Multi-window Web Apps with React

Hello!

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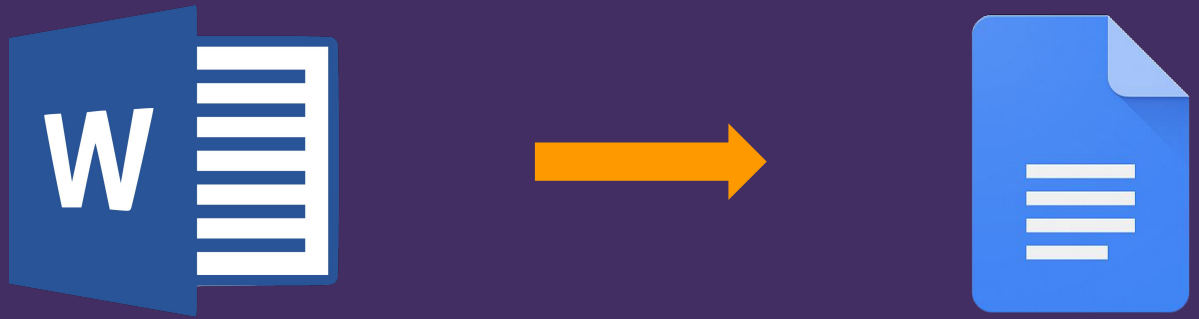
I am a software engineer building cutting-edge tools for Intelligent Retail Lab – Walmart’s in-store AI lab

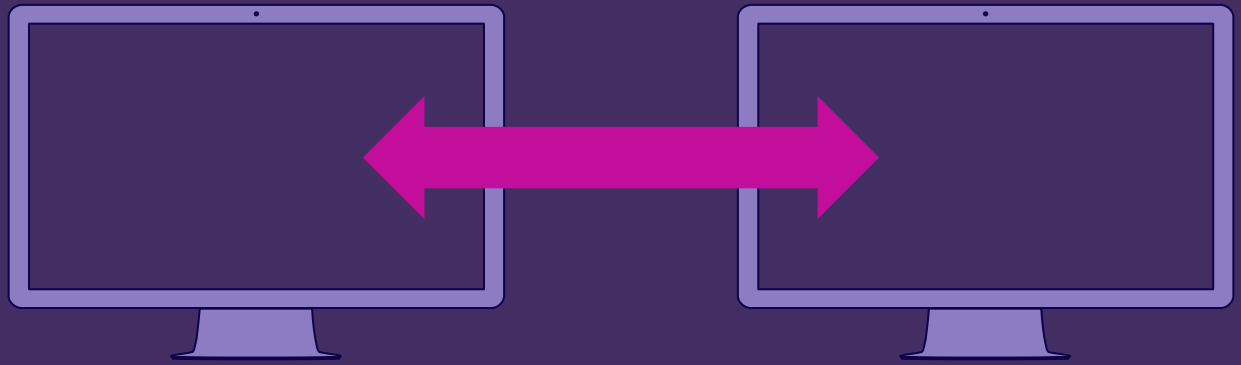
The Web: A Growing Application Platform

- Web apps can do more than ever
- Replacing desktop counterparts in areas



Web APIs: Unlocking Potential

- WebUSB API (Connecting USB devices)
- WebGL (Render interactive 3D graphics)
- Web Assembly (Near-native performance)
- Bluetooth API (Connect to wireless devices)
- Notifications API (Display system notifications)
- Service Workers (Offline usage)



Multi-Window

Enabling seamless communication between multiple windows running the same application

Agenda

- Use cases for multi-window
- Web APIs we might use
- Write a React hook
- Demo the result 🎉

Use Cases

Utilizing multi-window capabilities allows you to create applications that are not confined to a single browser window.

Possible use cases:

- Detect user actions in other tabs
- Know when a user logs into their account in another window/tab
- Instruct a worker to perform some background work
- Share state between multiple windows

Web APIs

1.

window.postmessage()

window.postmessage()

Basic Usage

```
const newWindow = window.open("your-url.com");

// Send message
newWindow.postMessage({ data: "demo" });

// Receive message
function receiveMessage(event) {
  if (event.origin !== "your-url.com") return;

  // handle event.data
}
window.addEventListener("message", receiveMessage);
```

window.postmessage()

Pros

- 98.33% Browser Compatibility
- Can be used cross-origin
- Simple usage

Cons

- Requires a handle to the other window
- Refreshing either window puts them out of sync

2.

SharedWorker

SharedWorker

Basic Usage

```
// Initialize
const worker = new SharedWorker("worker.js");
worker.port.start();

// Send message to work
worker.port.postMessage("message to worker");

// Receive message
worker.port.onmessage = (event) => {
  // Handle event.data
};
```

SharedWorker

Set up shared worker

```
// worker.js
onconnect = (event) => {
  const port = event.ports[0];

  port.addEventListener("message", (e) => {
    // handle e.data

    // Send message to clients
    port.postMessage("message to clients");
  });

  port.start();
};
```

SharedWorker

Pros

- Powerful and robust
- Windows do not have to know about each other

Cons

- Cannot be polyfilled
- 40.50% Browser Compatibility
- Same-origin only
- More complex usage

3.

Broadcast Channel API

Broadcast Channel API

Basic Usage

```
// Initialize
const channel = new BroadcastChannel("myChannel");

// Send message
channel.postMessage("this is a message");

// Receive message
channel.onmessage = (event) => {
  // Handle event.data
};
```

Broadcast Channel API

Pros

- Windows do not have to know about each other
- Can be “polyfilled”
- Simple usage

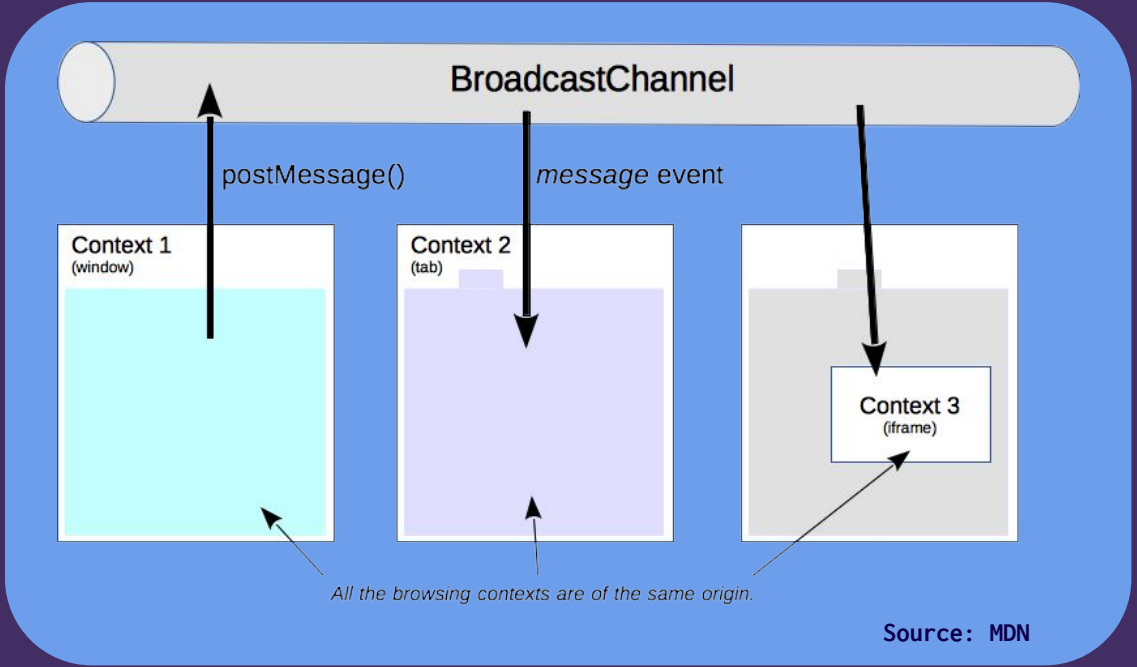
Cons

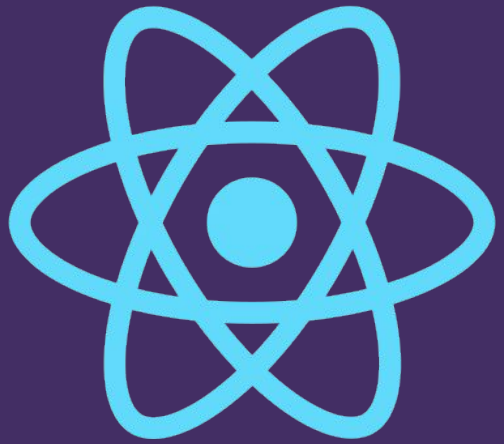
- Same-origin only
- 74.71% Browser Compatibility

Comparison

	window.postmessage	SharedWorker	BroadcastChannel
Ease of use	★★	★	★★★
Robustness	★	★★★	★★
Compatibility	★★★	★	★★

More on Broadcast Channel API





Demo Time

Takeaways

Broadcast Channel API is a simple and effective way to enable seamless communication between browser windows.

Possible use cases:

- Detect user actions in other tabs
- Know when a user logs into their account in another window/tab
- Instruct a worker to perform some background work
- Share state between multiple windows

Thanks!

Any questions?

You can find the slides and code examples at

github.com/blakezimmerman/multi-window-react