Let's make things better.

Opportunities for migration of Internet and Digital TV applications

by Jan van der Meer and
Jorgen Rosengren
Philips -- Netherlands

Philips Electronics

PHILIPS

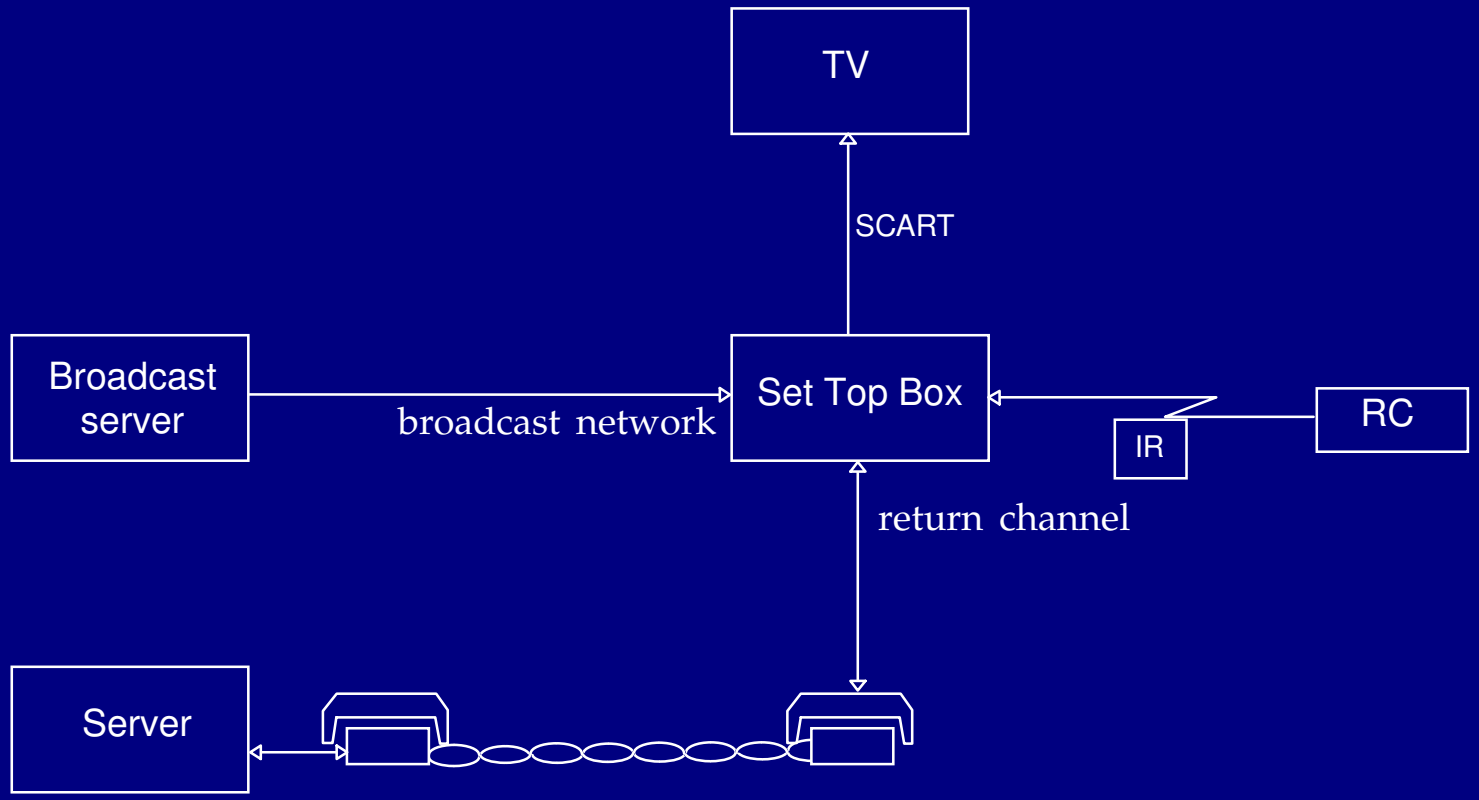
Contents

- Sideline: MPEG, DVB and DAVIC
- Introduction on Digital TV receiver
- Internet and Digital TV Broadcast
- Migration of Internet and Digital TV applications
- Conclusions

DVB and DAVIC

- DVB
  - is an industry, government and organization cooperation organization with links to ETSI; a few hundred member organizations
  - has made WW spec for digital video broadc.
- DAVIC
  - is an industry forum for end-to-end system specification of digital TV systems; a few hundred member companies
  - is making end-to-end specifications for digital TV systems using MPEG and DVB.

Typical Digital TV receiver

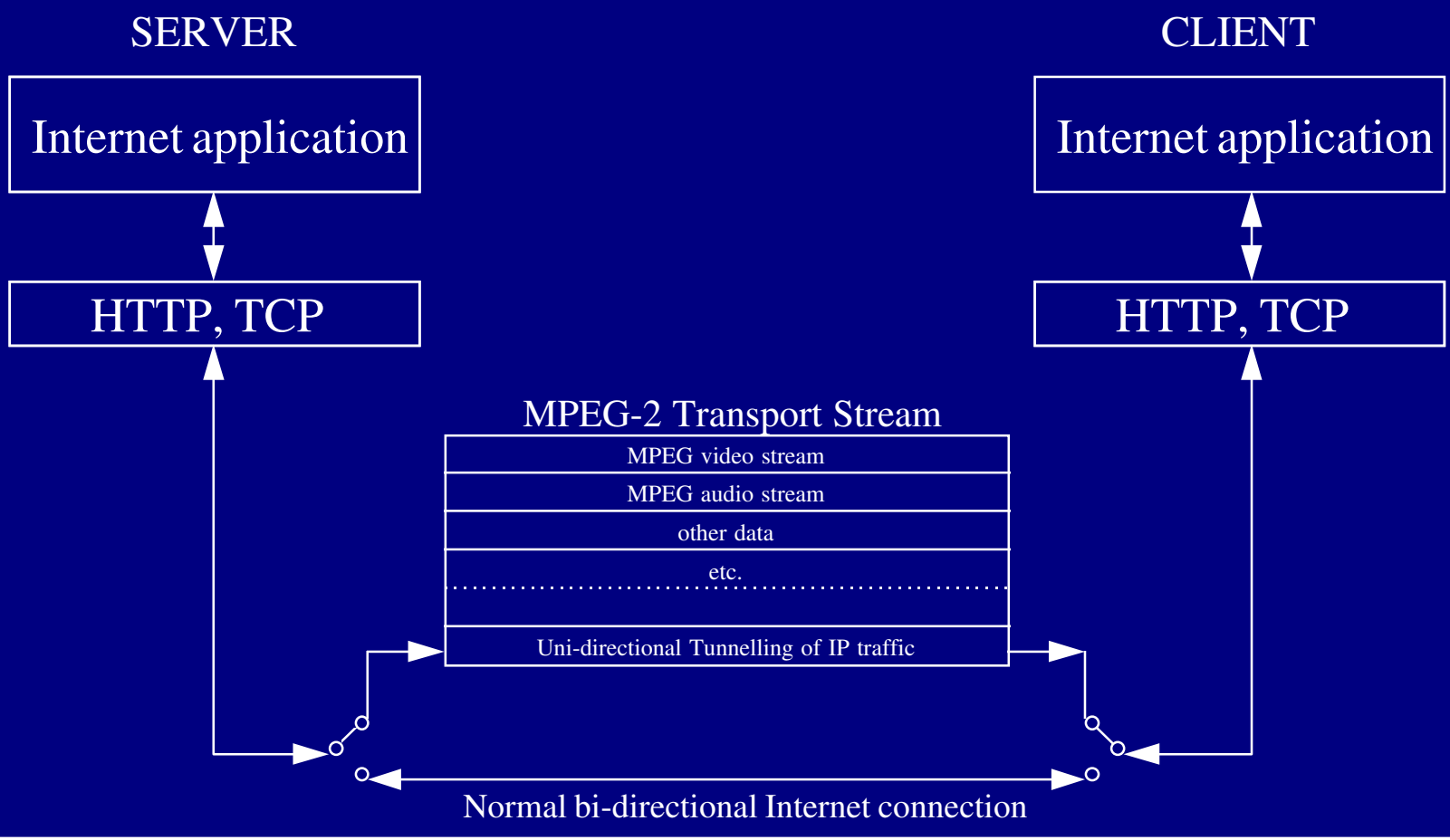


Typical Digital TV services

- traditional TV services
  - replacement of analog by digital services
- data services
  - interactive applications
    - added value to digital services; examples EPG (Electronic Program Guide), betting, play along games, etc.
  - internet access (connectivity, not technology)
    - usually driven by desire to add value to broadcast service, not by desire to support majority of current Internet content (Internet browsing can be implemented in STB, if desired)
  - IP Tunneling, data broadcast

Let's make things better.

IP Tunneling within MPEG-2 TS



Philips Electronics

PHILIPS

Comp. of Internet and MPEG/DVB Env:s

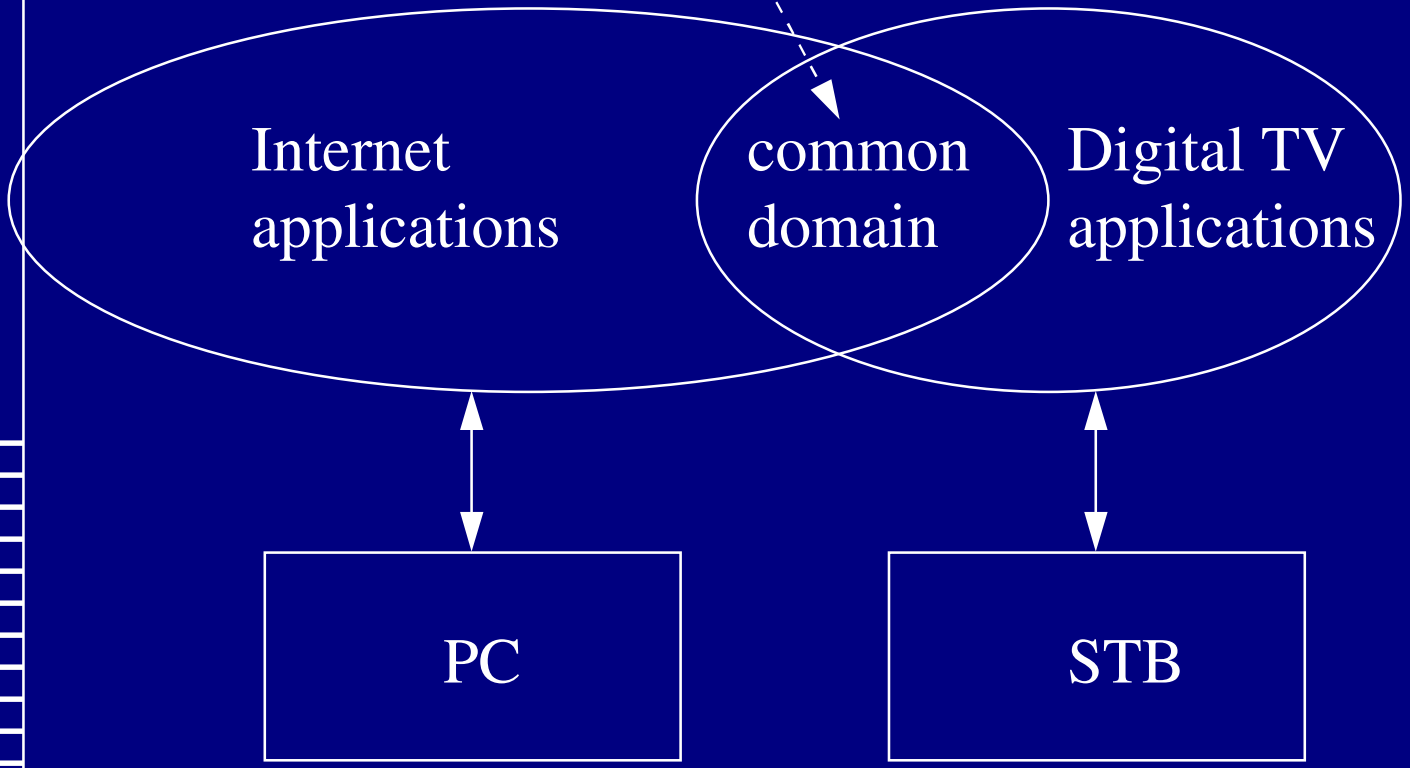
- Internet
  - Focussed on data (but: rapidly moving towards MM)
  - Best-effort delivery
  - PC
  - explosive growth
- MPEG/DVB
  - Excellent quality MM
  - Guaranteed QOS delivery
  - set-top box
  - explosive growth

Digital TV receiver requirements

- user friendly
  - remote-style UI
  - no application failures
- cost effective
  - in first generation products
    - about 1Mbyte RAM, 2 Mbyte ROM
    - no downloading of decoding tools; only subset of Internet contents supported
- Set Top Box implementation independent API
  - no single STB architecture =>need for abstract execution model of Set Top Box

Conv. of Internet and Dig. TV App. Domains

applications within common domain run on PC and STB



Common application domain

- shared protocols
  - HTTP; TCP; IP
  - MPEG-2 transport stream (=> high-bw isochronous delivery!)
  - initially no IP over MPEG, no (real time) MPEG over IP
  - URL references between Internet and Broadcast (and back!)
- shared contents
  - HTML 3.2,including CSS-1; PNG; AIFF-C
  - MPEG-2 video, incl. MPEG-2 stills; MPEG-1 audio

Common application domain

- shared API
  - HTML
  - MHEG-5
  - in future JAVA VM with restricted set of libraries to support
    - Internet functions
    - Broadcast functions (e.g. Service Information and Conditional Access)
    - Presentation functions

Common Application Domain

- shared abstract model of execution platform
  - suitable for STB and PC
  - modeling of available platform resources
    - memory
    - decoders
    - hardware filters
  - usage of resources by applications

Conclusions

- Major opportunity for convergence of Internet and Digital TV application domains
- Need for common application domain
  - common protocols, contents and API
  - URL links between Internet and Broadcast (and back!)
  - abstract model of execution platform
- Requirements on common domain solutions
  - user friendliness major issue
  - Modeling of execution platform essential
  - Extensibility