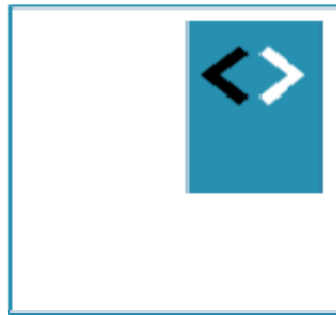


Angular Advanced @ngrx/store – Action Creators



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State & Store abstraction

Abstracting actions, using models, services and interfaces

OLD way: (V2.0.0) define actions in an object

```
// city.actions.ts
```

```
// An object, holding all possible actions on the store
```

```
export const ACTIONS = {  
  ADD_CITY    : 'ADD_CITY',  
  REMOVE_CITY: 'REMOVE_CITY',  
  EDIT_CITY   : 'EDIT_CITY'  
};
```

```
addCity(city: HTMLInputElement) {  
  // add city to store  
  this.store.dispatch({type: ACTIONS.ADD_CITY, payload: city.value});  
  city.value = '';  
}
```



Create City Model & AppState interface

- This is not mandatory, but gives you better type checking

```
export class City {  
  constructor(public id: number      = -1,  
               public name: string    = 'unknown',  
               public province: string = 'unknown',  
               public inhabitants?: number) {  
  
  }  
}
```

```
//appstate.ts  
import {City} from './city.model';  
  
export interface AppState{  
  cities: City[]  
}
```

Use a service as a middle man

By using a service, we can abstract `Http` later on and we don't have our components talking directly to the `Store` or `Http`.

```
// city.service.ts
@Injectable()
export class CityService {
  cities: Observable<City[]>;


  constructor(private store: Store<AppState>) {
    this.cities = this.store.select(s => s.cities);
  }
}
```

V2.0.0: combine reducers to AppReducer


- Often, you'll have multiple reducers in your application
- Combine them into a single reducer using `combineReducers`.
- This allows for picking the reducer you need in any given situation
- You can't initialize the store with multiple reducers. If you have more, you need to combine them into a single reducer.
- See also this blog by Kwinten Pisman:
<https://blog.kwintemp.com/combinereducers-enhanced/>

example appReducer

// appReducer, combine reducers to be supplied in app.module.ts.

```
export function appReducer(state: AppState, action: Action) : AppState{  
  const reducer = combineReducers({   
    cities: citiesReducer,  
    selectedCity: selectedCityReducer  
  });  
  return reducer(state, action);  
}
```

```
export interface AppState{  
  cities: City[];  
  selectedCity: City;  
}
```

```
@NgModule({  
  ...,  
  imports      : [  
    BrowserModule,  
    StoreModule.provideStore(appReducer)   
  ],  
  ...  
})
```

“Making an interface for the application state really helped me to understand how reducers fit into the application. In our **AppState** interface, you can see that we are dealing with a single object that has an **cities** collection and a **selectedCity** property which holds a single **City** object.

If we needed to add additional functionality, the store would just expand with new key value pairs to accommodate the updated model.”

Using the AppState from the store

Subscribe to particular reducer, for instance

```
this.selectedCity$ = this.store.select(s => s.selectedCity)
```

This is the same as:

```
this.selectedCity$ = this.store.select('selectedCity')
```

The screenshot displays a web application interface with two main sections: 'List of cities' and 'Selected City'.

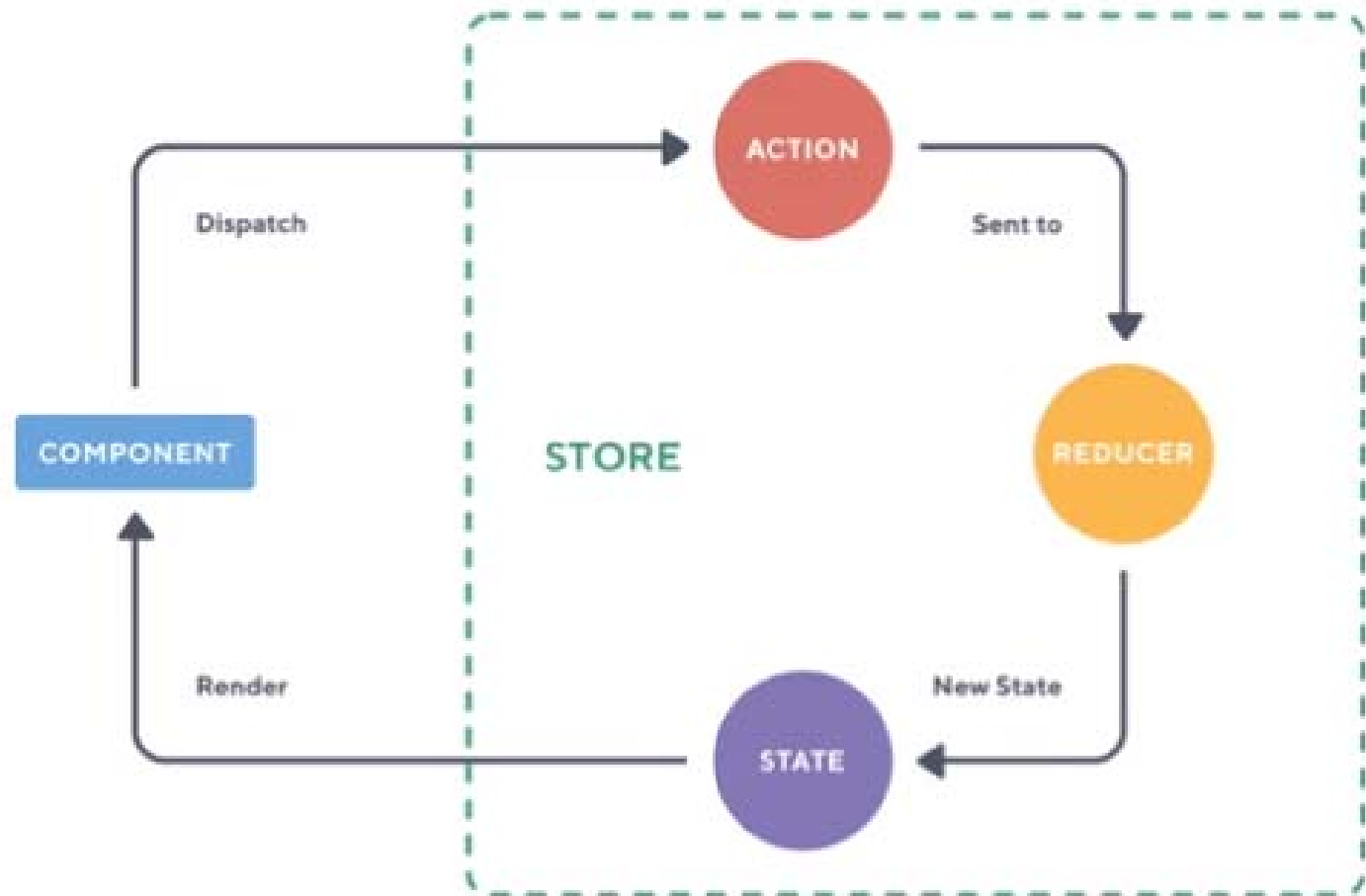
List of cities: This section contains three input fields for 'city name...', 'province...', and 'inhabitants...'. Below these is a blue 'Add city' button. A table lists five cities, each with a red 'Remove' button:

1 - Dieren	Remove
2 - Amsterdam	Remove
3 - New York	Remove
4 - Tokyo	Remove
5 - Breda	Remove

Selected City: This section displays details for 'New York' in a light gray box. It shows 'Province: NY' and 'Population: 4500000'. A blue 'Clear' button is located at the bottom of this section.

REDUX ARCHITECTURE

One-way dataflow



<https://platform.ultimateangular.com/courses/ngrx-store-effects/lectures/3788532>



Action Creators

Store V4.0.0 and up: create constants and classes for actions

Step 1 – create the Action Constants

- Create Constants for Actions...
 - a) to produce more readable output
 - b) Benefit from static typing

```
// counter.action.ts  
// import Action interface for static typing later on  
import {Action} from '@ngrx/store';  
  
// *** Action constants  
// These are the strings for the action  
export const INCREMENT = '[COUNTER] - increment';  
export const DECREMENT = '[COUNTER] - decrement';  
export const RESET = '[COUNTER] - reset';
```

Action Creators

- Create a class for each action...
 - Which implements `Action`
 - Defines a `type` property with the constant of your choice
 - In the constructor you define your own, optional `payload` property

```
// *** Action Creators  
  
export class CounterIncrement implements Action {  
  readonly type = INCREMENT;  
  constructor(public payload?: number) {}  
}
```

You now can define a specific type for every `payload`

Export type

- Not mandatory, but seen very often (and considered best practice):
 - Export a new type `All` or `YourNameAction`, of the types you just created.
 - Again, gives you nice intellisense and type safety in the reducers

```
//export action types, so they can be used in the reducers  
export type CounterActions = CounterIncrement | CounterDecrement | CounterReset;
```

```
//OR: simply call the type All:  
export type All = CounterIncrement | CounterDecrement | CounterReset;
```

Step 2 – create reducers to use the Actions

- Optional
 - Create constants for `initialState`
 - and for the type that the reducer returns (in this case a `number`, but it can be a custom object or `interface`)

// counter.ts - a simple reducer, now with abstracted Counter Actions

```
import * as fromActions from '../actions/couter.actions';
```

// Optional: create initial State.

```
export const initialState: number = 0;
```

// Optional: create an interface as the return type for the reducer.

```
export interface counterState{
```

```
}
```

Build the reducer

- Create switch statement to manipulate the state

```
// counter.ts
export function counterReducer(state = initialState,
                              action: fromActions.CounterAction): counterState {
  switch (action.type) {
    case fromActions.INCREMENT:
      return action.payload ? state + action.payload : state + 1;

    case fromActions.DECREMENT:
      return state - 1;

    case fromActions.RESET:
      return 0;

    default:
      return state;
  }
}
```


Edit the Component

```
// app.component.ts
```

```
...
import {AppState} from './appState';
import * as fromActions from './actions/couter.actions';

...
export class AppComponent implements OnInit {
  counter$: Observable<number>;

  constructor(private store: Store<AppState>) {}

  ngOnInit() {
    this.counter$ = this.store.select('counter');
  }

  increment() {
    this.store.dispatch(new fromActions.CounterIncrement());
  }

  decrement() {
    this.store.dispatch(new fromActions.CounterDecrement());
  }

  reset() {
    this.store.dispatch(new fromActions.CounterReset());
  }

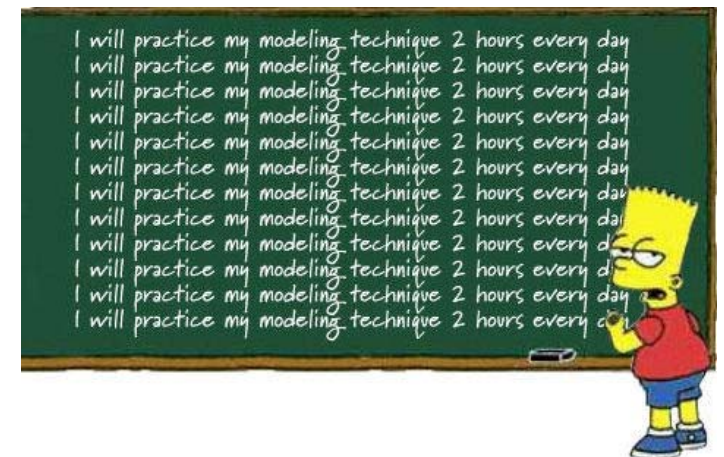
  // Add a specific number to the counter in the store
  addNumber(txtNumber: string) {
    this.store.dispatch(new fromActions.CounterIncrement(+txtNumber));
  }
}
```

New instance of Action
Creator class

With optional
payload

Workshop

- Start from `../202-ngrx-action-creators`
- Create your own Action Creator. Goal: multiply the current counter with a given number, typed in a textbox
 - Edit `counter.action.ts`
 - Edit `couter.reducer.ts`
 - Edit component so the user can type a multiplier in a textbox, which is handled by dispatching a new action to the reducer.



More info

The screenshot shows a Medium article page. On the left is a dark sidebar with the author's profile: Todd Motto, Developer, blogger, course maker, with 38.3K followers. The main header has a search bar and navigation links for Angular, NGRX, TypeScript, AngularJS, and JavaScript. The article title is 'NGRX Store: Actions versus Action Creators', tagged in NGRX, dated Dec 16, 2017, 10 mins read, by Todd Motto. The article text discusses Redux actions and TypeScript. A quote from Jules Kremer is featured on the right, and a photo of a man at a conference is at the bottom right.

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NGRX Store: Actions versus Action Creators

Tagged in NGRX • Dec 16, 2017 • 10 mins read • by Todd Motto

Actions in the Redux paradigm are the initiators of the one-way dataflow process for state management. Once an action is triggered, or rather dispatched, the process is kicked off for new state to be composed - which is typically composed by the payload we sent through our dispatched action. What we want to learn is how to properly create, structure, and use actions to our full advantage with NGRX Store and TypeScript.

Typical redux patterns used to created actions come in the form of plain objects, or pure function wrappers that act as action creators. However by adding Typescript, we see even more benefit at hand when it comes to using classes to compose actions. So, let's take a dive into actions and how we can maintain a

There's no place like Ultimate Angular - I can't think of training I trust more to be accurate and promote best practices.

Jules Kremer
Angular Developer Relations, Google

Telerik

<https://toddmotto.com/ngrx-store-actions-versus-action-creators>

Action reducers

Provide the `ActionReducerMap<T>` with your reducer map for added type checking.

```
import { ActionReducerMap } from '@ngrx/store';
import * as fromAuth from './auth';

export interface State {
  auth: fromAuth.State;
}

export const reducers: ActionReducerMap<State> = {
  auth: fromAuth.reducer
};
```

Typed Actions

Use strongly typed actions to take advantage of TypeScript's compile-time checking.

```
// counter.actions.ts
import { Action } from '@ngrx/store';

export enum CounterActionTypes {
  INCREMENT = '[Counter] Increment',
  DECREMENT = '[Counter] Decrement',
  RESET = '[Counter] Reset'
}

export class Increment implements Action {
  readonly type = CounterActionTypes.INCREMENT;
}

export class Decrement implements Action {
```

<https://github.com/ngrx/platform/blob/master/docs/store/actions.md#action-reducers>