Testing with Mock Store in NgRx v10

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Scuba Diver

When I was learning to test with NgRx...

State

Store Module

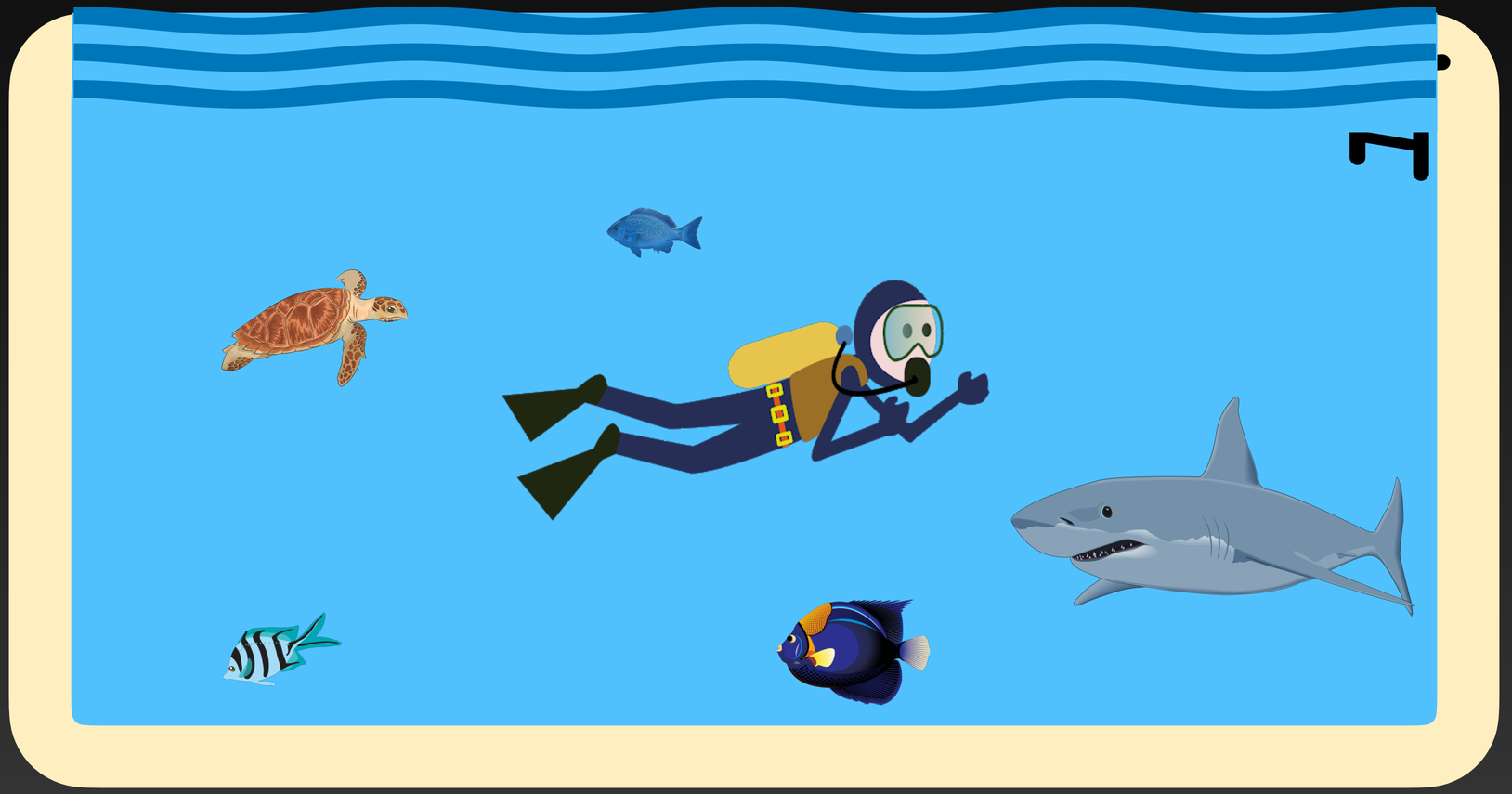
Reducers

Effects

Selectors

Component

When I was learning to scuba dive...

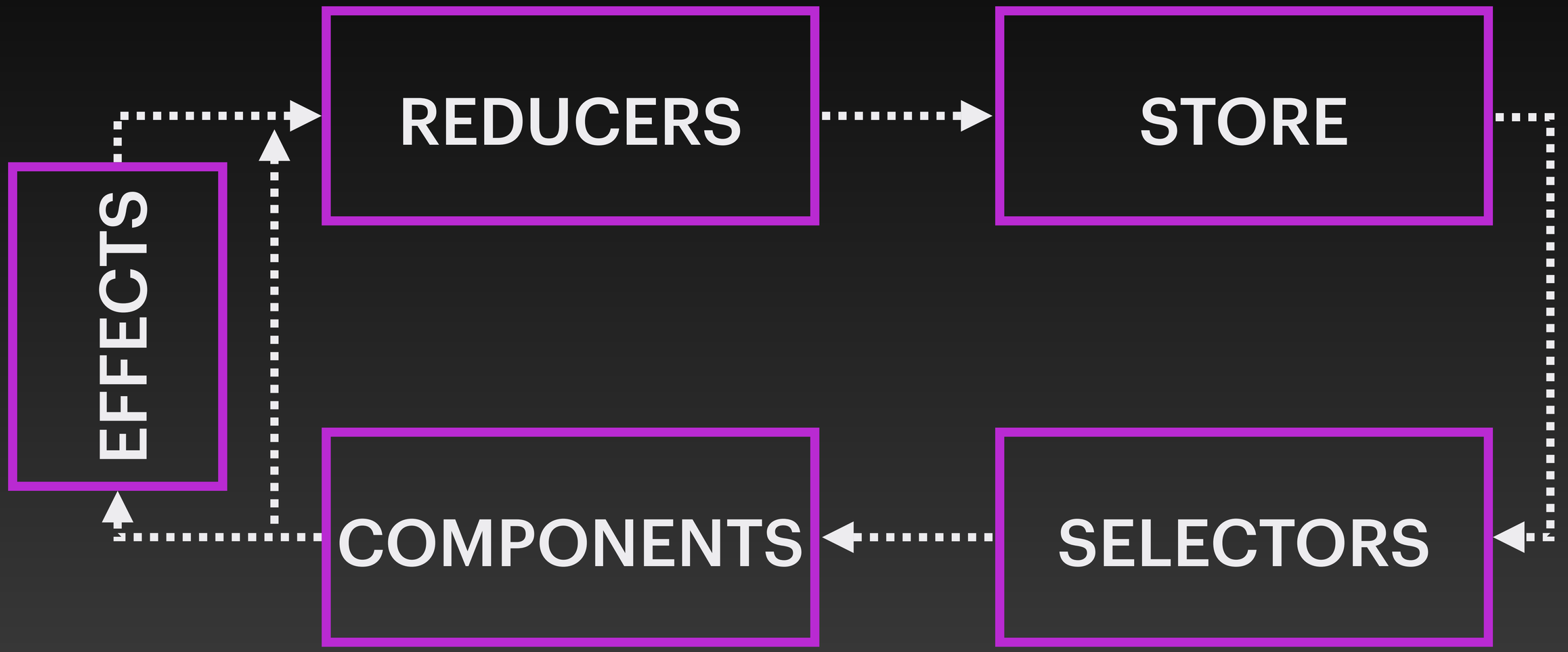


Agenda

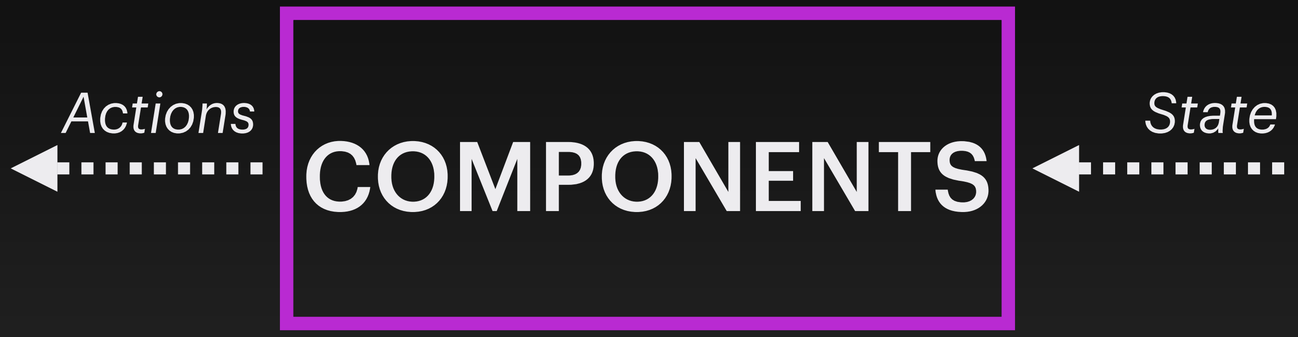
- Testing Angular classes that inject the NgRx Store
- Unit testing in NgRx v6
- Mock Store in NgRx v7
- Mock Selectors in NgRx v8
- Examples updated for latest NgRx

```
class AngularClass {
    constructor(ngrxStore: Store) { }
}
```

NgRx State Data Flow



Unit Testing



Unit Testing Goal:

- Condition mock state to assert component behavior
- Validate that actions are dispatched appropriately

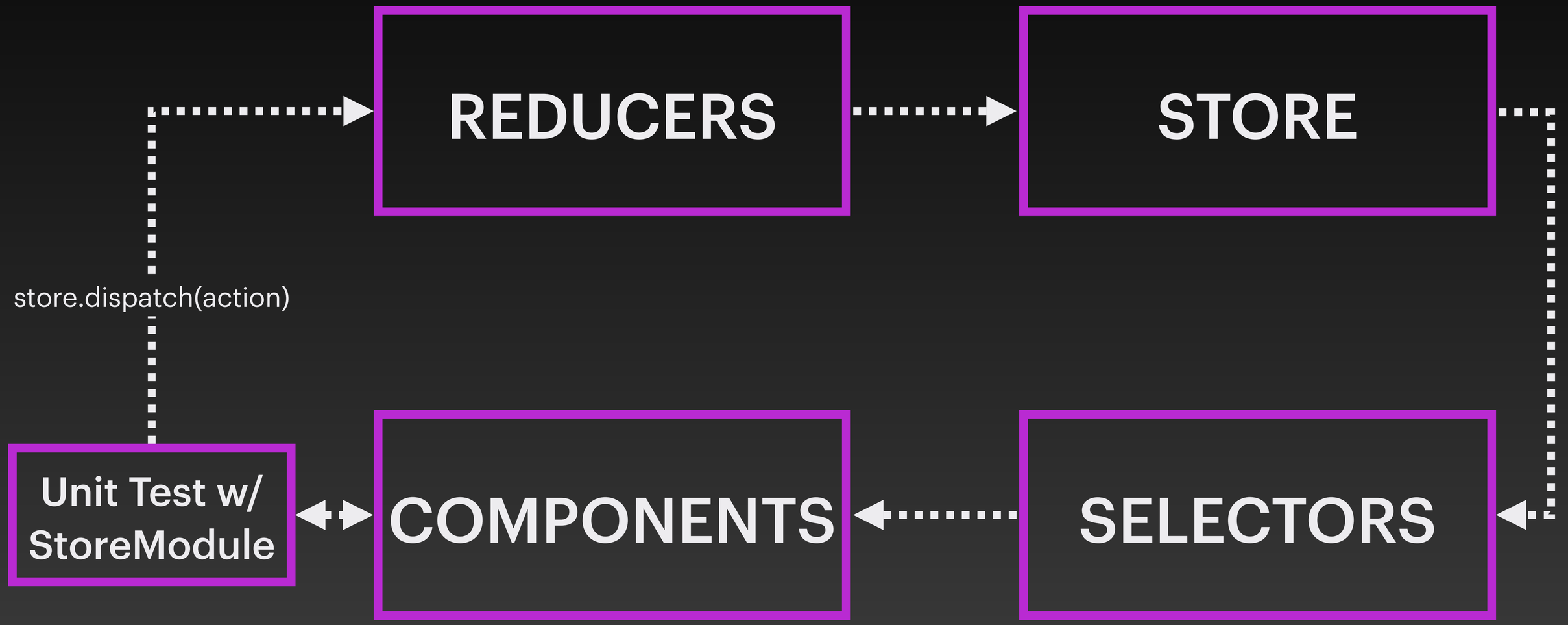
Documentation in NgRx v6:

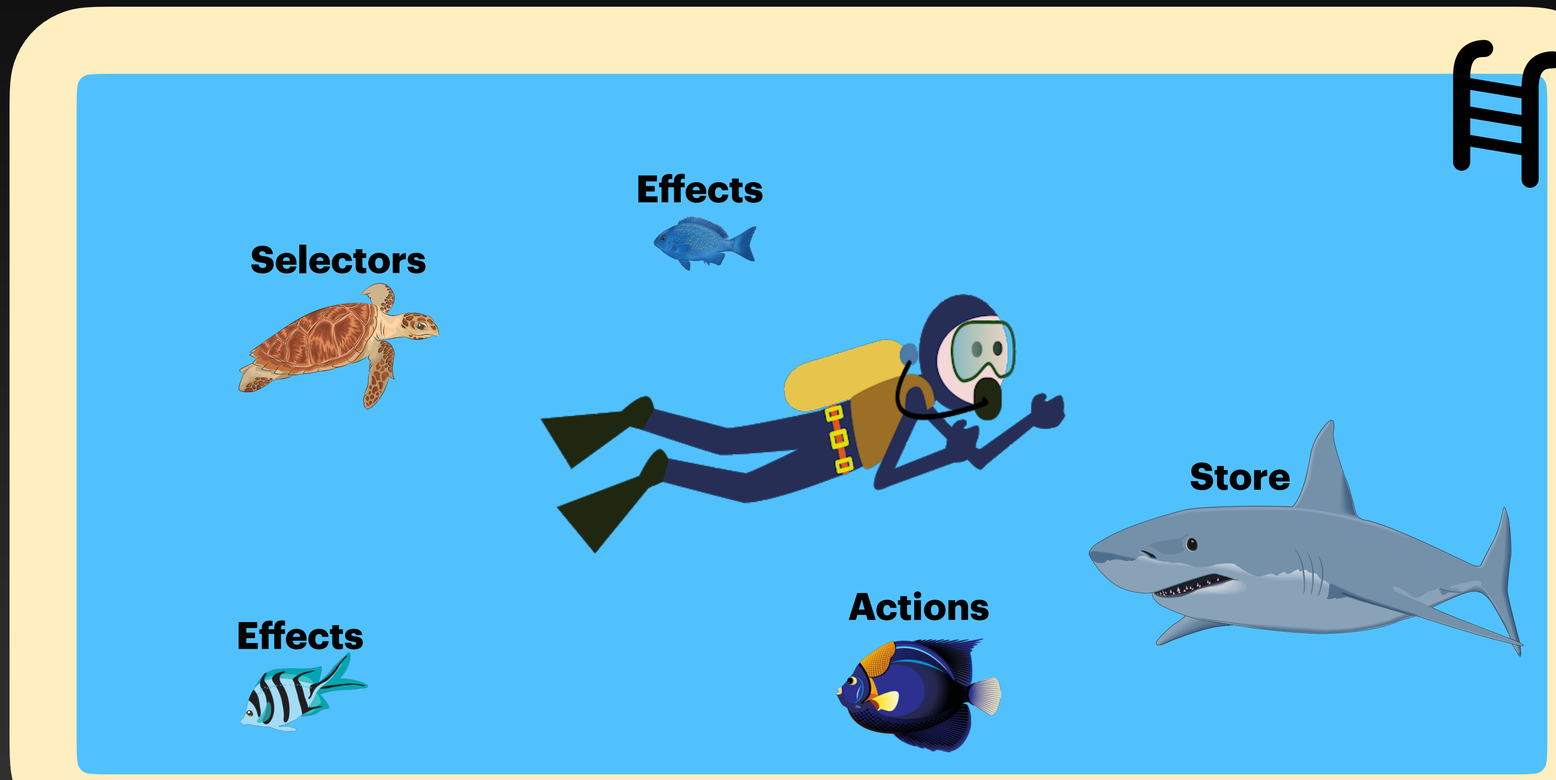
1. Import StoreModule in testing module
2. Dispatch sequence of actions to condition state

Unit Testing in NgRx v6

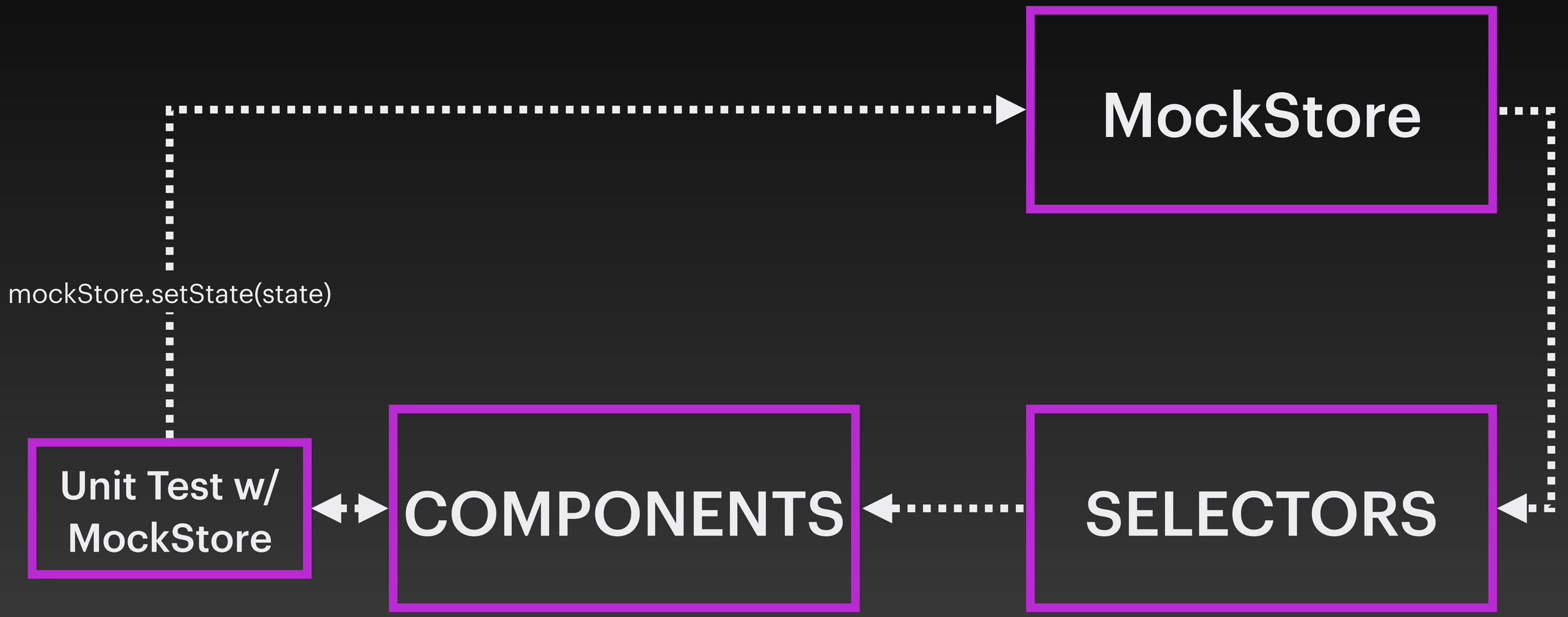
```
TestBed.configureTestingModule({
    // ...
    imports: [ StoreModule.forRoot({ feature: featureReducer }) ]
});

it('should display a list of all items after the data is loaded', () => {
    store.dispatch(loadSaleItemsSuccess({ items: [1, 2, 3] }));
    store.dispatch(loadClearanceItemsSuccess({ items: [1, 2, 3] }));
    store.dispatch(loadNewItemsSuccess({ items: [1, 2, 3] }));
    // ...

    component.allItems$.subscribe(allItems =>
        expect(allItems.length).toBe(6)
    );
});
```

Unit Testing in NgRx v6




Effects
Selectors
Store
Actions
Effects

Unit Testing in NgRx v7



import { MockStore } from '@ngrx/store/testing'

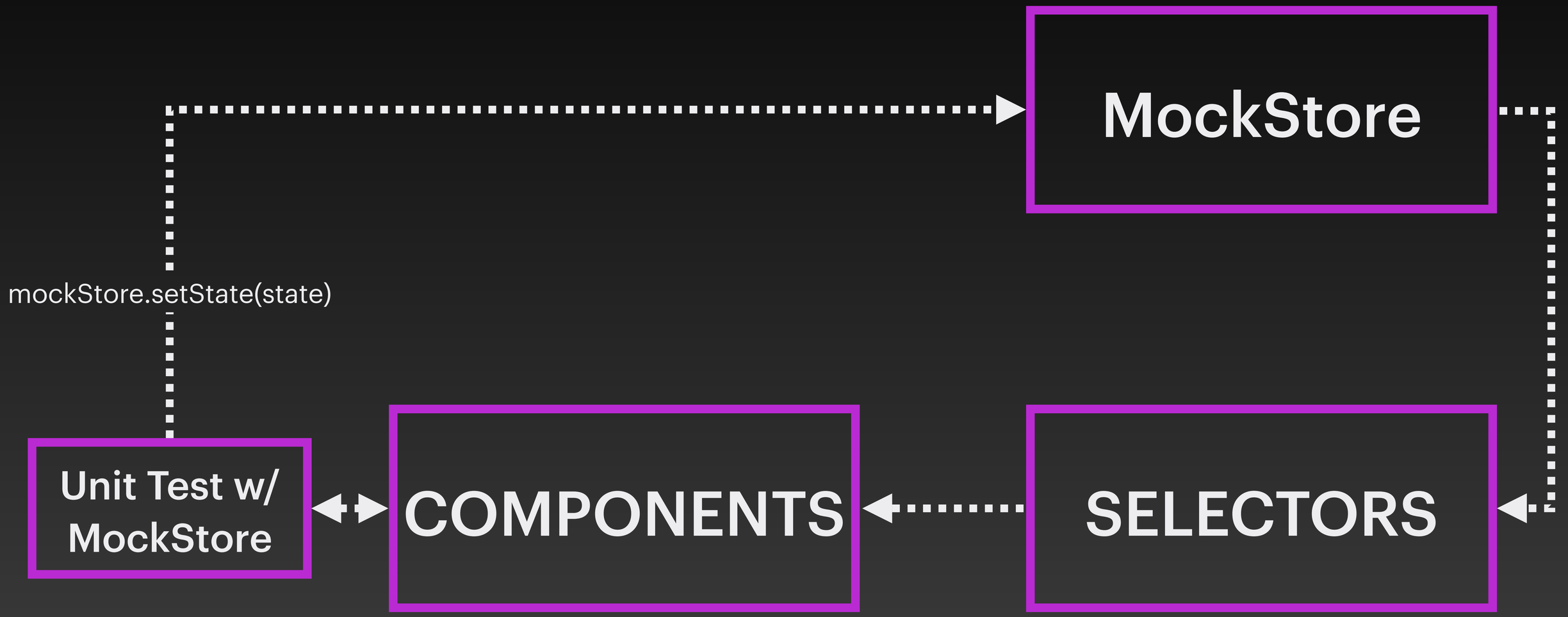
- Directly condition a given mock state to test against
- Selectors automatically trigger
- Conditioning steps:
    1. Provide provideMockStore({ initialState }) in testing module
    2. Update state with mockStore.setState(state)

Unit Testing with MockStore

```
import { provideMockStore, MockStore }
    from '@ngrx/store/testing';

let mockStore: MockStore<fromItems.State>;
const initialState = {
    items: {
        saleItems: [],
        clearanceItems: [],
        newItems: []
    }
} as fromItems.State;

beforeEach(() => {
    TestBed.configureTestingModule({
        // ...
        providers: [
            provideMockStore({ initialState })
        ]
    });

    mockStore = TestBed.inject(MockStore);
});
```

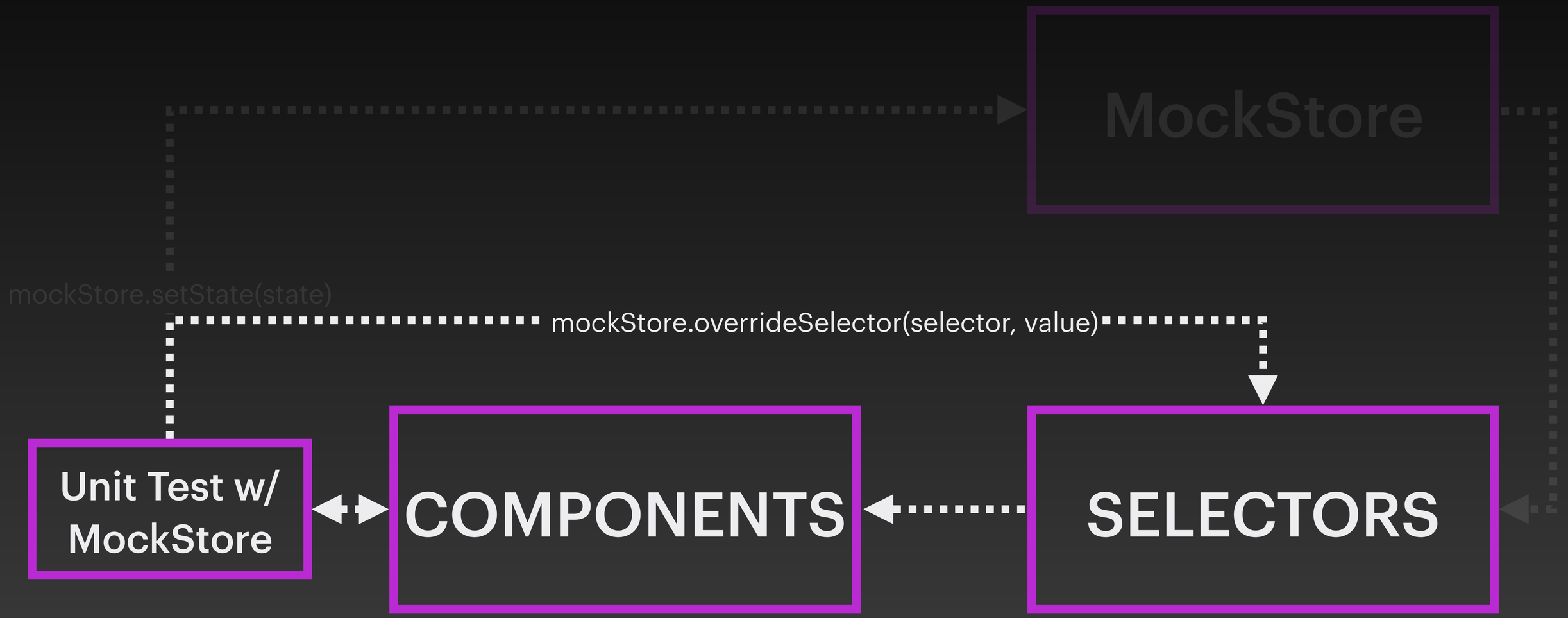
```
it('should display a list of all items'
    + ' after the data is loaded', () => {

    component.allItems$.subscribe(allItems =>
        expect(allItems.length).toBe(0)
    );

    const loadedState = {
        items: {
            saleItems: [1, 2],
            clearanceItems: [3, 4],
            newItems: [5, 6]
        }
    };

    mockStore.setState(loadedState);

    component.allItems$.subscribe(allItems =>
        expect(allItems.length).toBe(6)
    );
});
```

Unit Testing in NgRx v7



Selectors

Unit Testing in NgRx v8



Mock Selectors

- Condition a mock selector without mocking the entire state
- Test complexity does not increase with selector complexity

```
const selectAllItems = createSelector(
    selectSaleItems,
    selectClearanceItems,
    selectNewItems,
    (saleItems, clearanceItems, newItems) =>
        [...saleItems, ...clearanceItems, ...newItems]
);
```

- Conditioning steps:
    1. Provide provideMockStore() in the testing module
    2. Mock selectors with mockStore.overrideSelector(selector, value)

Unit Testing with Mock Selectors

```
import { provideMockStore, MockStore }
    from '@ngrx/store/testing';

let mockStore: MockStore<fromItems.State>;
let mockSelector:
  MemoizedSelector<fromItems.State, number[]>;

beforeEach(() => {
    TestBed.configureTestingModule({
        // ...
        providers: [ provideMockStore() ]
    });

    mockStore = TestBed.inject(MockStore);
    mockSelector = mockStore.overrideSelector(
        fromItems.selectAllItems,
        []
    );
});
```

```
it('should display a list of all items'
    + ' after the data is loaded', () => {
    component.allItems$.subscribe(allItems =>
        expect(allItems.length).toBe(0)
    );

    mockSelector.setResult([1, 2, 3, 4, 5, 6]);

    mockStore.refreshState();
    fixture.detectChanges();

    component.allItems$.subscribe(allItems =>
        expect(allItems.length).toBe(6)
    );
});
```

Mock Selector Notes

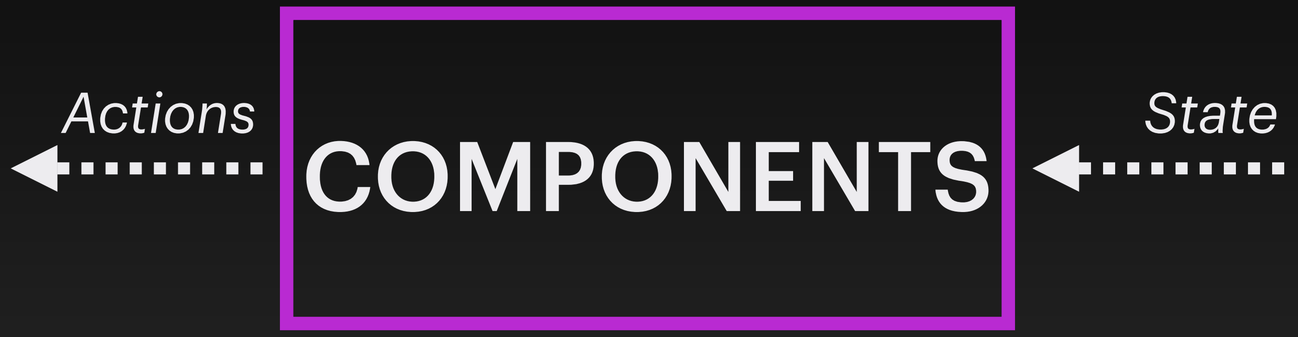
- Mock selectors that don’t need to be updated can be setup in provideMockStore:

```
providers: [ provideMockStore(
      {
          selectors: [
              {
                  selector: fromItems.otherSelector,
                  value: 'value that won`t need to change'
              }
          ]
      }
  )]
```

- Mock selectors are automatically reset after each test.
  - Uses MockStore.resetSelectors() internally
- Supports all types of selector usage:

```
• store.select('saleItems');
• store.select(fromItems.selectSaleItems);
• store.pipe(select('saleItems'));
• store.pipe(select(fromItems.selectSaleItems));
```

Verifying Dispatched Actions w/ MockStore




```
// Component
fetchData() {
    store.dispatch(fetchSaleItems());
}
// Component Test
it('fetchData should trigger a fetchSaleItems action', () => {
    component.fetchData();
    const expected = cold('a', { a: fetchSaleItems() });
    expected(store.scannedActions$).toBeObservable(expected);
});
```

Why Should I Use...

StoreModule

- Integration testing

Mock Store

- Triggers state change automatically
- Grouping test case state together can be more readable

Mock Selectors

- Most isolated
- Only mock what you need
- Eliminates selector complexity

Closing Remarks

Limit the Dependency on Store

Container components only!

Use Package-Specific Testing Libraries

Like NgRx MockStore! Ever tried mocking store.pipe(select(...))? 🙄

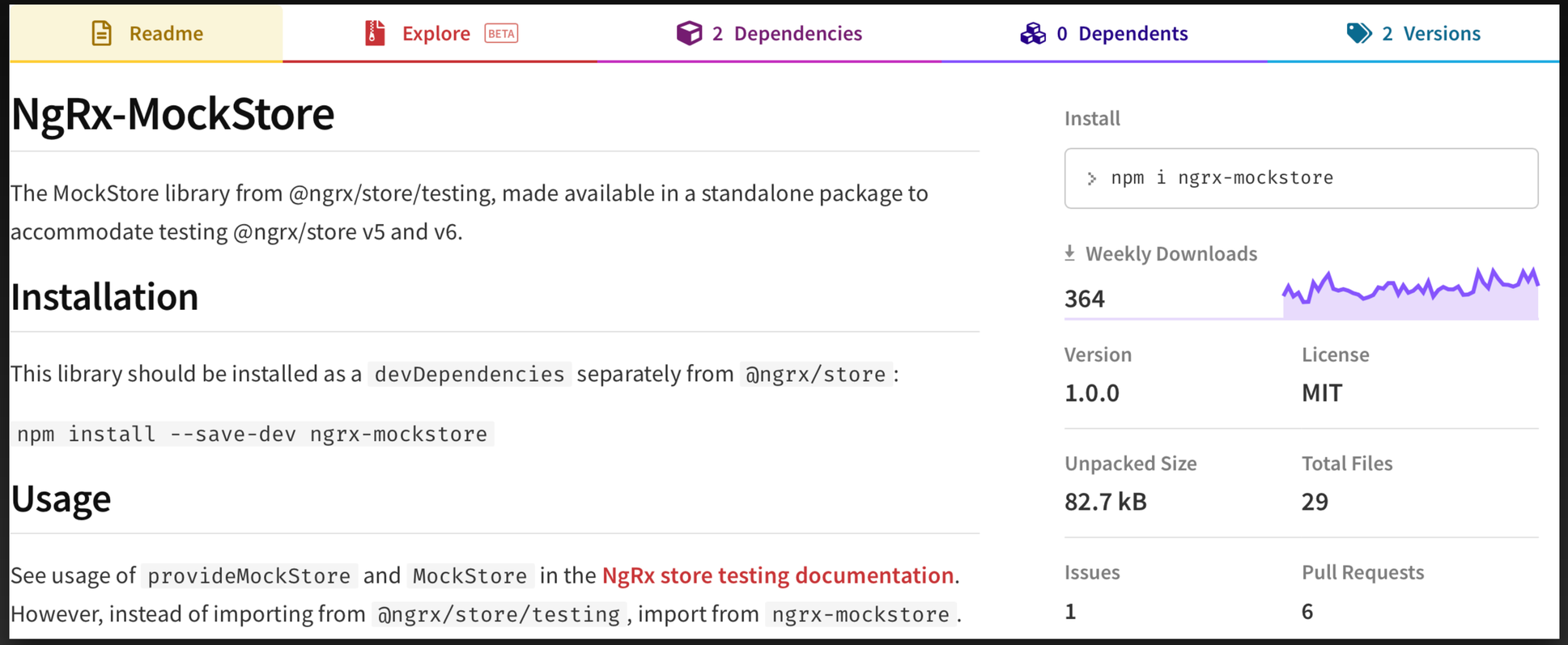
Use Schematics

```
ng generate container ComponentName --testDepth  unit
ng generate container ComponentName --testDepth  integration
```

Not on NgRx v7+ Yet?

Good news...

Checkout NgRx-MockStore



Start Small: Scuba Dive in a Pool

Mock Store > StoreModule

References

- https://ngrx.io/guide/store/testing
- https://ngrx.io/guide/schematics/container
- https://JohnCrowson.com/assets/angularday2020.pdf
- Questions?
  - @John_Crowson

Thank You!