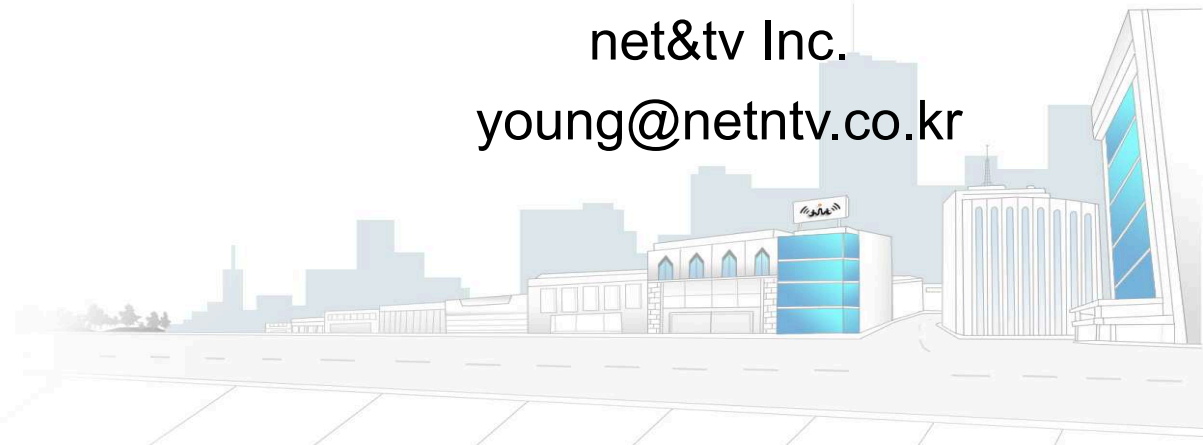


# MPEG-4 BIFS for IPTV

*Convenience by Convergence*



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# Contents

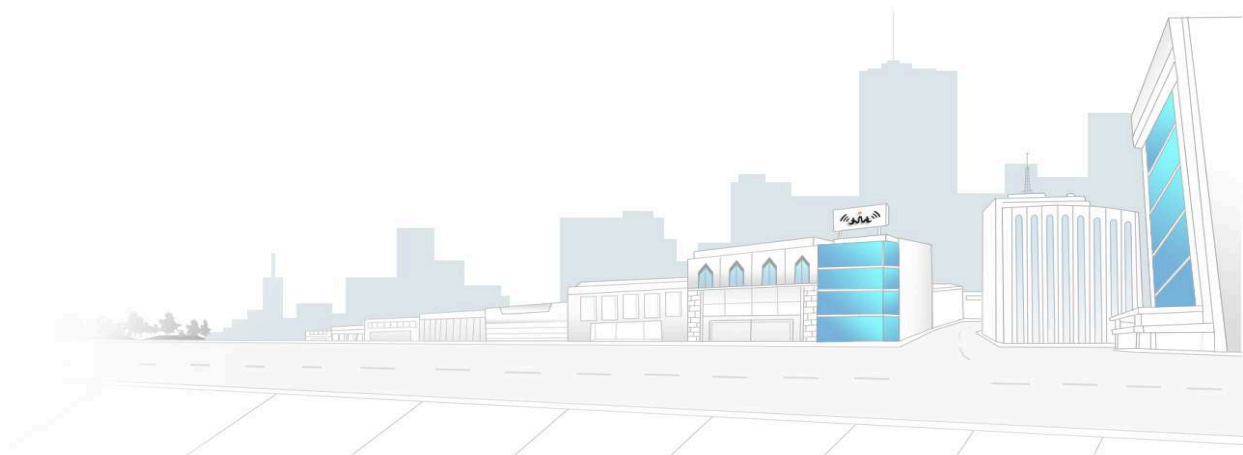
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- Overview of BIFS
- Profiles of BIFS
- Examples of BIFS
- Conclusion

# Overview of BIFS

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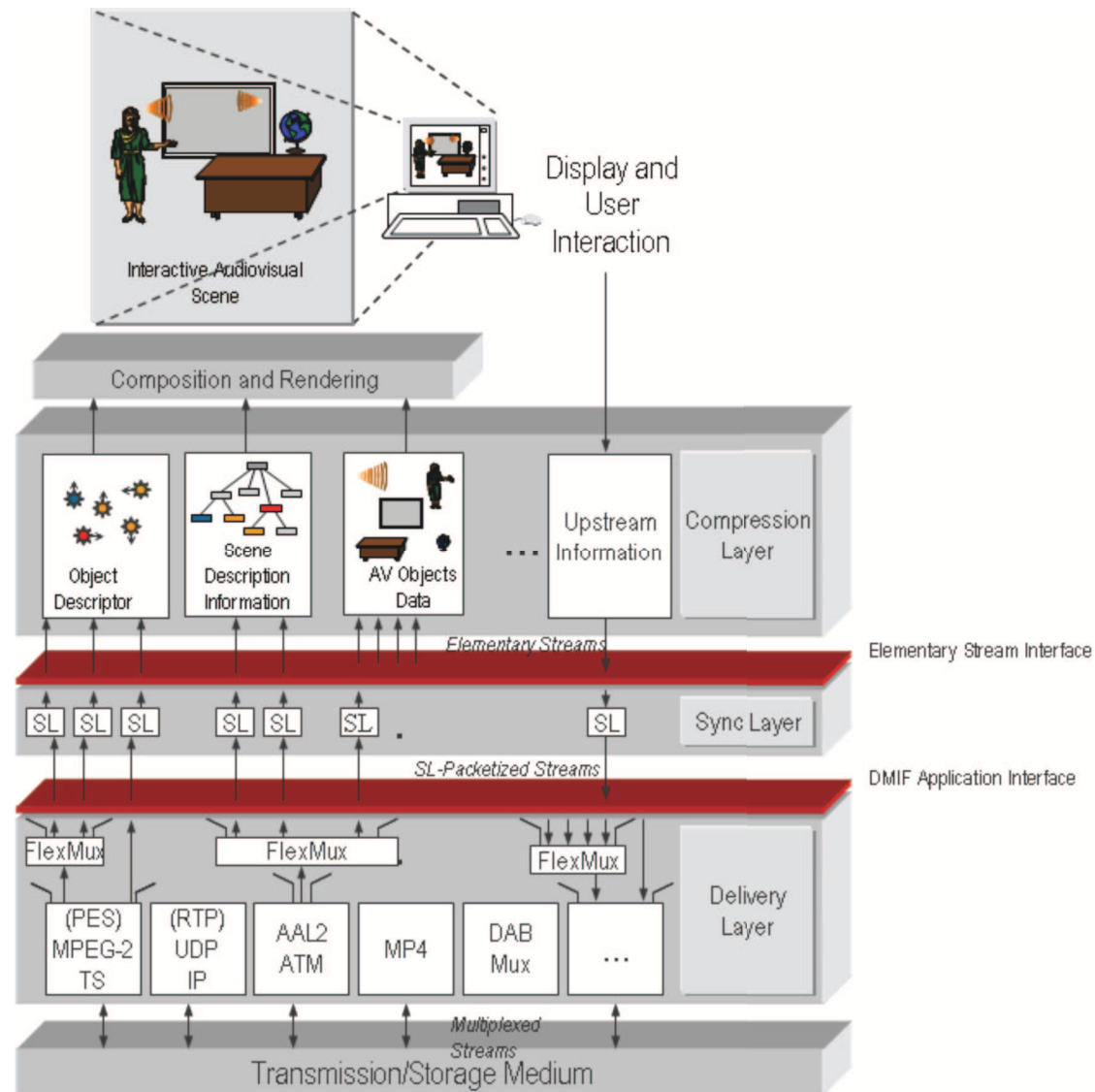


# BIFS (Binary Format for Scene)

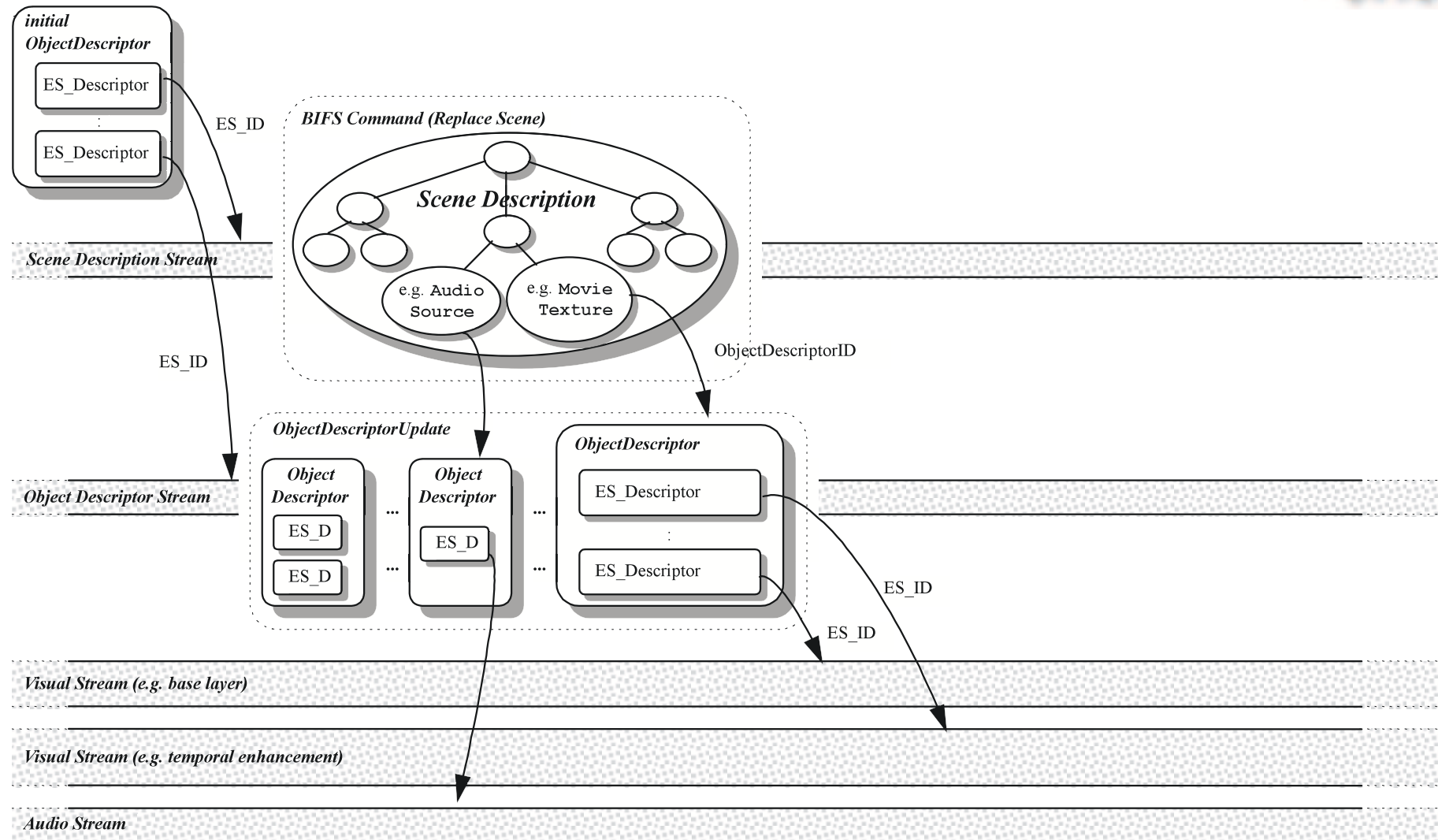


- A scene description for composition is needed because MPEG-4 is an object-based representation system
- BIFS is the MPEG-4 scene description protocol
  - to compose MPEG-4 objects
  - to describe interaction with MPEG-4 objects
  - to animate MPEG-4 objects

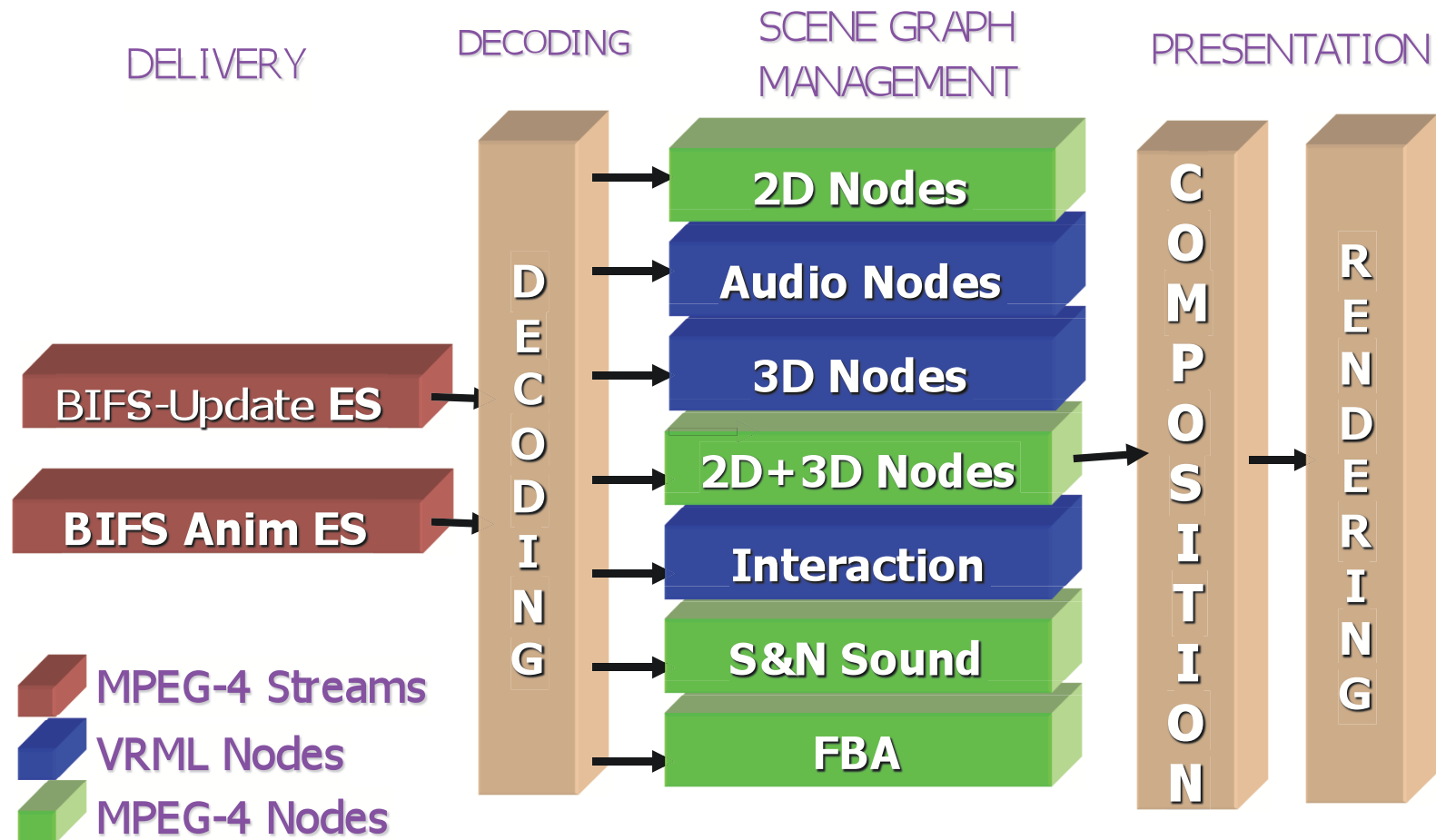
# MPEG-4 Architecture



# MPEG-4 Contents



# Components of BIFS



## BIFS Scene Features

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- Control of audio & video (objects) playback
- 2D Composition & Graphics
- 3D Composition & Graphics (VRML inclusive)
- Advanced audio composition
- Interactivity and Behavior
- Scripting (javascript)
- Face & Body Animation



## BIFS Scene Features



- Advanced Audio
  - Perceptual approach to modify natural source
  - Acoustic properties for physical based audio rendering
- Stream and server control
  - VCR controls
  - Application specific messaging
- Extensibility (Prototypes)
  - Definition of new BIFS interfaces
- Hierarchical 3D objects
  - Progressive loading and local degradation of 3D mesh
- Web interface
  - Linking and embedding of a web page

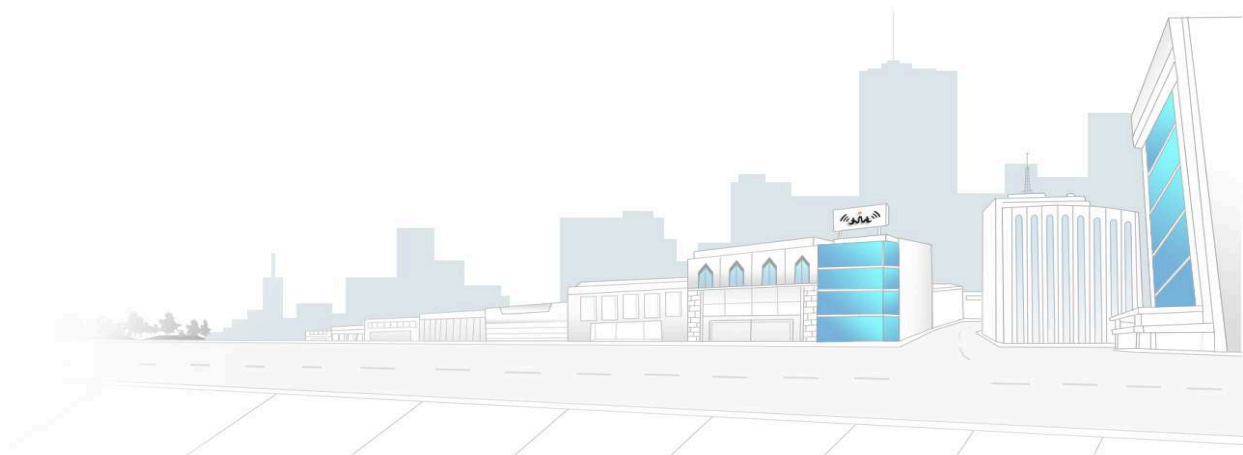
# BIFS Scene Compression



- BIFS Scene
  - Up to 25 time less than VRML-like text files
  - Context dependency
  - Hierarchical, linear quantization of scene data
  - Differential multiple fields coding and mesh coding integration (v2)
- BIFS-Anim
  - Up to 30 compression gain for animation contents
  - Linear quantization
  - Predictive coding (including rotation and normals)
  - Adaptive arithmetic encoding

# Profiles of BIFS

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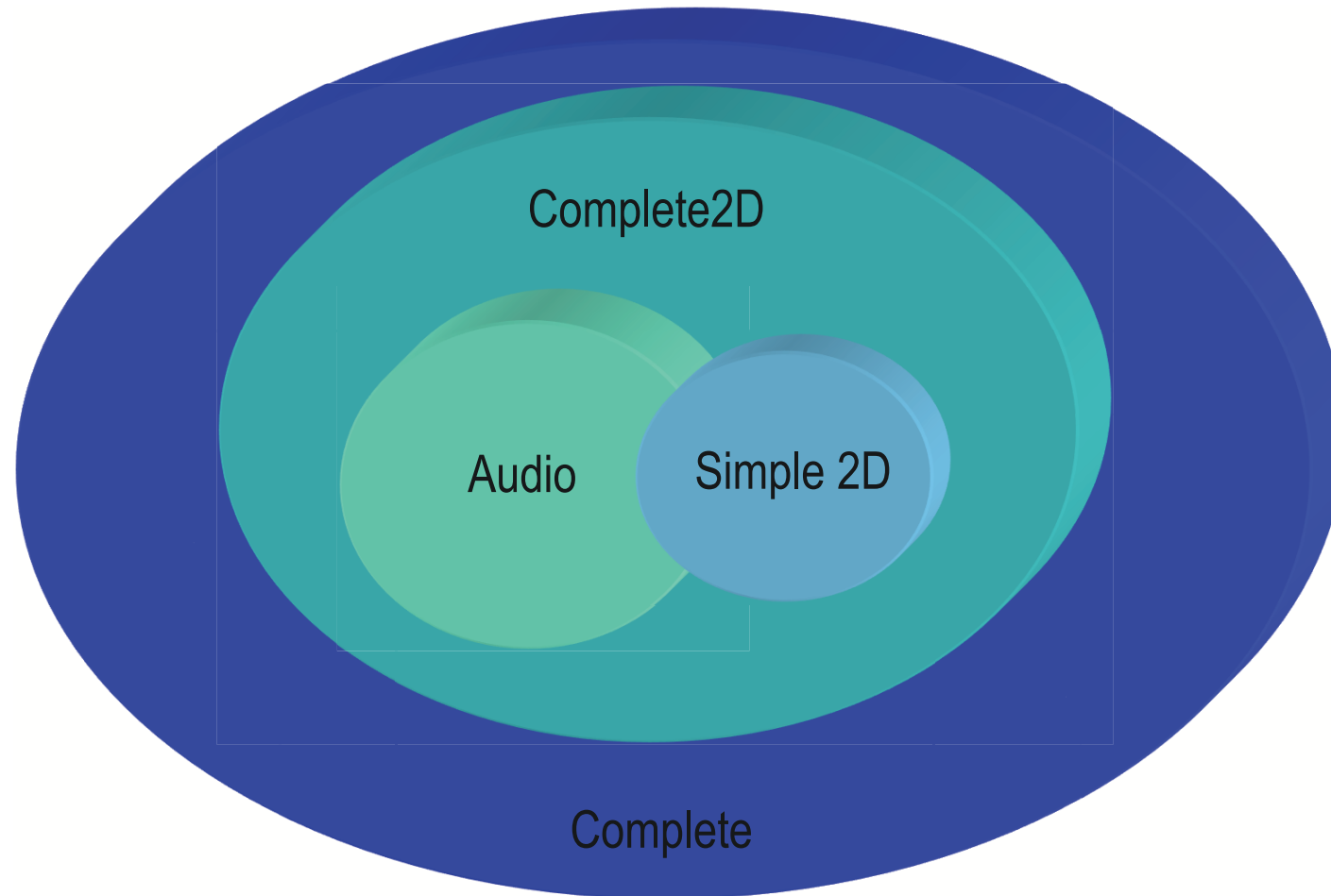


## Profiles for MPEG-4 BIFS



- Scene Graph Profiles
  - the scene graph elements of the BIFS tool that are allowed.
  - the means to describe the spatio-temporal locations, the hierarchical dependencies as well as the behaviours of audio-visual objects in a scene.
- Graphics Profiles
  - the graphics elements of the BIFS tool that are allowed.
  - The means to represent graphics visual objects in a scene.

# MPEG-4 System Profiles in Version 1



# Simple2D + Text Graphics Profile

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- Applications
  - Audio and video delivery to mobile/wireless terminals
    - video telephony
    - video clip download
  - Audio and video streaming over Internet
    - web pages enhanced with simple audio-video and text content
    - simple Internet radio or Internet TV
    - slide show with audio comment for educational presentations
    - commercials
  - Etc
    - Karaoke
    - audio-video and subtitles
    - news cast
    - streaming text

# Simple2D + Text Graphics Profile

---



- Tools
  - Nodes in Simple2D
    - Appearance
    - Bitmap
    - Shape
  - Material2D
  - Text
  - FontStyle

# Core2D Graphics Profile



- Applications
  - Video on Demand
    - interactive audio-video over the Internet
    - scalable content delivery
  - Enhanced digital TV
    - MPEG-4 video over MPEG-2 Picture in Picture
    - Interactive Electronic Program Guides
    - enriched TV programs
  - Advertisement
    - animated banners
    - video warping and incrustation
    - Personalization
    - web links
  - Interactive presentations
    - basic graphics animations
    - e-commerce
    - interactive contests or voting



# Core2D Graphics Profile

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- Nodes
  - Simple2D+Text
  - Color
  - Coordinate2D
  - IndexedFaceSet2D
  - Rectangle

# Advanced2D Graphics Profile

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- Applications
  - Games
  - Complex and streamed graphics animations, cartoons
  - Advanced Graphical User Interfaces (GUI)
- Nodes
  - Core2D
  - Circle
  - Coordinate2D
  - Curve2D
  - IndexedLineSet2D
  - LineProperties
  - MaterialKey
  - TextureCoordinate
  - TextureTransform

# Basic2D Scene Graph Profile

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- Applications
  - Audio and video delivery to mobile/wireless terminals
    - video telephony
    - video clip download
  - Audio and video streaming over Internet
    - web pages enhanced with simple audio-video content
    - simple Internet radio or Internet TV
    - slide show with audio comment for educational presentations
    - commercials

# Basic2D Scene Graph Profile

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- Nodes
  - OrderedGroup
  - Sound2D
  - AudioClip
  - ImageTexture
  - MovieTexture

# Core2D Scene Graph Profile



- Applications
  - Video on Demand
    - interactive audio-video over the Internet
    - scalable content delivery
  - Enhanced digital TV
    - MPEG-4 video over MPEG-2 Picture in Picture
    - Interactive Electronic Program Guides
    - enriched TV programs
  - Advertisement
    - animated banners
    - video warping and incrustation
    - Personalization
    - web links
  - Interactive presentations
    - basic graphics animations
    - e-commerce
    - interactive contests or voting

## Core2D Scene Graph Profile



- Functionalities
  - Basic 2D composition
  - 2D texturing
  - Local interaction
  - Local animation
  - BIFS updates
  - Quantization
  - Access to web links
  - Sub-scenes
  - Back channel (ServerCommand)
  - VoD (MediaControl, MediaSensor)

# Advanced2D Scene Graph Profile

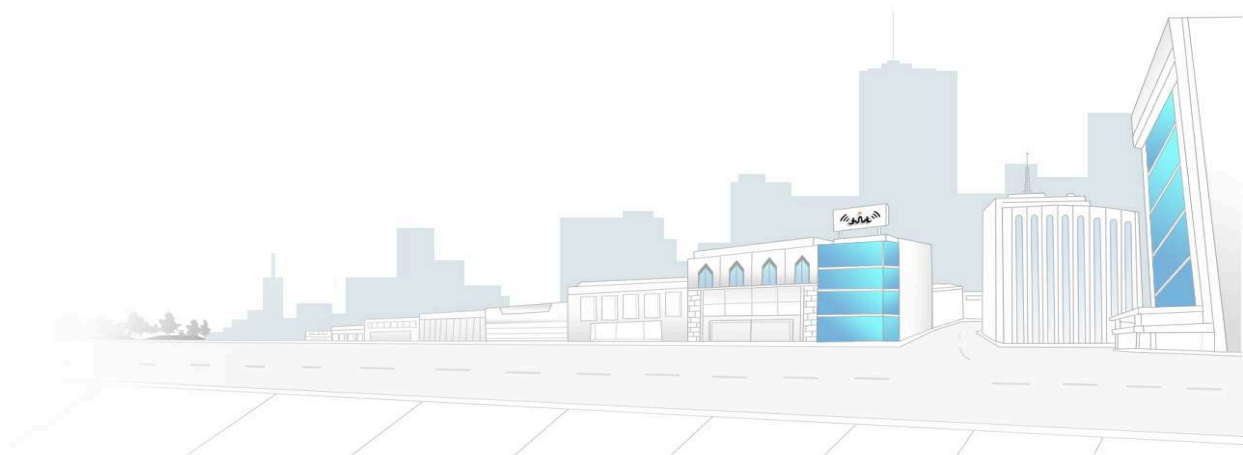
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- Applications
  - Games
  - Complex animations
  - Streamed graphics animations, cartoons
  - Advanced Graphical User Interfaces (GUI)
- Functionalities
  - Advanced 2D composition
  - Advanced local interaction
  - Streamed animation (BIFS-Anim.)
  - Scripting
  - Advanced audio
  - PROTO

# Examples of BIFS

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# BIFS in T/S-DMB



# Advanced Contents with BIFS





# BIFS for IPTV (Soccer Match)



Menu #1 : Presentation of the scoreboard and the match statistics



## BIFS for IPTV (Soccer Match)



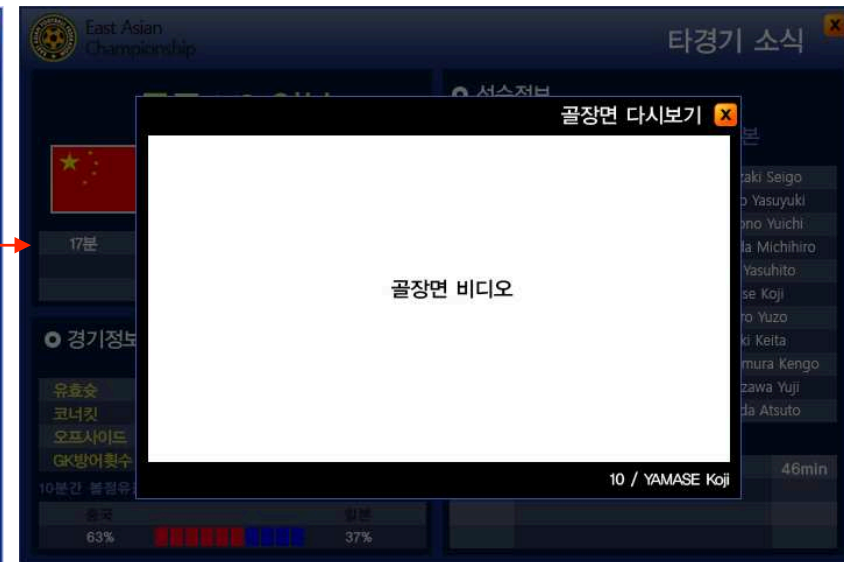
Menu #2 : Option to view multiple cameras and audio



# BIFS for IPTV (Soccer Match)



Menu #3 : Results presentation of other matches of the day



# BIFS for IPTV(Quiz Show)



Menu#1 : The user joins the interactive Show



## BIFS for IPTV (Quiz Show)



- The question is displayed to the user synchronized with the program and the user selects the answer

Wrong answer



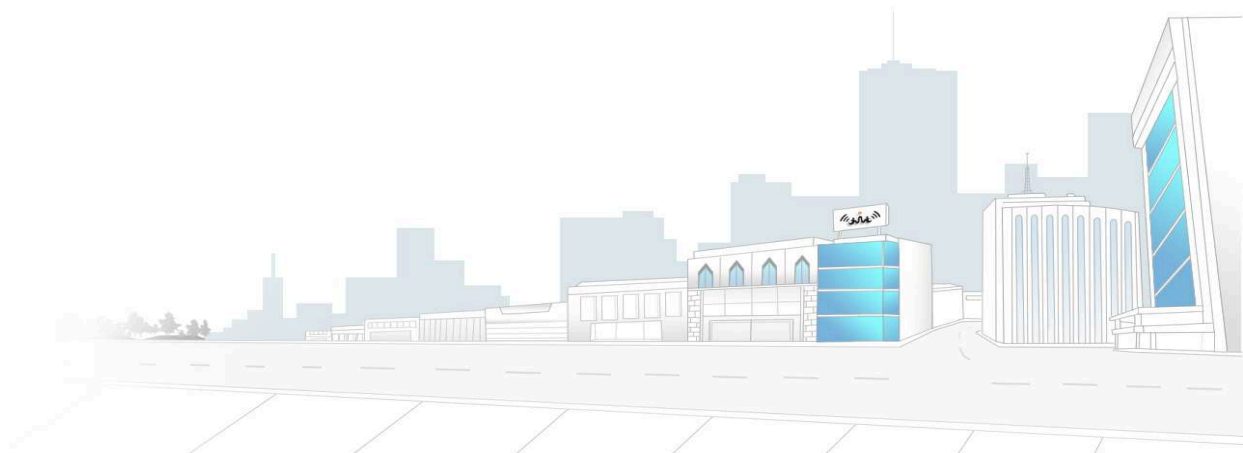
Correct Answer





# Conclusion

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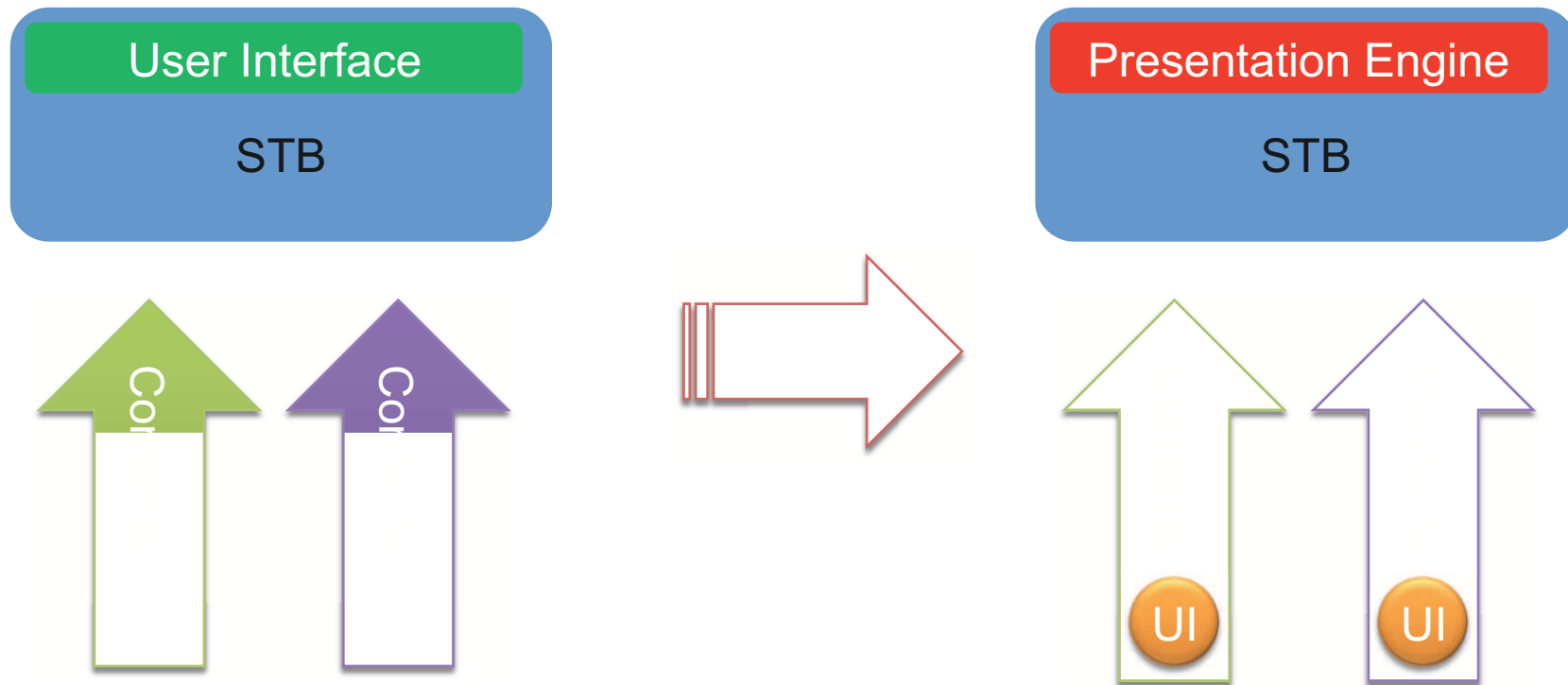




# Change of User Interface



# Paradigm Shift



# Thank you!

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## Questions?

