What's new with the Firefox Profiler

Nazım Can Altınova

https://share.firefox.dev/profiler-whatsnew-fosdem-2023

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profiler.firefox.com

github.com/firefox-devtools/profiler/

What is a profiler?

Helps developers to analyze performance issues.

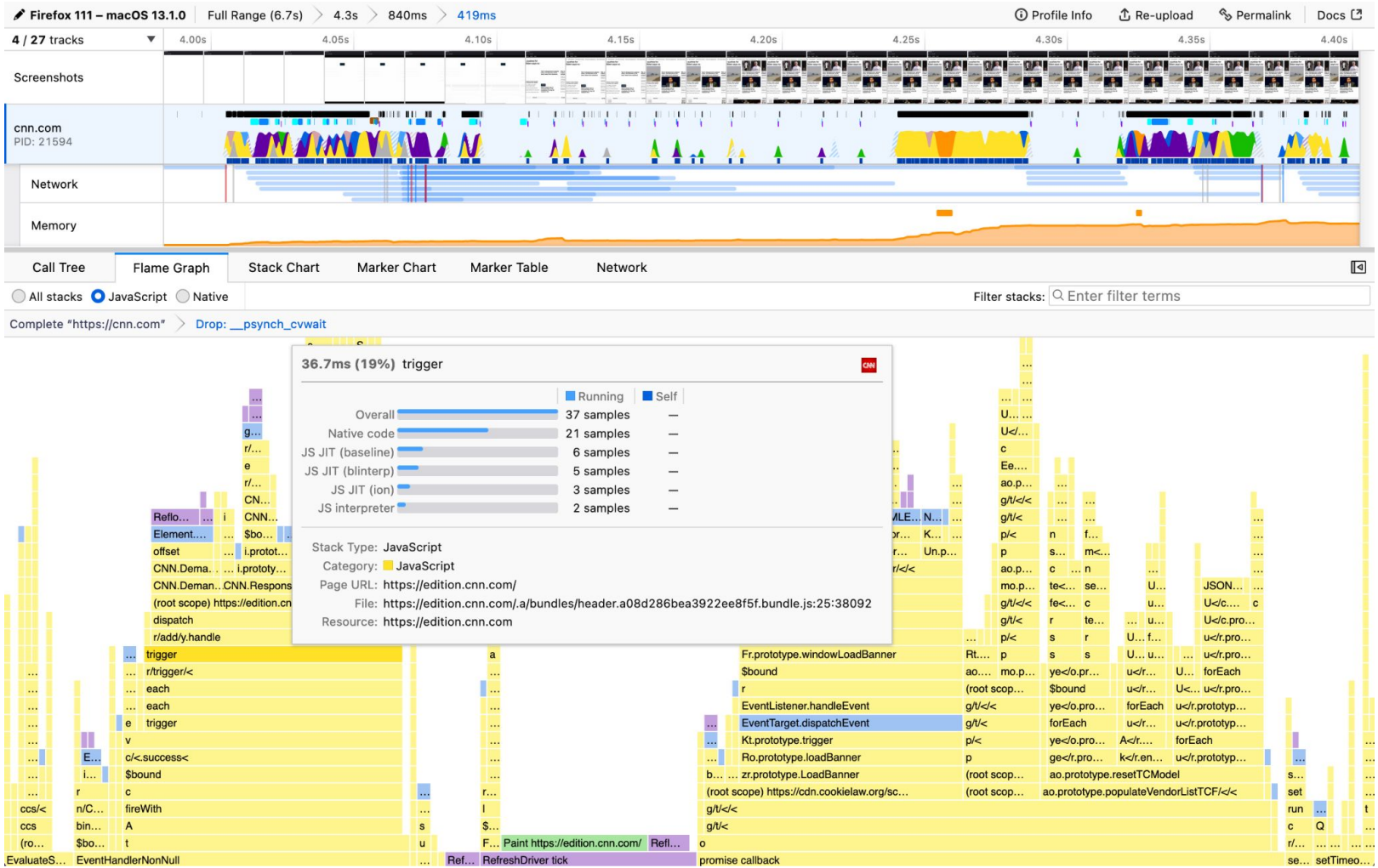
It gives insight and clues.

This is detective work.

What is the Firefox Profiler

Statistical profiler with additional data

Main data sources:
Sampling + Markers


Firefox 111 – macOS 13.1.0
Full Range (6.7s)
4.3s
840ms
419ms
Profile Info
Re-upload
Permalink
Docs
4 / 27 tracks
4.00s
4.05s
4.10s
4.15s
4.20s
4.25s
4.30s
4.35s
4.40s
Screenshots
cnn.com
PID: 21594
Network
Memory
Call Tree
Flame Graph
Stack Chart
Marker Chart
Marker Table
Network
All stacks
JavaScript
Native
Filter stacks:
Enter filter terms
Complete "https://cnn.com"
Drop: __psynch_cvwait
36.7ms (19%) trigger
Running
Self
Overall 37 samples
Native code 21 samples
JS JIT (baseline) 6 samples
JS JIT (blinterp) 5 samples
JS JIT (ion) 3 samples
JS interpreter 2 samples
Stack Type: JavaScript
Category: JavaScript
Page URL: https://edition.cnn.com/
File: https://edition.cnn.com/.a/bundles/header.a08d286bea3922ee8f5f.bundle.js:25:38092
Resource: https://edition.cnn.com
trigger
r/trigger/<
each
each
e trigger
v
E… c/<.success<
i… $bound
r c
ccs/< n/C… fireWith
ccs bin… A
(ro… $bo… t
EvaluateS… EventHandlerNonNull
Paint https://edition.cnn.com/
RefreshDriver tick
Fr.prototype.windowLoadBanner
$bound
r
EventListener.handleEvent
EventTarget.dispatchEvent
Kt.prototype.trigger
Ro.prototype.loadBanner
zr.prototype.LoadBanner
(root scope) https://cdn.cookielaw.org/sc…
promise callback
ao.prototype.resetTCModel
ao.prototype.populateVendorListTCF/</<
forEach
JSON…

Introduction to Firefox Profiler talk:

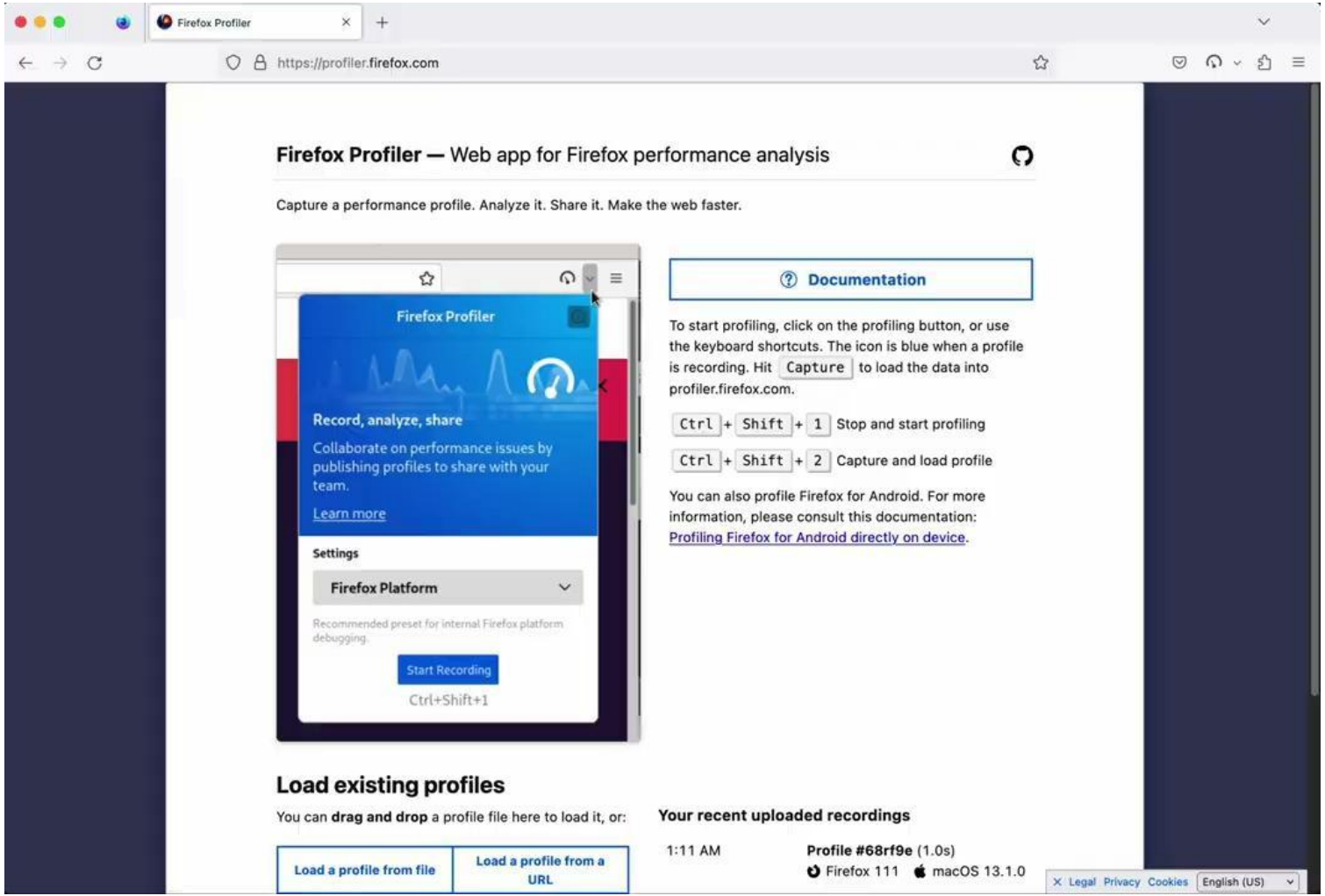
By Julien Wajsberg
JavaScript devroom
Sunday, 16:30 - 16:55

Importers from other profilers

Currently supported profile formats

1. Chrome Performance Tab – Trace Event Format
2. Linux perf script
3. ART Trace
4. Valgrind DHAT

All you need to do is drag and drop the file into profiler.firefox.com

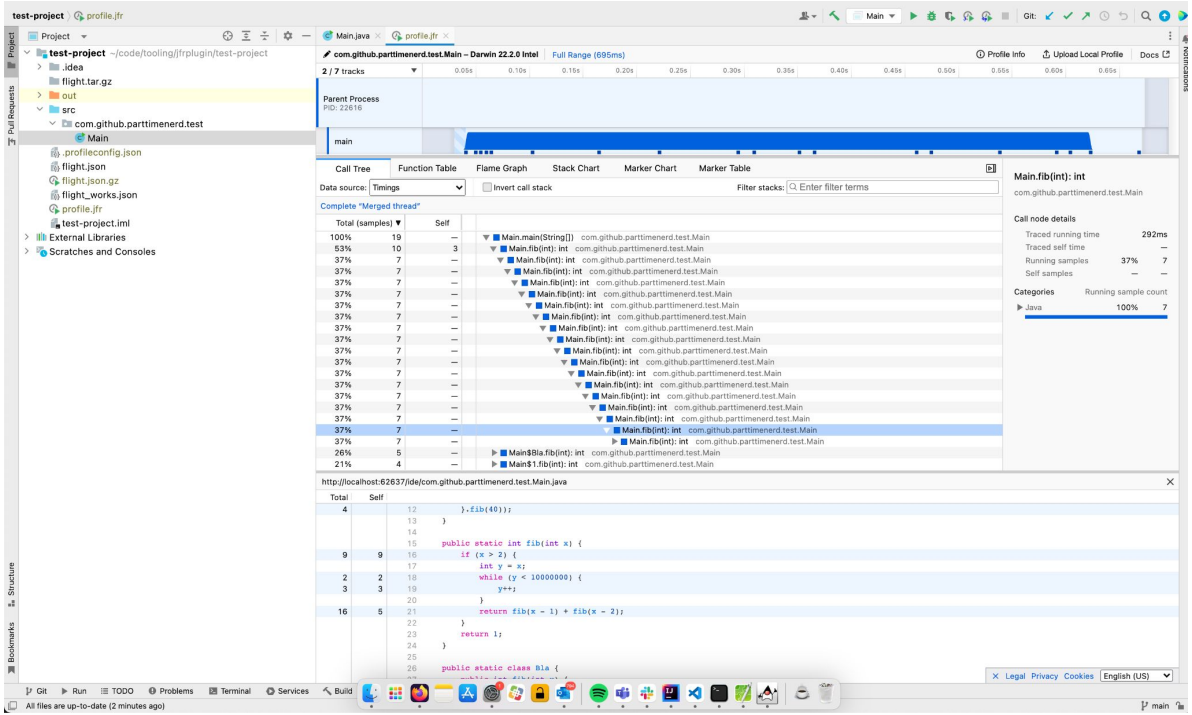

Firefox Profiler
https://profiler.firefox.com
Firefox Profiler — Web app for Firefox performance analysis
Capture a performance profile. Analyze it. Share it. Make the web faster.
Firefox Profiler
Record, analyze, share
Collaborate on performance issues by publishing profiles to share with your team.
Learn more
Settings
Firefox Platform
Recommended preset for internal Firefox platform debugging.
Start Recording
Ctrl+Shift+1
Documentation
To start profiling, click on the profiling button, or use the keyboard shortcuts. The icon is blue when a profile is recording. Hit Capture to load the data into profiler.firefox.com.
Ctrl + Shift + 1 Stop and start profiling
Ctrl + Shift + 2 Capture and load profile
You can also profile Firefox for Android. For more information, please consult this documentation:
Profiling Firefox for Android directly on device.
Load existing profiles
You can drag and drop a profile file here to load it, or:
Load a profile from file
Load a profile from a URL
Your recent uploaded recordings
1:11 AM
Profile #68rf9e (1.0s)
Firefox 111
macOS 13.1.0
Legal
Privacy
Cookies
English (US)

ETW importer
By Jeff Muizelaar

https://github.com/jrmuizel/etw-profiler/tree/main/etw-gecko

Other tools that use the Firefox Profiler

Java JFR Profiler
By Johannes Bechberger (SAP)

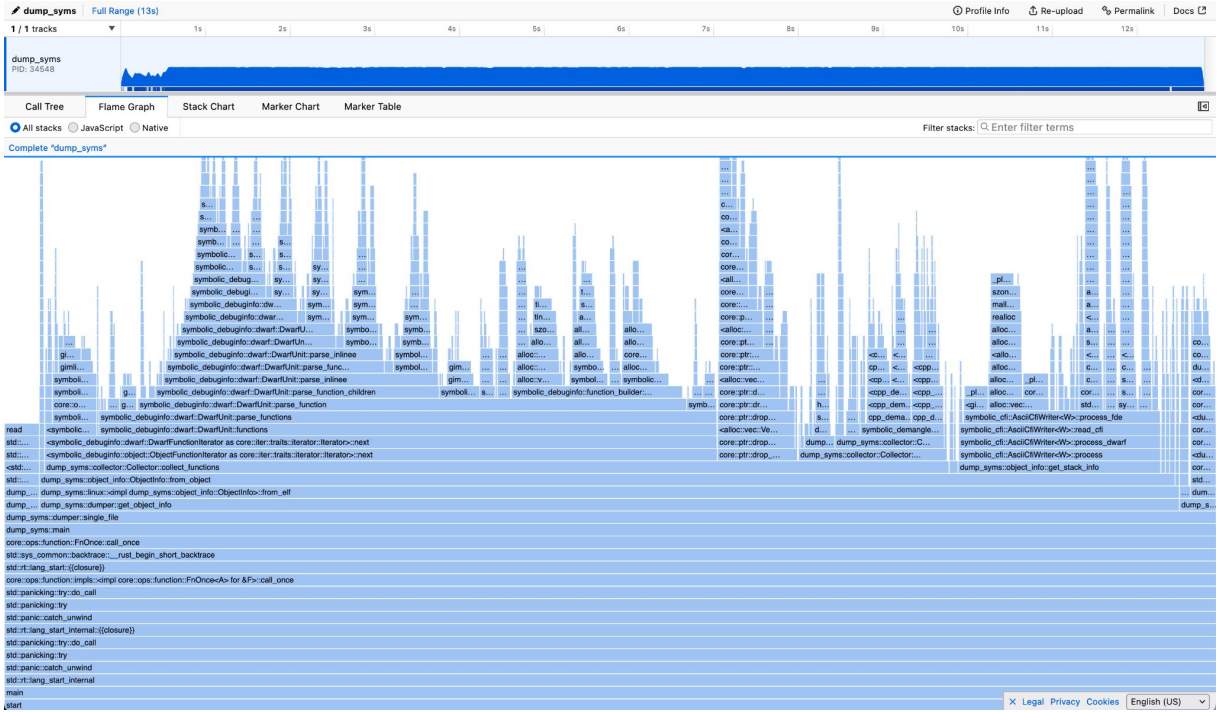


https://plugins.jetbrains.com/plugin/20937-java-jfr-profiler

Firefox Profiler beyond the web

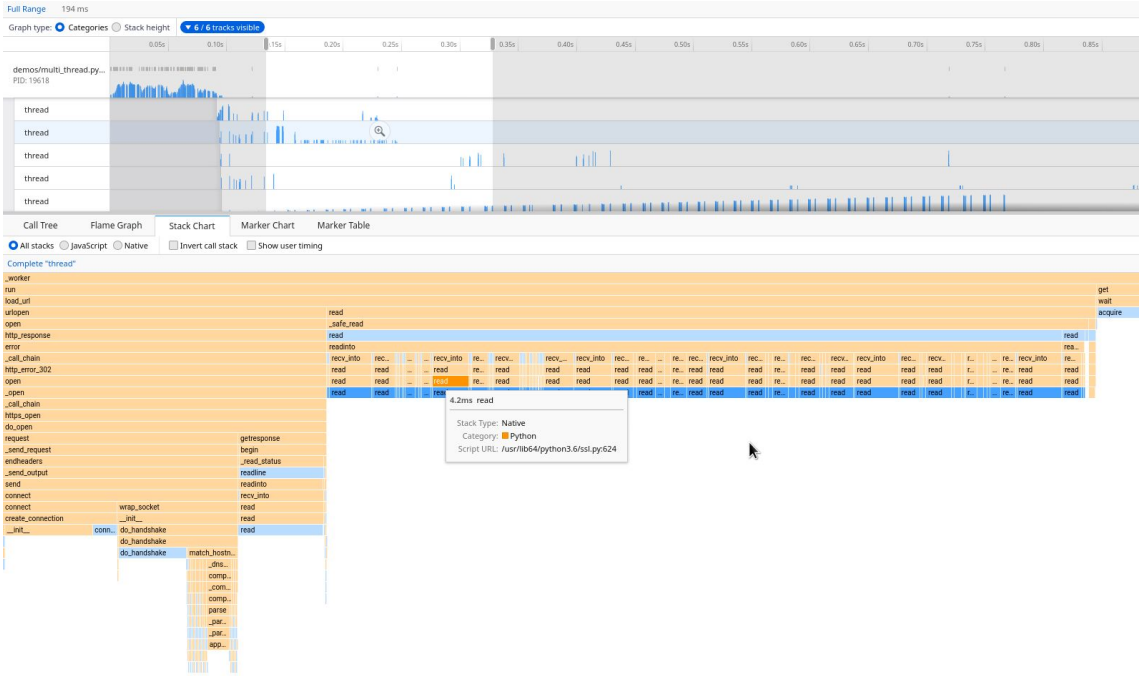
By Johannes Bechberger (SAP)
Mozilla devroom
Saturday, 17:30 - 18:00

Samply
By Markus Stange



https://github.com/mstange/samply

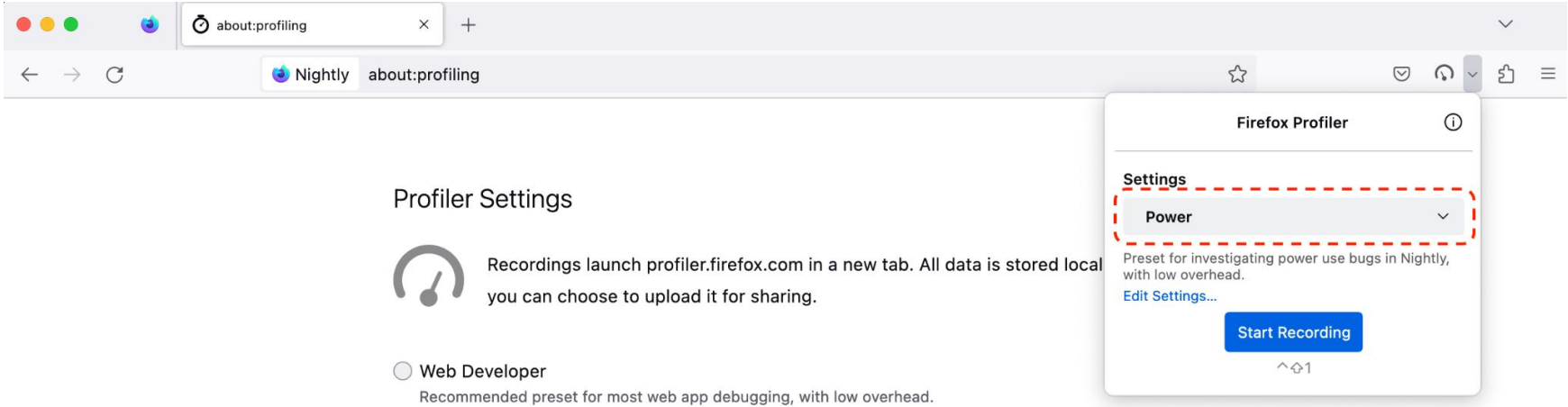
FunctionTrace
By Matt Bryant

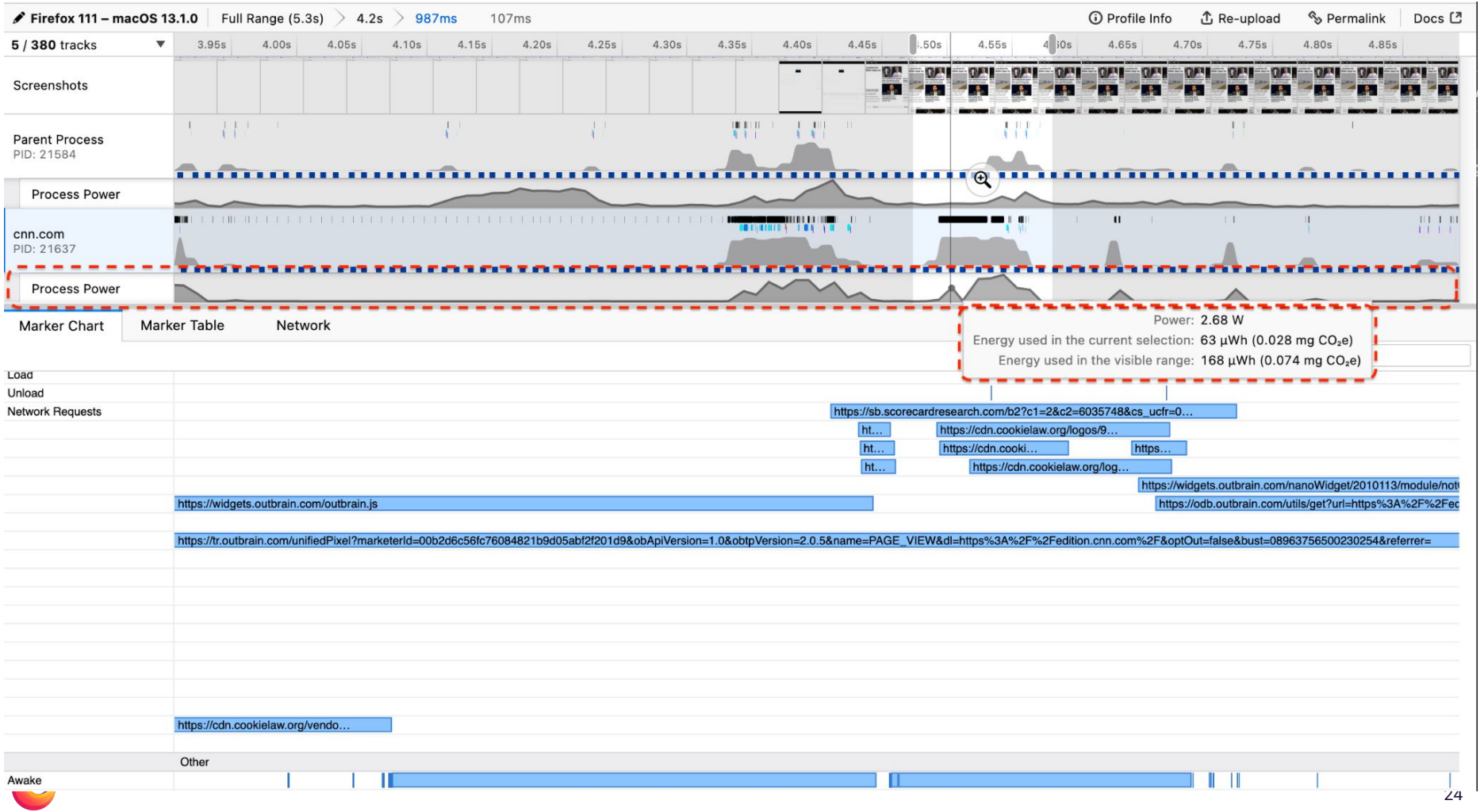


https://functiontrace.com/

New features
&
UI improvements

Power profiling


about:profiling
Nightly
about:profiling
Firefox Profiler
Settings
Power
Preset for investigating power use bugs in Nightly, with low overhead.
Edit Settings...
Start Recording
^⇧1
Profiler Settings
Recordings launch profiler.firefox.com in a new tab. All data is stored local
you can choose to upload it for sharing.
Web Developer
Recommended preset for most web app debugging, with low overhead.
Nightly
Recommended preset for profiling Nightly.
Graphics
Preset for investigating graphics bugs in Nightly.
Media
Preset for investigating audio and video bugs in Nightly.
Networking
Preset for investigating networking bugs in Nightly.
Power
Preset for investigating power use bugs in Nightly, with low overhead.
Custom
Full Settings


Firefox 111 – macOS 13.1.0
Full Range (5.3s)
4.2s
987ms
107ms
Profile Info
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Docs
5 / 380 tracks
3.95s
4.00s
4.05s
4.10s
4.15s
4.20s
4.25s
4.30s
4.35s
4.40s
4.45s
4.50s
4.55s
4.60s
4.65s
4.70s
4.75s
4.80s
4.85s
Screenshots
Parent Process
PID: 21584
Process Power
cnn.com
PID: 21637
Process Power
Marker Chart
Marker Table
Network
Power: 2.68 W
Energy used in the current selection: 63 µWh (0.028 mg CO₂e)
Energy used in the visible range: 168 µWh (0.074 mg CO₂e)
Load
Unload
Network Requests
https://sb.scorecardresearch.com/b2?c1=2&c2=6035748&cs_ucfr=0…
ht…
https://cdn.cookielaw.org/logos/9…
ht…
https://cdn.cooki…
https…
ht…
https://cdn.cookielaw.org/log…
https://widgets.outbrain.com/nanoWidget/2010113/module/not
https://widgets.outbrain.com/outbrain.js
https://odb.outbrain.com/utils/get?url=https%3A%2F%2Fec
https://tr.outbrain.com/unifiedPixel?marketerId=00b2d6c56fc76084821b9d05abf2f201d9&obApiVersion=1.0&obtpVersion=2.0.5&name=PAGE_VIEW&dl=https%3A%2F%2Fedition.cnn.com%2F&optOut=false&bust=08963756500230254&referrer=
https://cdn.cookielaw.org/vendo…
Other
Awake

With CO_2 emission information

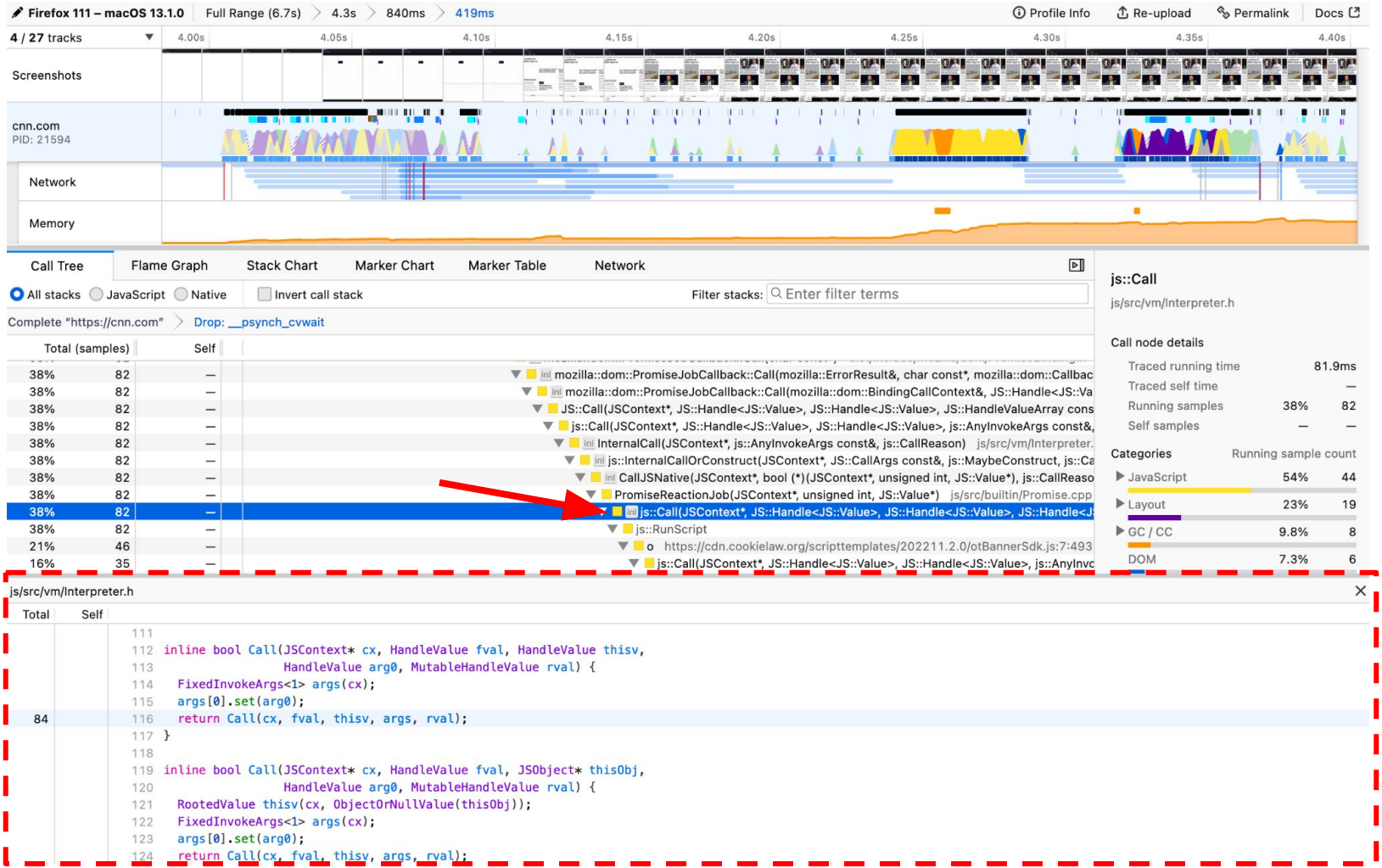
Power:	2.68 W
Energy used in the current selection:	63 µWh (0.028 mg CO_2e)
Energy used in the visible range:	168 µWh (0.074 mg CO_2e)

Thanks to **Chris Adams** and **Fershad** from **The Green Web Foundation**.

Power profiling with the Firefox Profiler talk:

By Florian Quèze
Energy devroom
Saturday, 17:30 - 18:00

Source code view & inline call stacks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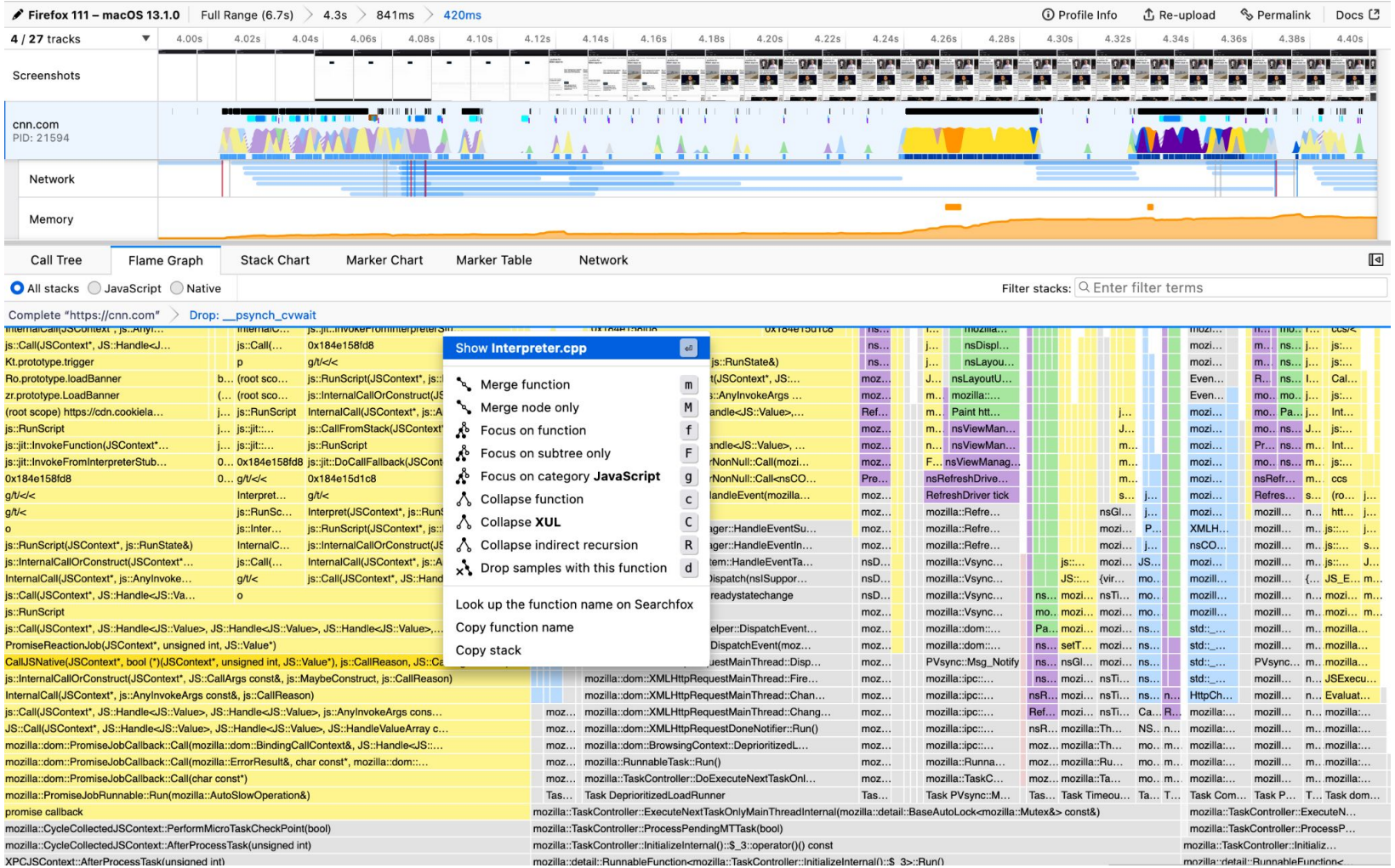
Memory
Call Tree
Flame Graph
Stack Chart
Marker Chart
Marker Table
Network
All stacks
JavaScript
Native
Invert call stack
Filter stacks:
Enter filter terms
Complete "https://cnn.com"
Drop: __psynch_cvwait
Total (samples)
Self
38% 82 —
38% 82 — mozilla::dom::PromiseJobCallback::Call(mozilla::ErrorResult&, char const*, mozilla::dom::Callbac
38% 82 — mozilla::dom::PromiseJobCallback::Call(mozilla::dom::BindingCallContext&, JS::Handle<JS::Va
38% 82 — JS::Call(JSContext*, JS::Handle<JS::Value>, JS::Handle<JS::Value>, JS::HandleValueArray cons
38% 82 — js::Call(JSContext*, JS::Handle<JS::Value>, JS::Handle<JS::Value>, js::AnyInvokeArgs const&,
38% 82 — InternalCall(JSContext*, js::AnyInvokeArgs const&, js::CallReason) js/src/vm/Interpreter.
38% 82 — js::InternalCallOrConstruct(JSContext*, JS::CallArgs const&, js::MaybeConstruct, js::Ca
38% 82 — CallJSNative(JSContext*, bool (*)(JSContext*, unsigned int, JS::Value*), js::CallReaso
38% 82 — PromiseReactionJob(JSContext*, unsigned int, JS::Value*) js/src/builtin/Promise.cpp
38% 82 — js::Call(JSContext*, JS::Handle<JS::Value>, JS::Handle<JS::Value>, JS::Handle<J
38% 82 — js::RunScript
21% 46 — o https://cdn.cookielaw.org/scripttemplates/202211.2.0/otBannerSdk.js:7:493
16% 35 — js::Call(JSContext*, JS::Handle<JS::Value>, JS::Handle<JS::Value>, js::AnyInvc
js::Call
js/src/vm/Interpreter.h
Call node details
Traced running time 81.9ms
Traced self time —
Running samples 38% 82
Self samples — —
Categories Running sample count
JavaScript 54% 44
Layout 23% 19
GC / CC 9.8% 8
DOM 7.3% 6
js/src/vm/Interpreter.h
Total
Self
111
112 inline bool Call(JSContext* cx, HandleValue fval, HandleValue thisv,
113 HandleValue arg0, MutableHandleValue rval) {
114 FixedInvokeArgs<1> args(cx);
115 args[0].set(arg0);
84 116 return Call(cx, fval, thisv, args, rval);
117 }
118
119 inline bool Call(JSContext* cx, HandleValue fval, JSObject* thisObj,
120 HandleValue arg0, MutableHandleValue rval) {
121 RootedValue thisv(cx, ObjectOrNullValue(thisObj));
122 FixedInvokeArgs<1> args(cx);
123 args[0].set(arg0);
124 return Call(cx, fval, thisv, args, rval);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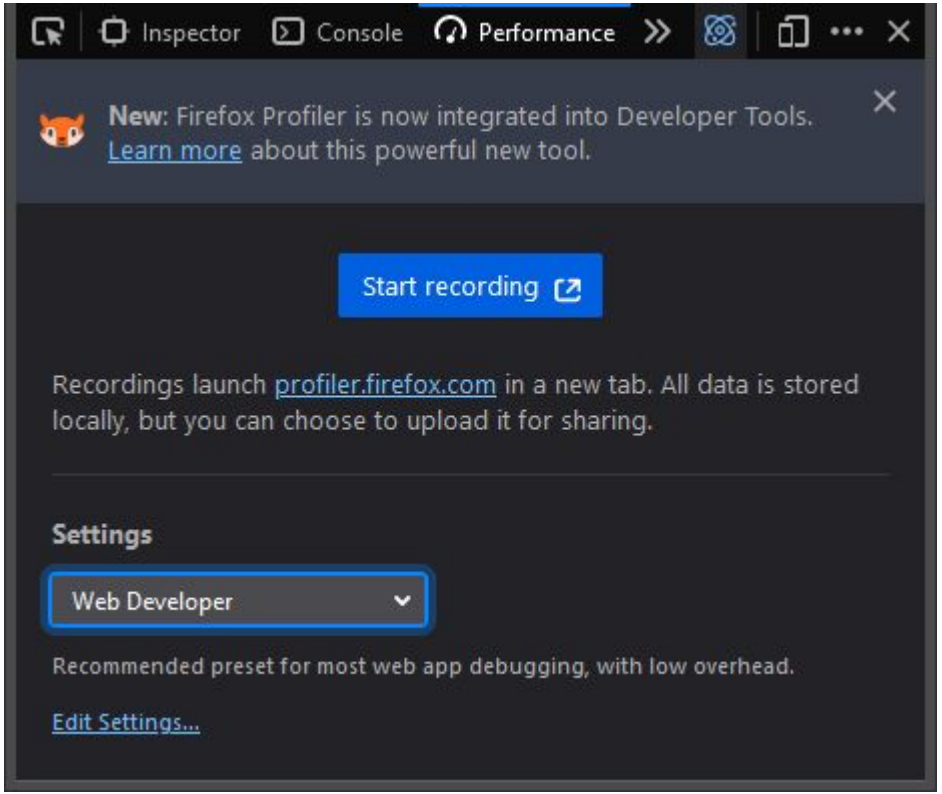
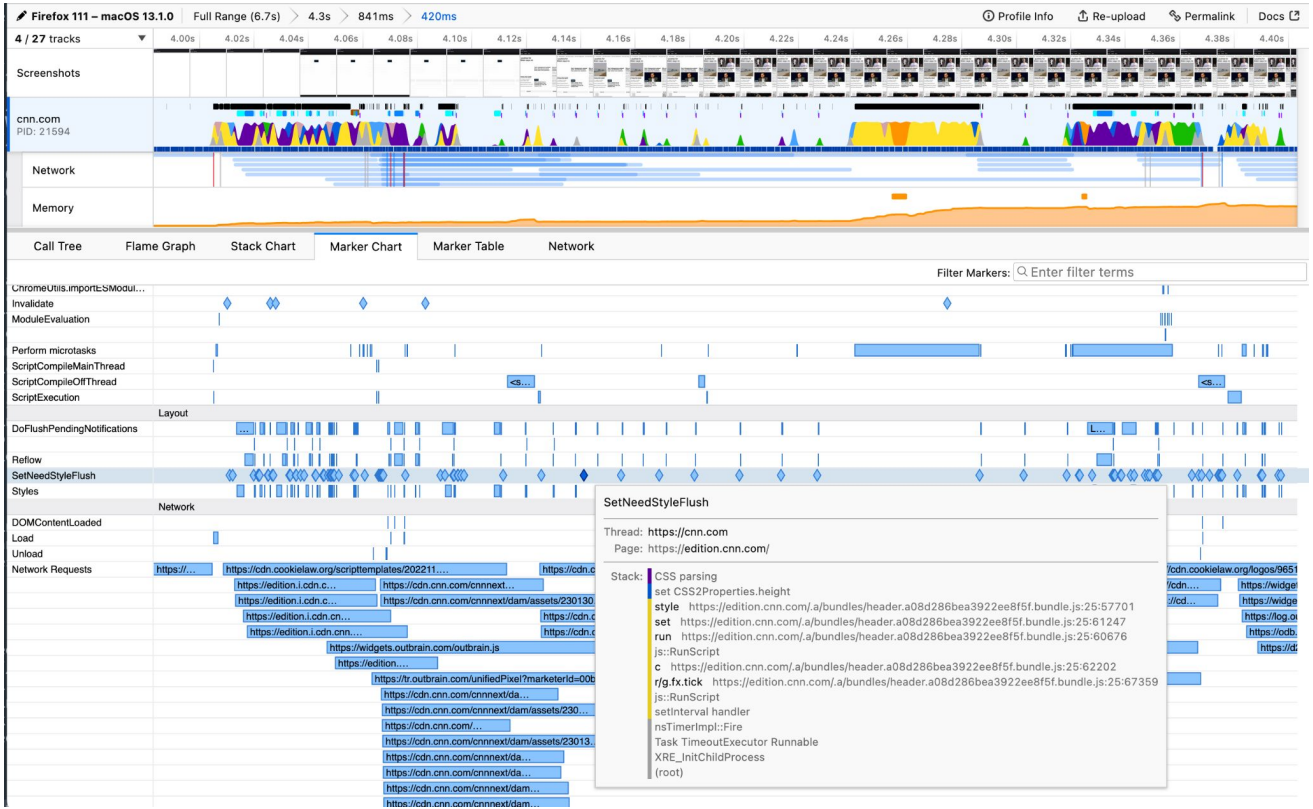
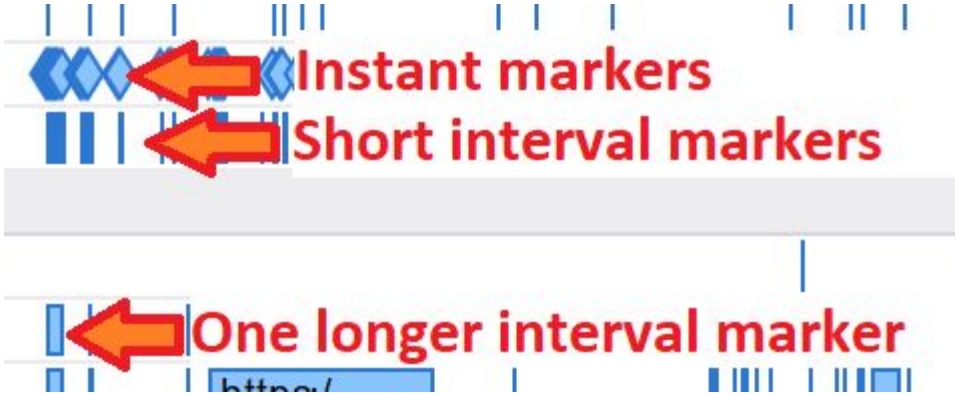
Marker Chart
Marker Table
Network
All stacks
JavaScript
Native
Filter stacks:
Enter filter terms
Complete "https://cnn.com"
Drop: __psynch_cvwait
Show Interpreter.cpp
Merge function
Merge node only
Focus on function
Focus on subtree only
Focus on category JavaScript
Collapse function
Collapse XUL
Collapse indirect recursion
Drop samples with this function
Look up the function name on Searchfox
Copy function name
Copy stack

New DevTools performance panel

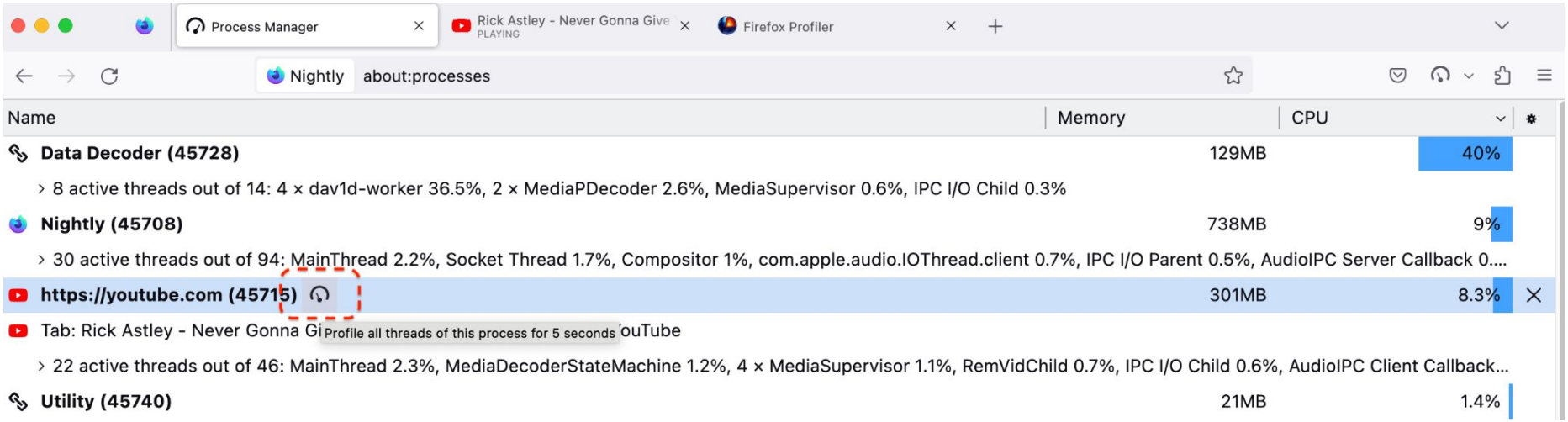


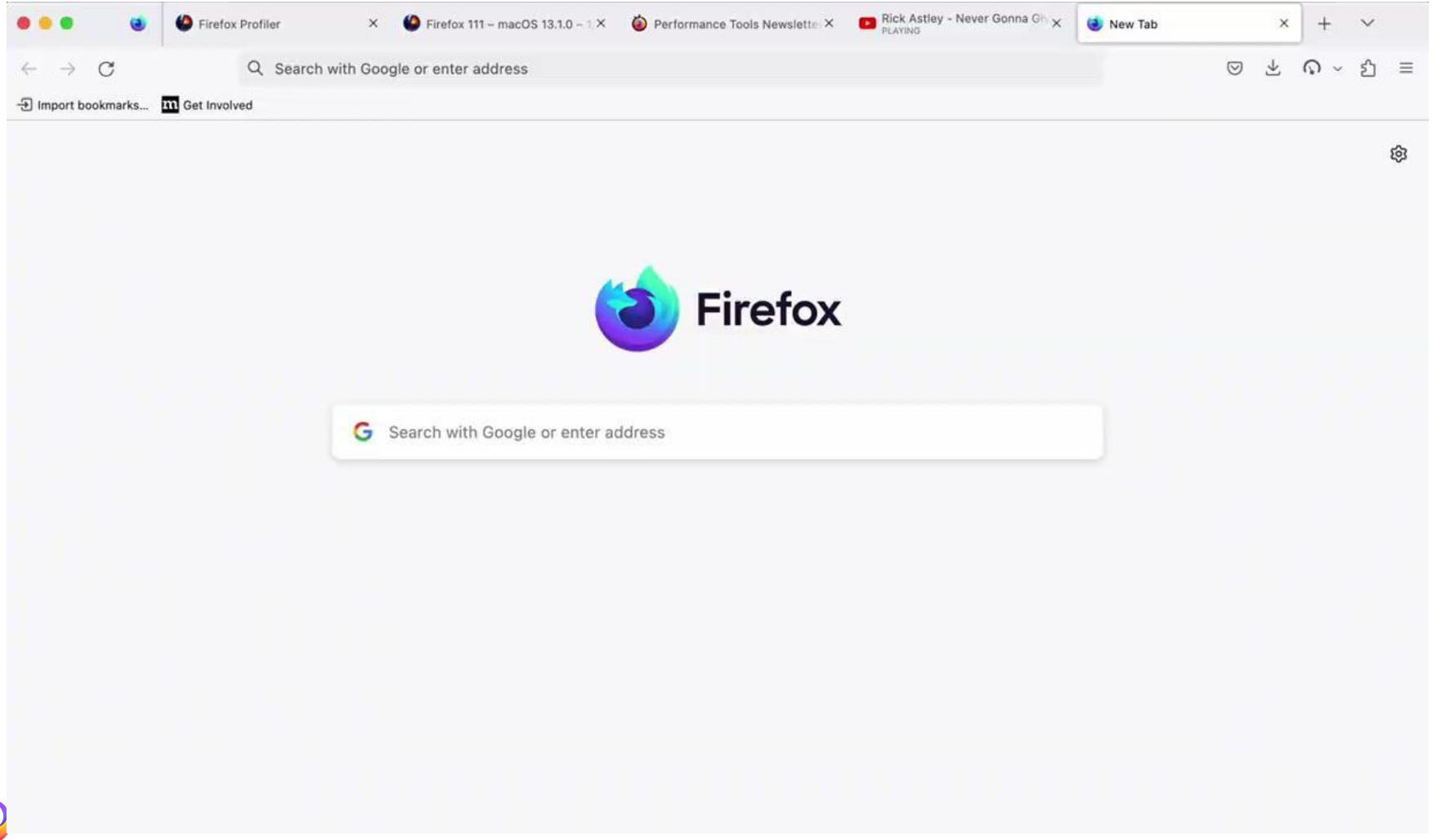
Marker Chart improvements



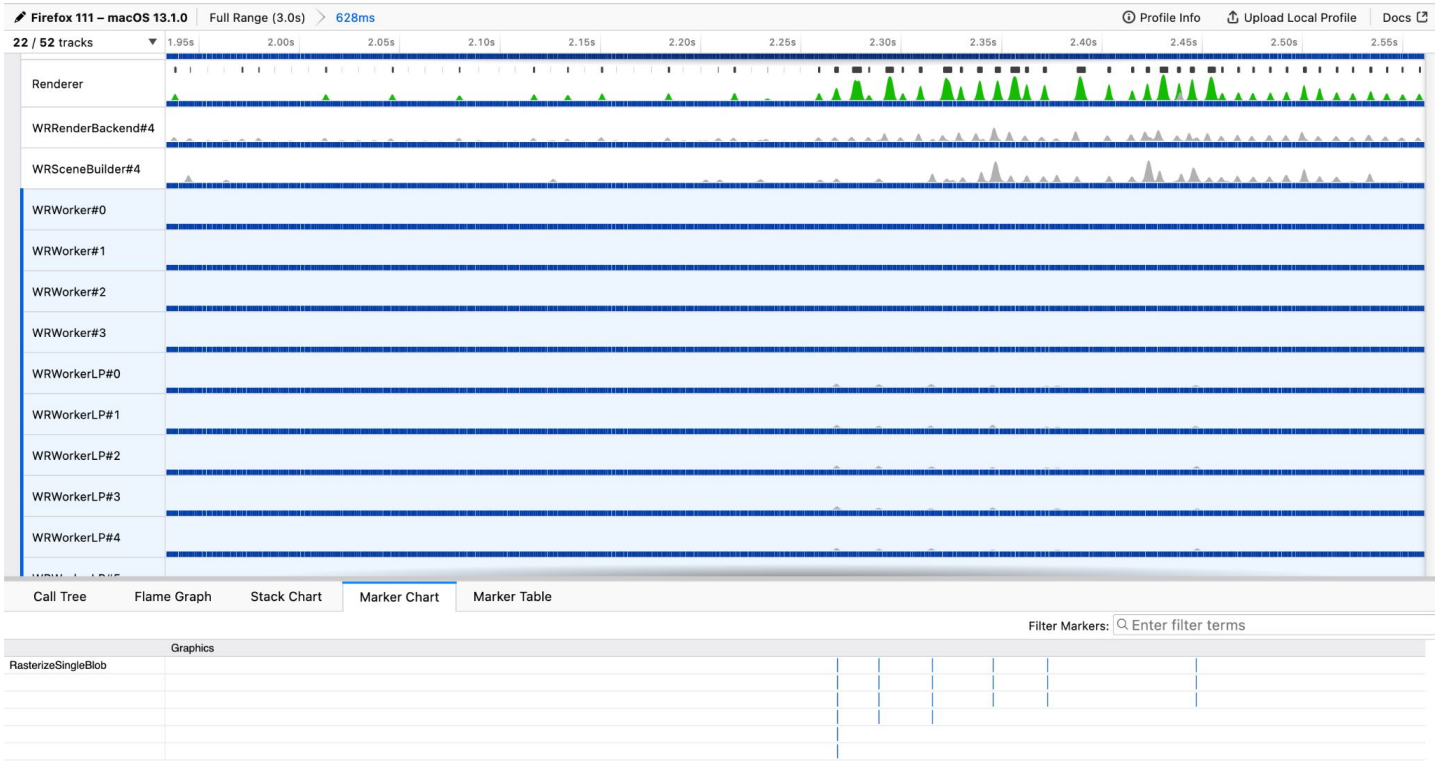

Instant markers
Short interval markers
One longer interval marker

One-click profiling on Task Manager (a.k.a. about:processes)



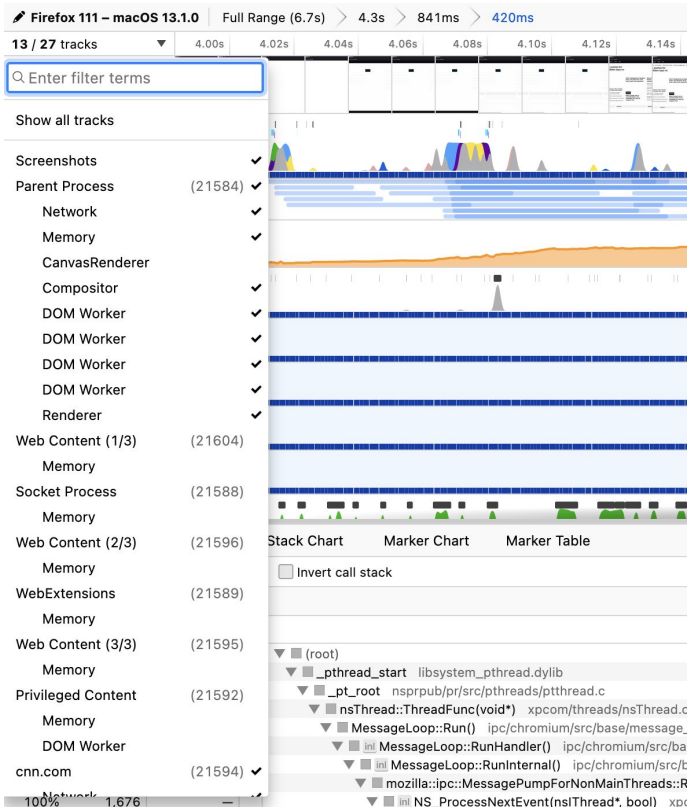

Firefox Profiler
Firefox 111 – macOS 13.1.0 –
Performance Tools Newslette
Rick Astley - Never Gonna Gi
PLAYING
New Tab
Search with Google or enter address
Import bookmarks...
Get Involved
Firefox
Search with Google or enter address

Select multiple tracks

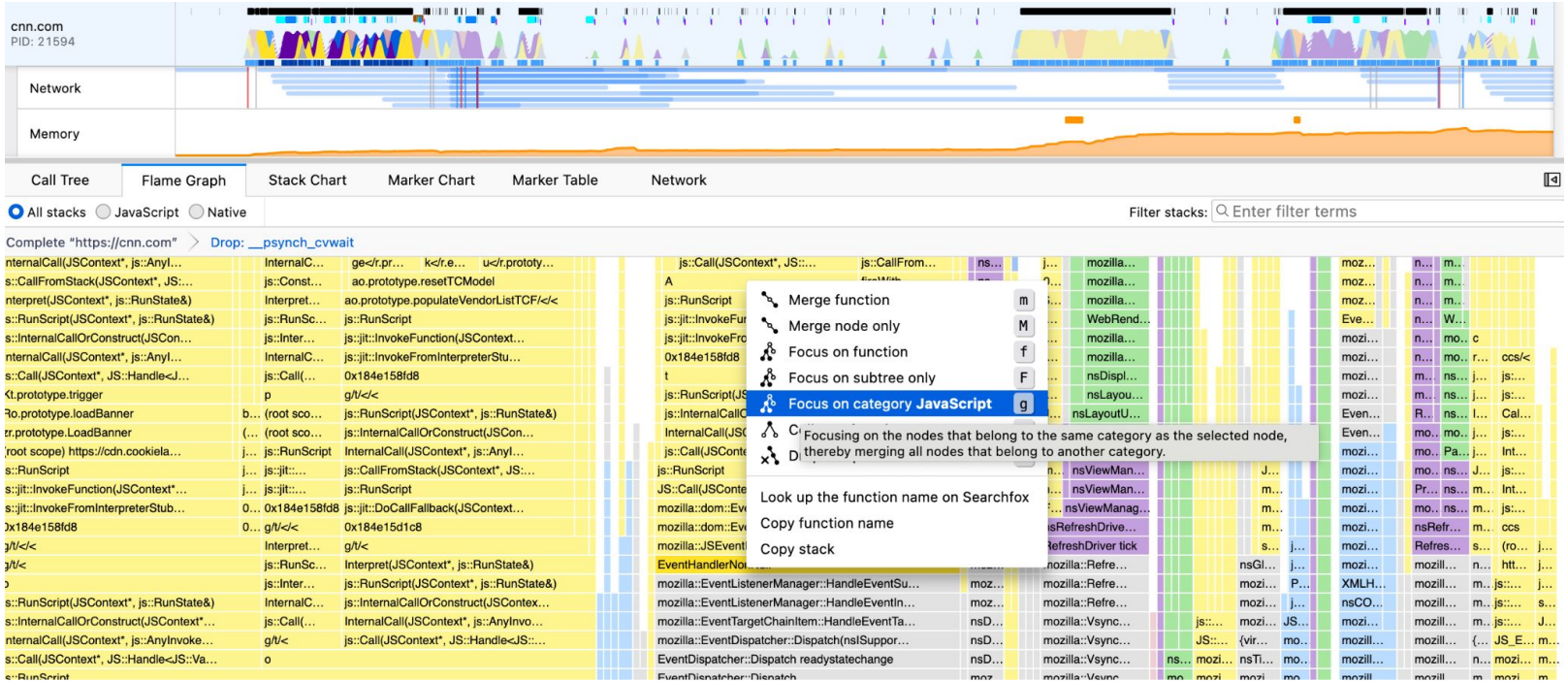


Use CTRL+Click or Shift+Click to select multiple tracks quickly.

Tracks selection list

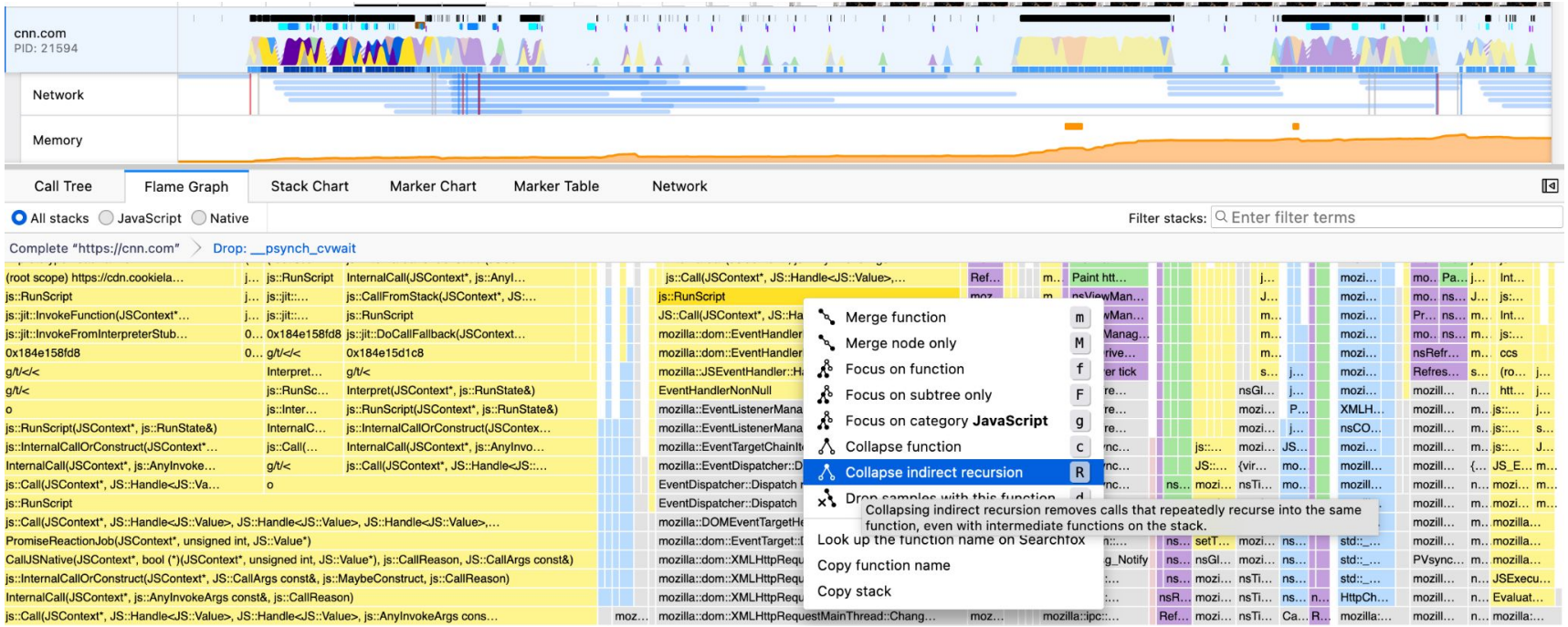


New transform #1: Focus on Category



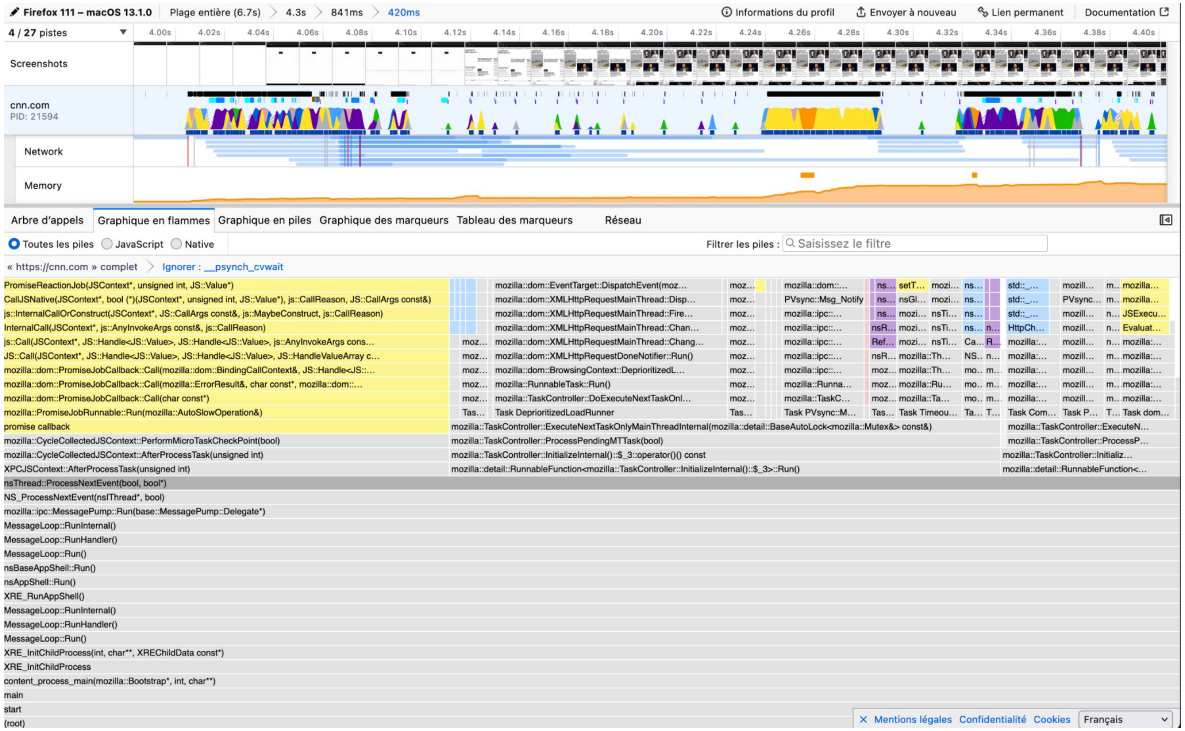
Thanks to our contributor **Johannes Bechberger (SAP)**!

New transform #2: Collapse Indirect Recursion



Thanks to our contributor **Simmo Saan**!

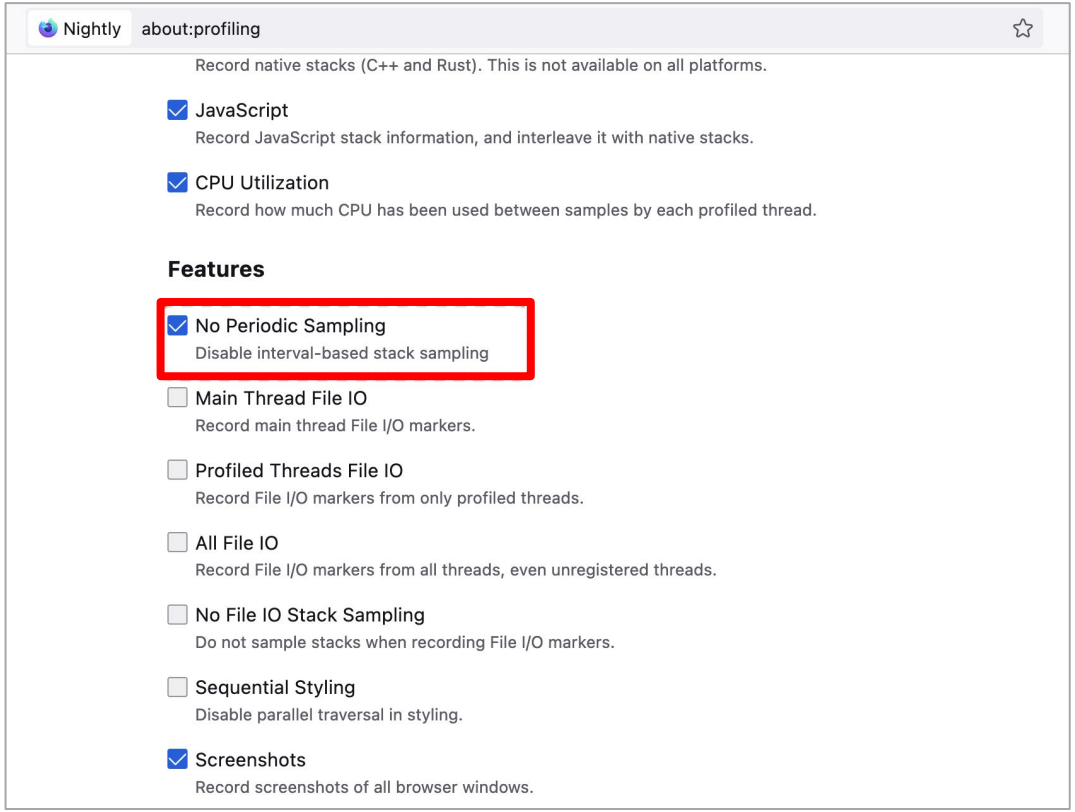
Localization



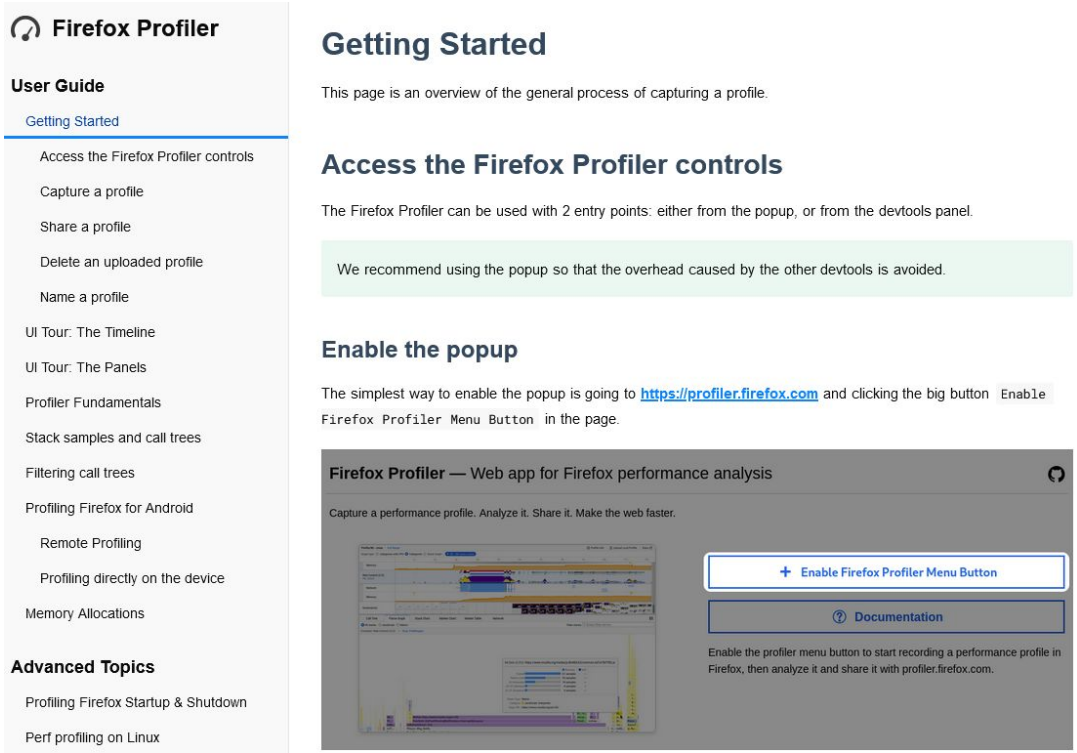
Thanks to our Outreachy intern **Hasna Hena Mow** for her internationalization project!

Locale picker

No periodic stack sampling feature



Documentation



https://profiler.firefox.com/docs/

Thank you!

Firefox Profiler docs:
https://profiler.firefox.com/docs/
Slides:
https://share.firefox.dev/profiler-whatsnew-fosdem-2023
Matrix channel:
https://chat.mozilla.org/#/room/#profiler:mozilla.org