Angular Advanced Module @ngrx/effects

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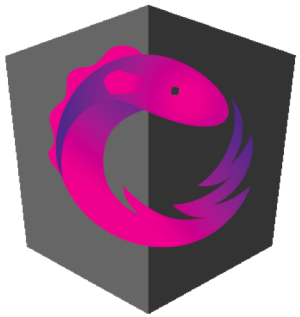
What is @ngrx/effects for?

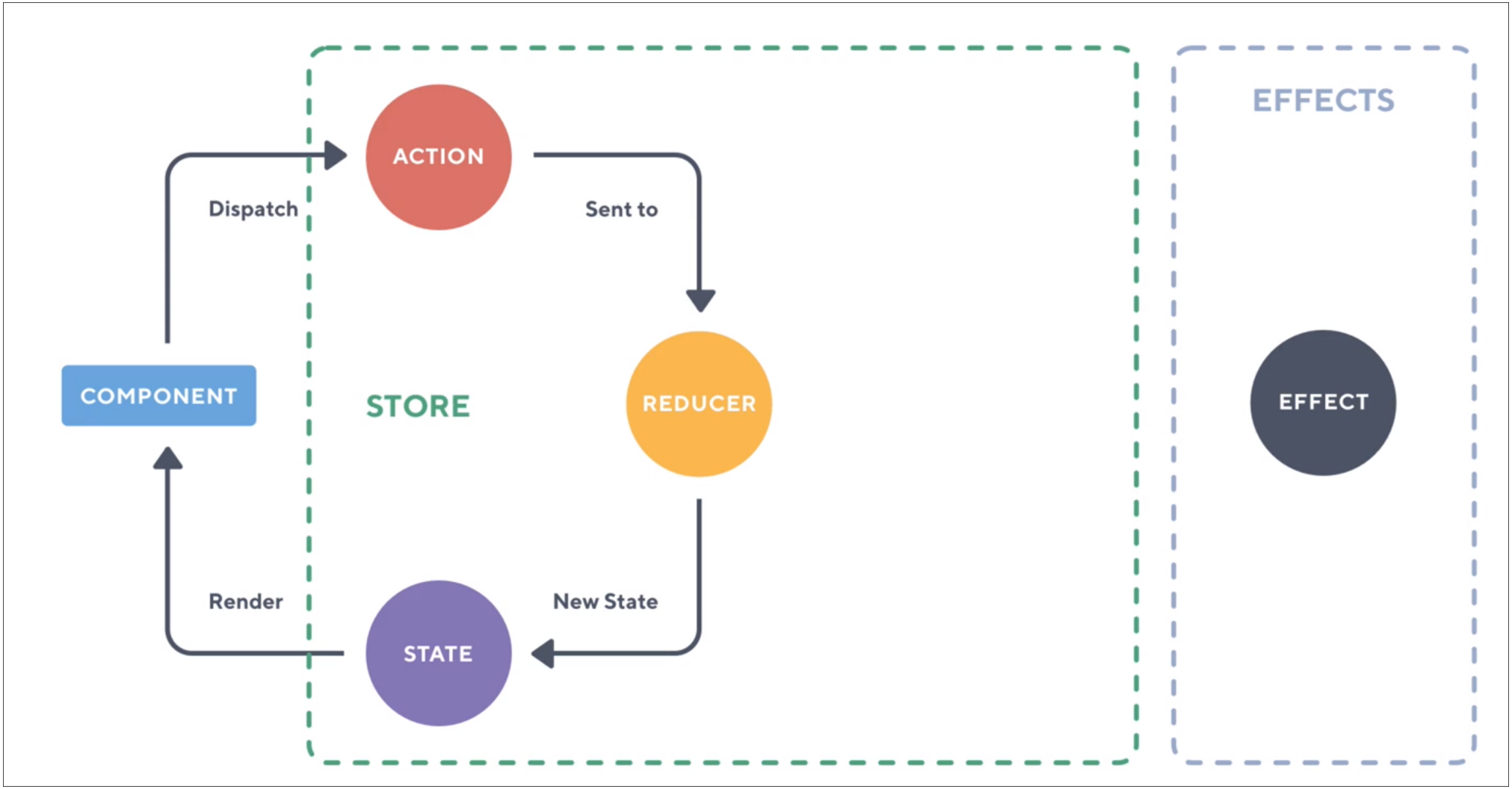
- `@ngrx/effects` provides an API to model event sources as actions. Effects:
  - *Listen* for actions dispatched from `@ngrx/store`
  - *Isolate side effects* from components
  - Provide *new sources* of actions to reduce state based on *external interactions* such as network requests, web socket messages and time-based events.



For Instance (when to use ngrx/effects):

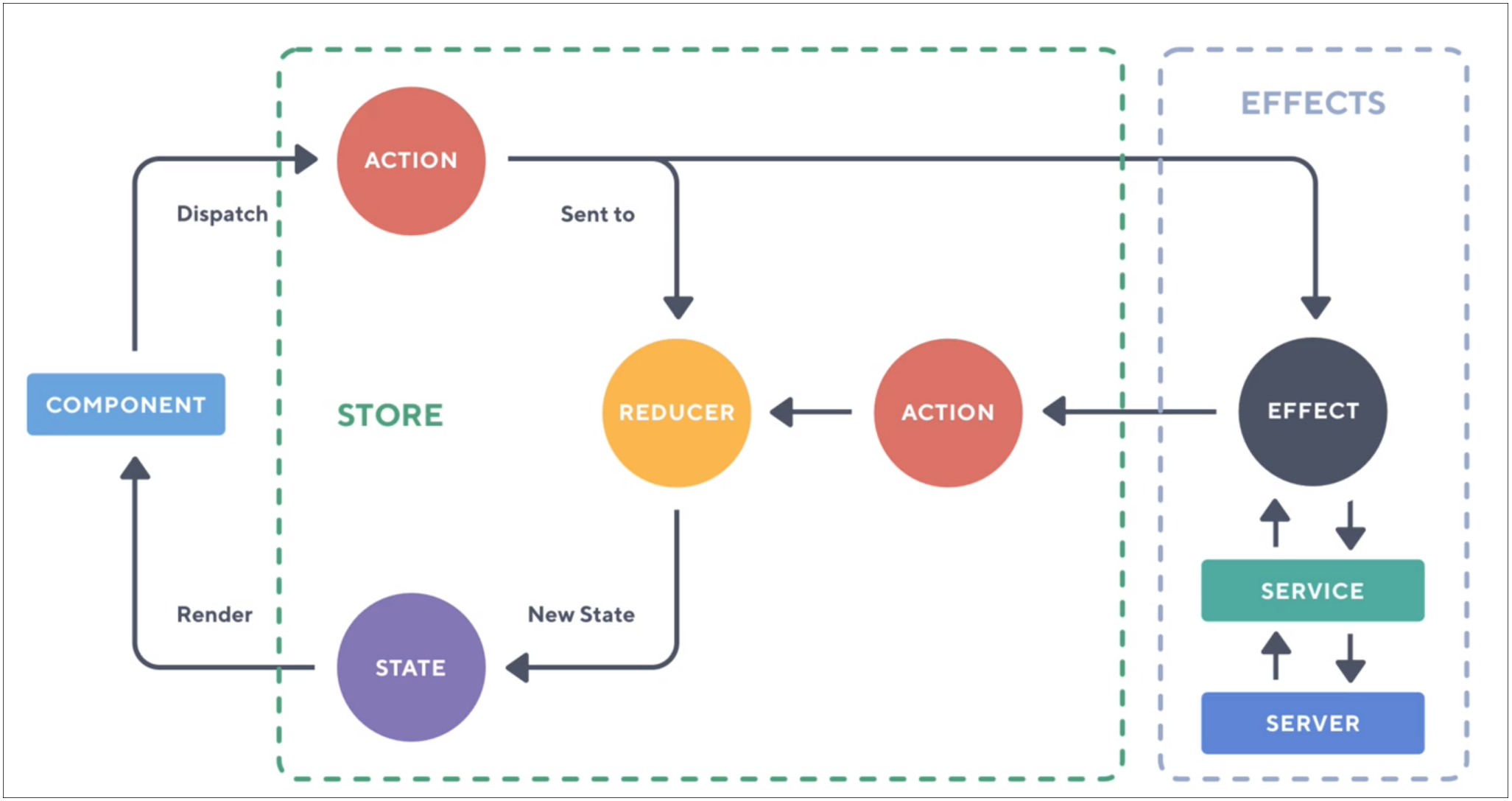
- Talking to a RESTFul server == a side effect with implications on the store.
  - Hence the name, `ngrx/effects`
  - So, it is a side effects model for `ngrx/store`
- Listen for `ngrx/store` actions
- Isolate effects from components and reducers
- Communicate outside of Angular, notify the store when changes are complete
  - Perfect for Asynchrounous operations

Effects flow



https://platform.ultimateangular.com/courses/ngrx-store-effects/lectures/3919211

Effects flow



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So, an effect...

1. Listens to store `Actions`.
    - YOU define which action an effect listens to
2. Performs an action (such as talking to a webserver)
3. Dispatches the result to the reducer as a new `Action`.
4. The reducer in turn updates the store/state

Adding @ngrx/effects

```
npm install @ngrx/effects --save
```

OR

```
yarn add @ngrx/effects
```

Adding effects to the module

- Import `EffectsModule` from `@ngrx/effects`
- Use `EffectsModule.forRoot()` for root module
- Use `EffectsModule.forFeature()` for feature module

```
// Effects
import {EffectsModule} from '@ngrx/effects';

// exported effects from general index file
import { effects } from './effects/index';

@NgModule({
   …
   imports      : [
      …
      EffectsModule.forRoot(effects),    // array of effects
   ],
   …
})
export class AppModule {
}
```

Export all effects from index.ts file

Not necessary – but seen often: export all files from a folder from an index.ts-file

```
// effects/index.ts, export everything from this folder
// TODO: add extra/new effects to this file to auto-export them
import {CitiesEffects} from './citiesEffects';

export const effects: any[] = [CitiesEffects];

export * from './citiesEffects';
```

Example effect - /230-store-effects

```
import {Injectable} from '@angular/core';
import {Actions, Effect} from '@ngrx/effects';
import {CityService} from '../services/city.service';

import * as cityActions from '../actions/cities.actions'
import {map, switchMap, catchError} from 'rxjs/operators';

@Injectable()
export class CitiesEffects {
   constructor(private action$: Actions,
               private cityService: CityService) {
   }

   @Effect()
   loadCities$ = this.action$.ofType(cityActions.LOAD_CITIES_EFFECT)  // 1. Receive action from dis
      .pipe
         switchMap(() => {
            return this.cityService.loadCitiesViaEffect()            // 2. Talk to API
               .pipe(
                  map(cities => new cityActions.LoadCities(cities)), // 3. Dispatch new action
                  catchError(err => {
                     console.log(err);
                     throw err.json();           // 4. Optional (but best practice): catch errors
                   })
               )
         })
      )
```

Difference with service-based approach

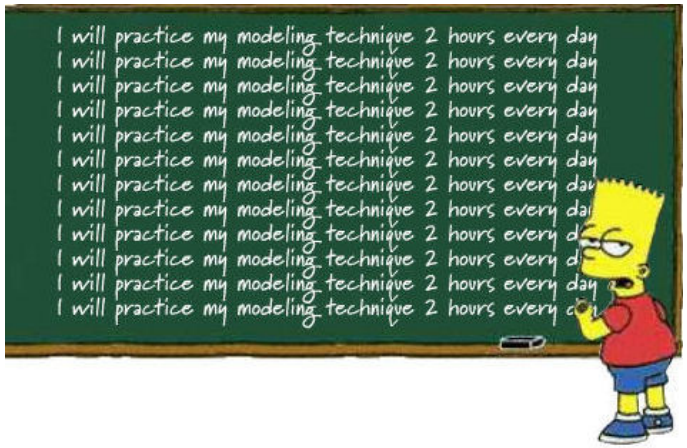
- The Service *does not* subscribe.
- Instead it just fetches content from an URL and returns it to the effect
- …which in turn dispatches a new Action to update the store.

```
loadCitiesViaEffect() {
   return this.http.get(BASE_URL).pipe(
      tap(res => console.log('just received', res))
   ).pipe(
      catchError(err => {
         console.log(err);
         throw err.json();
      })
   )
}
```

Workshop

- Start from `/230-ngrx-store-effect`
  - Use `cities.json`, or another `.json`-file you create yourself
  - Implement the `@Effect()`'s for Adding and Removing a city

- OR: Create a blank project:
  - Add `@ngrx/effects` to the project and to the module
  - Create an `@Effect()` to load an external resource (your `.json`-file)
  - Notify the store once the resource is loaded and update the UI.



Don’t always use switchMap()

https://twitter.com/victorsavkin/status/963490147328290816

More info on @ngrx/effects

- https://github.com/ngrx/platform/blob/master/docs/effects/README.md
- https://www.youtube.com/watch?v=f97ICOaekNU
- https://angular-2-training-book.rangle.io/handout/state-management/ngrx/side_effects.html