

Getting into web engine contributing

Web Engines Hackfest 2023

Whoami

- Open-source developer doing various things in available free time
- Also doing independent security research
- Little formal programming qualifications/experience
- Not (real) named online

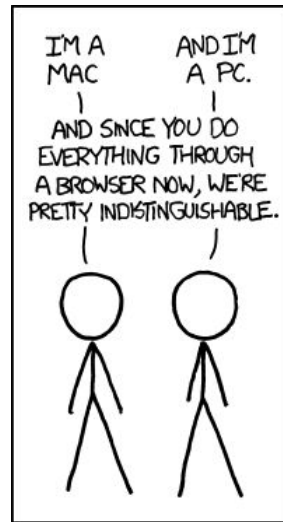
Agenda

- What do browser engines use for contributing (bugs, patches, chat)
- How I got into browser contributing, and what I've shipped (in Gecko)
- Expanding out into the wider ecosystem
- The cycle of browser contributing/development
- Lessons learnt and potential improvements
- Live Gecko programming 🙌
- Thanks/outro

Features a lot of my own opinions/experiences, but please insert your own too (old and new).
Questions and discussion welcome at any time throughout!

Browser engines

The world relies on web browsers, and browser engines run them under the hood. There are many browser engines with various setups for bugs, patches, chat which can vary wildly...



Chromium

Bugs: Monorail (bugs.chromium.org)

Patches: Gerrit (chromium-review.googlesource.com)

Chat: Slack*

* Only available to existing authors, not new contributors.



Monorail

chromium ▾ **New issue**

Open issues ▾

[Sign in](#)

☆ Starred by 3 users

Owner: [futhark@chromium.org](#)

CC: [andruud@chromium.org](#)
 [ericwilligers@chromium.org](#)
[futhark@chromium.org](#)

Status: Started (Open)

Components: [Blink>CSS](#)

Modified: Apr 28, 2023

Backlog-Rank: ----

Editors: ----

EstimatedDays: ----

NextAction: ----

OS: ----

Pri: 2

Type: [Bug](#)

BlockedOn: [Issue 1440517](#)
[Issue 1440518](#)
 [View details](#)

Blocking: [Issue 1366314](#)

Issue 1380321: Add support for supports() as part of import-conditions

Reported by [futhark@chromium.org](#) on Tue, Nov 1, 2022, 9:06 AM GMT [Project Member](#)

[Code](#) [Prev](#) 14 of 64 [Next](#)
[Back to list](#)

See:
<https://w3c.github.io/csswg-drafts/css-cascade-5/#import-conditions>

Comment 1 by [Git Watcher](#) on Tue, Nov 1, 2022, 1:28 PM GMT [Project Member](#)

The following revision refers to this bug:
<https://chromium.googlesource.com/chromium/src/+72ea30d9f7f922f741bcae27c3c88cbf2143031>

commit 72ea30d9f7f922f741bcae27c3c88cbf2143031
Author: Rune Lillesveen <futhark@chromium.org>
Date: Tue Nov 01 13:27:29 2022

Add test for css-cascade-5 import conditions

Per css-cascade-5, @import rules can have supports() queries in addition to media queries.

[Bug: 1380321](#)

Change-Id: Ib3e3a254a9d65b05e60d315a53278ec684be26a9
Reviewed-on: <https://chromium-review.googlesource.com/c/chromium/src/+3991292>
Commit-Queue: [Rune Lillesveen <futhark@chromium.org>](#)
Reviewed-by: [Anders Hartvoll Ruud <andruud@chromium.org>](#)
Cr-Commit-Position: refs/heads/main@{#1065905}

[add] https://crrev.com/72ea30d9f7f922f741bcae27c3c88cbf2143031/third_party/blink/web_tests/external/wpt/css/css-cascade/import-conditions.html
[add] https://crrev.com/72ea30d9f7f922f741bcae27c3c88cbf2143031/third_party/blink/web_tests/external/wpt/css/css-cascade/import-conditions-expected.txt

Comment 2 by [futhark@chromium.org](#) on Mon, Nov 7, 2022, 10:17 AM GMT [Project Member](#)

Status: Started (was: Assigned)

Comment 3 by [futhark@chromium.org](#) on Thu, Apr 27, 2023, 12:18 PM GMT+1 [Project Member](#)

Blockedon: 1440517

Comment 4 by [futhark@chromium.org](#) on Thu, Apr 27, 2023, 12:19 PM GMT+1 [Project Member](#)

Blockedon: 1440518

Comment 5 by [futhark@chromium.org](#) on Fri, Apr 28, 2023, 9:09 AM GMT+1 [Project Member](#)

Cc: [andruud@chromium.org](#) [ericwilligers@chromium.org](#) [futhark@chromium.org](#)
[Issue 1440604](#) has been merged into this issue.

Gerrit

Ready to submit4594300Avoid some unneeded floating-point subtractions.

Change Info

SHOW ALL

OwnerSteinar H. Gunderson

ReviewersRune Lillesveen

CCAlexis Menardapavlov+blink...blink-reviews...blink-reviews...chromium-revi...TriciumChromium LU...

Repo | Branchchromium/src | main

Submit Requirements

Code-Review+1

Code-OwnersApproved

Code-CoverageNo votes

Avoid some unneeded floating-point subtractions.

Doing the current order would convert '0' to a float before subtraction, which is rather unnecessary.

Perf test (MotionMarkMultiply, Alder Lake) goes from 79.615 to 76.467 ns/iteration (+4.1%).

Change-Id: I5a9a8cbf29248726970c5c89283efd6c899ae0a7

Comments1 resolved

Checkschromium_presubmit2win-presubmit30

Relation chain

Parse hue without scanning through to find the length first.

Use cheaper rounding in the CSS fast parser. (Submittable)

Avoid some unneeded floating-point subtractions. (Submittable)

Mark some CSS parser fast path functions as ALWAYS_INLINE. (Merged)

Reject UChar in the fast path for parsing CSS colors. (Merged)

Files

Comments

Checks

Findings

BasePatchset 1602b201

DOWNLOADEXPAND ALL

Owners	File	Comments	Size	Delta	Cov	ΔCov	Cov (U)	ΔCov(U)
	Commit message							
✓	[M] third_party/blink/renderer/core/css/parser/css_parser_fast_paths.cc			+3 -3	90%	100%	82%	100%
				+3 -3				

Gold

CL added at least one new image

INTERNALFAQFILE BUG

Change Log

Show all entries (1 hidden)

EXPAND ALL

Steinar H. Gunde...

Uploaded patch set 1.

VIEW DIFFPatchset 1 | Jun 06 2:39 PM

Steinar H. Gunde...

Rune Lillesveen, who was added as reviewer owns the following files: * third_party/blink/renderer/core/css/parser/css_parser_fast_paths.cc

Patchset 1 | Jun 06 2:39 PM

Tricium

Added to cc: Tricium

Patchset 1 | Jun 06 2:41 PM

Tricium

1

Patchset 1 | Jun 06 2:41 PM

Rune Lillesveen

Code-Review +1 1 lgtm

Patchset 1 | 9:27 AM

Steinar H. Gunde...

Commit-Queue +1

Patchset 1 | 9:32 AM

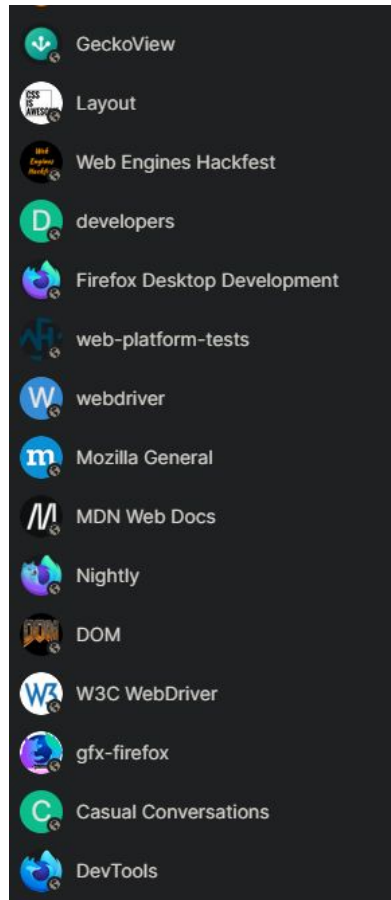
Gecko

Bugs: Bugzilla (bugzilla.mozilla.org)

Patches: Phabricator (phabricator.services.mozilla.com)

Chat: Matrix (chat.mozilla.org)

Mozilla have open and active development discussions in their Matrix server in many dedicated rooms, which is very nice to have for new (and experienced) developers.



Bugzilla (Mozilla)

Open

Bug 1834134

Opened 19 days ago

Updated 13 days ago

Update SVGScriptElement GetScriptType with HTMLScriptElement changes

Categories

Product: Core

Component: DOM: Core & HTML

Type: defect

Priority: Not set

Severity: S3

Tracking

Status: NEW

People

Assignee: Unassigned

Take

Reporter: canadahonk

Triage Owner: hsinyi

CC: 3 people including you

Add

References

Depends on: 1834110

Blocks: 1769709

Dependency tree / graph

Details

Votes: 0

Vote

Attachments

Attach New File

Add Comment

Timeline

CanadaHonk [canadahonk]

Reporter

Description • 19 days ago

We are currently failing many (160) WPT subtests due to SVGScriptElement's GetScriptType never being updated with HTMLScriptElement's changes to fix WPTs.

This bug depends on others (Bug 1834110) as they update/fix HTMLScriptElement with more WPTs and it would be a waste otherwise.

WPT tests: <https://wpt.fyi/results/html/semantics/scripting-1/the-script-element/script-type-and-language-js-svg>

Phabricator

Bug 1834703 - Return null origin of "blob:" URL containing disallowed inner schemes


✓ Accepted

🌐 Public



Authored by **CanadaHonk** on Tue, May 30, 12:18 AM.

Details

Reviewers  smaug

 valentin

Commits [rMOZILLACENTRAL7cd945c5be6e: Bug 1834703 - Return null origin of "blob:" URL containing disallowed inner...](#)
[rMOZILLACENTRAL34c5add98599: Bug 1834703 - Return null origin of "blob:" URL containing inner non-"http\(s\):" ...](#)

Bugzilla Bug ID 1834703

☰ SUMMARY

Return null origin of a blob URL containing an inner URL which is not of some schemes (https, http, file per spec) to comply with new spec changes.

Allowed schemes also include moz-extension for our own purposes.

Examples:

- "blob:blob:https://example.org/" - inner blob URL
- "blob:ws://example.org/" - inner non-http(s) URL

Spec PR: <https://github.com/whatwg/url/pull/771>

WPT tests: <https://github.com/web-platform-tests/wpt/pull/40133>

New WPT tests are not merged into central yet, so tested manually instead and results are as expected with WPTs.

📄 TEST PLAN

<https://treeherder.mozilla.org/jobs?repo=try&revision=08981b0f14011f6b4a1629ef1108e86e87255ee7>

WebKit

Bugs: Bugzilla (bugs.webkit.org)

Patches: GitHub PRs ([WebKit/WebKit](https://github.com/WebKit/WebKit))

Chat: Slack



WebKit uses GitHub PRs for submitting patches and code review, which is rather unique compared to other major engines which use self-hosted solutions.

Bugzilla (WebKit)

Bug List: (40 of 1000) | < First Last > | < Prev Next > Show last search results

Bug 256180 - Implement supports() syntax for @import rules

Status: NEW

Alias: None

Product: WebKit

Component: CSS ([show other bugs](#))

Version: WebKit Nightly Build

Hardware: Unspecified Unspecified

Importance: P2 Normal

Assignee: Nobody

URL: <https://drafts.csswg.org/css-cascade-...>

Keywords: InRadar

Personal Tags:

Depends on:

Blocks:

Reported: 2023-05-01 14:51 PDT by [Sebastian Zartner](#)

Modified: 2023-05-18 14:29 PDT ([History](#))

CC List: 6 users including you ([edit](#))

Ignore Bug Mail: ☐ (never email me about this bug)

[See Also:](#)

Attachments

[Add an attachment](#) (proposed patch, testcase, etc.)

Additional Comments:

Comment Preview

Status: NEW

Save Changes

[Sebastian Zartner](#) 2023-05-01 14:51:58 PDT

[Description](#) [\[reply\]](#) [\[-\]](#)

[Collapse All Comments](#)

[Expand All Comments](#)

CSS Cascading 4 defines a `supports()` syntax for `@import` rules allowing support-dependent importing of other style sheets. See <https://drafts.csswg.org/css-cascade-4/#typedef-import-conditions>.

This feature is important for different features, especially for those introducing new syntax like CSS Nesting.


Sebastian

GitHub PRs (WebKit)

Merge CSSImportRule layer IDL extensions into main interface #14034

[Merged](#) webkit-commit-q... merged 1 commit into [WebKit:main](#) from [CanadaHonk:eng/Merge-CSSImportRule-IDL-extensions-into-main-interface](#) 3 weeks ago

Conversation 2 Commits 1 Checks 0 Files changed 7 +4 -44

**CanadaHonk** commented 3 weeks ago • edited by webkit-early-warning-system

da47779

Merge CSSImportRule layer IDL extensions into main interface
https://bugs.webkit.org/show_bug.cgi?id=256979

Reviewed by Tim Nguyen.

Merged the CSSImportRule layer extensions (layerName) into the main interface.
Spec PR: [w3c/csswg-drafts#8711](#)

Simplifies the IDL files from two to one :)

* Source/WebCore/CMakeLists.txt:
* Source/WebCore/DerivedSources-Input.xcfilelist:
* Source/WebCore/DerivedSources-output.xcfilelist:
* Source/WebCore/DerivedSources.make:
* Source/WebCore/WebCore.xcodeproj/project.pbxproj:
* Source/WebCore/css/CSSImportRuleLayer.idl: Removed.
* Source/WebCore/css/CSSImportRule.idl:

Canonical link: <https://commits.webkit.org/264261@main>

86161c1

Misc	iOS, tvOS & watchOS	macOS	Linux	Windows
✓ style	✓ ios	✓ mac	✓ wpe	✓ wincairo
✓ bindings	✓ ios-sim	✓ mac-AS-debug	✓ wpe-wk2	
✓ webkitperl	✓ ios-wk2	✓ api-mac	✓ gtk	
	✓ ios-wk2-wpt	✓ mac-wk1	✓ gtk-wk2	
	✓ api-ios	✓ mac-wk2	✓ api-gtk	
	✓ tv	✓ mac-AS-debug-wk2		
	✓ tv-sim			

Reviewers

ntlm ✓

smfr ●

edumez ●

antijk ●

Assignees

CanadaHonk — unassign me

Labels

CSS

Projects

None yet

Milestone

No milestone

Notifications

Unsubscribe

You're receiving notifications because you were assigned.

6 participants

☐ Allow edits by maintainers ⓘ

Servo

Bugs: GitHub Issues ([servo/servo](https://github.com/servo/servo))

Patches: GitHub PRs ([servo/servo](https://github.com/servo/servo))

Chat: Zulip



Servo's source is ~completely Rust resulting in an interesting toolchain.

Servo was in awkward state but is now being reactivated by Igalia! 🎉

Ladybird

Bugs: GitHub Issues

Patches: GitHub PRs

Chat: Discord



Ladybird is a young hobbyist browser spawned from the larger [SerenityOS project](#).

It is nice to tinker with as it is built from specs, and some concerns of major browsers do not exist; like fingerprinting and stability (shipping experimental/new features by default!).

Getting into it

Originally, I was never planning to do any browser development, but whilst working on a side project I found a [tiny bug in Gecko](#), and a Mozilla employee suggested to make a patch as it was simple.

Since then...

Things I've shipped (Gecko)

- @media (scripting) (113)
- @import supports() (114)
- CSS NaN/infinity fixes + ship (114)
- URL.canParse() (115)
- Soon: <search> (116?)
- @media (prefers-reduced-transparency) + @media (inverted-colors) (behind flag)
- Various CDP ([Chrome's remote debugging protocol](#)) fixes and new methods (110 -)
- Many, many small WPT ([standard browser tests](#)) fixes ;)

Expanding out into the wider ecosystem

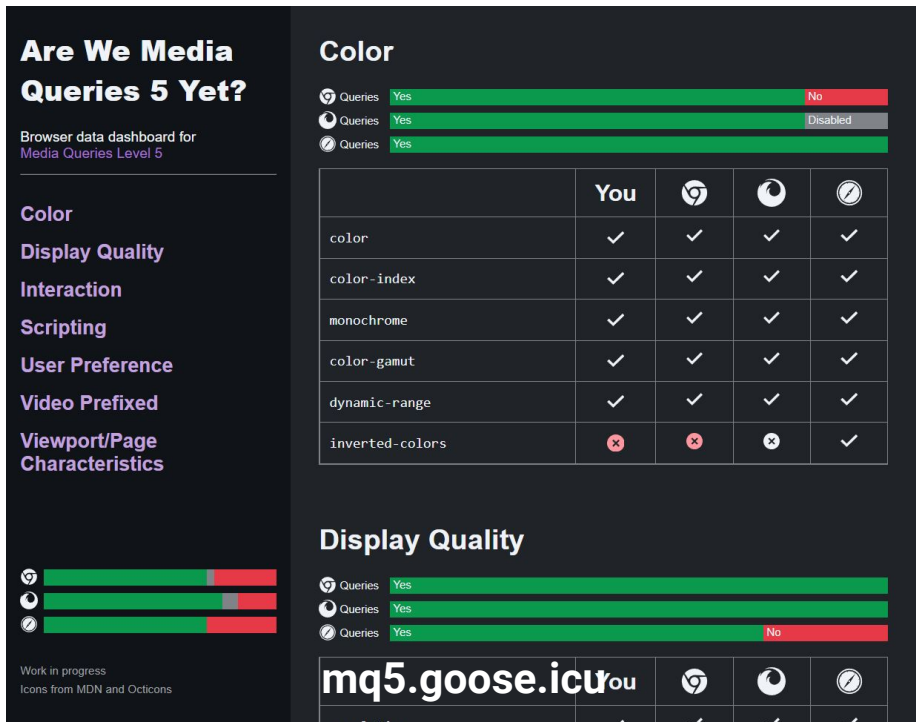
While working on browsers, the specs (and tests) behind them will always come up. Inevitably, if you work on browsers or are generally passionate about the web you will end up finding issues in a specification... so make a PR!

I have already written a few whilst working on some features in Gecko:

- CSS: [\[cssom-1\] Add CSSImportRule supportsText attribute](#)
- CSS: [\[cssom-1\] Merge CSSImportRule layer extensions from cascade-5](#)

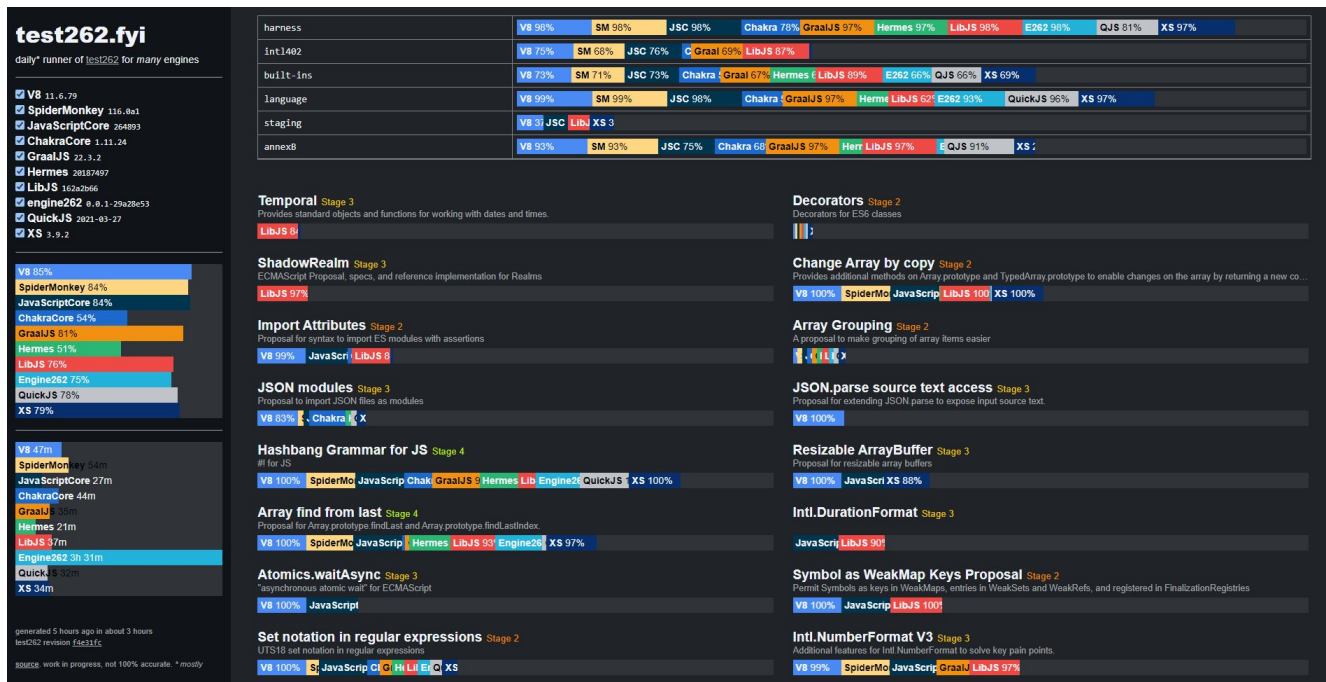
Bonus: Dashboards

I've also created a few dashboards for some web-related data.




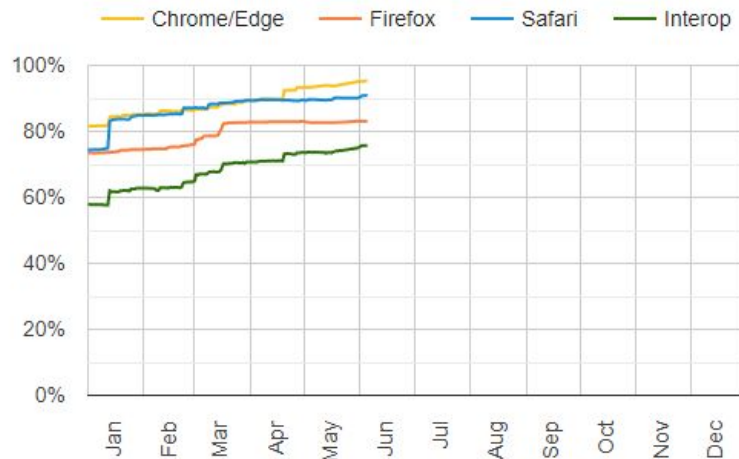
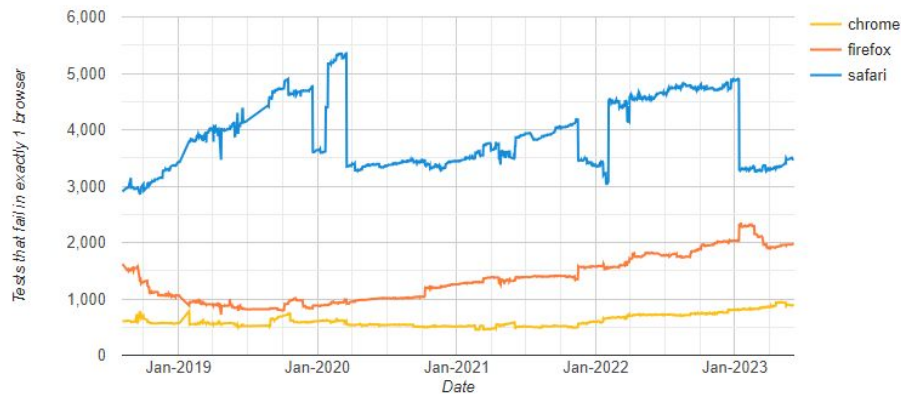
test262.fyi

Created test262.fyi (~4 days ago) as a new dashboard for viewing test262 (standard test suite) results of most JS engines.



Psychology hack: Graphs

Graphs are a good technique to reward yourself/others to fix even tiny bugs to pass more tests (WPTs, test262, etc) by seeing the line go up and getting that dopamine 



Browser contributing cycle

- Find a bug to work on
- Research context, history, spec details
- Look at surrounding code
- Write the patch
- Test (or write tests)
- Reviews
- Ship 🚀

(get lost in a spec rabbit hole along the way)

Lessons learnt

- Huge projects *seem* impossible but quickly become easy to work on with enough dev
- Everyone in browser development is kind, cool, and willing to help (mostly)
- The best way to do something is just to try
- You do not need to be an expert in X or Y to do anything
- Specs are a blessing and if not, make a PR!

Improvements engines could take

- Having an open, active chat really helps encouraging people to participate
 - Most engines now have this (with Chromium being the large exception)
- An easy setup process helps too for the very start
 - Example: Firefox has [MozillaBuild](#) which automatically sets up an environment on Windows with dependencies, etc ready to go
- Detailed bug info (blockers, relevant files, etc) can help make bugs seem more achievable for everyone

Let's try fixing some WPTs in Gecko

Live demo as an example of a quick tiny fix, testing, and submitting a patch to Gecko to show the process. Let's attempt :)

[Bug 1834134 - Update SVGScriptElement GetScriptType with HTMLScriptElement changes](#)

AKA: `<script>` elements inside SVGs have a different class (and code) than HTML, and it was never updated with fixes to improve spec compliance.

Thanks

Thank you to:

- Everyone who works on browsers, specs, etc
 - Special thanks to Gecko and WebKit people who reviewed my patches
- Mozillians who encouraged me along the way (@emilio, @zcorpan, @whimboo, more)
- Igalians for organising Web Engines Hackfest
- You for being in this session!

Slides: <https://goose.icu/wehf23.pdf>

GitHub: [@CanadaHonk](#)

I am also available to hire / looking for opportunities ;)