Audiovisual Services over ADSL

November 17, 2004

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Laboratory "Distribution and Protection of Contents"

France Telecom, R&D Division

- 3rd R&D center in the world in the telecom sector
- 3400 R&D staff, 15 locations in the world
- 1,3 % of France Telecom revenue spent on R&D
  - + 20 % in 2004
- main stakes :
  - Deliver growth services for the FT group
  - Anticipate the services of the integrated operator
- D : short or mid term projects for France Telecom, Orange, Wanadoo, Equant

Plan

- Service definition : live TV + VOD
- Network options : open Internet or dedicated network
- Devices : PC, STB/TV, others
- Video encodings and required bitrates
- Sharing intelligence between service platform and terminals
- Access control, content protection
- VOD : content distribution on VOD servers / on STBs
- maLigneTV implementation
- conclusions

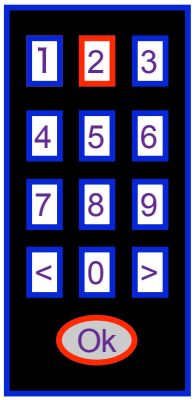
Service definitions

There are 2 main kinds of audiovisual services

- Audiovisual broadcast (TV, live event) : "one-to-many"
  - bouquets : mosaic, zapping, EPG
  - local recording : PVR, time shifting
- On-demand video : "one-to-one" service
  - Streaming / download
  - Pull / push
  - Free (ads) / pay per view / subscription
  - Network Video Recorder
    - content saved on a server in the network (time shifting...)
    - issue : volume saved / time to live

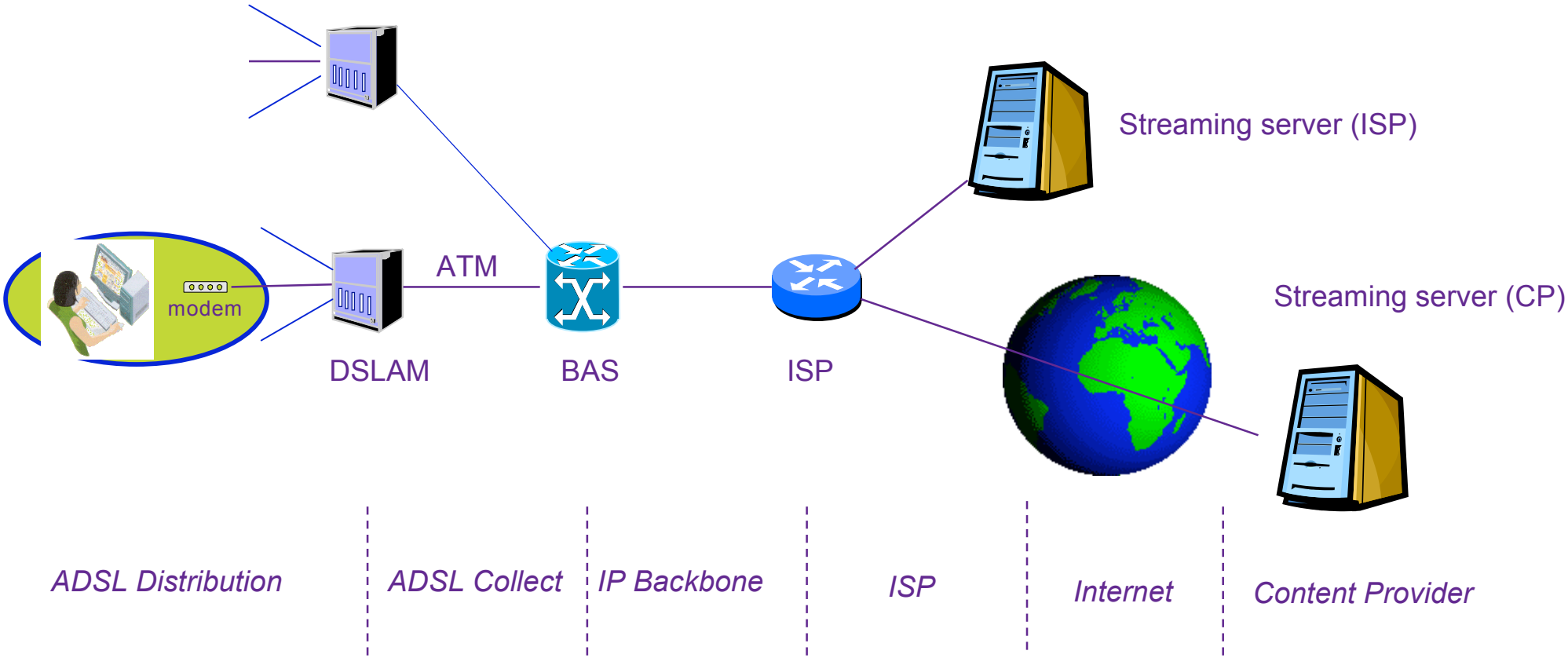
TV service

Set top box
(STB)

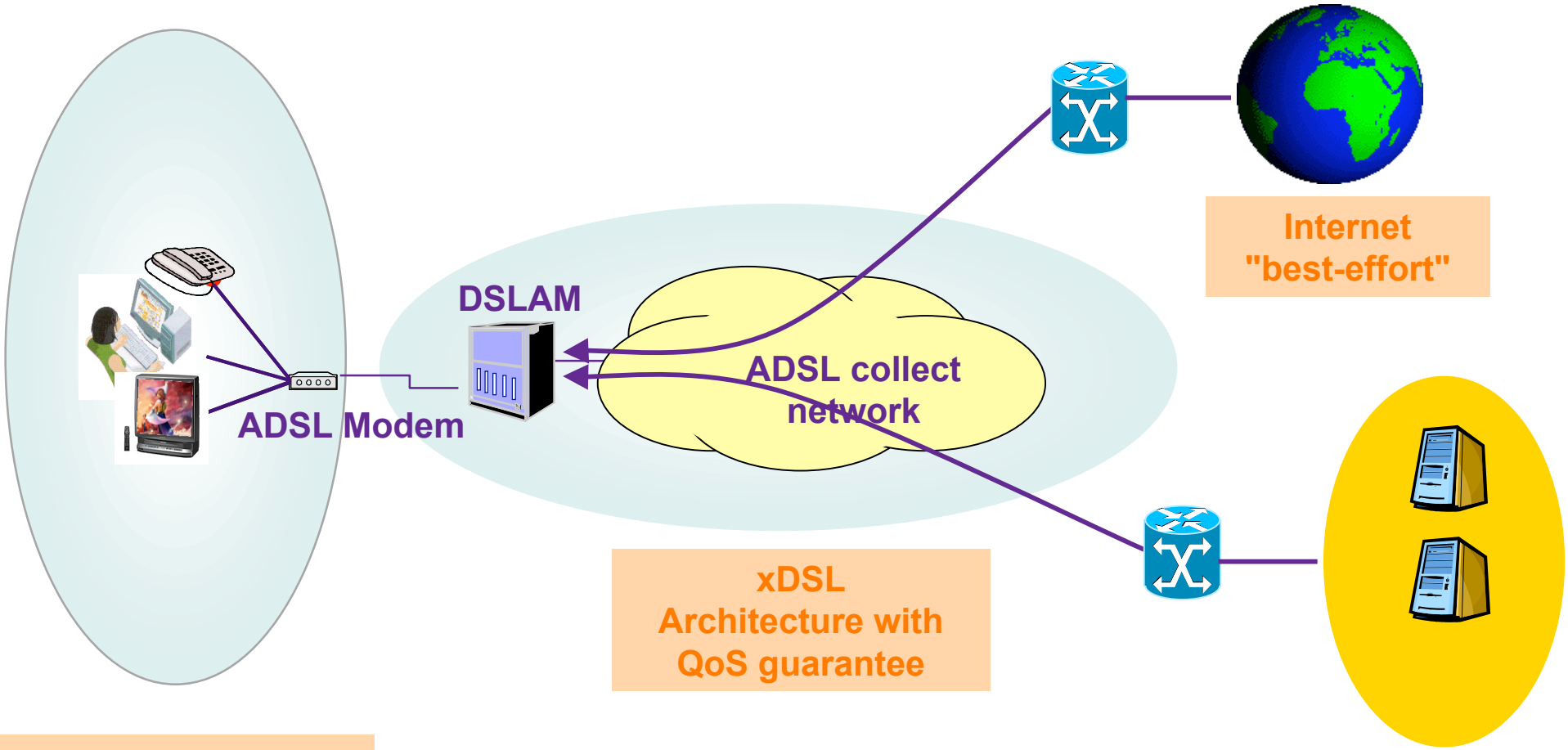


VOD portal

Open Internet



Operator network



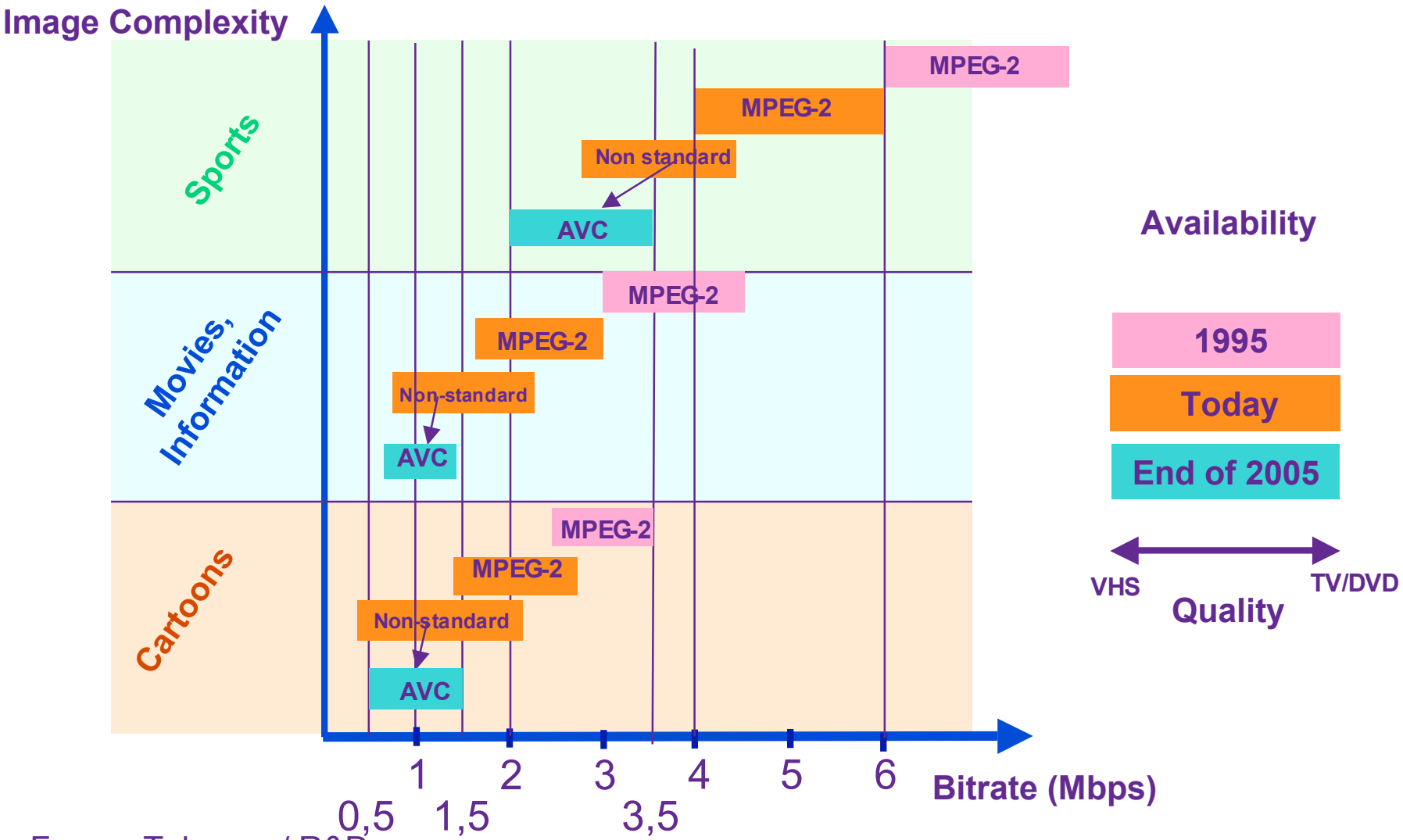
Network options

- Open Internet
  - better use of subscriber line
  - better potential integration with Internet services
- Dedicated network
  - better quality of service
- Unicast or multicast ?
  - unicast much easier to implement
  - but much more resource-consuming

Devices

- PC
  - widespread
  - powerful
  - unmanaged, open, difficult to protect
  - image quality < TV sets
- STB + TV
  - better quality, better control (smart cards)
  - cheap STBs ➔ less powerful than PCs
- other devices
  - PDAs, portable players (iPod like), "network-agnostic" devices
  - integration in home network

Bandwidth requirements (SD TV)



Client and server

- Same problems as for all distributed architectures
  - "thin" or "thick" client ?

- Example : zapping information
  - a short message to show the title of current program on a channel
  - option 1 : regularly upload all STBs with these information
    - requires persistence on the STB and APIs between mosaic and data
  - option 2 : a request to the server for each zapping
    - heavy load on the server
    - must handle the case when server is off

Access control and content protection

- A very important issue for content providers
  - pay-TV channels
  - right owners for VOD content providers
- Good security level for STB/TV solutions
  - network access control
  - platform access control
  - reuse of satellite/cable technologies : encrypted content, descrambling keys stored on smart cards
- More problems for PCs
  - capture of contents on the clear

VOD : delivery network

- Centralized or decentralized architecture ?
  - network costs vs. VOD server costs
  - at least for frequently asked contents
- Content Delivery Network architecture
  - the provider sends its content to the VOD platform
  - the content is sent to n VOD servers
    - FTP
    - secure multicast (VFDP protocol)
- "Push" to STBs
  - movie previews, offline order (with mobile ?), gifts...
  - secure multicast