



MOBILE BROWSERS

The Best of Times, the Worst of Times

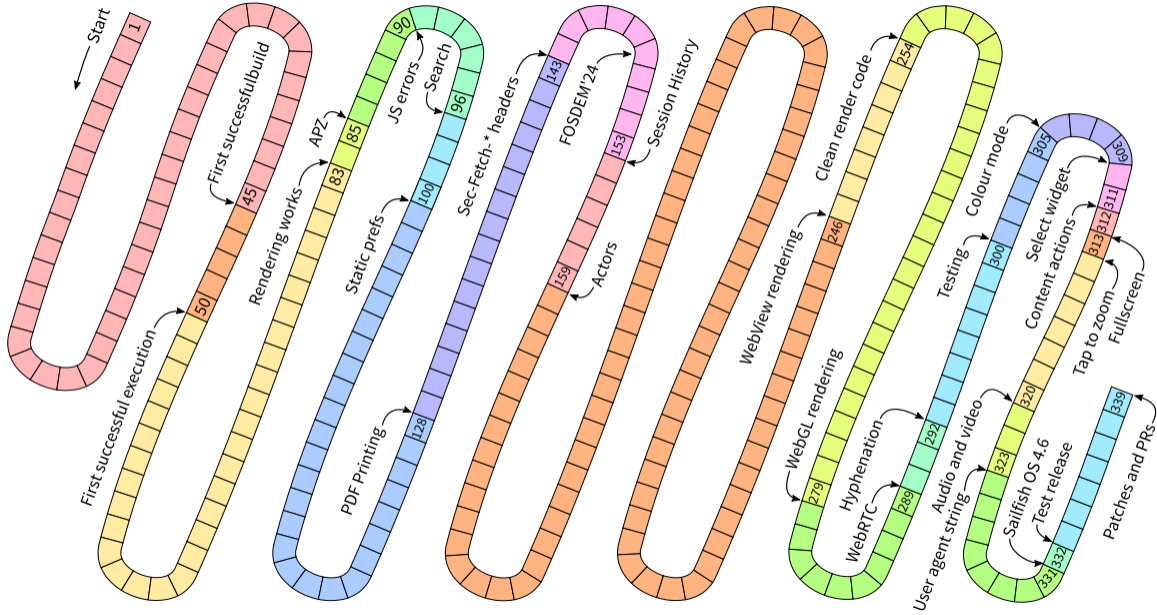
David Llewellyn-Jones
1st February 2025

CONTEXT

1. Presentation at FOSDEM'24
2. Work upgrading the browser on Sailfish OS
3. ESR 78.15.0 to ESR 91.9.1



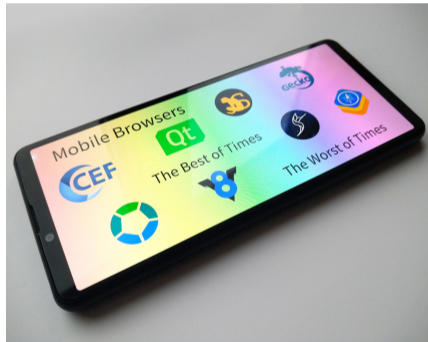
`https://
www.flypig.co.uk
/gecko`



OUR JOURNEY

What can we learn from other distros?

1. Survey the landscape
2. Understand mobile browsers
3. How to improve the ecosystem?



THE BEST OF TIMES

1. Top browser engines are open source and standards compliant
2. Cross-platform development now includes Web
3. Many apps are built on Web technologies
4. For services Websites offer a similar experience to apps



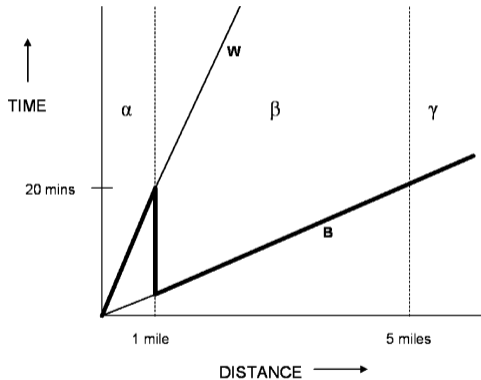
THE WORST OF TIMES

1. Web apps are not designed for tight integration
2. Services often choose a Web-interface over a publicly accessible API
3. Less impetus to develop native alternatives

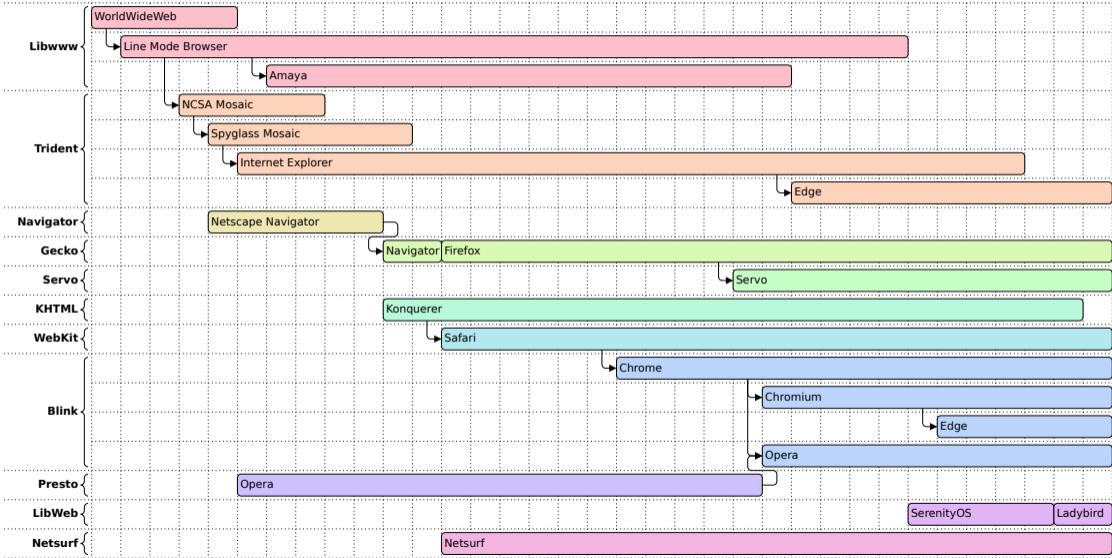


THE REGION-BETA PARADOX

“ *Web apps make the platform daily-usable, while at the same time disincentivising native development.* ”

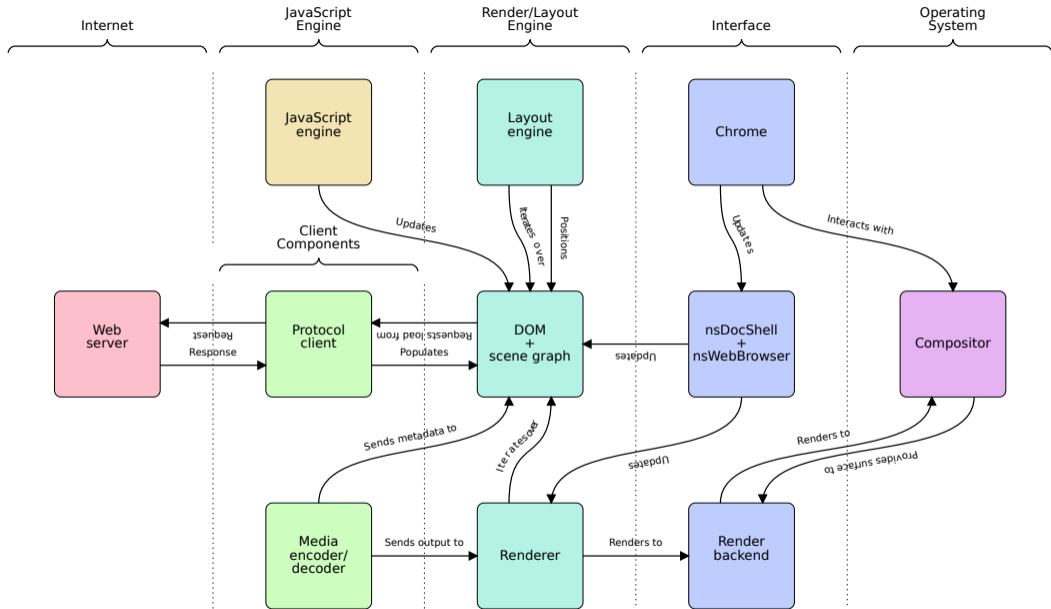


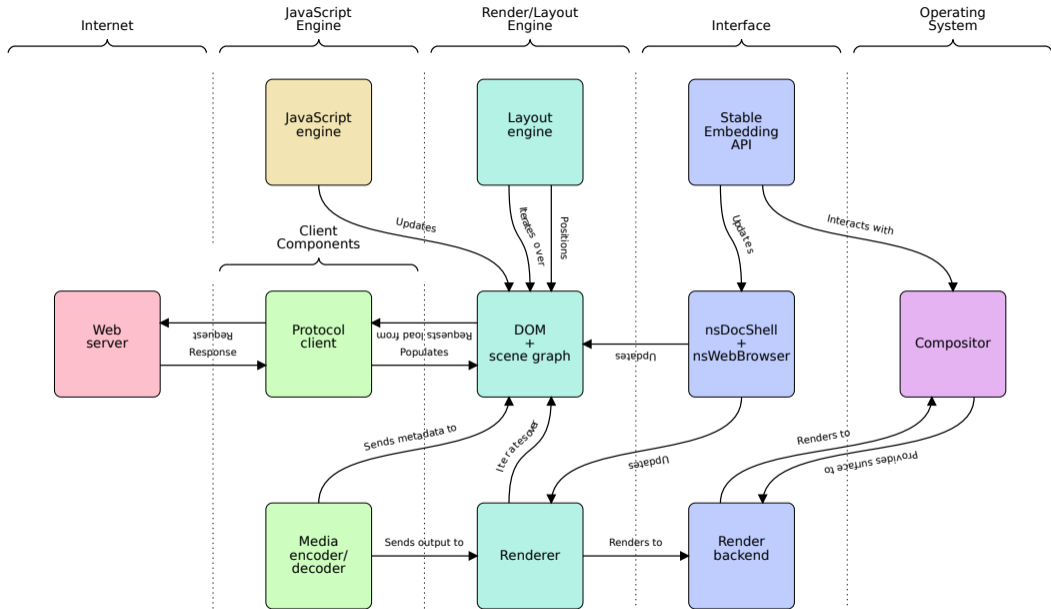
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MOBILE BROWSERS

	Gecko	Webkit	Blink
Phosh	Firefox	Epiphany WebKitGTK	Chromium QtWebEngine
Plasma Mobile			Chromium QtWebEngine Angelfish, Maui-Fiery
Ubuntu Touch		Mimi WPE	Morph, Sapot QtWebEngine
Sailfish OS	Sailfish Browser Sailfish WebView		

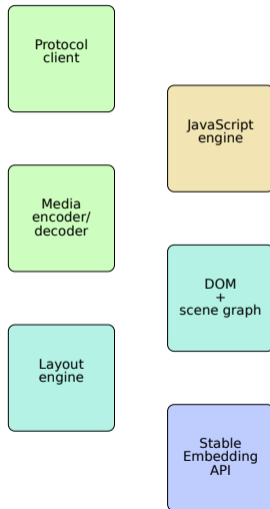




FOUNDATIONS

On mobile, the key components are:

1. Rendering engine
2. JavaScript engine
3. Embedding API
4. *Minimal or no user interface*



EMBEDDED BROWSER LANDSCAPE

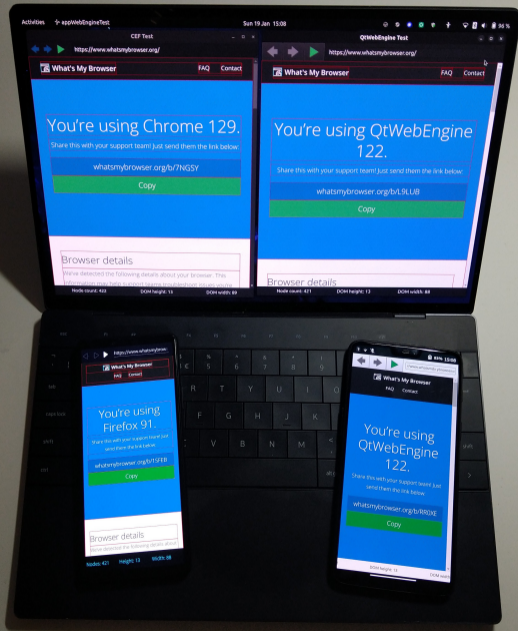
What does “embedded” mean?

1. Resource-constrained devices
2. Embeddable in other programs
3. Minimal user interface

Technologies

1. Blink, V8 – CEF, Electron
2. WebKit, JavaScriptCore - WPE, QtWebEngine
3. Gecko, SpiderMonkey – Sailfish WebView





```

1 function collect_node_stats(global_ctx, local_ctx, node) {
2   // Update the context
3   local_ctx.depth += 1;
4   local_ctx.breadth.push(node.childNodes.length);
5   global_ctx.nodes += 1;
6   global_ctx.maxdepth = Math.max(
7     local_ctx.depth, global_ctx.maxdepth);
8
9   // Recurse into child nodes
10  for (child of node.childNodes) {
11    child_ctx = structuredClone(local_ctx);
12    child_ctx.breadth = local_ctx.breadth.slice(
13      0, local_ctx.depth + 1);
14    child_ctx = collect_node_stats(
15      global_ctx, child_ctx, child);
16
17    // Recalculate the child breadths
18    for (let i = local_ctx.depth + 1;
19         i < child_ctx.breadth.length; ++i) {
20      local_ctx.breadth[i] = (local_ctx.breadth[i]||0)
21        + child_ctx.breadth[i];
22    }
23  }
24
25  // Paint the DOM red
26  if (node.style) {
27    node.style.boxShadow = "inset 0px 0px 1px 0.5px red";
28  }
29
30  // Move back up the tree
31  local_ctx.depth -= 1;
32  return local_ctx;
33 }

```

```

1 function node_stats() {
2   // Data available to all nodes
3   let global_ctx = {
4     "nodes": 0,
5     "maxdepth": 0,
6     "maxbreadth": 0
7   }
8
9   // Data local to the node and shared with the parent
10  let local_ctx = {
11    "depth": 0,
12    "breadth": [1]
13  }
14
15  // Off we go
16  local_ctx = collect_node_stats(
17    global_ctx, local_ctx, document);
18  global_ctx.maxbreadth = Math.max.apply(
19    null, local_ctx.breadth);
20  return global_ctx;
21 }
22
23 // Return the results (only strings allowed)
24 JSON.stringify(node_stats())

```

KEY TAKEAWAYS

Browser embedding frameworks offer similar APIs

1. Settings controller
2. Separate view widgets
3. Web controls (load, forwards, back)
4. JavaScript injection
5. Message passing interface



ACTION

1. Gecko upgrade 91.9.1 to 102.15.1
2. Enhancing mobile-config-firefox
3. Get Sailfishh WebView to latest ESR
4. WebView as a stable embedded API beyond Sailfish OS
5. Demonstrate value of embedded Gecko



FURTHER INFO

Slides source <https://codeberg.org/flypig/fosdem25-mobile-browsers>

Website <https://www.flypig.co.uk>

Embedded expo <https://www.flypig.co.uk/gecko>

Mastodon [@flypig@mastodon.social](https://mastodon.social/@flypig)

Sailfish WebView <https://sailfishos.org/develop/docs/sailfish-components-webview>