



MPEG-4 BIFS and MPEG-2 TS: Latest developments for digital radio services

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Chronology of MPEG-4 BIFS new dev. for Digital Radio Services

- **Requirement Phase (July 2008 – July 2009)**
 - V0 July 2008, V1 Oct. 2008, V2 Feb. 2009, V3 Apr. 2009, V4 July 2009 (N10856)
- **Development Phase (Feb. 2009 – Apr. 2010)**
 - WD1.0 Feb.2009, CfP Apr. 2009, PDAM July 2009, FPDAM Oct. 2009, Study Jan. 2010, FDAM Apr. 2010 (N11251)
- **Published as ISO/IEC 14496-11:2005/Amd 7:2010**
 - Dec. 2010
- **Reference & Conf. Soft (Jan. 2011 – now)**
 - 14496-4:2004/AMD 40 (N11716)
 - 14496-5:2001/AMD 30 (N11720)



Requirements

- **Backward compatibility with Core2D**
- **Maximize quality while minimizing bit rate**
- **Avoid modifications of T-DMB transport layers**
- **Minimize the additional implementation costs**

- **Provide new features for**
 - Vector Graphics enhancements
 - Text handling
 - Scene layout
 - Adaptation
 - Navigation
 - Delivery of images
 - Scene state management
 - Integration with external data sources



Content of the Amendment

■ New tools

- CacheTexture
- EnvironmentTest
- KeyNavigator
- Storage
- ExtendedReplace & ExternalReplace (To/From) Updates

■ Minor modifications

- Layout Node with "justify" alignment
- Valuator Node for concatenation of strings

■ XCore2D profile definition



The CacheTexture Node

- **Transport of images within the BIFS stream:**
 - without a separate elementary stream
 - without OD signaling
 - With native image encoding (no base64)
 - Cache optional

Field	SFInt32	objectTypeIndication	0
Field	SFString	decoderSpecificInfo	NULL
Field	SFString	image	NULL
Field	SFString	cacheURL	NULL
Field	MFURL	cacheOD	[]
Field	SFInt32	expirationDate	0
Field	SFBool	repeatS	TRUE
Field	SFBool	repeatT	TRUE



The EnvironmentTest Node

- **Detecting environment parameters**
 - Aspect ratio, display w/h, dpi, automotive ...
 - Code points available for other SDO
- **and triggering scene events for adaptation**

eventIn	SFBool	evaluate	
exposedField	SFBool	enabled	TRUE
exposedField	SFInt32	parameter	0
exposedField	SFString	compareValue	NULL
exposedField	SFBool	evaluateOnChange	TRUE
eventOut	SFBool	valueLarger	
eventOut	SFBool	valueEqual	
eventOut	SFBool	valueSmaller	
eventOut	SFString	parameterValue	



The KeyNavigator Node

- Removes the need for some complex Conditional + Routes logic + InputSensor

eventIn	SFBool	setFocus	
exposedField	SFNode	sensor	NULL
exposedField	SFNode	left	NULL
exposedField	SFNode	right	NULL
exposedField	SFNode	up	NULL
exposedField	SFNode	down	NULL
exposedField	SFNode	select	NULL
exposedField	SFNode	quit	NULL
exposedField	SFFloat	step	0
eventOut	SFBool	focusSet	

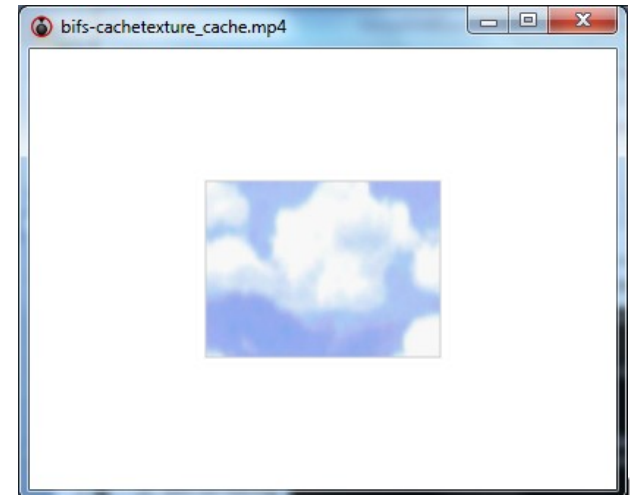
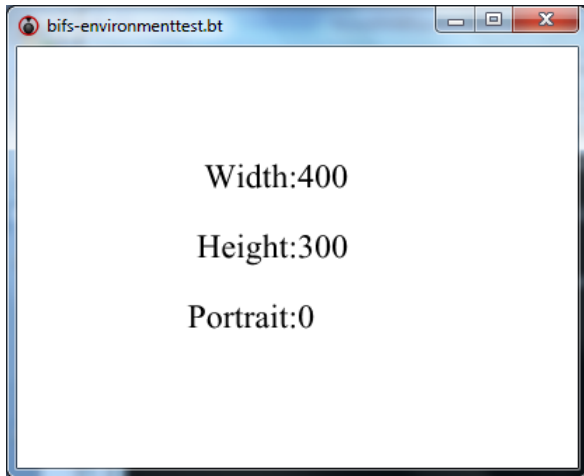
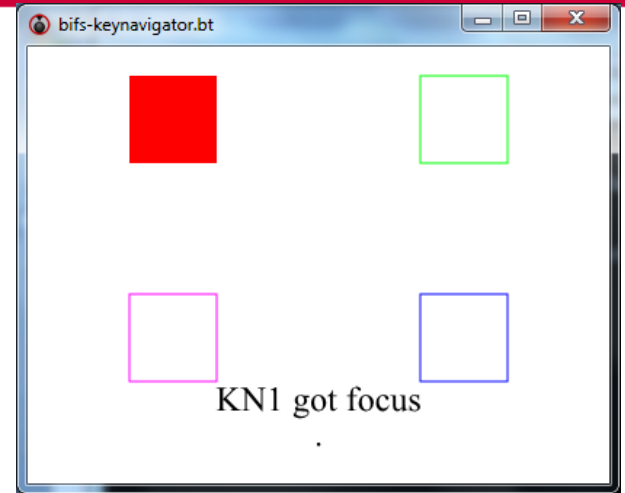
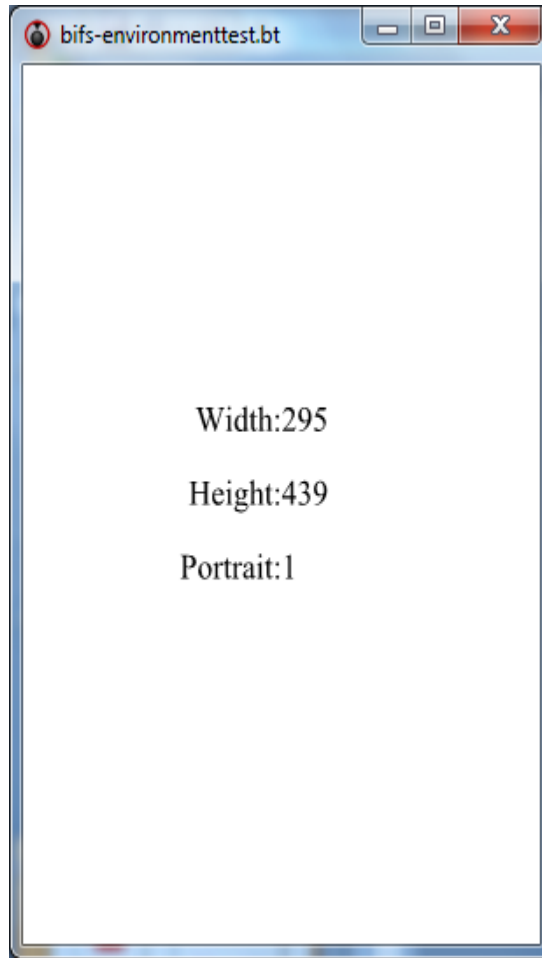
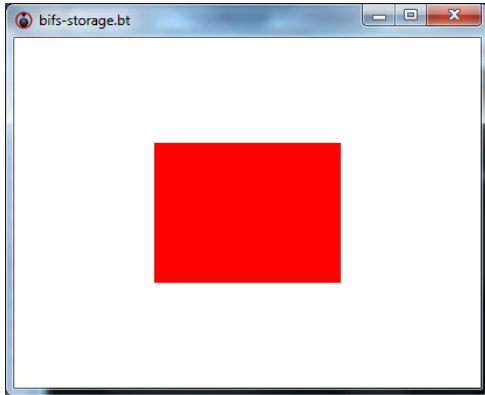


The Storage Node

- Ability to save user preferences and restore them after radio station change

eventIn	SFBool	forceSave	
eventIn	SFBool	forceRestore	
exposedField	SFBool	auto	TRUE
Field	SFInt32	expireAfter	0
Field	SFString	name	NULL
Field	MFAAttrRef	storageList	[]

Demos





New Updates

■ ExtendedReplace

- XREPLACE LABEL.emissiveColor BY LABEL2.emissiveColor

■ ReplaceFromExternalData

- Use data located outside the BIFS engine
 - Identified by a 'free-form' string
- REPLACE T.string BY "urn:....:epg:title"

■ ReplaceToExternalData

- Reports data outside the BIFS engine
- REPLACE "urn:user:pref:....:value" BY V.outSFBool

XCore2D Scene Graph Profile definition

- **XCore2D = Core2D +**
 - CacheTexture / EnvironmentTest / KeyNavigator
 - CompositeTexture2D (cache of vector graphics)
 - Layer2D
 - Layout (only text children)
 - TransformMatrix2D
 - Viewport
 - WorldInfo
 - PROTO
 - Extended updates



XCore2D Graphics Profile Definition

- **XCore2D = Core2D +**
 - Curve2D / XCurve2D
 - Ellipse
 - LineProperties / XLineProperties
 - LinearGradient / RadialGradient

Extensions for simplified carriage of MPEG-4 over MPEG-2

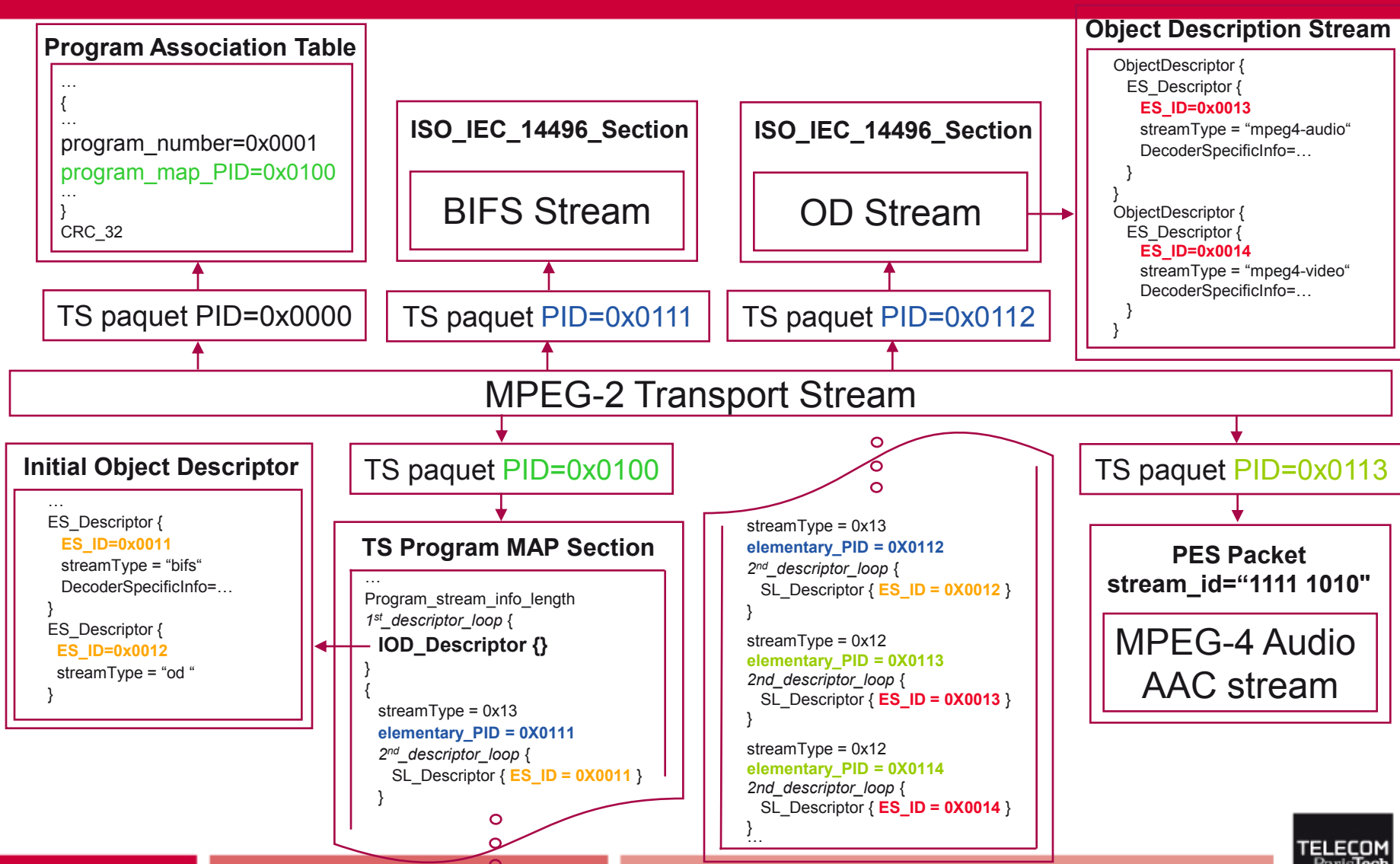
- **Chronology of 13818-1:2007/Amd.8**
 - WD1.0, Daegu, Jan. 2011
 - WD2.0, Geneva, Mar. 2011

- **Provides DVB/ATSC/ISDB backward-compatible services**
 - Carriage of A/V data w/o SL, with PES
 - <http://www.youtube.com/watch?v=Bmer91TZhCo>

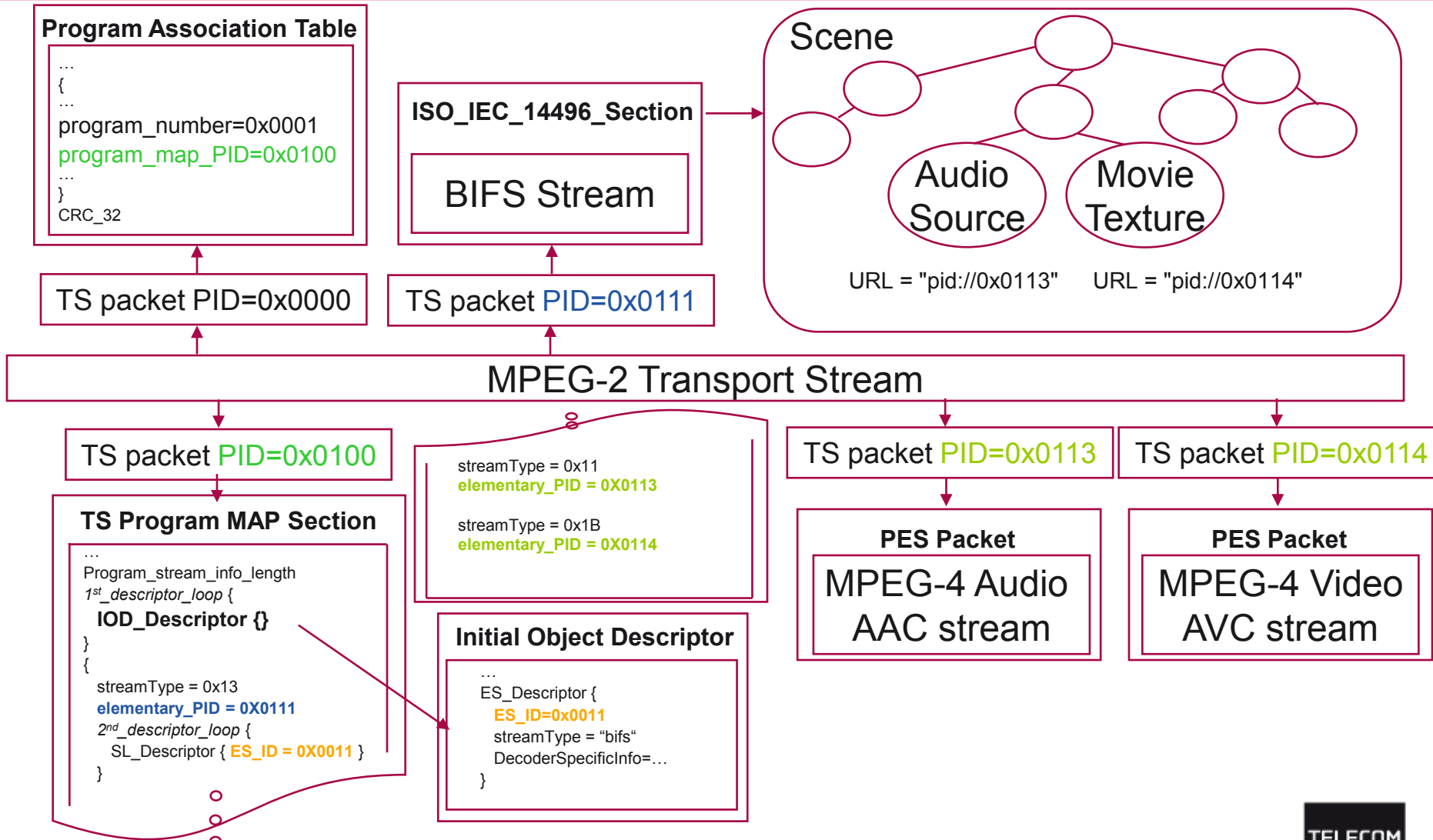
- **Improves efficiency of carriage**
 - Use BIFS URL like: « PID://xxx »
 - No need for OD declaration
 - Removes the need for OD stream (in some cases)
 - Declaration of OD within the PMT
 - Use of the MPEG-2 TS « ODUUpdateDescriptor »
 - Predefined SLConfig value for SL-section in PMT

- **Enable use of other MPEG-4 data (fonts, ...)**
 - Ability to carry any MPEG-4 Systems stream within ISO/IEC-14496 sections

Existing carriage



Backward-compatible carriage





Other MPEG documents

- *One pager on BIFS for digital radio,*
 - March 2011, N11958.
- New edition (4th) of MPEG-4 Systems: 14496-1:2010
 - Integration of corrigendum, and amendments



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