



3-D virtual worlds for broadcast television

IST project MADISON

Thierry Keutgen
Senior Application Engineer
DELTATEC

t.keutgen@deltatec.be
www.deltatec.be



Television ? Internet ?





Television ?

△ Internet on TV TV on Internet

Is it the issue ?

△ Television is evolving in a new framework

- ↻ New business models: pay TV, pay-per-view, games, T-commerce, ...
- ↻ Content to multiple types of supports



How do we make it happen ?

- △ Deltatec is a
 - ⌚ High-tech explorer for its customers
 - ⌚ Specialist in broadcast

This revolution is an opportunity

- △ It's far from trivial ... R&D work needed



European IST Project

With real-world objectives it is a nice framework to

- △ Meet technical experts
- △ Meet industrial end-users
- △ Explore new technical fields
- △ Get a technical edge for our customers





Idea – Issues - Solutions

- △ 3-D
- △ Multi-user
- △ Latency
- △ Distributed application
- △ IEEE DIS
- △ Client-to-client interaction
- △ Broadcast
- △ No demonstrator for the technology
- △ MPEG-4



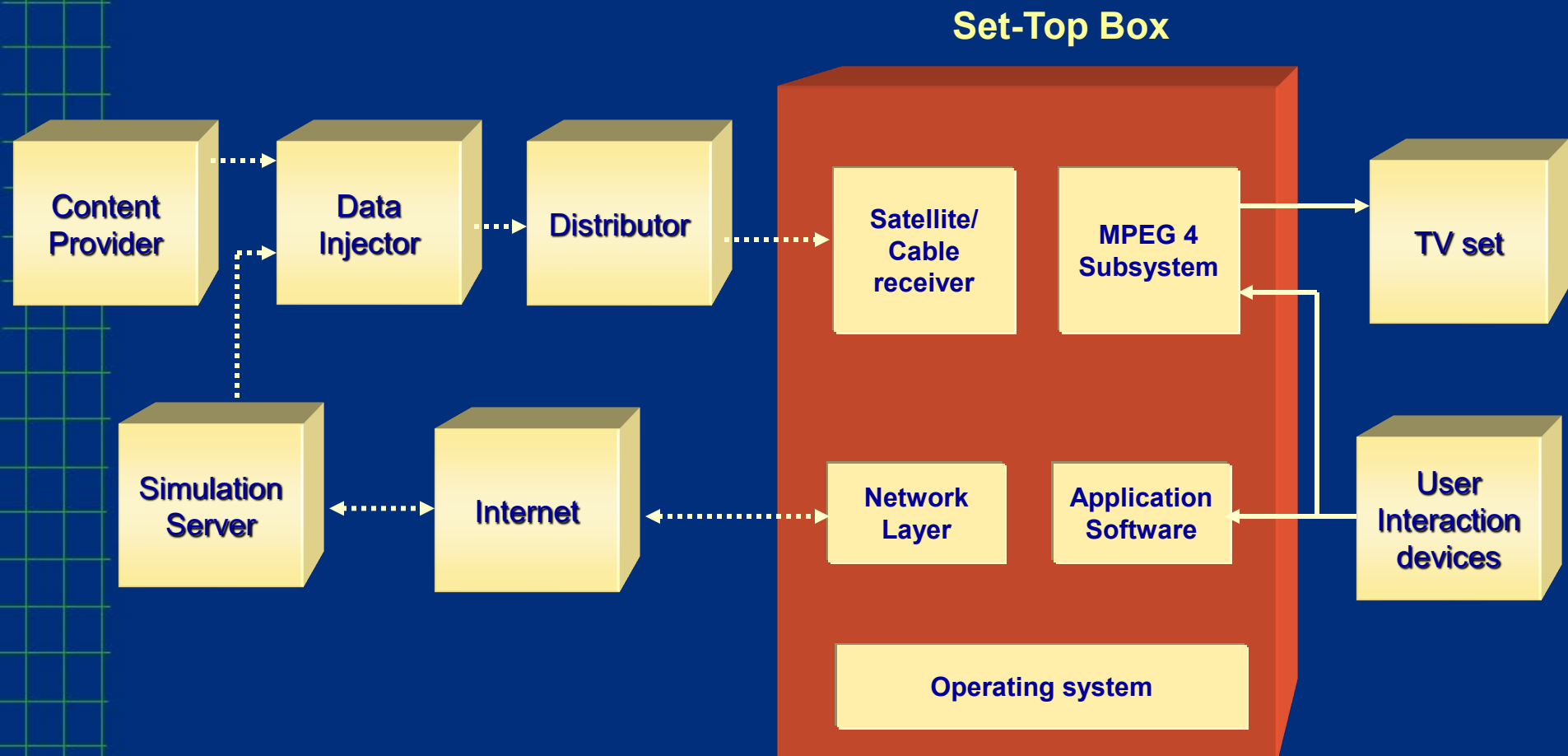
MPEG-4

MPEG-4 allows to wrap 3-D synthesis information into more general multimedia structures where video, audio, 3-D and image objects coexist and interact

- △ NOT low bit rate video
- △ NOT encoding / decoding
- △ NOT internet
- △ BROADCAST

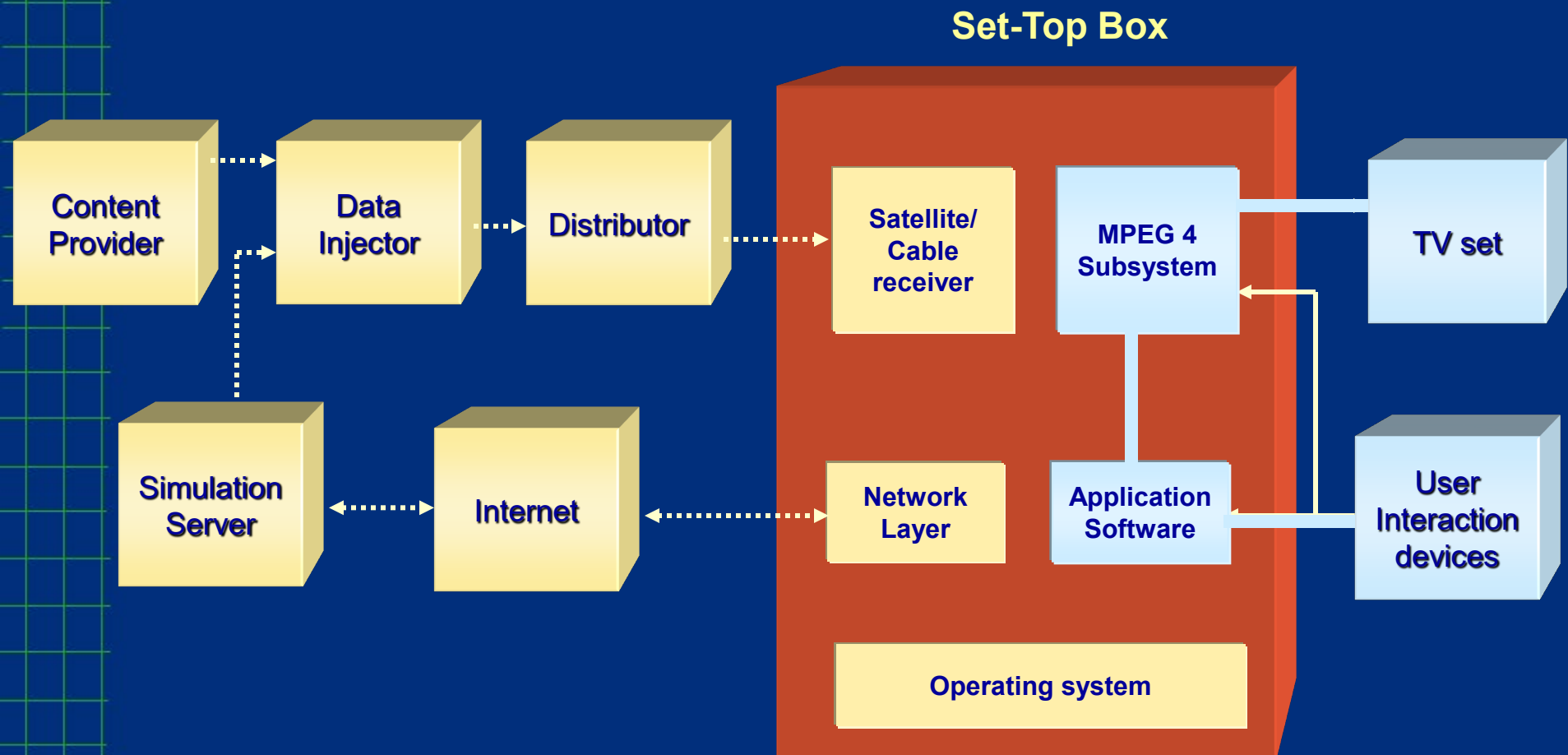


Architecture



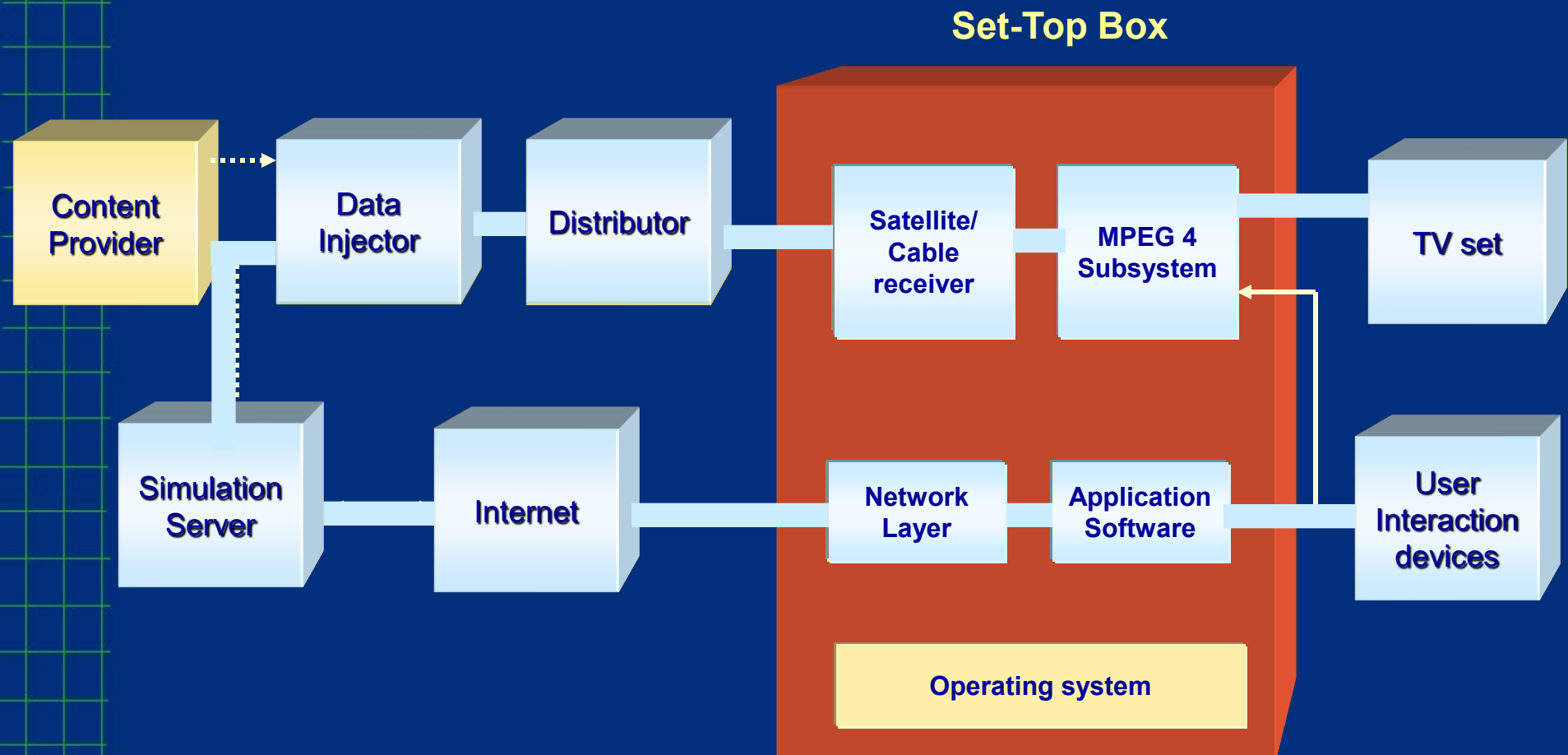


Architecture





Architecture





Partners



Archetypon



Boostworks



Canal+ Belgique



Deltatec



EPFL



Memondo



Norsk Regnesentral



Results produced

- △ Simulation server – IEEE DIS-like message protocol
- △ MPEG-4 over MPEG-2 injector
- △ Network acceleration layer
- △ Prototype STB





Channel selection

MADISON

CHANNEL GUIDE 7 CHANNELS

CHOOSE YOUR CHANNEL

- CANAL +
- CANAL BLEU
- CANAL JAUNE — MADCHANNEL
- CANAL+ 16/9**
- CANAL BLEU 16/9
- CANAL JAUNE 16/9
- EPG

MP4 STATUS

■■■



3-D virtual world



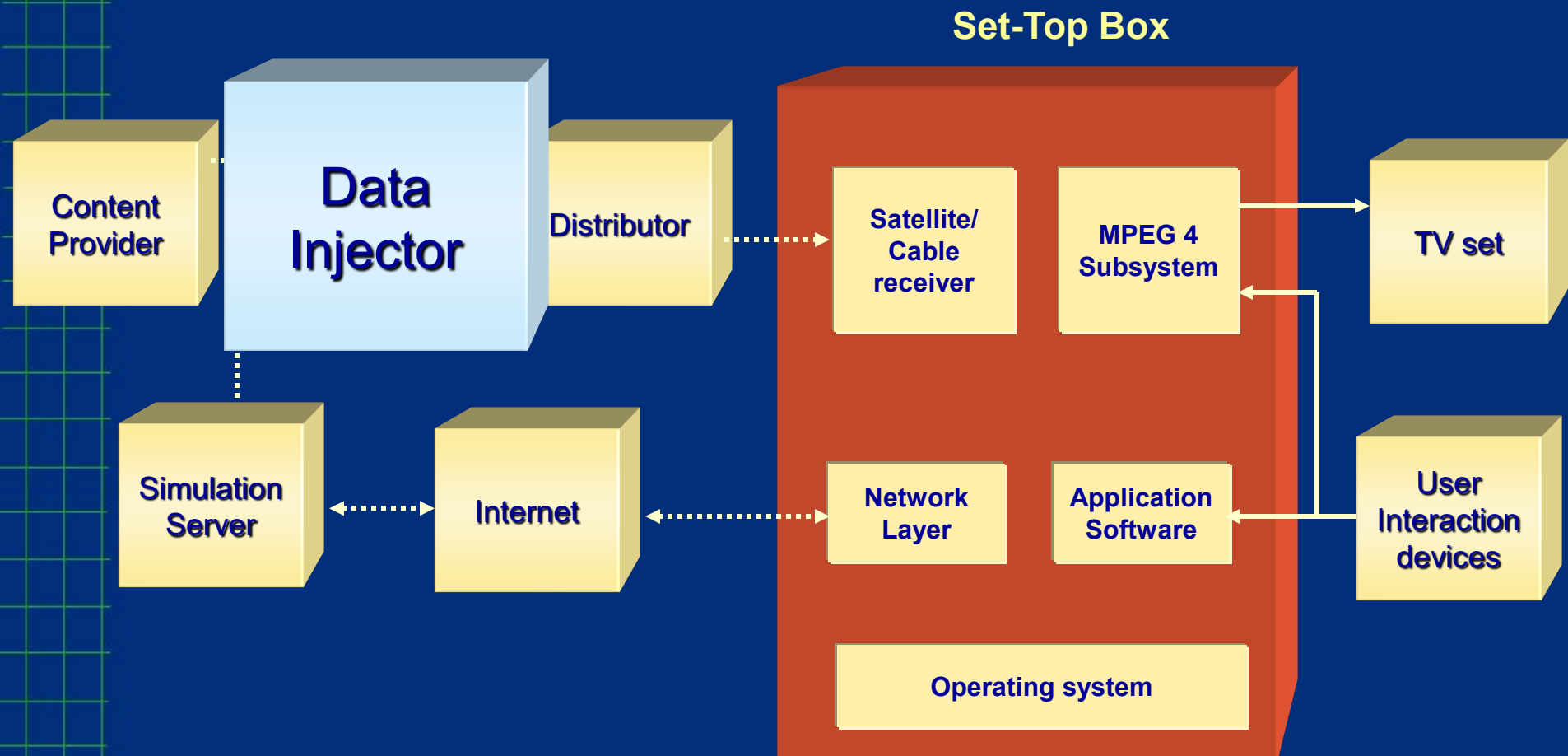


Interaction with context or other users





Data Injector

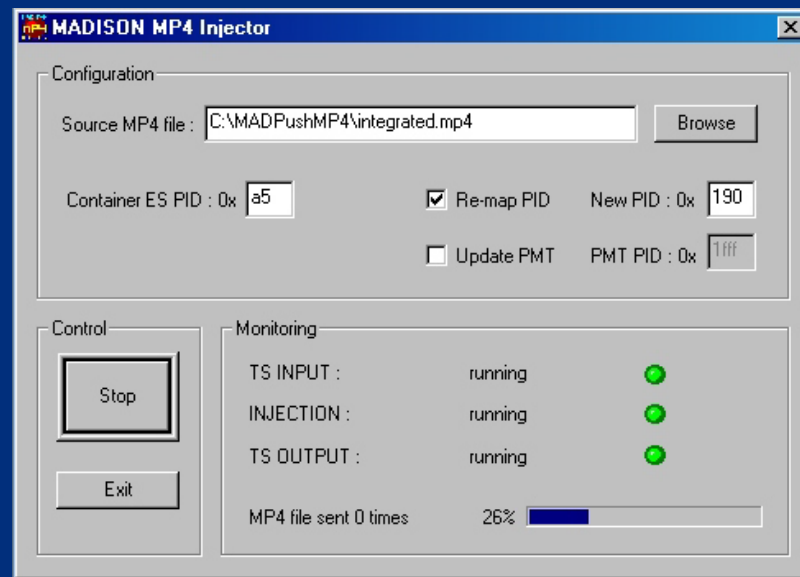




MPEG-4 over MPEG-2 injector

Different options to inject data over a MPEG-2 TS :

- △ Raw data over a MPEG-2 TS
- △ IP over MPEG-2 TS
- △ MP4 file hinting and injection
- △ «True» MPEG-4 SL-Packets embedding through a DMIF interface

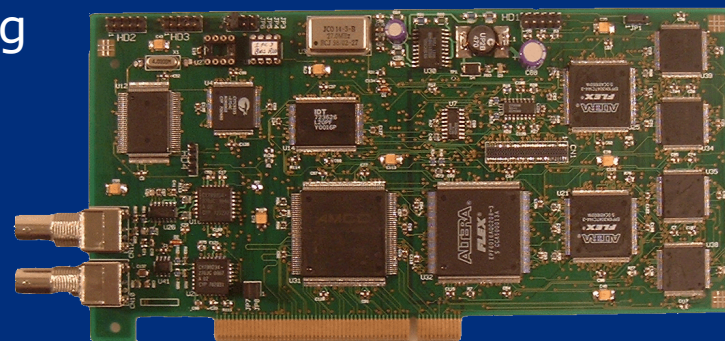




MPEG-4 over MPEG-2 injector

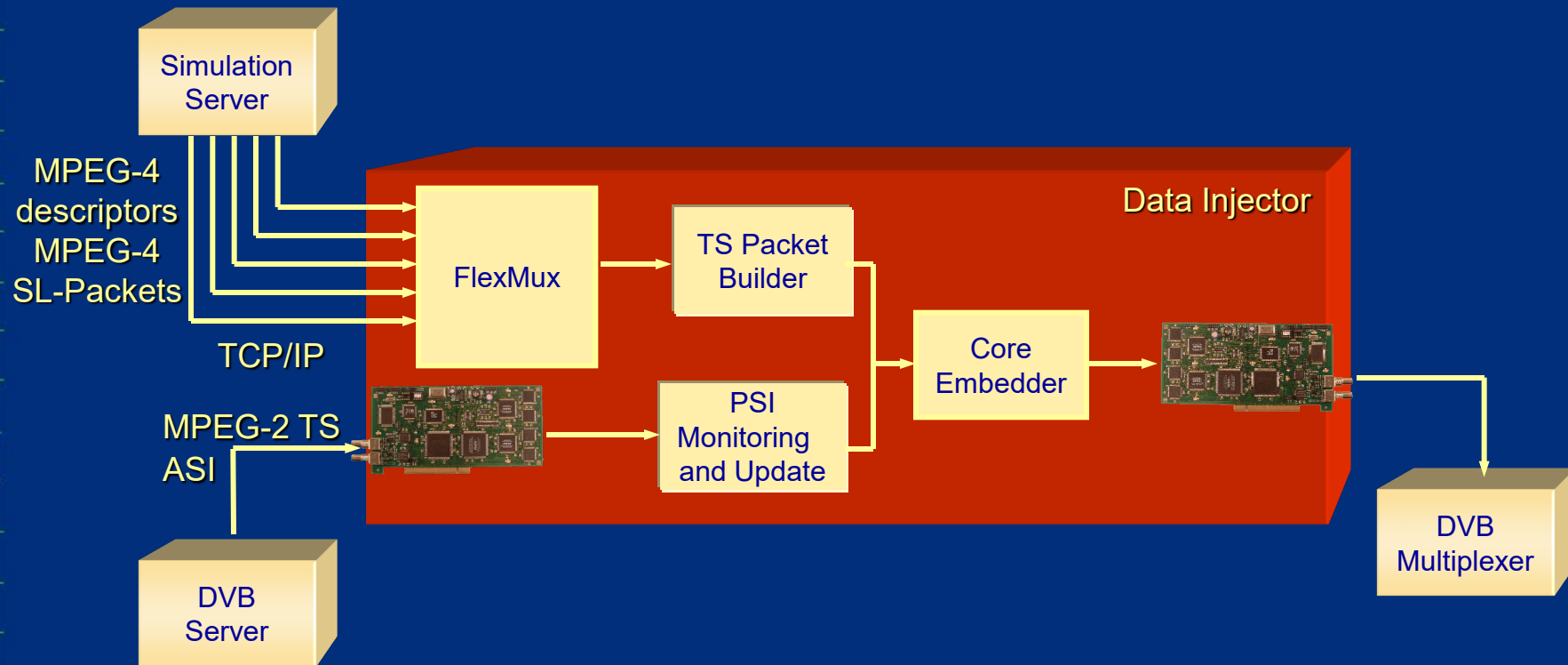
- △ Based on a PCI board with:
 - ⌚ 2 DVB ASI transmitters and 2 receivers
 - ⌚ Reconfigurable I/O controller to process MPEG-2 TS

- △ Applications:
 - ⌚ PID filtering and TS processing
 - ⌚ DVB MPEG-2 video servers
 - ⌚ Interactive Television (iTV)
 - ⌚ IP data insertion/Data broadcasting
 - ⌚ Video over IP (VoIP)
 - ⌚ Video-on-Demand (VoD)



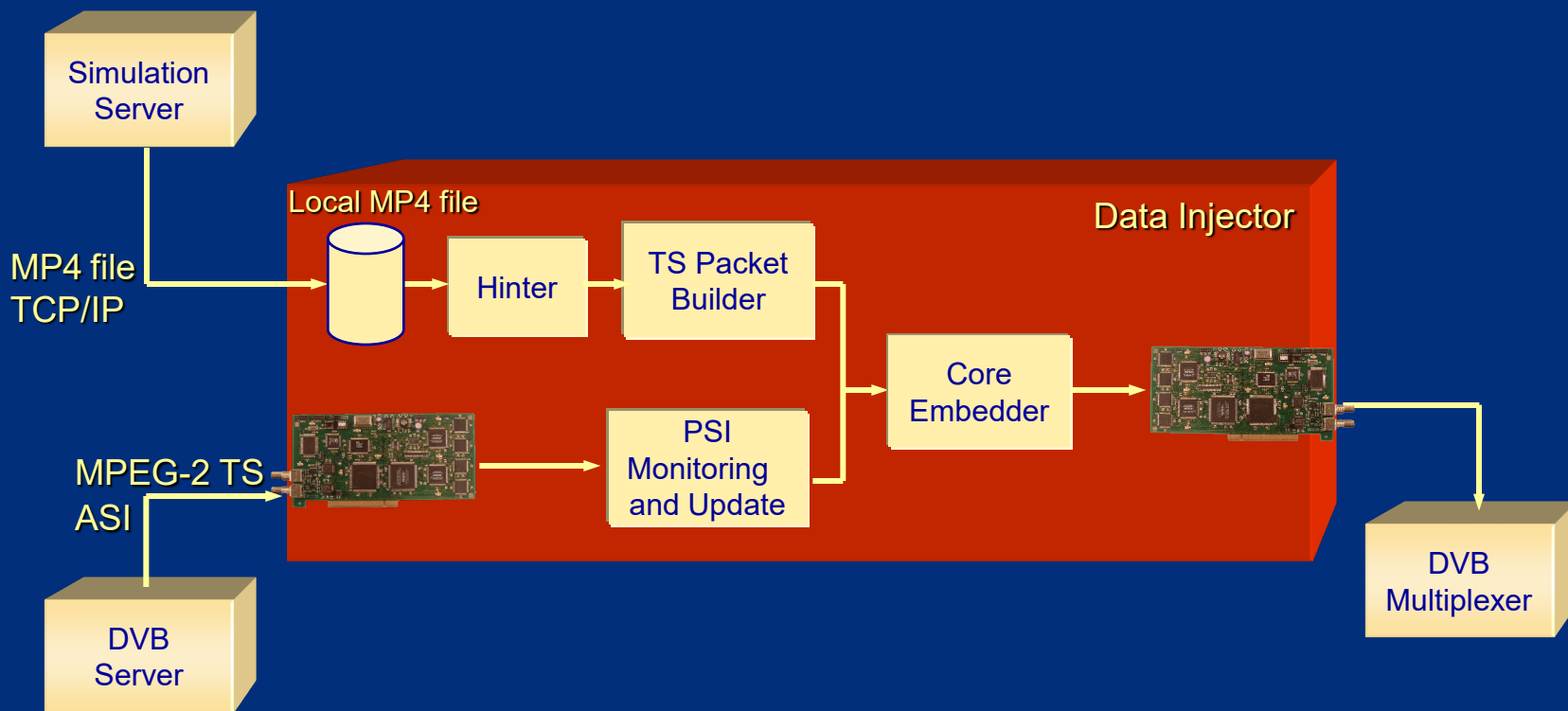


SL-Packets injector



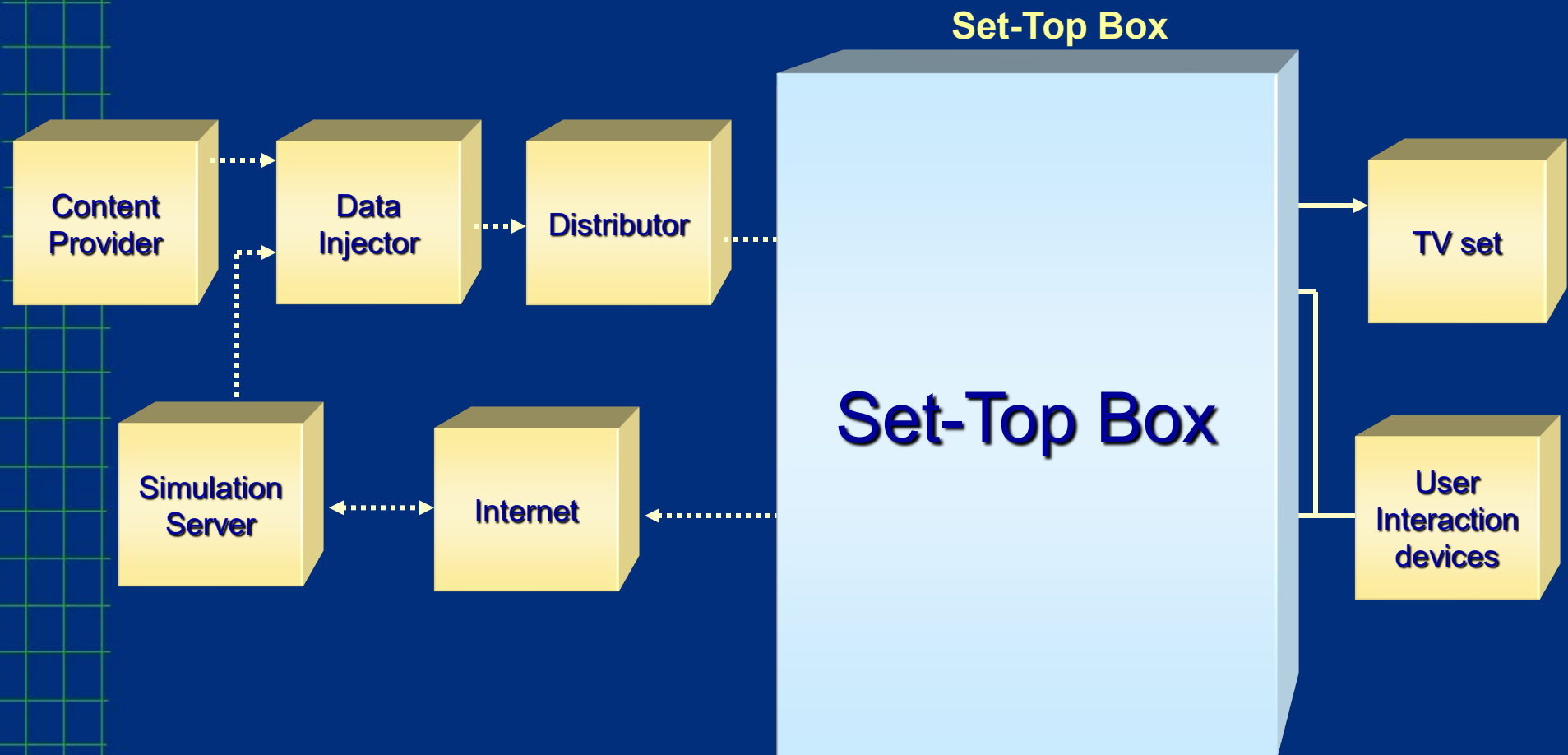


MP4 file hinter and injector





Prototype Set-Top Box





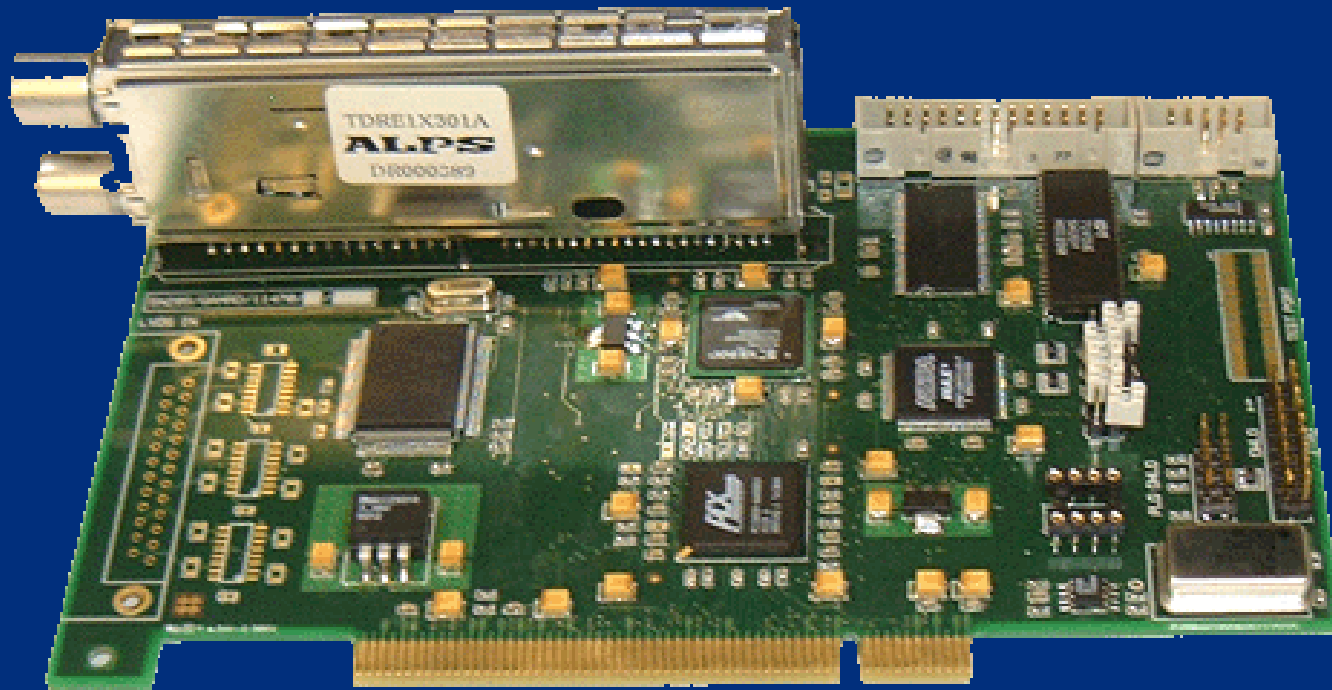
Prototype STB - MadBox

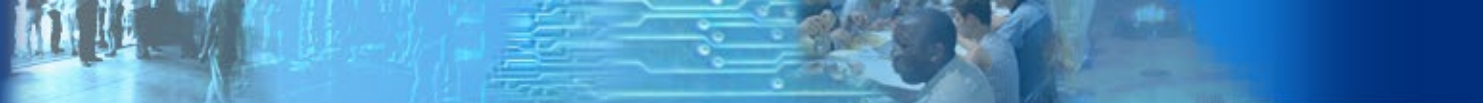
- △ Based on a PC running Windows 2000
- △ QAM receiver board and demultiplexer
- △ MPEG-4 DMIF for
 - ⌚ Local files
 - ⌚ Internet
 - ⌚ Broadcast
- △ Customised housing
- △ Everything managed through a TV remote control



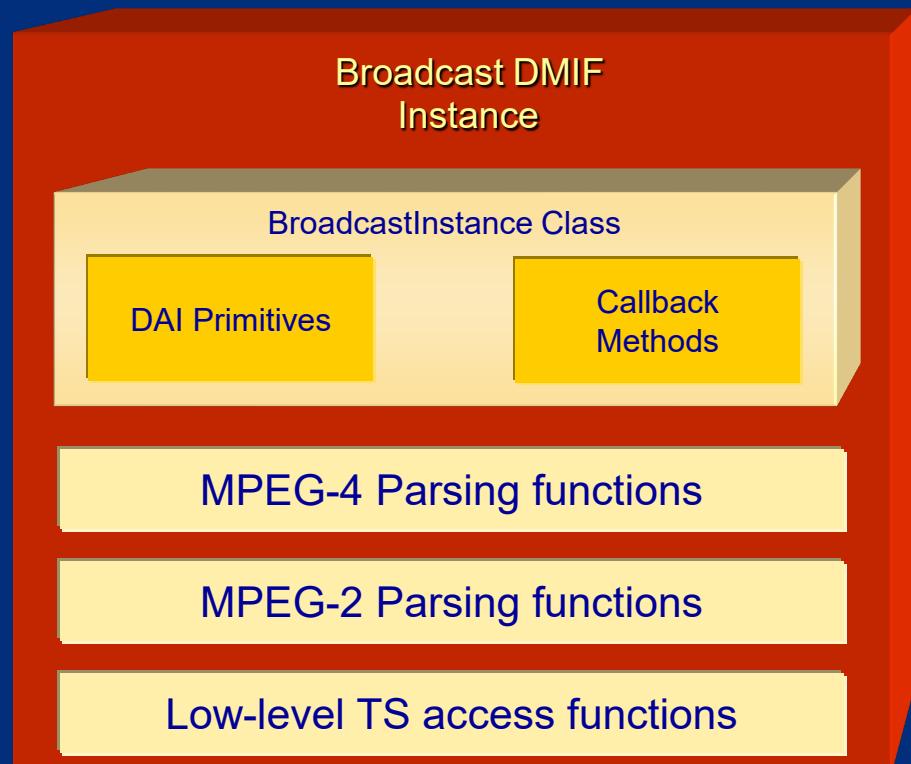
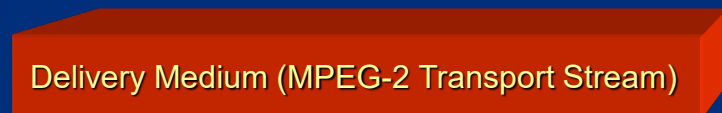
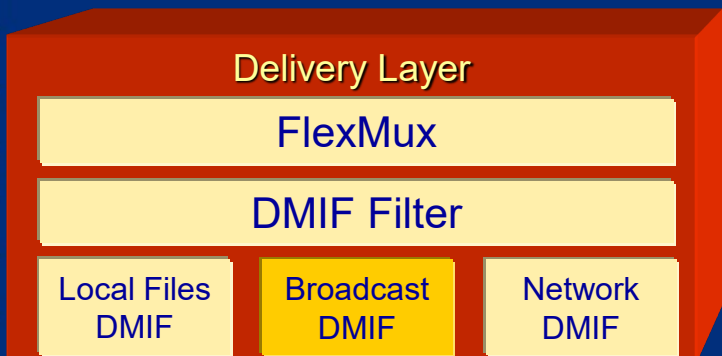
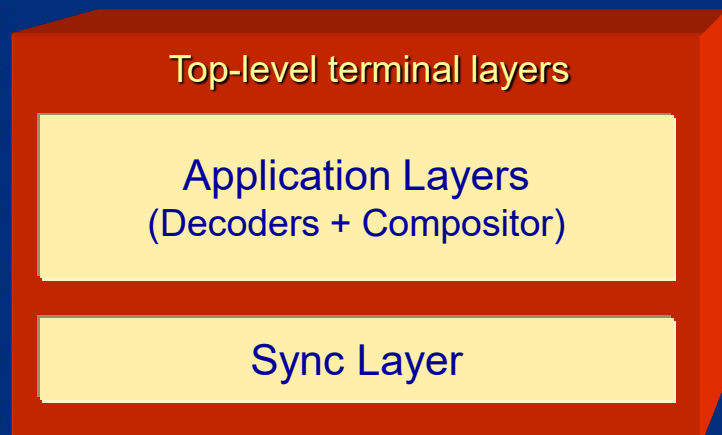


Broadcast DMIF





Broadcast DMIF





MPEG-4 for broadcast... for now

- △ MPEG-4 is not just low bit-rate video
- △ Authoring tools are missing
- △ 3-D is really a step forward
- △ MPEG-4 and 3-D are very demanding for the STB
- △ Enhancements are good, content is key



Next R&D step

- △ We are ready for MPEG-4 in broadcast
- △ We want to go further
- △ IST ENAMORADO project:
 - ⌚ Production of multimedia content for live events: AR, metadata, transmission, ...
 - ⌚ Delivery to multiple types of mobile clients
 - ⌚ Focus on MPEG-7, R&D on MPEG-21
 - ⌚ Deltatec, Canal+, Siemens Mobile, ...



Get concrete

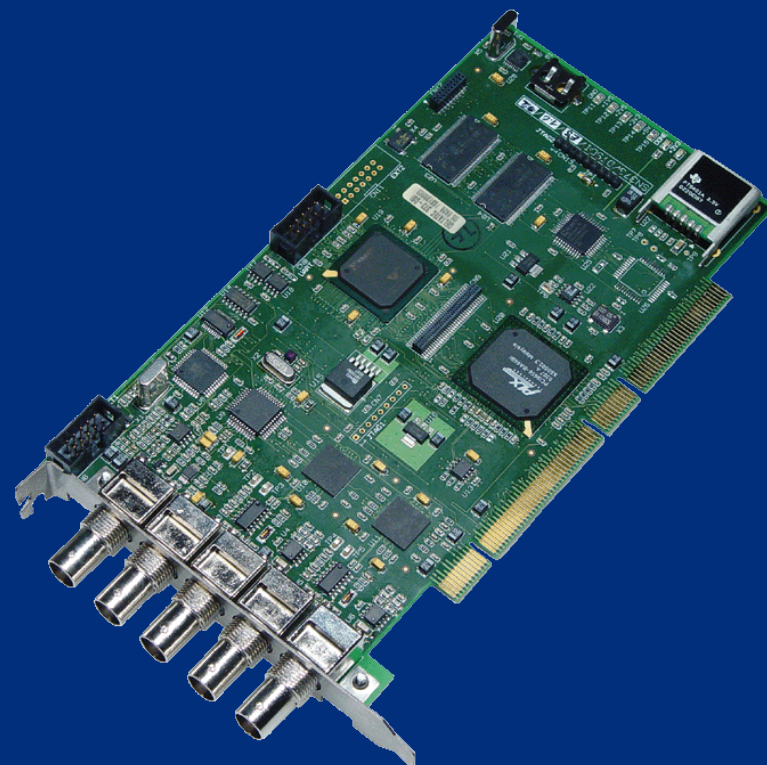
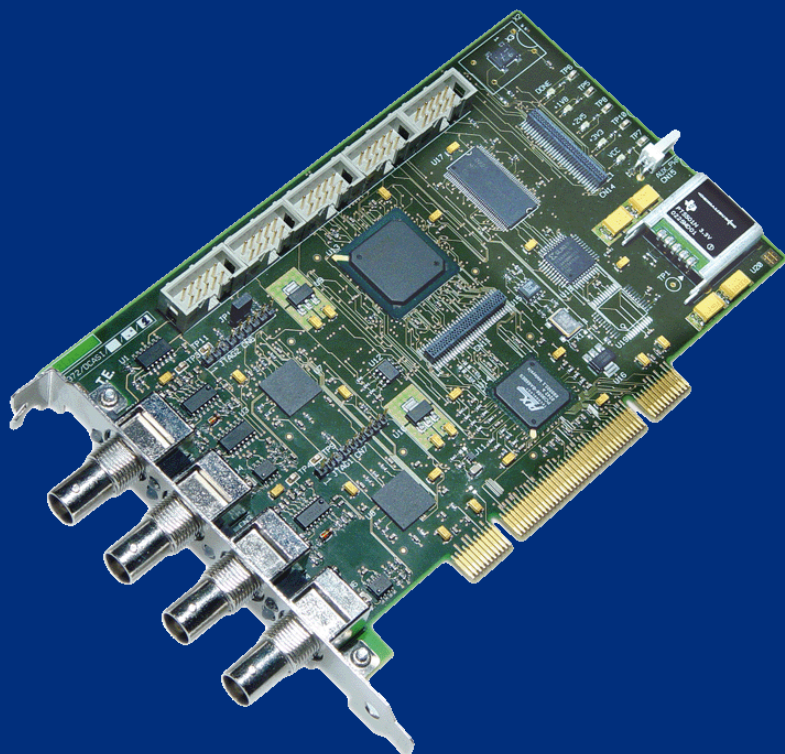




DELTA-asi

DELTA-sdi

From a MADISON prototype ... to a range of products



www.deltacast.tv



Get concrete

- △ STB processing power is market-driven ...
- △ Manufacturers still to endorse the technology
- △ Let's demonstrate the technology on programs that pay
- △ In football: ad insertion, synthetic replay, new camera views, T-commerce, virtual after-match pub, ...



Thank you

Thierry Keutgen
t.keutgen@deltatec.be
+32 4 239 78 80

www.deltatec.be