Philips Softworks

Opportunities in MHP & MPEG-4
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Let's make things better

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Basics of MHP

- Public Standard for Interactive TV
- Integrates Internet Connectivity
- 3 profiles
  - Enhanced TV, Interactive TV, Internet TV
- Uses Java as its foundation
- TV Centric
- Same system for Satellite, Cable, Terrestrial
- Unified Global Content
- Covers end-to-end chain
- Secure, Open, Extensible Framework
- Scalable Architecture
- Only Proven Interoperable Solution

Basics of MPEG-4

- Standard for A/V delivery on Internet and Mobile Networks
- Main features of MPEG-4 Visual (Video & Graphics)
  - Optimized quality at low bit rates : 10K to 1Mbps
  - **Object** oriented
  - BIFS (graphics format)
  - Robust and scalable
- Main features of MPEG-4 Audio (Speech & Audio)
  - Suite of audio coding
  - Speech coding
  - Synthetic audio, and speech
- Efficient low bit rate coding
  - Separate streams for audio, video, graphics, etc.
  - Allows streaming by any transport layers
  - (RTP, MPEG2-TS…)

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MPEG-4 Features (1)

- MPEG-4 visual
- natural textures, still images, video
  - textures and still images wavelets, video DCT based
- synthetic objects
  - face and body animation at very low bitrates
- arbitrary shapes
- transparency plane, in addition to YUV planes
- high coding efficiency at low bitrates
  - obvious choice for streaming over Internet
- scalability
  - spatial, temporal, FGS

MPEG-4 Features (2)

- MPEG-4 Audio
  - a range of codecs for speech and music
  - high level of scalability
  - seamless adaptation to varying bandwidth
- MPEG-4 Graphics
  - VRML based
  - binary format for transport
  - streaming of animations at a few kbit/sec

MPEG-4 Features (3)

- MPEG-4 Scenes
  - MPEG-4 is about Objects !
  - Scenes define how to compose objects
  - Dynamic composition
    - composition may vary in time and space
  - Suitable for Personalized Services
    - user specific composition
  - Efficient transport format

Object-Based Coding

Object #2:
Graphic Overlay
(Station ID)

Object #1: Main Program
(Newscast)

Object #3:
Graphic Overlay
(Sponsor)

Object #4:
Graphic Overlay
(Stock Ticker)

▲Philips 40% ▼SONY 25% ▼ Panasonic 12% ▼Thomson 34%
▲Gemstar 30%

Composed Image

- **Object Oriented**
  - Free composition of graphics, and video objects into scenes (overlays)
  - Audio and video objects can be independently manipulated
  - Arbitrary shapes (binary or alpha blended)
  - BIFS : text, 2D, and 3D binary format
  - separate front and background
  - multiple foreground objects
  - variable spatial placing of objects
  - alpha shape to blend visual objects
- **Object-Based Coding MPEG-4 is a great vehicle for:**
  - Interaction at the end user level
  - Capturing user profile
  - Adding value to the content

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Personalised Video

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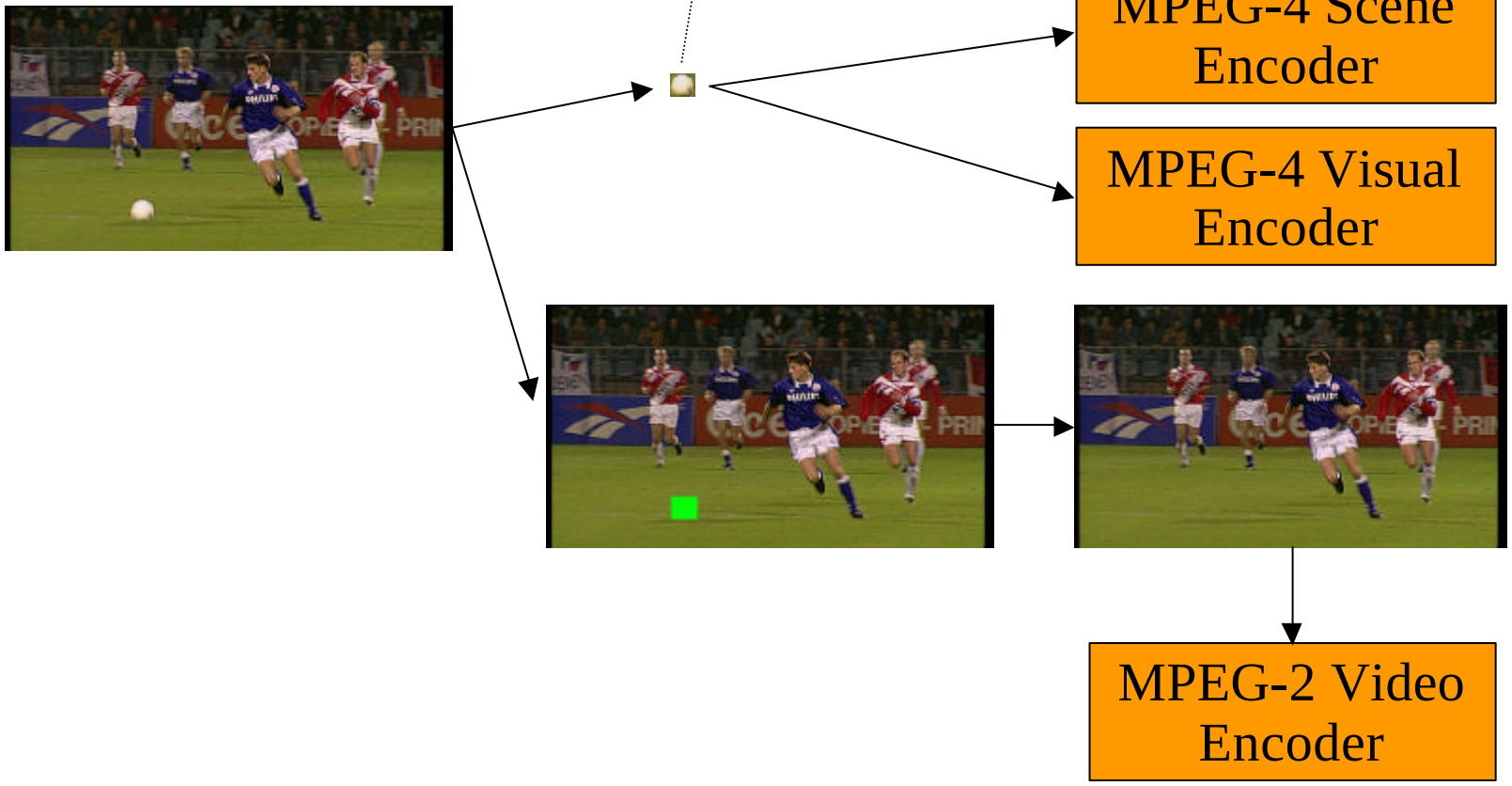
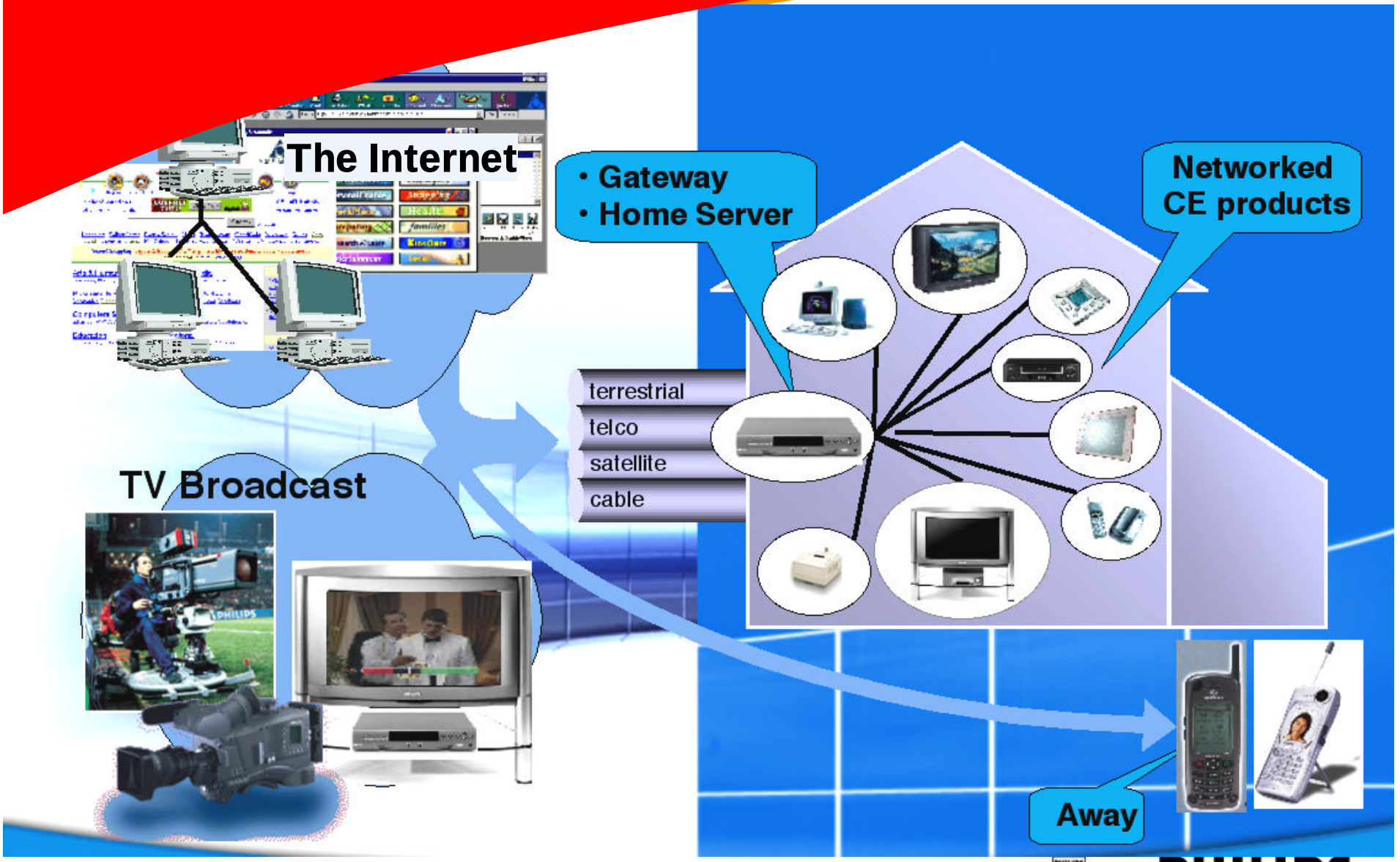
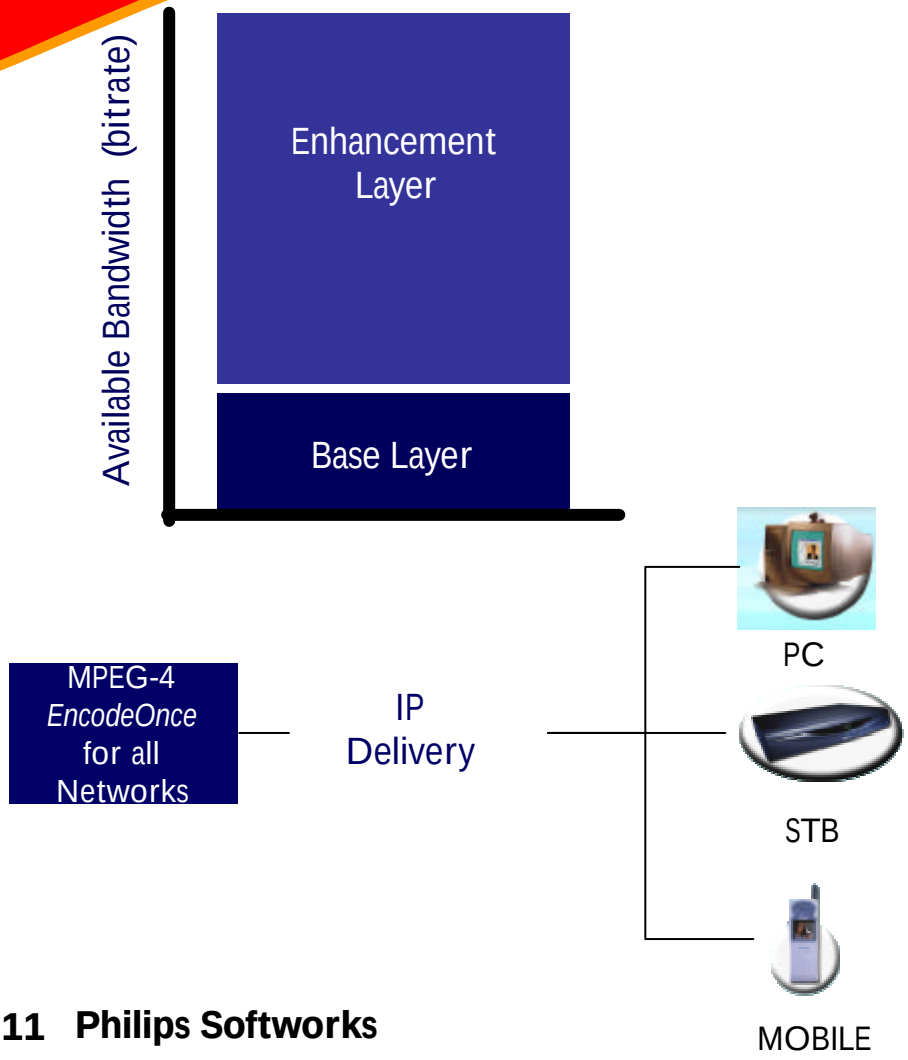
“Buy the Ball” PPV



The Digital Home



Encode*Once* for Various Networks



- Robust
  - Resync markers
  - Error recovery tools : data partitioning, reversible variable length coding
  - Error resilience tools
- Scalable
  - Encode only once for multiple devices and circumstances
  - Users unaware of bitrate choice
  - Enhancement layers to basic quality object
  - Low priority objects can be dropped to save bits

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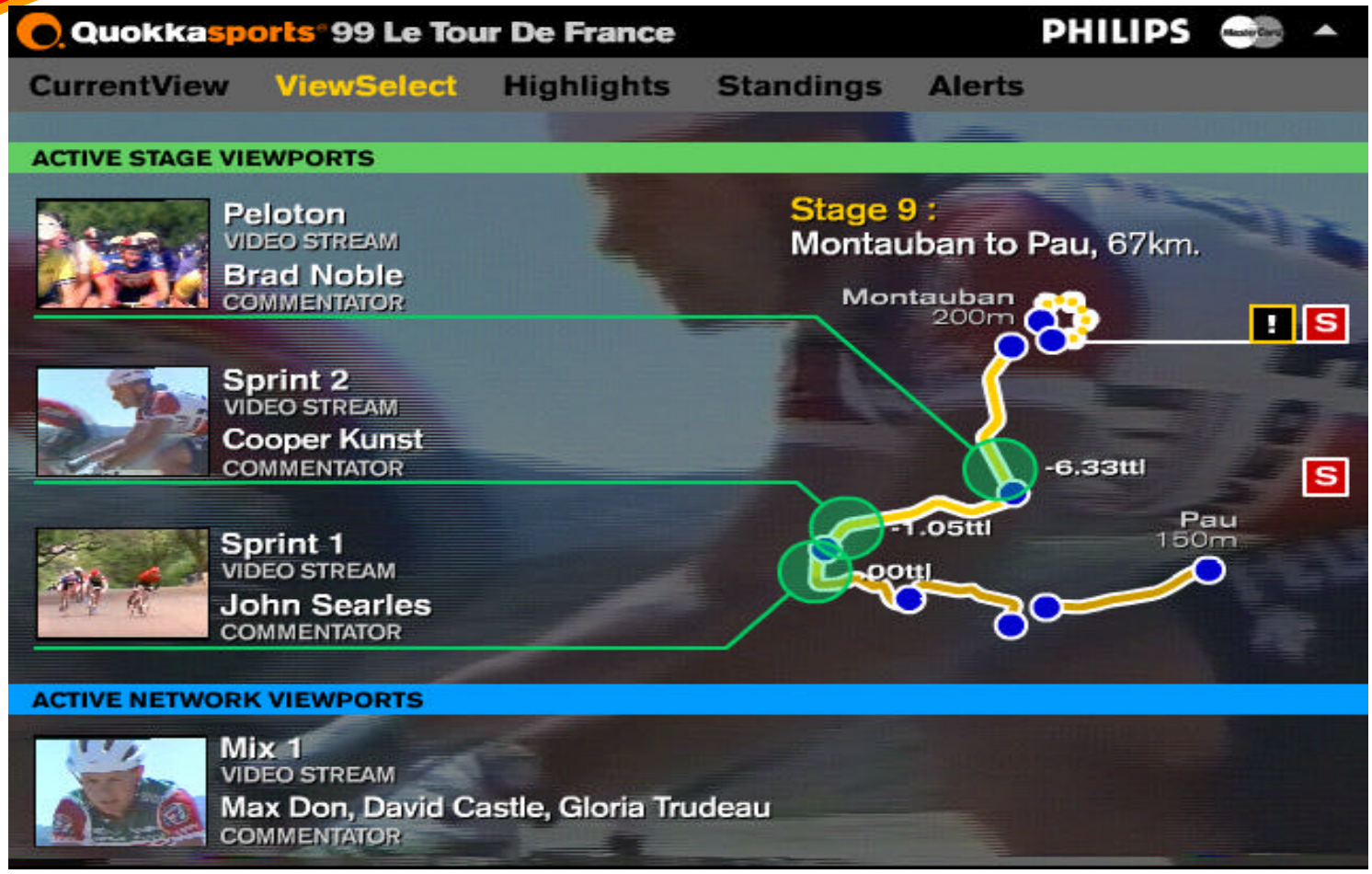
Potential MPEG-4 applications

- Streaming over IP
- Enhanced broadcast
- Storage in Set Top Boxes
- Personalized services
- Scalable services
- Combining all of the above
  - single application format
  - (very) rich multimedia applications
- But …. Already many existing formats
  - HTML, SMIL, MHP, etc.
  - Business Model ?
- Can easily fit into MHP
  - JMF, life cycle, signalling is all there

MPEG4 enabled MHP: Immersive Broadcast



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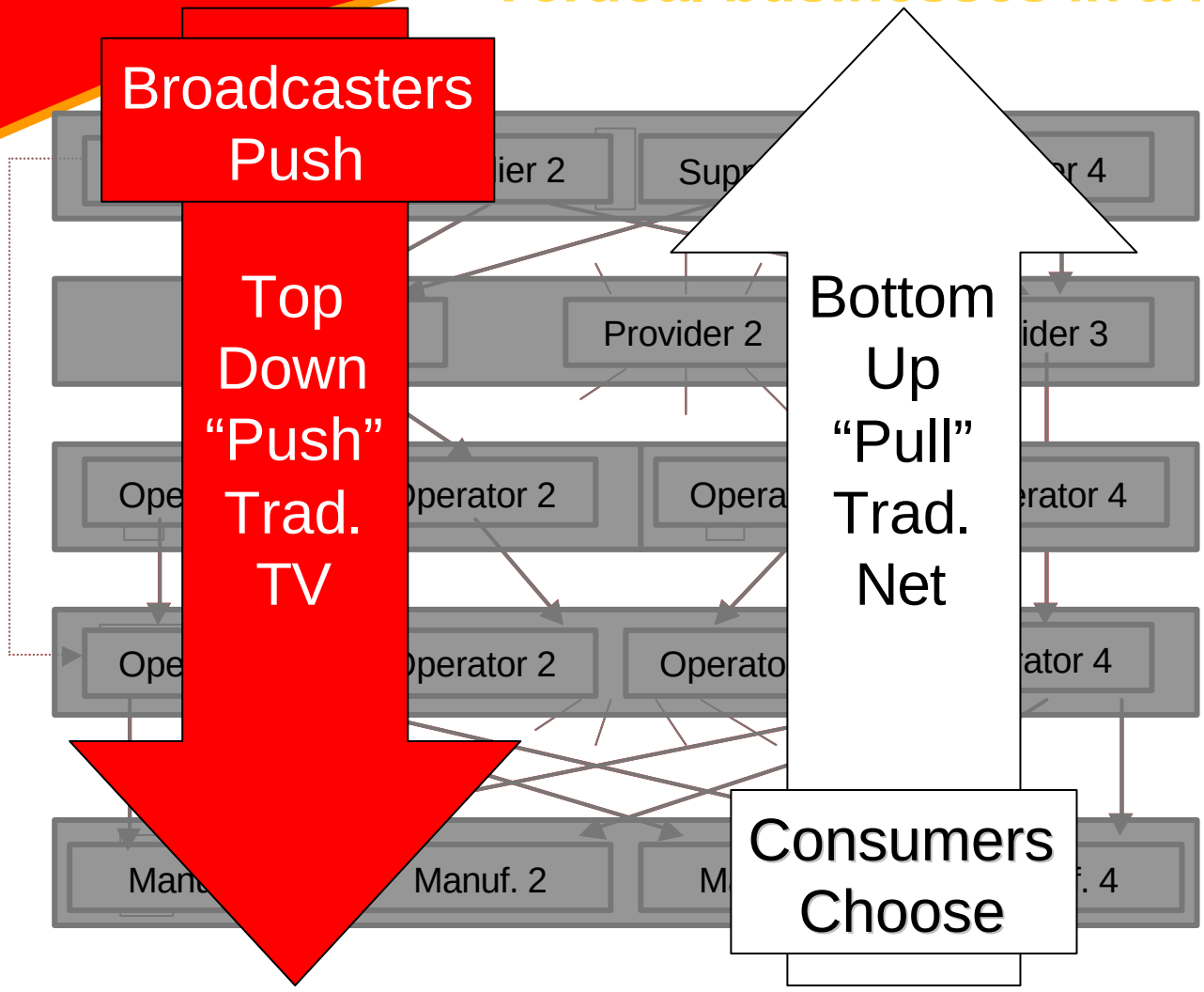
MHP Market Model Evolution

Vertical businesses in a horizontal market



Applications & Content
(*Producers/Distributors*)

Programmes & Services
(*Broadcasters, Web Sites*)

Conditional Access
(*Service Providers*)

Networks / Transport
(*MPEG-2 & IP*)

Receivers / Terminals
(*CE devices / PCs*)

All competing for consumers

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Conclusion

- MHP allows rich applications for iTV
- MPEG-4 allows rich media types, which MHP does not cover
- Putting the two together makes sense
- MPEG-4 solves many IP streaming issues
- More than just a video codec
  - Video
  - Audio
  - Speech
  - Media Synthesis
  - 2D graphics
  - 3D graphics
  - Scene composition
- Finally, H26L is MPEG4 Level 10!

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Questions?

- Ask now…
- Email me paul.bristow@philips.com
- or go to http://www.mhp.philips.com
- and http://www.mpeg-4.philips.com

Other useful web sites:

- DVB: http://www.dvb.org
- MHP: http://www.mhp.org
- MPEG : http://www.cselt.it/mpeg/
- M4IF : http://www.m4if.org/
- ISMA : http://www.isma.tv/
- 3GPP : http://www.3gpp.org/