

Fraunhofer FOKUS Institute for Open Communication Systems

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# HbbTV Webinar: The WAVE Test Environment for HbbTV and ATSC

## WMAS testing

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# Web Media API Snapshot - WMAS

- Developed as part of [CTA WAVE Project](#)
- Lists web APIs for media apps that are supported across all four of the most widely used user agent code bases
- The specification is updated annually
- It references existing specifications in W3C and other specification groups (ECMAScript, WebGL, ...)
- WMAS Test suites are developed as part of [CTA WAVE Project](#) as well

W3C Community Group  
Final Report

## Web Media API Snapshot 2022

Final Community Group Report 15 December 2022

Consumer Technology Association CES W3C

**This version:**  
<https://www.w3.org/2022/12/webmediaapi.html>

**Latest editor's draft:**  
<https://w3c.github.io/webmediaapi/>

**Previous version:**  
<https://www.w3.org/2021/12/webmediaapi.html>

**Test suite:**  
<https://webapitests2022.ctawave.org/wave/>

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**Feedback:**  
[GitHub w3c/webmediaapi](#) ([pull requests](#), [new issue](#), [open issues](#))

[Copyright](#) © 2016-2022 Consumer Technology Association & the Contributors to the Web Media API Snapshot 2022 Specification, published by the [Web Media API Community Group](#) under the [W3C Community Final Specification Agreement \(FSA\)](#). A human-readable [summary](#) is available.

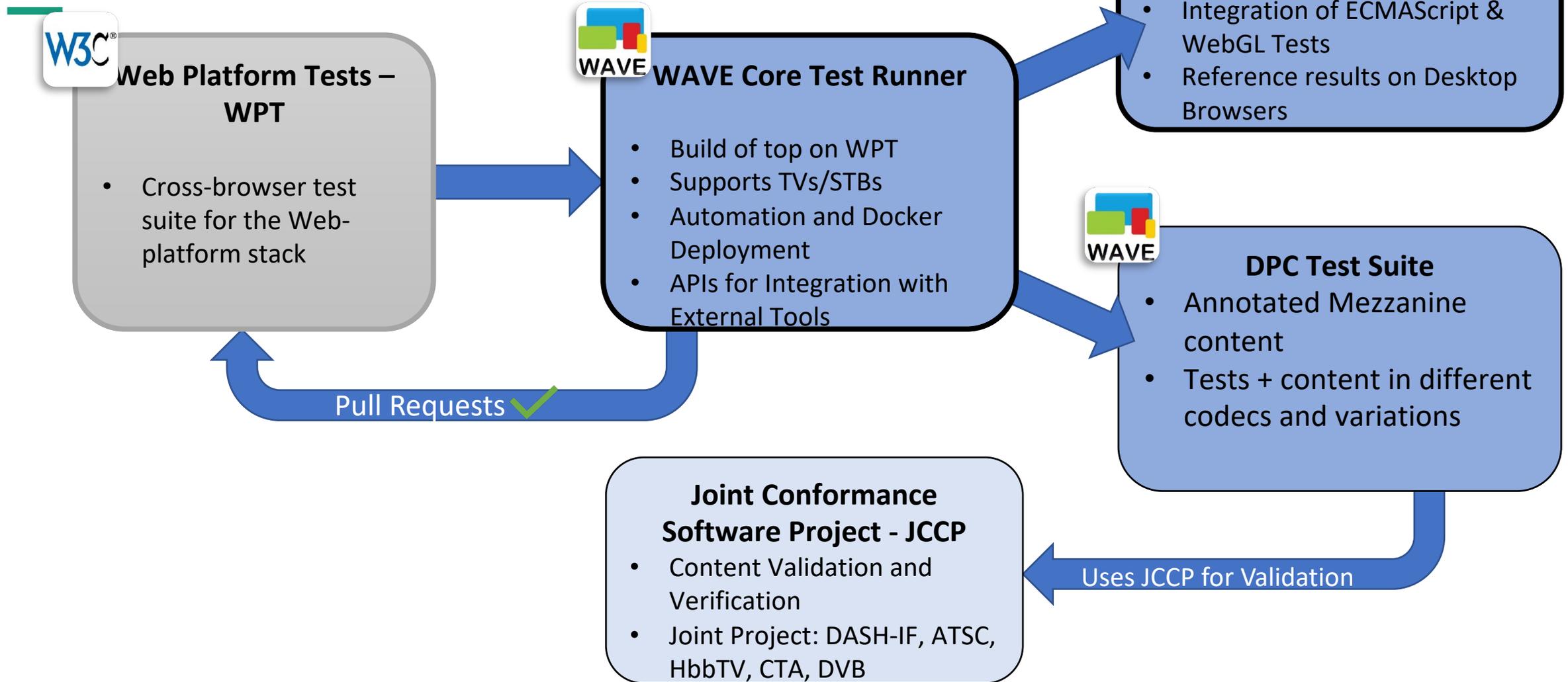
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### Abstract

This specification lists the web APIs to support media web apps that are supported across all four of the most widely used user agent code bases at the time of publication. This specification should be updated at least annually to keep pace with the evolving web platform. We encourage manufacturers to develop products that support the APIs in the most recent version of Web Media API Snapshot. This specification is comprised of references to existing specifications in W3C and other specification groups. The target devices will include any device that runs a modern HTML user agent, including televisions, game machines, set-top boxes, mobile devices and personal computers.

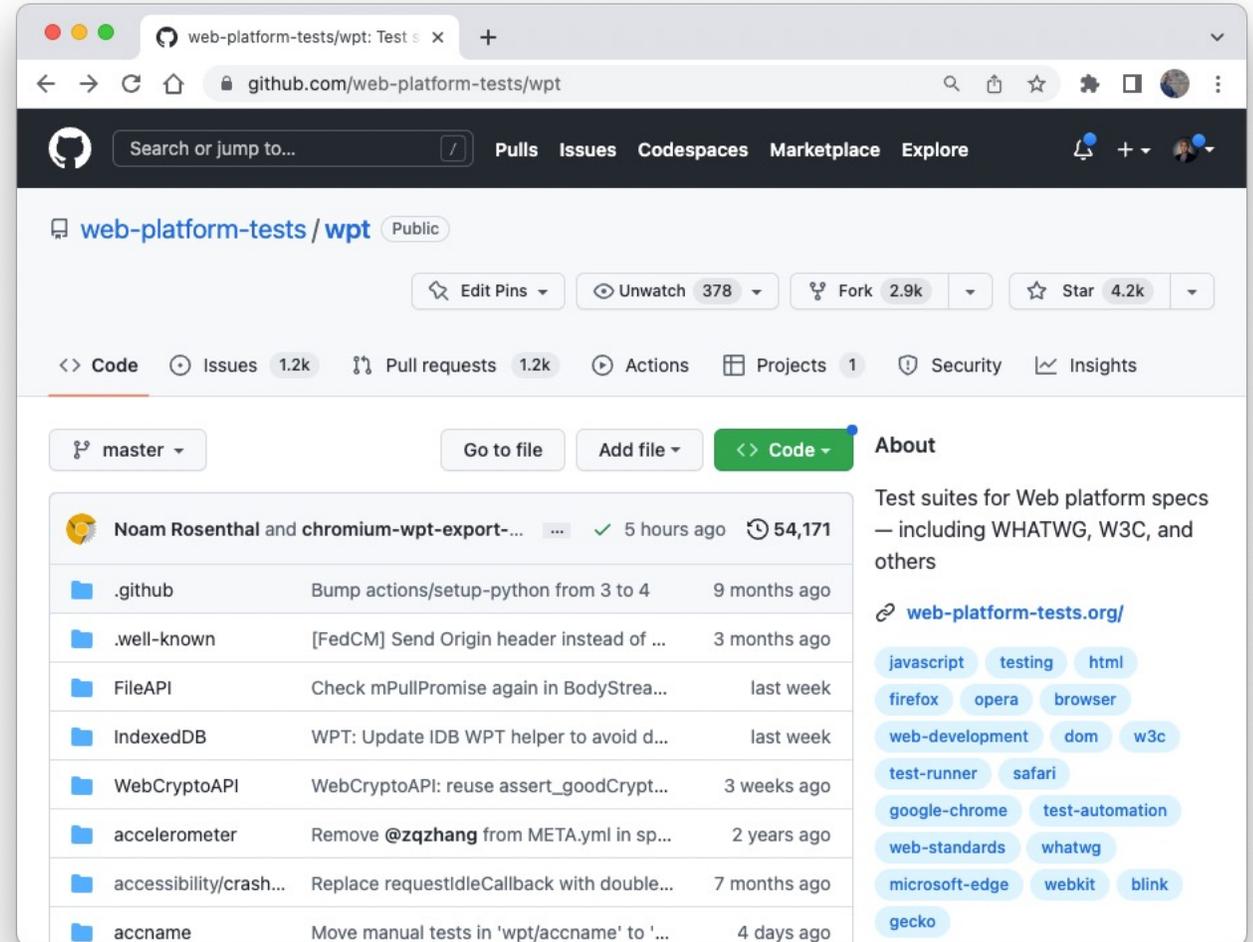
# WMAS (Web Media API Snapshot) Testing

## WAVE Test Suites



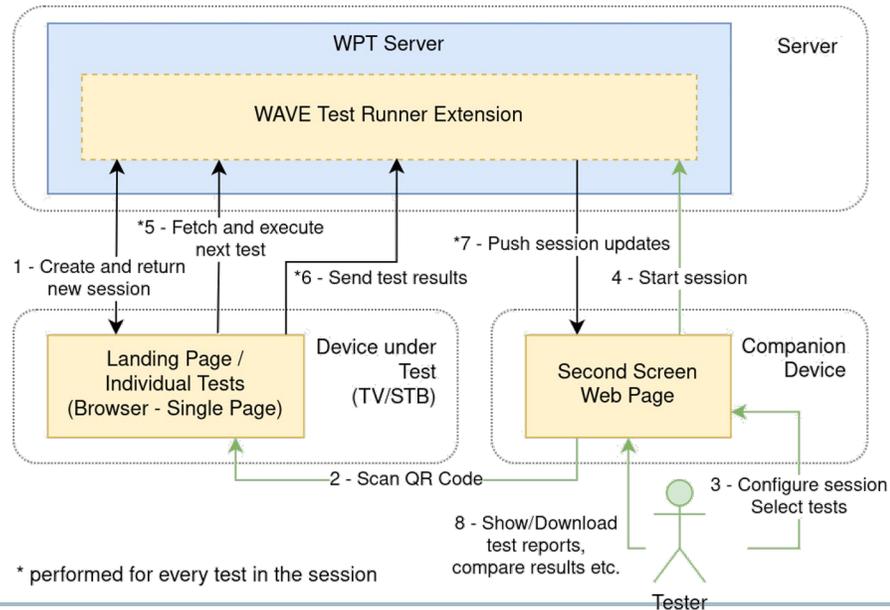
# Web Platform Tests - WPT

- Cross-browser test suite for the Web-platform stack
- <https://github.com/web-platform-tests/wpt>
- Built for desktop
  - accessible via mouse and keyboard
  - multi window
  - hosted locally, persisting results locally
  - hard to run on embedded devices



# WAVE Core Test Runner

- Built on top of WPT to make test runner 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



**WAVE**  
WEB APPLICATION VIDEO ECOSYSTEM

## WAVE Test Suite

[GitHub](#)

### New test session

Token: 64f7dcf0-326f-11ec-8a04-0242ac110002  
Expires: 10/21/2021, 3:34:15 PM  
(Session start revokes expiration.)

Configure a new session on a second device or click the button:

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

**Session Configuration**

Token: 64f7dcf0-326f-11ec-8a04-0242ac110002

Expires: 10/21/2021, 3:34:15 PM

Labels: Add

APIs: All None

2dcontext

ecmaascript

encrypted-media

Test Types: Automatic Manual

Reference Browsers: All None

Chromium 89.0.4349.0  
Blink 66

Edge 94.0.992.38

Firefox 94.0

### Resume running session

Last session: d71ac01e-24ea-11ec-83fd-0242ac110002



# WAVE Core Test Runner

- Share test results
  - HTML reports
  - JSON reports
  - Export/Import results between multiple instances
- Use completed sessions as reference for new sessions
  - e.g. run tests on TV that pass on Desktop Browser code bases

The screenshot displays the WAVE Core Test Runner interface. At the top right, there is a 'Results Overview' button. Below the WAVE logo, the word 'Result' is prominently displayed, followed by 'Pause', 'Stop', and 'Delete' buttons. The 'Session details' section provides the following information:

- Token:** da39b02a-2503-11ec-ad8a-6c88140d17f8
- User Agent:** Mozilla/5.0 (X11; Linux x86\_64; rv:84.0) Gecko/20100101 Firefox/84.0
- Test Paths:** /2dcontext, /beacon, /content-security-policy, /css, /dom, /ecmascript, /encrypted-media, /fetch, /FileAPI, /fullscreen, /hr-time, /html, /IndexedDB, /manifest, /media-source, /navigation-timing, /notifications, /page-visibility, /performance-timeline, /referrer-policy, /resource-timing, /service-workers, /subresource-integrity, /uievents, /upgrade-insecure-requests, /user-timing, /webaudio, /WebCryptoAPI, /webgl, /webmessaging, /websockets, /webstorage, /workers, /xhr
- Excluded Test Paths:** 0 (with a 'show' button)
- Total Test Files:** 48872
- Status:** running (indicated by a blue pill)
- Date Started:** 10/4/2021, 1:11:48 PM
- Date Finished:** 10/13/2021, 5:31:04 PM
- Duration:** 220:19:16

The 'API Results' section contains a table with the following data:

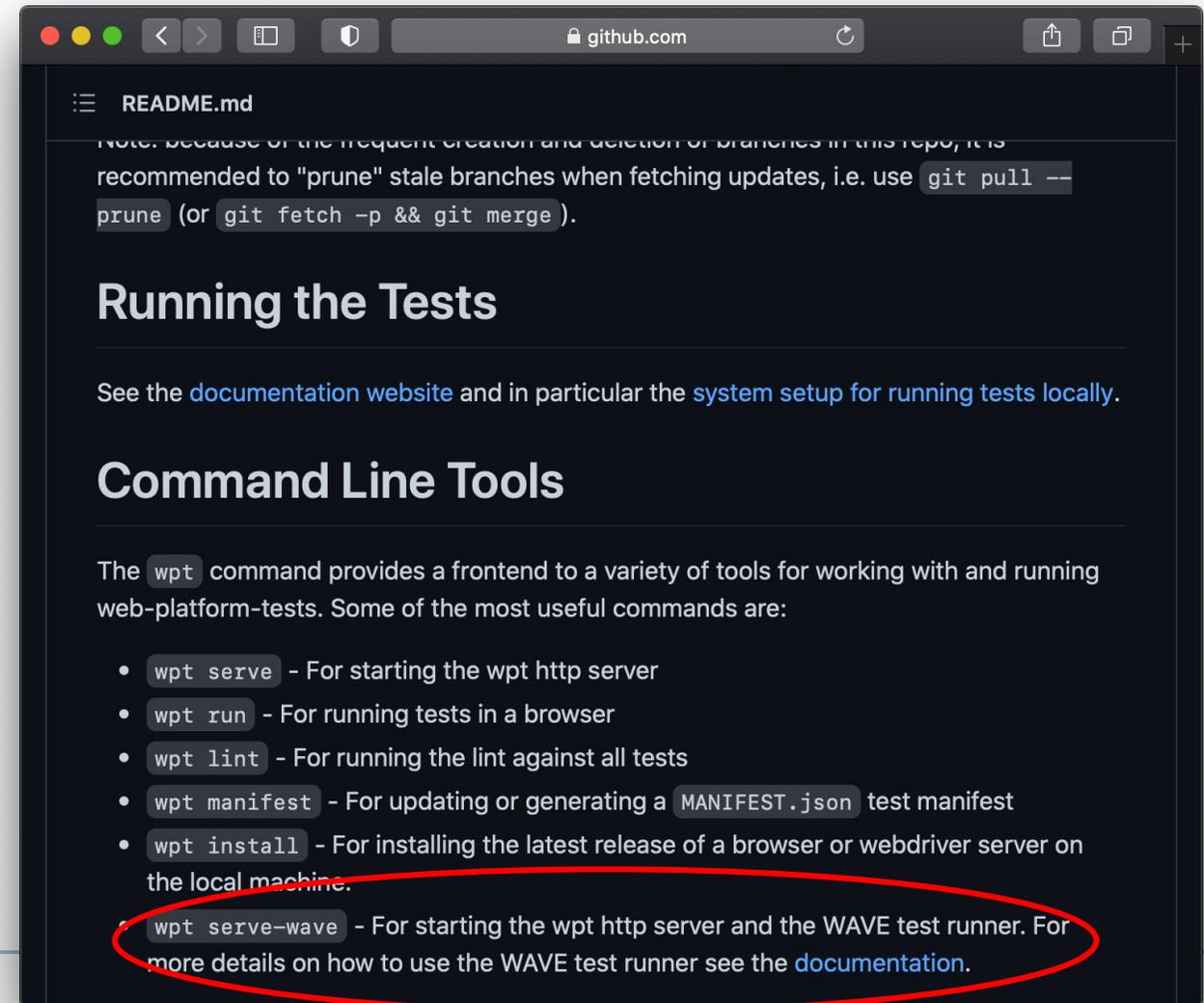
API	Pass	Fail	Timeout	Not Run	Test Files Run	Export
2dcontext	774 (87.95%)	106 (12.04%)	0 (0%)	0 (0%)	880/880 (100%)	json report
beacon	18 (85.71%)	1 (4.76%)	1 (4.76%)	1 (4.76%)	10/10 (100%)	json report
content-security-policy	2353 (62.93%)	1199 (32.06%)	139 (3.71%)	48 (1.28%)	764/764 (100%)	json report
css	26972 (67.5%)	12743 (31.89%)	86 (0.21%)	154 (0.38%)	2117/2117 (100%)	json report

The 'Export' section offers three options:

- Results:** Download results for import into other WMAS Test Suite instances. (Download Zip button)
- All JSON Files:** Download JSON files containing results of completed test files. (Download Zip button)
- Session result HTML:** Download this sessions result as standalone HTML page, similar to this page. (Download HTML button)

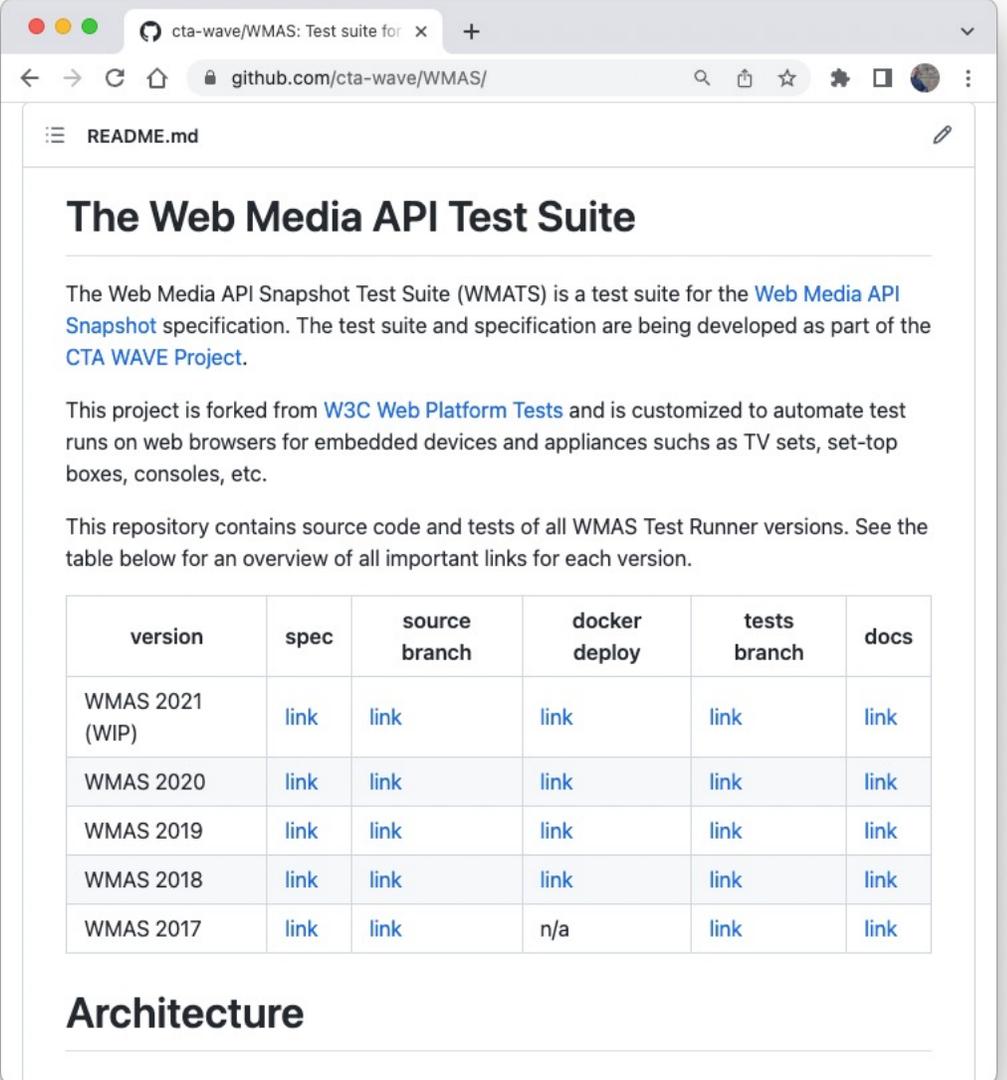
# Contribution to WPT

- The WAVE WPT Extension is contributed and merged periodically into the WPT project.
- New Features and bug fixes are also contributed back to the WPT project



# WMAS Test Suite

- Built on top of WAVE Core Test Runner
- Defines subsets of WPT Tests according to WMAS specifications
- Integrates external test suites and convert tests to WPT compatible format: ECMAScript, WebGL
- Provides reference test results for major desktop browsers (Chrome/Chromium, Edge, Safari/WebKit, Firefox)
- Provides Docker configurations for easy deployment
- Validation on embedded devices (TV/STB, **HbbTV**, **ATSC**)
- GitHub:
  - WMAS Test Runner: <https://github.com/cta-wave/WMAS/>
  - Docker Deployment: <https://github.com/cta-wave/WMAS-deploy>



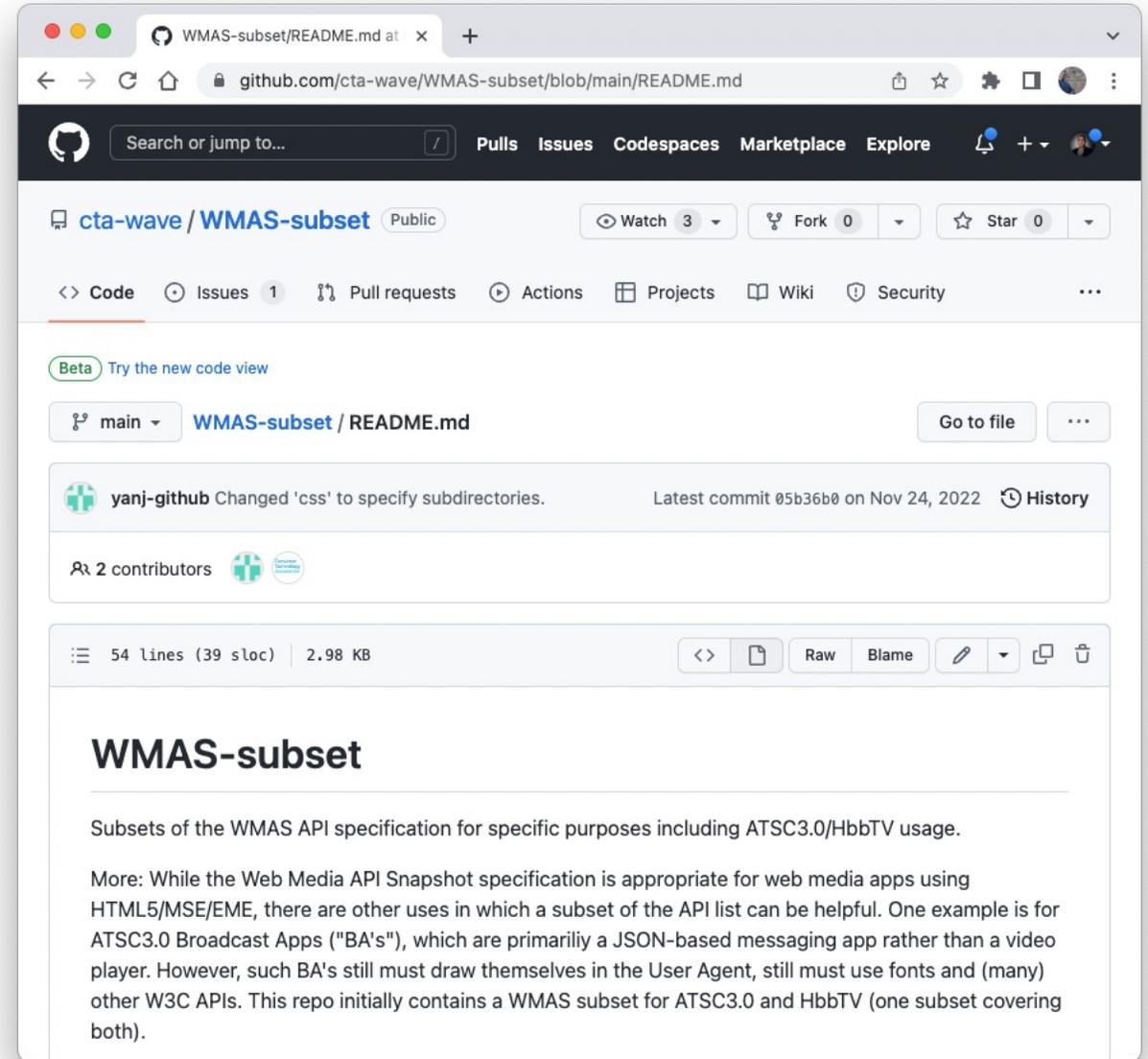
The screenshot shows a web browser displaying the GitHub README for the WMAS Test Suite. The page title is "The Web Media API Test Suite". The text describes the Web Media API Snapshot Test Suite (WMATS) as a test suite for the Web Media API Snapshot specification, developed as part of the CTA WAVE Project. It mentions that the project is forked from W3C Web Platform Tests and is customized for embedded devices. A table provides an overview of important links for each version of the WMAS Test Runner.

version	spec	source branch	docker deploy	tests branch	docs
WMAS 2021 (WIP)	<a href="#">link</a>				
WMAS 2020	<a href="#">link</a>				
WMAS 2019	<a href="#">link</a>				
WMAS 2018	<a href="#">link</a>				
WMAS 2017	<a href="#">link</a>	<a href="#">link</a>	n/a	<a href="#">link</a>	<a href="#">link</a>

**Architecture**

# WMAS Subset for ATSC3.0 and HbbTV

- GitHub: <https://github.com/cta-wave/WMAS-subset>
- Subsets of the WMAS specification for specific purposes including ATSC3.0/HbbTV usage.
- The GitHub repository initially contains a WMAS subset for ATSC3.0 and HbbTV (one subset covering both)

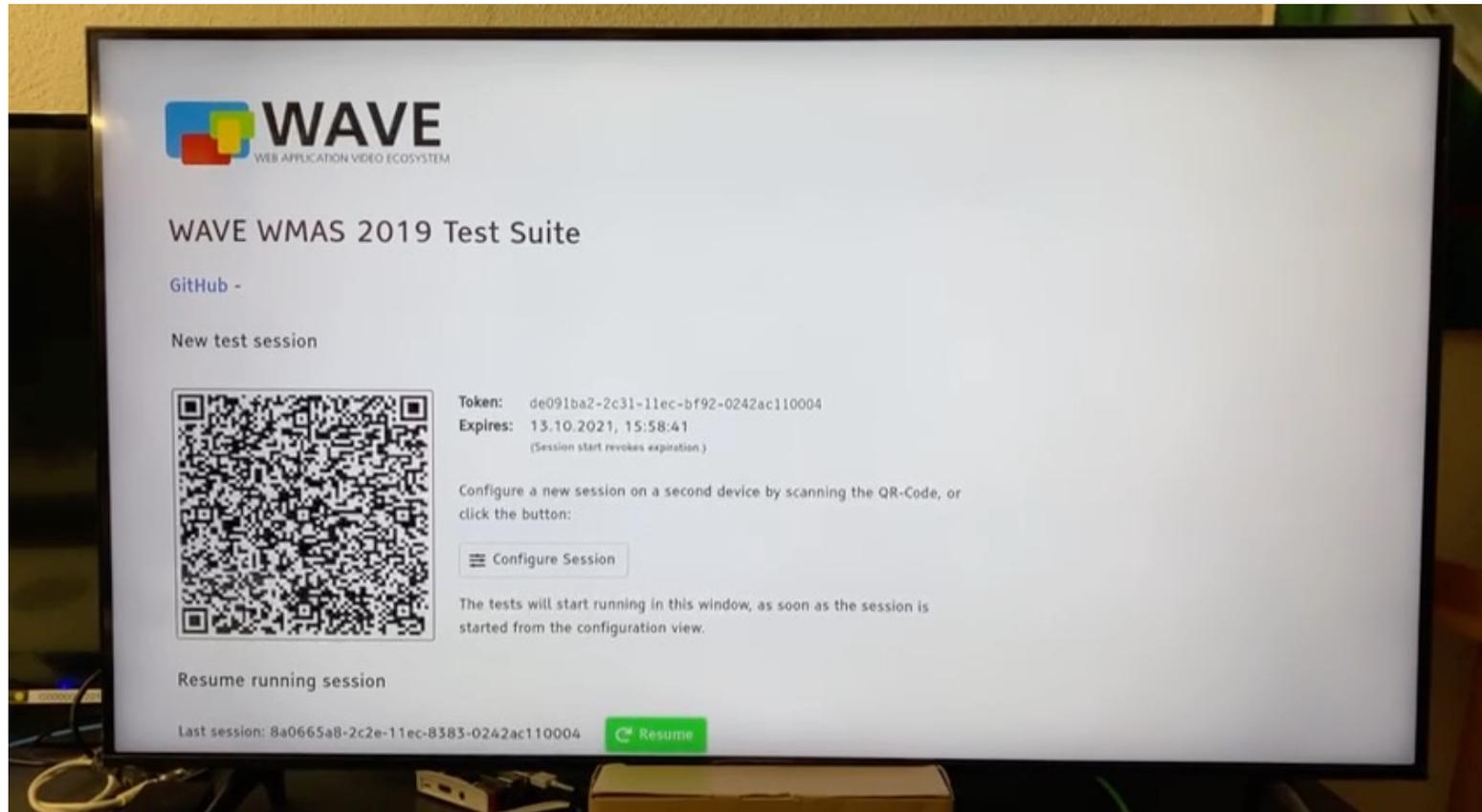


# Hosted WMAS Test Suites

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- WMAS2017:
  - Spec: <https://www.w3.org/2017/12/webmediaapi.html>
  - Test Runner: <https://webapitests2017.ctawave.org/>
- WMAS2018:
  - Spec: <https://www.w3.org/2018/12/webmediaapi.html>
  - Test Runner: <https://webapitests2018.ctawave.org/wave/>
- WMAS2019:
  - Spec: <https://www.w3.org/2019/12/webmediaapi.html>
  - Test Runner: <https://webapitests2019.ctawave.org/wave/>
- WMAS2020:
  - Spec: <https://www.w3.org/2020/12/webmediaapi.html>
  - Test Runner: <https://webapitests2020.ctawave.org/wave/>
- WMAS2021:
  - Spec: <https://www.w3.org/2021/12/webmediaapi.html>
  - Test Runner : <https://webapitests2021.ctawave.org/wave/>
- WMAS2022:
  - Spec: <https://www.w3.org/2022/12/webmediaapi.html>
  - Test Runner: not started yet

# WMAS Test Suite on HbbTV - Demo



# 10<sup>th</sup> FOKUS Media Web Symposium

June 13 – 14, 2023, Berlin



**MARK YOUR CALENDAR!**



**Advanced Streaming Technologies:** DASH, HLS, SAND, Low Latency Streaming, Content Steering, Media Delivery in 5G/6G, HbbTV, Video Player Tech, DRM, Quality of Experience, Edge and Cloud processing, Remote Rendering

**Artificial Intelligence for Media:** AI-based-Media-Encoding, Streaming Analytics, Content Analytics and Metadata, AI based Media Solutions, Content Provenance and Authenticity

**Media Applications and Services:** Metaverse, Addressable TV, Dynamic Ad Insertion/Substitution, Audience Measurement, Programmatic Advertisement, Holo Conferencing, XR



[www.fokus.fraunhofer.de/go/mws](http://www.fokus.fraunhofer.de/go/mws)



# Joint Plugfest of DTVP & DTG and the HbbTV Testing Event (June 26-30)



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

Hosted by Fraunhofer FOKUS Berlin

Monday 26.06.	DTVP / DTG Plugfest* <i>HbbTV, UHD, DVB-I, NGA</i> <b>Start time: 10:00</b>	
Tuesday 27.06.	DTVP / DTG Plugfest* <i>HbbTV, UHD, DVB-I, NGA</i>	
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)	
Friday 30.06.	HbbTV Testing Event** (in-person and remote) ½ Day	
	HbbTV Testing Group Meeting***	

 **Get-Together**  
(location t.b.c.)



<https://tv-plattform.de/themen/plugfest/>

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

# Contact

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