Innovative standards for a new web

Jeff Jaffe, W3C CEO
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Open Web Platform

A single video, song, book, game, or other type of content is available worldwide using:

- TVs and game consoles
- Smartphones and tablets
- Car navigation systems
- Digital cameras
- Projectors

HTML5
Moving up the layers

- With the completion of HTML5 (2014) the focus in web standardization shifted to upper layers.

- Rather than an architecture for browsing web pages, the design point was to build a broader platform (sometimes called a Web OS) to support distributed applications.

- At the time we called it Application Foundations for the Web
  - [https://www.w3.org/blog/2014/10/application-foundations-for-the-open-web-platform/](https://www.w3.org/blog/2014/10/application-foundations-for-the-open-web-platform/)

- We no longer call it that – but this is an update on progress and what to expect
Application Foundations

- **Security & Privacy**
  - Identity, crypto API, multi-factor authentication

- **Usability & Accessibility**
  - Content and software accessibility, internationalization

- **Application Lifecycle**
  - Offline, push, geofencing, sync

- **Common Services**
  - Social, payments, annotation, Web of data

- **Performance & Tuning**
  - Profiling, enhancements, responsive design

- **Media & Real-Time Communications**
  - WebRTC, streaming media, second screen

- **Device Interaction**
  - Sensors, orientation, vibration, touch, bluetooth, etc.

- **Core Web Design & Development**
  - HTML, style, layout, graphics, animations, typography

Open Web Platform Application Foundations
Roadmap of Web applications on Mobile

Describes Web technologies that apply to the mobile context

- Graphics & Layout
- Media
- Application lifecycle
- Device Adaptation
- User Interaction
- Payment & Services
- Forms
- Sensors
- Performance & Tuning
- Data Storage
- Network & Comm.
- Security & Privacy

https://www.w3.org/Mobile/roadmap/
Entertainment and Media

- WebRTC
- Streaming video
- Streaming video next steps (e.g. ad insertion)
- Immersive Web
Web Real-Time Communications (WebRTC)

- IETF protocols and W3C APIs combine to make audio/video communication available to any Web app
- Planned for Recommendation status by the end of this year
WebRTC: Spawning a new ecosystem

Credits: WebRTC ecosystem report
WebRTC Next Version

- Identifying needs for new features or performance improvements emerging from existing usage of the WebRTC Stack, incl.:
  - Video stream processing
  - Object recognition and machine-learning on audio and video streams
  - End-to-end encryption in multi-party calls
  - Low-latency cloud-based gaming
Full Video experience

Web technologies at the core of the media pipeline

- **Capture**: Ex: getUserMedia
- **Processing**: Ex: TTML, EME
- **Distribution**: Ex: WebRTC
- **Processing**: Ex: MSE
- **Rendering**: Ex: <video>

Server-side / Client-side

Broadband / Broadcast

Client-side / Cloud-based

2018 Emmy® Award – Standardization of a Full TV Experience
Media streaming

• Media Source Extensions (MSE) is the core enabler of adaptive streaming experiences on the Web

• Allows apps to generate media streams for playback, independently of how the media is fetched

• Integrates with EME for encryption and the <video> tag for rendering

• Splicing and buffering model also facilitates time-shifting scenarios
New Media Working Group to standardize improved client-side media processing and playback features on the Web, including:

- Support for real-world ad-insertion use cases through new codec switching feature in MSE
- Exposure of decoding, encoding, and encryption capabilities to select optimal media content
- Measurement of user perceived playback quality to improve adaptive streaming algorithms
- Detection of the autoplay policy
- Support for picture-in-picture scenarios
Immersive Web

- Virtual Reality (VR) and Augmented Reality (AR) opens the door to fully immersive experiences and spatial computing.

- WebXR enables **both** VR & AR in Web browsers, creating low-friction entry points for immersive experiences.
Accessibility solutions for AR/VR

- Multimodal inputs/outputs
  - Gestural inputs, haptic outputs
  - Adapted wearables
- Leverage existing descriptors
  - From product and object databases
  - From customized elements
- Interoperable with assistive technologies
Payments, e-commerce, and security

- Payment Request API
- Payment Handler API
- Web authentication
- WebAppSec
- Payment security
Payment Request API

- Streamlines checkout through re-use of stored data.
- Creates a consistent checkout experience across the Web to speed up conversions.
- Reduces merchant integration costs; use one API instead of multiple API integrations.
- Browser support today in Chrome, Safari, Edge, Samsung Internet Browser.
- SDK support today in Stripe, Braintree, Facebook, WePay, Bluesnap, Paysafe, BS Payone.
# Web Payments Working Group

## Merchants
- Airbnb
- Alibaba
- Rakuten
- Wiley

## Browsers/Platforms/Services
- Apple
- Brave
- Facebook
- Google
- IBM
- Intel
- LGE
- Microsoft
- Mozilla
- Opera
- Oracle
- Samsung
- Seeroo
- Tencent
- Verizon

## Networks
- American Express
- Carte Bancaire
- Clearing House
- Discover
- JCB
- Mastercard
- NACHA
- Visa

## Gateways/PSPs
- BlueSnap
- Klarna
- PayGate
- Reach
- Ripple
- Shopify
- Stripe
- Worldpay

## Payment Handler / Wallet Providers
- Abine
- Amazon
- Apple
- Beem It
- Bread
- Coil
- Digital Bazaar
- Google
- Klarna
- Microsoft
- Samsung

## Associations / Regulators / Bodies
- MAG
- Conexxus
- IFSF
- ISO 20022
- GS1
- GSMA
- HM Government
- PayCert
- Payments Canada
- US Fed

## Acquirers/Processors
- Lyra Networks
- Worldpay

## Issuers
- American Express
- Bank of America
- Barclays
- Capital One
- Wells Fargo

## Telcos
- China Mobile
- Deutsch Telekom
- Telenor
Payment Handler API

- Innovation through Web-based payment handlers (“digital wallets”).
- Banks and other payment service providers maintain customer facing relationships.
- Fast, harmonized user experience through browser-based UX.

We will articulate a vision for payment security on the Web.

We expect to do a gap analysis between existing technical specifications in order to increase compatibility.

As the Web supports new services — streaming video, real-time communications, augmented reality, etc. — we need to ensure the security of emerging payment models.
WebAuthn: Unphishable Sign-on Credentials

- WebAuthn, a Web API for FIDO 2.0, uses a cryptographic challenge **unique** to each website and **bound** to its origin.

- Local authentication such as biometrics never leaves the device.

- Level 1 is a REC: 
  [https://www.w3.org/TR/webauthn/](https://www.w3.org/TR/webauthn/)
Web Authentication Deployment

Legend:
- Green: Implemented / Stable
- Yellow: In Development
- Red: Not Supported / No ETA

Credit: Adam Powers
WebAppSec: Encryption Everywhere

- Standardizing and Enabling HTTPS for confidentiality, integrity, and authentication
- Secure Contexts
- Upgrade Insecure Requests
- Mixed Content
- Referrer Policy
- Subresource Integrity

Security Related APIs
- Permissions API
- Credential Management
- Clear Site Data

Enlisting the User Agent in Cooperative Policy Enforcement
- Content Security Policy
  - Level 2 is Recommendation; Level 3 in development (Editor’s Draft)
- Secure Contexts
- Subresource Integrity (Rec), Mixed Content
- Feature Policy
Web for all

- Internationalization
- Web Content Accessibility 2.1
- Accessibility conformance testing
Internationalization

- Encouraging experts around the world to ensure that their language is well supported on the Web.
- Tracking issues.
- Documenting gaps & requirements.

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<th>Typographic features</th>
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- 33 languages need work for advanced publishing
- 27 languages need work for basic features
- 1 language doesn’t work well on the Web
- 41% of cells still need investigation.
**WCAG 2.1**

- [Web Content Accessibility Guidelines 2.1](https://www.w3.org/TR/2018/REC-webcontentaccessibilityguidelines-20180605/) update published June 5, 2018
  - 17 new success criteria: [What’s new in WCAG 2.1](https://www.w3.org/TR/2018/REC-webcontentaccessibilityguidelines-20180605/)
  - Expands success criteria for low vision, cognitive and learning disabilities
  - Expands coverage for mobile and other touch-screen devices
  - Updates to [WCAG Techniques](https://www.w3.org/TR/2018/REC-webcontentaccessibilityguidelines-20180605/) and [Understanding WCAG](https://www.w3.org/TR/2018/REC-webcontentaccessibilityguidelines-20180605/) in progress

- Already taken up in Europe through an update to EN 301-549

- Next steps for accessibility guidelines:
  - Planning WCAG 2.2, to address additional user needs
  - Prototyping “Silver,” restructured to increase usability and broaden scope
Objective: Transparent and more uniform conformance test results

- ACT Rules Format 1.0 specification defines how “ACT Rules” are written
- ACT Rules Community Group develops rules according to specifications
- Accessibility Guidelines Working Group (AGWG) may approve rules with adequate community support, as part of the WCAG support documents
Web publications

- Current status
- Future of Web publications
- Audiobooks as first instance of the future
Web Publications: EPUB3

- Electronic publishing is currently using EPUB3
  - *the* e-Publication standard
  - originally developed at IDPF, currently maintained at W3C
  - widely used in e-book publishing as an interchangeable book format
    - format used directly in iBooks, Kobo, Bluefire, Google Play,…
    - submission format for Kindle
    - export format for Google docs, Apple Pages, …
  - *largely based on W3C standards for content*: HTML, CSS, SVG,…
However...

- EPUB 3 is not really used “on” the Web; content lives only in packages

- Some publishers are *not* really interested in packaged the content, “just” want to publish on the Web (e.g., scholarly publications)

- Though a booming area, audiobooks or sequential art cannot be published easily as EPUB 3
“Web Publications”: what is the goal?

Publications—with all their specificities and traditions—should become first class entities on the Web.

- This means:
  - it should be possible to load the publication content into a browser or a specialized reader, whatever the user prefers;
  - it should be possible to read the book either offline or online, whatever the circumstances dictate;
  - it should be possible to rely on browser core engines to implement any reading system for packaged content;
  - contents could be authored regardless of where they are used.
First incarnation of Web Publications: audiobooks

- Currently: many different formats, packages, distribution approaches
  - there is a real need for standardization!

- Relatively simple compared to, say, scholarly publications, textbooks or magazines: good first case

- Others (e.g., educational publications) would follow later, defining specialized Web Publication “profiles”
The Internet of Things refers to connected sensors and actuators.

But highly fragmented with myriad technologies and a lack of interoperability for devices and platforms.

W3C is defining Web standards to unlock the potential.

Web of Things:
- Services decoupled from underlying communications
- Things as software objects with properties, actions and events
- Linked Data as basis for describing things and their relationships

https://w3c.github.io/wot-thing-description/
Summary: Wide growth in web tech

- Roadmap for mobile apps
- WebRTC
- Streaming video
- Ad insertion
- Immersive
- Payments
- Web authentication
- Web of Things
- Web App Sec
- Internationalization
- Accessibility guidelines
- Accessibility testing automation
- E books
- Audiobooks