DASH - From OTT to VR

VR and 360:
The Broadcaster’s Perspective

Richard Mills
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Sky VR Timeline

April 2016: Sky VR announced

October 2016: App launched

Phase 1: 360 Video immersive content

Phase 2: Interactive, and Room-Scale experiences
Sky VR aims

• Produce content In-house
• Commission Content
• Aggregate 3rd Party Content
Sky VR

1 - Planning and Shooting for VR

2 - Design and implementation of a VR App

3 – 360/VR within a Broadcast infrastructure
Sky VR Content Creation aims:

• Native 360 Shooting
• Hybrid 360 plus CGI
• Pure CGI
• Volumetric Asset creation and integration

1 - Production - Planning and Shooting
Production - Planning and Shooting

Sky Sports – Closer

David Beckham – Sky Ambassador

Showcase Sky Sports’ new season

Hi-tech virtual environment

Fresh, exciting look

Compelling action
Production - Planning and Shooting

Sky Sports – Closer: The concept

David Beckham in Virtual hub – with “Micro-worlds”

Live action 360 content combined with Studio Shoot
Production - Planning and Shooting

Sky Sports – Closer: The Shoot
Production - Planning and Shooting

360 Content insertion techniques

Pre-shot content – Match action
- Williams: F1
- Football: Final
- Boxing: Anthony Joshua

Post-shot content – Direct the shoot
- Cricket: Lords Test
- Golf: British Open
Alternative Shooting Techniques for VR

Giselle VR

3D 360

Nodal spherical arc

Freehand Camera moves

MoCo Background
2 – Design and implementation of a VR App

VR App – Platform Aims

Mobile Phone, Cardboard and Tablet

GearVR Store

HTC Vive

Facebook

YouTube
VR App Content Aims

5 Sky UK Genres:
Sport
Arts
News
Entertainment
Sky Cinema
VR App – Design Specification

Ease of Use – Brilliantly simple
UI designed to be intuitive
High quality content
Reliability of playback
Mobile, Tablet, Cardboard
Download or Streamed Content
VR Post Production – an overview

- Rushes Back up
- Join FAT subclips
- Rough Stitch
- Offline
- Delivery encoding
- Online/Fine Stitch
3 - 360/VR pipelines in a Broadcast environment

Commissioning or Acquisition of 3rd party Content

Content Guidelines Delivery Specification

Compliance

Master programme file delivery

QC Delivery encoding QA

Comfort/Age Rating
360/Video Technical Specification

Content Creation Guidelines – Motion, Orientation, Comfort

Content Technical Spec for Master file – Sky final encode

4096 x 2048, 10-bit, 4:2:2 colour, Progressive 25 to 120fps

MXF, IMF, DnxHR HQ, ProRes 422 HQ

Audio: Preferably Spatial WXYZ, or 5.1, or Stereo
Next Steps: Tiled FOV Delivery via DASH

Streamed vs download: compromise – Speed, Volume vs image quality

New approach: Field-of-view Adaptive delivery

• Content is resident on Cloud server
• “Viewport” is delivered in Dynamic Adaptive bitrate Streaming
• Low latency essential (user disorientation): 50 – 100ms max
• 4-15Mb/s with this service is equivalent to 10-60Mb/s of whole scene content
Next Steps: Tiled FOV Delivery via DASH
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Cube Projection
Next Steps: Tiled FOV Delivery via DASH
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