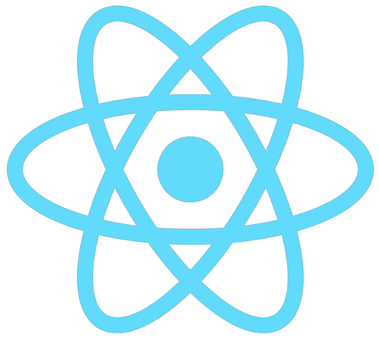
請先下載這個專案

https://github.com/Jerry-Hong/fake-data



React 開發實戰

課程大綱

- Redux 簡介
- Redux 核心觀念
  - action / Action Creator
  - reducer
  - store
  - middleware
- React-Redux
  - Provider
  - connect
- Development Tool
- React-Router
- Third party library

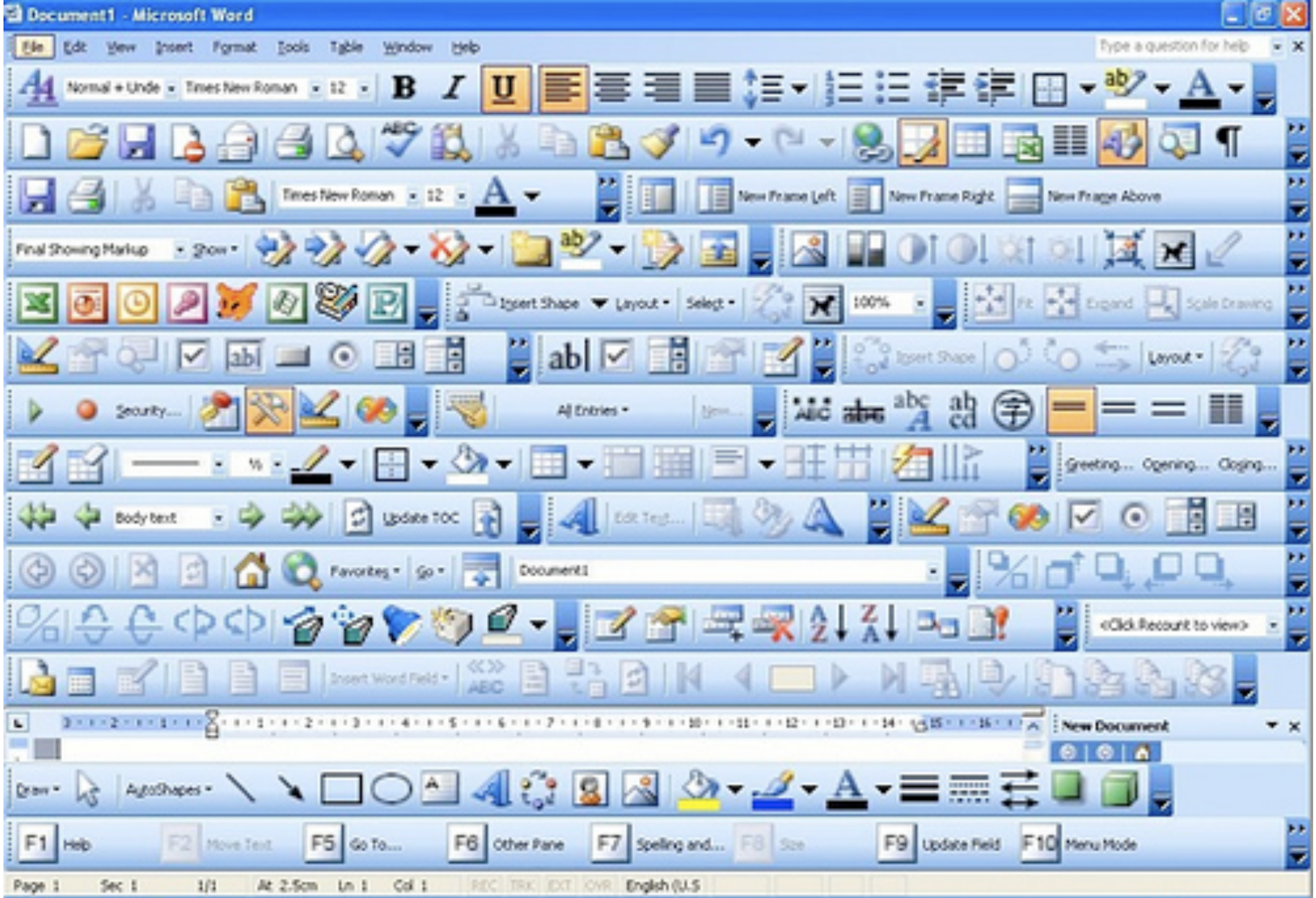
Redux 簡介

Redux 簡介

- Redux 是一套用來管理狀態 (state management) 的 Library
- Redux 可以搭配任何前端框架使用，不限於 React
- Redux 是目前 React 生態圈最多人使用的狀態管理工具

為什麼需要 Redux?

- 隨著 Single-page Applications 的功能越多，我們就需要管理更多的狀態，包含來自 Server 的 response 還有快取的資料。
- 要管理每個狀態的變更是非常困難的，當專案變得複雜，很容易喪失對某些資料改變的發生時機、為什麼發生以及改變了哪些狀態的控制


Document1 - Microsoft Word
File Edit View Insert Format Tools Table Window Help
Type a question for help
Normal + Unde
Times New Roman
12
New Frame Left
New Frame Right
New Frame Above
Final Showing Markup
Show
Insert Shape
Layout
Select
100%
Security...
All Entries
Greeting... Opening... Closing...
Body text
Update TOC
Favorites
Go
Document1
<Click Recount to view>
New Document
Draw
AutoShapes
F1 Help
F2 Move Text
F5 Go To...
F6 Other Pane
F7 Spelling and...
F8 Size
F9 Update Field
F10 Menu Mode
Page 1
Sec 1
1/1
At 2.5cm
Ln 1
Col 1
English (U.S

為什麼需要 Redux?

- 隨著 Single-page Applications 的功能越多，我們就需要管理更多的狀態，包含來自 Server 的 response 還有快取的資料。
- 要管理每個狀態的變更是非常困難的，當專案變得複雜，很容易喪失對某些資料改變的發生時機、為什麼發生以及改變了哪些狀態的控制
- 簡單來說，我們需要一個可預測的狀態管理工具。

Redux 的優勢與特色

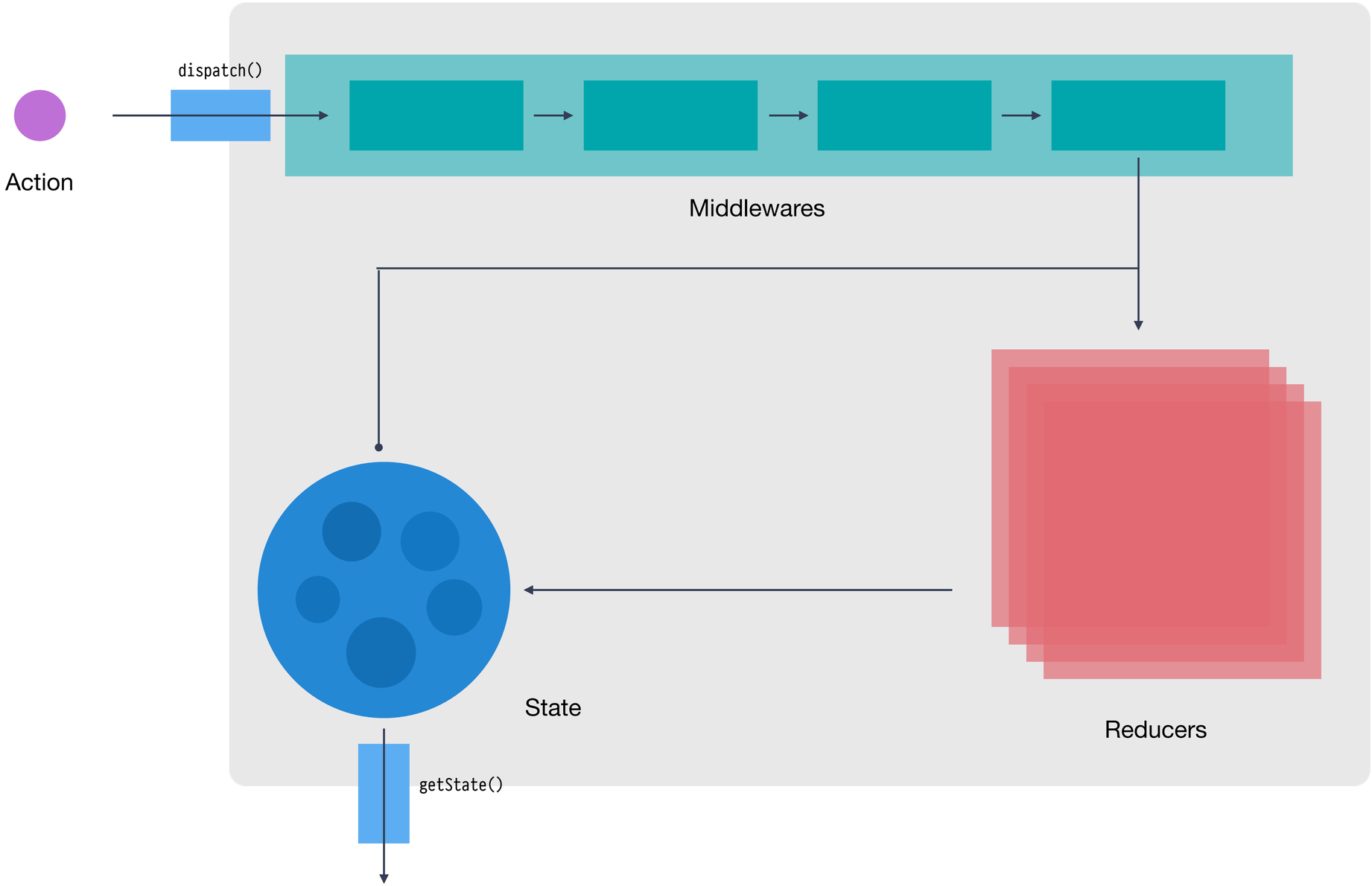
- 可預測 Predictable
- 集中化 Centralized
- 可除錯 Debuggable
- 彈性 Flexible

Redux 核心觀念

Redux 三個核心

- Store
  - Reducer
  - Middleware
- Action

Store



reduce

```
[1, 2, 3, 4]
  .reduce(( state, action ) => state + action, 0)
```

reducer

```
(state = 0, action) => state + action
```

reducer

- reducer 就是一個 pure function
- reducer 吃兩個參數，第一個參數是當前的狀態，第二個參數是 action
- reducer 回傳一個新狀態

```
(state = initialState, action) => newState
```

reducer

- reducer 就是一個 pure function
- reducer 吃兩個參數，第一個參數是當前的狀態，第二個參數是 action
- reducer 回傳一個新狀態

```
function counter(state = 0, action) {
  switch(action.type){
  case 'ADD_COUNT':
    return state + action.payload
  default:
    return state;
  }
}
```

action

- action 就是一個 plain object
- 一個具有 type 屬性的 object

```
{
  type: 'ADD_COUNT'
}
```

action creator

- 一個 function 用來建立並回傳 action

```
function addCount(payload = 1) {
  return {
    type: 'ADD_COUNT',
    payload
  };
}
```

Store

- 由 reducer(與 middleware) 所組成

```
function counter(state = 0, action) {
  switch(action.type){
  case 'ADD_COUNT':
    return state + 1
  default:
    return state;
  }
}

const store = createStore(counter)
```

Store

- 由 reducer(與 middleware) 所組成
- 多個 reducer 可以透過 combinReducers 組成一個 root reducer

```
function counter(state = 0, action) {
  // ...
}

function user(state = {}, action) {
  // ...
}

const rootReducer = combineReducers({
  counter,
  user
})
const store = createStore(rootReducer)
```

Store

- 由 reducer(與 middleware) 所組成
- 多個 reducer 可以透過 combinReducers 組成一個 root reducer
- Store 負責儲存狀態，可以透過 getState() 拿到當前的狀態

```
const state = store.getState()
```

Store

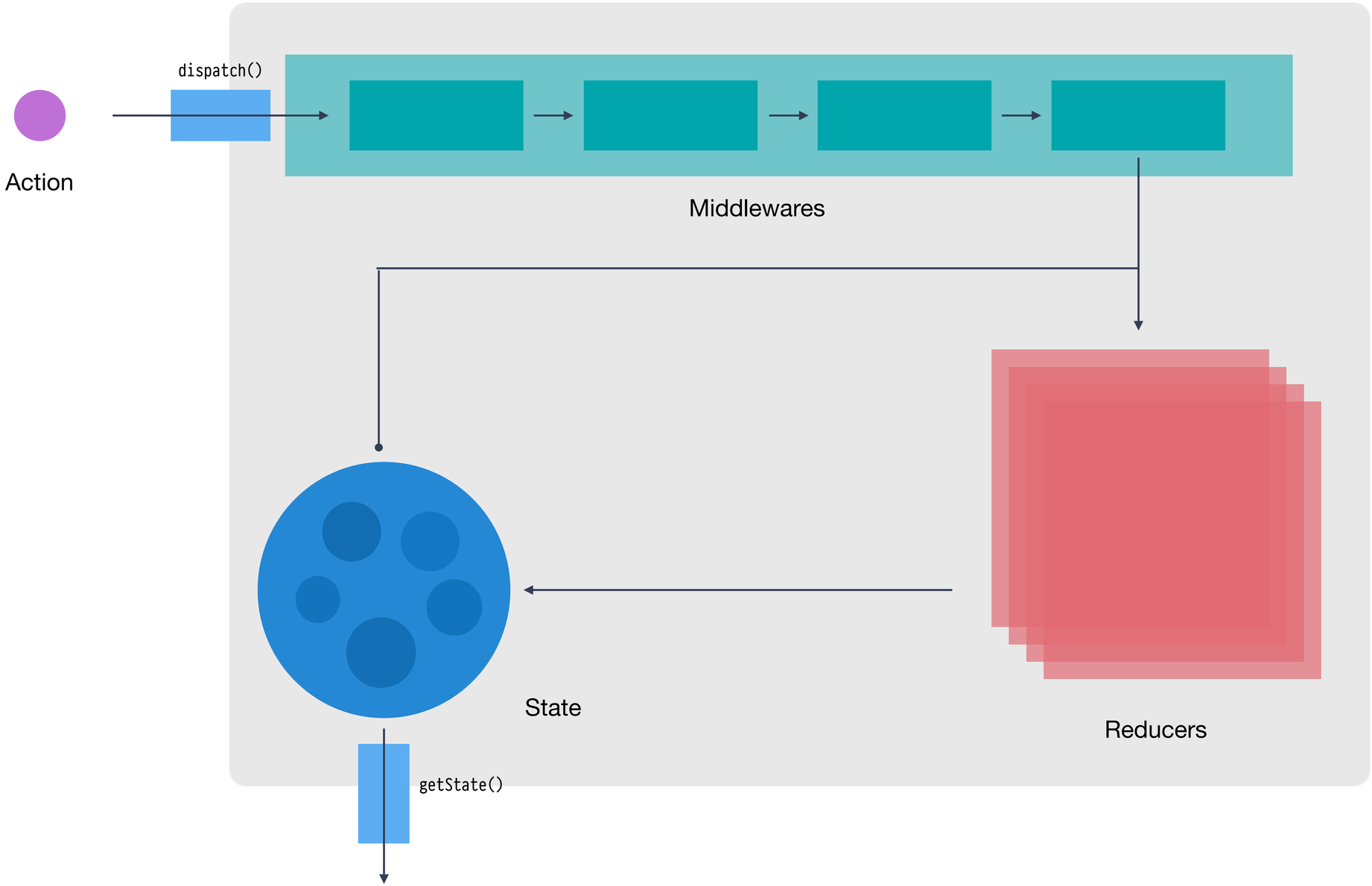
- 由 reducer(與 middleware) 所組成
- 多個 reducer 可以透過 combinReducers 組成一個 root reducer
- Store 負責儲存狀態，可以透過 getState() 拿到當前的狀態
- 可透過 dispatch 傳入 action 來修改當前的狀態

```
var state = store.getState();

store.dispatch(action);

var newState = store.getState();
```

Redux - 練習一

Redux - 練習二

Store



middleware

- 一個 higher order function
- 專門拿來處理 side effect
- 大多數的情境下不用自己寫 middleware

```
const middleware =
  store => next => action => any
```

middleware

- 一個 higher order function
- 專門拿來處理 side effect
- 大多數的情境下不用自己寫 middleware

```
const logger = store => next => action => {
  console.log('dispatching', action)
  let result = next(action)
  console.log('next state', store.getState())
  return result
}
```

Store
加入 middleware

```
const store = createStore(
  rootReducer,
  // applyMiddleware() tells createStore() how t
  applyMiddleware(logger)
)
```

Redux - 練習三

redux-thunk

- GitHub
- thunk middleware for redux
- 專門用來處理非同步的 side effect
- 目前 redux 主流的 side effect 處理工具

```
npm install redux-thunk
```

```
import thunk from 'redux-thunk';

const store = createStore(
  rootReducer,
  applyMiddleware(thunk)
);
```

什麼是 thunk？

```
let x = 1 + 2;

let foo = () => 1 + 2;
```

thunk 版本的 action creator

```
function asyncAddCount(payload = 1, ms = 500) {
  return function(dispatch) {
    return delay(ms).then(() => {
      dispatch({
        type: 'ADD_COUNT',
        payload,
      })
    })
  };
};
```

Redux - 練習四

Redux - 練習五

自訂 middleware

Error log collect

```
const errorLogger = store => next => action => {
  try {
    let result = next(action);
    return result;
  } catch (err) {
    console.error(err);
    logErrorToServer(err)
  }
};
```

自訂 middleware

Performance check

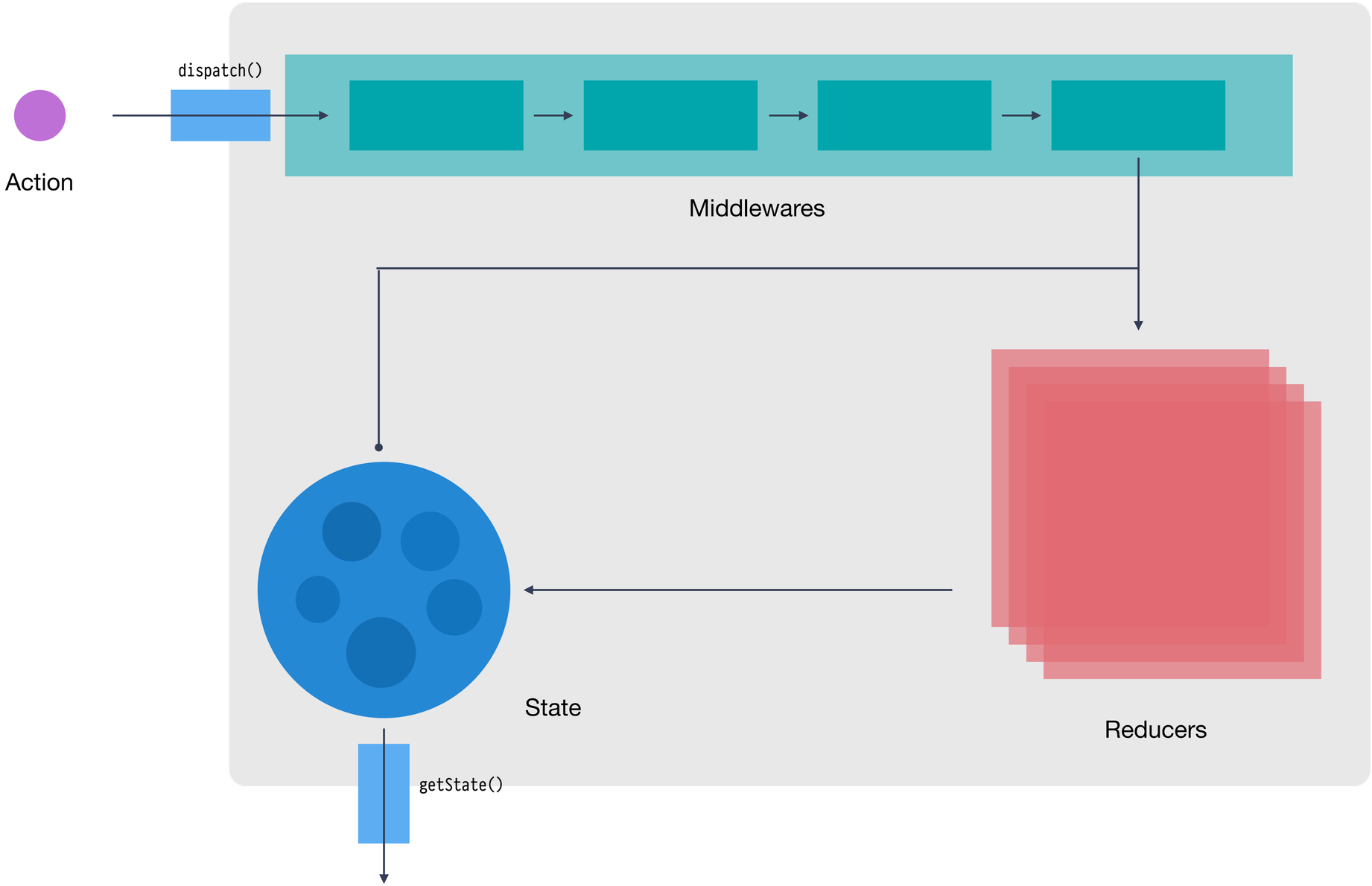
```
const benchmark = store => next => action => {
  var t0 = performance.now();
  let result = next(action);
  var t1 = performance.now();
  console.log(`Call to ${action.type}
    took ${t1 - t0} milliseconds.`);
  return result;
};
```

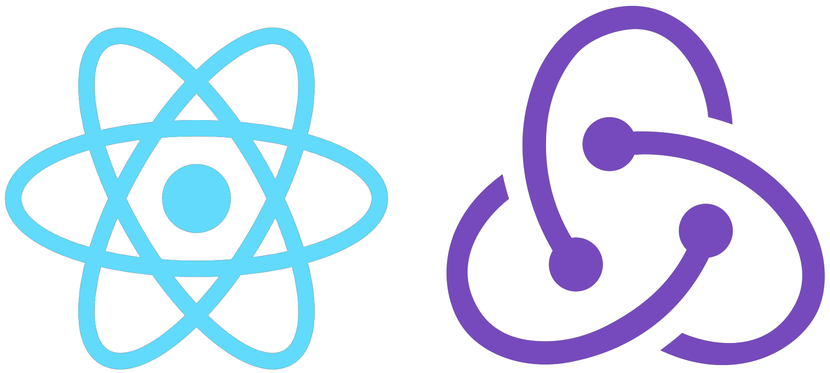
自訂 middleware

GA tracking

```
const ga = store => next => action => {
  let result = next(action);
  ga.send('', action.type, action.payload)
  return result;
};
```

Store





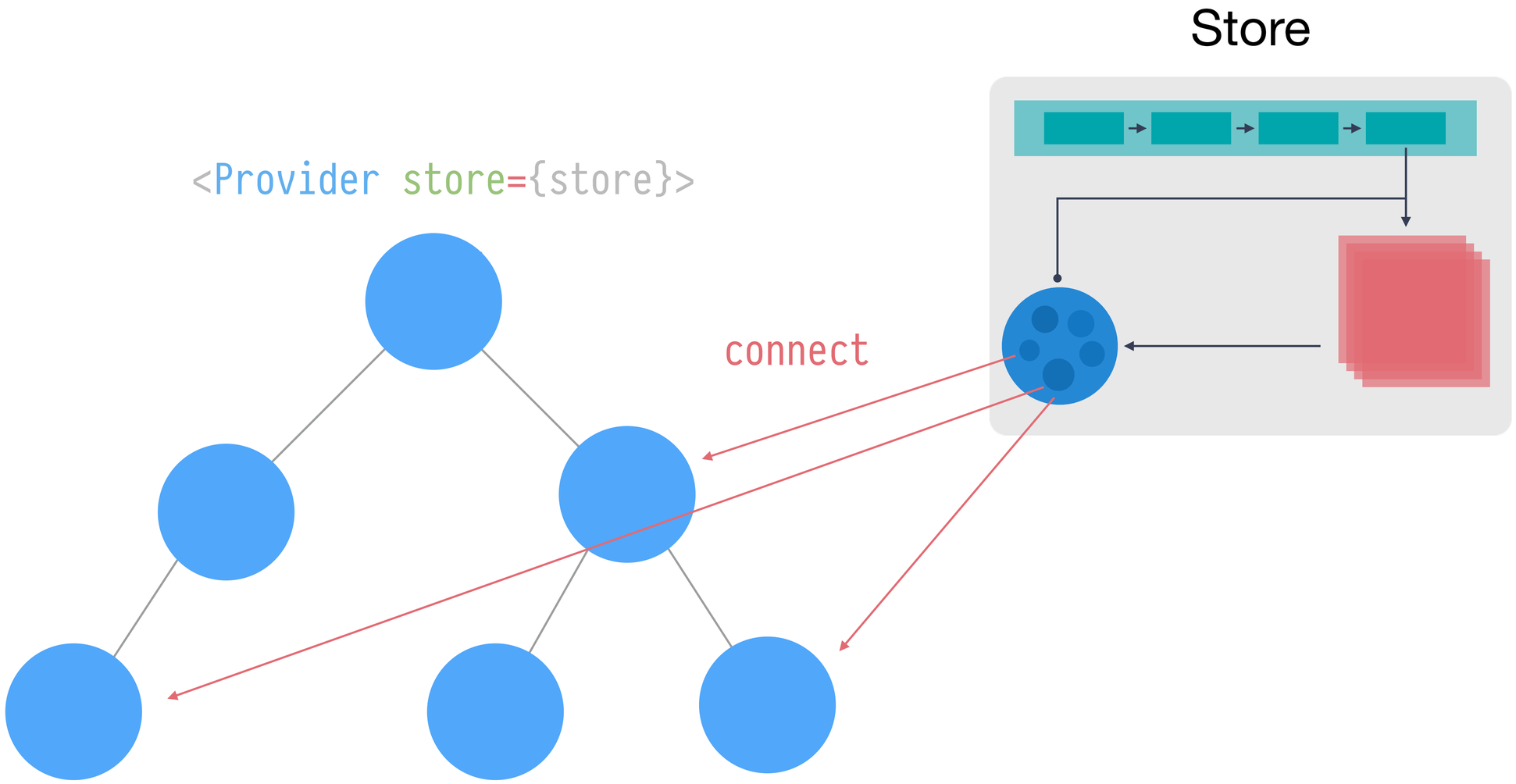
React-Redux 快速上手

React-Redux 簡介

- React-Redux 是用來介接 React 跟 Redux 的 Library
- React-Redux 跟 Redux 是完全獨立的 Library
- 其他前端框架也有類似的 Library 跟 Redux 介接
  - 例如： ng-redux, redux-vue

React-Redux 只有一個元件及一個 HOC

- Provider
- connect


Store
<Provider store={store}>
connect

安裝 react-redux

```
npm install react-redux
```

Provider

- 一個 React 元件
- 需接收 redux 的 store
- 會在內部透過 react 的 context 傳給子元件

```
import React from 'react'
import ReactDOM from 'react-dom'

import { Provider } from 'react-redux'
import store from './store'

import App from './App'

const rootElement = document.getElementById('root')
ReactDOM.render(
  <Provider store={store}>
    <App />
  </Provider>,
  rootElement
)
```

connect

- connect 是一個 Higher order Component
- 第一個參數可用來接收 store 的 state

```
import React from 'react';
import { connect } from 'react-redux'

class App extends React.Component {
  render() {
    const { count } = this.props;

    return <h1>Hello World {count}</h1>;
  }
}

export default (
  connect(state => ({ count: state.count }))(App)
);
```

React-Redux 練習一

安裝 react-redux 並使用 Provider & connect

connect

- connect 是一個 Higher order Component
- 第一個參數用來選擇接收 store 的 state
- 第二個參數用來綁定 store 與 action creator

```
class App extends React.Component {
  render() {
    const { count, addCount } = this.props;

    return <h1 onClick={addCount}>
      Hello World {count}
    </h1>;
  }
}

export default connect(
  state => ({ count: state.count }),
  {
    addCount,
    asyncAddCount,
  }
)(App);
```

React-Redux 練習二

使用 connect 綁定 action creator

React-Redux 練習三

嘗試自己建立 cats reducer 並把 CatPage 的資料改成抓 redux 的資料

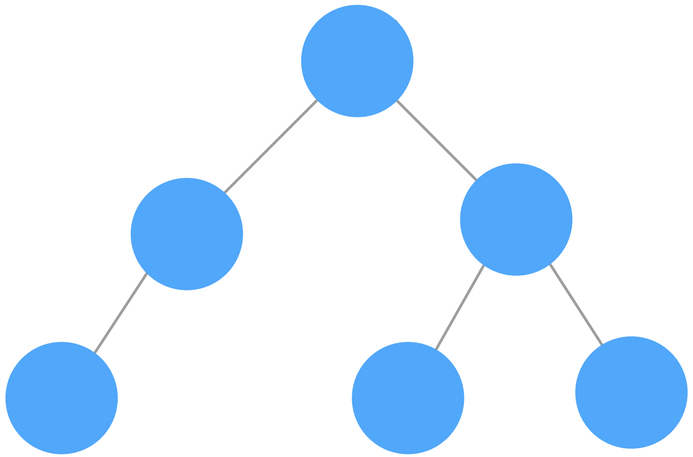
React-Redux 練習四

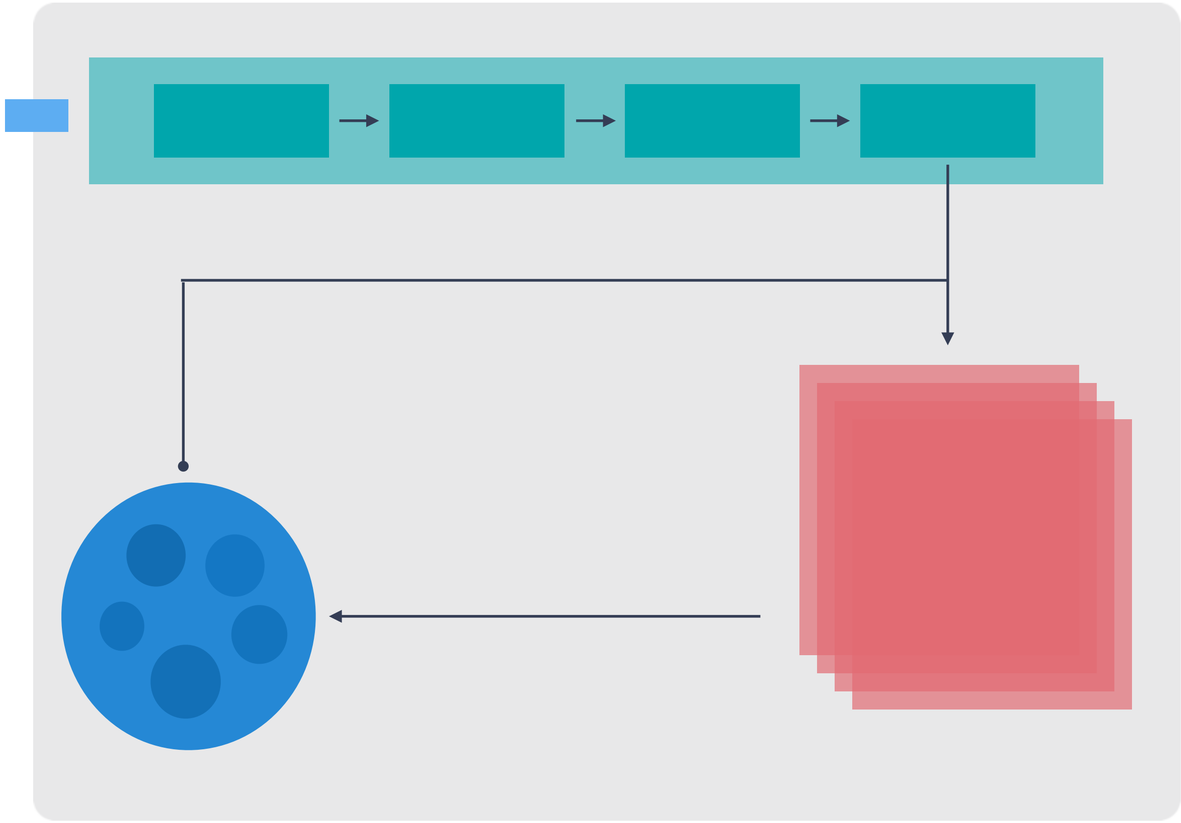
抓 http://localhost:4000/cats 的資料

React-Redux 練習五

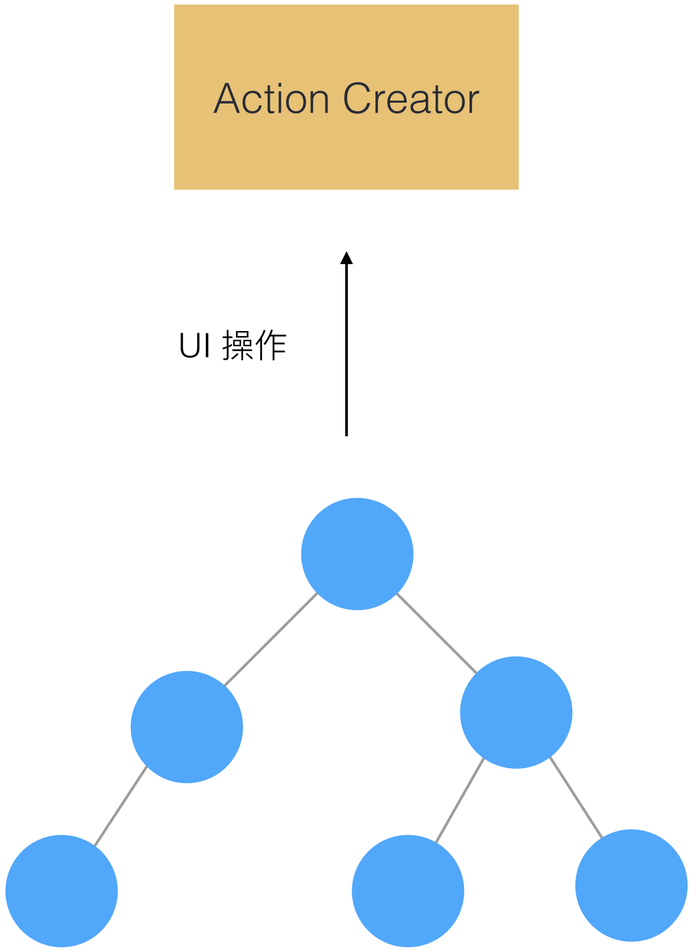
修改 addCat，打 POST http://localhost:4000/cats

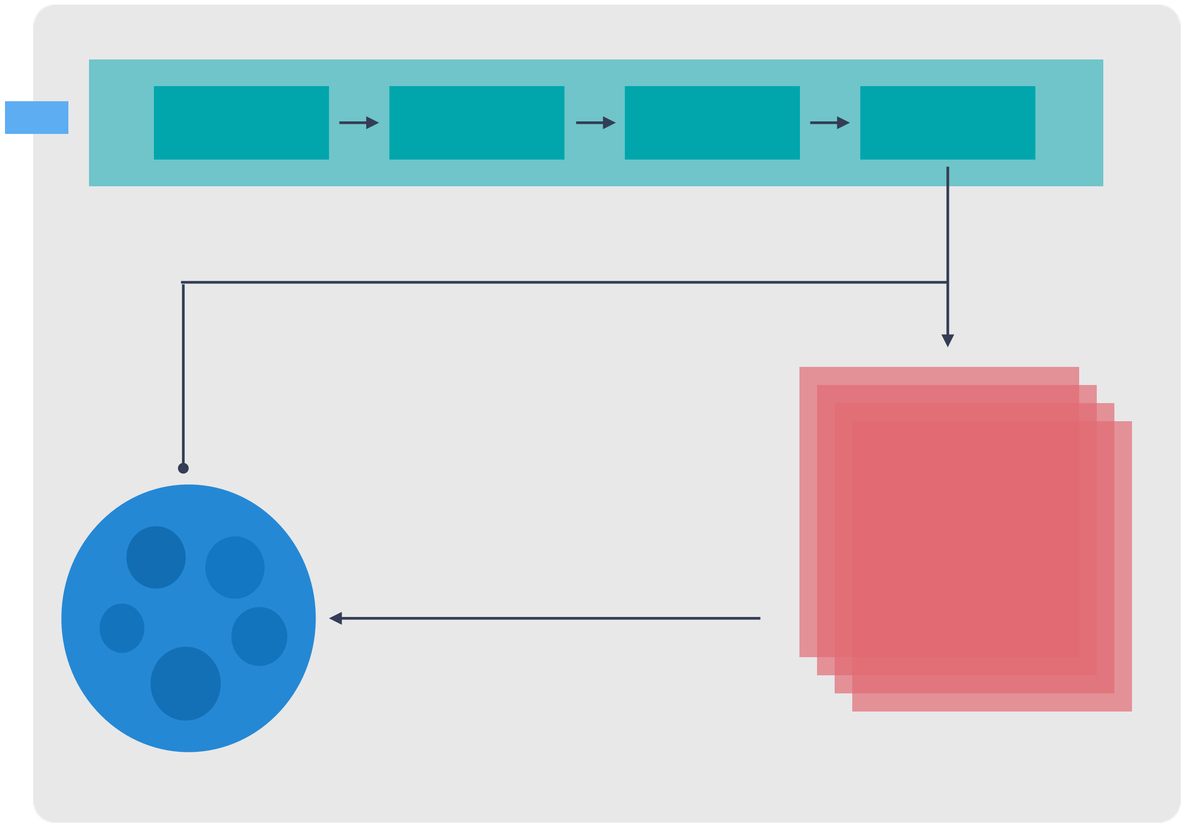
Action Creator



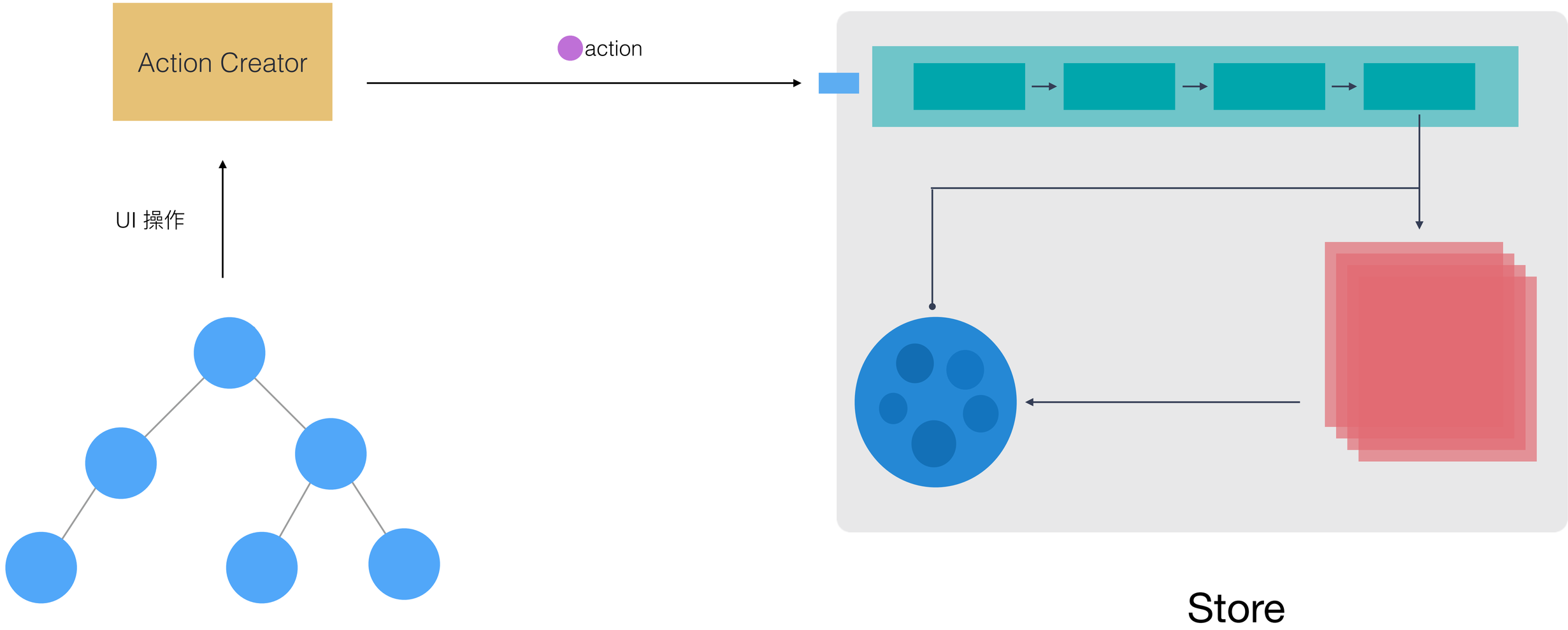


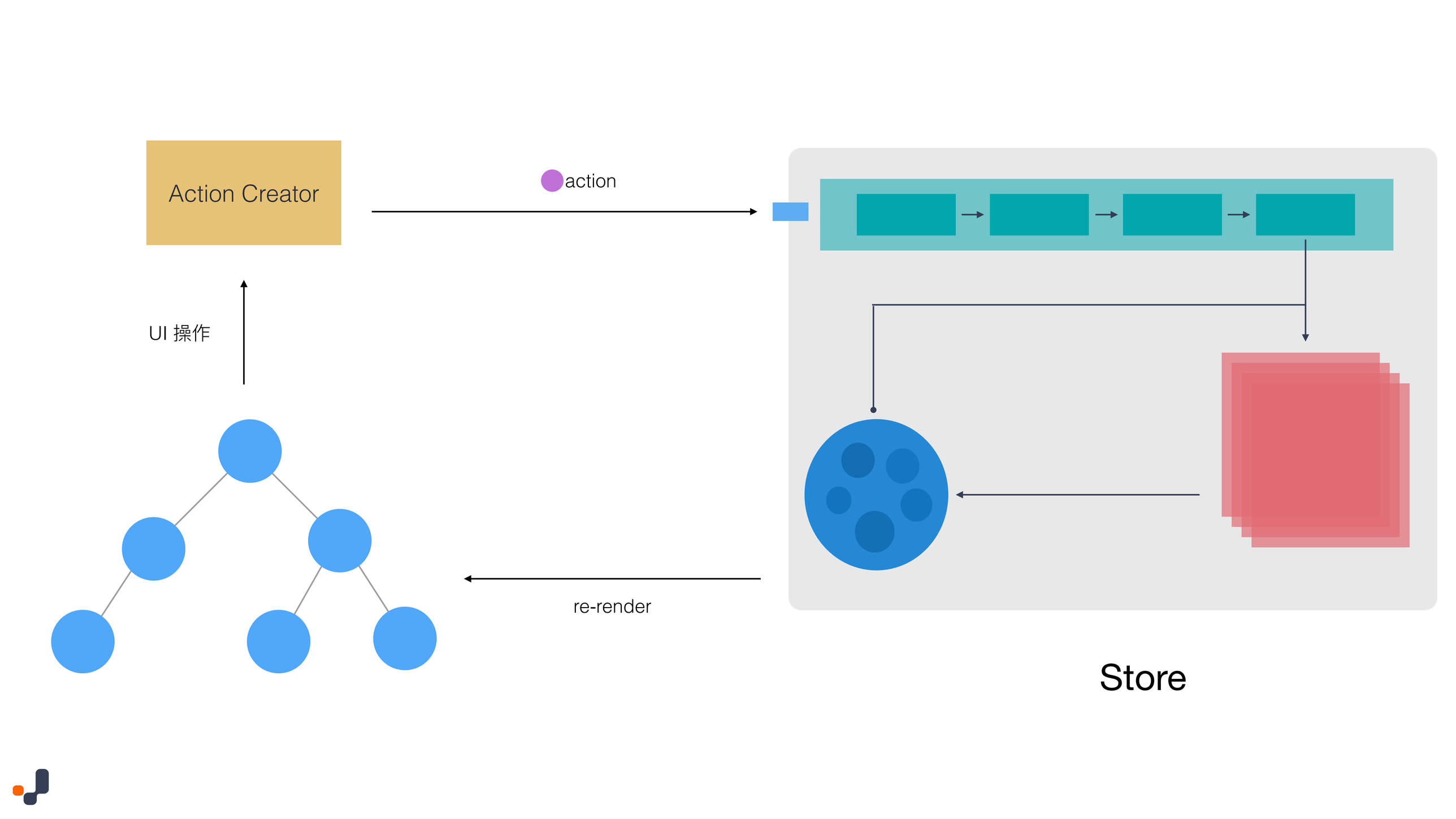
Store

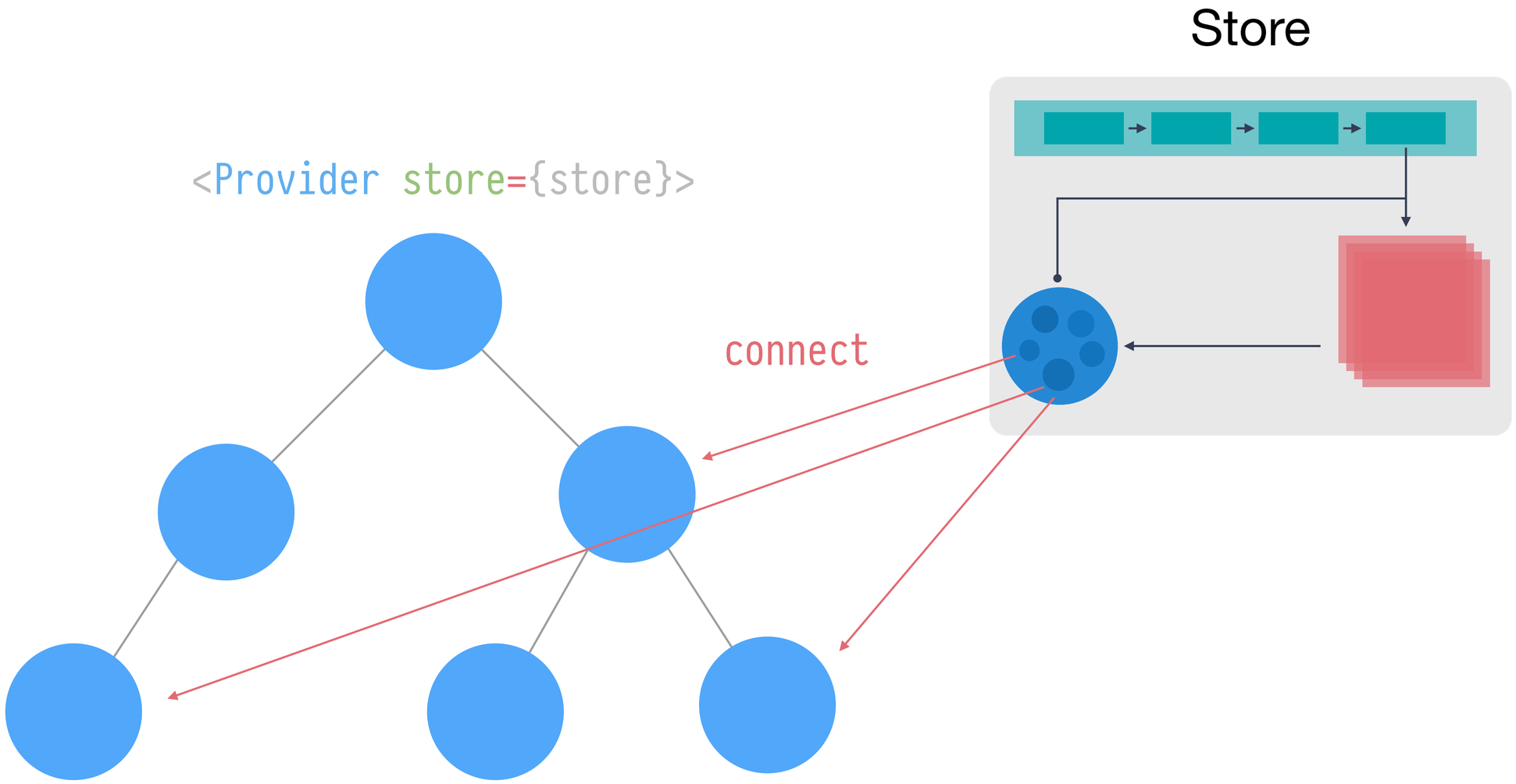




Store


Action Creator
action
UI 操作
Store

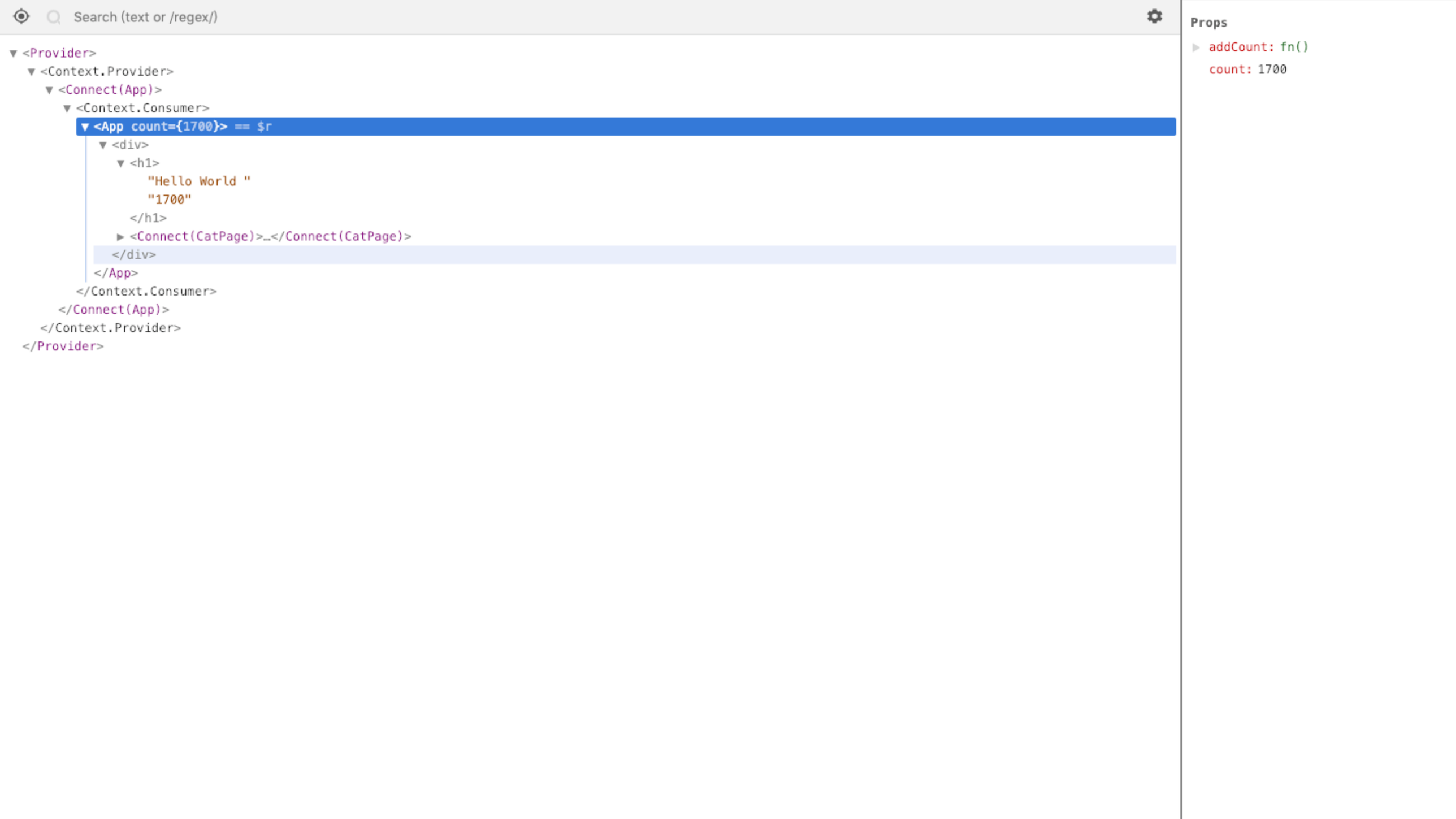

Action Creator
action
UI 操作
re-render
Store


Store
<Provider store={store}>
connect

DevTools

react-devtools

- 由 FB 官方所推出的開發輔助工具
- 可以查看各個元件拿到的 prop、當前的 state 以及 render 的頻率
- 不需額外撰寫任何程式碼
- 相關連結
  - Github
  - Chrome Store

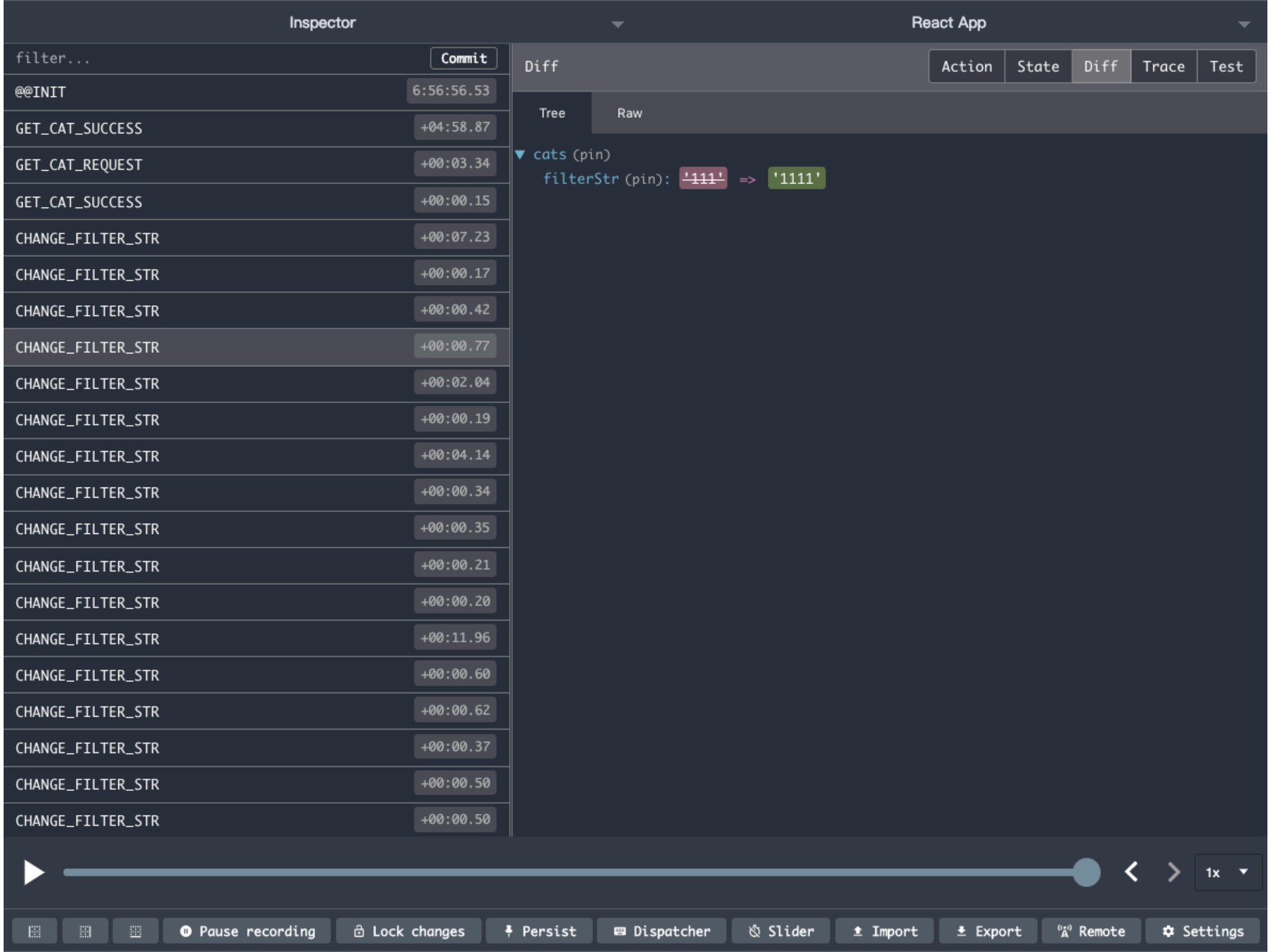

Search (text or /regex/)
<Provider>
<Context.Provider>
<Connect(App)>
<Context.Consumer>
<App count={1700}> == $r

<h1>
"Hello World "
"1700"
</h1>
<Connect(CatPage)>…</Connect(CatPage)>

</App>
</Context.Consumer>
</Connect(App)>
</Context.Provider>
</Provider>
Props
addCount: fn()
count: 1700

redux-devtools-extension

- 最早由 Redux 作者 Dan 實作了 redux-devtools，後來社群把 redux-devoots 做成 chrome extension
- 可以查看所有 action 送出的紀錄、當前的狀態以及時光旅行
- 相關連結
  - Github
  - Chrome Store


Inspector
React App
filter...
Commit
@@INIT 6:56:56.53
GET_CAT_SUCCESS +04:58.87
GET_CAT_REQUEST +00:03.34
GET_CAT_SUCCESS +00:00.15
CHANGE_FILTER_STR +00:07.23
CHANGE_FILTER_STR +00:00.17
CHANGE_FILTER_STR +00:00.42
CHANGE_FILTER_STR +00:00.77
CHANGE_FILTER_STR +00:02.04
CHANGE_FILTER_STR +00:00.19
CHANGE_FILTER_STR +00:04.14
CHANGE_FILTER_STR +00:00.34
CHANGE_FILTER_STR +00:00.35
CHANGE_FILTER_STR +00:00.21
CHANGE_FILTER_STR +00:00.20
CHANGE_FILTER_STR +00:11.96
CHANGE_FILTER_STR +00:00.60
CHANGE_FILTER_STR +00:00.62
CHANGE_FILTER_STR +00:00.37
CHANGE_FILTER_STR +00:00.50
CHANGE_FILTER_STR +00:00.50
Diff
Action
State
Diff
Trace
Test
Tree
Raw
cats (pin)
filterStr (pin): '111' => '1111'
1x
Pause recording
Lock changes
Persist
Dispatcher
Slider
Import
Export
Remote
Settings

redux-devtools-extension setup


```
npm install redux-devtools-extension
```

```
import {
  composeWithDevTools
} from 'redux-devtools-extension';

const store = createStore(
  rootReducer,
  composeWithDevTools(applyMiddleware(thunk))
);
```

React-Router 快速上手

安裝 react-router

```
npm install react-router-dom
```

React-Router 四個基本元件

- Router
- Route
- Switch
- Link

Router

- Router 是一個 React 元件，會負責記錄 History，全站只會使用一個 Router
- 需搭配 Route 使用
- Router 又分為 BrowserRouter、HashRouter 以及 MemoryRouter

```
import {
  BrowserRouter as Router,
  Route
} from "react-router-dom";

<Router>
  <Route exact path="/" component={Home} />
  <Route path="/about" component={About} />
  <Route path="/topics" component={Topics} />
</Router>
```

Route

- Route 是一個 React 元件，由外部傳入的 path 決定是否要 render 元件
- exact 為 true 時，path 做完全比對。
- 若沒有搭配 Switch 使用會比對全部的 Route，只要比對中的都會顯示
- 需搭配 Router 使用

```
import {
  BrowserRouter as Router,
  Route
} from "react-router-dom";

<Router>
  <Route exact path="/" component={Home} />
  <Route path="/about" component={About} />
  <Route path="/topics" component={Topics} />
</Router>
```

Route Path

- url 參數
- /:variableName

```
<Route path="/:id" component={Child} />

function Child(props) {
  return (
    <div>
      <h3>ID: {props.match.params.id}</h3>
    </div>
  );
}
```

Route Path

- url 參數規則
  - /users/:id
    - /users/1 match
    - /users not match
  - /users/:id?
    - /users/1 match
    - /users match

```
{/*
   It's possible to use regular expressions
   to control what param values should be matched.
      * "/order/asc"  - matched
      * "/order/desc" - matched
      * "/order/foo"  - not matched
*/}
<Route
  path="/order/:direction(asc|desc)"
  component={ComponentWithRegex}
/>
```

Switch

- Switch 是一個 React 元件
- Switch 內的 Route 只比對到第一個，後面的就不顯示

```
import {
  BrowserRouter as Router,
  Route,
  Switch
} from 'react-router-dom';

<Router>
  <Switch>
    <Route exact path="/" component={Home} />
    <Route path="/about" component={About} />
    <Route path="/:user" component={User} />
    <Route component={NoMatch} />
  </Switch>
</Router>;
```

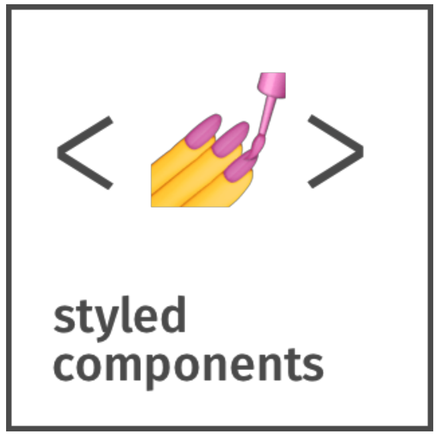
Link

- Link 是一個 React 元件
- 負責做導覽，一定要傳入 to 屬性

```
import { Link } from 'react-router-dom'

<Link to="/about">About</Link>
```

React-Router 練習

Third Party Library



Kendo UI®
by Telerik

安裝
styled-components

```
npm install styled-components
```

styled-components

- 一套 CSS-in-JS 的 Library
- 用來解決 CSS Naming Scope 的問題
- 使用 ES6 的 Tagged templates


```
const Button = styled.a`
  /* This renders the buttons above... Edit me! */
  display: inline-block;
  border-radius: 3px;
  padding: 0.5rem 0;
  margin: 0.5rem 1rem;
  width: 11rem;
  background: transparent;
  color: white;
  border: 2px solid white;

  /* The GitHub button is a primary button
   * edit this to target it specifically! */
  ${props => props.primary && css`
    background: white;
    color: palevioletred;
  `}
`
```

安裝 polish

```
npm install polish
```

polish

- 一套輕量的 toolset for styling
- 可搭配 styled-components 使用

```
import { lighten, modularScale } from 'polished'

const div = styled.div`
  background: ${lighten(0.2, '#FFCD64')};
  background: ${lighten('0.2', 'rgba(204,205,100,0.7)')};
`
```

安裝

@progress/kendo-scheduler-react-wrapper

```
npm install @progress/kendo-scheduler-react-wrapper
```

kendo-scheduler-react-wrapper

- 由 jQuery 包裝成 React 的套件
- 目前已被棄用，不在 kendo-react 中
- 文件網址：https://www.telerik.com/kendo-react-ui/wrappers/scheduler/

```
<Scheduler
  height={600}
  views={this.views}
  dataSource={this.dataSource}
  date={new Date("2013/6/13")}
  startTime={this.startTime}
  resources={this.resources}
/>
```

安裝

@progress/kendo-treeview-react-wrapper

```
npm install @progress/kendo-treeview-react-wrapper
```

@progress/kendo-treeview-react-wrapper

- 由 jQuery 包裝成 React 的套件
- 目前已被棄用，不在 kendo-react 中
- 文件網址：https://www.telerik.com/kendo-react-ui/wrappers/treeview/

```
<TreeView
  checkboxes={this.checkboxes}
  check={this.onCheck}
  dataSource={this.dataSource}
/>;
```