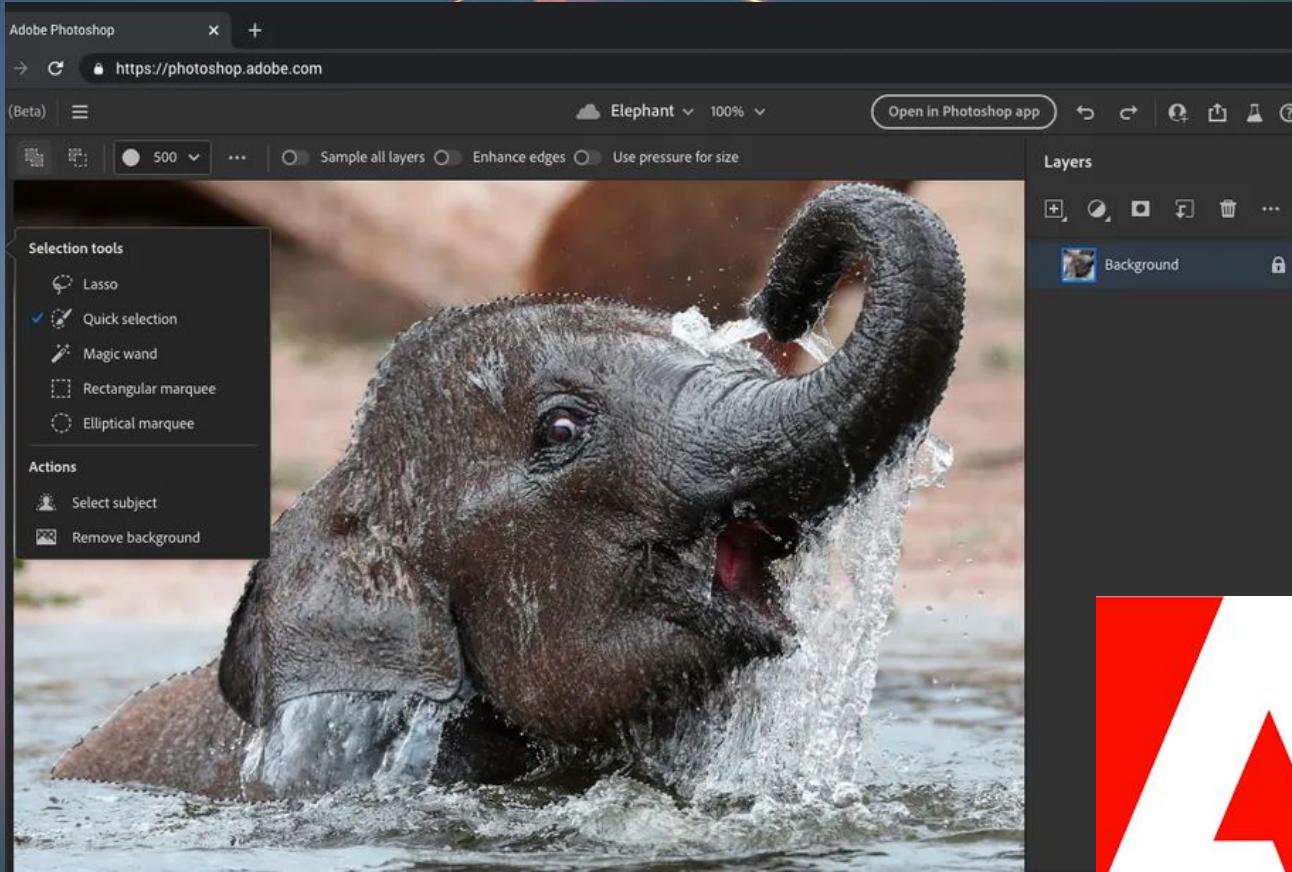


BlinkOn 16 Keynote

Daniel Clifford
Peter Beverloo



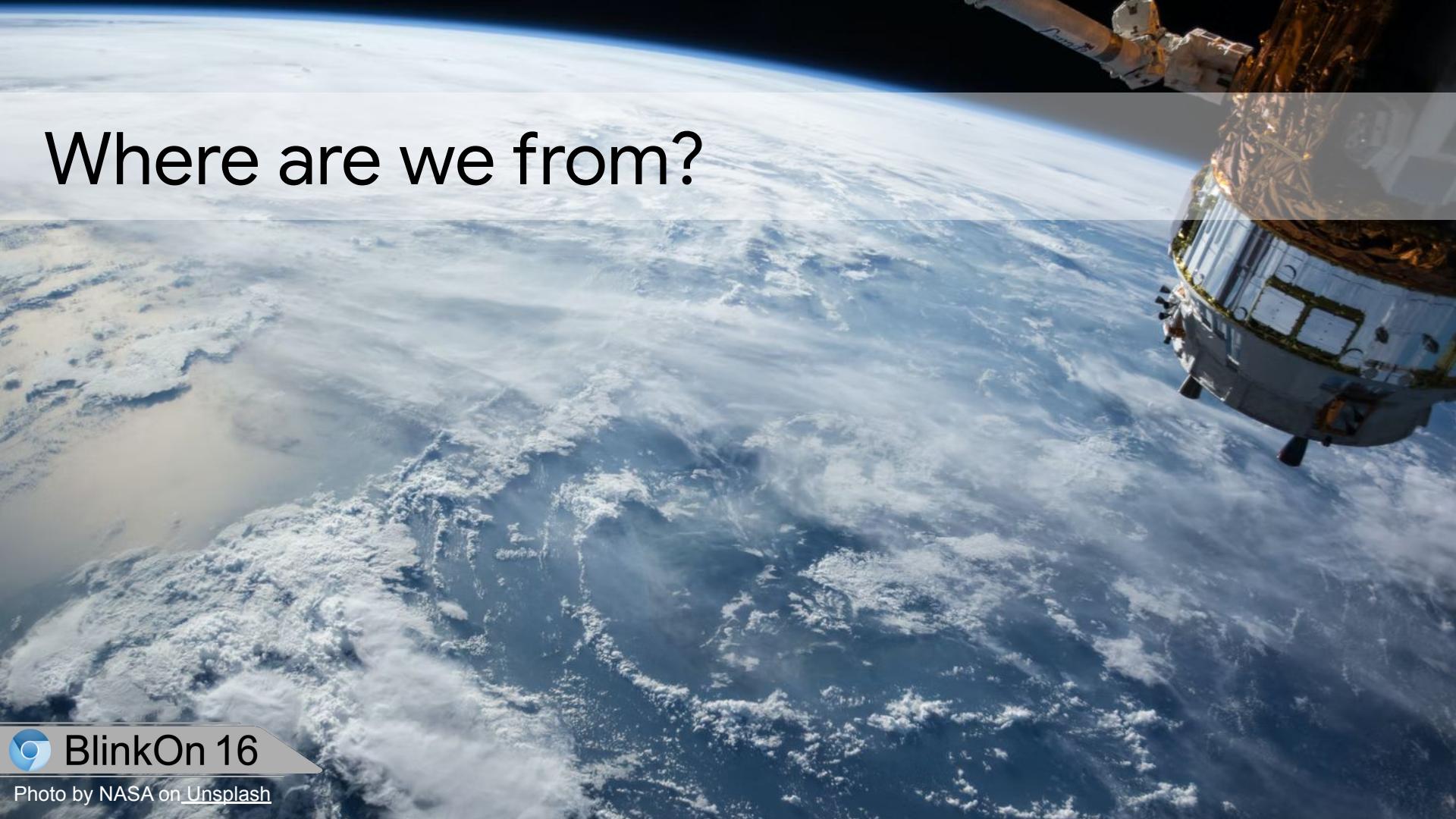




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Photo by SpaceX on [Unsplash](#)

The sky's the limit

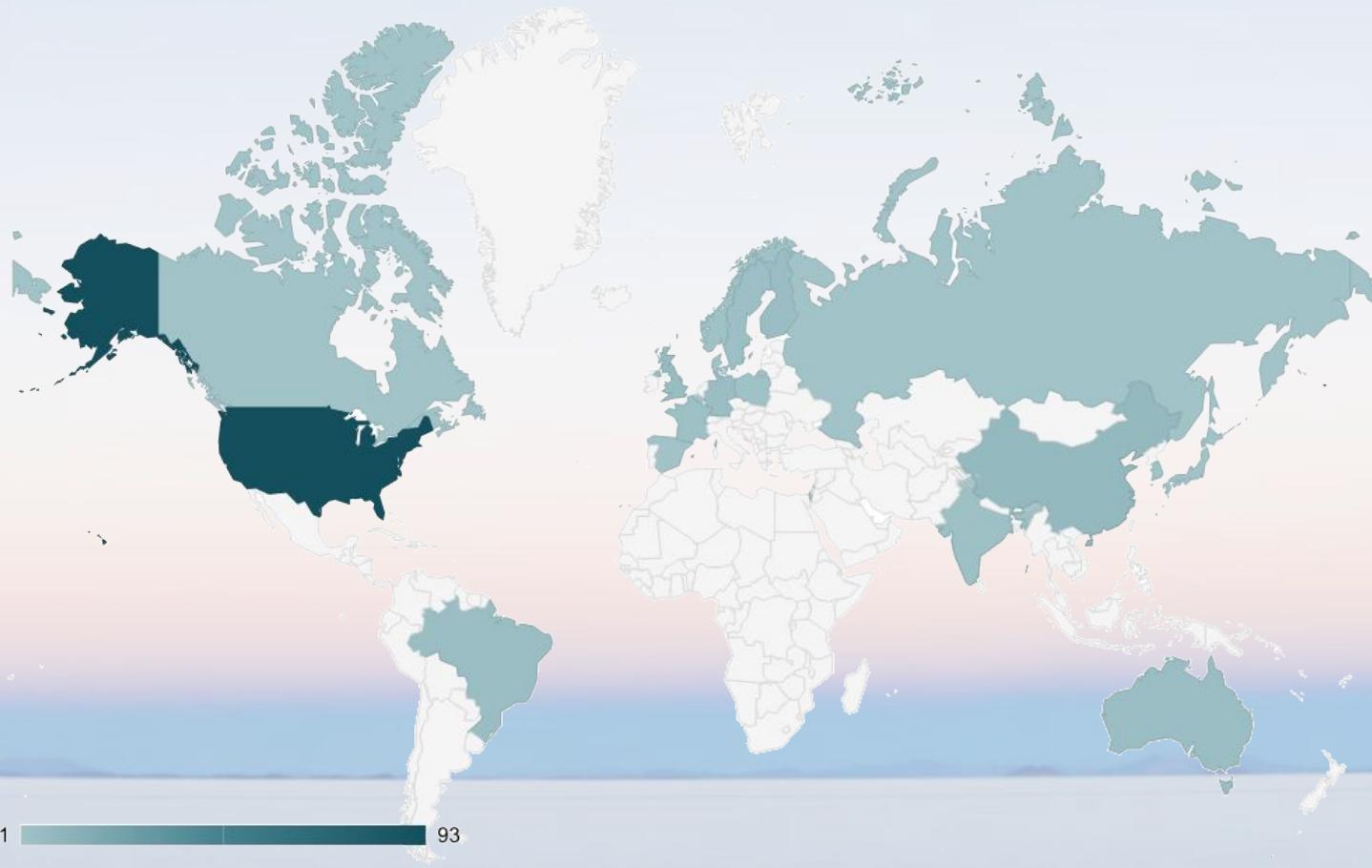


Where are we from?



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Photo by NASA on [Unsplash](#)

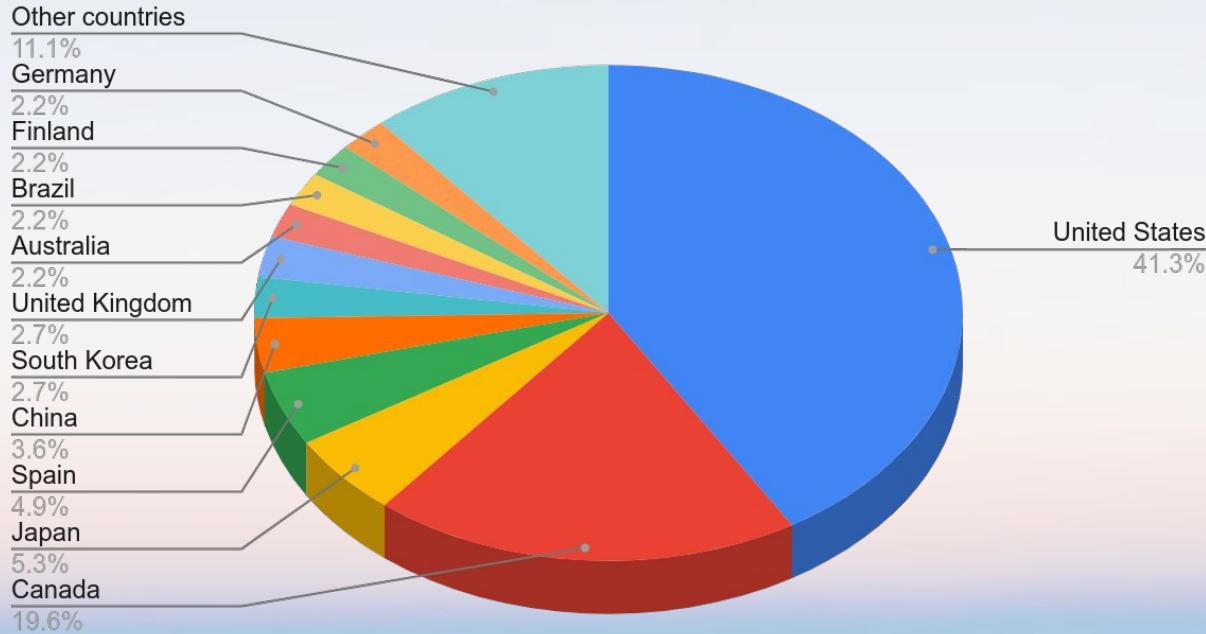


1 93



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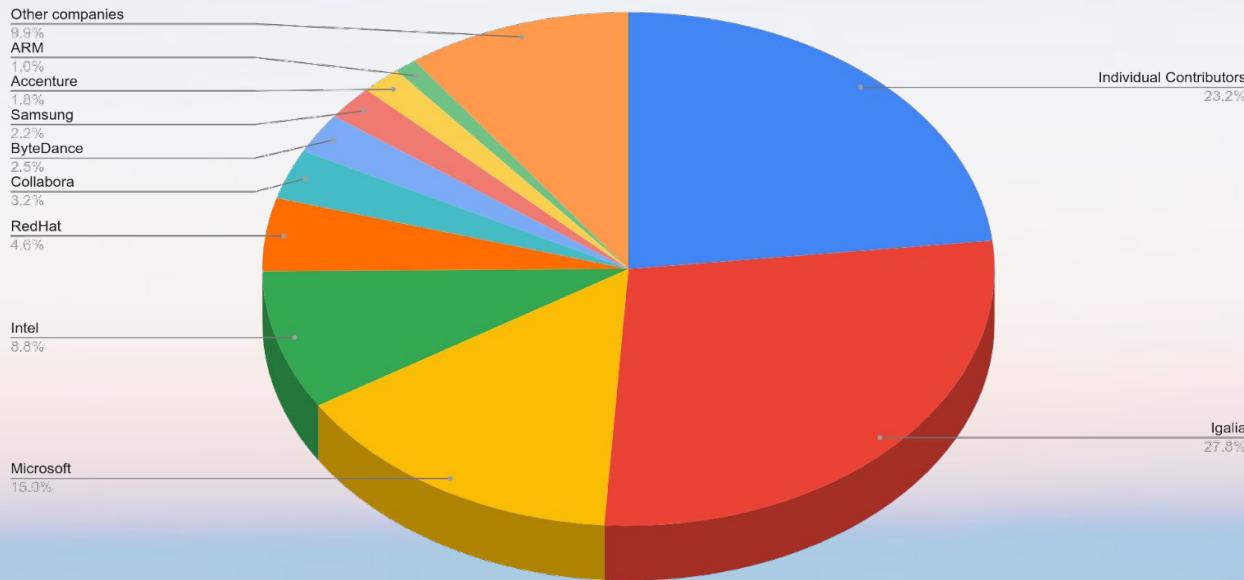
Where are we from?



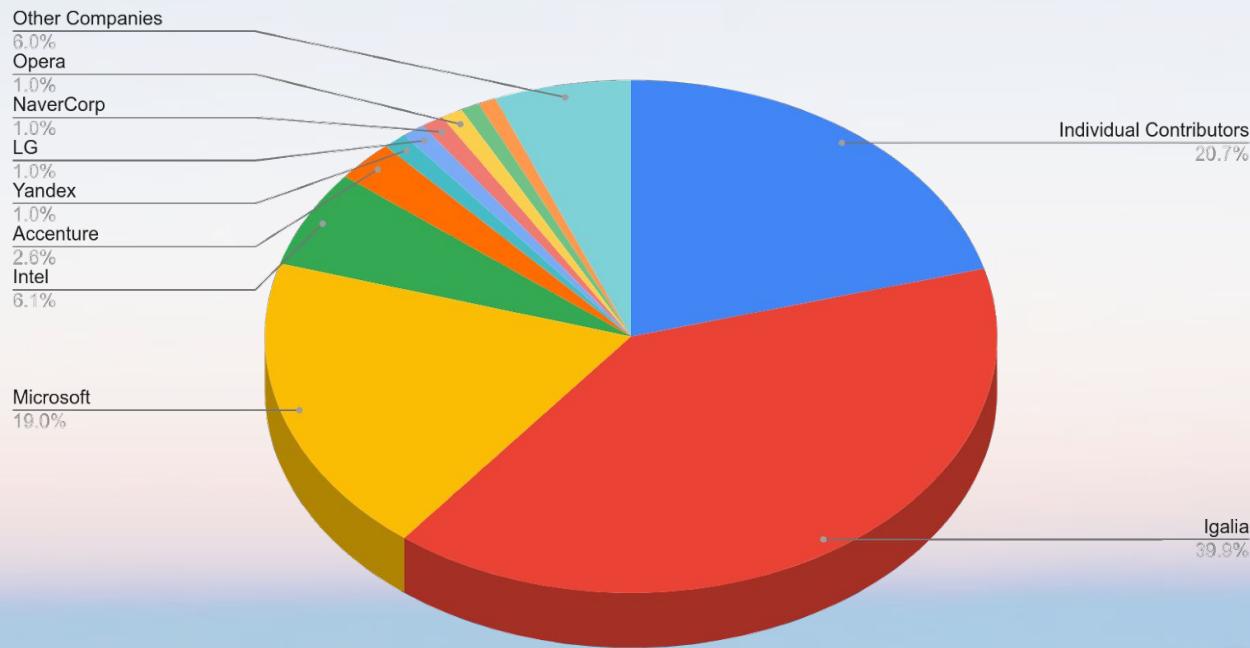
What about contributions?



Non-Google commits to Chromium-related repositories



Non-Google commits to the Chromium repository



161 Intent-to-* messages to blink-dev@

57 Intent to Prototype & Implement

32 Intent to Experiment (incl. renewals)

78 Intent to Ship

8 Intent to Deprecate and/or Remove





Thank you!



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Photo by [Luca Uppen](#) on [Unsplash](#)

Highlighted contributions



Igalia

27.8% of non-Google commits
overall, 39.9% in Chromium

- :has Intent to Ship
- MathML progress
 - BlinkOn session to discuss shipping plans for MathML
- Lots of other MPArch, CSS, Accessibility, Wayland, LaCrOS and V8 contributions (many coming up!)



Microsoft

15% of non-Google commits
overall, 19% in Chromium



- Canvas out-of-process rasterization
- Screen Capture improvements
- Web Codecs GC improvement
- Power improvements on Windows for DNS config service
- Service Worker install reliability bug fix
- Suspend support improvements on Win8+
- Scroll-linked Animations
- UA Client Hints supports Windows 11 detection
- Ink API
- Default SVG cursor size read from Windows settings
- Out-of-flow and flexbox fragmentation for LayoutNG
- Screen reader compatibility via Accessibility bug fixes
- Promise (async) support for clipboardItem objects
- JavaScript code space limits increased to 512MB on x64 to reduce OOM crashes
- JavaScript byte code caching for WebView2-based apps.
- JavaScript shared strings (infrastructure for upcoming shared struct object architecture)
- JavaScript memory tool heap snapshot verification



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Intel

8.8% of non-Google commits
overall, 6.1% in Chromium



- **Media**
 - Media Capabilities, WebRTC
- **PWAs**
- **Project Fugu**
 - Compute Pressure, Sensors
- **Web NN**
- **WebGL and WebGPU**



Individual Contributors

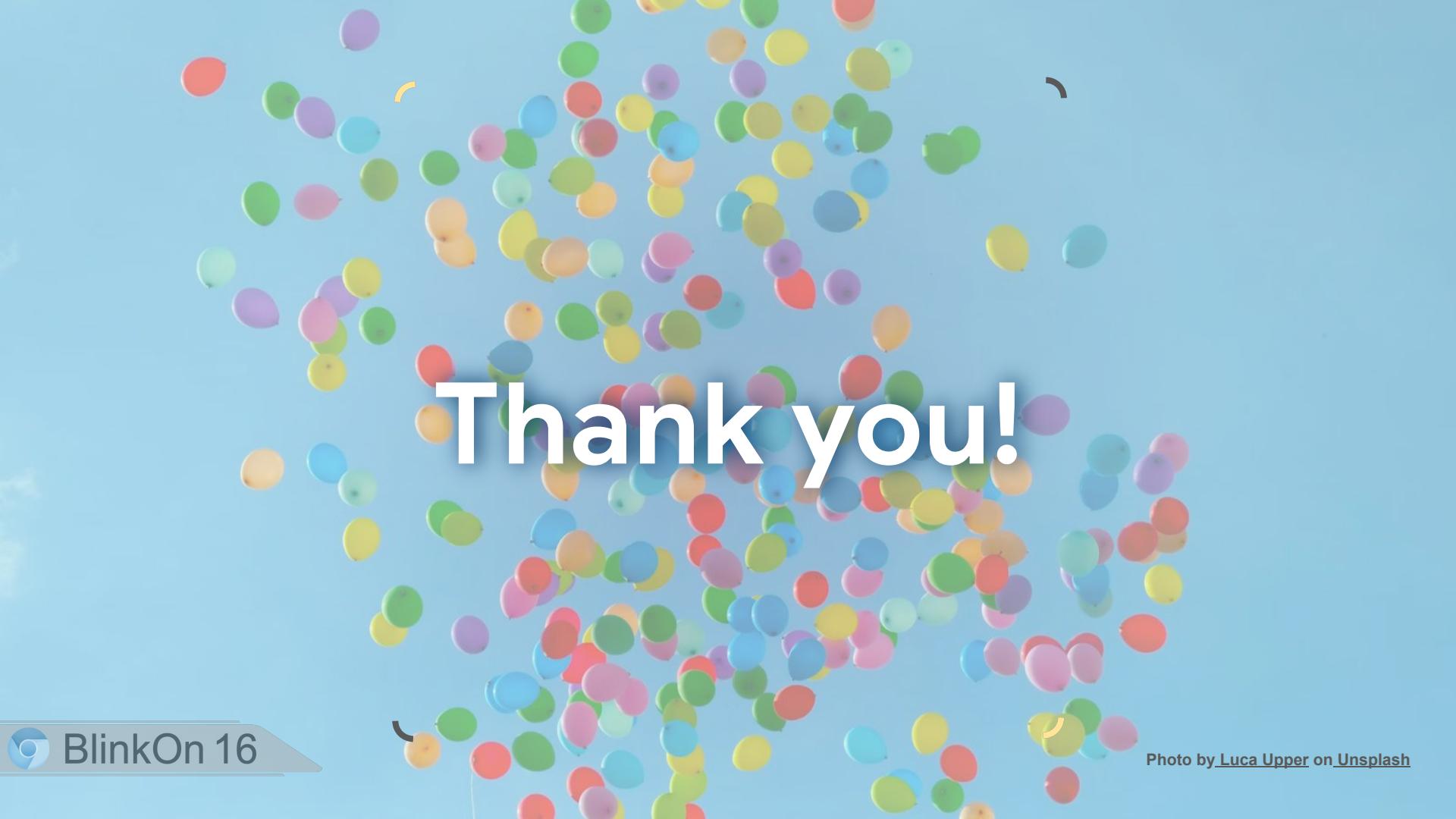
Open source FTW!

23.2% of non-Google commits overall, 20.7% in Chromium

```
.type {  
  /* Force the font-size to stay between 12px and 100px */  
  font-size: clamp(12px, 10 * (1vw + 1vh) / 2, 100px);  
}
```

- CSS calc() simplification and serialization, CSSOM CSSMathClamp (Joonghun Park)
- Support for the CSS Typed OM CSSHWB class, and the ButtonBorder CSS colour value. (Jan Keitel)
- Modernizing JavaScript code for internal pickers (Jihwan Kim)
- Many new WebRTC WPT tests (Philipp Hancke)
- Fenced Frames security improvements (Brendon Tiszka)





Thank you!



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Photo by [Luca Uppen](#) on [Unsplash](#)

A vibrant hot air balloon with a multi-colored envelope (red, orange, yellow, green, blue, purple) is shown from a low angle, floating against a clear blue sky. The basket is visible at the bottom.

Where has the last 6 months taken us?

How we evolve the web



Interop 2022



Photo by [Hannah Busing](#) on [Unsplash](#)



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Google

Interop 2022 - call to action!

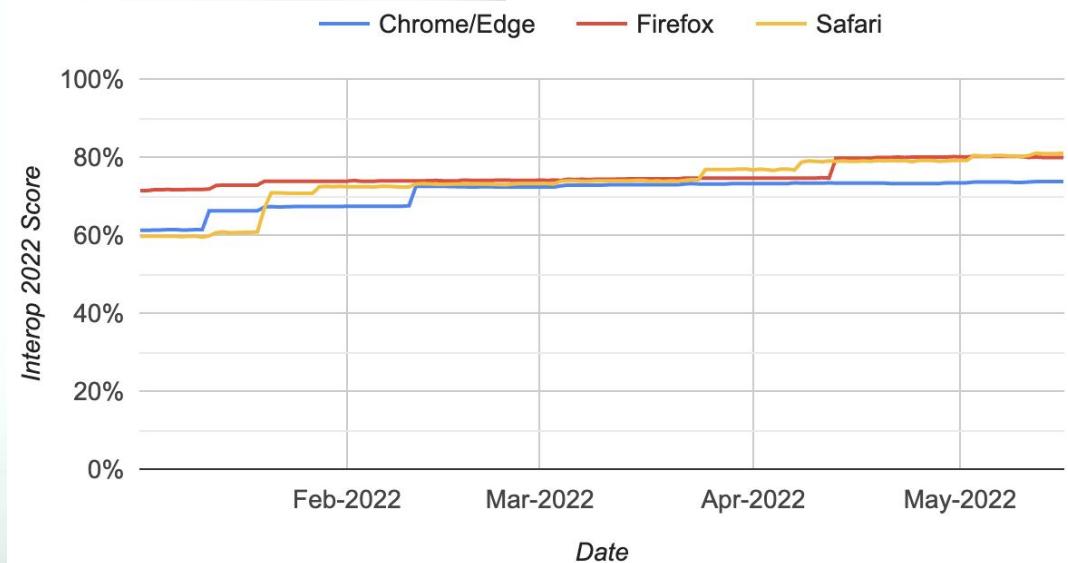
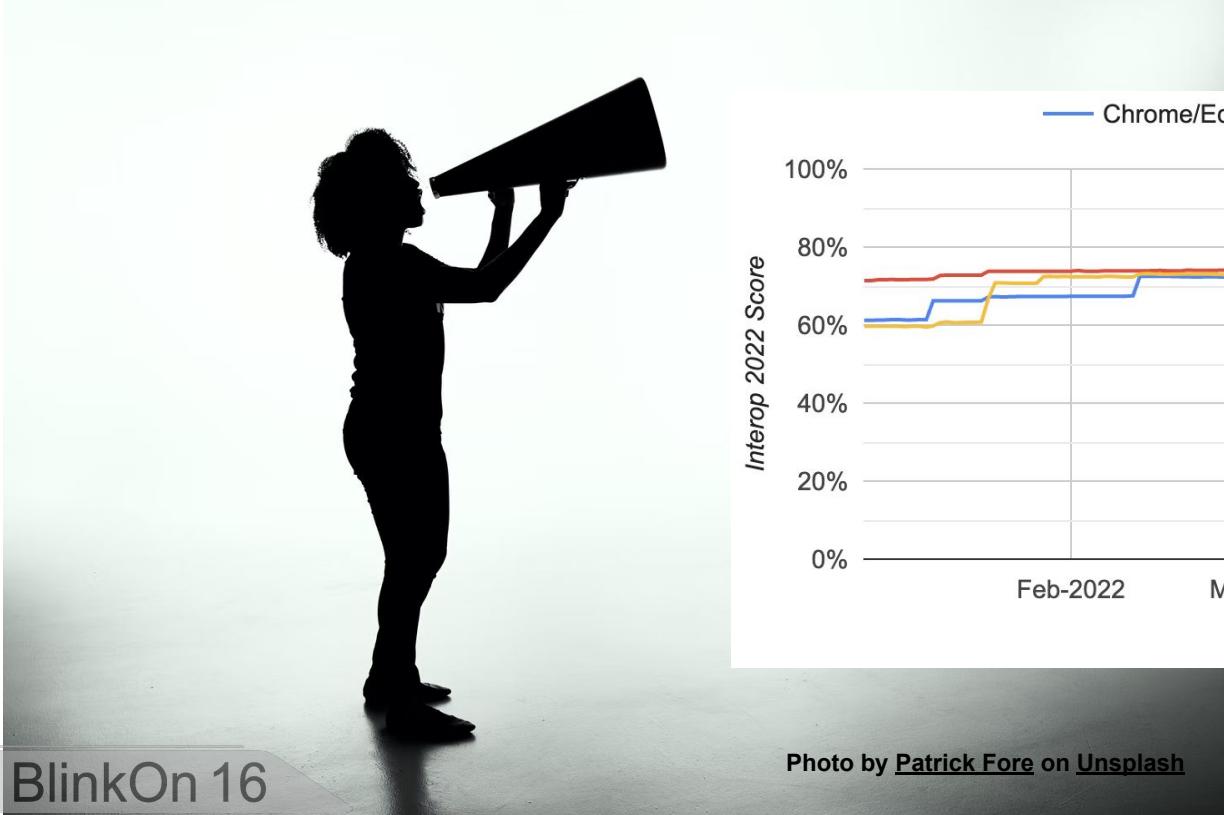


Photo by [Patrick Fore](#) on [Unsplash](#)



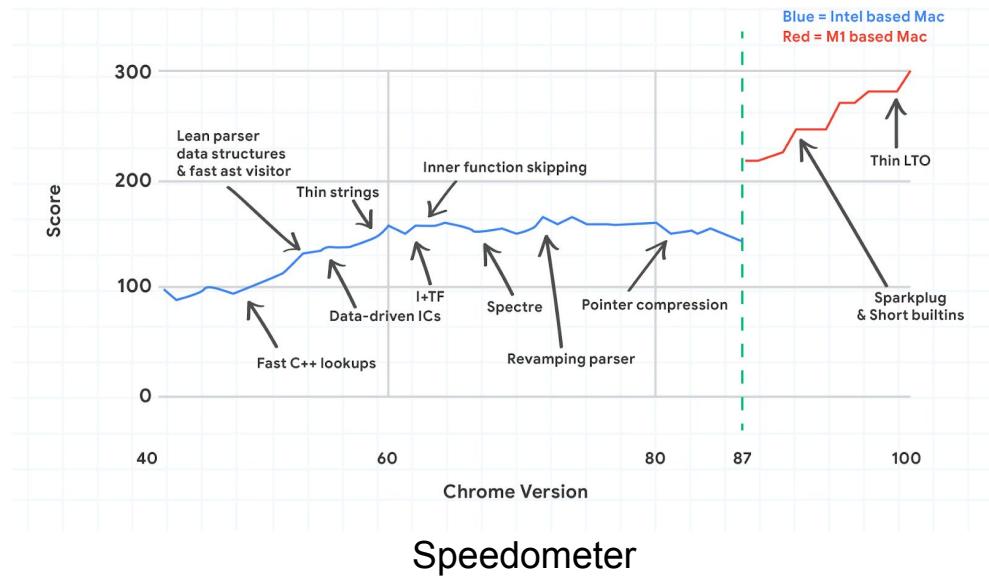
Web on Android



- Origin Trials coming to Android WebView
- Android WebView results now available on WPT.fyi



JavaScript and WebAssembly



1000+

**years of user time saved in
Q4 through Core Web
Vitals-related improvements**



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Product Excellence

P1 platform bugs fixed: 4949

Total platform bug fixes: 15792



Top-starred non-regression bug fixes:

1. window.open() disregards "left" parameter when Chrome is on second monitor
128 stars, msw@chromium.org
2. Implement comparison operators for range features from Media Queries level 4
103 stars, andruud@chromium.org
3. Scroll and Zoom logic on focused editable broken for elements inside remote iframes
71 stars, bokan@chromium.org



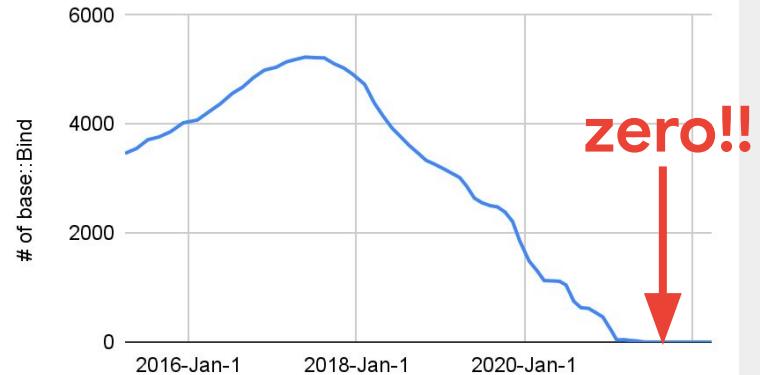
Code Health

Proj=CodeHealthRotation-Bug

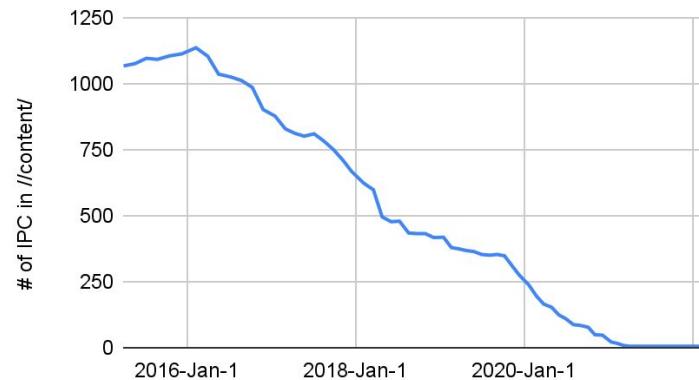
70 fixed since last BlinkOn

Thanks to:
fdegans@, jdh@, lingqi@,
shaseley@ and many others!

of base::Callback over time



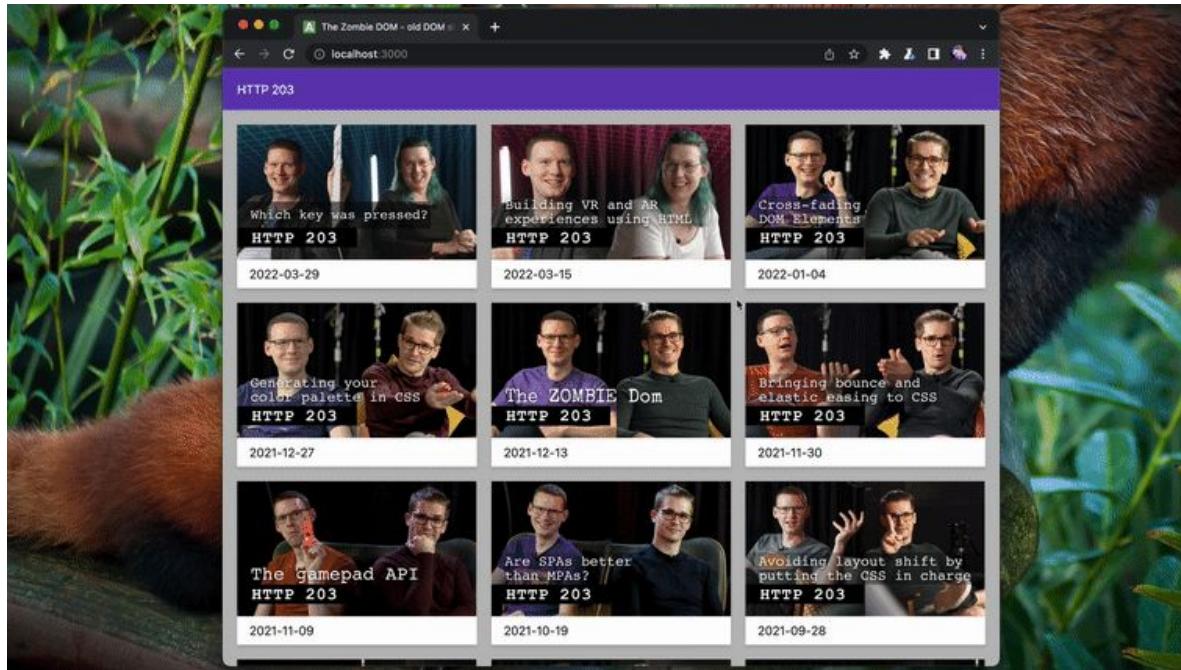
of IPC in //content/ over time



How we evolve the web



Shared Element Transitions



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Payments & Identity

Federated Credential Management



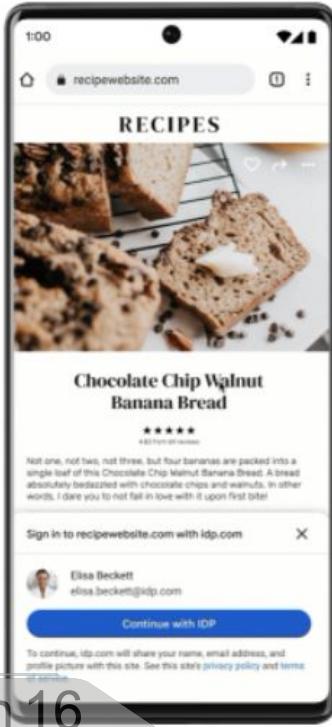
THIS!



BlinkOn16

Payments & Identity

Federated Credential Management



← Feature: Digital Goods API

An API for querying and managing digital products to facilitate in-app purchases from web applications, in conjunction with the Payment Request API (which is used to make the actual purchases). The API would be linked to a digital distribution service connected to via the user agent. In Chromium, this is specifically a web API wrapper around the Android Play Billing API.

Motivation

This is needed so that web apps in the Play Store can accept purchases for digital goods. (Play policies prevent them from accepting payment via any other method.) Without this, websites that sell digital goods are not installable through the Play Store.

Estimated milestones:

Platform	Origin Trial Range	Shipping Range
Desktop	89 to 99	100
Android	88 to 100	101

Consensus & Standardization

After a feature ships in Chrome, the values listed here are not guaranteed to be up to date.

... and THIS!



Fluid & Flexible UI and Interactions

- Support in WPT for automated testing of polyfills at scale
- Container Queries & scroll-linked animations polyfills
- Popup and @scope prototypes
- Scroller unification : One scroller to rule them all



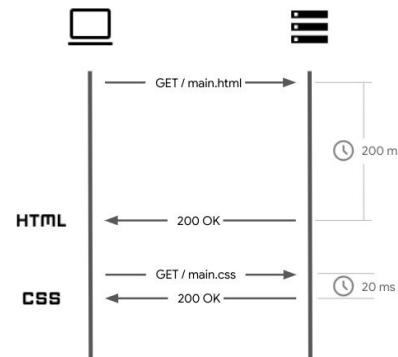
Photo by [Pawel Czerwinski](#) on [Unsplash](#)



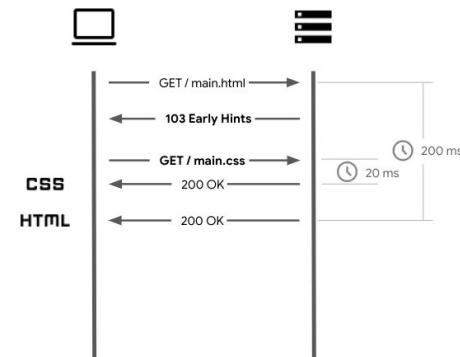
Instant Loading

- BFcache improvements
- Prerendering launch in M102
- Web Transport launch
- Early hints launch

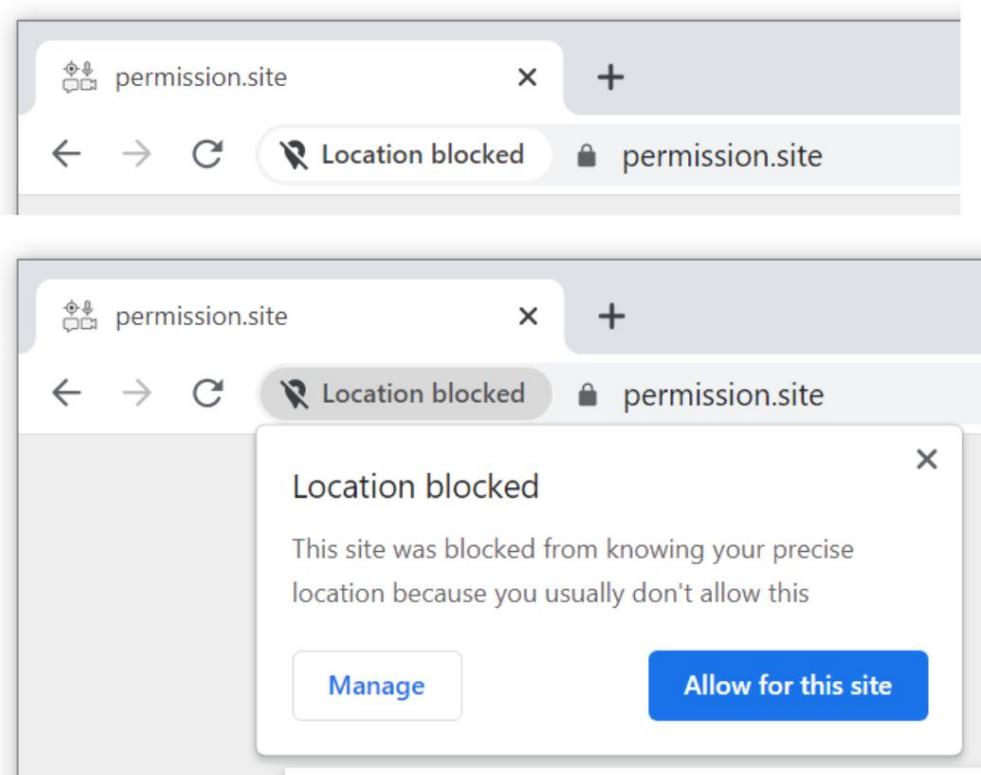
Without Early Hints



With Early Hints



Permissions



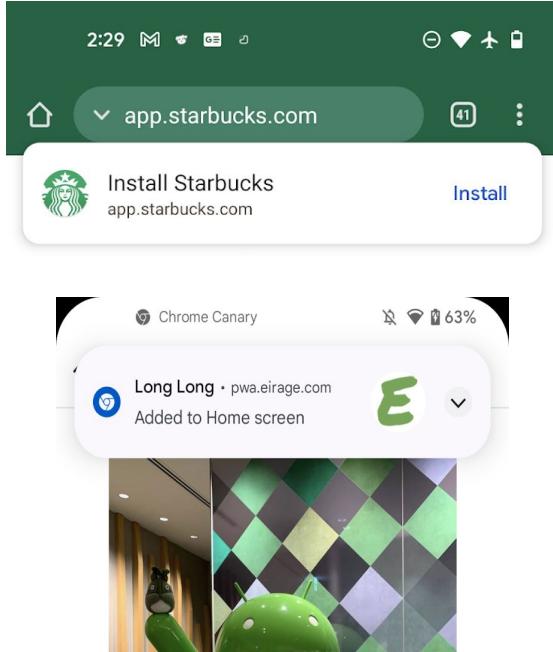
Measuring Responsiveness with INP



Initial Paint (INP) measures the time from when a user starts interacting with a page until the first visually perceptible content is displayed.



Mobile Web Install



- PWA install messages
- Install complete notification, bringing 64% more users into the PWA, and increasing sessions by 3% overall.



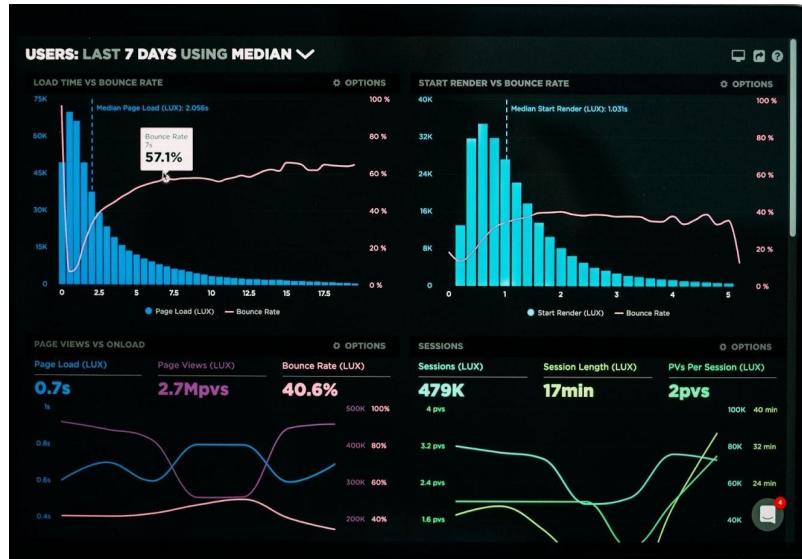
How we evolve the web



Measuring Responsiveness

Tool support:

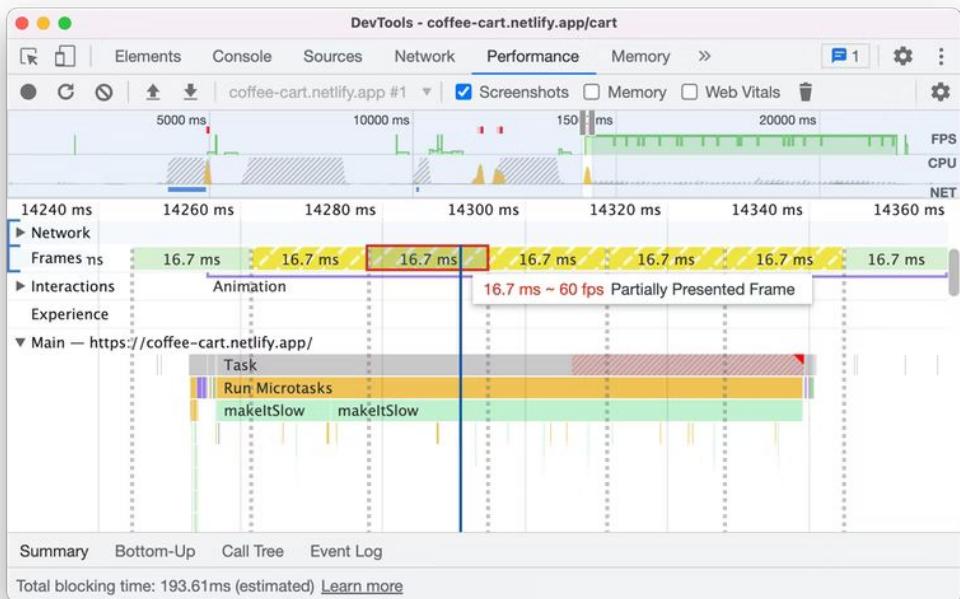
- Chrome UX Report & API
- Lighthouse User Flows
- PageSpeed Insights
- Web Vitals Extension



DevTools ...

... for performance

- New bfcache tab
- Lighthouse experimental timespan and snapshot mode
- **Partially presented frames in the Performance panel**
- Smoothness and responsiveness alerts in perfetto

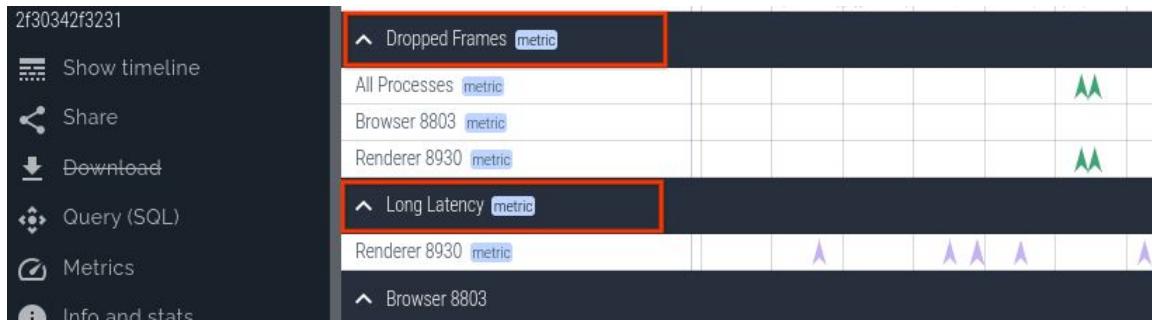


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DevTools ...

... for performance

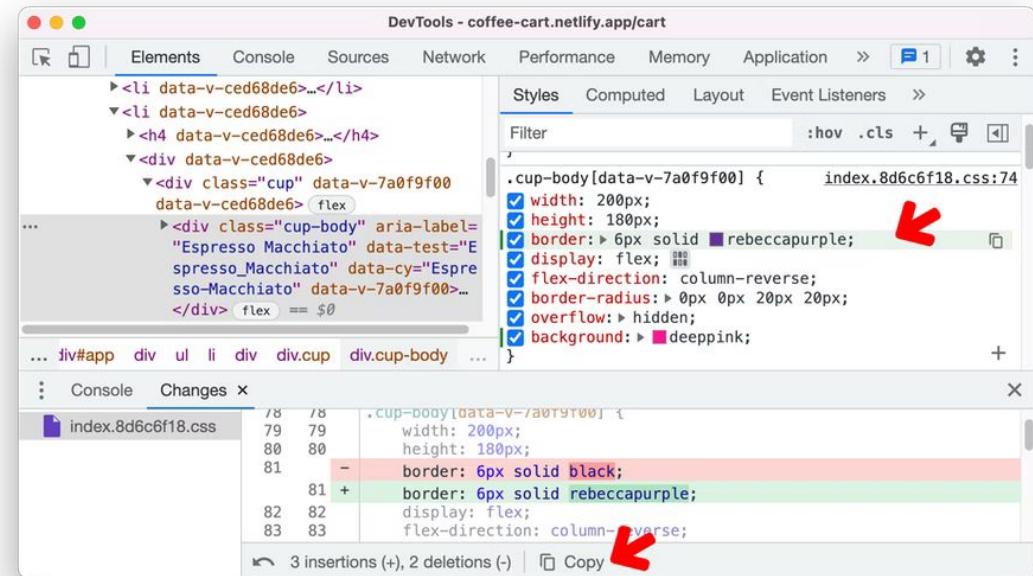
- New bfcache tab
- Lighthouse experimental timespan and snapshot mode
- Partially presented frames in the Performance panel
- **Smoothness and responsiveness alerts in Perfetto**



DevTools ...

... for performance

... for designers



- Support for Container Queries and Cascade Layer
- User adaptive emulation - forced color, prefers-contrast
- **Track and copy CSS changes in the Styles pane**
- Emulation shortcuts in the Styles pane
- Full page accessibility tree

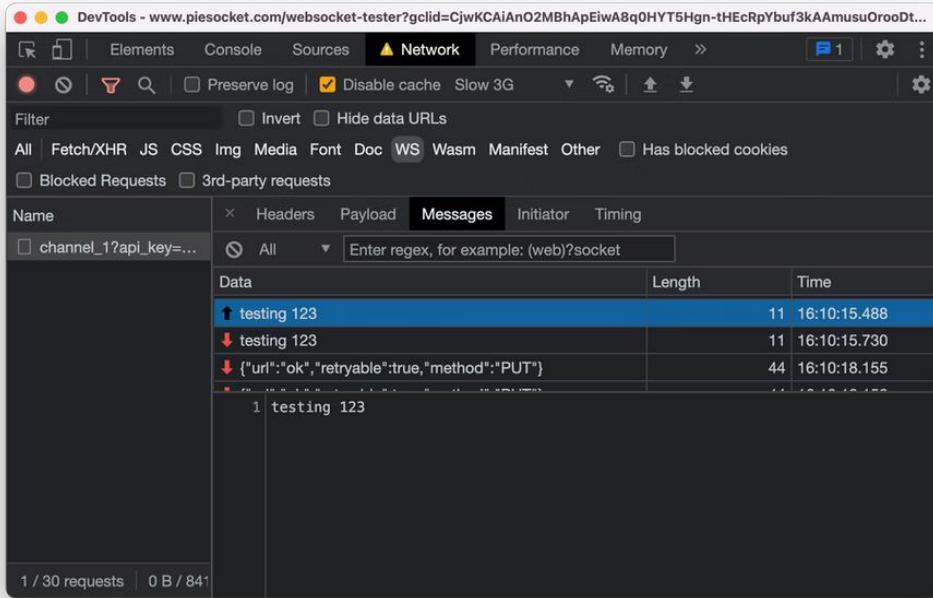


DevTools ...

... for performance

... for designers

... for debugging



- Throttling web socket requests
- [Faster](#) opening large files
- Faster WASM debugging for large applications
- Syncing DevTools settings across devices
- Improved reliability for breakpoints



DevTools ...

... for performance

... for designers

... for debugging

... for testing

Improvements to browser automation through WebDriver and new WebDriver BiDi standard



How we evolve the web



Rendering

- **LayoutNG fragmentation**
- **block-in-inline**

Sed ut perspiciatis, unde omnis
iste natus error sit voluptatem
accusantium doloremque
laudantium, totam rem aperiam
eaque ipsa, quae ab illo
inventore veritatis et quasi
architecto beatae vitae dicta
sunt, explicabo.

Nemo enim ipsam
voluptatem, quia
voluptas sit,
aspernatur aut odit

aut fugit, sed quia
consequuntur
magni dolores eos,
qui ratione
voluptatem sequi
nesciunt, neque
porro quisquam est,
qui dolorem ipsum,
quia dolor sit amet
consectetur

adipisci[ng] velit,
sed quia non
numquam [do] eius
modi tempora
inci[di]idunt, ut
labore et dolore
magnam aliquam

[Ut enim ad minim veniam, quis
nostrum[di] exercitationem
ullam corporis suscipit
laboriosam, nisi ut aliquid ex ea
commodi consequatur? [D]Quis

autem vel eum iure
reprehenderit, qui in ea
voluptate velit esse, quam nihil
molestiae consequatur, vel
illum, qui dolorem eum fugiat,
quo voluptas nulla pariat?

At vero eos et accusamus et
iusto odio dignissimos ducimus,
qui blanditiis praesentium
voluptatum deleniti atque
corrupti, quos dolores et quas
molestias excepturi sint,
obcaecati cupiditate non
provident, similique sunt in
culpa, qui officia deserunt
mollitia animi, id est laborum et
dolorum fuga.



Rendering

- LayoutNG fragmentation,
& block-in-inline
- **Cascade Layers**



Rendering

- LayoutNG fragmentation,
& block-in-inline
- Cascade Layers
- **hidden=until-found**



Rendering

- LayoutNG fragmentation,
& block-in-inline
- Cascade Layers
- hidden=until-found
- **inert**



powered by



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Graphics

- Direct Rendering Display Compositing
- Wide color gamut
- Blink internal color representation

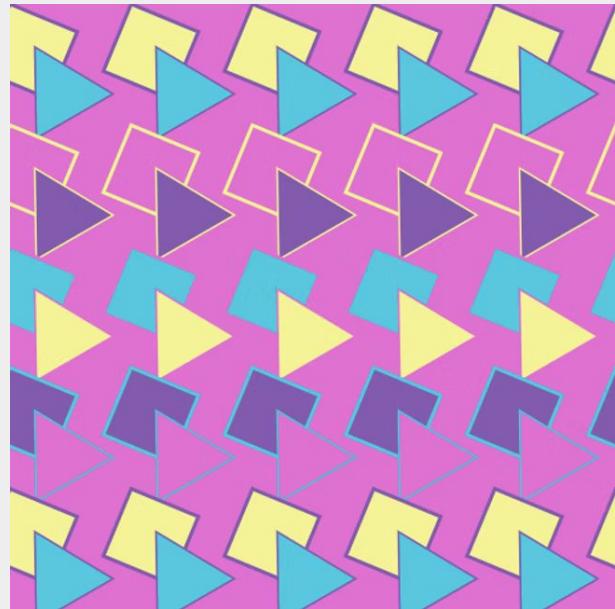


Photo by [Pawel Czerwinski](#) on [Unsplash](#)



Improved Canvas2D

- + Text Layout API
- + Canvas Layers



WebGPU and WebGL

- WebGPU V1
- WebGPU in OT
- Three.js's WebGPU
- Metal for WebGL's



How we evolve the web

Security & Privacy

Developers

New Capabilities

Our Code

Ecosystem

User Experience

Rendering & Graphics



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Photo by Szabo Viktor on [Unsplash](#)

Security

- PartitionAlloc



Security

- PartitionAlloc
- **MiraclePtr**



Photo by [Georg Bommeli](#) on [Unsplash](#)



Security

- PartitionAlloc
- MiraclePtr
- **Web Isolation**



Photo by [Georg Bommeli](#) on [Unsplash](#)



Security

- PartitionAlloc
- MiraclePtr
- Web Isolation
- **Injection Mitigations**

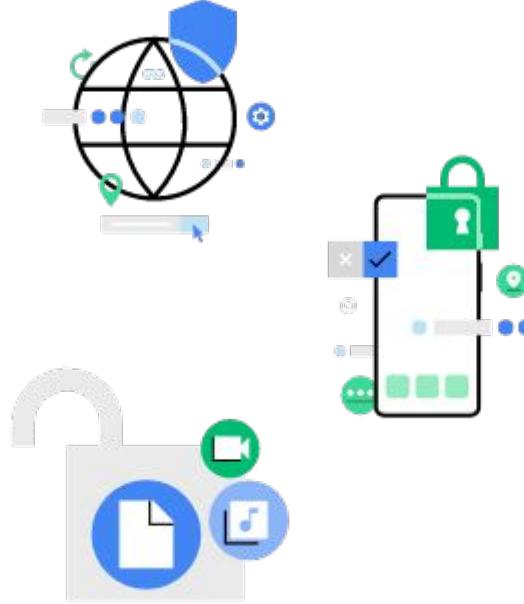


Photo by [Georg Bommeli](#) on [Unsplash](#)



Privacy Sandbox

- Chrome Stable (OT)
 - Trust Tokens
 - CHIPS
 - Federated Credential Management
- Chrome Beta (OT)
 - updated Privacy Settings
 - Topics API
 - FLEDGE API
 - Attribution Reporting API

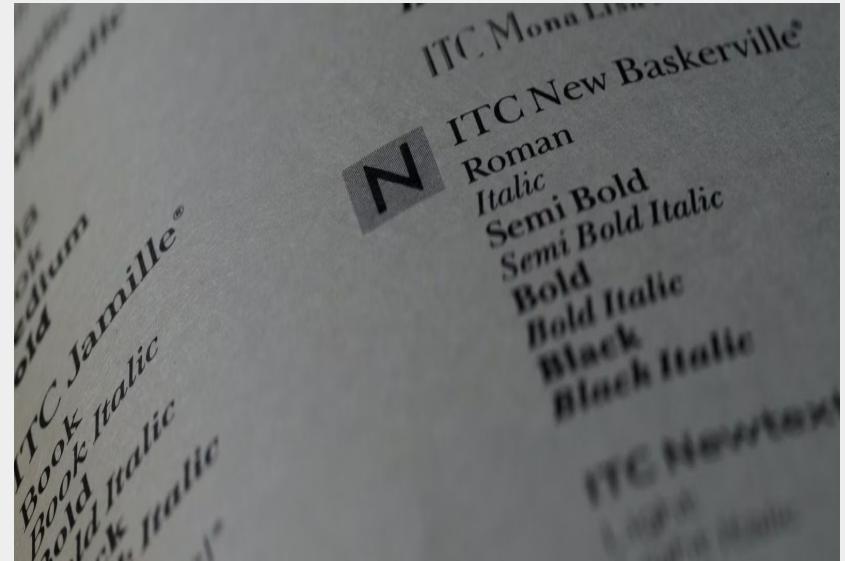


How we evolve the web



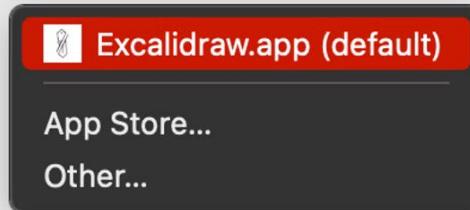
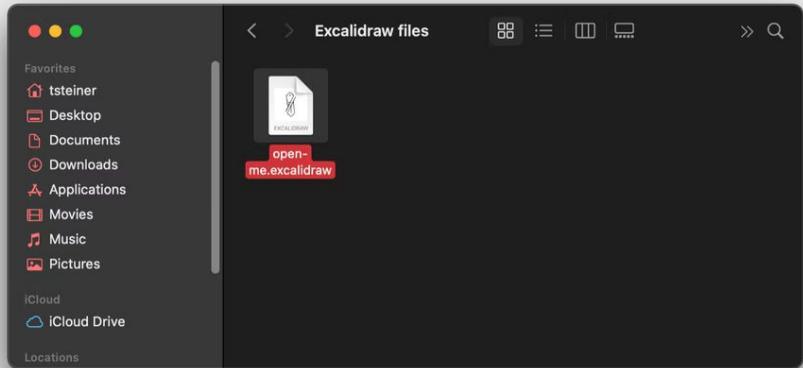
Local Font Access API

- Shipping in Chrome 103 🎉



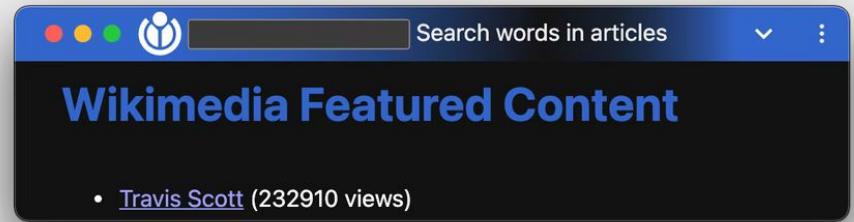
File Handling (Open with PWA)

- Shipping in Chrome 102 🎉



Window Controls Overlay

- Shipping in Chrome 103 or 104 



powered by

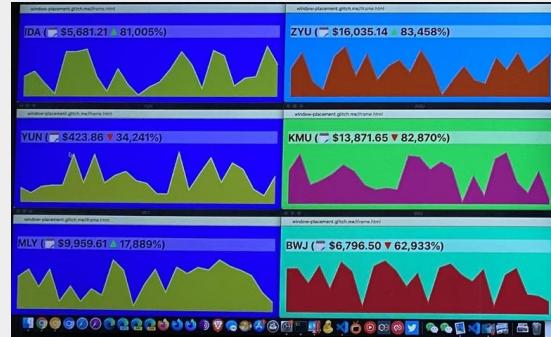


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Multi-Screen Window Placement



- Shipped in Chrome 100 🎉



Handwriting Recognition

- Shipped in Chrome 99 🎉



WebTransport

- Shipped in Chrome 97 🎉



URL Protocol Handlers for PWAs

- Shipped in Chrome 96 🎉



powered by



Microsoft

OPFS Access Handles

- Shipped in Chrome 102 🎉



Photo by [Mr Cup / Fabien Barral](#) on [Unsplash](#)



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Photo by [SpaceX](#) on [Unsplash](#)



Thank you!



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