

SAMBITS: Interactive Digital TV and Rich Media Streaming, based on DVB-MHP



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↪ Limitations of A/V-Streaming on the Internet today

↪ SAMBITS:

↪ System architecture

↪ Combination of broadcast and Internet delivery

↪ System proposal for Rich Media Streaming, using MPEG-4 and MPEG-7 in DVB-MHP

↪ Multimedia Studio System: New production tools

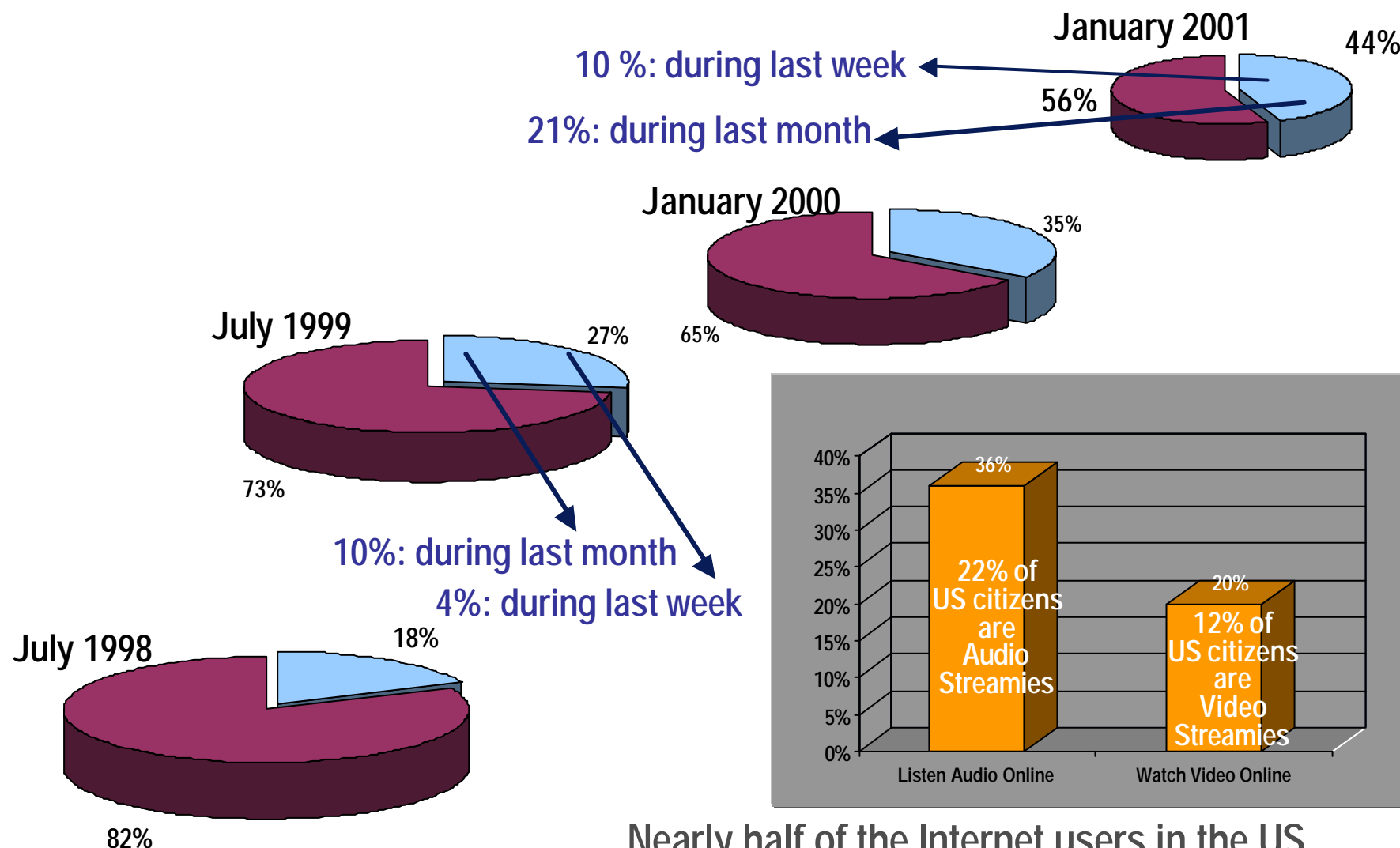
↪ Multimedia User Terminal

↪ SAMBITS Demonstration Scenarios

⇒ Eurovision Songcontest 2001

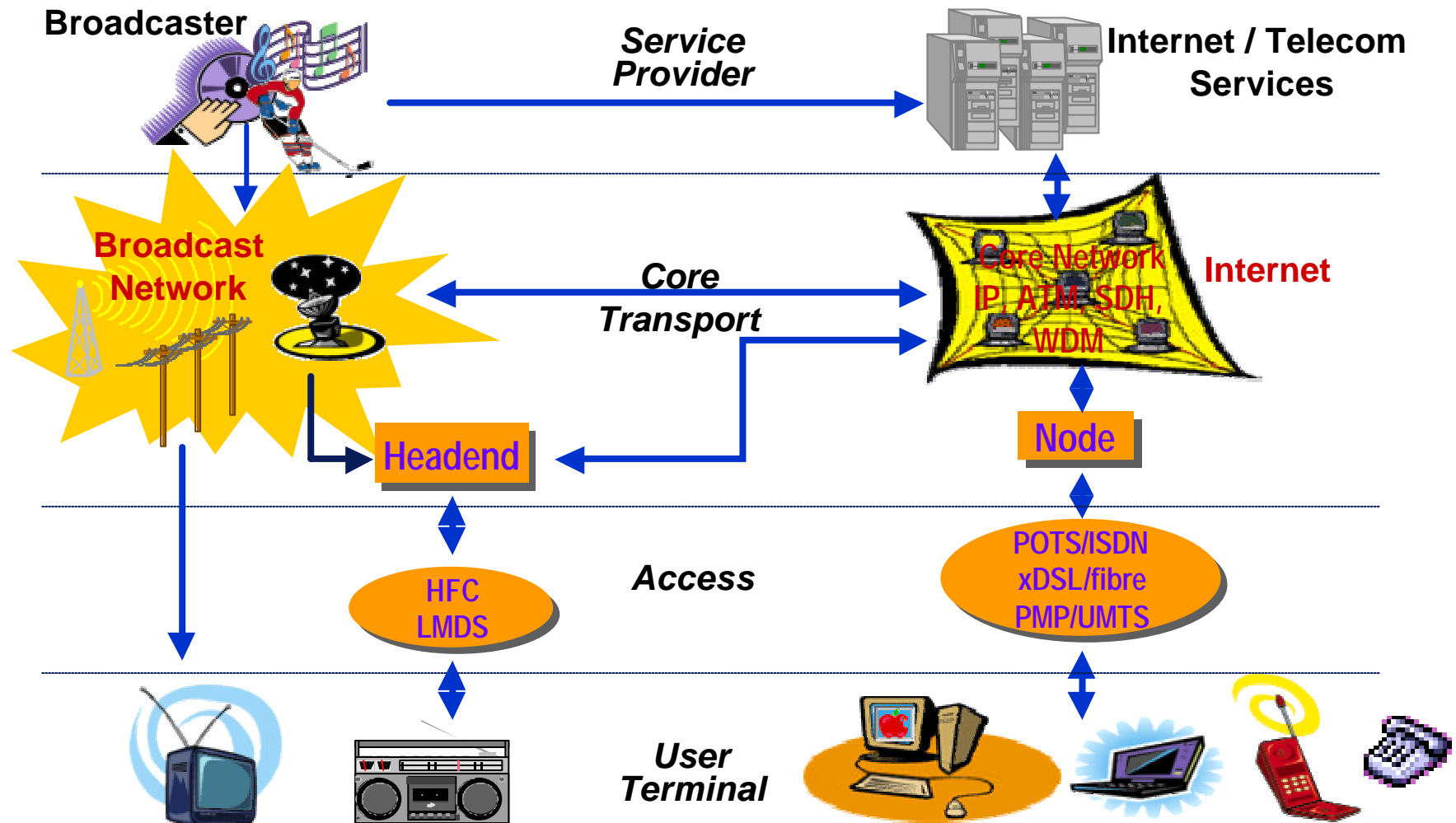
⇒ BBC's Big AI

The growths of A/V-streaming @ Internet: Interest in Internet-Streaming in the US



Nearly half of the Internet users in the US
was listening to Internet-Radio already

TV and Internet: Convergence of Broadcast & Telecom networks



Broadcast@Internet: Progress with Seven-League Boots or just a Hype?



↪ Streaming Audio/Video on the Internet gets more and more attention,

but

↪ Streaming of “events” does not work properly today, because

- ↪ Internet is not a “broadcast network”
- ↪ Multicasting is not implemented widely
- ↪ Serving millions of viewers is still expensive for the content provider
- ↪ QoS on the Internet is not guaranteed

↪ What happened during the EBU’s Webcast of the Eurovision Song Contest 2000 & 2001?

↪ Please have a look!

- ↪ A successful web-experience with live-streams of events needs an intelligent management of
- Internet (unicast) and
 - Broadcast (multicast) channels
 - Links between the two channels

- ↪ A system is needed, which
- ↪ combines the broadcast and Internet delivery
 - ↪ can manage both channels
 - ↪ produces and tailors the content for both channels
 - ↪ provides an easy to use multimedia terminal to the end-user

↪ Solution:



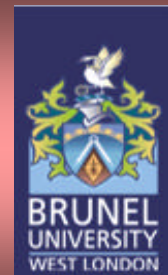
S A M B I T S



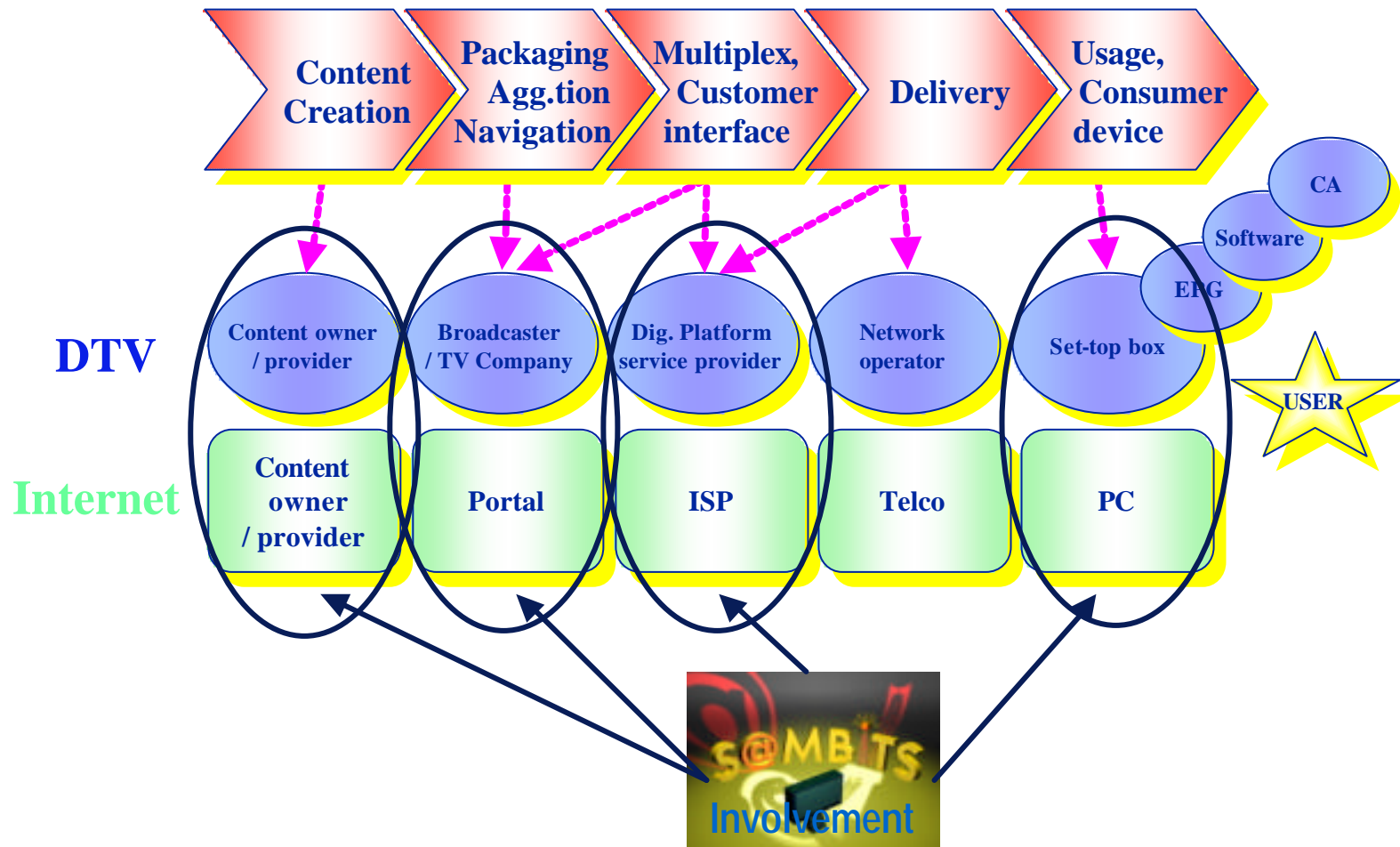
System for
Advanced
Multimedia
Broadcast &
Information
Technology
Services



Project Coordination:




Internet@DTV or DTV@Internet: „The value chain“



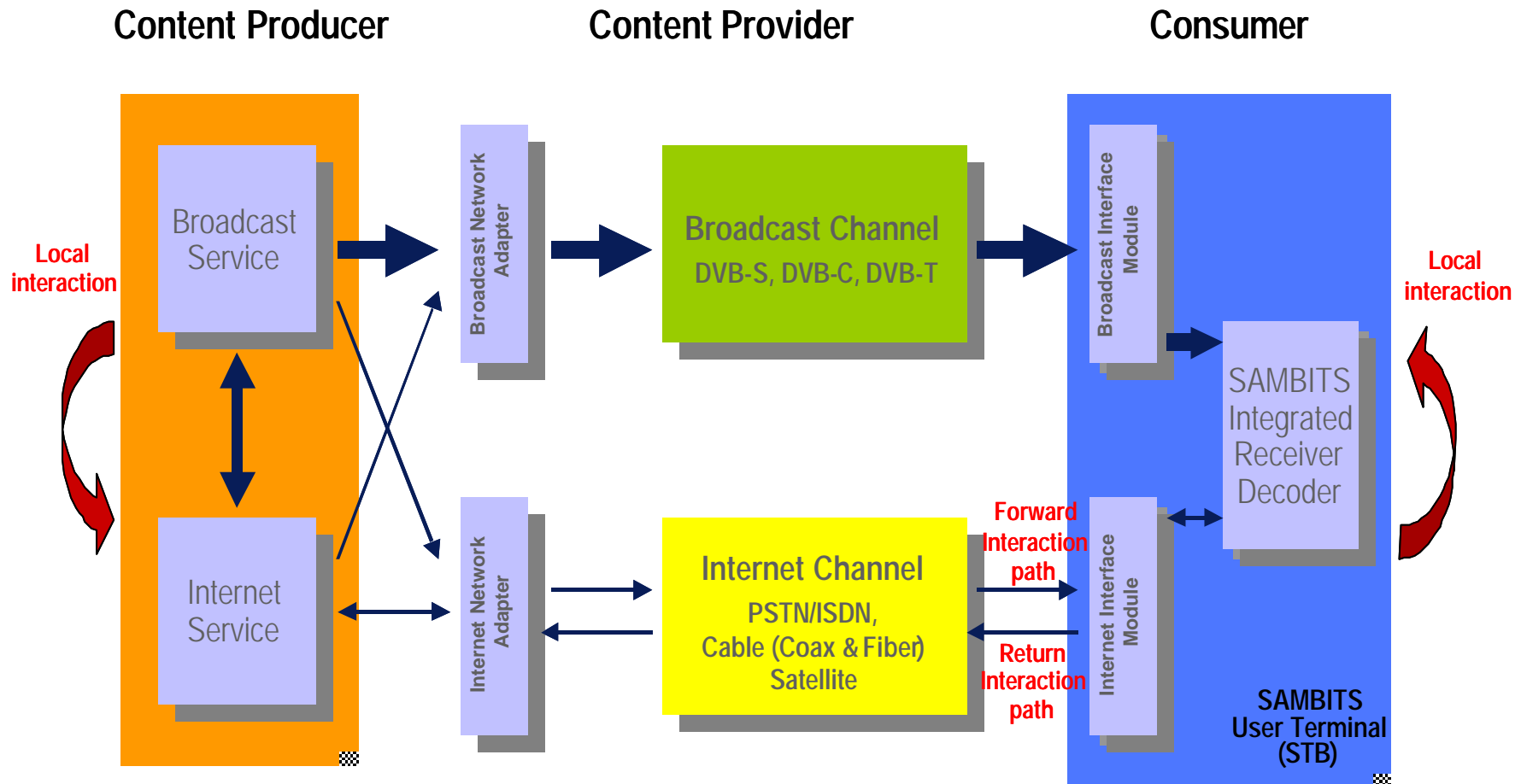
Internet@DTV or DTV@Internet : How to cross the DTV bridge?

SAMBITS: providing a perfect TV and Web experience for the viewer



- 
- A large, thick, orange curved arrow pointing from the S@MBITS logo towards the list of features.
- ↪ Combines MPEG-2, MPEG-4, MPEG-7, DVB-MHP and the Internet for high-quality interactive multimedia broadcasting, including Rich Media Streaming
 - ↪ Develops tools for integration of broadcast and internet value chain
 - ↪ Enables interactive personalised information through broadcast and internet channels

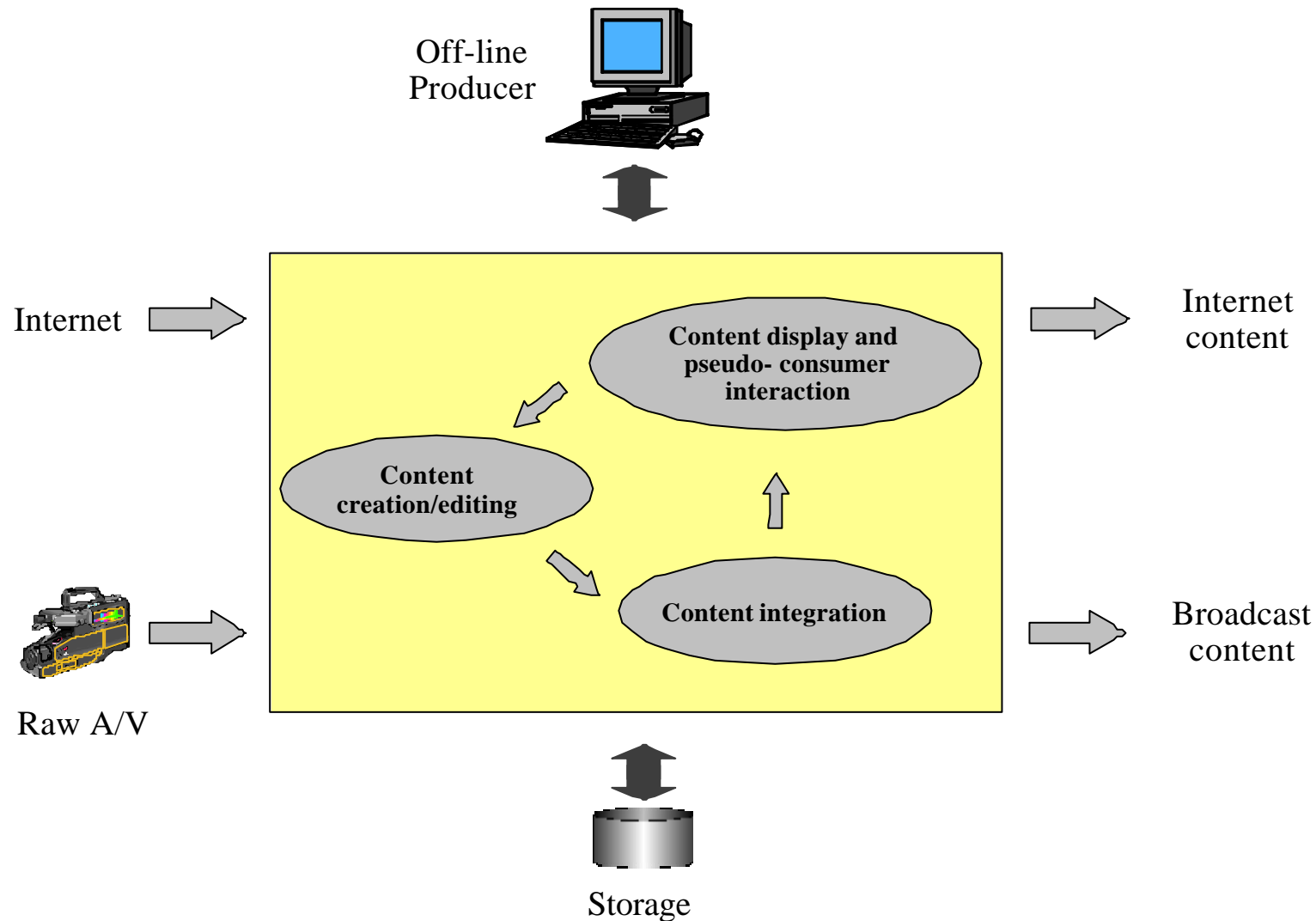
SAMBITS: Concept of complete System and Reference Chain



➤ Main Directions of the Project

- developed a multimedia studio system (example implementation) for real-time and offline content manipulation, annotation/event characterisation and insertion/integration
- developed a consumer type multimedia terminal
- interactive multimedia services based on MPEG-4 and MPEG-7 including synchronising broadcast and Internet content
- demonstrated integrated (DVB/Internet) services using a consumer type terminal
 - Eurovision Song Contest 2001
 - Scientific program: Story of "Big Al"
- Project duration: 1 January 2000 – 31 December 2001

SAMBITS: Concept of Interactive Programme Production Sub-System

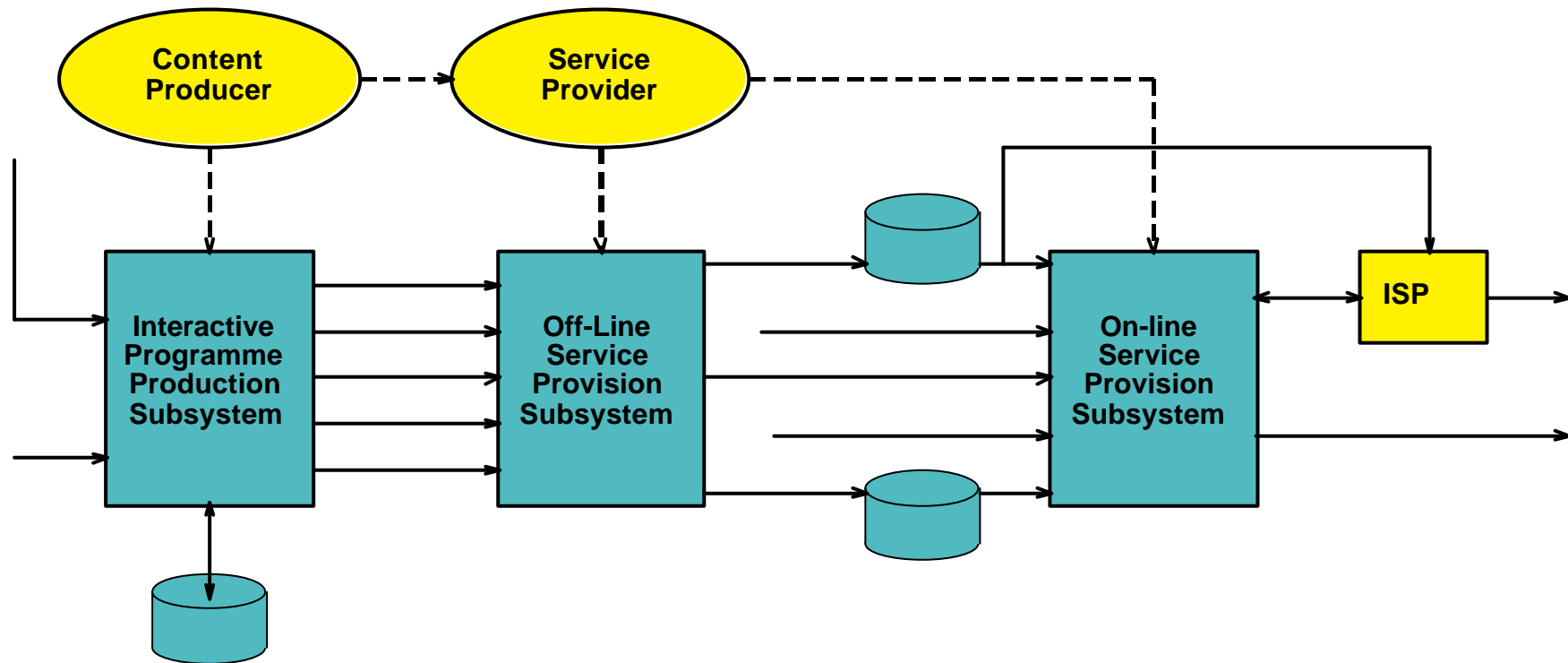


Interactive Programme Production System

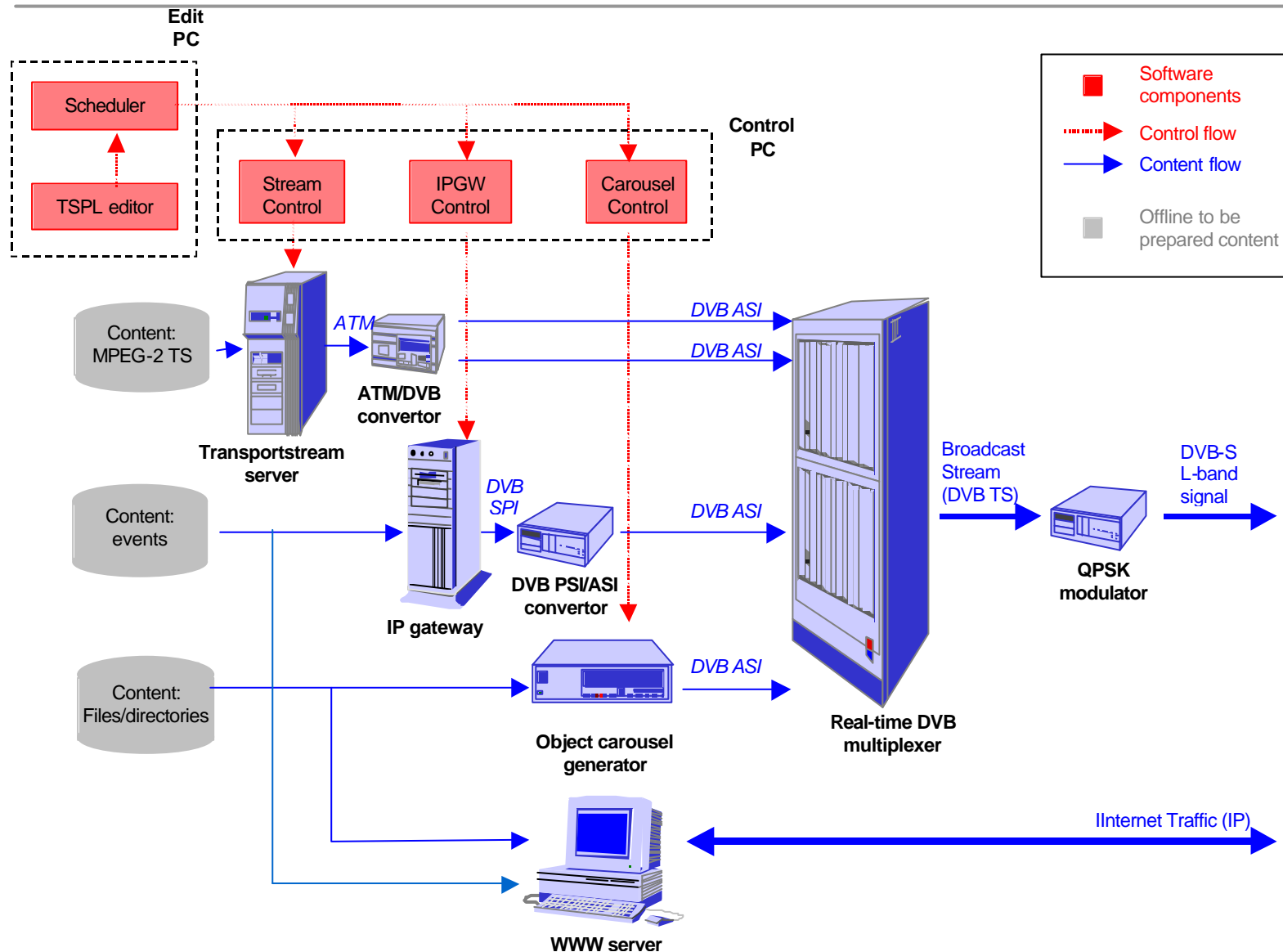


Content Capture Tools	Content Capture				
Content Creation Tools	MHP Workshop: Jpad Pro	Adobe Premiere 5.1	3D Studio Max 3.0	VRML to MPEG-4 Scene Translator	HTML Content Creation
Encoding Decoding Tools	MPEG-2 A/V Codecs	MPEG-4 A/V Codec	MPEG-7 Codec		
Indexing Tools	High Level Index	Segment Level Index			
Database & Search Tools	Image Search Tool				
Programme Creation & Visualisation Tools	Programme Creation	Programme Visualisation			

SAMBITS: Studio and Server Systems



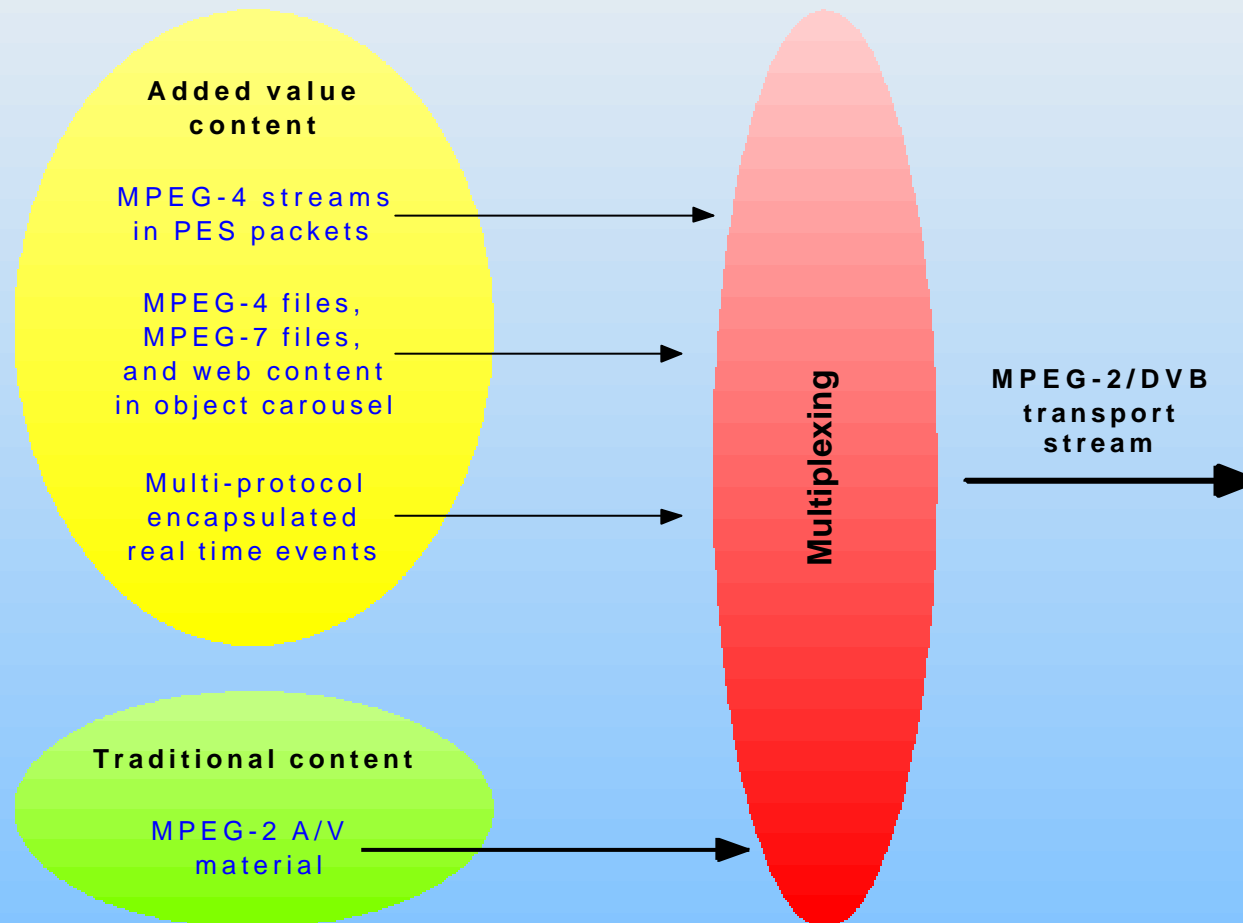
Online Service Provision Sub-system Hardware and Software Components



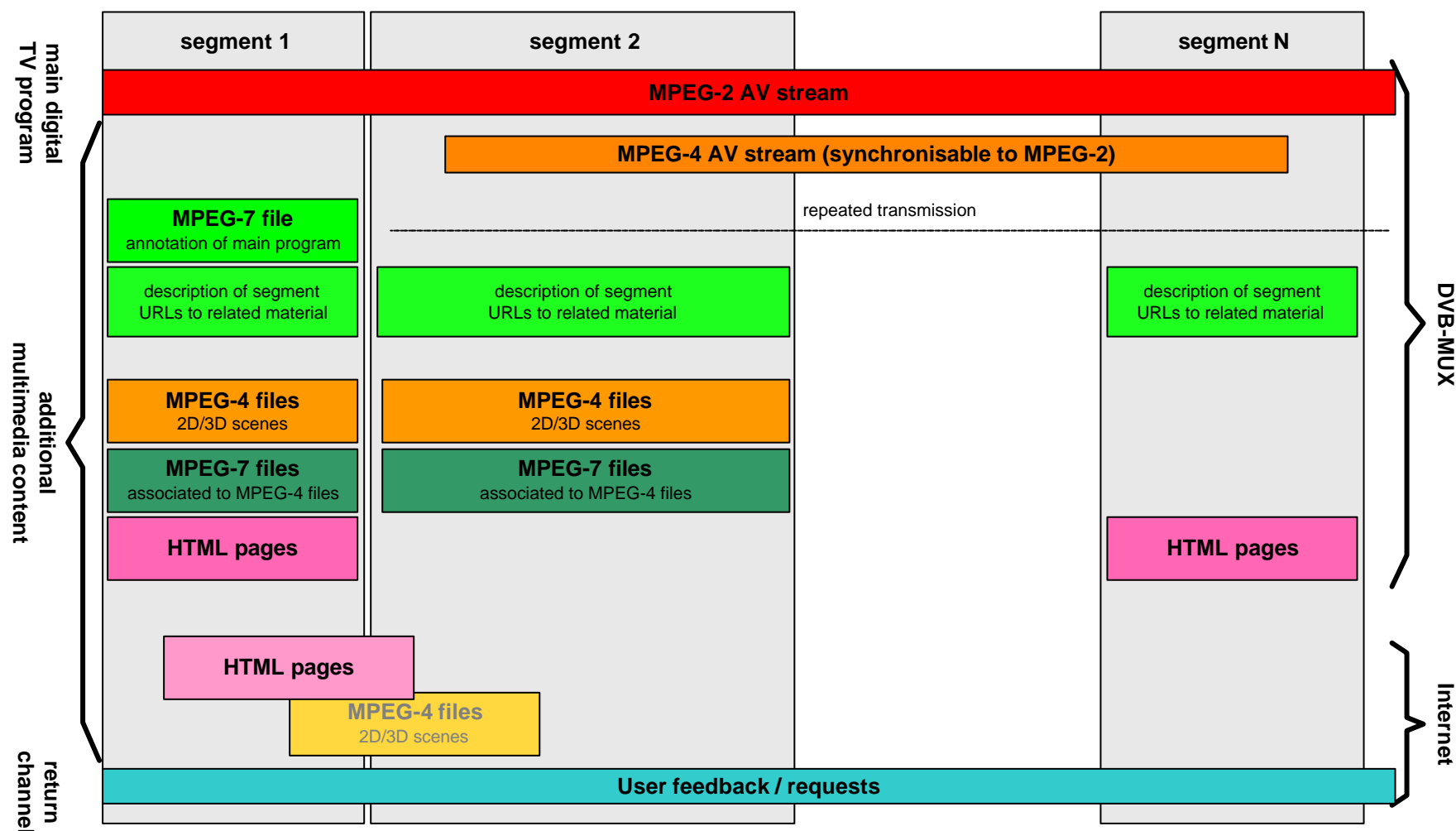
SAMBITS: Broadcast Mechanisms



Added value content synchronised with traditional DTV service



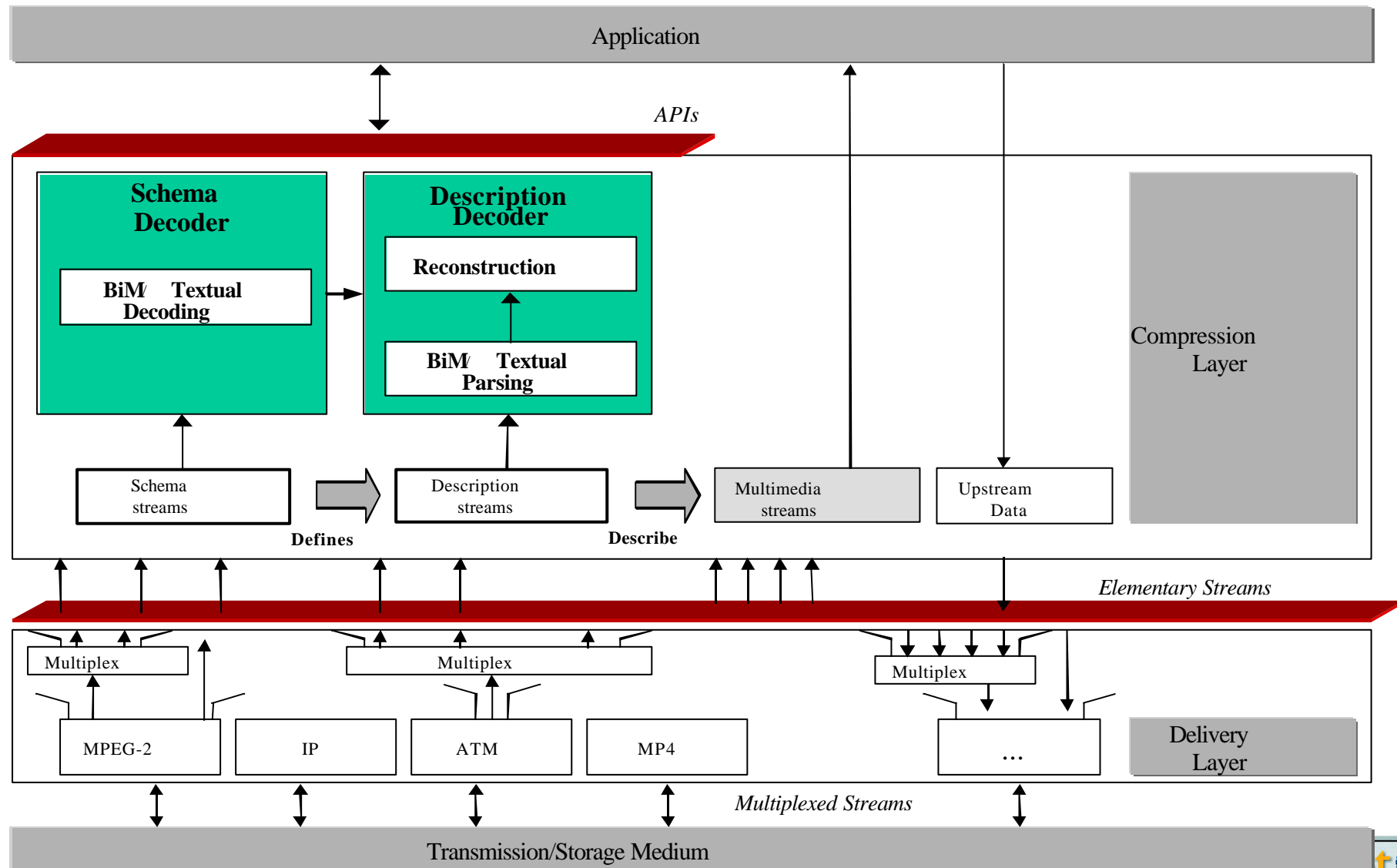
Composition of DVB-Transport stream and Internet delivery



Large-scale shared virtual and augmented environments

- ↪ SAMBITS as major European contributor to MPEG-7 Standard for interaction in combined broadcast and Internet applications
 - ↪ Contributions to “Multimedia Content Description Interface”
 - ↪ Participation in Core Experiment (CE) and Experimentation Model (XM) development
 - ↪ Creation of a production & postproduction studio system to enter and edit metadata-based High Level -semantic- and Low Level -syntactic- MPEG-7 descriptions
 - ↪ Development of a multimedia receiver terminal with metadata based search functionality and user interaction

SAMBITS: Contributions to MPEG-7 standardisation



Use on studio site:

↪ Generation of Descriptions

- ↪ Structure (e.g. Segments)
- ↪ Content (low level and high level)

↪ Searching and Filtering

- ↪ Support of Program Production
- ↪ Preparation for Delivery

Use on terminal site:

↪ Searching

- ↪ Content oriented search
(e.g. classification and structured annotation)

↪ User Interface Management

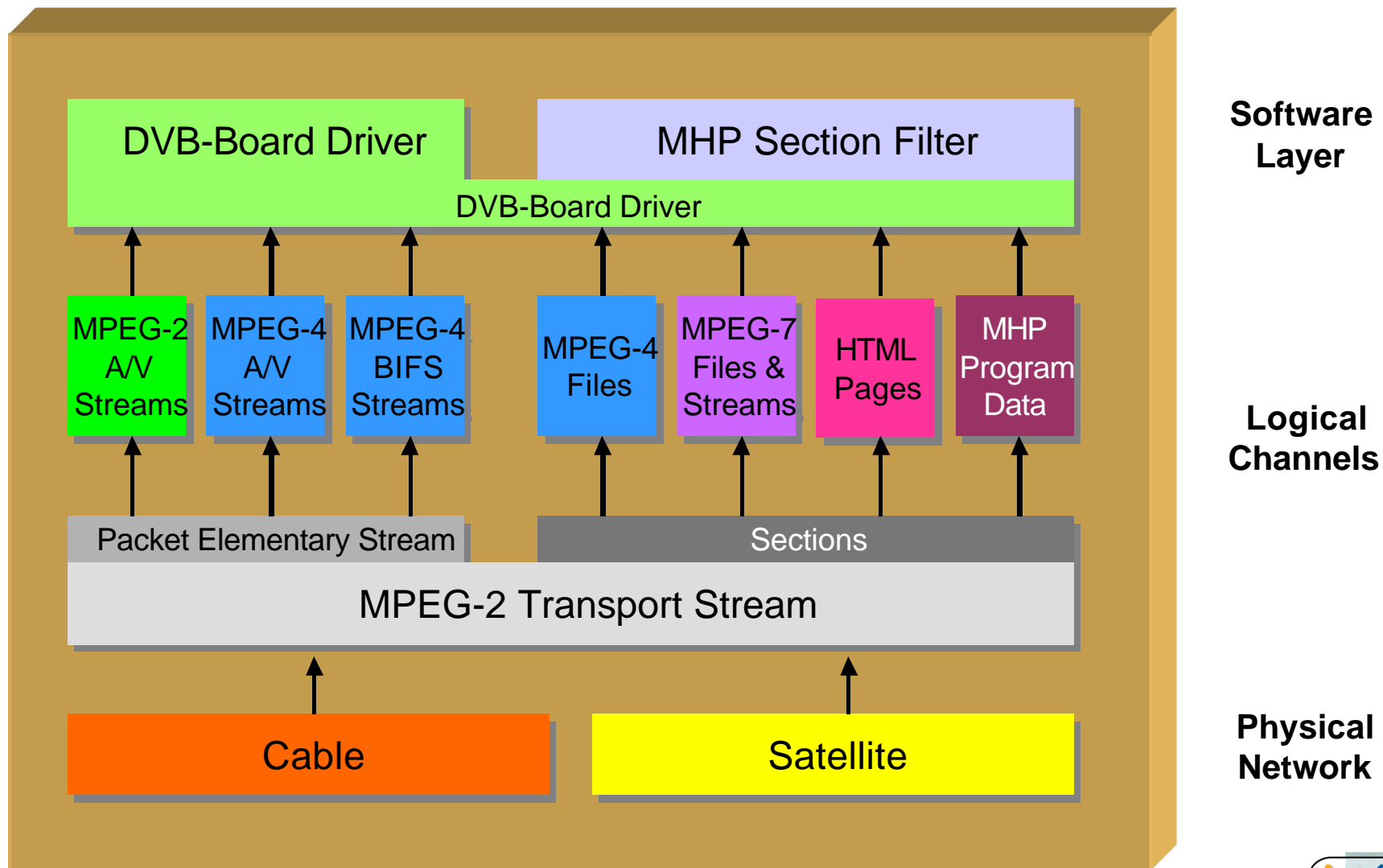
- ↪ Providing information about related material
- ↪ Triggering user interface events, based on scene change and new related material

SAMBITs Consumer Terminal: Functionality

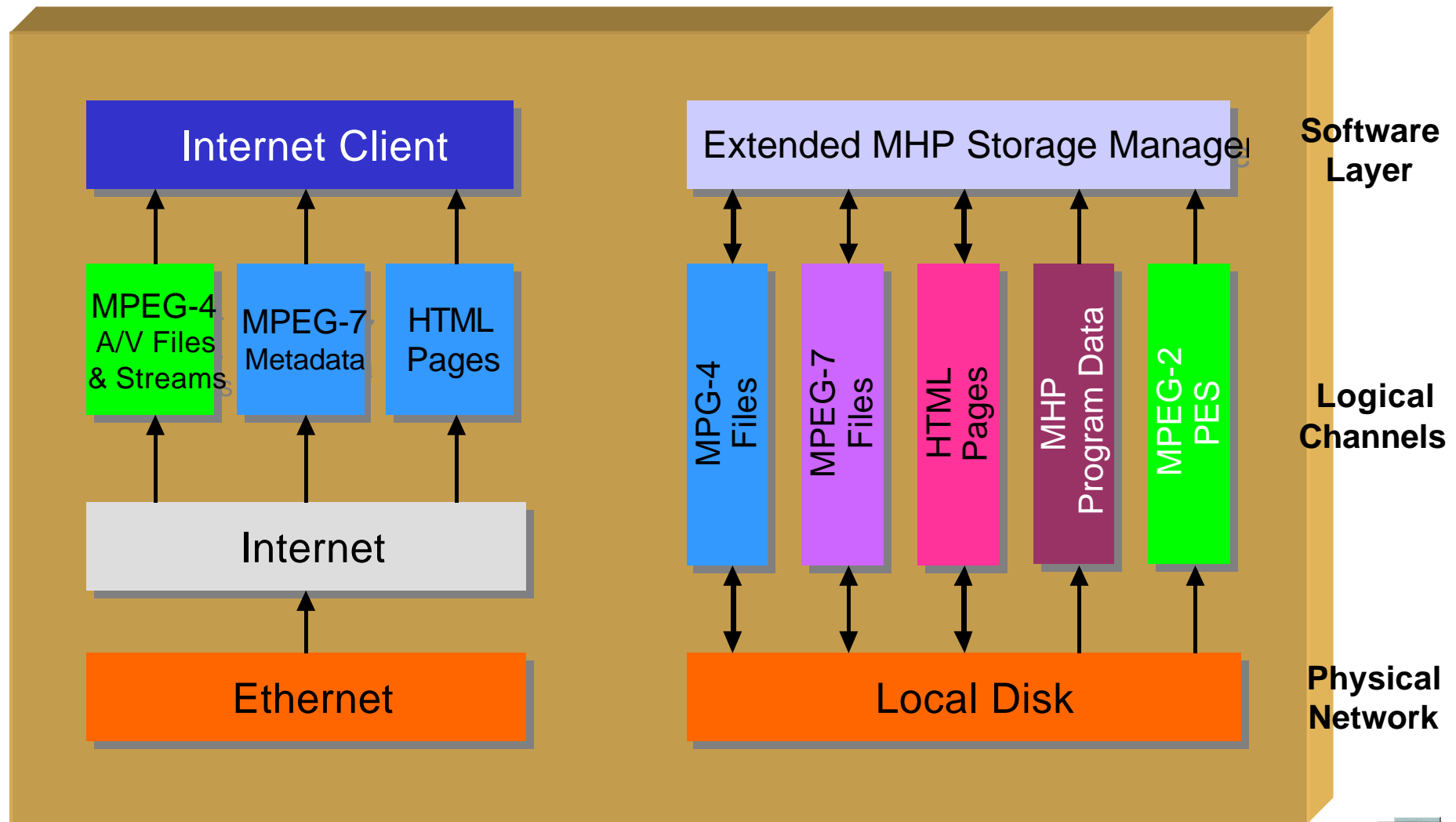


- ↳ Enable consumers to receive **multimedia broadcasting**
 - ↳ (MPEG-2, MPEG-4, MPEG-7)
- ↳ Enable user to retrieve **additional content** from the **Internet** (HTML)
- ↳ let users **interact** with **multimedia content**
- ↳ consumers have a **back-channel** available via Internet
- ↳ based on MPEG-7 meta-data user can **search and retrieve content**
- ↳ consumers can **create** their **individual reception experience**

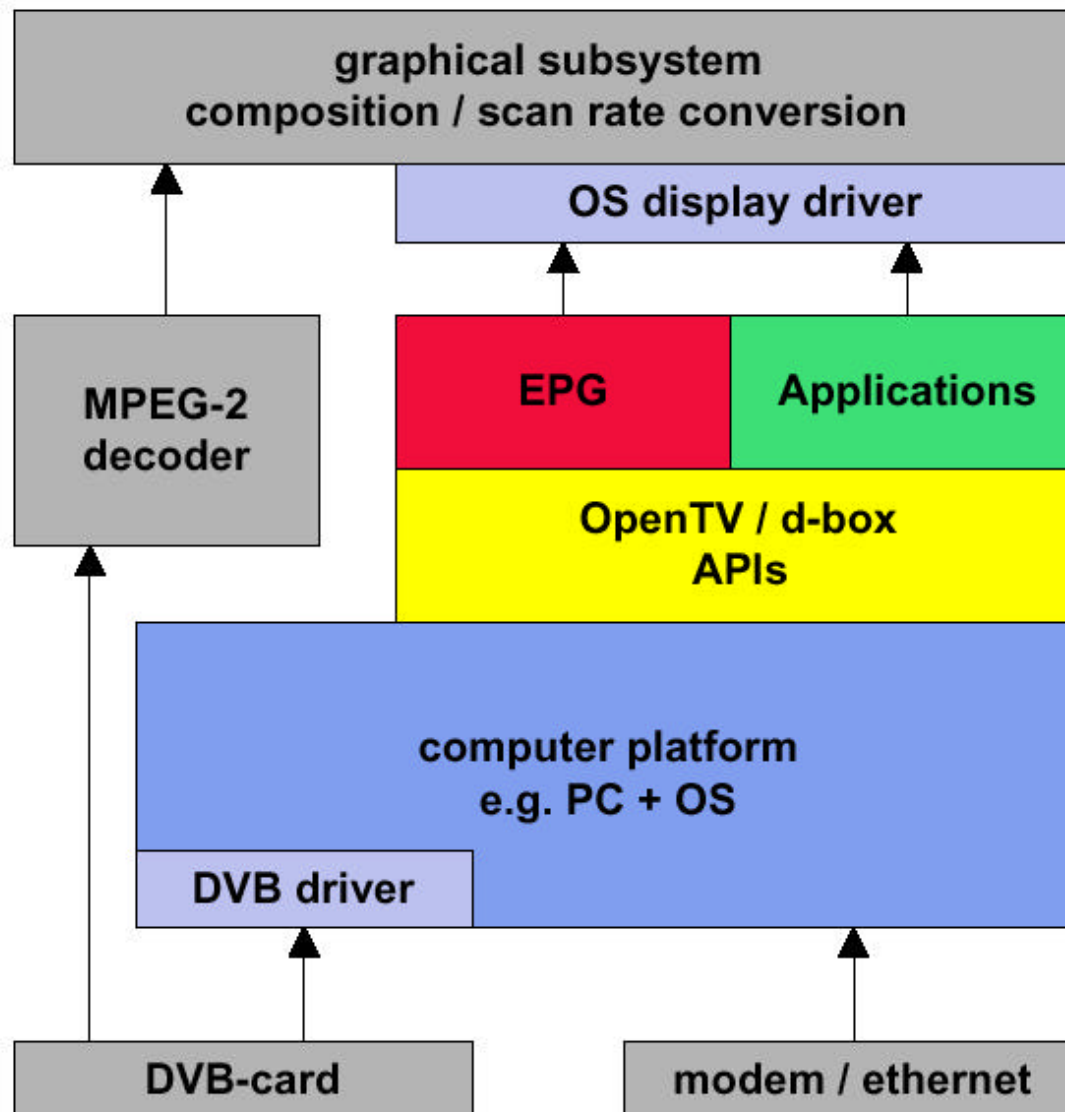
SAMBITs Multimedia Terminal: Types of content through broadcast channel



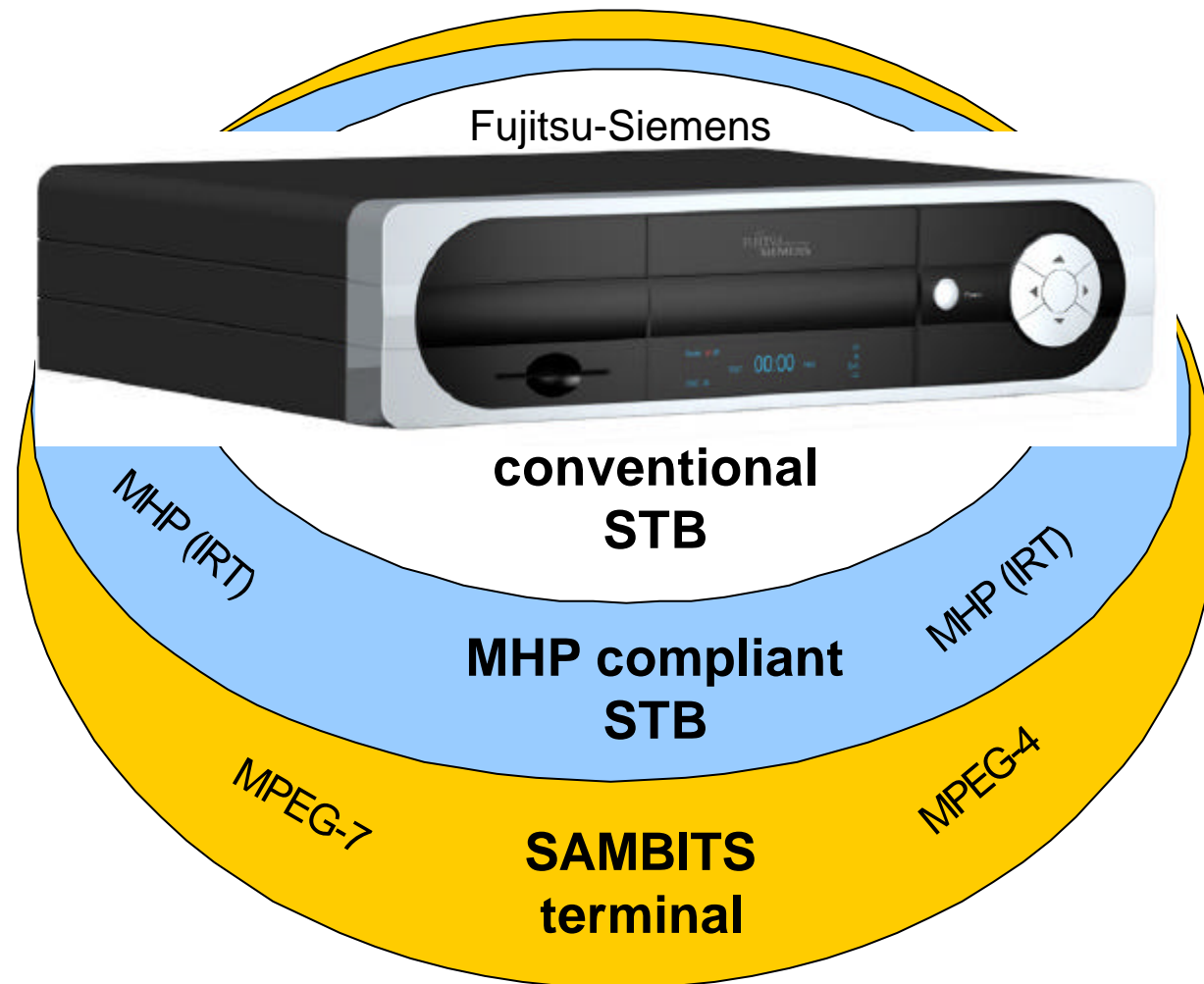
SAMBITs Multimedia Terminal: Types of content through Internet & local storage



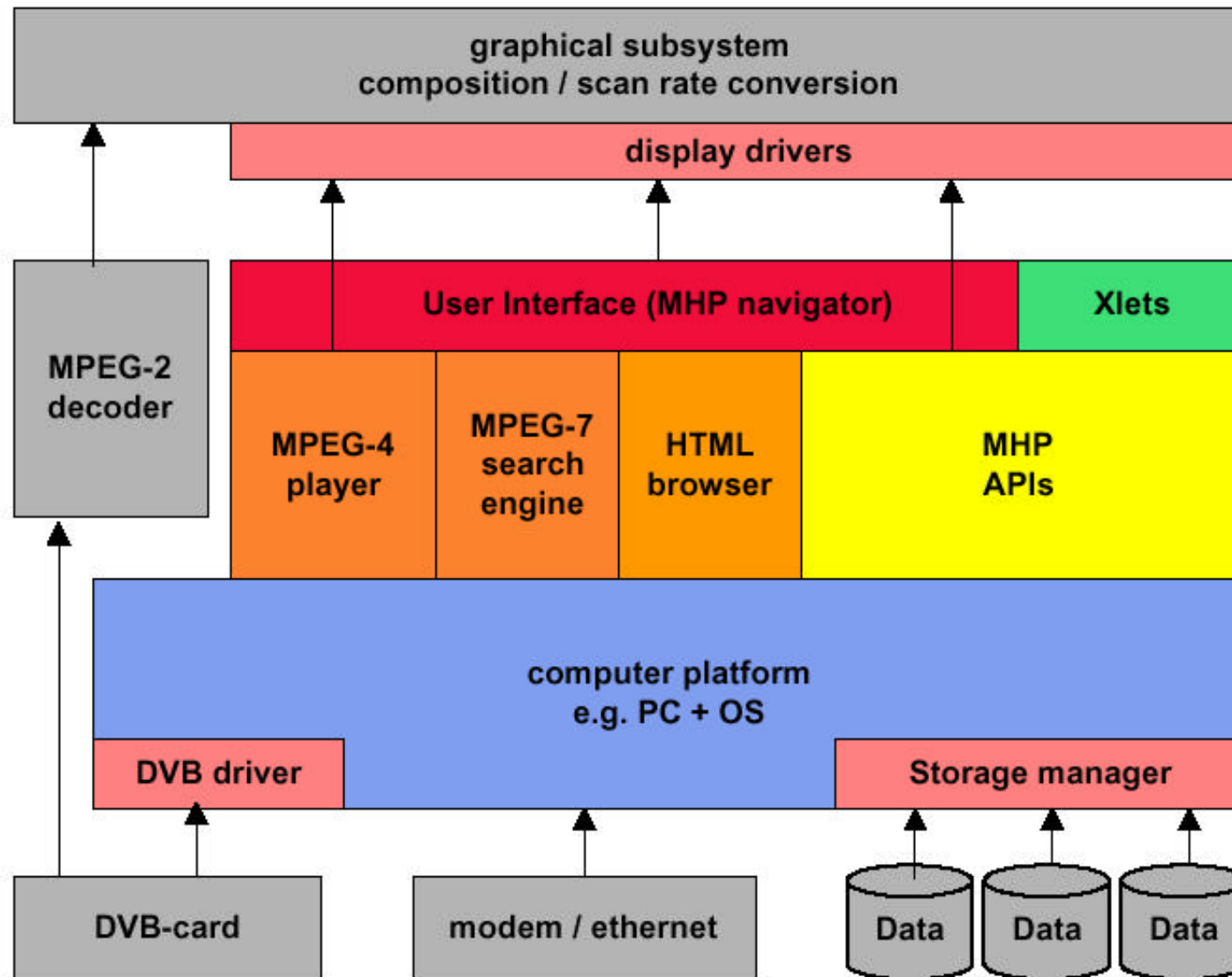
System outline of a conventional set-top box



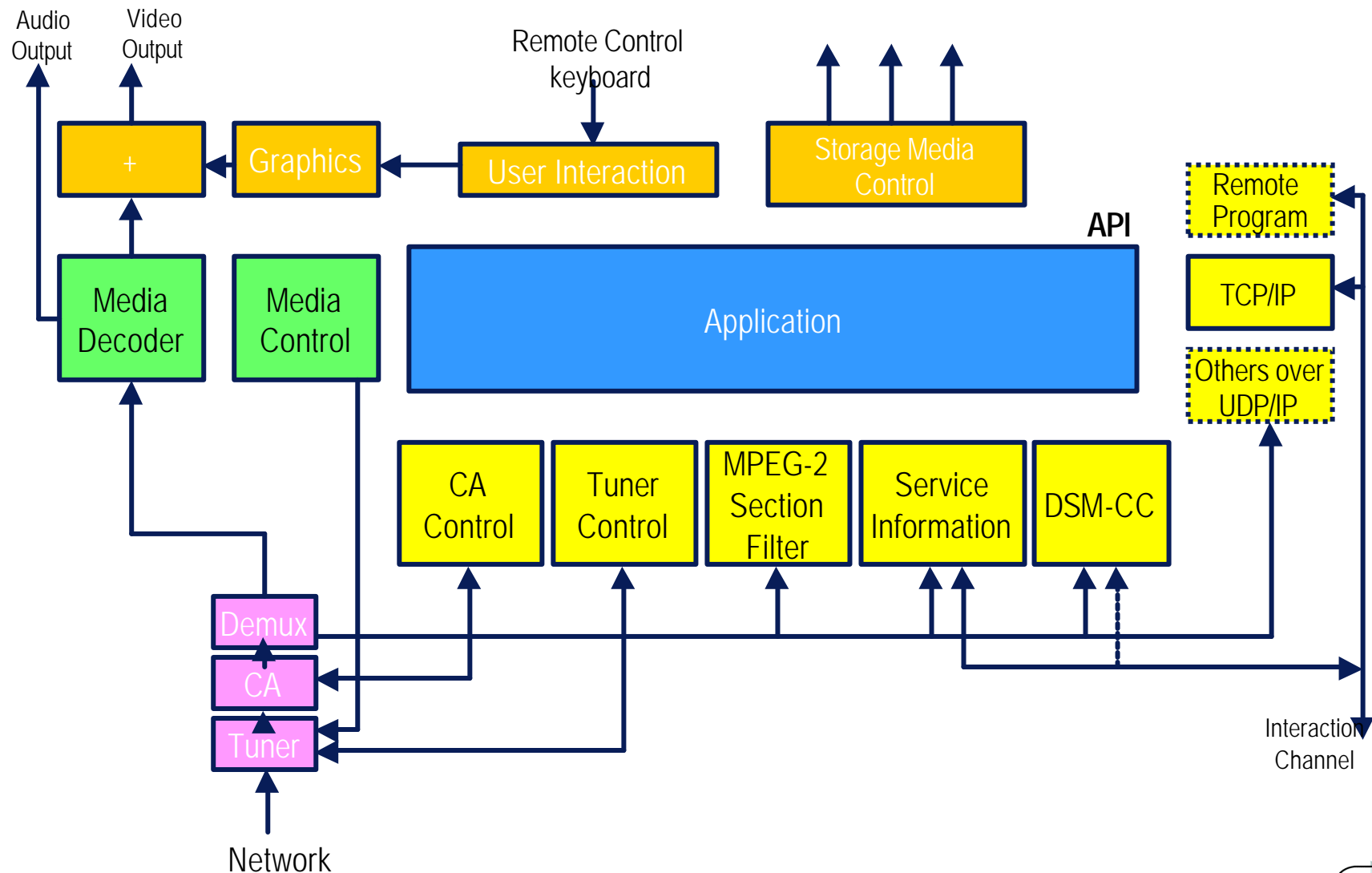
The SAMBITS terminal can be interpreted as an extension of a standard compliant MHP STB.



SAMBITS: System outline of the multimedia consumer terminal



Interaction of applications with the different modules of DVB-MHP



Answer: SAMBITS!

Systems for Advanced Multimedia Broadcast and IT Services



- Interactive Digital TV, based on MPEG-2 System as transport medium for broadcast and individually addressed traffic in connection with return channel
- MPEG-4 synchronised services to MPEG-2 main program
- MPEG-4 and MPEG-7 based push services
- Local and full, i.e. remote interactivity in user terminal
- Handover/roaming of network functionalities
- Compatibility with the standardised DVB API:
The Multimedia Platform (DVB-MHP)