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Further Topics of Performance Optimization

Hosted by Alex Thalhammer

Outline

1. Don't use Angular resolvers (if you ask me)
2. Smart vs Dumb Components
3. API Architecture
4. RxJS & NgRx
5. Web Workers for heavy calculations
6. Service Worker / PWA
7. Scheduling
8. Building with Nx



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#1: Don't use Angular resolvers

- Better to show the title and everything possible, even just the frame
- Instead use local spinners where data is being loaded

#2: Thought experiment

- What if <flight-card> would handle use case logic?
 - e.g. communicate with API
- Number of requests ==> Performance?
- Traceability?
- Reusability?



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Smart vs. Dumb
Components

#2: Smart vs. Dumb Components

Smart

- Use Case controller
- Container

Dumb

- Independent of Use Case
- Reusable
- Leaf



#3: API Architecture

- Try to minimize API calls
 - E.g. fetch data in list not list item
 - If possible aggregate data in backend, not frontend
- Think about caching API calls
 - If possible, maybe valid for limited time only

#4: Use RxJS & NgRx

- Use RxJS properly
 - Share hot observables where possible
 - Pipe operators
 - Use async pipe
 - Manage subscriptions
- Use State Management (NgRx preferred, else NGXS)
 - By using Redux libraries properly, you can improve its performance, by reducing the number of events that occur during data communication

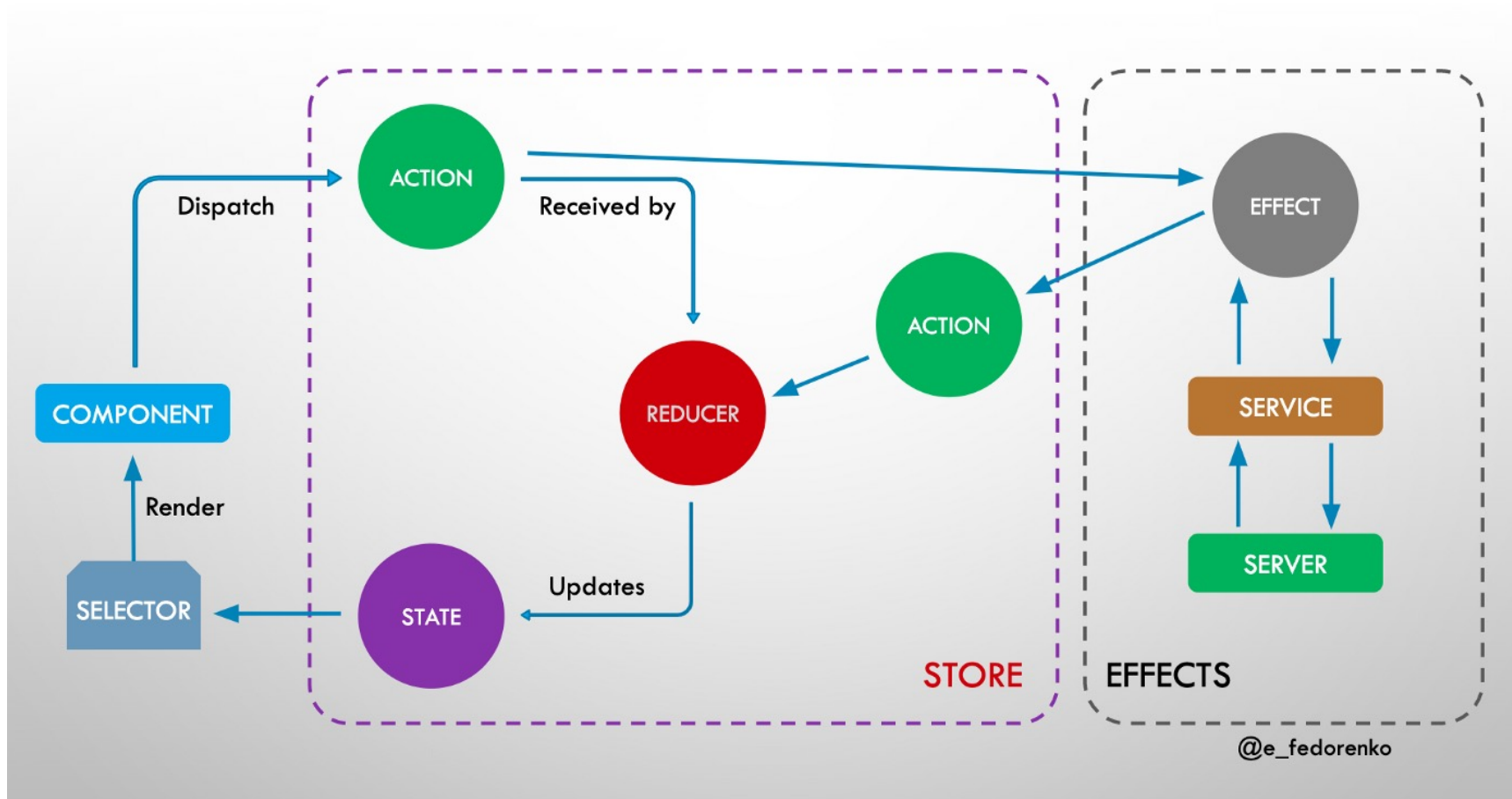


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#4: Use state management (NgRx)



<https://medium.com/angular-in-depth/how-i-wrote-ngrx-store-in-63-lines-of-code-dfe925fe979b>



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#5: Web Workers for heavy calculations

- Problem: JS is single threaded, how to do heavy calculations?
- Solution: Delegate to web worker, it will create a new thread called the Worker Thread that will run a JS script parallel to the main thread

#5: Web Workers – Use cases

- Import external scripts
- Make XMLHttpRequest / API requests
- Use setTimeout() and setInterval()
- Spawn other workers
- Use IndexedDB, Notifications API, Web Crypto API, WebAssembly, WebSockets, WebGL, OffscreenCanvas, ImageData...
- Terminate themselves when you deem they are no longer needed
- ...



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#5: Web Workers – Implementations

- Worklet API
- partytown
- ...



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#6: Service Workers (PWA)

- Proxy or serving HTTP requests
- Background code execution
- Web push notifications
- Process payments
- ...



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#7: Scheduling

- Use `setTimeout()` to delay work
- Use `setInterval()` to invoke tasks continuously
- Don't forget to `clearTimeout()` and `clearInterval()` on destroy



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#8: Building with Nx

- For bigger / enterprise Apps use @nrwl/nx
- Nx is a 3rd party extension for Angular CLI supporting
 - Monorepo workspace
 - Split App(s) into buildable parts / libs
 - Only recompile changed parts (both during serve & build)
 - Possible to have a cloud build cache
 - Other features like
 - Schematics / generators
 - Access restrictions
 - Dependency graph
 - Out-of-the-box support for JEST & Cypress



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Recap

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