Convergenza fra Digital Terrestrial TV e servizi Broadband IP

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Agenda

- DVB & MHP : the European standards for digital broadcasting
- Digital Television and interactivity
- Interactive services and data centers
- Best Practices and examples of MHP services.

Standardization

- The DVB consortium was created in Europe in 1993 and now has more than 300 partners like broadcasters, network operators and devices manufacturers distributed over 35 Countries

  - The first adopted standard was the DVB format : a broadcasting solution based on the MPEG-2 standard.
 - The java MHP stack was selected as the firmware for the receiving device
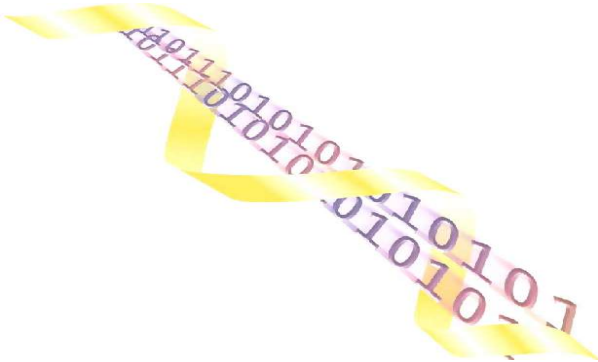
Digital television:multiple channels

Advantages of a digital signal adoption:

- Increase the number of digital broadcasted channels versus the analog signal.
- High definition tv broadcasting plus multiple audio tracks
- Data Service Distribution like interactive applications (associated with a video content) or raw data (i.e. IP stream)
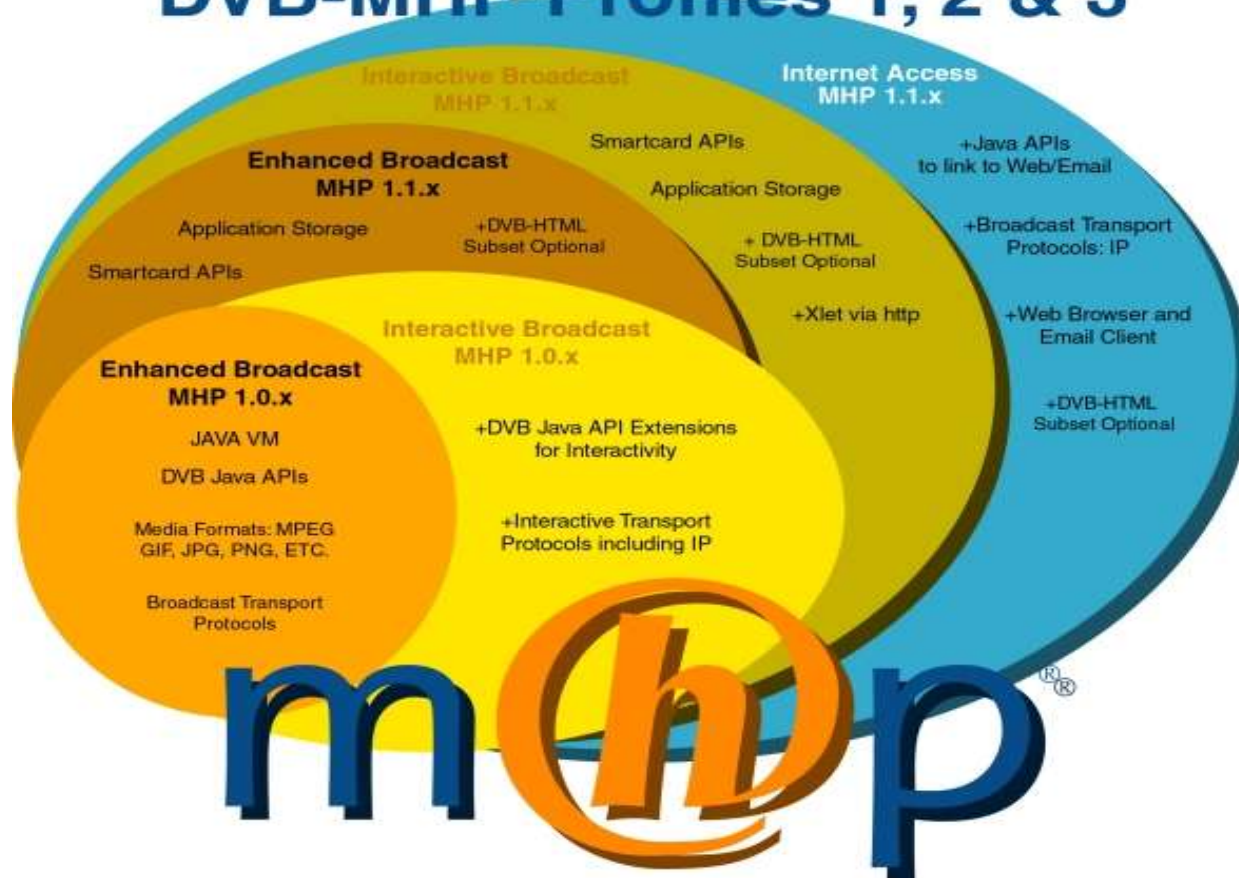
TV Stream
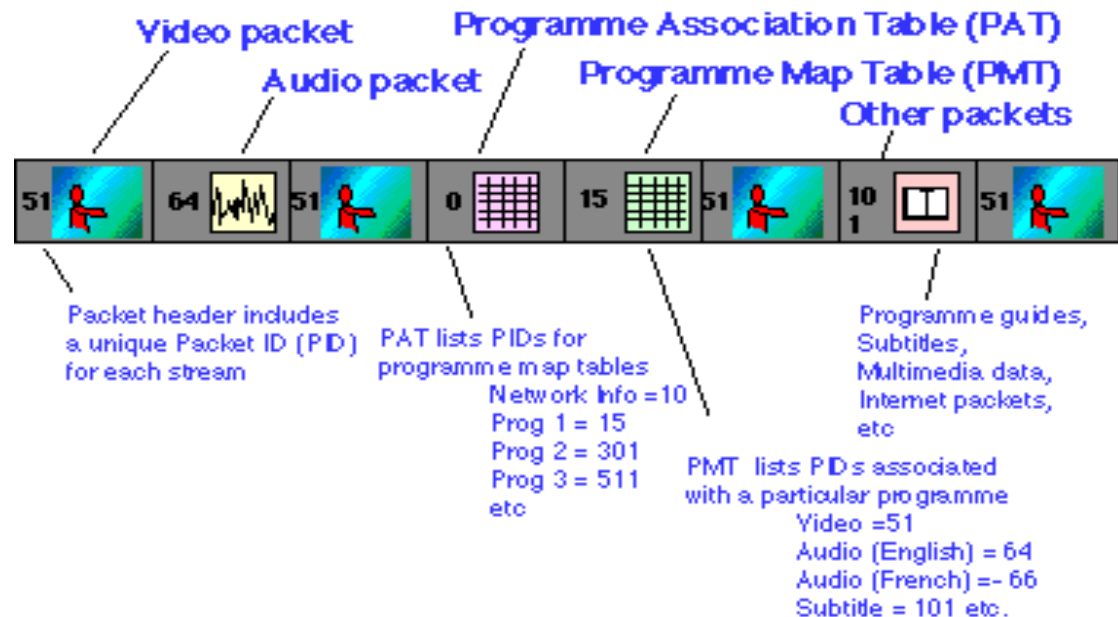
... and ONE set top box

- The basic architecture requires a Set Top Box that decodes the contents broadcasted by several television providers and that present them to the users along with some interactive applications

The ADB "classic" Set top box

Java-MHP: the standard of the DVB applications

Interactive TV

- The migration from analog TV to digital TV will coincide with the passing from a non interactive TV to an interactive one. This obviously is the aspect most perceived from the users

- It is possible to envision 4 profiles to show up all the potentialities of digital-interactive TV

<div align="center">

Enhanced TV

Interactive TV

Internet on TV

Personal TV (embedded video rec)

</div>

Enhanced TV

- This operational mode allow users to directly interact with the program they are watching. Besides the video display, the set top boxes are able to interpret also application contents broadcasted by TV networks and show them to users in the form of services usable through the remote control tv

All the data and the application itself are broadcasted with the TV stream so the service is available to the users even when   off- line (no TCP/IP links)

examples:

- EPG

- Television news

- Forecasts of the weather

- Real Time Sports Statistics
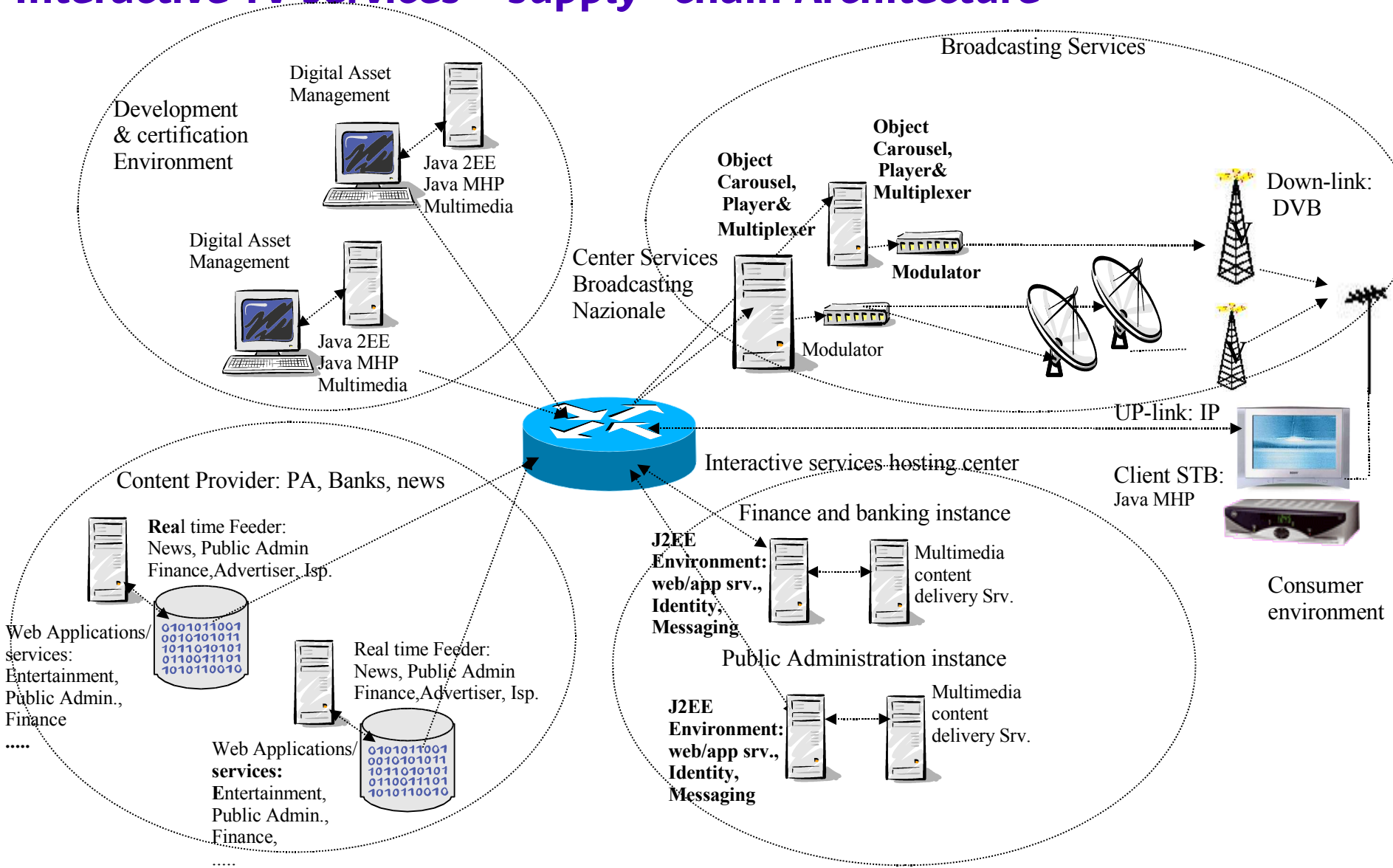
Examples of Interactive TV

In this operational mode the set top box establishes a TCP-IP connection with a "web portal" like   service center that hosts the server side business logic related to the TV applications.

This profile   will enable the user to execute real time transactions like:

- On demand contents related to the topics showed in video
- T-commerce (auctions and "special offerings")
- TV Home banking
- Mailing and instant messaging
- Videogames

Interactive TV services "supply" chain Architecture

Broadcasting Services

Development & certification Environment

Digital Asset Management

Java 2EE Java MHP Multimedia

Digital Asset Management

Java 2EE Java MHP Multimedia

Object Carousel, Player& Multiplexer

Object Carousel, Player& Multiplexer

Object Carousel, Player& Multiplexer

Modulator

Center Services Broadcasting Nazionale

Modulator

Down-link: DVB

UP-link: IP

Client STB: Java MHP

Content Provider: PA, Banks, news

Real time Feeder: News, Public Admin Finance,Advertiser, Isp.

Web Applications/ services: Entertainment, Public Admin., Finance

.....

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0010101011
1011010101
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Real time Feeder: News, Public Admin Finance,Advertiser, Isp.

Web Applications/ **services:** **E**ntertainment, Public Admin., Finance,

.....

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0110011101
1010110010

Interactive services hosting center

Finance and banking instance

J2EE Environment: web/app srv., Identity, Messaging

Multimedia content delivery Srv.

Public Administration instance

J2EE Environment: web/app srv., Identity, Messaging

Multimedia content delivery Srv.

Consumer environment
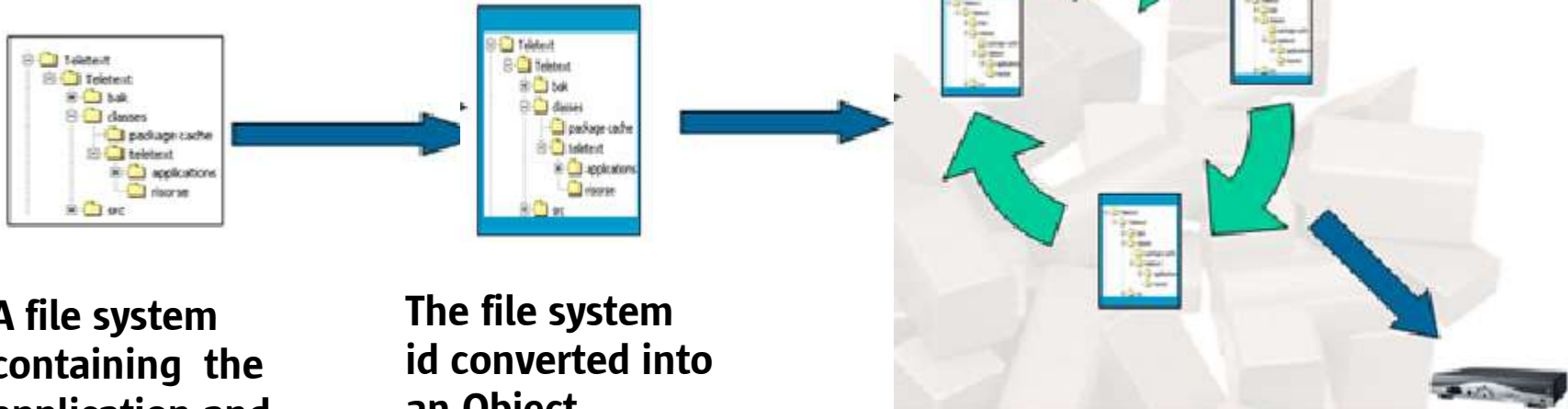
DVB-T: a transport tool for the Java-MHP applications

A **Object Carousel** is a transport system:
• Defined by MPEG-2 (ISO-13818-6) Standard
•It transmits binary data like a file system in cyclic way
•It was selected from the MHP organization as transport system

Cyclical Playout of the Object Carousel

Fundamental Parameter:
- size,
- bit/rate,
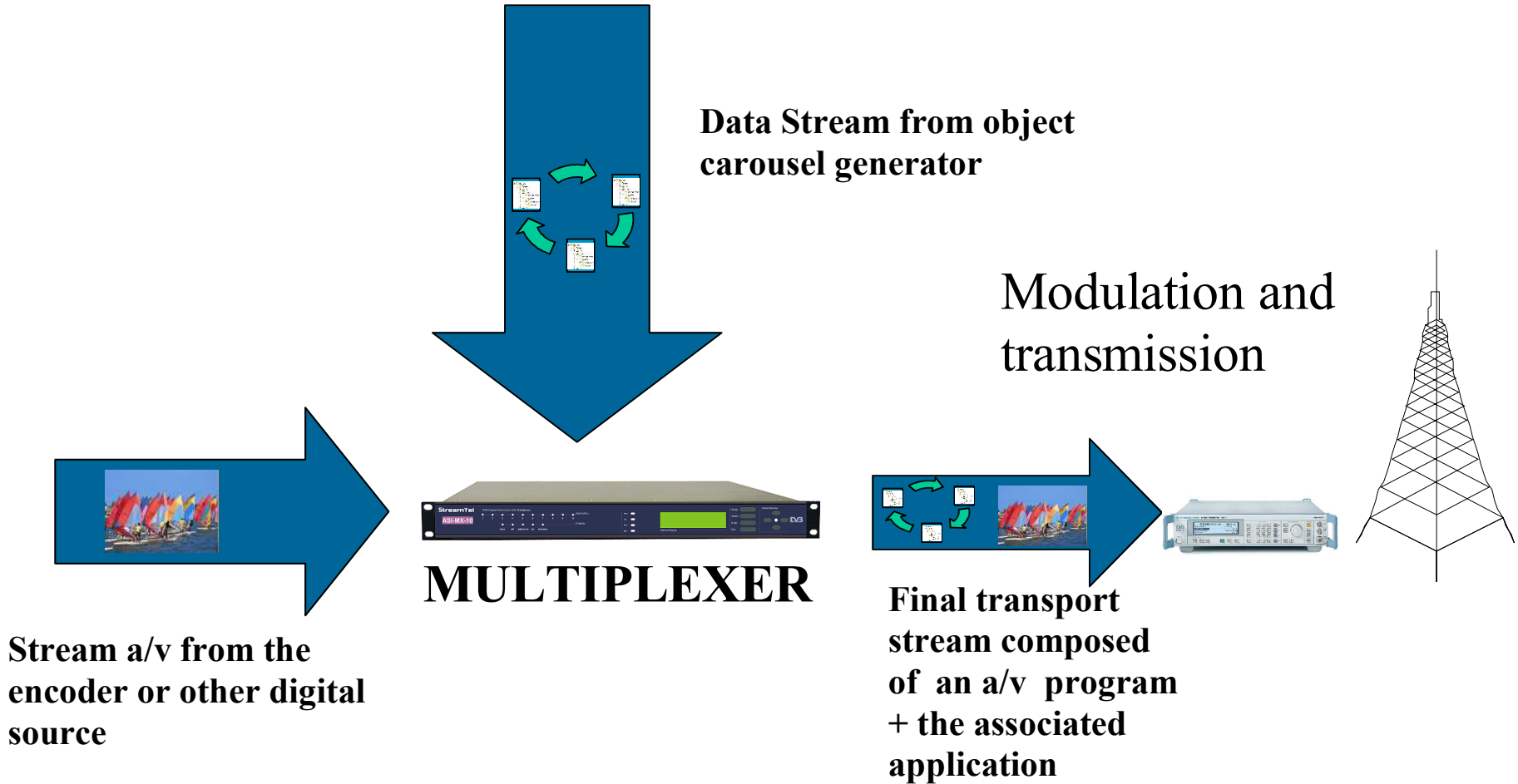**- repetition rate**

A file system containing the application and data (i.e. .jar and .xml files)

The file system id converted into an Object Carousel

The receiver must sincronize with the beginning of a new transmission cycle of the carousel in order to download the file system that is contained in the stream

Injection of the Java-MHP carousel into the TV DVB-Mpeg2 stream

Data Stream from object carousel generator

Modulation and transmission

MULTIPLEXER

Stream a/v from the encoder or other digital source

Final transport stream composed of an a/v program + the associated application

Multimedia Home Platform Architecture

The MHP terminals are equipped with a network interface, that allows the applications running in the box, to establish bidirectional IP connections for the access to standard IP networks.

The technology adopted for the network interface is usually :

- Modem V90
- ADSL
- GSM/GPRS
- Ethernet
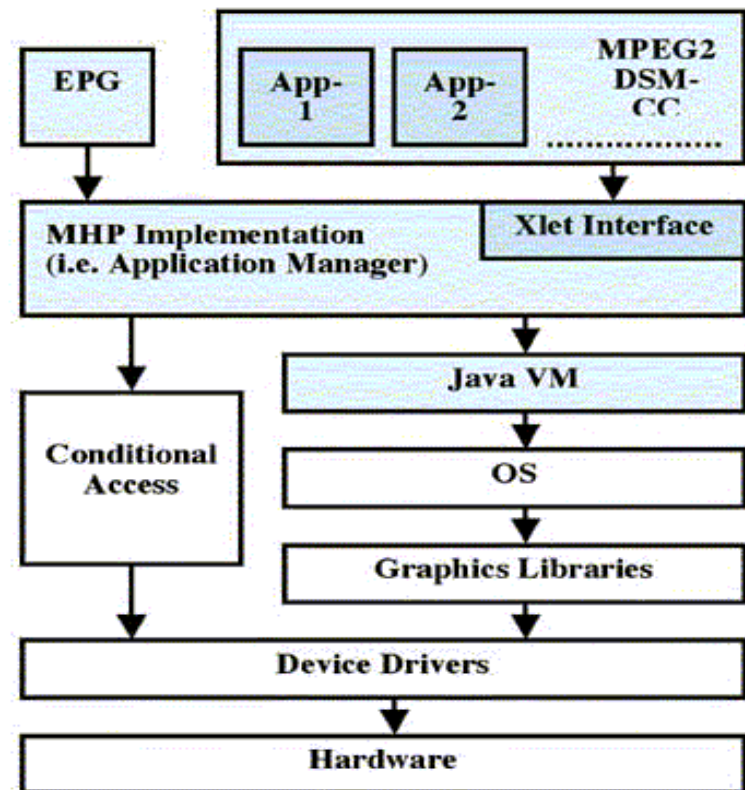
Interactive services architecture

Based and "hosted" on the Java Enterprise System platform:

- – J2EE Back-end services:

  - • Web and Application Services
  - • Network Identity Services
  - • Messaging services

- – Client Development:

  - • Stand alone client (RAD tool)
  - • Micro browser
  - • Rich client
  - • Client components
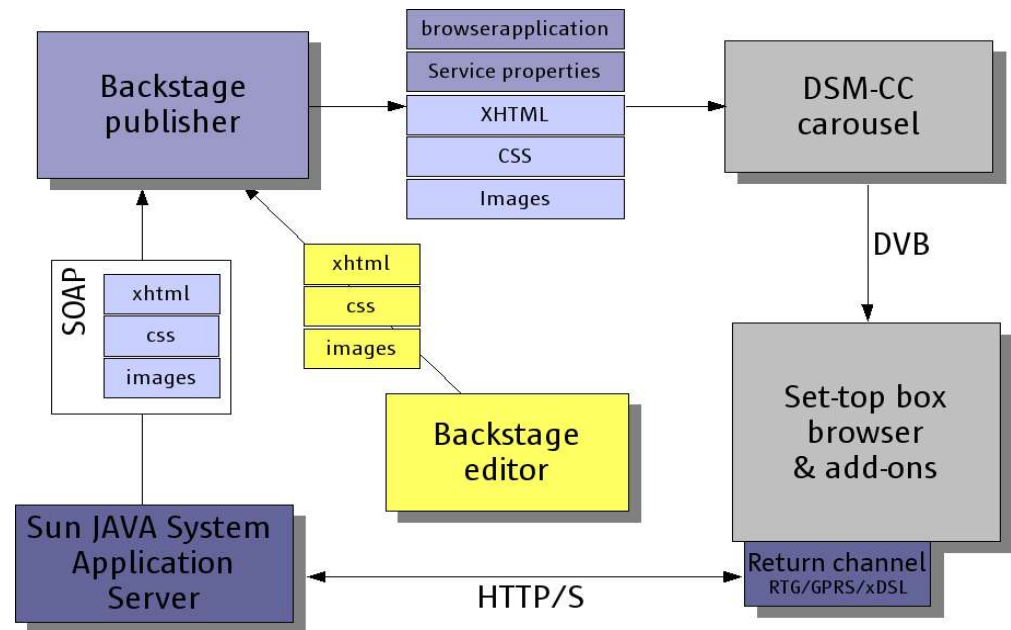
Advanced User Experience

- Stream events
- Video on demand
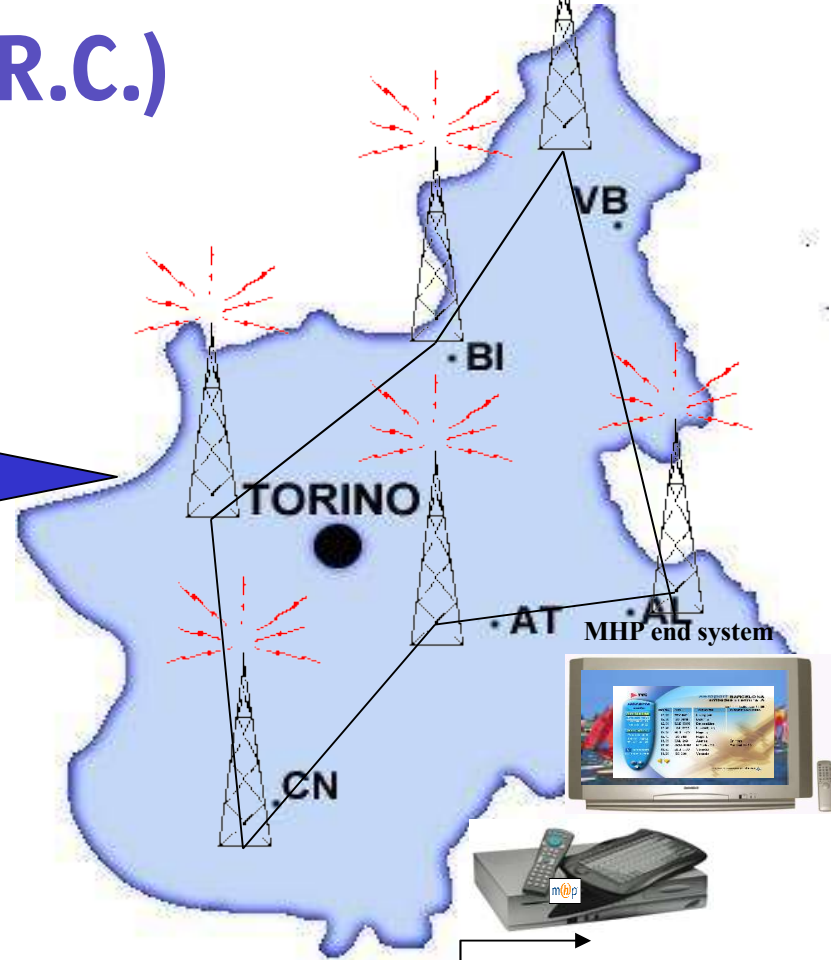- Client side interactivity (i.e. arcade games)

Reference Implementation

http://www.dttlab.it
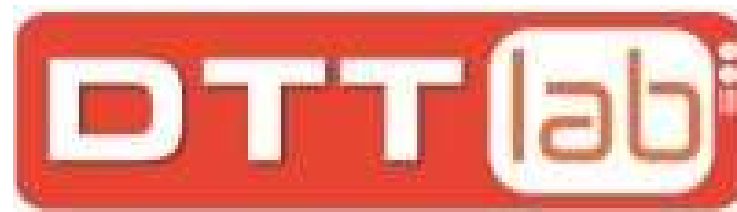
MHP – Logic Model (with R.C.)

Transport stream A/V
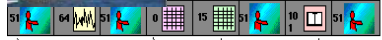
Multiplexer/Carousel generator

Application authoring

Content Supplier

Extra contents

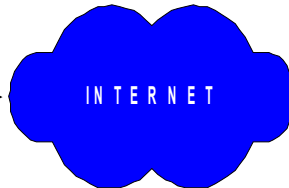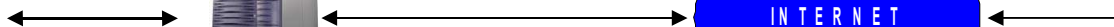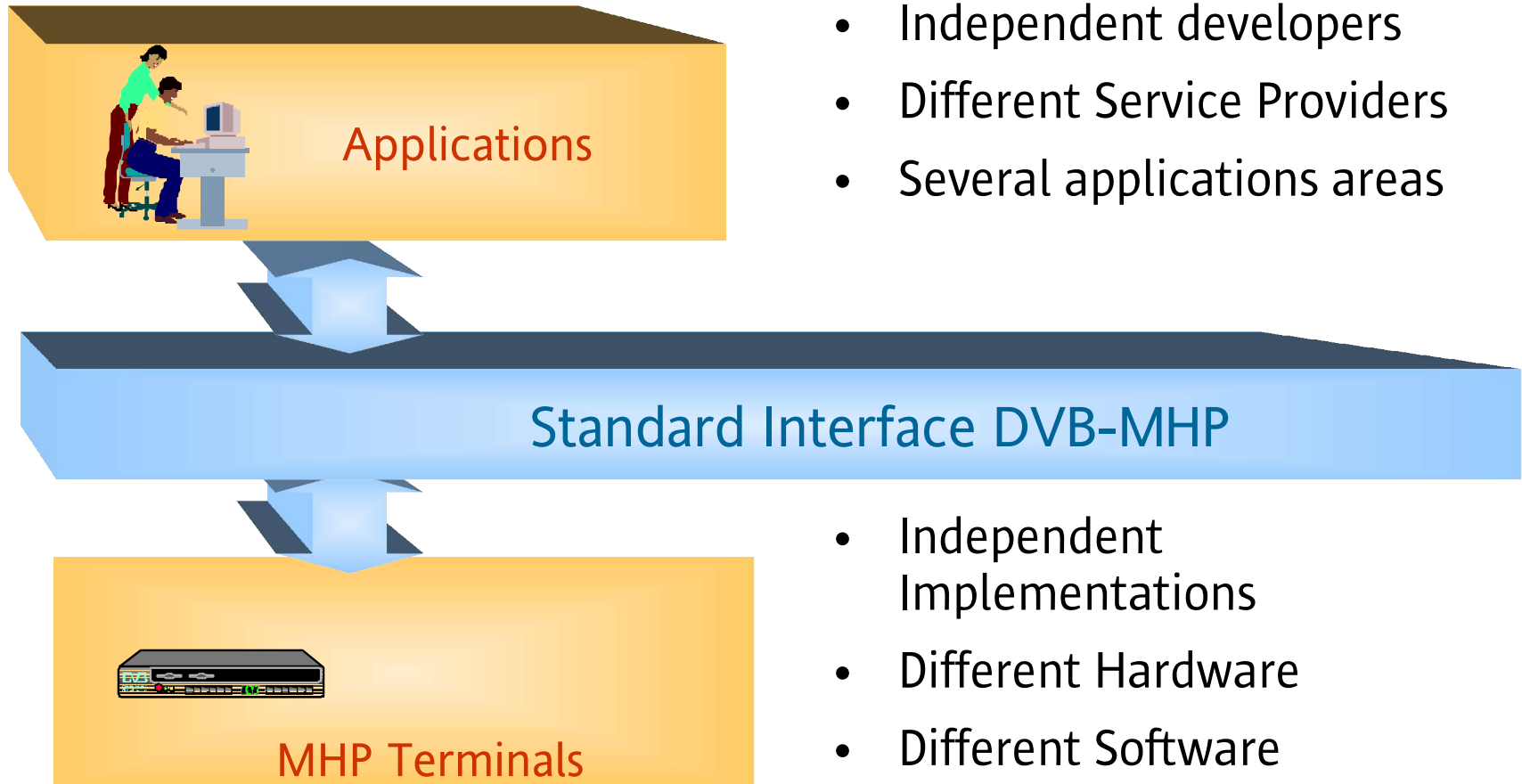Database: Contents

Access/gateway server

VB

BI

TORINO

AT · AL

MHP end system

CN

INTERNET

Advantages of Java-MHP model

Applications

- Independent developers
- Different Service Providers
- Several applications areas

Standard Interface DVB-MHP

MHP Terminals

- Independent Implementations
- Different Hardware
- Different Software
- All type of terminals (low-end/high-end STB)

... and side effects: DVB-T test plant

IP Interactive services stack   Broadcasting & MultimediaServices Stack

Servizi Interattivi Integrati

Contenuti Multimediali

Developers & MGMT

RDBMS Server
SW:Mysql
open source
HW: Sun v210

Mail/Identity
Services
SW:Sun Java ES
HW: Sun v210

Video encoder:
SW: Mpeg4IP
open source
HW:Sun v20x

Digital factory
based on J2EE
/Solaris OE

Storage Module
Sun 3310

Ip service channel
based on J2EE environment

Custom logic
on J2EE app.srv.
SW:Sun Java ES
HW: Sun v210

Video on Demand:
SW:Kasenna Mediabase
HW: Sun v210

Digital Asset Management :
SW:Artesia technologies Teams
SW:Sofia Backstage Publisher/mgr.
SW:My-tv content mgmt
Hw: Sun v210

Object Carousel:
SW:Strategy and Technology:
TS broadcaster
Hw: Sun v210

DVB channel
based on J2EE
/Solaris OE

Player & multiplexer :
SW:Strategy and Technology:
TS player & mux
Hw: Sun v210
Hw: DVB-ASI: videopropulsion

UP-link: IP

Client STB: ADB,Access media, Philips,
Java MHP: sun
Rendering Engine: Sofia browser,my-tv
Vertical Xlet : Sun

COFDM:
Rhode Shwarze,
Broadcasting Technologies

Down-link: DVB-T

DVB-T/MHP services design principles and lessons learned

- DO NOT try to bring the Internet on the TV:
  - There is no need of a "copy" of internet
  - The interface is simpler (The monitor is not good enough, as well as the remote control)
  - The audience is larger (and even You are not good enough, at least when laying on your armchair)

DVB-T: the added value

- Re-use the existing and proven technologies and infrastructure,
- But bring instead the TV users to Internet Services:
  - Selected
  - Simplified
  - Interactive
  - Ready to use
- No need to bootstrap, install, configure, update, virus-scan, ...: a "mainframe" just to get to the weather forecast...
- Convenience will drive the adoption

Example of DVB-T/MHP pilot service: infotainment, multi-hall reservation

Example of DVB-T/MHP pilot service: "job seeker"
(as an example of citizen interaction with Public Administration)

Example of DVB-T/MHP pilot service: message service integrated with: e-mails,SMS, MMS
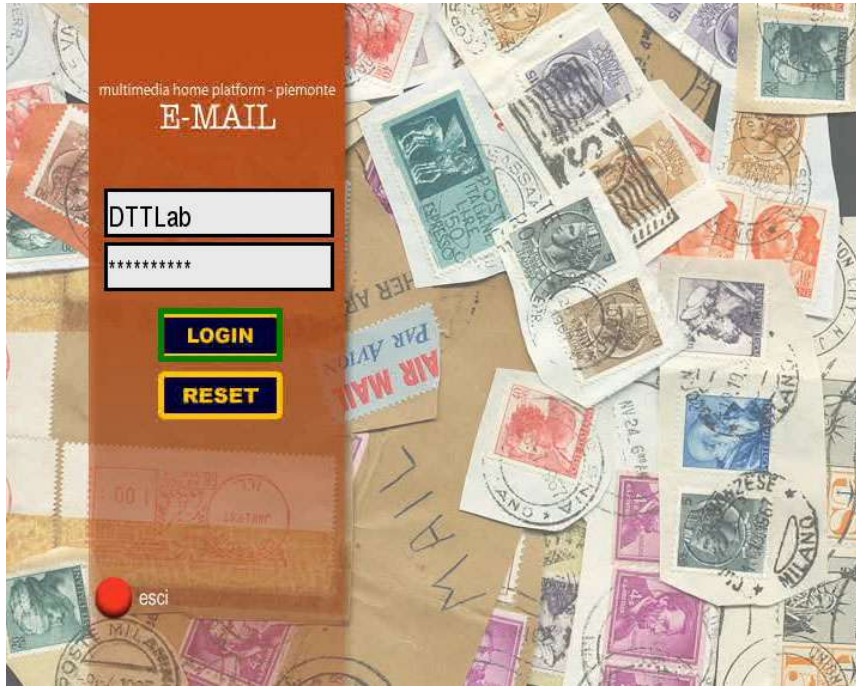
The future is ...

•DVB- H: Digital Video Broadcasting for Handhelds: it uses less power in receiving client than its big brother, DVB-T, and allows the receiving device to move freely while receiving the transmission, thus making it ideal for mobile phones and handheld computers to receive digital TV broadcasting over the digiTV network ("without using mobile phone networks at all").

•Open Source MHP community, italian i-force labs will offer a real TV development and test environment for selected projects

•Smart cards not only for Conditional access to TV channels but to authenticate the user and digital signing of transactions

Nokia's 7700 with support for DVB-H

Questions & Answers

Comunità degli sviluppatori italiani sulla TV Digitale:

Attivato il servizio "tienimi informato" per sapere tutto sui prossimi passi, iniziative ed altro sulla comunità

https://it.sun.com/secure/newsletter_developer_digital_tv.html

ISCRIVETEVI è Gratuito.

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