Media Orchestration from Capture to Consumption

MPEG Workshop Media Synchronization for Hybrid Delivery,
MPEG 110, Strasbourg

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MPEG Should Start Work on Media Orchestration

- m32404, argued that we needed support for
  1. Different but related streams on the same device
  2. The same stream on different devices, either local or physically remote.
  3. Different but related streams on different devices, either local or physically remote

- In this talk we'll look at the chain in a bit more detail, looking at
  - Production
  - Delivery
  - Consumption

- … and we'll conclude that MPEG should address Media Orchestration

Video pervades our lives, and this will only increase


Facebook acquired Oculus Rift because it believes virtual rea
could be the next big thing after mobile.

By Simon Parkin on March 26, 2014

- Oculus Rift bought by Facebook – for $2 Bn
  - Immersive experiences with cheap hardware
  - *Immersive virtual and augmented reality will become a part of people's everyday life* (Mark Zuckerberg)
- Google Cardboard
  - DYI Virtual Reality using your smartphone
  - Again for immersive & social experiences
- Bublcam achieves crowdfunding targets
  - crowd-sourced 360º camera to be used like a GoPro (32 Mpix, 1080p 30 fps)

Production Proliferates

- Media production gets easier all the time, with (potentially) high quality media coming from consumer devices
- These devices are always connected
- Production, including professional, is moving to all-IP
- Increasingly, user-generated content production is aided by apps and hosted functionality (“cloud”)
- Production includes social media-enabled sharing
- Object-based broadcast comprised of individual assets + metadata describing their relationships
  - BBC and its venue explorer
  - (for the older generations: MPEG-4! ;-)

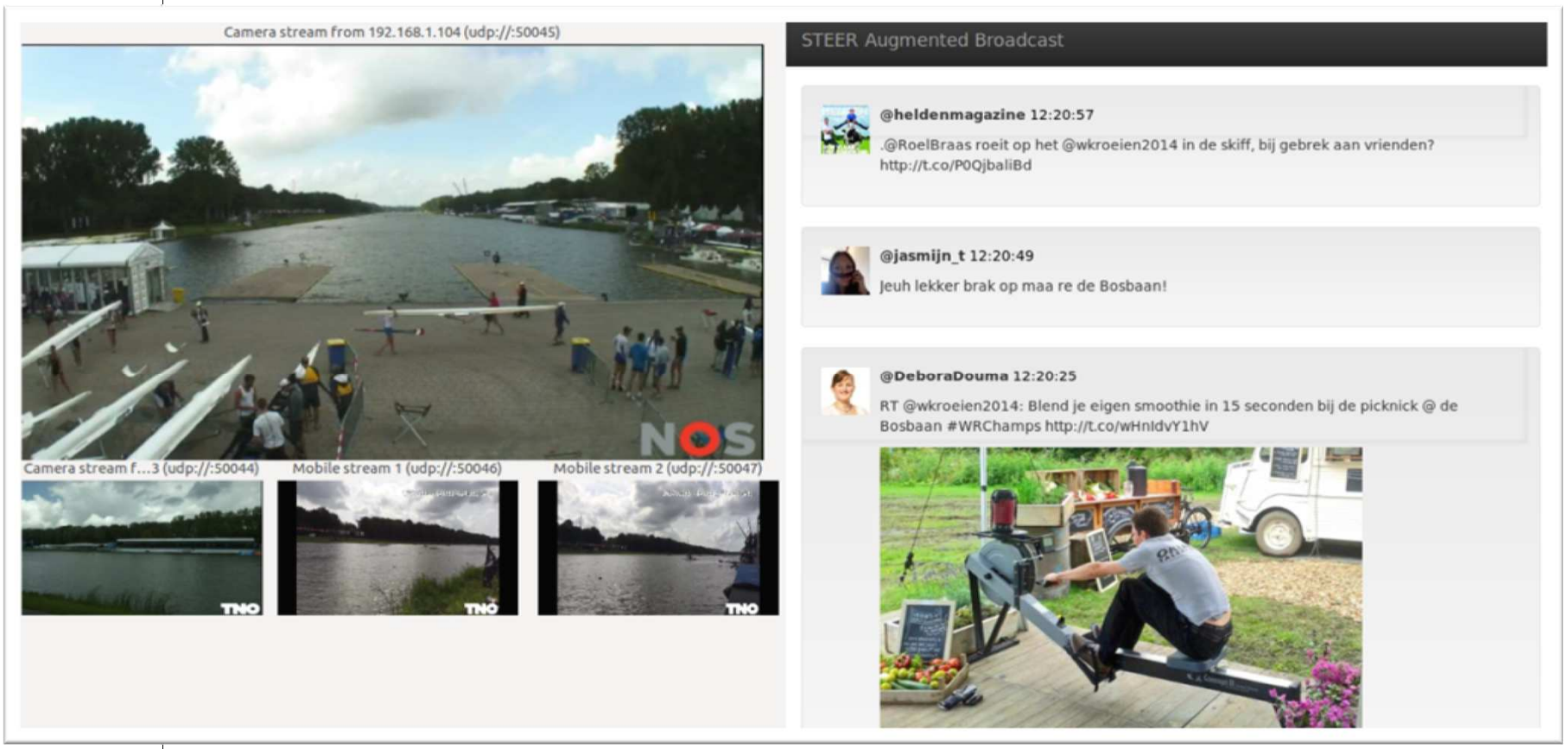
http://www.bbc.co.uk/rd/projects/venue-explorer

Example: STEER
Live Augmented Broadcast

- Social Telemedia Environment for Experimental Research EU FP& project on Collaborative content creation, mixing professional and user-created content

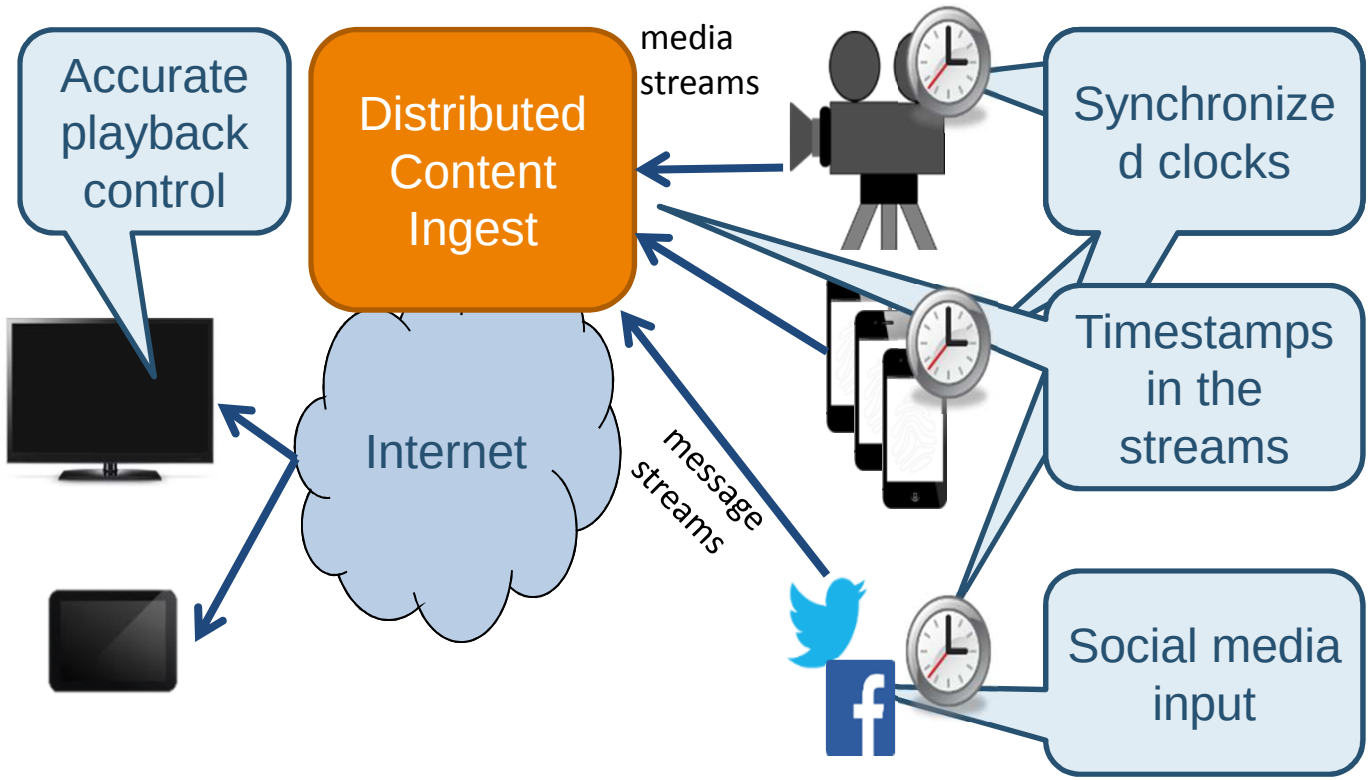
- Experiments at:
  - World Rowing Championships
    - *United (production house)*
    - *NOS (Netherlands Public Broadcaster)*
    - *Steer Partners Uni Patras, BitNomica, TNO*
  - Formula 1 in Silverstone
  - Skiing in Schladming

FP7 STEER @ World Rowing Championships



See the demo!

FP7 STEER –Live Augmented Broadcast



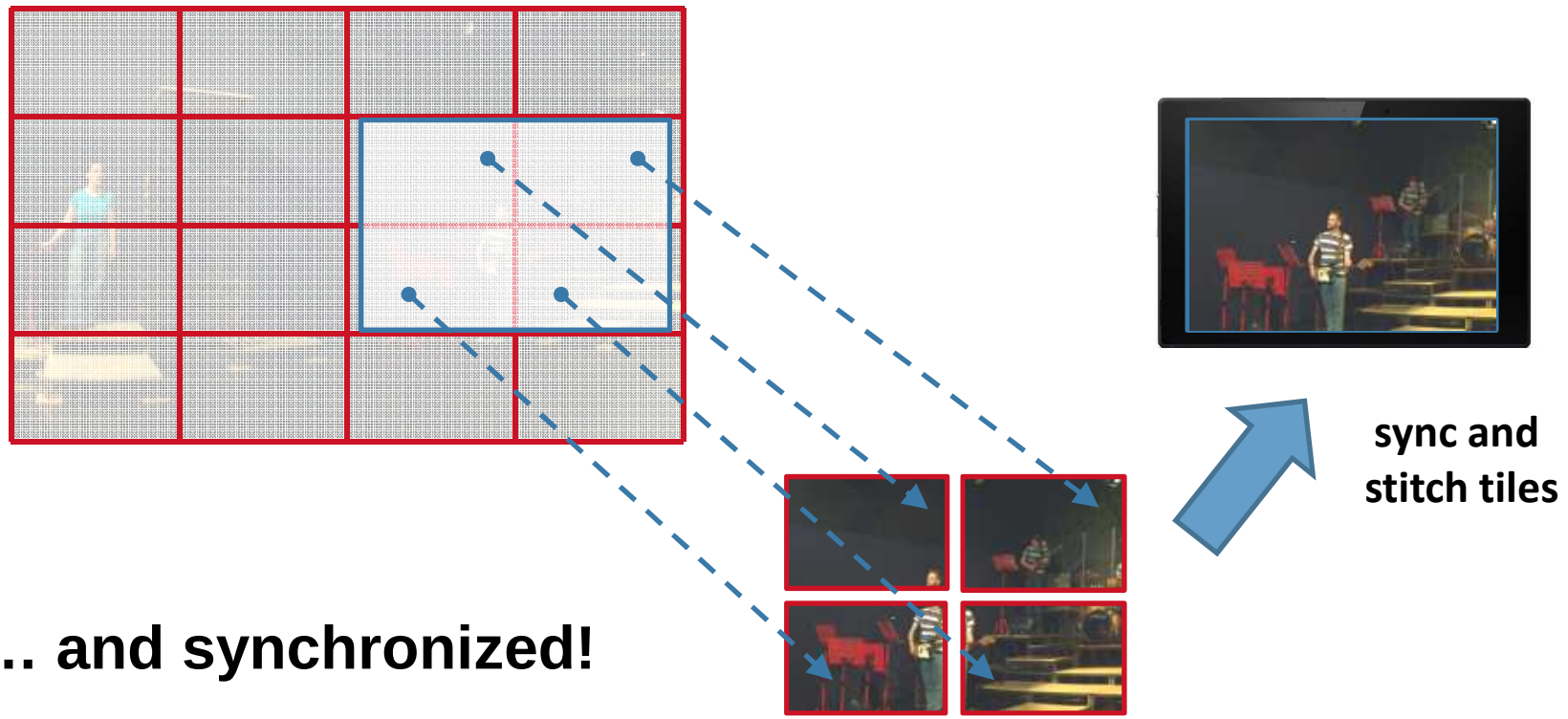
Between Production and Consumption: Delivery is now hybrid

- Contribution / upload:
  - all IP, any network
  - including WiFi, 4G and in a few years 5G
  - Seamlessly switching networks during streaming, calling, receiving “broadcast” (upstream and downstream)
- Distribution / download / play-out:
  - moving to CDN-enabled DASH even for “multicast”
  - Caching, Repackaging, Transcoding
  - Low delays are important, and will become even more important
  - Mixed broadcast/broadband delivery
- Physical proximity may not imply networked proximity

Consumption

- Increasingly powerful devices
- Higher resolution screens, regardless of screen size
- Always connected with multiple (wireless) links supported
  - Bit budgets will keep increasing, even on public networks
- Multiple devices in use simultaneously
- Increasing diversity in size, form factor, networking capabilities

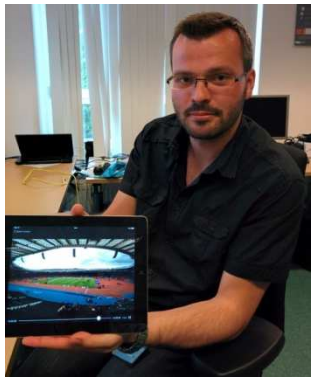
Example: Tiled Streaming – any resolution to any device, optimized & interactive



… and synchronized!

FP7 FascinatE, FP7 Hbb-NEXT, trials at the Commonwealth Games

See the demo!



What should still be tackled?

1. Multi source content: orchestrating a single media experience from multiple independent sources
   - *Discovery and coordination of diverse and dynamic sources*
2. Multi-domain content distribution: controlling and harmonizing play-out across different delivery methods on a single device and on multiple devices
3. Accurately controlling play out on a given device
   - *Taking into account delay between decoding and presentation*
4. Spatial orchestration: dynamically orchestrating media coming from, and played across, multiple devices (speakers & screens)
   - *Discovery & presentation in a dynamic environment. “Switch & Stitch””*

MPEG is *the* body to address Media Orchestration

- MPEG's expertise and mandate include
  - "protocols associated with coded representation of moving pictures, audio and their combination"
  - "interworking with other applications such as telecommunications and broadcasting"

- Orchestration of media requires formats, metadata and protocols that are media-aware – the thing that MPEG does best.

End of Presentation – Questions?

(See you at the Social Event)