Intensive-Seminar Adaptive Streaming & MPEG-DASH
for PC, HbbTV and Mobil
Encoding, Transport and AV-Quality for Web-Distribution

Seminar in English: May 22 - 23, 2017

Location: IRT, Floriansmuehlstrasse 60, 80939 Munich, House 17 A - Room A116

State of the art of Streaming today?
The standards HTML5 and MPEG-4/H.264/H.265/AAC/MP3 are appropriate for cross-device distribution of content over the open internet. Nevertheless, suitable combinations of container formats, transport protocols and media coding schemes need to be defined, which ensure interoperability and maintain perceptible quality. IP-based delivery mechanisms need to follow the requirements of the multimedia transport at the consumers’ internet connection and their individual network access.

Multimedia-Transport at a glance
While transmission may be download, pseudo streaming or live streaming through different protocols (RTP, RTMP/E, HTTP), bottlenecks will be compensated by load balancing and caching of Content Delivery Network-Providers (CDN) or via client based transport mechanisms like Adaptive Streaming. What are the benefits of HTTP Adaptive Streaming compared to the classic Progressive Download and traditional streaming protocols? What are the differences between MPEG-DASH and Adaptive Streaming implementations of Apple, Adobe and Microsoft? What is the Common Media Application Format (CMAF) compared to the ISO Base Media Fileformat (ISOBMFF) and how could DASH versus HLS benefit?

Experience for application developers, engineers and video technicians
The Seminar gives you an overview of the state of the art, shows problems and latest test results of IRT for PC, HbbTV and mobile devices. Practical examples for interoperable and cross-device streaming workflows in the CDN will be shown based on open source tools as well as on professional products from different manufacturers. Various media players for web browsers will be discussed. Will MPEG-DASH and possibly CMAF satisfy the needs for an adaptive, scalable cross-platform and cross media streaming solution for future OTT-Services in the exploding world of end user devices? We are looking forward to share our insights and discuss these issues with you!
Day 1: Monday, May 22, 2017 10:00 – 16:00

**Videocodecs, audience and devices**
- Target audience and broadband coverage fixed and mobile
- Distribution of operating systems and screen resolutions
- Encoding profiles, levels & quality of H.264/H.265 and UHD

**Lab:** Transcoding of DVB-Recordings with ffmpeg in SD for HbbTV, Tablet

**Multimedia Transport**
- Progressive Download vs. Adaptive Streaming
- Apple HLS, Adobe HDS und MPEG-DASH flavors
- Adobe Flash End of Live

**Lab:** Playback of IRT Reference Clips on Tablet, PC and HbbTV

**MPEG-DASH**
- Standardisation, testing and services with MPEG-DASH
- Scope of DASH, multimedia transport and client architecture
- Media Presentation Description, Adaptation Sets and Representations
- DASH descriptors, segment alignment and timeline

**Lab:** Playback and debugging of a DASH Livestream with PC and HbbTV
- DASH Profiles, ISOBMFF container-structure and MPEG-TS format
- Segment indexing, referencing and initialization in DASH and CMAF
- Server and Network assisted DASH, CMAF for DASH and HLS, WebRTC

**Lab:** Segmenting of transcoded videos for HbbTV using mp4box

**Invitation to a social event in downtown Munich**

Day 2: Tuesday, May 23, 2017 10:00 – 16:00

**Constraints and Capabilities in HbbTV and PC**
- MPEG-DASH in HbbTV for Live-Events and UHD
- Capabilities, Supported media-formats and DASH Profiles in HbbTV 1.5 and 2.0
- Webplayers and Codec Support for MPEG-DASH on HTML5/MSE for PC
- Subtitles for PC, HbbTV and Mobile with MPEG-DASH and HLS

**Code-Review:** DASH-Playback with MSE in HTML5 vs. HbbTV App

**CDN-Workflow and Encoders**
- Encoding-Profiles and Pre-Processing for Webdistribution at ARD and workflows in the Akamai CDN
- MPEG-DASH Pass-Through for Live, Re-Packaging and Transcoding
- DASH-Encoders, Cloud Services and Monitoring for HbbTV 1.5
- Quality of Experience of Adaptive Playback with HLS, HDS and MSS

**Lab:** Segmentation and Delay of Adaptive Services, Best Practices

**Quality, Monitoring and Delay**
- Quality of Service (QoS) Metrics for Live-Events and Catchup-TV
- Privacy aspects, Beacon concept and Server performance

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**Online-Registration:**
[www.irt.de/anmeldung/MPEG-DASH-220517](http://www.irt.de/anmeldung/MPEG-DASH-220517)

**Location:**

**Conditions of participation:**
For participation a registration is required. Please note that the number of participants is limited to 17 persons.

**Participation fee (per participant; net, plus applicable VAT):**
- Both days Standard rate: 1.390,-- €
- (Affiliates of IRT: 1.190,-- €)

**Registration deadline:**
Thursday, May 11, 2017

From May 12, 2017 the full fee is payable in case of the cancellation of the participant. Any replacement participant is welcome without additional cost.

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