



2021

공개SW

페스티벌

ONLINE FESTIVAL



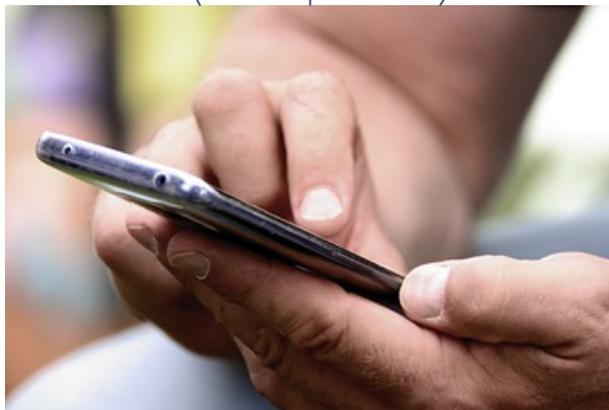
개발자와
함께
성장하는
오픈소스

브라우저 개발자의 Chromium Contribution

소속 : Igalia
이름 : 김정은



Web Pages



HTML

```
<input id="query" name="query" type="text" title="검색어  
입력" maxlength="255" class="input_text" tabindex="1"  
accesskey="s" style="ime-mode:active;"  
autocomplete="off" placeholder="검색어를 입력해 주세요."  
onclick="document.getElementById('fbm').value=1;"  
value="" data-atcmp-element>  
</div>  
</button>
```

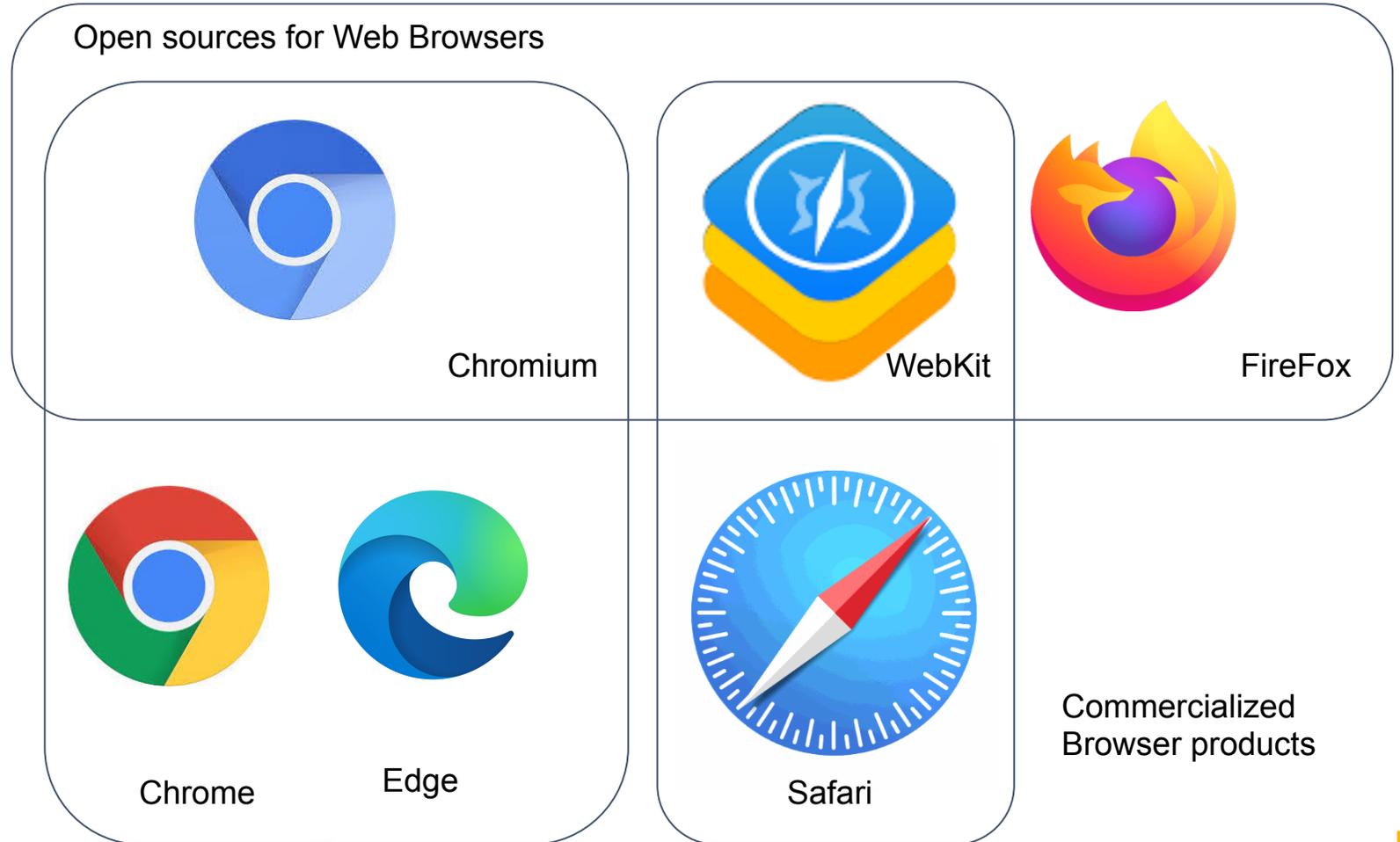
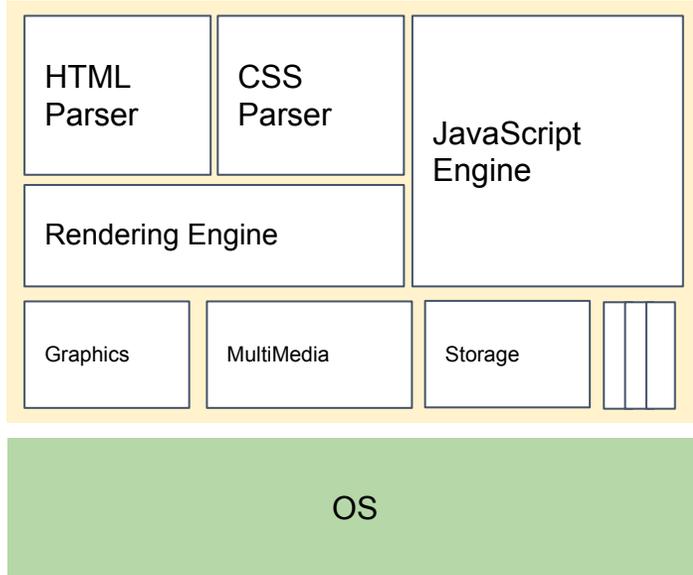
CSS

```
<style>  
:root{color-scheme:light}  
A{display:none}  
</style>
```

Java
Script

```
<script src="https://xxxxxxx" type="text/  
javascript" ></script>
```

Browser



Where the Web browsers are used



Chromium

- <https://www.chromium.org/>
- Chromium is an open-source browser project that aims to build a safer, faster, and more stable way for all users to experience the web.
- “Principally developed and maintained by [Google](#). Google uses the code to make its [Chrome](#) web browser, which has additional features.” from [https://en.wikipedia.org/wiki/Chromium_\(web_browser\)](https://en.wikipedia.org/wiki/Chromium_(web_browser))
- [3-clause BSD license](#)

Chromium Contribution

- Get the code
 - <https://www.chromium.org/developers/how-tos/get-the-code>
- A 64-bit intel machine with at least 8GB of RAM. More than 16GB is highly recommended.
- Compile time:
 - 5 hrs (16GB Memory, Intel® Core™ i7-7820HQ CPU @ 2.90GHz × 8, Ubuntu 20.04.3 LTS)
 - ICECC: A Distributed Compiler
 - GOMA: A distributed compiler service for open-source project
- Contributing to Chromium
 - <https://chromium.googlesource.com/chromium/src/+refs/heads/main/docs/contributing.md>

Chromium Community

- Chromium.org
- Technical discussion groups:
 - <https://www.chromium.org/developers/technical-discussion-groups>
 - chromium-dev: <https://groups.google.com/a/chromium.org/g/chromium-dev>
 - blink-dev: <https://groups.google.com/a/chromium.org/g/blink-dev>
- Become a committer:
 - “Technically, a committer is someone who has write access to the Chromium src Git repository. A committer can submit their own patches or patches from others.”
 - <https://www.chromium.org/getting-involved/become-a-committer>
- Getting a @chromium.org email address
 - je_julie.kim@chromium.org

Igalia



- A worked-owned cooperative of people in over 20 countries, over 100 people
- Headquartered in Spain, Igalia has become a global company based in Asia, Europe, Oceania and the Americas.





Igalia (Cont.)

- Building and advocating for healthy ecosystems around Free and OpenSource Software(FLOSS)
- Browsers are main areas of work (Layout, Graphics, Multimedia, etc)
- JavaScript Engines, Graphics Drivers, Multimedia libraries are also active areas of work
- Active participants in several standard organizations (e.g. TC39, W3C)
- Active Contributors for Web Engines (Chromium, WebKit, Servo)

History

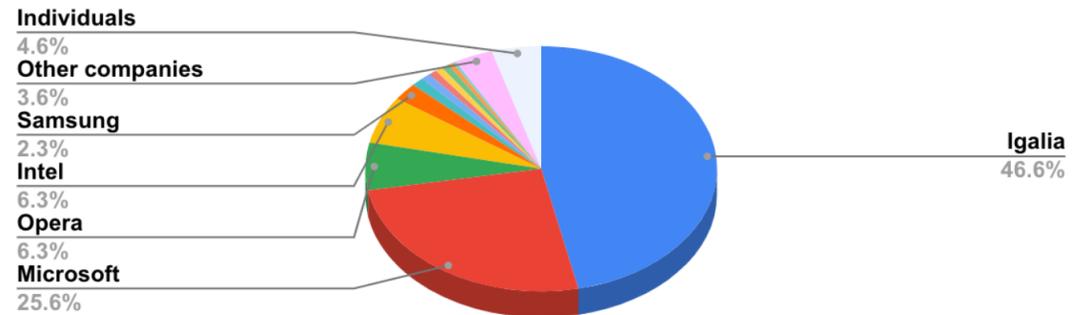
- 2001: Igalia is found
- 2003: Releases Fisterra, an opensource ERP solution build with GNOME technology
- 2008: First steps to consolidates as the leading WebKit consultancy
- 2010: Becomes a member of the Linux Foundation and a patron of the Free Software Foundation
- 2014: Becomes a leading contributor to Mesa3D and QEMU
- 2017: Begins to co-chair the W3C's ARIA Working Group and ECMA Javascript TC39 group. Igalia's work on CSS Grid Layout is publicly released.
- 2019: Becomes top contributors in all 3 browser engines for consecutive years, develops MathML-Core prototype in Chromium downstream
- 2020: Joins MDN Product Advisory Board, begins Igalia Chats podcast.
- 2021: Develops first collectively funded Web Platform features

Top Non-Google Contributor

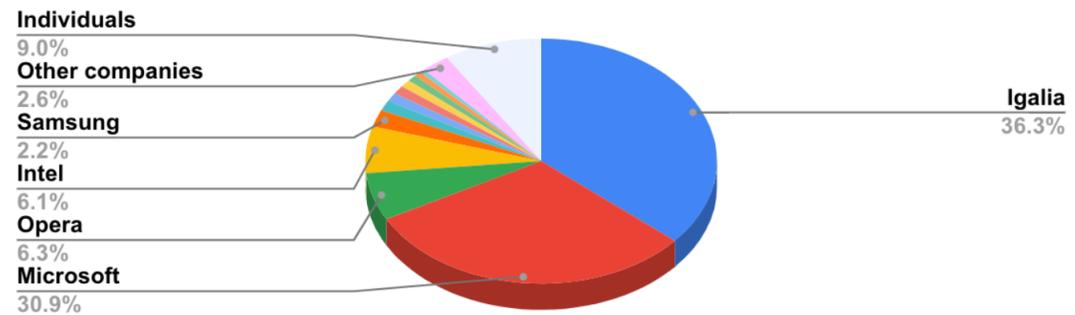
Chromium

BlinkOn 14

Non-google chromium commits (2019-2020)



Non-google chromium commits (2020-2021)



Chromium

Igalia

Since Nov 5, 2020:

1081 CLs from 34 contributors

(Chromium, ANGLE, WPT etc)

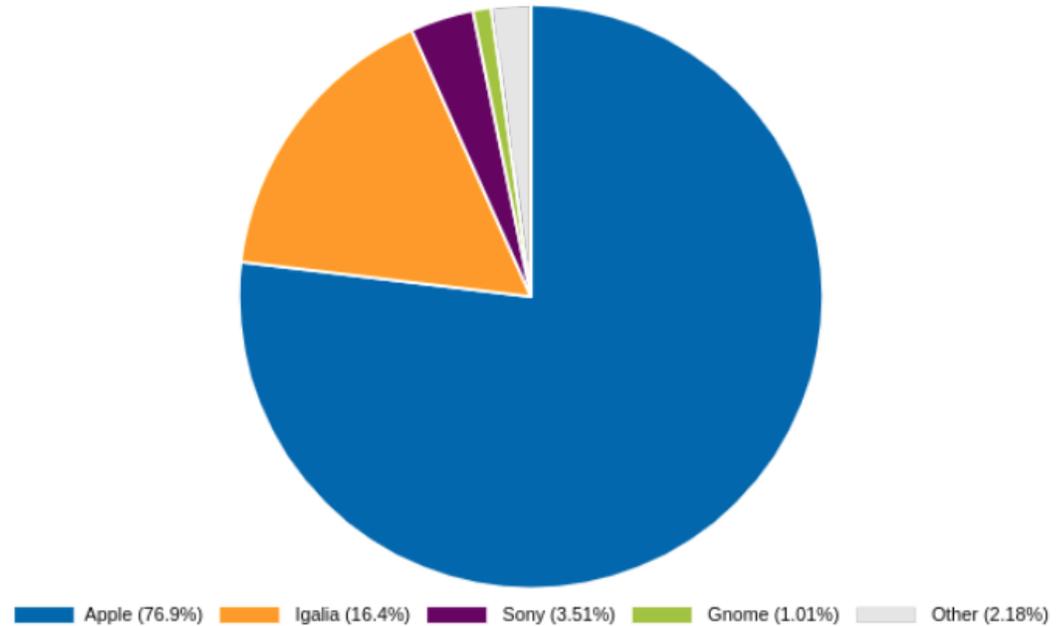
- CSS improvements
- JS Private methods / Class fields
- MathML
- Protocol Handlers improvements
- Onion Soup
- Accessibility
- Container Queries
- CSS: flow-relative, :focus-visible, spelling & grammar feat.
- Ozone/Wayland
- [Open Prioritization](#)

https://docs.google.com/presentation/d/1WxwbecNNXp_5v0yUDR3EolXR5m86siHj4_QWgPnJ7IU/edit#slide=id.gd3ed2042b9_4_179

Top Non-Apple Contributor

WebKit

WebKit contributions 2021



So far in 2021 we are the #2 committer with 16.4% of all commits!!!

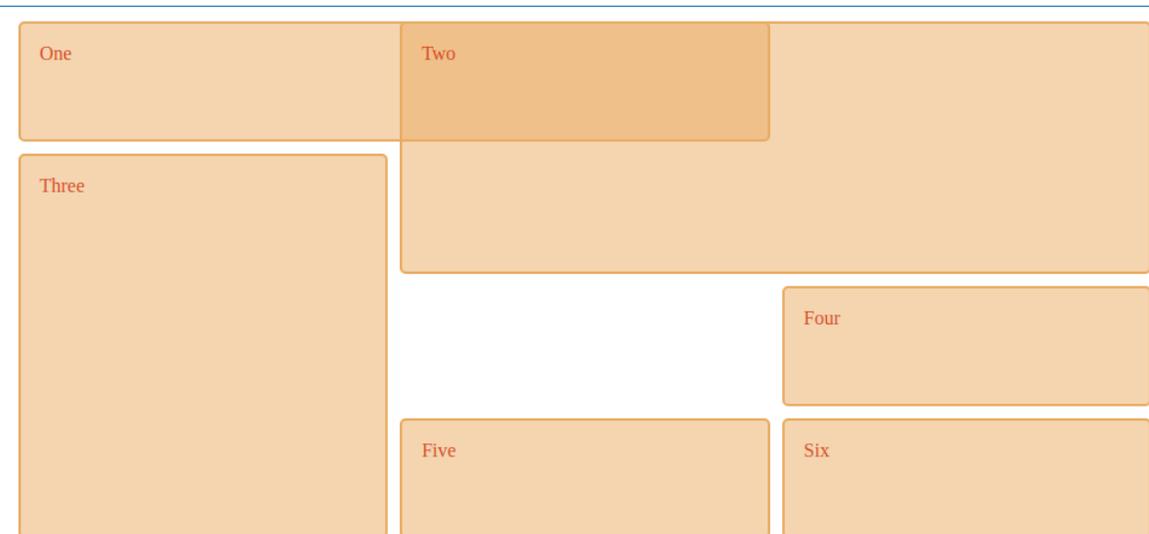
CSS Grid Layout

HTML

```
<div class="wrapper">
  <div class="one">One</div>
  <div class="two">Two</div>
  <div class="three">Three</div>
  <div class="four">Four</div>
  <div class="five">Five</div>
  <div class="six">Six</div>
</div>
```

CSS

```
.wrapper {
  display: grid;
  grid-template-columns: repeat(2, 1fr);
  grid-gap: 10px;
  grid-auto-rows: minmax(100px, auto);
}
.one {
  grid-column: 1 / 2;
  grid-row: 1;
}
.two {
  grid-column: 2 / 4;
  grid-row: 1 / 3;
}
.three {
  grid-column: 1;
  grid-row: 2 / 5;
}
.four {
  grid-column: 3;
  grid-row: 3;
}
.five {
  grid-column: 2;
  grid-row: 4;
}
.six {
  grid-column: 3;
  grid-row: 4;
}
```



- Bloomberg funded
- Worked on the standard (W3C CSS Grid Layout Module)
- Implement all engines (WebKit, Chromium, and Mozilla)

:has() CSS pseudo-class

Matching <a> elements that directly contain an

The following selector matches only <a> elements that directly contain an child:

```
a:has(> img)
```

<https://developer.mozilla.org/en-US/docs/Web/CSS/:has>

- EyeO funded
- Igalia proposed and implemented it in Chromium community.
 - <https://www.chromestatus.com/feature/5794378545102848>

WPE WebKit port

- Designed with performance, small footprint, accelerated content rendering, and simplicity of embedding in mind
- Widely used in embedded
- $\frac{3}{4}$ of our WebKit-related income comes from embedded industries
- There are billions of embedded devices and growing
- We are able to upstream many improvements to the wider WebKit community thanks to interest in this port from our business partners.

MathML

- A W3C standard for mathematical and scientific content, already included in ISO/IEC, HTML5, ebook and office formats
- Implemented in the open source web engines used by Firefox (Gecko) and Safari (WebKit)
- One of the most requested web platform features in Google Chrome (using Chromium) and Microsoft Edge (switching to Chromium)
- Igalia brought our expertise in both standardization and implementation to lead the specification work and provide both the final implementation in Chromium

$$\Gamma(t) = \int_0^{+\infty} x^{t-1} e^{-x} dx = \frac{1}{t} \prod_{n=1}^{\infty} \frac{\left(1 + \frac{1}{n}\right)^t}{1 + \frac{t}{n}} \sim \sqrt{\frac{2\pi}{t}} \left(\frac{t}{e}\right)^t$$

$$\Gamma(t) = \int_0^{+\infty} x^{t-1} e^{-x} dx = \frac{1}{t} \prod_{n=1}^{\infty} \frac{\left(1 + \frac{1}{n}\right)^t}{1 + \frac{t}{n}} \sim \sqrt{\frac{2\pi}{t}} \left(\frac{t}{e}\right)^t$$

$$\Gamma(t) = \int_0^{+\infty} x^{t-1} e^{-x} dx = \frac{1}{t} \prod_{n=1}^{\infty} \frac{\left(1 + \frac{1}{n}\right)^t}{1 + \frac{t}{n}} \sim \sqrt{\frac{2\pi}{t}} \left(\frac{t}{e}\right)^t$$

From top to bottom: MathML formula rendered by
Chromium (Igalia's build), Safari and Firefox

MathML

- Seeking sponsors

Sponsorship
mathML in Chromium

EMAIL TWITTER

Primary sponsor

Igalia has become the primary sponsor for the implementation of MathML in Chromium, to continue improvement of test coverage, and interoperability, as well as work around MathML standard at W3C. The project was started in 2007 with primary sponsorship from NISO/Dean Paulson for us as well as support from Pearson Publishing, APS, and other community donors. We have become the primary sponsor because we understand the current web mobile challenges and wish to continue the project moving forward. We greatly appreciate financial sponsorship both past and present, and would happily engage with interested parties. If you are interested in becoming a sponsor please contact us.

Other sponsors

Platinum sponsor

Bronze sponsor

Developer

Open Prioritization

- An experiment in crowd-funding prioritization of new feature implementations for web browsers.
- Homepage: <https://www.igalia.com/open-prioritization/>
- Video: <https://youtu.be/xCRxNVbUqhk>

The screenshot shows a crowdfunding page for the `:focus-visible` feature. At the top left, there is a green pill-shaped label with the text `:focus-visible`. Below it, the main heading reads `:focus-visible` in WebKit/Safari. To the right of the heading, there is a paragraph of text explaining the feature: "The `:focus-visible` pseudo-class matches only in heuristic cases where a native indicator would be shown, thus making it possible to have good style *and* retain good accessibility." Below this, a status line reads: "Status: Shipped by default in Chrome and Edge 86 in October 2020 : Planned for shipping by default in Firefox 85. Being crowd-funded by Igalia as the Open Prioritization crowd choice." At the bottom of the card, there is a progress bar. The bar is green and has a white circle marker. Above the bar, a callout box shows "\$30.9k". To the right of the bar, a green pill-shaped label shows "\$35K". To the right of the bar, there is a link "Learn more +" and a "Donate >" button.



References

- <https://www.chromium.org>
- [BlinkOn 14 KeyNote](#)
- [Igalia 2021/2022 Updates and Plans](#)
- [MDN CSS Grid Layout](#)
- [Igaia Open Prioritization](#)

감사합니다

