ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Further Topics of Performance Optimization

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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

#1: Don't use Angular resolvers

- Better to show the title and everyting 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 (thru a service)
- Number of requests ==> Performance?
- Traceability?
- Reusability?


Smart vs. Dumb
Components

#2: Smart vs. Dumb Components

Smart	Dumb
• Use Case controller • Container	• 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

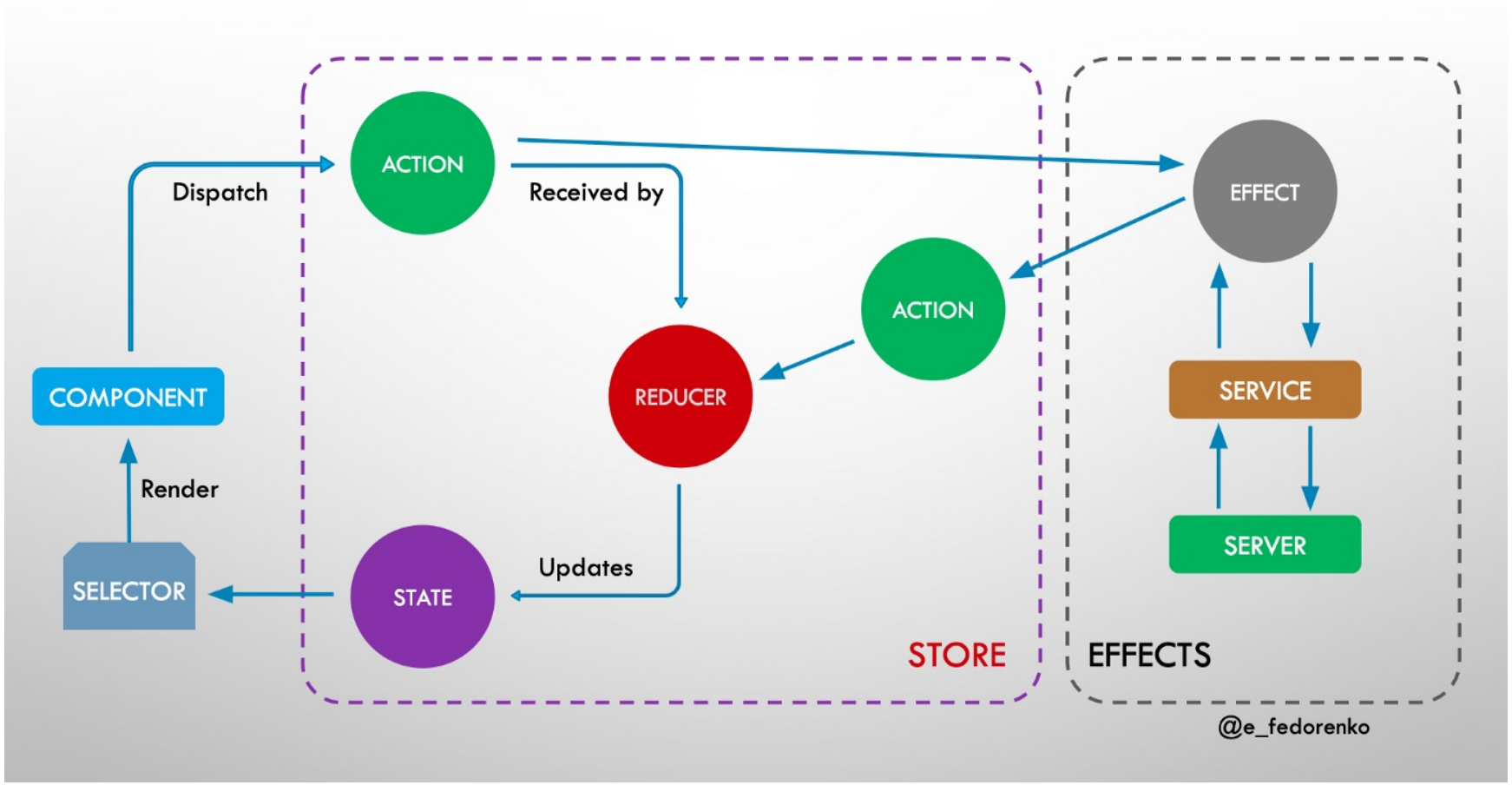
- Think about caching API calls
  - If possible, maybe valid for limited time only

#4: Use RxJS & NgRx

- Use RxJS properly
  - Share hot observables where possible
  - Pipe operaters
  - 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

#4: Use state management (NgRx)



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

#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
- …

#5: Web Workers – Implementations

- Worklet API
- partytown
- …

#6: Service Workers (PWA)

- Proxy or serving HTTP requests
- Background code execution
- Web push notifications
- Process payments
- Handle offline state (no connection)
- …

#7: Scheduling

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

#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
    - Dependy graph
  - Out-of-the-box support for JEST & Cypress

Recap

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