



WAVE
WEB APPLICATION VIDEO ECOSYSTEM

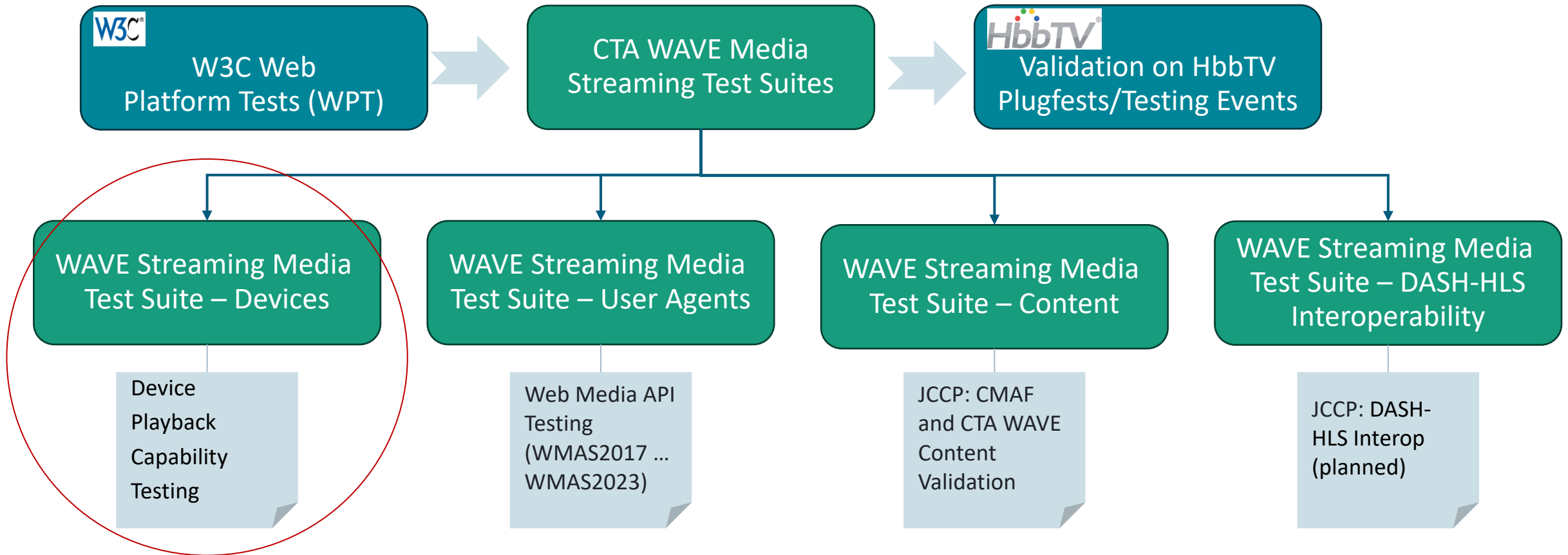


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Updates on CTA WAVE Media Streaming Test Suite

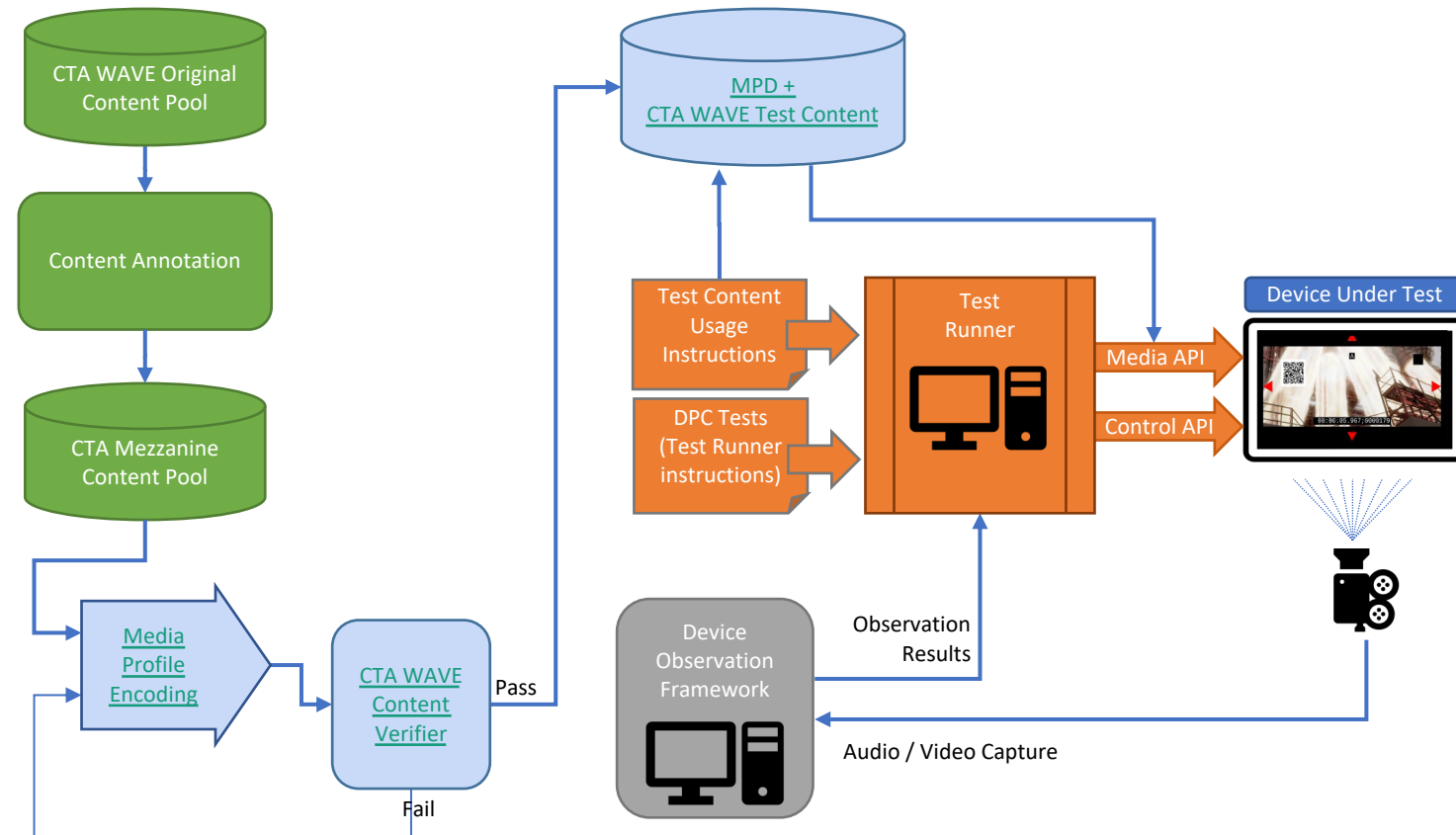
Dr. Louay Bassbouss | OSMART Workshop #2 | 06.12.2023



CTA WAVE Streaming Media Test Suite - Devices

CTA WAVE Streaming Media Test Suite – Devices: Main Components

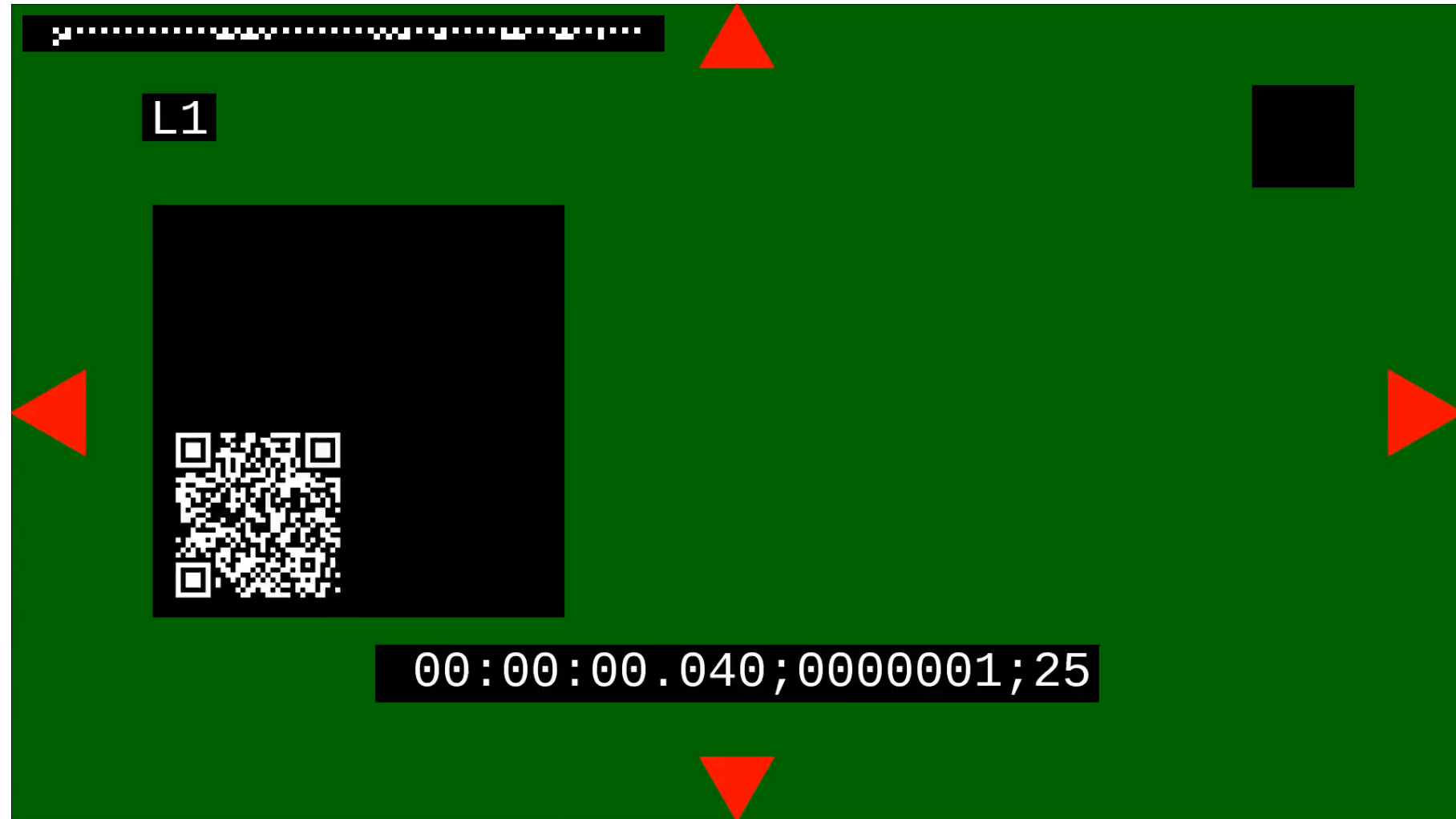
1. CTA WAVE Mezzanine Content
[\[GitHub\]](#)
2. CTA WAVE Test Content
[\[GitHub\]](#)
3. CTA WAVE Test Runner
[\[GitHub\]](#)
4. CTA WAVE Observation Framework
[\[GitHub\]](#)



CTA WAVE Streaming Media Test Suite

1 - CTA WAVE Mezzanine Content


- The Mezzanine GH repo contains scripts that builds annotated test content from specific source content, compatible with the WAVE device playback test suite



CTA WAVE Streaming Media Test Suite

2 - CTA WAVE Test Content


- The Test Content GH Repo offers Test Content generated from the Mezzanine Content in different codecs and variations



Github Search Syntax

Search... Search

L1



00:00:09.000;0000225;25

CFHD

CFHD-CENC

CFHD-SPLICING

CAAC

CEAC

CA4S

CAAA

CAMC

DTS1

File	Representations	VSE
https://dash.akamaized.net/WAVE/vectors/cfhd_sets/12.5_25_50/t1/2023-09-01/stream.mpd	1. { "resolution": "1920x1080", "framerate": 25, "bitrate": "5100", "input": "croatia_L1_1920x1080@25_30.mp4" }	avc1
https://dash.akamaized.net/WAVE/vectors/cfhd_sets/12.5_25_50/t2/2023-09-01/stream.mpd	1. { "resolution": "1920x1080", "framerate": 25, "bitrate": "5000", "input": "croatia_L1_1920x1080@25_30.mp4" }	avc3
https://dash.akamaized.net/WAVE/vectors/cfhd_sets/12.5_25_50/t3/2023-09-01/stream.mpd	1. { "resolution": "1920x1080", "framerate": 25, "bitrate": "4900", "input": "croatia_L1_1920x1080@25_30.mp4" }	avc1+3

CTA WAVE Streaming Media Test Suite

3 - CTA WAVE Test Runner

- CTA WAVE Test Runner is built on top of W3C Web Platform Tests (WPT) to make tests accessible on embedded devices (TVs/STBs)
 - Remote server manages test sessions and results
 - Custom wrapper executes tests in single window
 - Configure session using companion device by scanning QR code
 - REST API for full automation and integration into other systems and workflows
 - Companion web app to configure, run and monitor test sessions running on DUT (Device under Test)
 - Export test results as JSON or HTML



CTA WAVE Streaming Media Test Suite

[GitHub - DPCTF Specification](#)

New test session



Token: 5e125574-4e5a-11ee-a416-0242ac110003

Expires: 08/09/2023, 17:44:12

(Session start revokes expiration.)

Configure a new session on a second device by scanning the QR-Code, or click the button:

[Configure Session](#)

The tests will start running in this window, as soon as the session is started from the configuration view.

Resume running session

Session Results - Web Platform - x

trillian.fokus.fraunhofer.de/_wave/results.html?token=dd26eefc-159c-11ee-aa0e-0242ac110003

automatic: 100s

Date Started 28/06/2023, 12:17:35
Date Finished 28/06/2023, 12:36:08
Duration 00:18:32
Labels [Add](#)

Last Timed-Out Test Files (most recent first)

- No Timed-Out Tests -

API Results

API	Pass	Fail	Timeout	Not Run	Test Files Run	Export
cfhd_12.5_25_50-local	50 (98.03%)	1 (1.96%)	0 (0%)	0 (0%)	26/26 (100%)	non report
Total	50 (98.03%)	1 (1.96%)	0 (0%)	0 (0%)	26/26 (100%)	

Export

Results Download results for import into other WMAS Test Suite instances. [Download Zip](#)

All JSON Files Download JSON files containing results of completed test files. [Download Zip](#)

Session result HTML Download this sessions result as standalone HTML page, similar to this page. [Download HTML](#)

CTA WAVE Streaming Media Test Suite

4 - CTA WAVE Observation Framework

- The Observation Framework determines pass or fail results, based on observations taken of tests which are run by the Test Runner



DTVP/DTG Plugfest and HbbTV Testing Event - Berlin Overview

- Location: Fraunhofer FOKUS – Berlin / June 2023
- Participants: 80
- TV Manufacturers: **11**
- STBs (HDMI Interop Tests): **6**
- Content Providers (HbbTV, DVB-I, UHD, HDR, NGA): **15**
- Details: <https://tv-plattform.de/themen/plugfest/>

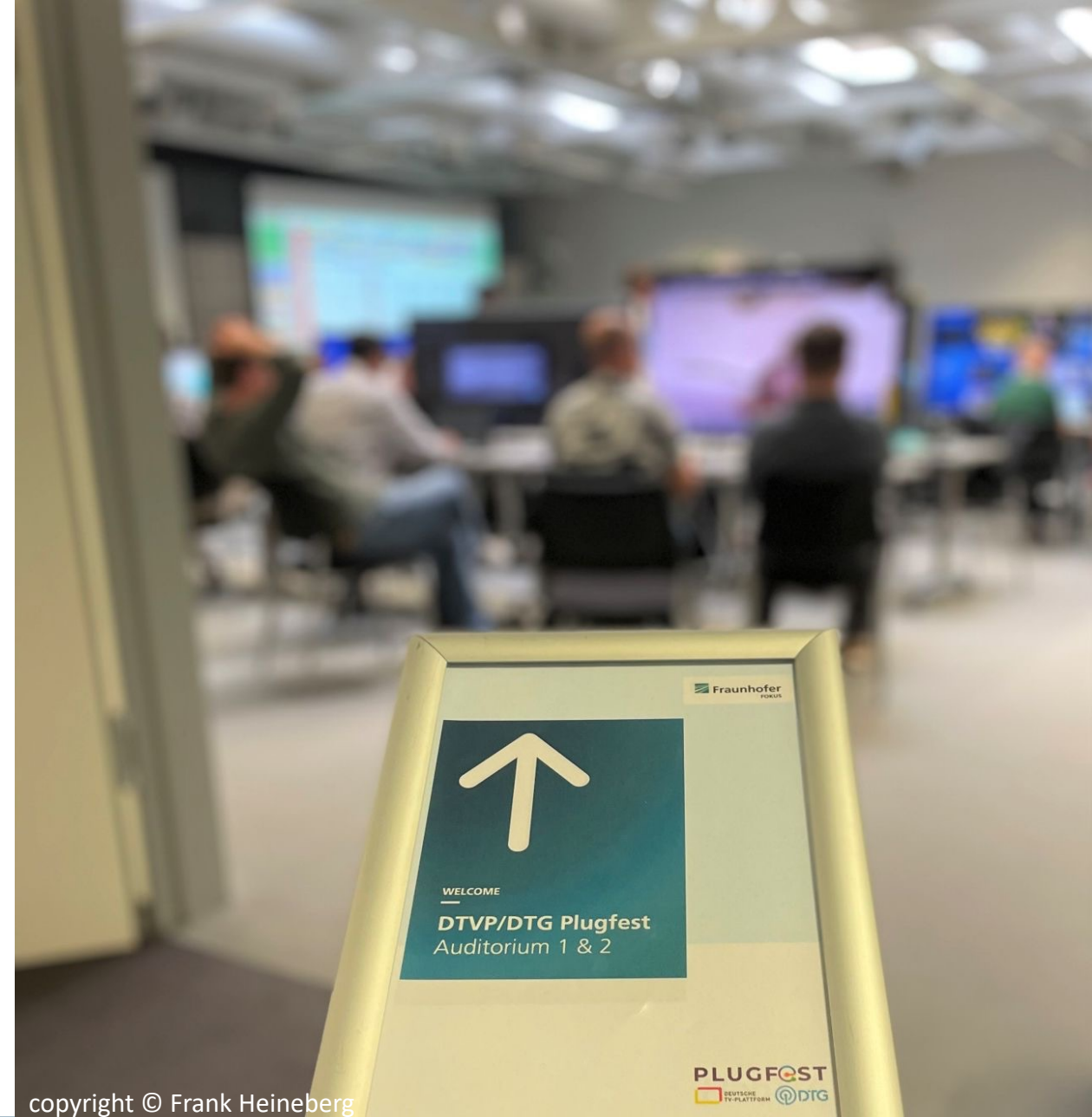
2023 DTVP / DTG Plugfest + HbbTV Testing Event, June 26 – 30

Hosted by Fraunhofer FOKUS Berlin

Monday 26.06.	DTVP / DTG Plugfest* HbbTV, UHD, DVB-I, NGA Start time: 10:00	
Tuesday 27.06.	DTVP / DTG Plugfest* HbbTV, UHD, DVB-I, NGA	
Wednesday 28.06.	DTVP / DTG Plugfest* ½ Day	HbbTV Testing Event** (in-person and remote) ½ Day
Thursday 29.06.	HbbTV Testing Event** (in-person and remote)	
	HbbTV Testing Group Meeting***	
Friday 30.06.	HbbTV Testing Event** (in-person and remote) End time: 16:00	



* DTVP/DTG/HbbTV members: free
Non-members: entry-fee
** HbbTV members only, no fee
*** HbbTV Testing Group members only

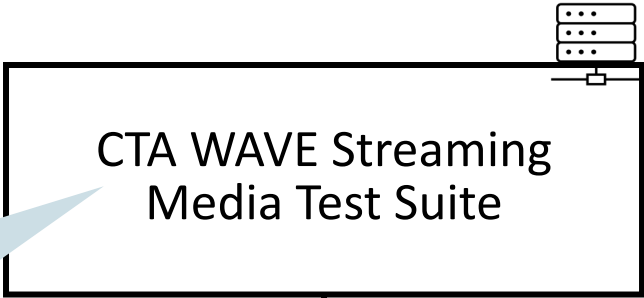


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CTA WAVE Streaming Media Test Suite at HbbTV Berlin Plugfest Setup



Ubuntu VM at Fraunhofer FOKUS Data Centre

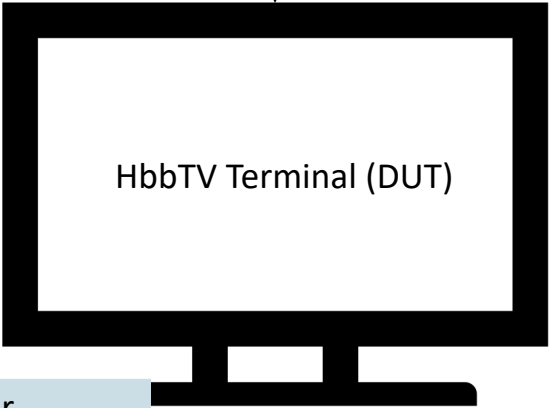


2 Launch Test Runner Landing Page

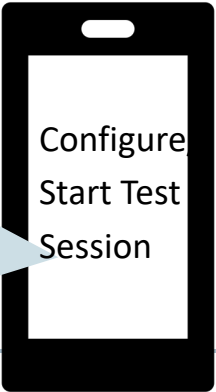


DekTek DVB Modulator

1 DVB-S

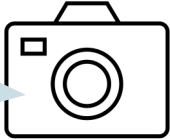


Any Smartphone to scan QR code of Session configure, Start and monitor session



3

Recording for Later observation. We used a Smartphone with 120FPS (Disabled some features like auto-focus,...)



4 Recording

CTA WAVE Streaming Media Test Suite at HbbTV Berlin Plugfest

Demo



CTA WAVE Streaming Media Test Suite at HbbTV Berlin Plugfest

Summary of Results

- The table shows the results for all tests without observation on 13 TVs sets (11 during plugfest, 2 at Fraunhofer FOKUS TV Lab)

#	Status	Start	End	Duration	Test F	HbbTV Version	PASS	FAIL	TIMEOUT	NOT RUN
1	completed	26/06/2023,	26/06/202	00:22:38	26/26	HbbTV/1.6.1	42	1	4	0
2	completed	26/06/2023,	26/06/202	00:22:39	26/26	HbbTV/1.6.1	44	1	3	0
3	completed	26/06/2023,	26/06/202	00:18:27	26/26	HbbTV/1.6.1	50	1	0	0
4	completed	26/06/2023,	26/06/202	00:20:27	26/26	HbbTV/1.5.1	50	1	0	0
5	completed	26/06/2023,	26/06/202	00:19:08	26/26	HbbTV/1.6.1	50	1	0	0
6	completed	27/06/2023,	27/06/202	00:21:19	26/26	HbbTV/1.5.1	48	1	1	0
7	crashed	27/06/2023,	14:42:09		20/26	HbbTV/1.6.1	24	0	8	0
8	completed	27/06/2023,	27/06/202	00:18:50	26/26	HbbTV/1.6.1	50	1	0	0
9	completed	28/06/2023,	28/06/202	00:19:08	26/26	HbbTV/1.6.1	50	1	0	0
10	completed	28/06/2023,	28/06/202	00:18:32	26/26	HbbTV/1.6.1	50	1	0	0
11	completed	28/06/2023,	28/06/202	00:19:30	26/26	HbbTV/1.6.1	50	1	0	0
12	completed	7/14/2023,	7/14/2023	00:21:54	26/26	HbbTV/1.6.1	52	0	0	0
13	completed	7/14/2023,	7/14/2023	00:20:05	26/26	HbbTV/1.6.1	52	0	0	0

Lessons Learned

- HbbTV Plugfests (Berlin, Naples) played a crucial role in validating and enhancing the CTA WAVE Streaming Media Test Suite, particularly on HbbTV devices.
- Identified issues in various components of the test suite (Mezzanine, Test Content, Test Runner, Observation) prompted necessary improvements.
- Plugfest test results led to adjustments in tolerance values for PASS/FAIL tests. Notably, the startup time tolerance was increased to 1s, aligning with HbbTV specifications.
- Hands-on experience and documentation saw significant enhancements based on valuable feedback from TV manufacturers who had already deployed the test runner.
- The second iteration of evaluating the CTA WAVE Streaming Media Test Suite, post-improvements, took place during the Naples HbbTV Testing Event.
- Ongoing plans include further testing and evaluation with a more extensive set of tests at the Fraunhofer FOKUS TV Lab. Additionally, upcoming HbbTV Plugfests and testing events are slated for continued validation and refinement.

Contact



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