If these tabs could talk?

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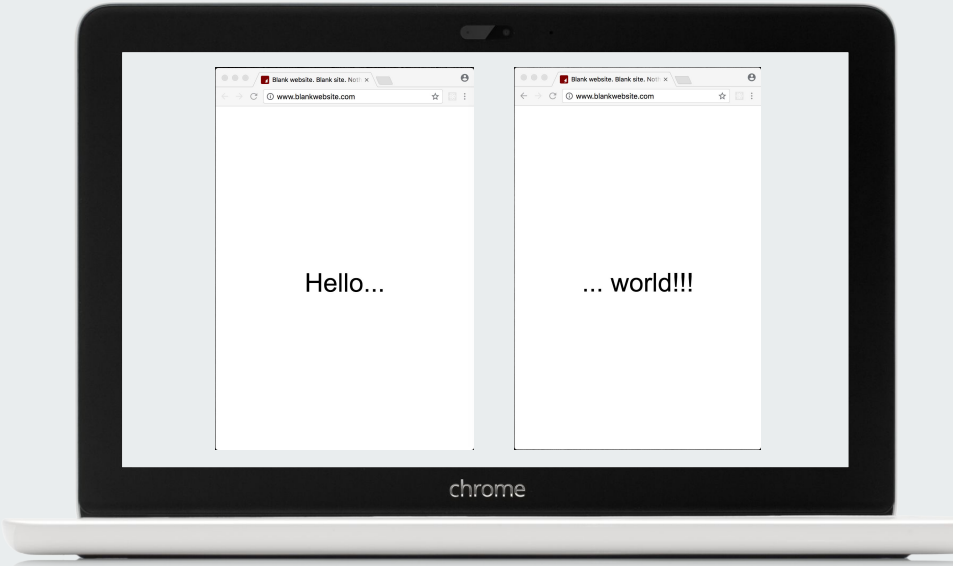
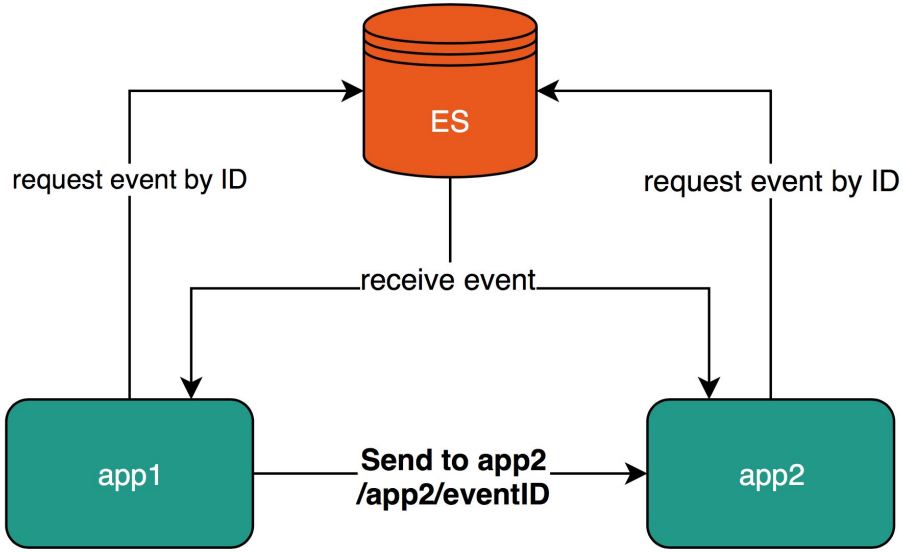
06/21/2018

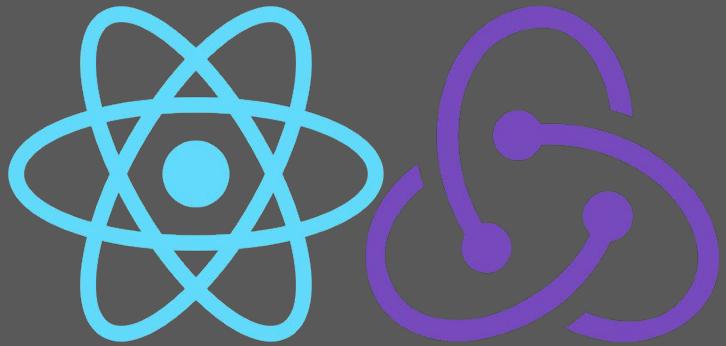


Motivation

- Deep Linking
- Redux and sharing redux state
- No Local Storage



Outline



Redux
- Relation to React
- Actions/Reducers

Redux Middleware
- What and why?
- Examples

Tab Communication
- Implementations
- Web Workers

Redux && Web Workers
- Motivation
- Demo

Redux

Relation to React

Used by React applications to manage state with a single store

- State is read-only… never mutate it
- To update the state, emit objects **(actions)** describing the change
- State is transformed as a result of these actions through pure functions **(reducers)** that return new state

Action (‘type’ is required)

```
{
 type: ADD_TODO,
 text: 'Im a redux action'
}
```

Reducer

```
function todoApp(state = initialState, action) {
 switch (action.type) {
   case ADD_TODO:
     return Object.assign({}, state, {
       text: action.text
     })
   default:
     return state
 }
}
```

Redux Middleware

What is Redux Middleware?

- Extension point between dispatching an action, and the moment it reaches the reducer
- Composable Chain

Why use Redux Middleware?

- Side-effects to any/all actions -- in a singular location
- Triggering an actions from an action (careful here)
- Example use-cases:
  - logging
  - crash reporting
  - async APIs
  - routing

Examples

creating middleware

Middleware to log every action and the resulting state after the action.

```
const logger = store => next => action => {
    console.log('dispatching', action);
    let result = next(action);
    console.log('next state', store.getState());
    return result;
}
```

Examples

creating middleware

Middleware to send metrics to a DB based on different action types.

```
const metricMiddleware = store => next => action => {
   if(action.type.includes('CLICK')) {
      client.click(action);
   }
   if(action.type.includes('ERROR')) {
      client.reportError(action);
   }
   return next(action);
}
```

Examples

applying middleware

applyMiddleware() tells createStore() how to handle middleware

```
import { createStore, applyMiddleware } from 'redux';

const store = createStore(
   reducers,
   applyMiddleware(logger, metricMiddleware)
);
```

Chaining Middleware

The middleware pipeline exactly matches the order that you passed to `applyMiddleware()`. So, in this example:

- calling `store.dispatch()` passes the action to **`logger`**
- when **`logger`** calls `next(action)`, it goes to **`metricMiddleware`**
- when **`metricMiddleware`** calls `next(action)`, it goes to the store and the reducer logic is executed

Tab Communication

Implementations

- Local Storage Events
  - Most browser support
- Broadcast Channel API
  - Easy to use and no worker.js file needed
  - Little browser support -- see caniuse.com
- Shared Web Workers API
  - Reasonable browser support -- see caniuse.com

Shared Web Workers

- Web Workers are a simple means for web content to run scripts in background threads

```
var myWorker = new SharedWorker('/path/to/worker.js');

myWorker.port.start();

myWorker.port.postMessage(“hello world”);

myWorker.port.onmessage = function(e) {
  console.log('Message received from worker -- ', e.data);
}
```

Redux && Web Workers

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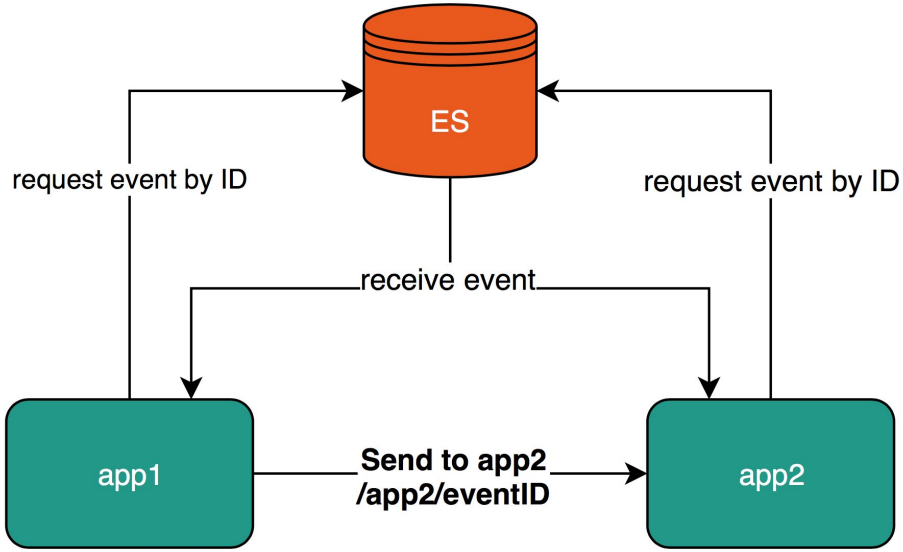

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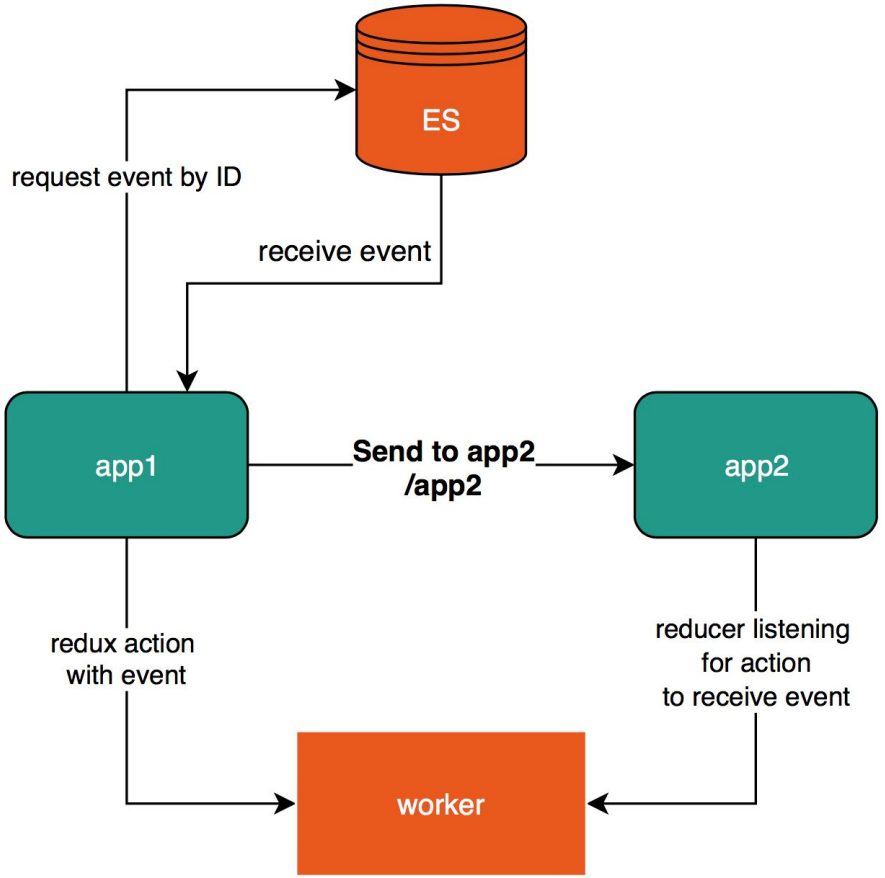

Demo

What next?

- ➔ Find your own use cases for Redux Middleware and create your own!
- ➔ Web Workers can be used in other ways as well
- ➔ If you're interested in other ways we have used Redux Middleware or Web Workers in our applications, feel free to ask! (yes, there is more)
- ➔ You can find the demo source and download/view this presentation here

Questions?

References

redux

redux-logger

web workers

caniuse.com