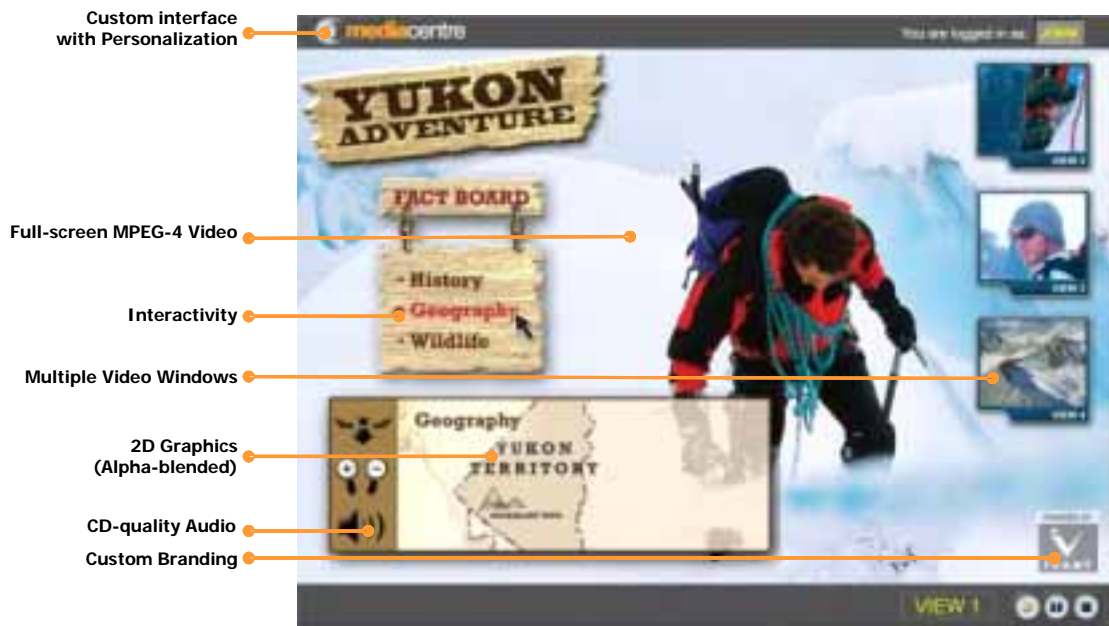


OBJECT ORIENTED INTERACTIVITY

MPEG-4 was built from the ground up to allow for object-oriented interactivity. The MPEG-4 standard embraces the concept of object-based coding and incorporates not just audio and video, but also 2D and 3D objects, animation, text, interactivity, data and more.

Because MPEG-4 is object-based, it is possible to construct multimedia scenes which revolutionize the possibilities of interactive media. With MPEG-4, interactive programming seamlessly integrates audio/video with 2D, 3D objects, animation and interactivity. For example, a viewer can navigate a sporting event's course from a 3D map, select information about aspects of the program, listen to commentary within a picture-in-picture window, and watch sponsored advertising – all within a single MPEG-4 stream supporting multiple media objects.



MPEG-4 Interactive TV "Scenes" support flexible post-decoding composition



A variety of media objects can be sent individually in elementary streams

POWERFUL INTERACTIVE MEDIA AUTHORIZING

To compose these various media elements, an MPEG-4 presentation consists of audio and/or visual objects and scene description information, called BiFS (binary format for scenes). The precise description of the object layout and interaction is critical given that the scene composition and rendering in MPEG-4 are done on the presentation level. MPEG-4's scene description tools also bring interactivity to the content, as each object can be enabled with unique functionality. Thus, with object-based interactivity, all media elements – whether audio, video, 2D or 3D graphics, text, animations, etc. – can be easily authored and managed.

MPEG-4 allows the same interactive programming to be used across different delivery channels. The same interactive program can be used on a DVD or delivered across a broadband network, something that is impossible with other technologies and standards.

SERVER-CLIENT INTERACTION

The power of MPEG-4 object-based interactivity is that the interactivity can be local (watching a live stream or playing back from a stored file such as on a CD-ROM or DVD), or remote – interacting with a media server. Client-side interactivity includes object-to-object interaction (e.g. one object can trigger another) or user interaction (e.g. a user clicks on an object and it zooms to the foreground).

BENEFITS OF OBJECT ORIENTED INTERACTIVITY

- **Complete Standards-based Implementation:** To facilitate interoperability across various MPEG-4 servers and terminals, the presentation layer, communication and messaging protocols are defined by the standard
- **Flexibility and Creative Control:** The experience of the media consumer and the user interface can be completely controlled by the content creator. The user only needs to deal with a single, consistent user interface.
- **Create Once, Distribute Everywhere:** Unique objects within an MPEG-4 scene can be swapped in or out for ease in re-purposing content
- **Delivery over Any Network:** The separation of the media objects' description and presentation enables the ability to deliver interactive MPEG-4 data across broadcast, broadband or wireless networks
- **Delivery to Any Device:** MPEG-4 set of technologies enable content flow seamlessly across media delivery networks to these end devices whether Given the proliferation of presentation devices cell phones, PDAs, PCs, or set-top boxes
- **Integrated Security and Copyright Protection:** MPEG-4 addresses the concerns of content providers by integrating interfaces to digital rights management systems deeply into the system.
- **Powerful Digital Asset Management:** Treating meta-data as an additional associated object within the scene allows for a complex set of archival capabilities.