

Authoring Tool based on MPEG-4

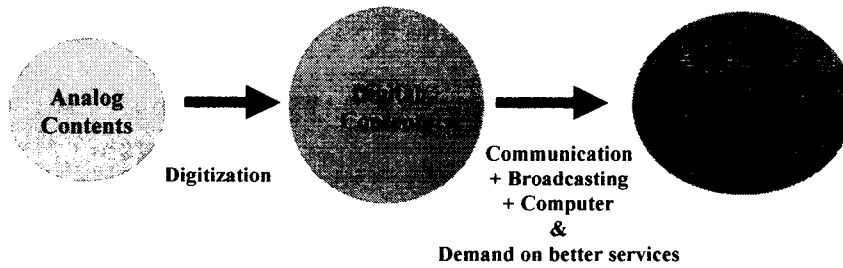


Contents

- Brief introduction
- MPEG-4 features & systems
- System architecture of Interactive Richmedia
- Graphic user interface / Data Access APIs
- XMT parser & generator / MP4 Converter
- Media Library
- System architecture for MP4 contents streaming
- Conclusions

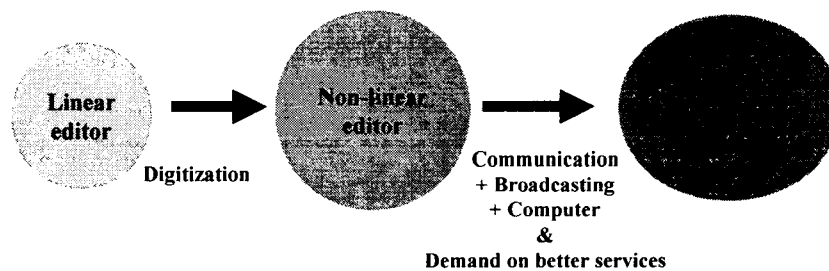
Brief introduction (I)

□ Trends of Information and Multimedia contents



Brief introduction (II)

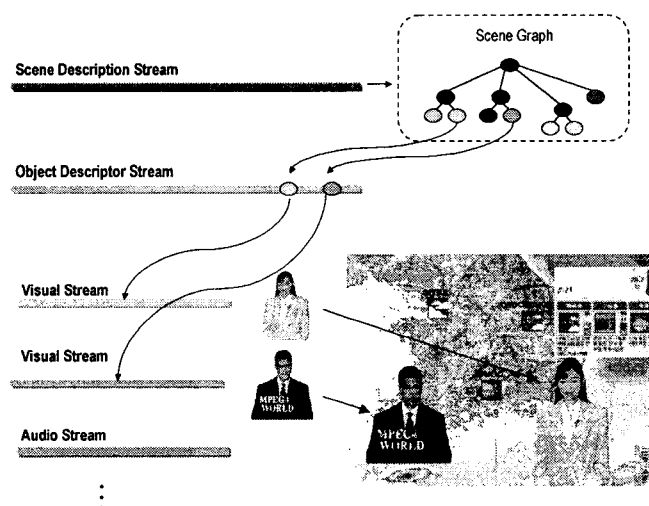
□ Trends of Editing and Authoring technology



MPEG-4 Features

- Scene composition of many different types of objects
- Separate object description from scene description
- Provision and manipulation of user interactions and hyperlink capabilities
- Binary & textual representation of contents
- Encoding of arbitrarily shaped video sequences

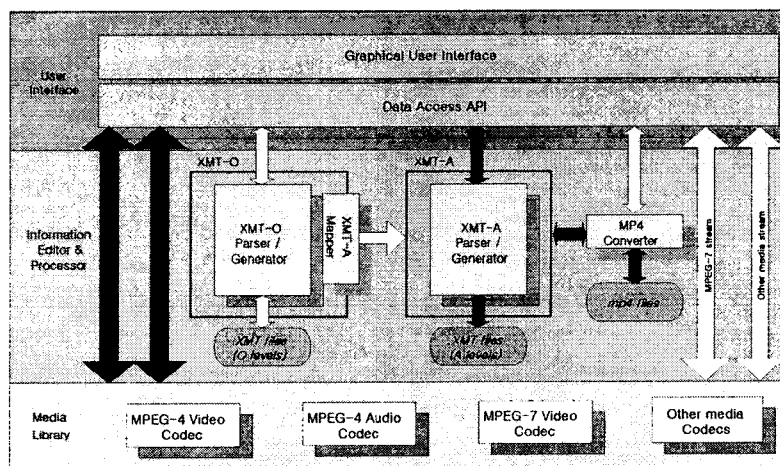
MPEG-4 Systems



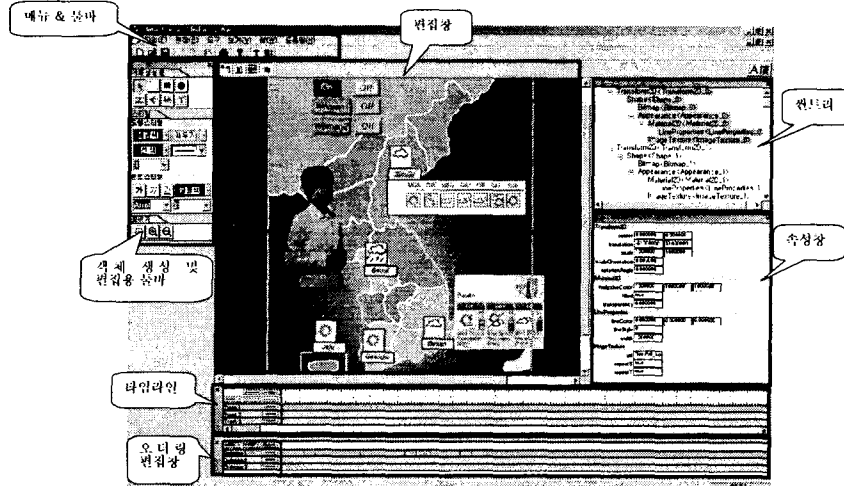
Interactive Richmedia

- Interactive contents authoring system
 - ✓ Compatible with MPEG-4 specifications
 - ✓ Easy and convenient when producing interactive multimedia contents
 - ✓ Producing MPEG-4 contents in the binary and/or textual formats
 - ✓ Supporting arbitrarily shaped video sequences
 - ✓ Equipped with semi-automatic segmentation tool

System architecture



Graphic User Interface (I)



ETRI Proprietary

Broadcasting Media Technology Dept., ETRI

Graphic User Interface (II)

- Menu & Tool bar
 - ✓ Providing fundamental tools
- Main editing window
 - ✓ Editing spatial layout of objects
 - ✓ Inserting, deleting and modifying objects
- Scene tree window
 - ✓ Viewing and editing the node structure of a scene
- Attribute window
 - ✓ Showing the attributes relevant to the selected node in the scene tree

ETRI Proprietary

Broadcasting Media Technology Dept., ETRI

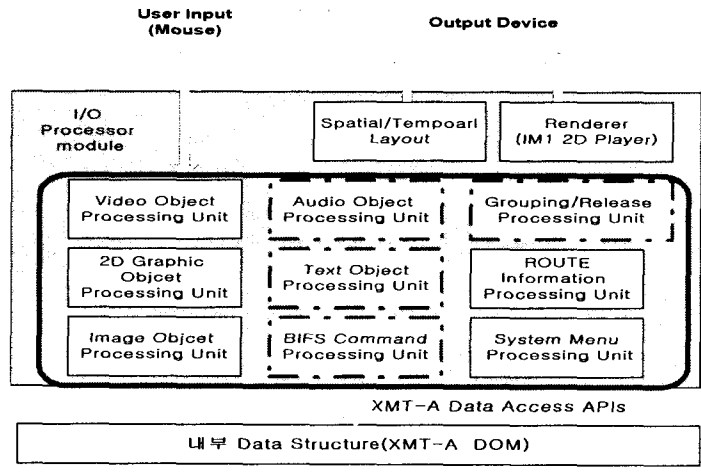
Graphic User Interface (III)

- Timeline window
 - ✓ Setting and modifying temporal attributes of each object in a scene
- Ordering control window
 - ✓ Editing orders of objects in a scene
- Object generation & editing tools
 - ✓ Providing geometry objects
 - ✓ Tools for geometry and text objects such as fonts, styles and viewing levels

Data Access APIs (I)

- Providing interfaces of
 - Constructing an internal data structure of XMT documents
 - Manipulating the internal data structure

Data Access APIs (II)



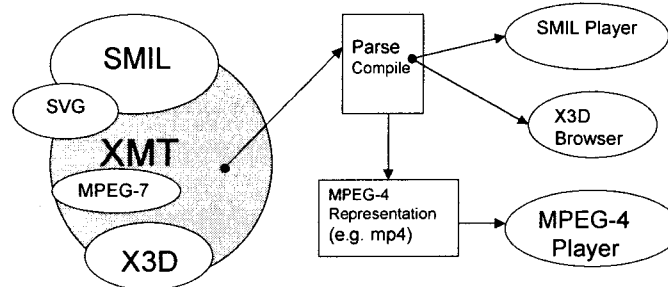
eXtensible Textual format (XMT) (I)

- ❑ Representing MPEG-4 contents in terms of a textual format
- ❑ Consisted of the following two levels
 - XMT-A
 - Lower level description of MPEG-4 contents
 - Provision of a straightforward one-to-one mapping between the textual and binary formats
 - Subset of X3D
 - XMT-O
 - Higher level description of MPEG-4 contents
 - Based on SMIL

eXtensible Textual format (XMT) (II)

➤ XMT-C

- Define common elements and attributes between XMT-O and A such as encodingHints, authoring, etc.

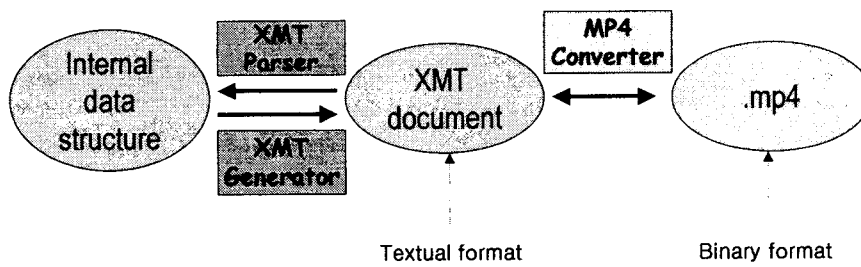


XMT-O to XMT-A Mapper

- Why is it needed?
 - ✓ It is impossible to directly convert XMT-O format into its binary format (BiFS)
 - ✓ Due to that XMT-O is designed in terms of a user rather than of MPEG-4 Systems specifications
- Providing mapping mechanism from a higher level textual format to a lower level one.

Flow chart among XMT parser/ generator & MP4 converter

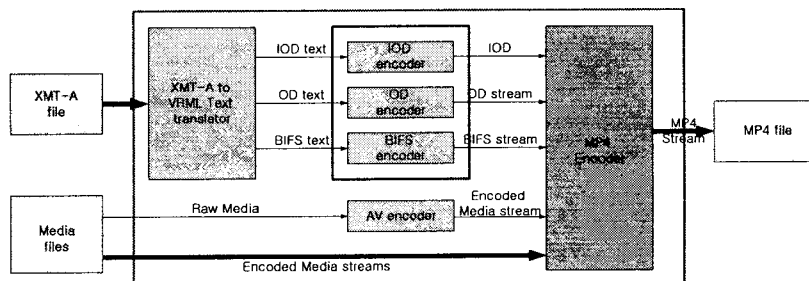
□ XMT parser/generator & MP4 converter



MP4 Converter (I)

□ Input : XMT-A file, Media file(s)

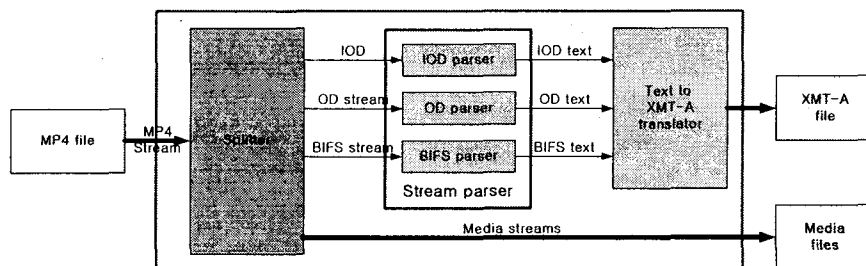
□ Output : MP4 file



MP4 Converter (II)

❑ Input : MP4 file

❑ Output : XMT-A file, Media file(s)

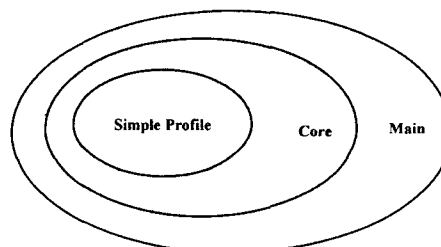


Media Library

❑ Providing various multimedia codecs

✓ MPEG-2, 4, 7 video/audio codecs

✓ JPEG, gif codecs



MPEG-4 Video Codec profiles

Conclusions

- ❑ **Interactive Richmedia, an interactive contents authoring tool for MPEG-4,**
 - ✓ Allows a content creator to compose spatially and temporally large number of objects
 - ✓ Provides an easy way to add user interactions
 - ✓ Is considering interactive web casting applications

- ❑ **In future, it is required to research on**
 - ✓ Integration of hardware acceleration
 - ✓ Adaptation of streaming technologies for real-time broadcasting