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A TEST-BED FOR THE DYNAMIC
ADAPTIVE STREAMING OVER HTTP
FEATURING SESSION MOBILITY

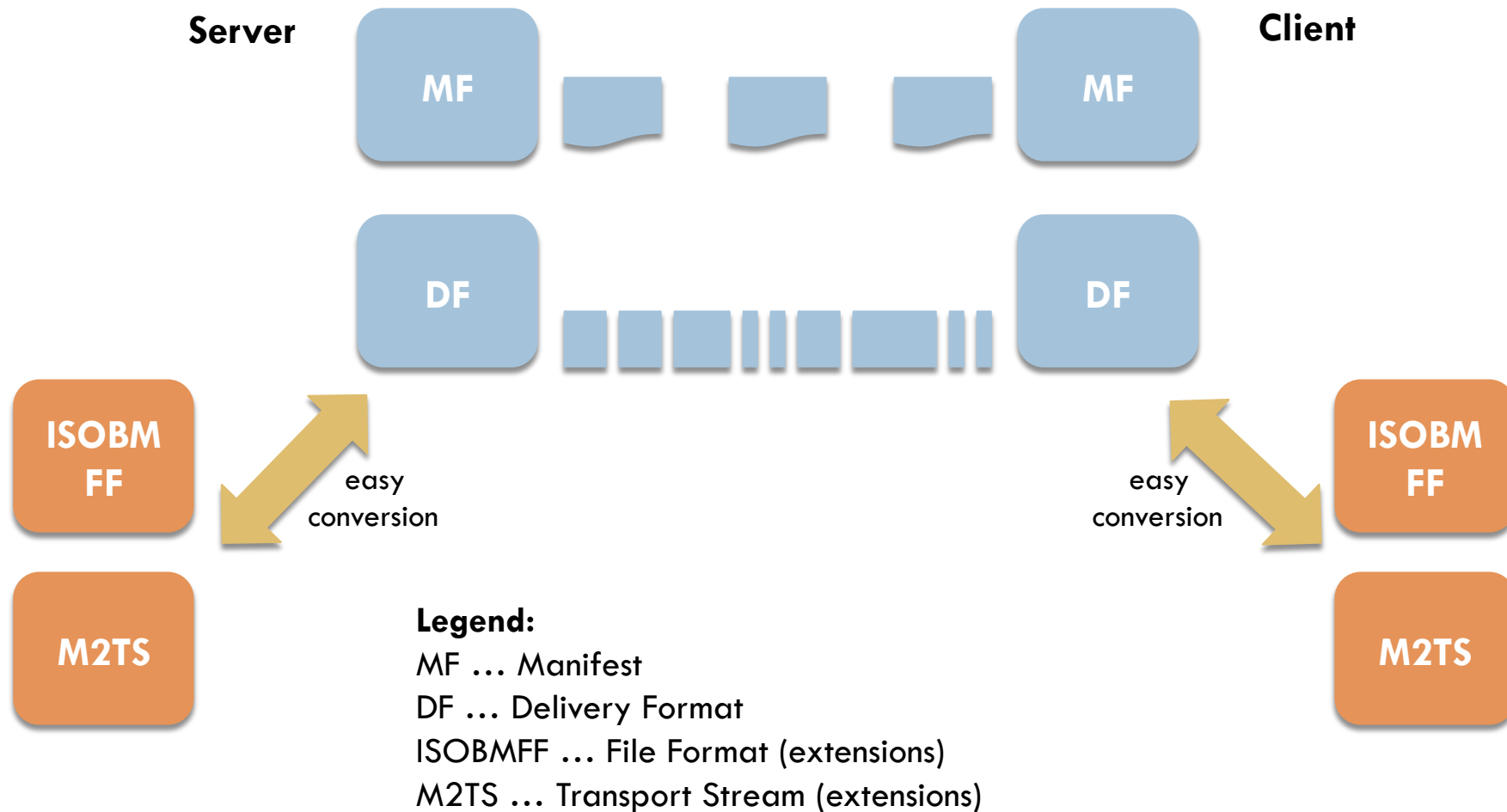
Outline

2

- Introduction, Background, System Architecture
 - [DASH]
 - Composition of Media Presentation
 - Session Mobility
- Implementation
 - VLC Architecture
 - Interface Layer
 - Access Layer
 - Session Mobility Demo

DASH System Architecture

3



Composition of Media Presentation

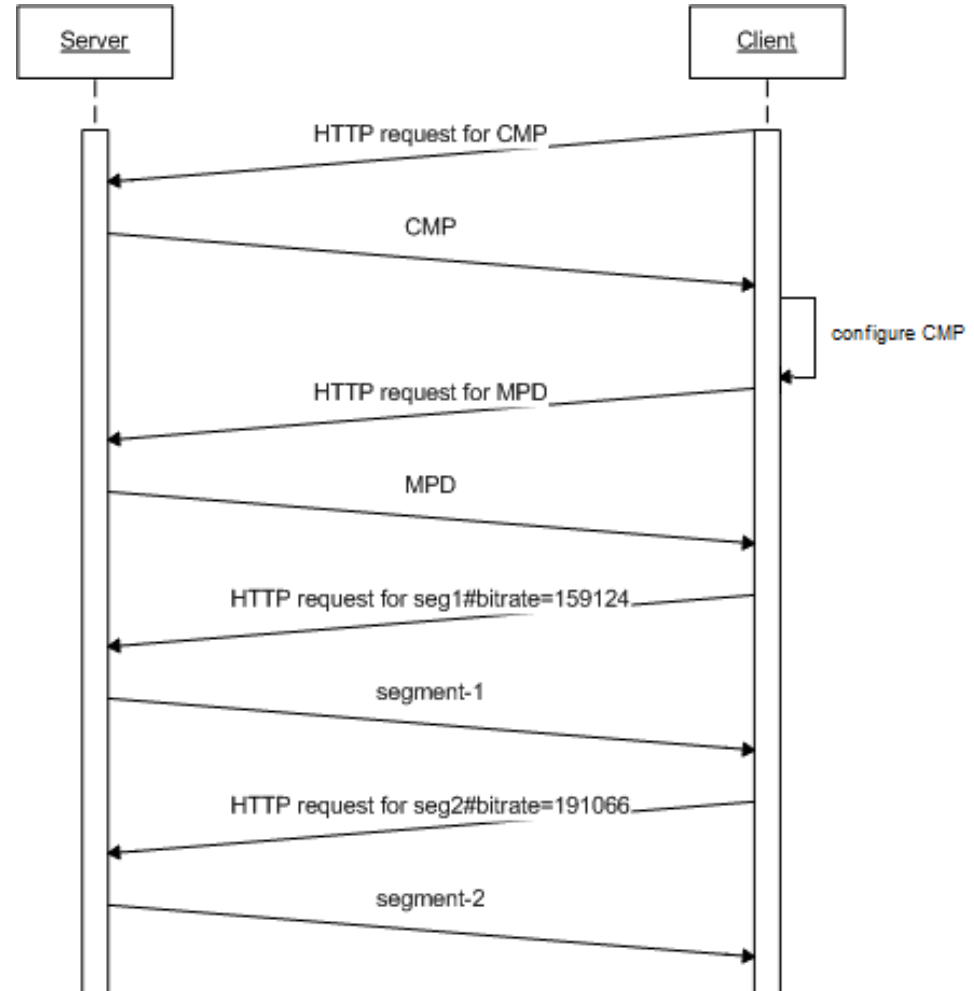
4

- Layer on top of the MPD which specifies initial user and device options
- Why?
 - ▣ The size of a MPD expands very fast (different camera angles, subtitles, audio languages, etc.)
 - ▣ Device pre-configuration due to its capabilities (supported codec, resolution, etc.)
 - ▣ User pre-configuration due to her/his preferences (camera angle, subtitle, audio language, etc.)
 - ▣ Flexibility and compatibility with existing repository formats (e.g. UPnP/DLNA)

CMP Sequence Diagram

5

1. Request for CMP
2. Configuration due to the needs of the client
3. Request for MPD that fulfils the requirements
4. Compliant to DASH

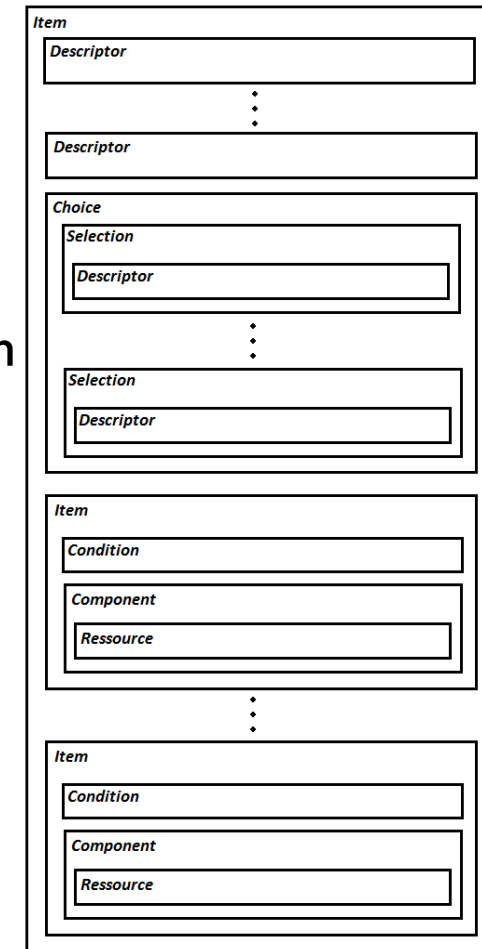


CMP with MPEG-21 Digital Item

6

Why MPEG-21?

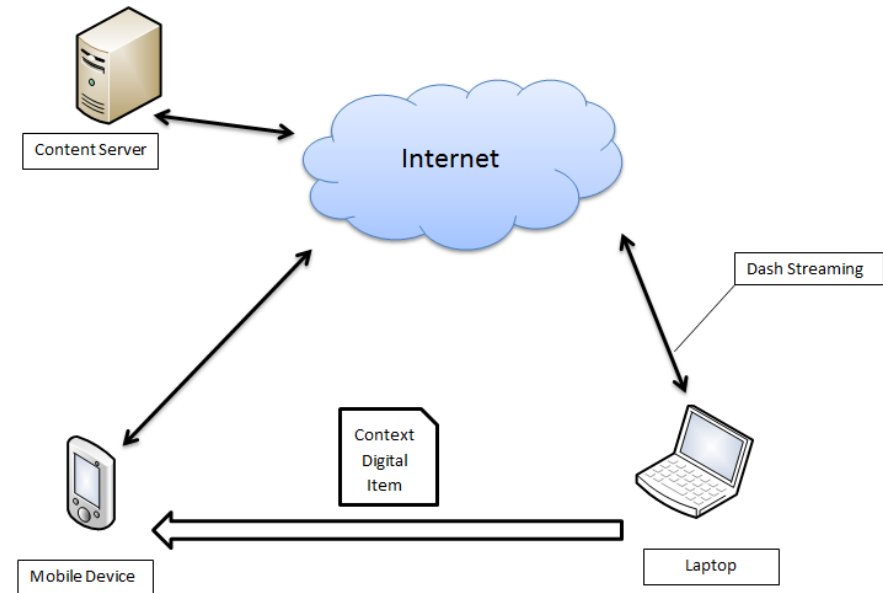
- International Standard
- Digital Item
 - Structured digital object, compatible with DIDL-Lite (UPnP)
 - Configurable through choice/selection
- Digital Item Adaptation
 - Preserve the users current state
 - Reconfiguration of the Digital Item
- Session Mobility Concept



DASH featuring Session Mobility

7

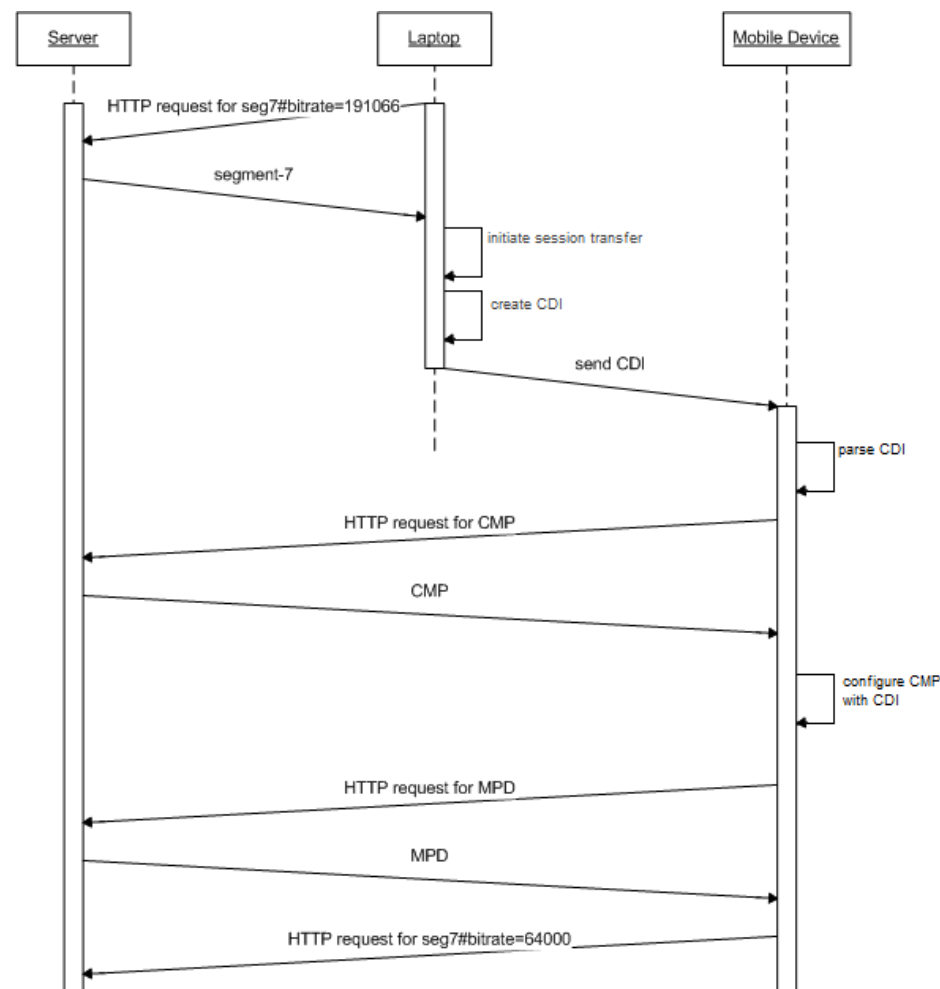
- Why? User decides to switch to another device
- How?
 - ▣ Transfer configuration of the CMP and additional information for the pre-configuration to the selected device
 - ▣ Configure CMP on the selected device
 - ▣ Download MPD and start session with the received parameters



Session Mobility Sequence Diagram

8

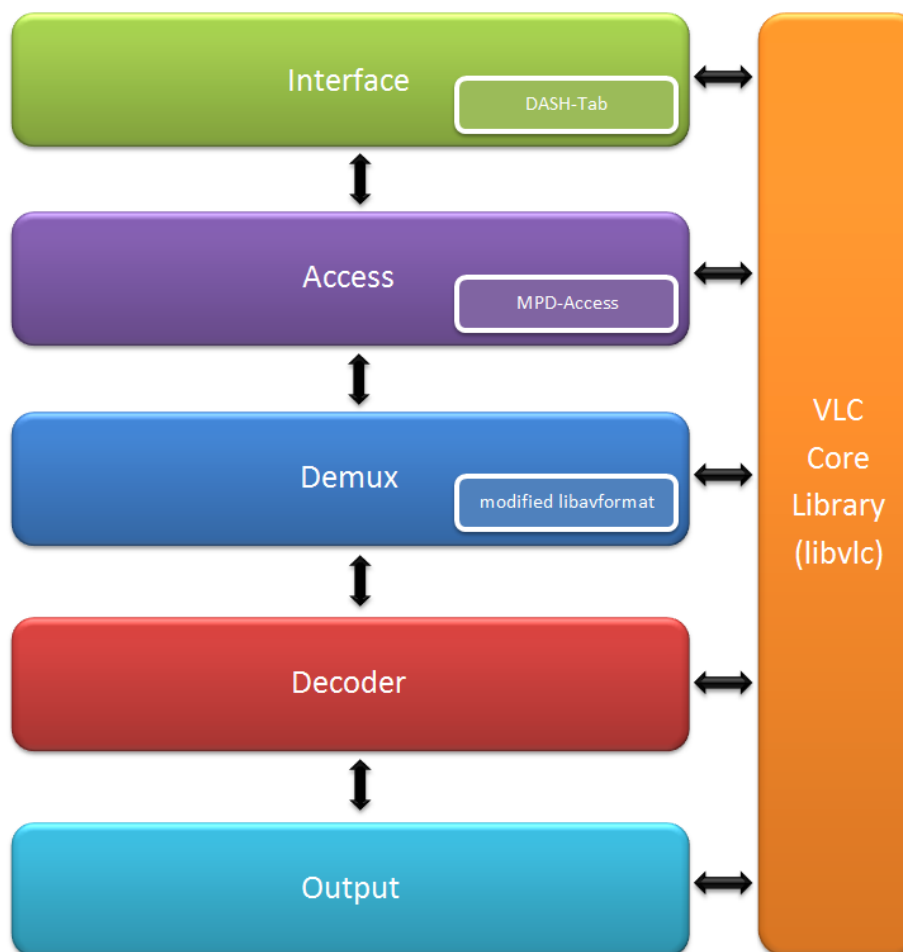
1. Initiate Session Transfer
2. DIA preserves the current state of the DI
3. Transfer Context Digital Item to the selected device
4. Download CMP
5. Reconfigure device
6. Compliant to DASH



VLC Architecture Modifications

9

- Interface Layer
 - DASH tab
- Access Layer
 - MPD access
- Demux layer
 - Modified libavformat
- Decoder Layer
- Output Layer
- VLC Core Library



Interface-Layer

10

- Open DASH stream dialog feat. MPEG-21 DID Choice/Selection
- Download CMP file
- General description
- Additional description for choices
- URL for MPD
- Play .3gp/.3gs files based on MPD (.3gm)

The screenshot shows the VLC media player interface with the 'Open Media' dialog box open. The 'Network Protocol' section is active, showing a URL: `http://www-itec.uni-klu.ac.at/~cmueller/adaptivestreaming/cmp/sample_cmp.xml`. Below the URL is a 'General description' section containing XML metadata for an MPD file. The 'Codecs' section shows 'MPEG-2' selected, with 'MPEG-4_Part_10' and 'MPEG-4_Part_2' also listed. The 'MPEG-4_Part_10' information window is open, displaying detailed XML metadata for the selected codec, including profile, format, and resolution information. The VLC player window in the background shows a video frame with the text 'JENS LEHMANN' overlaid.

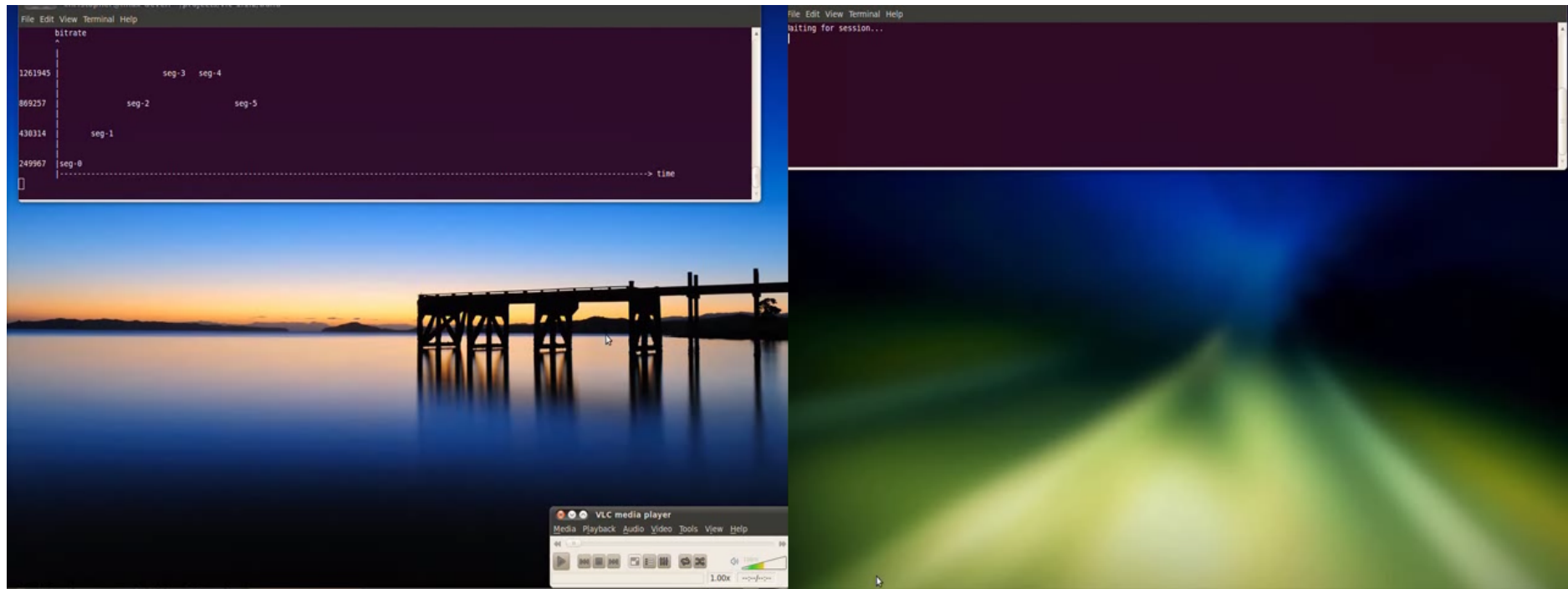
Access Layer

11

- XML parsing of the MPD
- Interpretation of the Context Digital Item
- Create adaptation logic and adapt to the current conditions
- Handle HTTP connections
- Download segments and pass the data to the demux layer

Session Mobility Demo

12



Conclusions

13

- Test-bed for DASH featuring session mobility
 - ▣ Based on international open standards
 - ▣ Fully integrated into well-known VLC
- Facilitates MPEG-21 Digital Item
 - ▣ Leverage existing media repositories such as UPnP
- Provides a testing framework for actual dynamic adaptive streaming algorithms
 - ▣ Including the possibility for transferring a running session from one device to another
- Current implementation available under <http://www-itec.uni-klu.ac.at/dash/> (DASH only)