

MPEG-4 표준의 진화

세종대학교

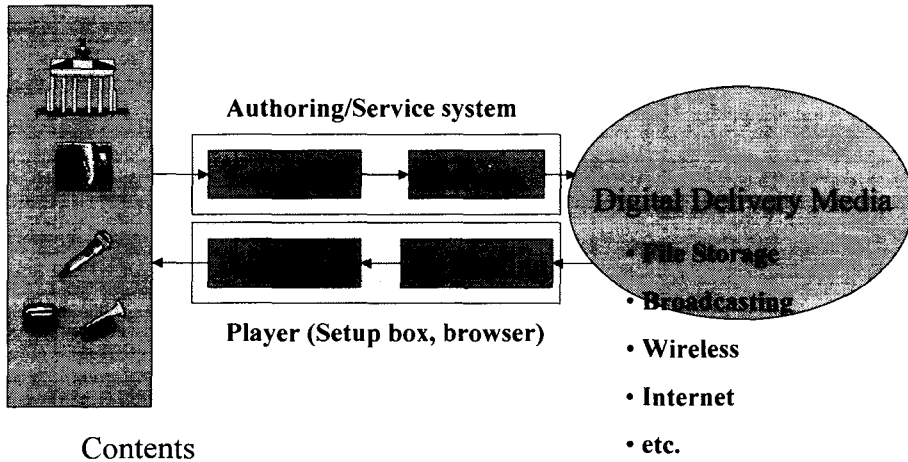
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- Industry

MPEG

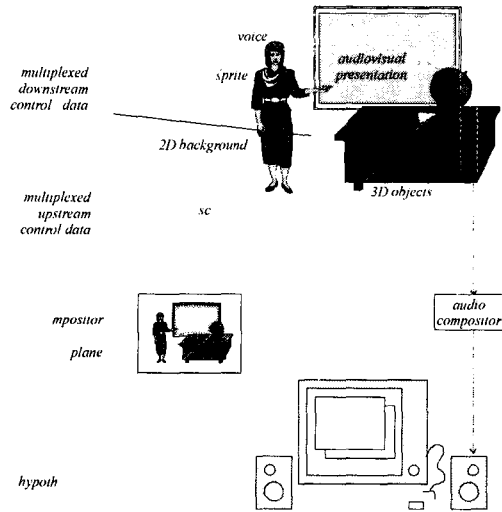
– Digital Multimedia Contents Coding



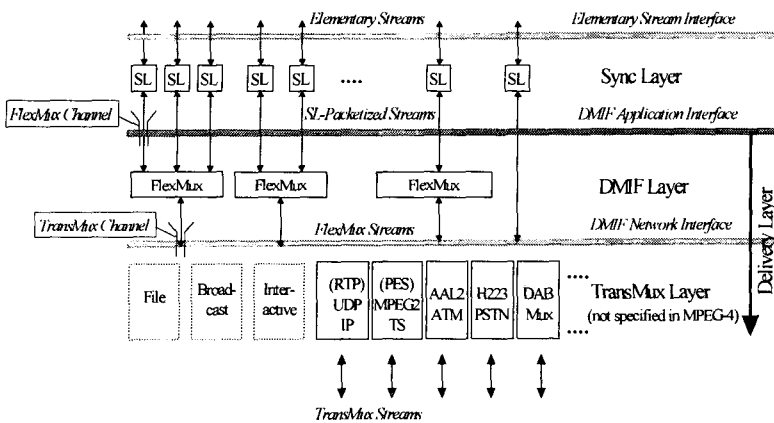
MPEG-4

- Target Delivery Media
 - Almost All channels (Internet, TV channel, Wireless, Storage)
- Target Contents
 - Rich Media (Multimedia Contents with User Interaction)
- Standardized
 - Video Coding
 - Object-based, FGS (Fine Granularity Scalability)
 - SNHC (Avatar, Computer Graphics/Animation, Text)
 - Audio Coding
 - Computer Audio (SAOL)
 - System
 - Auxiliary Information (Simple Metadata)
 - Scene Composition (BIFS, OD, XMT)
 - Delivery Protocol Framework (DMIF)
 - File Format (MP4)
 - IPMP (Intellectual Property Management System)

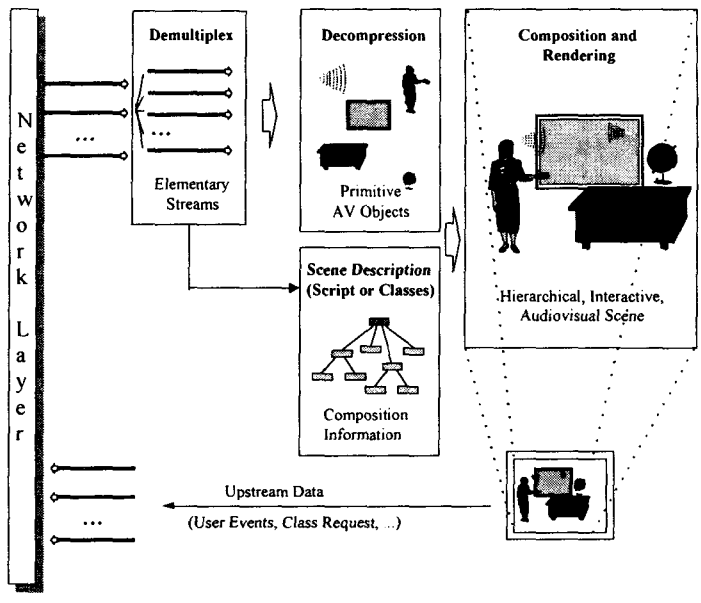
MPEG-4 Version 1 System



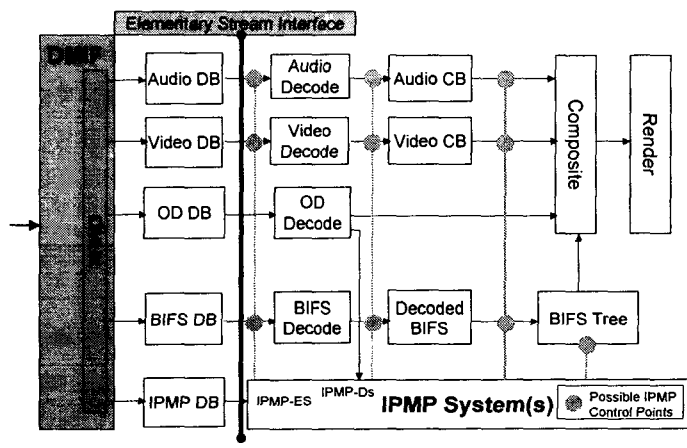
MPEG-4 Version 1 System



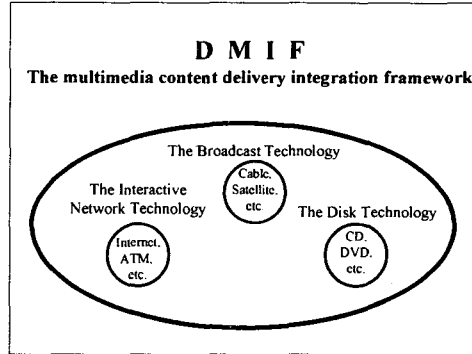
MPEG-4 Version 1 System



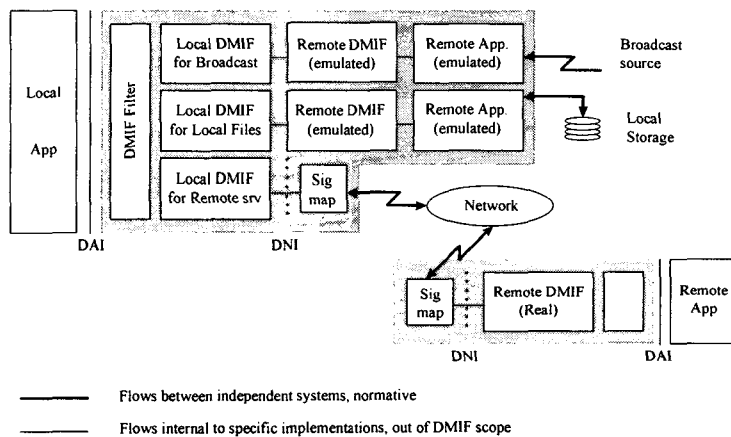
MPEG-4 Version 1 IPMP



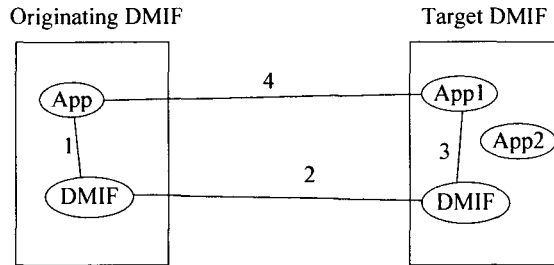
MPEG-4 Version 1 DMIF



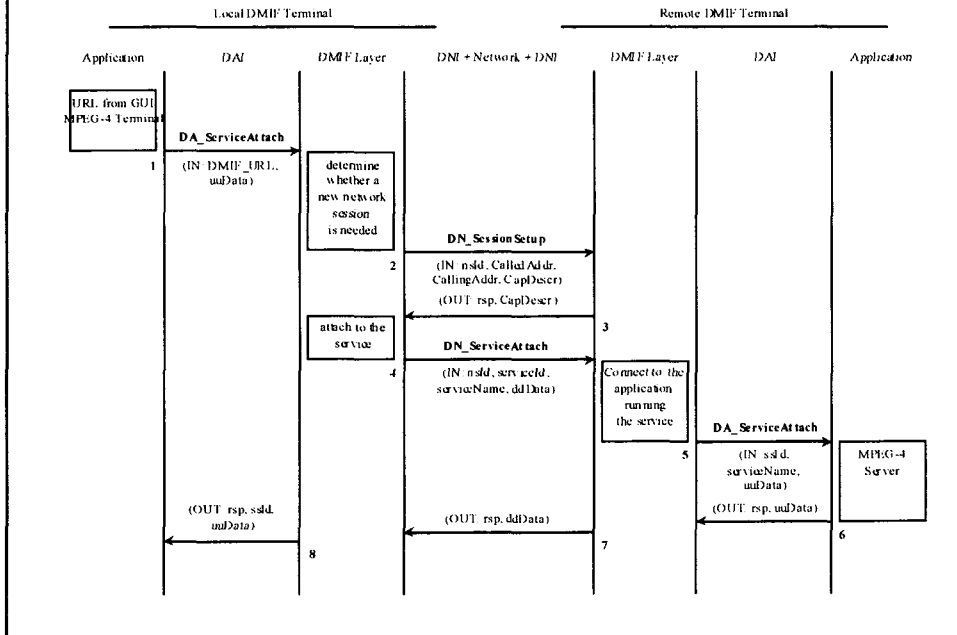
MPEG-4 Version 1 DMIF



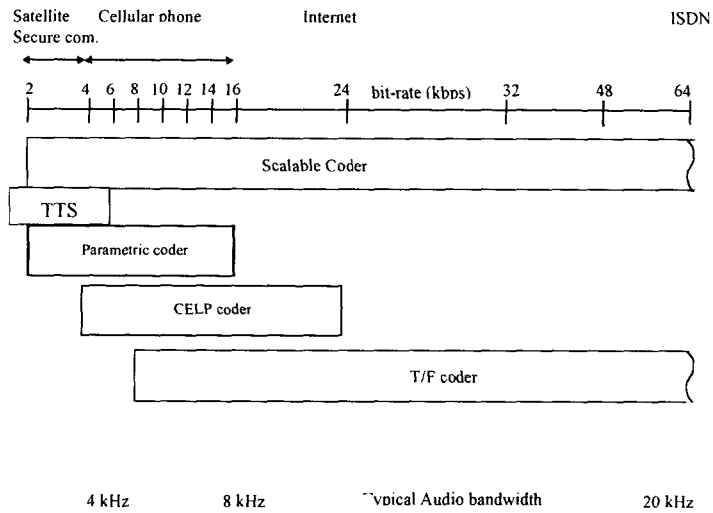
MPEG-4 Version 1 DMIF



MPEG-4 Version 1 DMIF

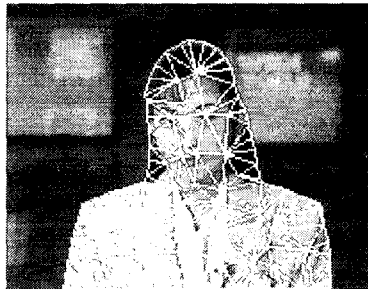


MPEG-4 Version 1 Audio

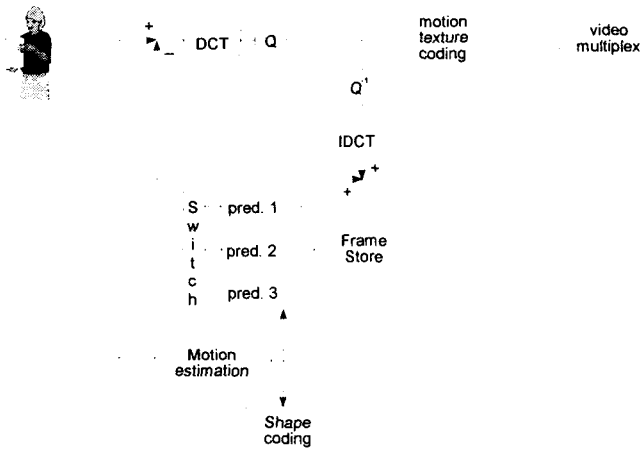


MPEG-4 Version 1 SNHC

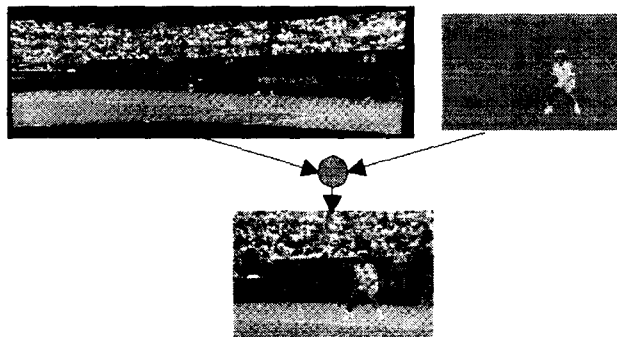
- Face Animation
- 2D static and dynamic mesh coding

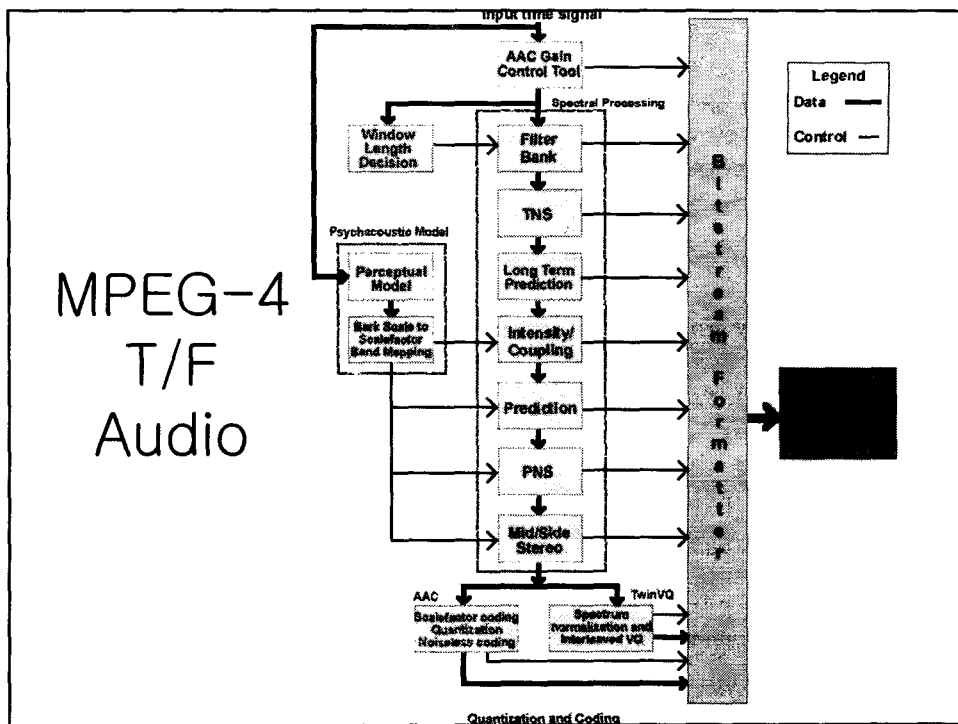


MPEG-4 Video Version 1



MPEG-4 Version 1 Sprite coding





MPEG-4 Version 1 Profiles - Video

- Simple Visual Profile
 - error resilient coding of rectangular video objects
- Simple Scalable Visual Profile
 - temporal and spatial scalable objects to the Simple Visual Profile
- Core Visual Profile
 - arbitrary-shaped and temporally scalable objects to the Simple Visual Profile
- Main Visual Profile
 - interlaced, semi-transparent, and sprite objects to the Core Visual Profile
- N-Bit Visual Profile
 - pixel-depths ranging from 4 to 12 bits to the Core Visual Profile

MPEG-4 Version 1 Profiles – SNHC

- Simple Facial Animation Visual Profile
- Scalable Texture Visual Profile
- Basic Animated 2D Texture Visual Profile
- Hybrid Visual Profile
 - decode arbitrary-shaped and temporally scalable natural video objects with the ability to decode several synthetic and hybrid objects, including simple face and animated still image objects.
- 2D Graphics Profile
- Complete Graphics Profile

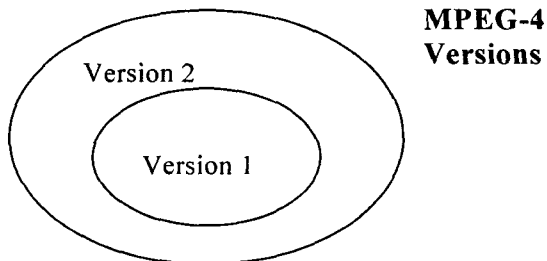
MPEG-4 Version 1 Profiles – Audio

- Speech Audio Profile
 - very-low bit-rate parametric speech coder, a CELP speech coder, and a Text-To-Speech interface.
- Low Rate Synthesis Audio Profile
 - a low bit-rate synthesis method, wave tables and a Text-to-Speech Interface
- Scalable Audio Profile,
 - a superset of both the Speech and Low Rate Synthesis Audio Profile
- Main Audio Profile
 - superset of all the other Profiles, containing tools for natural and synthetic Audio.

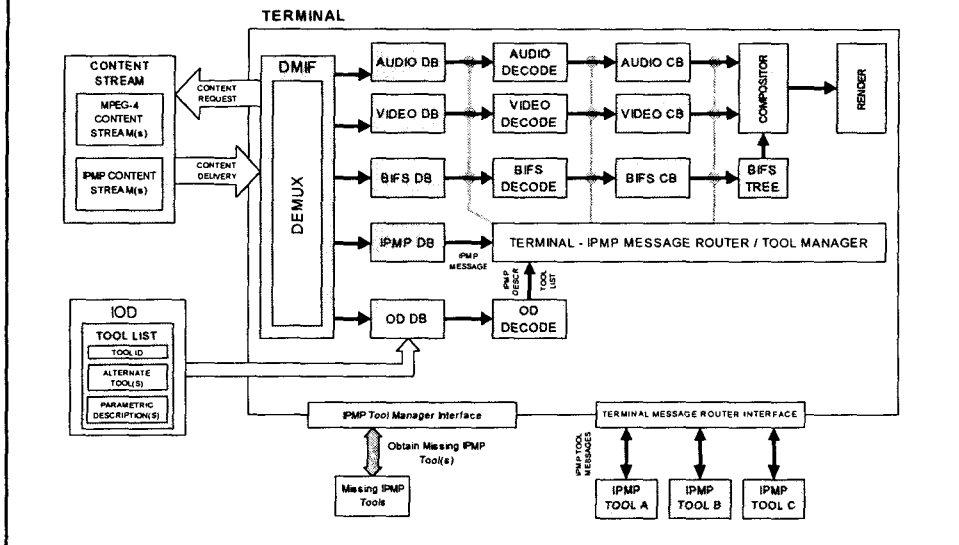
Scene Description Profile Version 1

- simple Scene Profile
 - composition of a traditional audio-video scene
- 2D Scene Profile
 - low complexity graphics, i.e. 2D transformations and alpha blending.
- VRML Scene Profile
 - 3D graphics capabilities
- Audio Scene Profile
 - only audio scenes.
- Complete Scene Profile

MPEG-4 Version 2



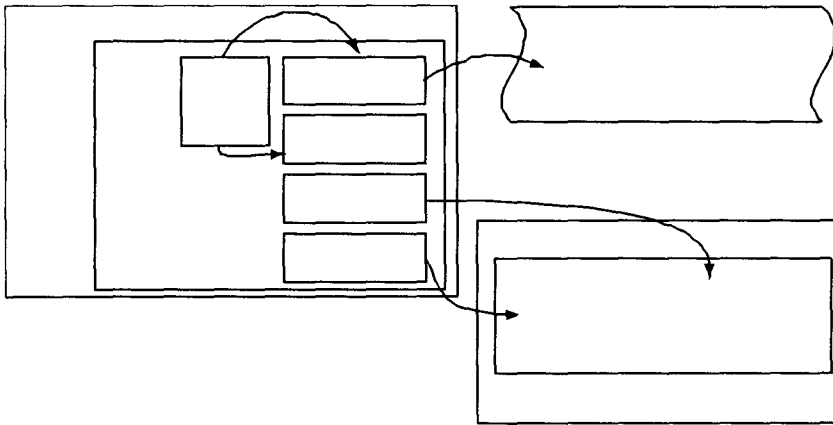
MPEG-4 Version 2 IPMP extensions



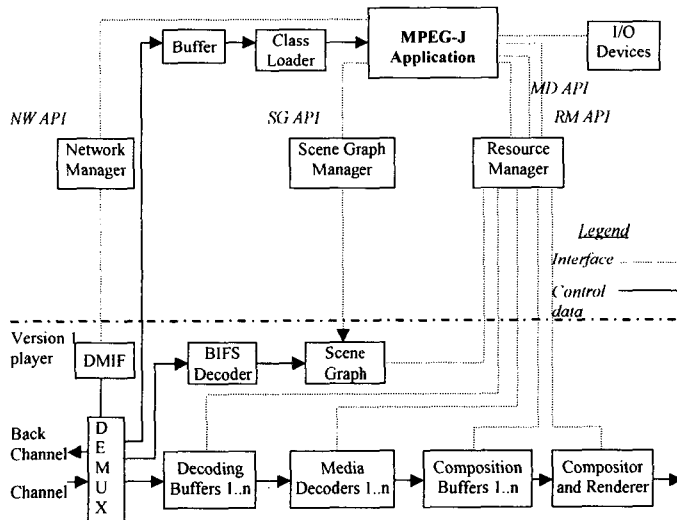
MPEG-4 Version 2 Advanced BIFS

- Multi user functionality to enable several users to access the same scene and interact with its content
- Advanced Audio BIFS for enabling more natural sound source and sound environment modeling
- Face and body animation by a Body node
- Proto and Externproto and Script VRML constructs,
- Other VRML nodes that are not specified in the current Version of BIFS

MPEG-4 Version 2 File Format



MPEG-4 Version 2 MPEG-J



MPEG-4 Version 2 SNHC

- 3D mesh Coding
- Body Animation

MPEG-4 Version 2 Audio

- HILN, BSAC, Low delay AAC
- EP Tool, Error Resilient AAC
- HVXC 4k VR
- CELP silence-compression

MPEG-4 Version 2 Video

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MPEG-4 Version 2 DMIF

- *Extend DMIF V1 QoS to Access Unit Loss and Delay parameters at the DAI*
- *Invoke SRM*
- *Allow heterogeneous connections with end-to-end agreed QoS level*
- *Etc.*

MPEG-4 System evolution

- XMT-O
- XMT-A
- MP4 file format
- AVC file format
- MP4 over IP
- Text streaming

MPEG-4 Video evolution

- MPEG-4 Advanced Video Coding
 - Multi frame, loop filter, etc.
- Error Resilient Simple Scalable Profile
- New levels and tools for MPEG-4 Visual
 - Simple Scalable Profile @ Level L0
- Streaming video profile
- Fine Granularity Scalability
- Exploration
 - 3D Video coding
 - Scalable Video coding
 - Wavelet Video coding

MPEG-4 Audio evolution

- Audio Lossless Coding – ALS
- MP3 on MP4
- Parametric Audio

MPEG-4 SNHC evolution

- AFX
 - Subdivision
 - Mesh grid
 - Bone-Based Animation
 - NURBS
 - Progressive Texture
 - Depth image, layered depth image
 - Particle system
 - fire, smoke, rushing water, etc.
- OLGA (On-Line Game application)
- Middleware for game application

MPEG-4 Now

- *Part 1: Systems*
- *Part 2: Visual*
- *Part 3: Audio*
- *Part 4: Conformance testing*
- *Part 5: Reference software*
- *Part 6: Delivery Multimedia Integration Framework (DMIF)*
- *Part 7: Optimized software for MPEG-4 tools*
- *Part 8: Carriage of ISO/IEC 14496 contents over IP networks*
- *Part 9: Reference hardware description*
- *Part 10: Advanced Video Coding (AVC)*
- *Part 11: Scene description and application engine*
- *Part 12: ISO media file format*
- *Part 13: IPMP extensions*
- *Part 14: MP4 file format*
- *Part 15: AVC file format*
- *Part 16: Animation Framework eXtension (AFX)*
- *Part 17: Streaming text format*

Industry

- MPEGIF
- ISMA (Internet Streaming Media Association)
- 3GPP
- DMB
- Divx