Architecture made for SwiftUI

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Architecture made for declarative user interface

```
import SwiftUI

struct LandmarkList: View {
    var body: some View {
        NavigationView {
            List(landmarkData) { landmark in
                NavigationButton(destination: LandmarkDetail(landmark: landmark)) {
                    LandmarkRow(landmark: landmark)
                }
            }
            .navigationBarTitle(Text("Landmarks"), displayMode: .large)
        }
    }
}
```

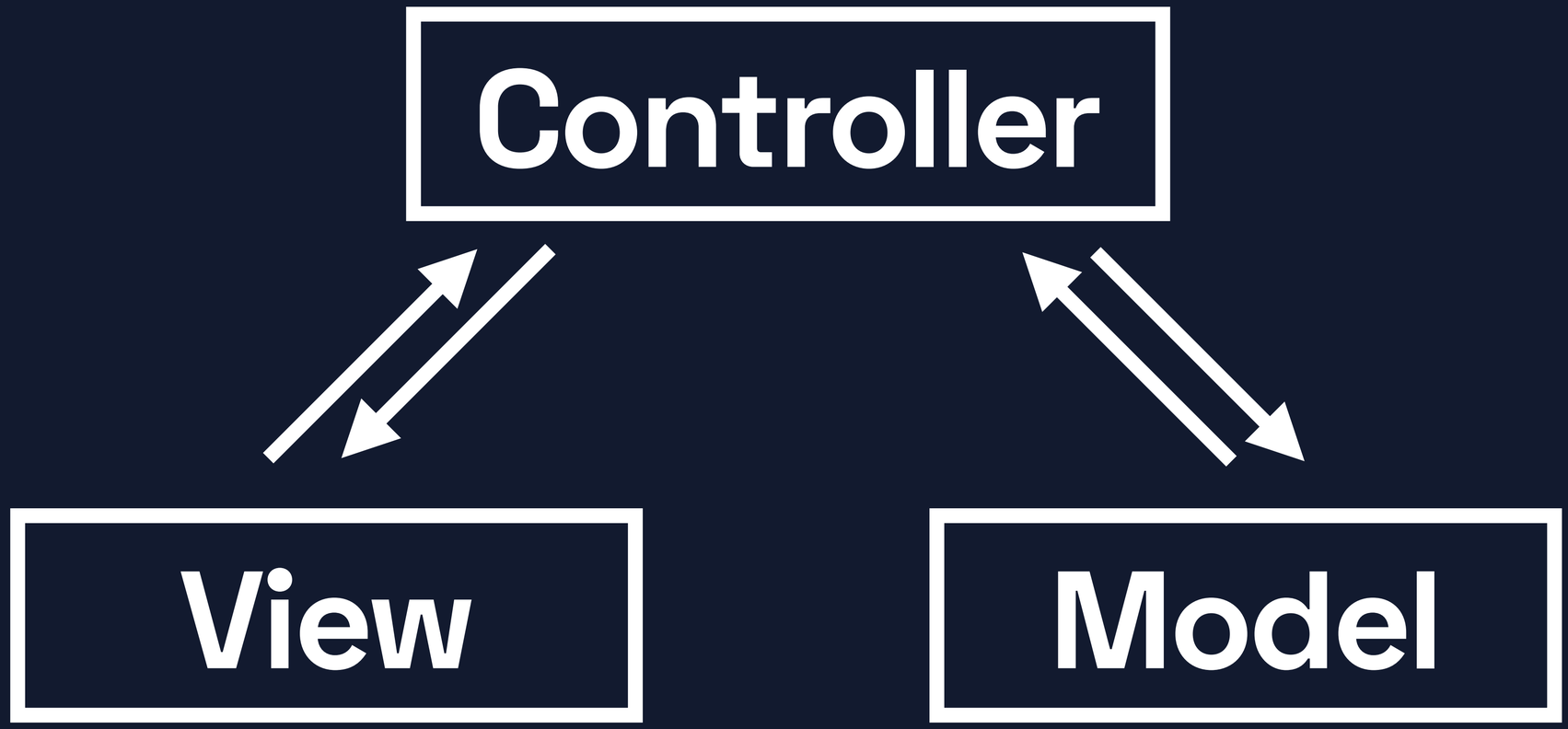
M

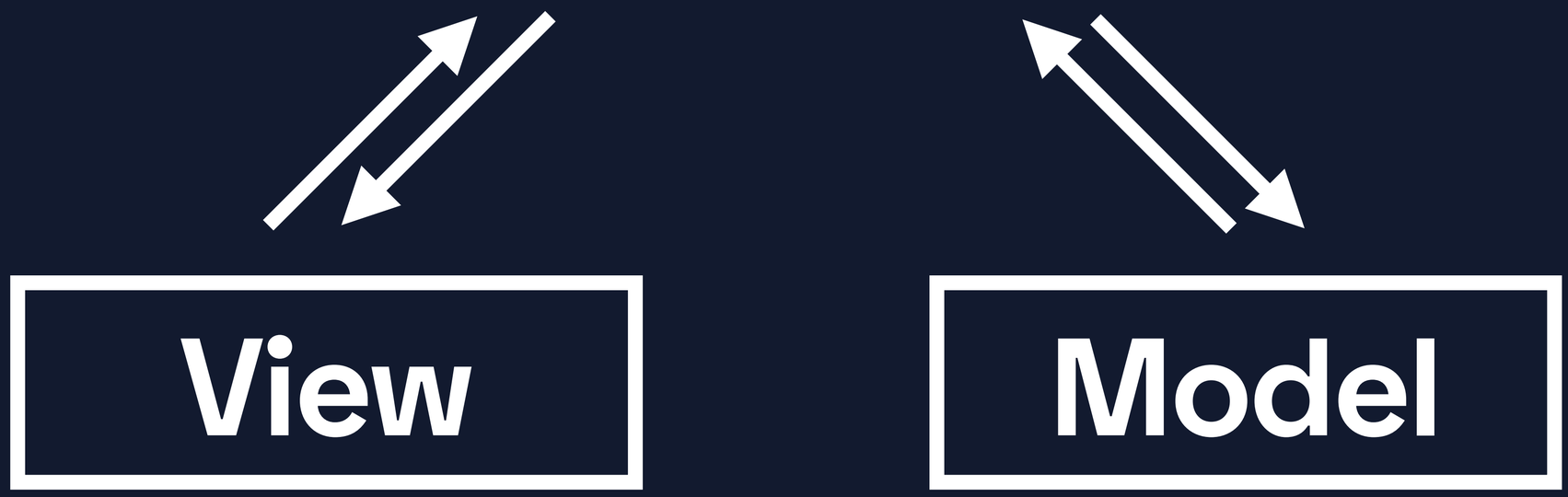
MV

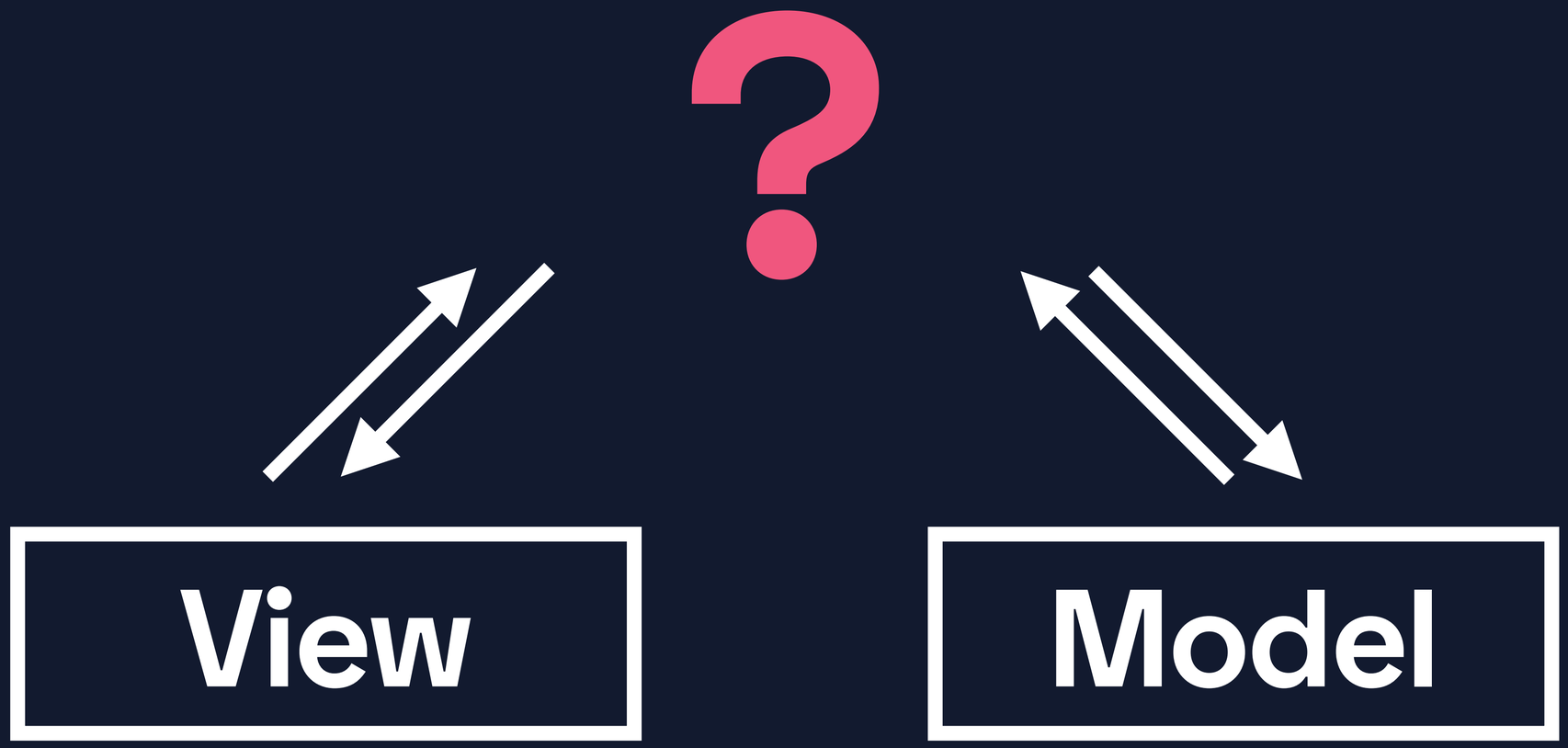
MVC

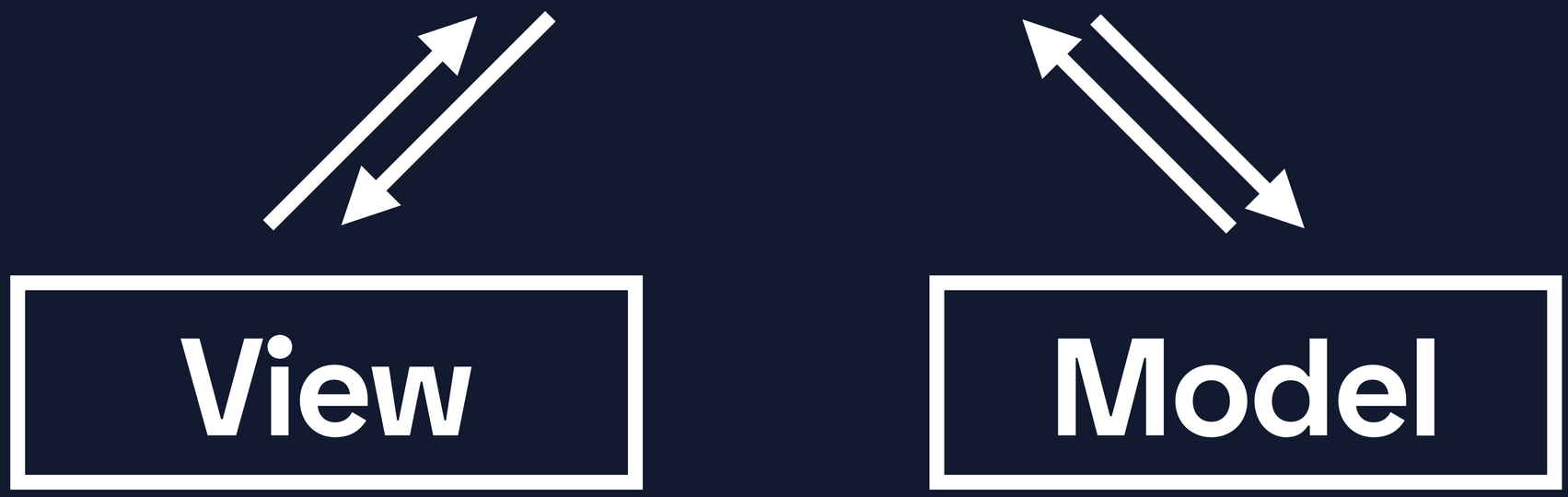

MVC

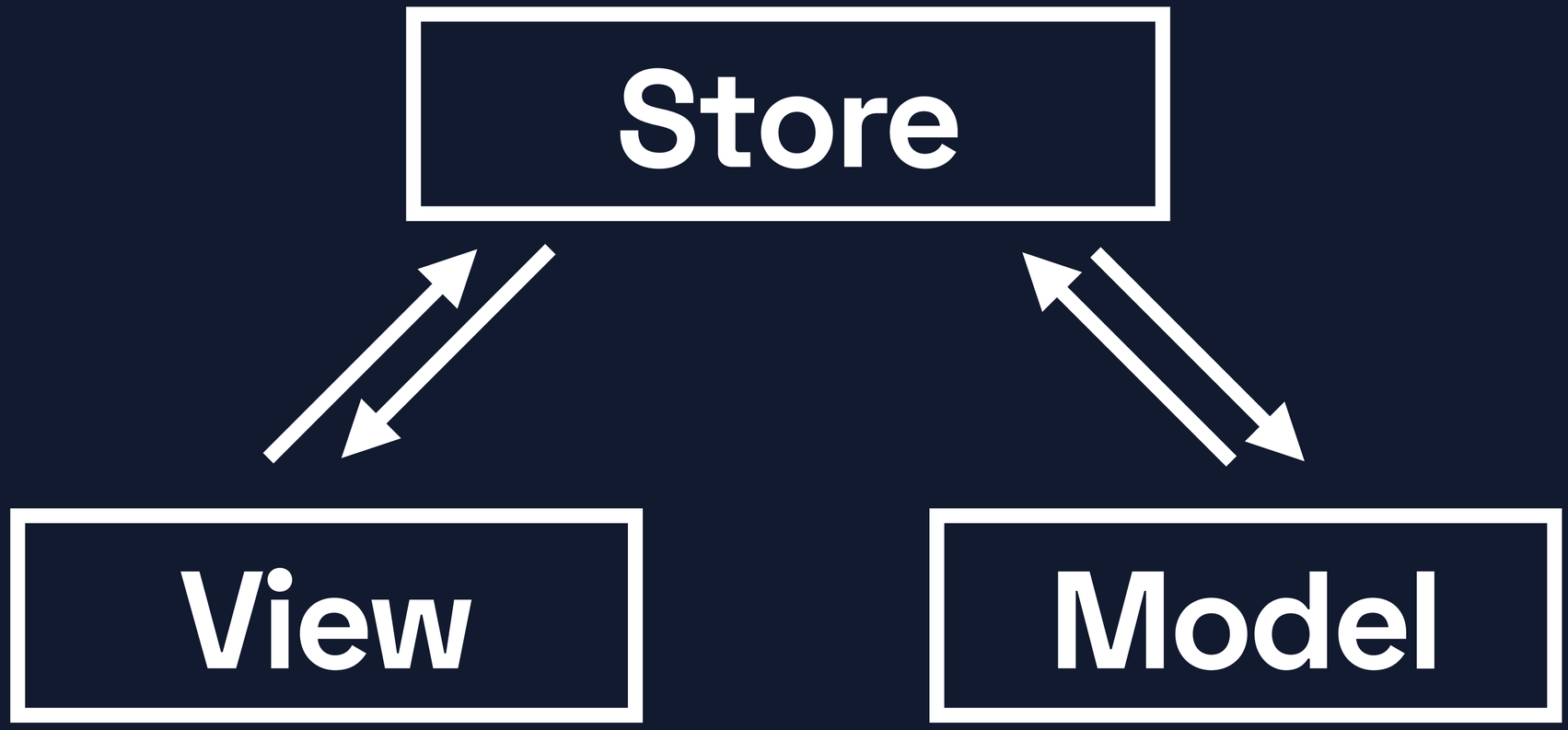
Bi-directional architecture?

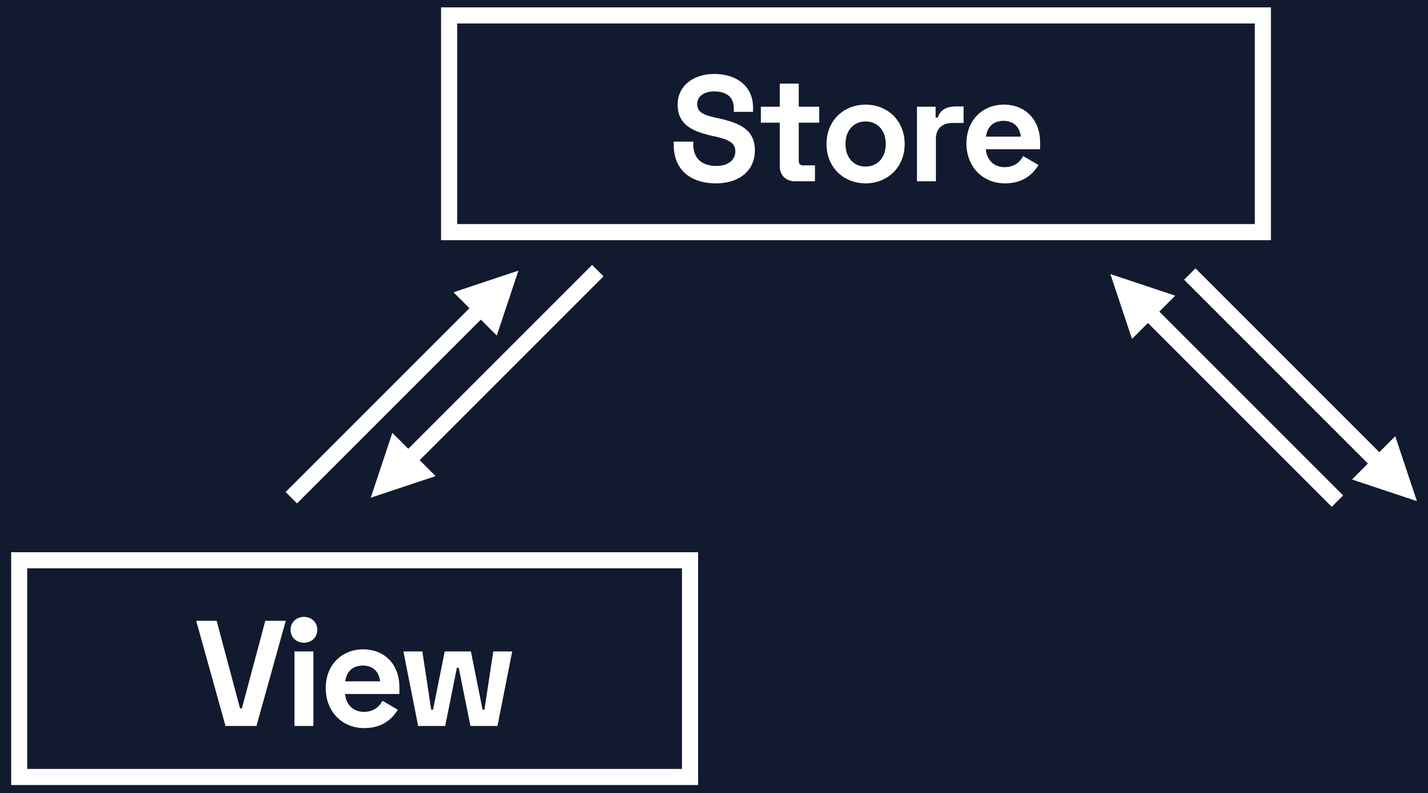

Controller
View
Model

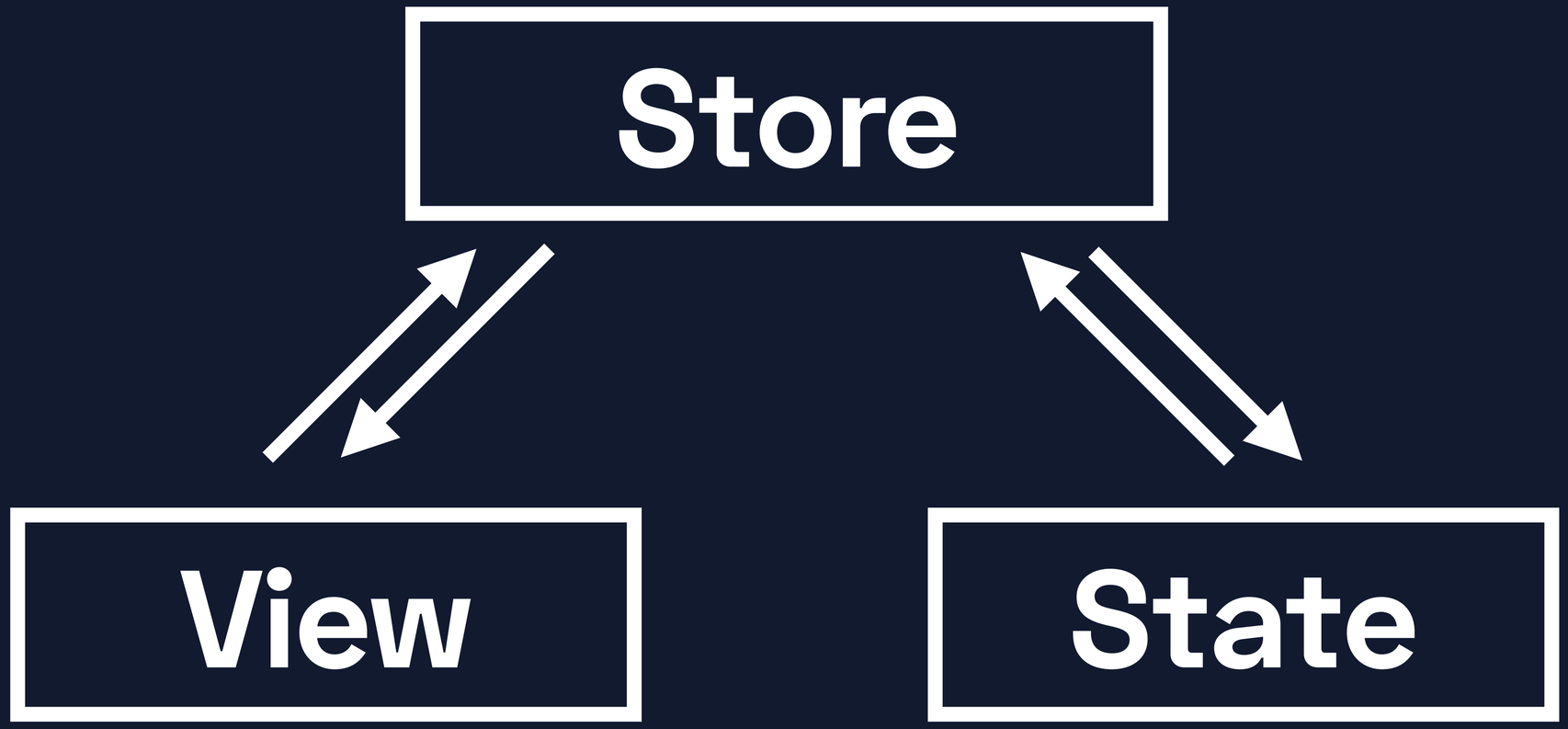

View
Model


?
View
Model


View
Model


Store
View
Model


Store
View


Store
View
State

Let’s start from scratch

Uni-directional architecture

dispatches

Action

dispatches

Action

creates new

State

dispatches

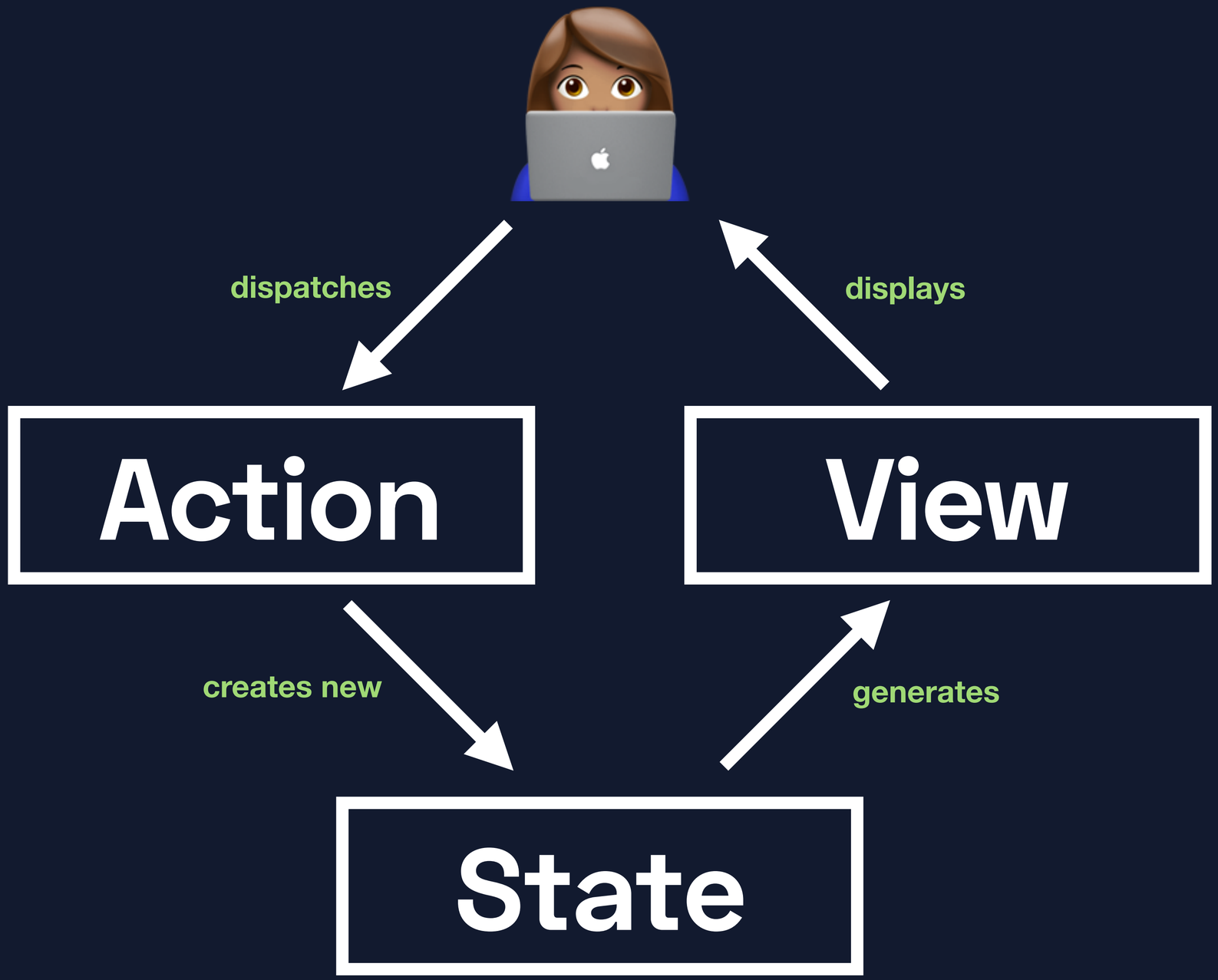
Action

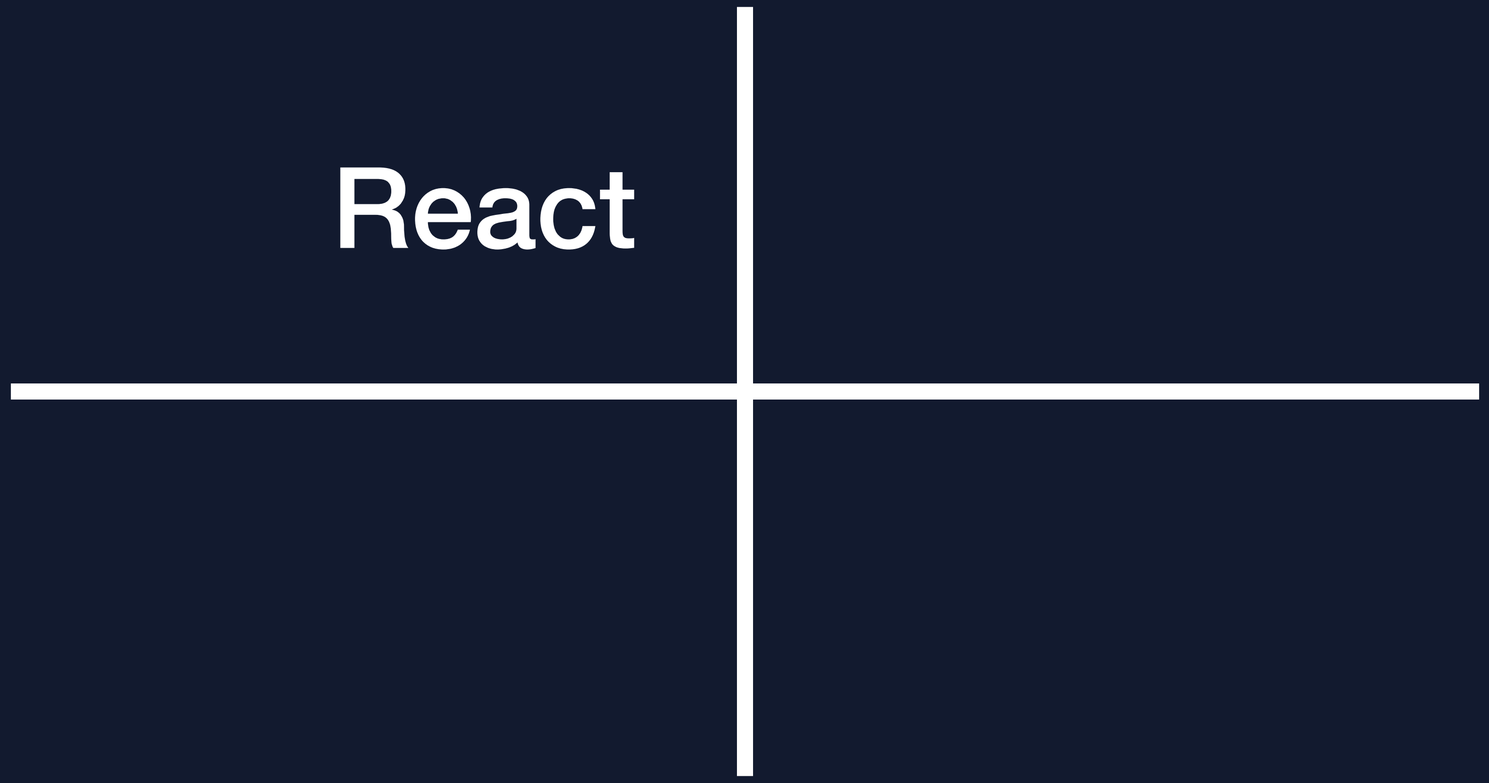
View

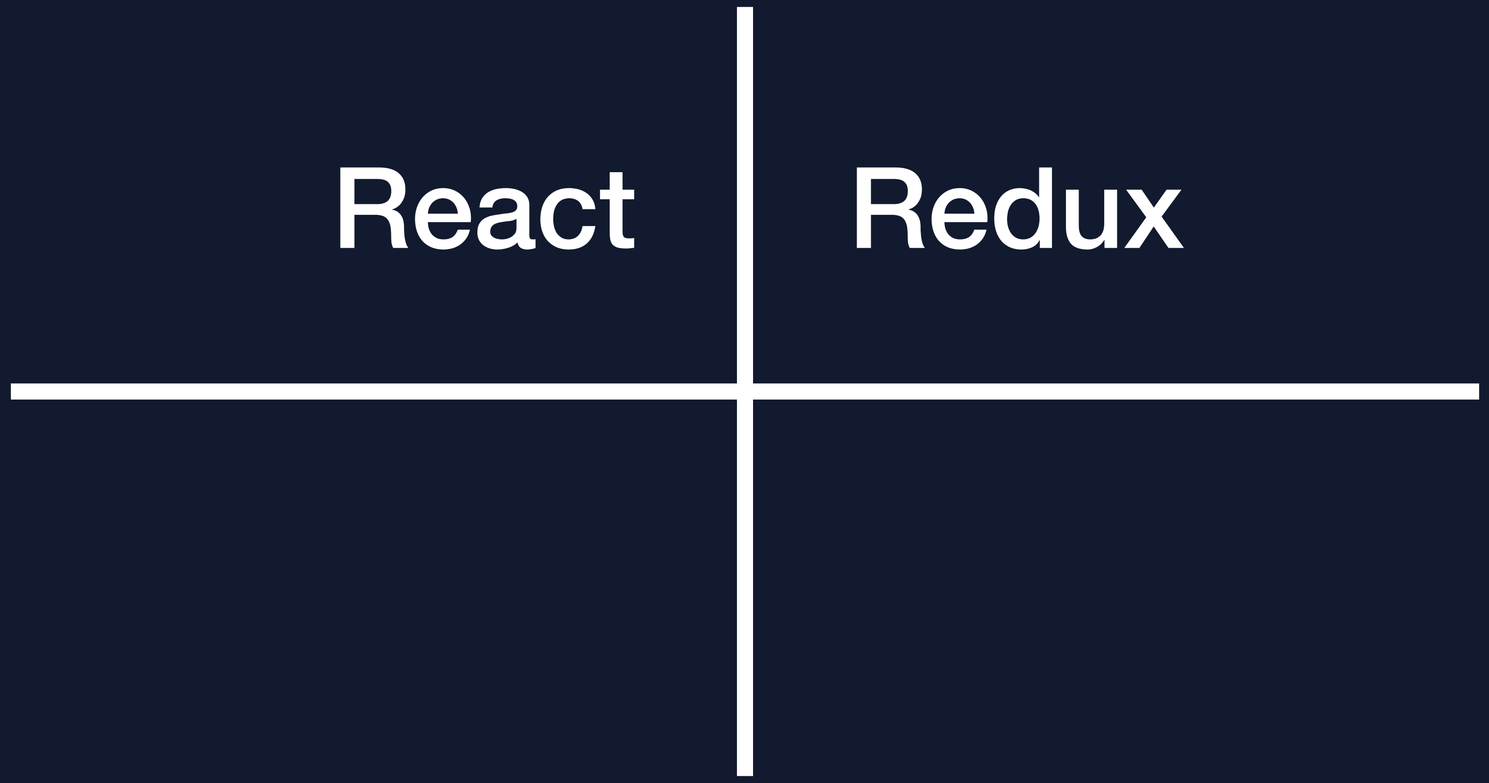
creates new

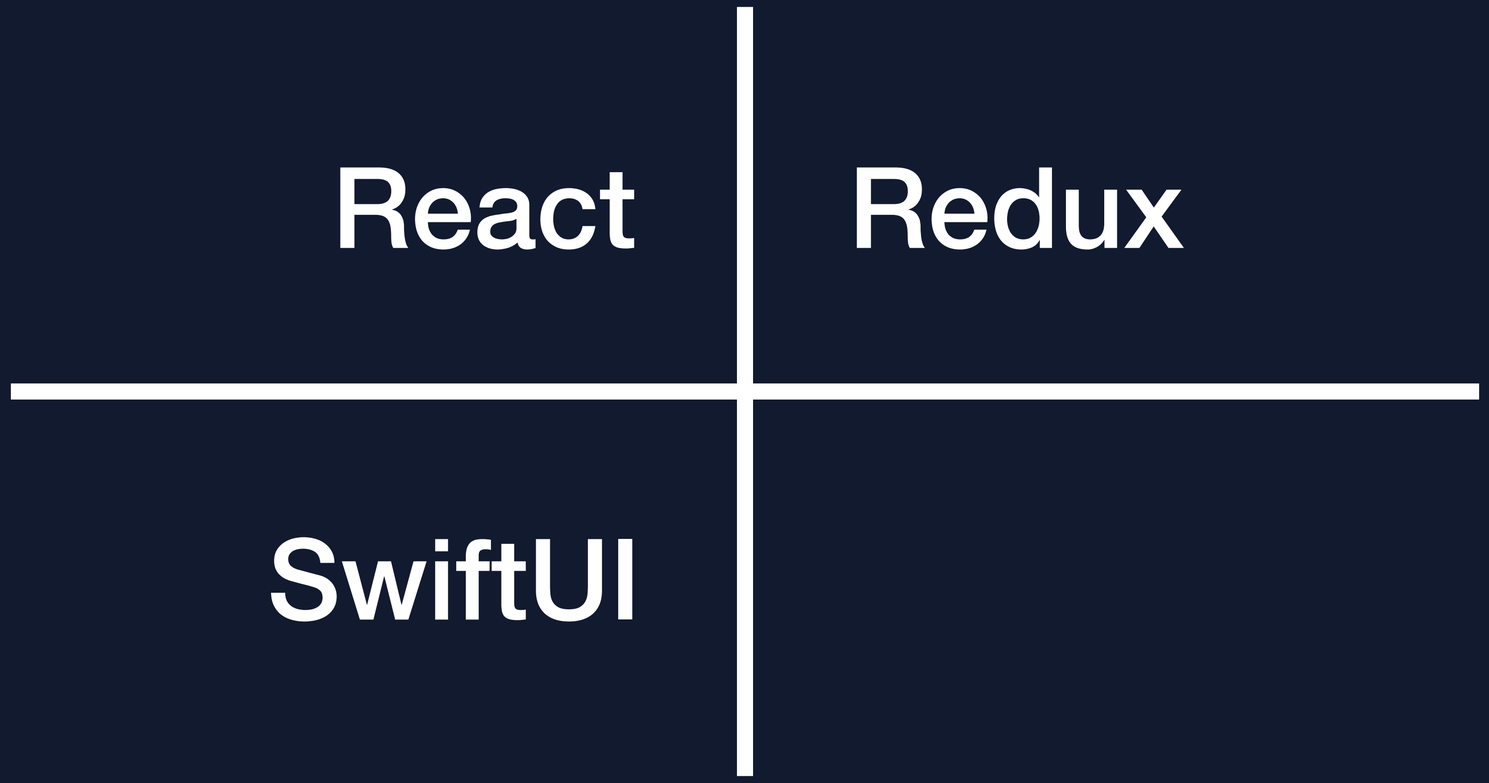
generates

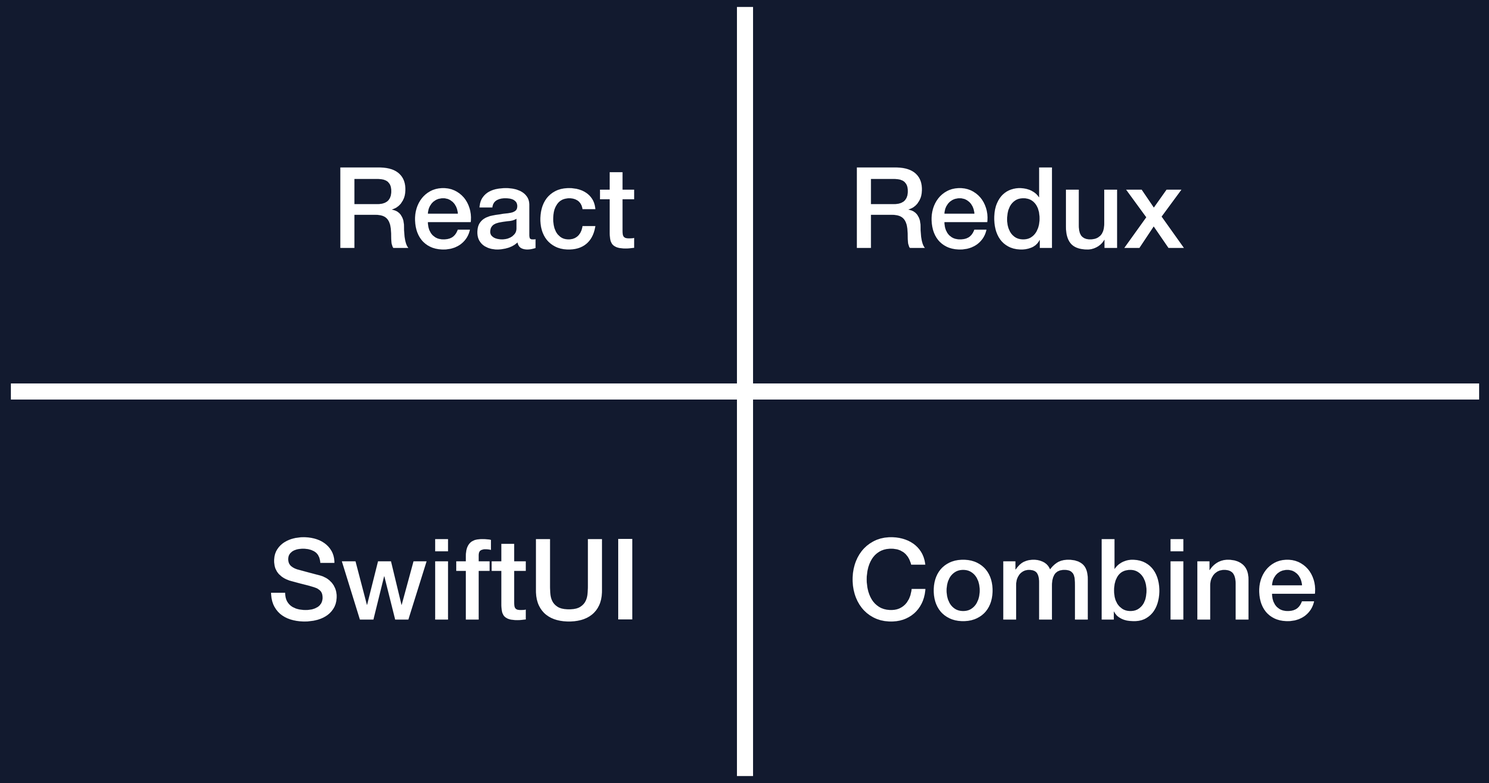
State

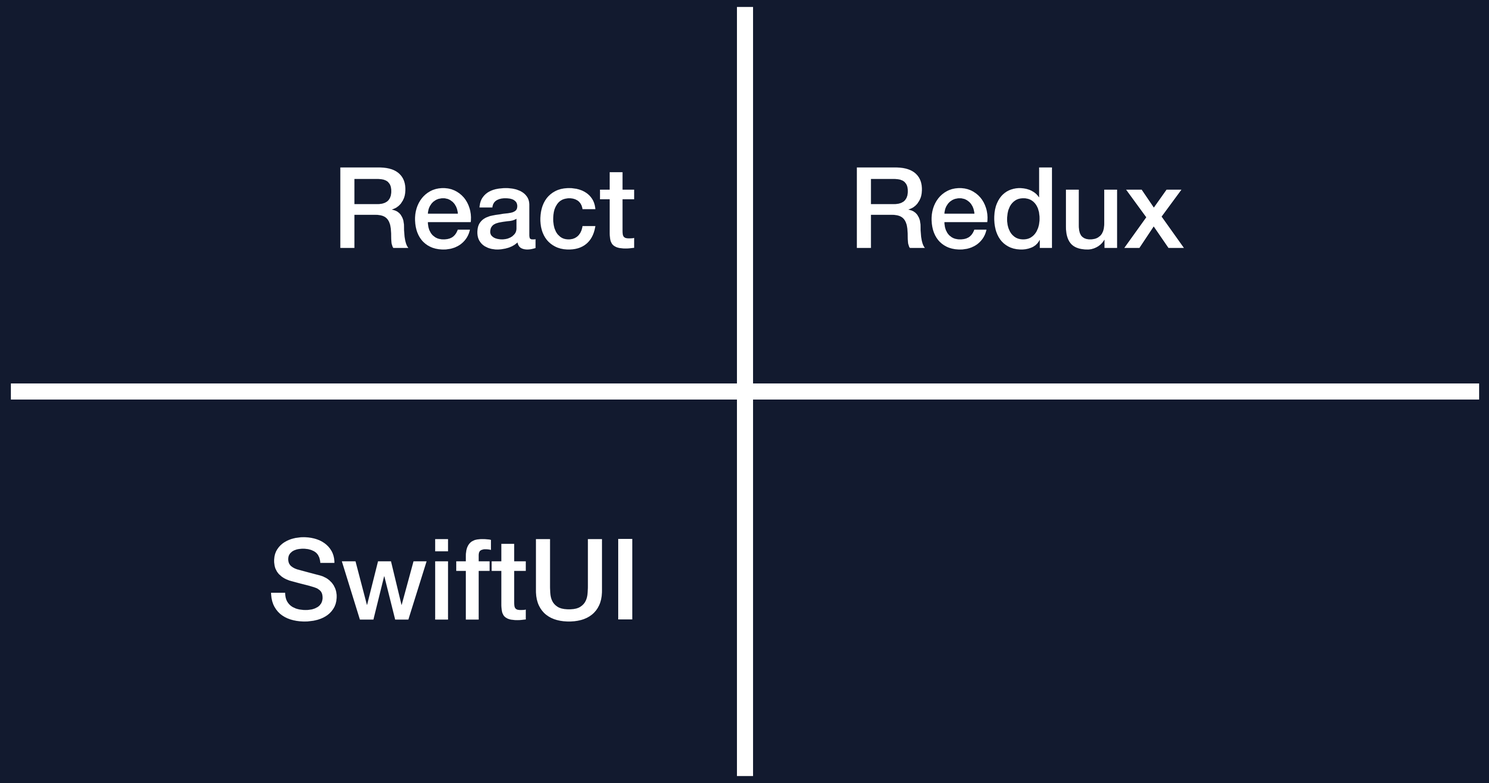

dispatches
displays
Action
View
creates new
generates
State


React


React
Redux


React
Redux
SwiftUI


React
Redux
SwiftUI
Combine


React
Redux
SwiftUI

```
protocol Action {}
```

```
protocol Action {}
typealias Reducer<State> = (State, Action) -> State
```

```
typealias Call = () -> Void
```

```
typealias Call = () -> Void
typealias Dispatch = (Action) -> Call
```

Counter.app


+
Counter app
Example
-

```
typealias AppState = Int
```

```
typealias AppState = Int
```

```
typealias AppState = Int

enum AppAction: Action {
```

```
typealias AppState = Int

enum AppAction: Action {
    case increment
```

```
typealias AppState = Int

enum AppAction: Action {
    case increment
    case decrement
```

```
typealias AppState = Int

enum AppAction: Action {
    case increment
    case decrement
    case reset
```

```swift
typealias AppState = Int

enum AppAction: Action {
    case increment
    case decrement
    case reset
}
```

```
func appReducer(state: AppState, action: Action) -> AppState {
```

```
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
```

```
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
```

```
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
```

```
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
    case AppAction.reset:
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
    case AppAction.reset:
        return 0
```

```
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
    case AppAction.reset:
        return 0
    default:
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
    case AppAction.reset:
        return 0
    default:
        return state
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
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        return max(state - 1, 0)
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        return 0
    default:
        return state
    }
```

```swift
func appReducer(state: AppState, action: Action) -> AppState {
    switch action {
    case AppAction.increment:
        return state + 1
    case AppAction.decrement:
        return max(state - 1, 0)
    case AppAction.reset:
        return 0
    default:
        return state
    }
}
```

```swift
final class ViewController: UIViewController {

    @objc func increment() {
        store.dispatch(action: AppAction.increment)
    }

    @objc func decrement() {
        store.dispatch(action: AppAction.decrement)
    }

    @objc func reset() {
        store.dispatch(action: AppAction.reset)
    }

    override func viewDidLoad() {
        super.viewDidLoad()
        view.backgroundColor = .white

        let label = UILabel()
        label.textAlignment = .center

        let incrementButton = UIButton(type: .system)
        incrementButton.setTitle("+", for: .normal)
        incrementButton.addTarget(self, action: #selector(increment), for: .touchUpInside)

        let decrementButton = UIButton(type: .system)
        decrementButton.setTitle("-", for: .normal)
        decrementButton.addTarget(self, action: #selector(decrement), for: .touchUpInside)

        let resetButton = UIButton(type: .system)
        resetButton.setTitle("Reset", for: .normal)
        resetButton.addTarget(self, action: #selector(reset), for: .touchUpInside)

        let stackView = UIStackView(arrangedSubviews: [label, incrementButton, decrementButton, resetButton])
        stackView.distribution = .fillEqually
        stackView.axis = .vertical
        stackView.frame = CGRect(x: 0, y: 0, width: 300, height: 300)
        view.addSubview(stackView)

        store.subscribe { [weak label] state in
            label?.text = String(state)
        }
    }
}
```

```swift
final class ViewController: UIViewController {

    @objc func increment() {
        store.dispatch(action: AppAction.increment)
    }

    @objc func decrement() {
        store.dispatch(action: AppAction.decrement)
    }

    @objc func reset() {
        store.dispatch(action: AppAction.reset)
    }

    override func viewDidLoad() {
        super.viewDidLoad()
        view.backgroundColor = .white

        let label = UILabel()
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        let incrementButton = UIButton(type: .system)
        incrementButton.setTitle("+", for: .normal)
        incrementButton.addTarget(self, action: #selector(increment), for: .touchUpInside)

        let decrementButton = UIButton(type: .system)
        decrementButton.setTitle("-", for: .normal)
        decrementButton.addTarget(self, action: #selector(decrement), for: .touchUpInside)

        let resetButton = UIButton(type: .system)
        resetButton.setTitle("Reset", for: .normal)
        resetButton.addTarget(self, action: #selector(reset), for: .touchUpInside)

        let stackView = UIStackView(arrangedSubviews: [label, incrementButton, decrementButton, resetButton])
        stackView.distribution = .fillEqually
        stackView.axis = .vertical
        stackView.frame = CGRect(x: 0, y: 0, width: 300, height: 300)
        view.addSubview(stackView)

        store.subscribe { [weak label] state in
            label?.text = String(state)
        }
    }
}
```

```swift
struct CounterScene: View {

    let dispatch: Dispatch
    let count: Int

    var body: some View {
        VStack {
            Text("Count: \(count)")
            Button(
                action: dispatch(AppAction.increment),
                label: { Text("+") }
            )
            Button(
                action: dispatch(AppAction.decrement),
                label: { Text("-") }
            )
            Button(
                action: dispatch(AppAction.reset),
                label: { Text("Reset") }
            )
        }
    }
}
```

```
Button(action: {
    […]
}, label: {
    Text("SomeLabel")
})
```

```
Button(action: doSomeAction, label: {
    Text("SomeLabel")
})
```

```
(Calls, State) -> View
```

Demo

“There’s beauty in going slowly, in learning things as we come across them.”

–Pedro Piñera

More information

More information

- WWDC 2019 — Session 226 — Data Flow Through SwiftUI

More information

- WWDC 2019 — Session 226 — Data Flow Through SwiftUI
- WWDC 2019 — Session 204 — Introducing SwiftUI: Build Your First App

More information

- WWDC 2019 — Session 226 — Data Flow Through SwiftUI
- WWDC 2019 — Session 204 — Introducing SwiftUI: Build Your First App
- ELM, Flux, Redux, ReSwift

More information

- WWDC 2019 — Session 226 — Data Flow Through SwiftUI
- WWDC 2019 — Session 204 — Introducing SwiftUI: Build Your First App
- ELM, Flux, Redux, ReSwift
- https://github.com/mkj-is/SwiftUI-Architecture

Q&A