International Intensive Seminar

Adaptive Streaming & MPEG-DASH

for PC, HbbTV and Mobiles
Encoding, Transport and AV-Quality for Web-Distribution

Seminar in English: July 10 – 11, 2018

Location: IRT, Floriansmuehlstrasse 60, 80939 Munich, Germany (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 perceptive quality. IP-based delivery mechanisms need to follow the multimedia transport with the consumers' internet connection and their individual network access. Special requirements emerge with High Definition-Formats from UHD and HDR, HFR to 360° Video.

Multimedia-Transport at a glance
While transmission may be download, pseudo streaming or live streaming through different protocols (RTP, RTMP/E, HTTP), bottlenecks need to 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 and Peer to Peer (P2P) 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? Can the Common Media Application Format (CMAF) satisfy the need of a combined delivery via HLS and DASH to HbbTV, PC and Mobiles?

Experience for application developers, engineers and video technicians
The Seminar gives you an overview of the state of the art, identifies problems and shows results of IRTs' streaming tests for PC, HbbTV and mobile devices. Practical examples for interoperable and cross-device streaming workflows over the CDN will be shown based on open source tools and professional products from different manufacturers. Various media players for web browsers will be discussed. Can MPEG-DASH or 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!
Programm

Day 1: Tuesday, July 10, 2018 10:00 – 16:30

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/VP9 and UHD
- Variable bitrate encoding and quality-optimized compression

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

History of Multimedia Transport
- Progressive Download vs. Adaptive Streaming
- Apple HLS, Adobe HDS and MPEG-DASH flavors
- Adobe Flash End of Live and fragmented MP4 in iOS

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

MPEG-DASH and CMAF Standardization
- Standardization, testing and services in MPEG, DASH-IF and WAVE
- Scope of DASH, multimedia transport and client architecture
- Media Presentation Description, Adaptation Sets and Representations
- DASH descriptors, segment alignment and AD-Insertion

Lab: Playback and debugging of a DASH Livestream with PC and HbbTV
- DASH Profiles, ISOBMFF-container-structure and MPEG-TS format
- Segment indexing and referencing, initialization and validation
- Redundancy and failover for Live Delivery and manifest manipulation
- Combined delivery for DASH and HLS using CMAF
- Server and Network assisted DASH (SAND) and 360 Tiled Streaming

Lab: Segmentation of transcoded videos for HbbTV using mp4box

Invitation to a social event in downtown Munich

Day 2: Wednesday, July 11, 2018 9:30 – 16:00

Constraints and Capabilities in HbbTV and PC
- MPEG-DASH in HbbTV for Live-Events and UHD
- Capabilities, media-formats and DASH Profiles in HbbTV 1.5 and 2.0
- Supported transitioning and HDR support in DVB-DASH and HbbTV 2.0
- Webplayers and Codec Support for MPEG-DASH on HTML5/MSE for PC
- Common Encryption and DRM Capabilities in HTML5 and HbbTV
- Subtitles for PC, HbbTV and Mobile with MPEG-DASH and HLS

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

CDN-Workflow and Encoders and QoE
- Encoding-Profiles and Pre-Processing for Webdistribution at ARD and workflows
- Comparison of YouTube and Netflix encoding profiles
- Live Pass-Through for DASH and CMAF, Re-Packaging and Transcoding with Akamai
- Client and Ingest-Acceleration, Multi-CDN, WebRTC and SRT
- DASH-Encoders, Cloud Services and Monitoring for HbbTV 1.5
- Quality of Experience of Adaptive Playback with HLS, HDS and MSS
- Bitrate Adaption Algorithms, segment duration and low latency streaming

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

Online-Registration: www.irt.de/registration/MPEG-DASH-170717
Location: www.irt.de/en/irt/directions.html

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,- €
(Proprietors of IRT: 1.190,- €)

Registration deadline: Monday, July 2, 2018

From July 3, 2018, the full fee is payable in case of cancellation of the participant. Any replacement participant is welcome without additional cost.