terrestrial television – Data coding and transmission specification – Part 2: Ginga-NCL for fixed and mobile receivers: XML application language for application coding.</i> |
| [ABNT 15606-5] | ABNT NBR 15606-5 V2 (2008), <i>Digital terrestrial television – Data coding and transmission specification – Part 5: Ginga-NCL for portable receivers: XML application language for application coding.</i> |
| [ARIB STD-B24] | ARIB STD-B24 Ver.5.3 (2013), <i>Data Coding and Transmission Specification for Digital Broadcasting.</i> |
| [ATSC A/101] | ATSC A/101 (2005), <i>Advanced Common Application Platform (ACAP).</i> |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 application programming interface [ITU-T J.200]

3.1.2 cascading style sheet [ITU-T J.200]

3.1.3 document object model [ITU-T J.200]

3.1.4 integrated broadcast and broadband (IBB) DTV service [b-ITU-T J.205]

3.1.5 nested context language [ITU-T J.200]

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ACAP-X ACAP declarative (XHTML)

API Application Programming Interface

BML Broadcast Markup Language

CSS Cascading Style Sheet

DOM Document Object Model

DTV Digital Television

HTML Hyper Text Markup Language

IBB Integrated Broadcast-Broadband

MHEG Multimedia Hypermedia Experts Group

NCL Nested Context Language

VOD Video On Demand

wTVML worldwide Television Markup Language

XHTML extensible Hyper Text Markup Language

XML extensible Markup Language

5 Conventions

None.

6 Recommendation

The harmonized declarative content formats specified in Annexes A-F should be used for interactive TV applications in the declarative application environment.

When additional interoperability to the core functionality of the declarative content formats defined in this Recommendation is required, the approach described in Annexes E and F is recommended.

Annex A

Common core

(This annex forms an integral part of this Recommendation.)

Methodology for common core, common core of media types, extensible markup language (XML) markup, stylesheet markup, monomedia and behavioural application programming interfaces (APIs), which are based on the commonality between ACAP declarative (XHTML) (ACAP-X), broadcast markup language (BML), Ginga-nested context language (NCL) and DVB-HTML, are described below. Note that BML has four content profiles. Except where otherwise noted, all four profiles of BML are assumed. Note also that NCL embeds HTML objects requiring the common core conformance.

A.1 Methodology

A.1.1 Layer model

The graphics layer should lie on top of other layers such as video or text plane.

A.1.2 Application lifecycle

There should be a mechanism to destroy an application from outside the application itself.

A.2 Media type

Common media types are listed in Table A.1.

Table A.1 – Common media types

Image/jpeg
Image/png
Text/cascading style sheet (css)
Application/xhtml+xml

A.3 XML markup

Common XML markups are listed in Table A.2.

Table A.2 – Common XML markup modules

Structure
Text
Hypertext
List
Presentation
Bidirectional text
Forms
Image
Client-side image map
Object
Frames

Table A.2 – Common XML markup modules

Target
Meta information
Scripting
Stylesheet
Style attribute
Link
Base

Common XML markups for the BML for basic services ("fixed terminal profile"), Ginga-NCL XHTML objects, ACAP-X and DVB-HTML are listed in Table A.3.

Table A.3 – Common XML markup for BML for basic services, Ginga-NCL XHTML objects, ACAP-X and DVB-HTML

Common attributes		
Core attributes		id class
Style attributes		
		style
Core modules		
Structure module		
	body	%Core.attrib
	head	
	title	
Text module		
	br	%Core.attrib
	div ¹⁾	%Common.attrib
	p ^{1), 2)}	%Common.attrib
	span	%Common.attrib
Hypertext module		
	a	%Common.attrib accesskey href
Forms modules		
Forms module		
	input ¹⁾	%Common.attrib accesskey disabled readonly maxlength type value

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**Table A.3 – Common XML markup for BML for basic services,
Ginga-NCL XHTML objects, ACAP-X and DVB-HTML**

Object module		
	object ¹⁾	%Common.attrib data type
Metainformation module		
	meta	name content
Scripting module		
	script	
Stylesheet module		
	style	
¹⁾ Only these elements can be a child element of <div>.		
²⁾ Only these elements and CDATA can be a child element of <p>.		

A.4 Stylesheet

A.4.1 Common stylesheet properties

Common stylesheet properties are listed in Table A.4.

Table A.4 – Common stylesheet properties

Background	Clear	Outline-color
Background-attachment	Clip	Outline-style
Background-color	Color	Outline-width
Background-image	Content	Overflow
Background-position	Counter-increment	Padding
Background-repeat	Counter-reset	Padding-bottom
Border	Cisplay	Padding-left
Border-bottom	Float	Padding-right
Border-bottom-color	Font	Padding-top
Border-bottom-style	Font-family	Position
Border-bottom-width	Font-size	Right
Border-color	Font-style	Text-align
Border-left	Font-variant	Text-decoration
Border-left-color	Font-weight	Text-indent
Border-left-style	Height	Text-transform
Border-left-width	Left	Top
Border-right	Letter-spacing	Vertical-align
Border-right-color	Line-height	Visibility
Border-right-style	List-style	White-space
Border-right-width	List-style-image	Width
Border-style	List-style-position	Word-spacing
Border-top	List-style-type	Z-index
Border-top-color	Margin	Nav-index
Border-top-style	Margin-bottom	Nav-left

Table A.4 – Common stylesheet properties

Border-top-width	Margin-left	Nav-right
Border-width	Margin-right	Nav-up
Bottom	Margin-top	Nav-down
Caption-side	Outline	

Common stylesheet properties for BML for basic services, Ginga-NCL XHTML objects, ACAP-X and DVB-HTML are listed in Table A.5.

Table A.5 – Common stylesheet properties for BML for basic services, Ginga-NCL XHTML objects, ACAP-X and DVB-HTML

@media	Left ¹⁾	Background-image
Margin	Top ¹⁾	Background-repeat
Padding-top	Width ¹⁾	Font-family
Padding-right	Height ¹⁾	Font-size
Padding-bottom	Z-index	Font-weight
Padding-left	Line-height	Text-align
Border-width	Display	Letter-spacing
Border-style	Visibility	White-space
Position	Overflow	Background-image
¹⁾ The elements <input>, <object>, <div> and <p> must have these property values. The elements , <a>, must not have these property values.		

Furthermore, the following restrictions should be applied:

- Display property:
Only block element can be applied for <p>, <div>, <body>, <input> and <object>.
Only inline values can be applied for
, <a> and .
- Position property:
Only absolute values can be applied for <p>, <div>, <input> and <object>.
Only static values can be applied for
, and <a>.

A.4.2 Common CSS selectors

Common CSS selectors are listed in Table A.6.

Table A.6 – Common CSS selectors

Universal
Type
Descendant
Class
Id
:first-child pseudo-class
:link pseudo-class
:hover pseudo-class
:active pseudo-class
:focus pseudo-class
:lang pseudo-class